

# TELEPHONE

1 HARDWARE

2 WOOD

3 INSULATORS

4 TOOLS (Small)

5 TOOLS (Large)

6 WIRE

7 CABLE

8 CORDS

9 TERMINALS

10 POWER

11 MISCELLANEOUS

12 INDEX

LABORATORY TESTED AND APPROVED

AUTOMATIC  ELECTRIC

1950  
COMPLETE SATISFACTION GUARANTEED

# SUPPLIES

**CATALOG 7000**

# **TELEPHONE SUPPLIES**

**for**

## **Construction and Maintenance**

**CONSTRUCTION MATERIALS  
LINEMEN'S EQUIPMENT  
INSTALLATION TOOLS  
EXCHANGE ACCESSORIES**

**AUTOMATIC  ELECTRIC**

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems  
Makers of Telephone, Signaling and Communication Apparatus . . . Electrical Engineers, Designers and Consultants

**Distributors in U. S. and Possessions: Automatic Electric Sales Corporation**  
**Export Distributors: International Automatic Electric Corporation**  
1033 West Van Buren Street, Chicago 7, U. S. A.

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*Detailed information on any of the above products will be furnished on request.*

# Foreword

This new Supply Catalog is your key to the shelves and bins of Automatic Electric's large and well-stocked warehouses. On its pages you will find all of the standard telephone supply items that have become your favorites, plus many new ones that have not previously appeared in any supply catalog. These new items (and improvements made in many others) demonstrate the research and development which is constantly going on in the laboratories of our company and of our suppliers. Each item has passed thorough laboratory tests, and has also proved its practical worth in the field. We confidently recommend all of these products as being thoroughly dependable—properly designed and constructed for the job!

You need open only this one book to find everything you desire in the field of telephone supplies. And though it is a big book, you'll find that it's arranged and indexed to make using it a pleasure. Try it for your next requirements.

**AUTOMATIC**



**ELECTRIC**

*October, 1950*

## Orders

In the interest of accuracy, we request that you give both a description of the product and the catalog number when ordering. Orders written in this manner with the quantity clearly indicated expedite the delivery of the material to you.

## Shipments

Shipments will be made in accordance with instructions received with order. Specify whether we shall ship by freight, express or parcel post and also give preferred routing. In the absence of instructions, we will use our best judgment in routing shipments to give you the very best service.

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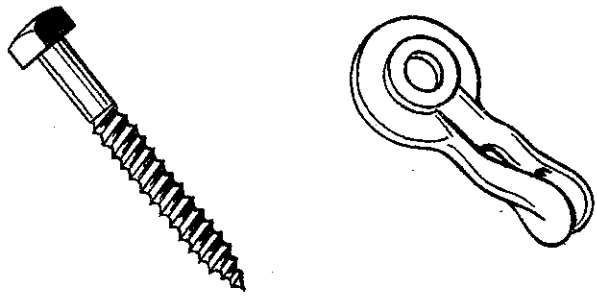
ELECTRIC

## Terms

New accounts are solicited on a credit basis. In order to facilitate prompt shipment, send references or other information of a credit character with your order provided you are not rated by the commercial agencies. If it is desired to avoid delay on your first order incidental to communicating with references, etc., instruct us to ship C. O. D. by express or parcel post, or by freight.

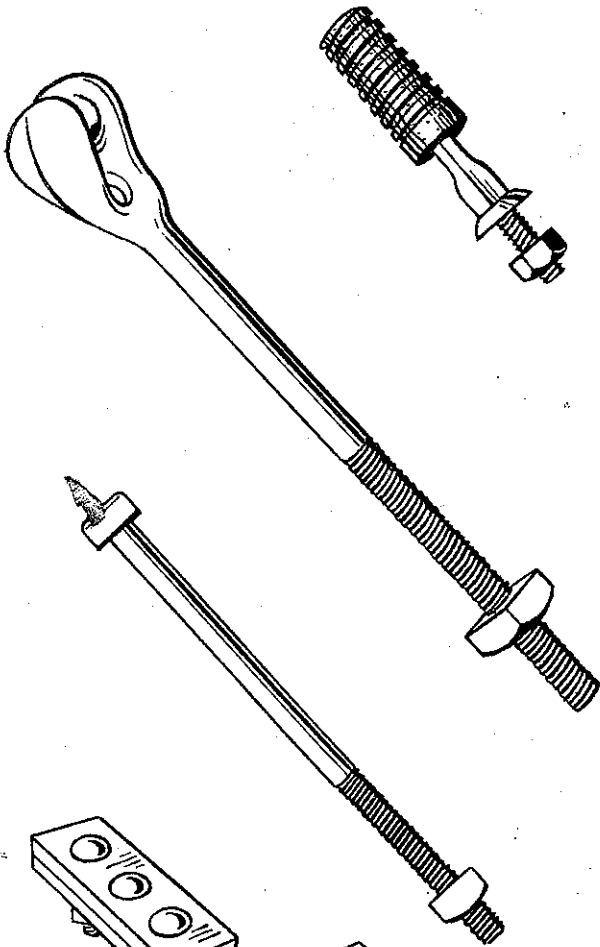
## Returned Goods

Always notify us before making a return shipment. This will enable us to make proper adjustment without delay.



ANCHORS

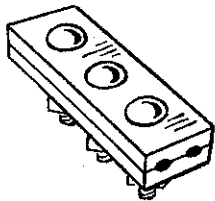
ANCHOR RODS



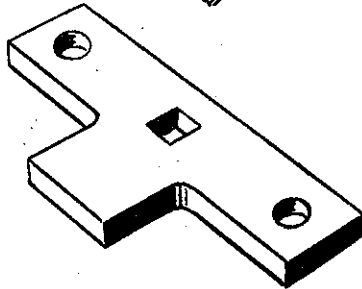
GUY CLAMPS

**1**

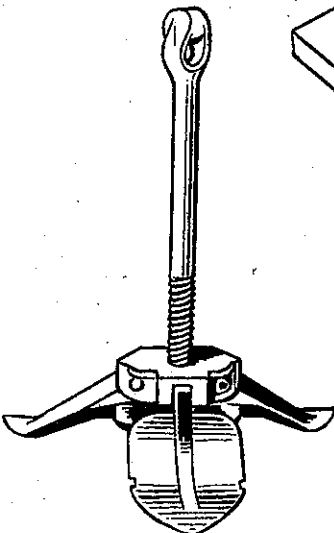
# Hardware



STRAND CONNECTORS



GUARD ARM BRACES



BOLTS

Index for this section on reverse side





## ***Index for Section One***

<b>Page</b>	<b>Item</b>	<b>Page</b>	<b>Item</b>
7 . . .	Anchors Nevercreep Anchor Rods	17 . . .	Grade Clamps Cable Suspension Clamps
8 . . .	Anchors Nevercreep Installing Tools Anchor Rods	18 . . .	Crossover Clamp Strand Ground Clamp Lead Serving Tape Reinforcing Links Strand Connector Wall Straps Alley Arm Braces
9 . . .	Steelwing Anchors Thimbleye Nuts Angle Bolt Thimbleyes Guy Hooks Guy Plates Guy Straps	19 . . .	Side Extension Fixtures Cable Extension Arms Guard Arm Brace
10 . . .	Guy Thimbles Guy Clamps Wire Rope Clips Washers	20 . . .	Steel Pins Pole Dating Nails Reinforcing Straps Guard Arm Hook Hook Brackets
11 . . .	Guy Wire Protectors Guy Wire Clips	21 . . .	Transposition Brackets
12 . . .	Servisleevs Messenger Hangers Terminal Brackets Cross Arm Braces	22 . . .	Transposition Brackets Corner Brackets
13 . . .	Thimbleye Bolts Machine Bolts Turnbuckles	23 . . .	Pole Bracket House Bracket Bracket Straps and Clips U Cable Guards Straps, Cable Guard Ground Wire Moulding
14 . . .	Wood Screws Double Arming Bolts Carriage Bolts Stove Bolts	24 . . .	Ground Rods Kling Ground Clamps Adjustable Ground Clamps Staples Galvanized Nails and Spikes Pole Shims
15 . . .	Lag Screws Pole Steps Pole Balcony	25 . . .	Span Clamps Locust Pin Bushing Galvanized Nuts Strain Plates
16 . . .	Pole Seats Pole Stubbing Clamps Aluminum Letters and Numbers Pole Tags Steel Girder Clamps		

## Kearney Expanding Anchors



Easily and quickly installed in any kind of soil, at any angle, by one man. A hole is bored and the anchor placed so that the blades will be horizontal. A tamping bar is pushed along the rod until it strikes the top of the blades. A few blows and the blades open into undisturbed earth.

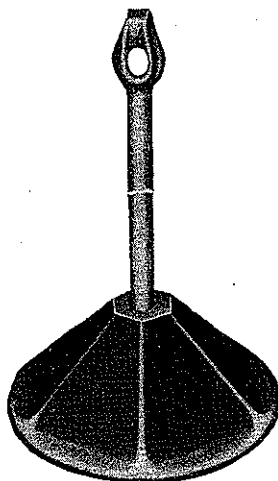
### Two-Way Types

Cat. No.	Type	Size Expanded Inches	Rod Size Inches	Wt. per 100, Lbs.
S-2018	5053	5 x 13	1/2 to 5/8	500
S-2019	6069	6 x 14 1/2	1/2 to 5/8	800
S-2089	6076	6 x 15	1/2 to 5/8	800
S-2020	82090	8 x 14	1/2 to 3/4	1040
S-2090	7104	7 x 17 1/2	5/8 to 3/4	1250
S-2091	8120	8 x 19	5/8 to 1	1400
S-2092	8136	8 x 20	5/8 to 1	1800
S-2022	10208	10 x 25	3/4 to 1	3175

### Three-Way Types

S-2023	8090	8 x 14 3/4	1/2 to 5/8	1000
S-2025	8110	8 x 16 3/4	1/2 to 3/4	1075
S-2026	8125	8 x 18 1/4	5/8 to 1	1250

## Cone Anchors



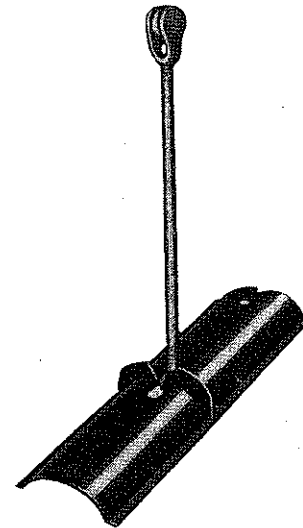
Cone anchors are designed for use in rocky locations, or other locations where moisture does not penetrate the earth deeply.

For installing bore a hole slightly larger than the diameter of the anchor. Drop anchor to bottom of hole (with anchor rod attached) and tamp a quantity of crushed rock around it. Hole is then filled with tamped earth and anchor is ready for use. (For anchor rods see page 8.)

Cat. No.	Base Diam. In.	Rod Size, In.	Wt. per 100, Lbs.
S-2006	6	1/2 or 5/8	320
S-2009	8	5/8 or 3/4	668

NOTE: 10 or 12-inch anchors supplied on order.

## Never-Creep Anchors



Pulling at right angles to strain in installing hole, the Chance Never-Creep anchor gives unusual holding power. All strain is directed against undisturbed earth.

To install, locate hole approximately at right angles to line of pull, drive anchor rod through solid earth into hole, pass anchor down hole and hang on rod. Anchor then rests against side of hole in inclined position at right angle to pull.

### Anchor Plates

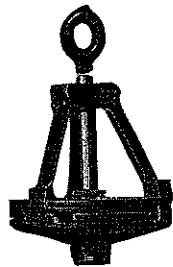
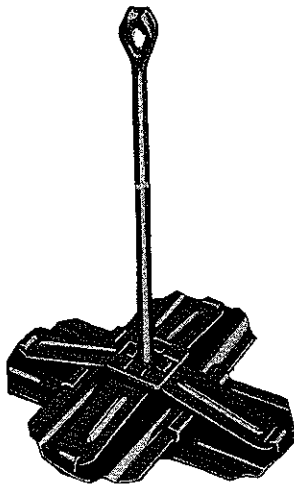
Cat. No.	Plate, In.	Rod Size, In.	Wt. Per 100, Lbs.
S-2073	6 x 17	1/2 or 5/8	905
S-2074	6 x 22	5/8 or 3/4	1180
S-2077	8 x 22	5/8 or 3/4	1602
S-2080	8 x 27	5/8 or 3/4	1935
S-2085	8 x 35	1	2750
S-2088	10 x 40	1	4761

### Never-Creep Thimbleye Anchor Rods

Never-Creep type anchors can be used only with Never-Creep rods. Rods with single thimbleye shown below; rods with twineye for double guying can be supplied on special order.

Cat. No.	Diameter, In.	Length, Ft.	Wt. per 100, Lbs.
S-6184	1/2	5	300
S-6186	1/2	6	450
S-6188	1/2	7	500
S-6190	5/8	6	680
S-6192	5/8	7	755
S-6194	5/8	8	830
S-6198	3/4	7	1120
S-6200	3/4	8	1245
S-6204	1	8	2300

## Expansion Anchors



Everstick—Above  
Chance—Left

Popular, easily installed anchors. A hole is dug and anchor dropped to bottom and expanded by striking with tamping bar. Requires little effort.

Standard styles from two prominent manufacturers (as listed below) in three types — two-way, three-way and four-way.

Designed to be used with standard galvanized anchor rods.

### Everstick Style

Cat. No.	Style	Type and Size Inches	Rod Size Inches	Area Expanded Sq. Inches	Lbs. per 100
S-2030	62	Two-way, 6	*	55	680
S-2036	82	Two-way, 8	5/8"	100	1100
S-2042	633	Three-way, 6	5/8"	65	780
S-2045	834	Three-way, 8	5/8"	90	1100
S-2048	836	Three-way, 8	3/4"	110	1400
S-2051	8310	Three-way, 8	3/4"	125	1450
S-2069	104	Four-way, 10	1"	210	3030
S-2068	124	Four-way, 12	1 1/4"	310	5350

\* Either 1/2 or 5/8 inch rod size

### Chance Style

Cat. No.	Style	Type and Size Inches	Rod Size, Inches	Area Expanded, Sq. Inches	Lbs. per 100
S-2027	62	Two-way, 6	1/2 or 5/8"	53	485
S-2033	826	Two-way, 8	5/8 or 3/4"	98	965
S-2054	64	Four-way, 6	1/2 or 5/8 or 3/4"	70	740
S-2060	846	Four-way, 8	5/8 or 3/4"	115	1407
S-2066	1044	Four-way, 10	1"	200	2493

## Never-Creep Anchor Installing Tool



Designed to use as an installing tool, retriever and a tamp. Hook designed to fit easily in hole in anchor. Seasoned hickory handle is fitted with malleable tamp casting.

Cat. No.	Length, Ft.	Wt., Lbs.
S-2362	10	9

## Maul



Used for driving rod into hole. Head is fitted with hot-paraffin-dipped, seasoned hickory inserts to prevent damage to anchor rods.

Cat. No.	Wt., Lbs.
S-5310	12

## Thimbleye Anchor Rods

### Hot Galvanized



As the name implies, Thimbleye Anchor Rods eliminate the need for guy thimbles. The rod ends are made to conform to the curvature of the guy strand—it can be pulled tight without distortion. Drop-forged steel, heavily galvanized, with clean threads. Deeply grooved to seat strands efficiently. Fitted with square nut. For washers see page 10.

Cat. No.	Diameter, In.	Length, Ft.	Wt. per 100, Lbs.
S-6156	1/2	5	375
S-6158	1/2	6	450
S-6160	1/2	7	510
S-6162	5/8	5	605
S-6164	5/8	6	680
S-6166	5/8	7	755
S-6168	5/8	8	830
S-6174	3/4	6	960
S-6176	3/4	7	1120
S-6178	3/4	8	1245
S-6179	3/4	9	1465

### Twineye Rods

Cat. No.	Diameter, In.	Length, Ft.	Wt. per 100, Lbs.
S-6177	3/4	8	1280
S-6180	3/4	9	1460
S-6181	1	8	2310
S-6182	1	10	2867

## Steelwing Anchors

Hot Galvanized



A labor-saving anchor that provides a large holding area in undisturbed earth. Requires no special tools to install. Drive a crowbar about 18 inches into earth and work with circular motion until top of hole is slightly larger than wing of anchor. Place anchor in hole and use crowbar to screw into ground to desired depth. Furnished with special E-Z eye, high-carbon steel rod and drop forged wings.

Cat. No.	Wing Diam., In.	Rod Diam., In.	Length, Ft.	Wt. per 100, Lbs.
S-2098	4	$\frac{3}{4}$	5½	800
S-2102	6	$\frac{3}{4}$	5½	1100
S-2103	7	1	5½	1750
S-2104	8	1	5½	2000
S-2107	10	1¼	5½	3200
S-2110	10	1¼	8	4300

## Thimbleye Nuts

Hot Galvanized



Drop forged. Designed for use on through bolts, eye bolts, double arming bolts, straight and angle thimbleye bolts, cross arm bolts and other attachments where it is desired to convert a standard threaded bolt to a thimbleye. Commonly used for dead-ending a messenger strand or span guy. Made with a generous radius and ample side-wall support for strand.

Cat. No.	Bolt Dia., In.	Weight per 100, Lbs.
S-5548	$\frac{1}{2}$	118
S-5550	$\frac{5}{8}$	117
S-5552	$\frac{3}{4}$	116
S-5553	1	166

## Angle Bolt Thimbleyes



These eliminate the use of strain plates, guy hooks, lags and nails in guying and often save from three to five feet of strand. They are easy to install and are often used under the nut of a dead-end thimbleye bolt. Hole is not threaded.

Cat. No.	Bolt Dia., In.	Strand, In.	Eye Radius, In.	Weight per 100, Lbs.
S-2164	$\frac{5}{8}$	$\frac{1}{2}$ and under	9/16	70
S-2165	$\frac{3}{4}$	$\frac{1}{2}$ and under	11/16	105

## Guy Hooks

Hot Galvanized

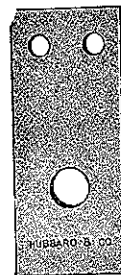


Made in three styles for a variety of needs. Constructed with rounded wire grooves to assure strand a safe bending radius. Have 9/16-inch holes for attaching to poles with half-inch lag.

Cat. No.	Size and Length, In.	Type	Weight per 100, Lbs.
S-4834	1¼ x ¼ x 3¼	Light (one hole)	40
S-4836	1½ x ⅝ x 3½	Heavy (one hole)	65
S-4838	1¾ x ⅝ x 4	Medium (one hole)	89
S-4840	1½ x ⅝ x 6	Heavy (two hole)	91

## Guy Plates

Hot Galvanized



Guy plates, or load or lift plates as they are also called, are used under the eye of the guyeye or thimbleye angle bolts to distribute the strain over a greater area. They are fastened to the pole with half-inch lag screws.

Curved

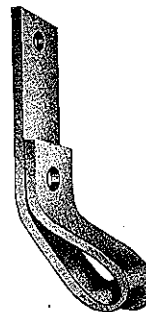
Cat. No.	Bolt Dia., In.	Plate Size, In.	Weight per 100, Lbs.
S-5712	$\frac{5}{8}$	2½ x 7 x ⅞	95
S-5714	$\frac{3}{4}$	2½ x 7 x ¼	124
S-5716	1	2½ x 7 x ⅞	148

Flat

S-5718	1 (and under)	2½ x 7 x ⅞	148
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## Guy Straps

Hot Galvanized



Guy Straps, or Storm Guys, as they are also known, are constructed with rounded wire grooves to give the strand safe bending radius. There are two types. Storm type has two holes for attaching, cross arm type has single hole. Will take strands to half-inch diameter.

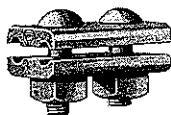
Cat. No.	Hole Diameter Upper Lower	Size, In.	Weight per 100, Lbs.
S-2262	9/16 13/16	¼ x 1½ x 7	117
S-2263	11/16	¼ x 1½ x 4½	86



**Guy Thimbles**

High grade steel, thoroughly galvanized. Thimbles are grooved to fit the guy strand and bent to the mechanically correct radius to avoid sharp kinks. Thimble ends are separated to enable slipping over size of guy rod indicated in listing below.

Cat. No.	Strand Size, In.	Rod Size, In.	Weight per 100, Lbs.
S-7488	$\frac{3}{8}$	$\frac{1}{2}$ and $\frac{5}{8}$	9 $\frac{1}{2}$
S-7490	$\frac{1}{2}$	$\frac{5}{8}$ and $\frac{3}{4}$	22
S-7492	$\frac{5}{8}$	1	45

**Guy Clamps**  
Hot Galvanized

Guy Clamps are held to rigid tolerances to assure proper seating of the guy strand and maximum holding power. All clamps have straight, smooth, parallel grooves, offer greater clamping area than any other design, and are not injurious to the guy strand. All holes are centered so that the two halves line up perfectly. Bolt shoulder and bolt holes are elliptical shaped to prevent turning when nut is tightened. Three-bolt clamps are assembled with center bolt reversed to provide ample wrench clearance.

**Light Type**

Cat. No.	No. Bolts	Length* Inches	Width Inches	Strand Size Inches	Weight Pounds 100 Pcs.
S-3516	1	1 3/4	1 1/4	1/8 to 1/4	48
S-3518	2	3 3/4	1 1/4	1/8 to 1/4	106
S-3520	3	5 3/4	1 1/4	1/8 to 1/4	160

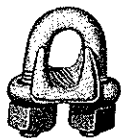
**Medium Type**

S-3522*	1	1 7/16	1 9/16	1/4 to 3/8	63
S-3524	2	3 3/8	1 9/16	3/16 to 1/4	132
S-3526	3	4	1 9/16	5/16 to 3/8	185
S-3530	3	6	1 9/16	5/16 to 3/8	246

**Heavy Type**

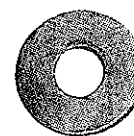
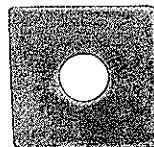
S-3532	2	4	1 21/32	5/16 to 1/2	174
S-3534	3	6	1 21/32	5/16 to 1/2	284

\* S-3522 has square bolt head and bolt hole to minimize tipping as bolt is tightened.

**Wire Rope Clips****Hot Galvanized**

Available in a complete range of sizes in malleable iron. Saddle properly grooved to fit specified strand. All surfaces smoothly finished to eliminate rough edges.

Cat. No.	Strand Size In.	Weight per 100, Lbs.
S-3662	$\frac{1}{4}$	16
S-3663	$\frac{5}{16}$	18
S-3664	$\frac{3}{8}$	24
S-3666	$\frac{1}{2}$	44
S-3668	$\frac{5}{8}$	61

**Round and Square Washers****Hot Galvanized**

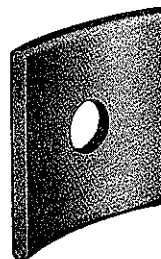
Washers are cleanly cut and galvanized in such a manner as to insure a smooth, even coating with no lumps or drops to interfere with bolt or nut.

**Round Washers**

Cat. No.	Outside Dia., In.	Hole Dia., In.	Thickness, In.	Weight per 100, Lbs.
S-7700	1	7/16	5/64	1.6
S-7702	1 1/4	1/2	5/64	2.6
S-7704	1 3/4	9/16	7/64	4.2
S-7706	1 3/4	1 1/16	1/8	8.4

**Square Washers**

Cat. No.	Size, In.	Hole Dia., In.	Bolt-Rod Dia., In.	Weight per 100, Lbs.
S-7708	2 x2 x1/8	11/16	1/2 or 5/8	14.6
S-7709	2 1/4 x2 1/4 x3/16	11/16	1/2 or 5/8	24.2
S-7710	2 1/4 x2 1/4 x3/16	13/16	5/8 or 3/4	22.8
S-7712	3 x3 x3/16	13/16	5/8 or 3/4	47.8
S-7716	4 x4 x3/16	13/16	5/8 or 3/4	87.5
S-7718	4 x4 x1/4	15/16	3/4	115
S-7719	4 x4 x1/2	1 3/16	1	251

**Curved Washers****Hot Galvanized**

Used in guy construction to help distribute strain over a large pole area. For dead-ending a messenger, curved washers are used on the nut end of a thimble bolt. Cleanly cut, smoothly galvanized, there are no irregularities to prevent proper seating of bolt heads or nuts.

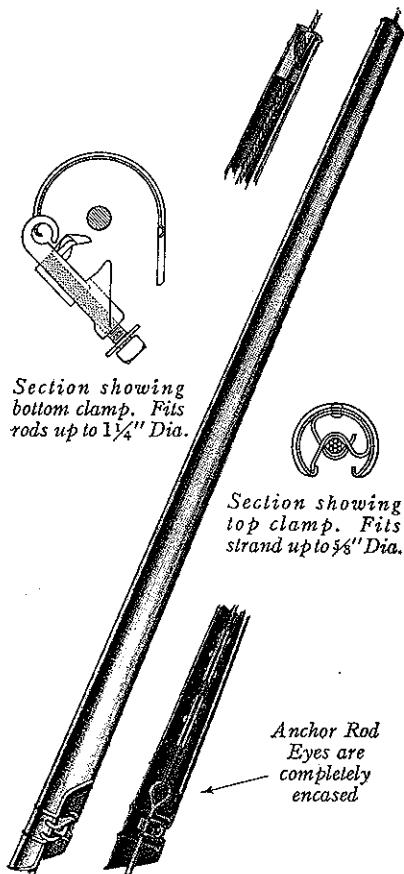
Cat. No.	Size, In.	Bolt Diam., In.	Wt. per 100, Lbs.
S-7722	2 1/2 x2 1/2 x3/16	5/8	34
S-7724	3 x3 x1/4	3/4	66

**Stubbing Washers****Hot Galvanized**

Identical in appearance with curved washers listed above. Used on each end of the through bolt to draw the pole and stub together and also used as a clip to draw together the wires wrapped around the pole and stub.

Cat. No.	Size, In.	Hole Dia., In.	Bolt Diam., In.	Wt. per 100, Lbs.
S-7726	3 1/4 x3 1/4 x1/4	13/16	5/8 or 3/4	85
S-7728	3 1/2 x3 3/8 x3/8	13/16	5/8 or 3/4	120

## Guy Wire Protectors Hot Galvanized



Full round guy-wire protectors are made from 18-gauge steel, combining strength, visibility and ease of installation. Attachment at top engages the guy wire (up to 3/8-inch) after which lower end is brought into alignment and swinging clamp is locked over rod, holding it rigidly centered on strand. Formed to provide ample clearance for all standard anchor eyes and clamps.

The half-round type of guy-wire protector also gives highly satisfactory service. Clamping is accomplished by U-Bolts which are designed to fit either clamp, rod or strand. Will not turn on wire. (Not illustrated).

Shipment is made with all parts assembled or attached. Nothing loose to be mislaid or forgotten. Be sure to specify style wanted on order.

Cat. No.	Style	Length, Ft.	Wt. per 100, Lbs.
S-5978	Half-Round	7	1100
S-5980	Half-Round	8	1200
S-5982	Full-Round	7	1100
S-5984	Full-Round	8	1200

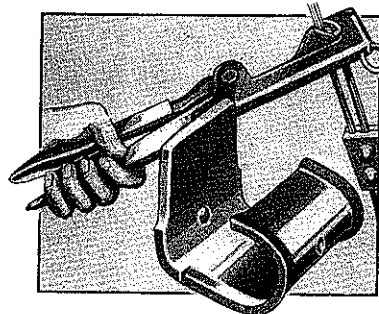
## Overton Flexibal Guy Guard



Designed by an engineer, tested in the field. The Flexibal combines unusual flexibility, visibility, protection and long-life. Seasoned hardwood, finished in durable aluminum paint with one hot-dipped galvanized nail already inserted. Easily and quickly applied with a few blows of a hammer. Safe for animals, cars, accidental impacts. Weather resistant, highly attractive. Each set complete with positive cable clamp.

Cat. No.	Type No.	Length Ft.	Weight Lbs.
S-4521	85	5	4
S-4523	86	6	4 1/2
S-4525	87	7	5

## Kearney Guy Wire Clips

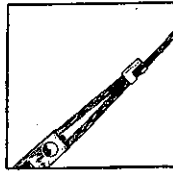
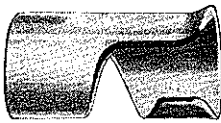
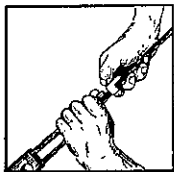


Designed to provide a safer, less laborious method of serving up strand ends. They are half-formed to fit the strand and may be installed with either ordinary pliers or a special tool. Cannot damage strand and are quicker to install than most ordinary guy wire clips. Furnished in aluminum, in five sizes, to fit standard guy strands. Can be supplied in copper or galvanized iron on order.

Cat. No.	Strand Size, In.	Wt. per 100, Lbs.
S-3674	1/4	2
S-3676	5/16	2
S-3678	3/8	2 1/2
S-3680	7/8	2 1/2
S-3682	1/2	2 3/4
S-7521	Guy Wire Clip Tool	300

**Servisleevs**

**Hot Galvanized**



Used to serve up strand ends. No cutting, clipping or crimping necessary. Easily and quickly installed without special tools. Retains original shape and maintains a firm grip at all times.

Cat. No.	Strand Size, Ins.	Length, In.	Weight per 100, Lbs.
S-6783	1/4	1 3/8	3
S-6784	5/16	1 1/2	5 1/2
S-6786	3/8	1 3/4	7 1/2

**Non-Breakable Messenger Hangers**

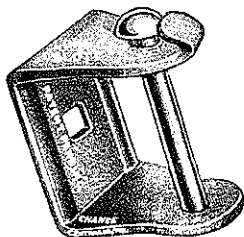
**Hot Galvanized**



Uses a standard 5/8-inch through bolt for installing—requires no extra nuts. The vertical finger keeps the messenger in place while it is being pulled tight and it is then dropped into groove and nut is set up. Made of malleable iron, with back curved to fit the pole. Has a long clamping surface and supports the cable well away from the pole.

Cat. No.	Size Strand, In.	Wt. per 100, Lbs.
S-4722	1/4 to 5/16	150
S-4710	3/8 to 1/2	160

**Chance Terminal Brackets**



For various types of dead-ending and terminal use. The insulator locks into the bracket after mounting. No keys or nuts are necessary. Brackets and pins are galvanized. Ideal for an inexpensive and efficient dead-ending method. Brackets and insulators must be ordered separately, as listed below.

Cat. No.	Description	Wt. per 100, Lbs.
S-3130	Brackets with Pins	35
S-4922	Single-Groove Insulators	38

**Cross Arm Back Braces**

**Hot Galvanized**



These braces are used for back-bracing cross arms at corners and on terminal poles. In many cases they eliminate the necessity for double arming.

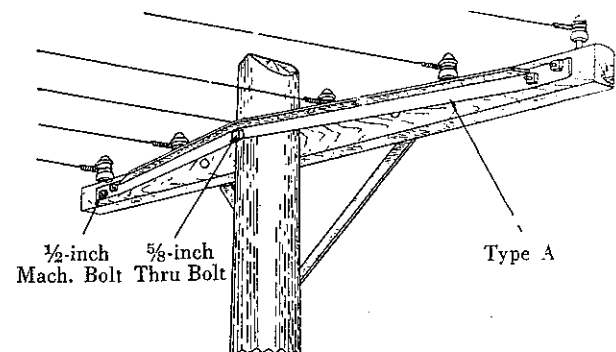
Open Hearth steel, furnished in two styles: Type A (light) shown above, fastens to cross arm by half-inch carriage bolts at each end and to pole by 5/8-inch machine bolt. Type B (heavy) fastens to arm by two half-inch machine bolts at each end and 5/8-inch machine bolt at pole.

**Type A**

Cat. No.	Steel Size, In.	Length, In.	Weight per 100, Lbs.
S-3027	1 1/2 x 1 1/2 x 3/16	72	1090

**Type B**

S-3028	1 3/4 x 1 3/4 x 3/16	109	2040
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**Flat Cross Arm Braces**



Open-hearth steel, thoroughly galvanized. Punched at both ends—one end with 7/16-inch hole for carriage bolt; the other end with 9/16-inch hole for lag screw.

Cat. No.	Length, Inches	Width, Inches	Thickness, Inches	Weight per 100, Pounds
S-3036	20	1-7/8	3/8	156
S-3038	22	1-7/8	3/8	172
S-3040	24	1-7/8	3/8	187
S-3042	26	1-7/8	3/8	202
S-3044	28	1-7/8	3/8	218
S-3046	30	1-7/8	3/8	233
S-3050	22	1 1/4	1/4	201
S-3051	24	1 1/4	1/4	220
S-3056	30	1 1/4	1/4	275

(Other sizes are available on order)



## Straight Thimbleye Bolts

Thimbleye bolts save from three to five feet of strand and leave the pole clear for ground wire or moulding. They eliminate strain plates, guy hooks, lags and nails. Eyes are drop forged and have ample radius to prevent strand being kinked too sharply and concentrating strain at any one point. Roll threaded.

Cat. No.	Diameter, In.	Length, In.	Weight per 100, Lbs.
S-2753	5/8	8	132
S-2755	5/8	10	154
S-2757	5/8	12	176
S-2759	5/8	14	198
S-2760	5/8	16	220
S-2761	5/8	18	242
S-2766	3/4	8	204
S-2768	3/4	10	229
S-2770	3/4	12	255
S-2772	3/4	14	280
S-2774	1	8	400
S-2775	1	10	448
S-2778	1	12	497

## Machine or Through Bolts



Sometimes known as cross-arm or pole bolts. Made with "buffer points" for quick easy threading. Also permits bolt to be hammered without damaging threads. Furnished with rolled threads and square nut. Thoroughly galvanized. Washers on page 10.

Cat. No.	Size, In.	Thread Length, In.	Weight per 100, Lbs.
S-2858	3/8x3	3	13.1
S-2860	3/8x3 1/2	3	14.6
S-2862	3/8x4	3	16.0
S-2864	3/8x4 1/2	3	17.5
S-2865	3/8x5	3	20.1
S-2868	3/8x5 1/2	3	20.4
S-2870	3/8x6	3	21.8
S-2878	1/2x4 1/2	3	33.8
S-2880	1/2x4 3/4	3	35.0
S-2882	1/2x5	3	36.3
S-2886	1/2x8	4	51.6
S-2890	1/2x10	4	61.8
S-2892	1/2x12	4	72.0
S-2894	1/2x14	6	82.2
S-2898	5/8x6	3	70
S-2900	5/8x8	4	82
S-2902	5/8x10	4	98
S-2904	5/8x12	4	114
S-2906	5/8x14	6	130
S-2908	5/8x16	6	146
S-2910	5/8x18	6	150
S-2912	5/8x20	6	164

## Thimbleye Angle Bolts



For use in place of guy hooks and strain plates. Eliminates the necessity of wrapping wire around pole. Saves time, material and labor. Eyes free from burrs to prevent strand injury. Angle convenient for most guying. Furnished with "buffer points" for quick, easy threading or hammering out without damaging threads.

Available in diameters of 5/8, 3/4 and one inches to accommodate 6,000, 10,000 and 16,000 pound strands respectively. When a strain of 8,000 or more pounds is imposed they should be used with the guy plates listed on page 9. Thoroughly galvanized, furnished with nuts.

Cat. No.	Diam., In.	Length, In.	Weight per 100, Lbs.
S-2776	5/8	6	110
S-2777	5/8	8	120
S-2779	5/8	10	140
S-2781	5/8	12	160
S-2783	5/8	14	180
S-2784	5/8	16	200
S-2785	5/8	18	220
S-2789	3/4	8	180
S-2791	3/4	10	210
S-2793	3/4	12	240
S-2795	3/4	14	280
S-2796	1	8	400
S-2797	1	10	448
S-2799	1	12	497

## Turnbuckles

### Hot Galvanized



All parts drop-forged from new open-hearth steel, assuring strength and reliability. Bodies are fitted with hexagonal ends so they may be adjusted with a wrench at the end as well as a lever at the center. Available in two types—Hook-and-Eye and Eye-and-Eye.

### Hook-and-Eye

Cat. No.	Size, In.	Wt. per 100, Lbs.
S-7641	1/2 x 6	163
S-7642	1/2 x 9	206
S-7643	1/2 x 12	250
S-7644	5/8 x 9	415
S-7645	5/8 x 12	477
S-7646	3/4 x 12	682

### Eye-and-Eye

Cat. No.	Size, In.	Wt. per 100, Lbs.
S-7647	1/2 x 6	163
S-7648	1/2 x 9	206
S-7649	1/2 x 12	250
S-7650	5/8 x 9	415
S-7651	5/8 x 12	477
S-7652	3/4 x 12	682



## Wood Screws

When ordering wood screws specify finish—either galvanized or blued—and type of head—round or flat. Length of screw is measured from the under side of the round head to the point, and from the top of the flat head to the point.

Number								
6	7	8	9	10	12	14	16	18
Length, Inches								
$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2
$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	1	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{2}$
$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	2	3
$\frac{7}{8}$	1	1	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$3\frac{1}{2}$
1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{1}{4}$	3	4
$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2	2	$2\frac{1}{2}$	$3\frac{1}{2}$	
$1\frac{1}{2}$		$1\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{1}{4}$	3	4	
		2		$2\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$		
		$2\frac{1}{2}$		3	3	4		
				$3\frac{1}{2}$	$3\frac{1}{2}$			

The following chart shows typical applications of some of the above screws in telephone work.

Type	Length	Ga. No.	Use
R.H. Galv.	$2\frac{1}{2}$ "	10	For attaching Type C Knob.
F.H. Galv.	$2\frac{1}{2}$ "	18	For attaching Type S Knob.
F.H. Galv.	3"	18	For attaching Type T Knob.
F.H. Galv.	$2\frac{1}{2}$ "	18	For attaching No. 4 Single Groove Knob.
F.H. Galv.	$3\frac{1}{2}$ "	18	For attaching No. 4 Double Groove Knob.
F.H. Galv.	$2\frac{1}{2}$ "	18	For attaching other than first "A" knobs.
F.H. Galv.	3"	18	For attaching first "A" knob.
F.H. Galv.	$3\frac{1}{2}$ "	18	For attaching to Stucco Walls.
R.H.B.	$\frac{3}{4}$ "	6	For leather strapping.
R.H.B.	$\frac{3}{4}$ "	8	For Cable Clamps.
R.H.B.	1"	6	For mounting Connecting Blocks.
R.H.B.	1"	8	For mounting Subsets on Oak.
R.H.B.	$1\frac{1}{4}$ "	6 & 8	For mounting Subsets on Oak.
R.H.B.	$1\frac{1}{2}$ "	6	For mounting Fanning Strips.
R.H.B.	$1\frac{1}{2}$ "	8	For mounting Subsets.
R.H.B.	$1\frac{1}{2}$ "	10	With lead screw anchor for 50 and 100 Pr. Clamp.
R.H.B.	2"	6 & 8	Mounting Subsets on plastered walls.
R.H.B.	$2\frac{1}{2}$ "	8	Mounting Subsets on plastered walls.
R.H. Galv.	$\frac{3}{4}$ "	8	Mounting $\frac{3}{8}$ " Wire Clamps.
R.H. Galv.	1"	8	Mounting $\frac{3}{8}$ " Wire Clamps.
R.H. Galv.	$1\frac{1}{2}$ "	14	For attaching House Brackets.
R.H. Galv.	2"	14	For attaching House Brackets to stucco walls.

## Double Arming Bolts

### Hot Galvanized



Used with four square washers in the approved method of tying two cross arms together. For correct length allow two inches for washers and nuts, add twice the thickness of the cross arm, plus diameter of pole (less depth of gain). Full length thread for ease of replacement and added flexibility. Furnished with nuts but not with washers.

Cat. No.	Size, In.	Weight per 100, Lbs.
S-2826	$\frac{1}{2}$ x12	111
S-2828	$\frac{1}{2}$ x14	120
S-2830	$\frac{1}{2}$ x16	129
S-2832	$\frac{1}{2}$ x18	138
S-2836	$\frac{5}{8}$ x12	165
S-2838	$\frac{5}{8}$ x14	194
S-2840	$\frac{5}{8}$ x16	200
S-2842	$\frac{5}{8}$ x18	218
S-2844	$\frac{5}{8}$ x20	235

(Longer bolts available on request)

## Carriage or Brace Bolts

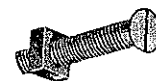
### Hot Galvanized



Standard heads, square nuts, finished points and rolled threads. Furnished without washers. For washers, see listing page 10.

Cat. No.	Size, In.	Length of Thread, In.	Wt., per 100, Lbs.
S-2800	$\frac{3}{8}$ x3	$1\frac{3}{4}$	12.9
S-2802	$\frac{3}{8}$ x3 $\frac{1}{2}$	$1\frac{3}{4}$	14.3
S-2804	$\frac{3}{8}$ x4	$1\frac{3}{4}$	15.8
S-2806	$\frac{3}{8}$ x4 $\frac{1}{2}$	$1\frac{3}{4}$	17.2
S-2808	$\frac{3}{8}$ x5	$1\frac{3}{4}$	18.7
S-2809	$\frac{3}{8}$ x5 $\frac{1}{2}$	$1\frac{3}{4}$	20.1
S-2810	$\frac{3}{8}$ x6	$1\frac{3}{4}$	21.6
S-2811	$\frac{3}{8}$ x8	4	27
S-2812	$\frac{3}{8}$ x10	4	33
S-2822	$\frac{5}{8}$ x6	3	66

## Stove Bolt



Cat. No.	Size, In.	Weight per 100, Lbs.
S-2930	5/16x2	6

## Lag Screws

Hot Galvanized



Gimlet Point



Fetter Drive

Clean and smooth, all sizes in both styles are made of new open-hearth steel, properly normalized after fabrication. Unless otherwise specified Fetter Drive Lag Screws will be furnished on all orders except for 1/4-inch and 5/8-inch sizes which are available in Gimlet Point only.

Cat. No.	Size, In.	Wt. per 100, Lbs.
S-6482	1/4 x 2	3.5
S-6484	1/4 x 2 1/2	5.0
S-6486	5/8 x 2	5.2
S-6488	5/8 x 2 1/2	6.2
S-6490	5/8 x 3	7.5
S-6492	5/8 x 3 1/2	9.7
S-6493	3/8 x 2 1/4	7.7
S-6494	3/8 x 2 1/2	9.7
S-6496	3/8 x 3	11.0
S-6498	3/8 x 3 1/2	12.8
S-6500	3/8 x 4	14.6
S-6502	3/8 x 4 1/2	16.4
S-6506	1/2 x 2 1/2	18.4
S-6508	1/2 x 3	20.9
S-6510	1/2 x 3 1/2	23.4
S-6512	1/2 x 4	26.0
S-6514	1/2 x 4 1/2	27.8

## Pole Steps

Hot Galvanized



S-7200



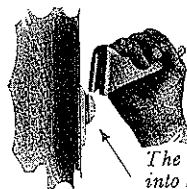
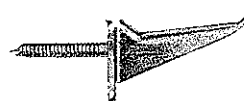
S-7202

Furnished in two styles, as illustrated. Both the standard hook-type step and the long-hook type have Fetter drive threads, which makes them easy to install and prevents tearing wood when steps are driven. No. S-7200 long-hook style is used at points where linemen stand to work. The long hook prevents the foot from slipping off the end of the step.

Cat. No.	Type	Diam., In.	Length, In.	Wt. per 100, Lbs.
S-7196	Std. Hook Head	5/8	9	88
S-7198	Std. Hook Head	5/8	9	70
S-7202	Std. Hook Head	5/8	10	94
S-7200	Long Hook Head	5/8	10	116

## Detachable Pole Step

Hot Galvanized



The Step slips easily into the grooves of the Lag Screw Head and is held solidly in place.

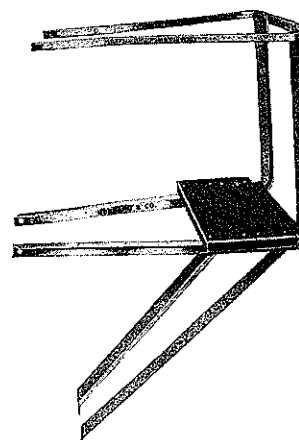
Easy to install—just slip the plate over the lag screw and drive lag in until plate bites into wood. Step slips over groove in each side of lag and is prevented from turning by lug on bottom of plate. A nail driven through the hole in the bottom of the plate offers additional security against turning. Steps are easily slipped on and off and

when removed unlicensed climbing is stopped. Order separately.

Cat. No.	Description	Size, In.	Wt. per 100, Lbs.
S-7199	Lag and Plate	5/8 x 1/4	93
S-7201	Step Only	5 1/8	50

## Pole Balcony

Hot Galvanized

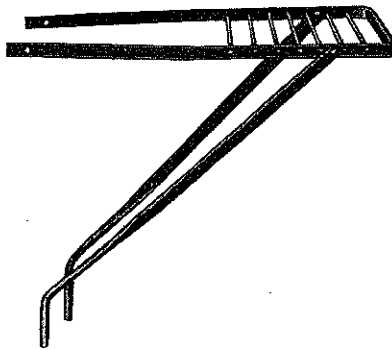


Standard with most companies. Frame, braces and guard rails are of open hearth steel and galvanized by the hot-dip method, while wooden platform is made of thoroughly seasoned oak painted with two coats of standard green pole paint.

Upright braces are 1 1/2 by 1 1/2 by 3/16-inch steel. Platform supports are 1 3/4 by 1 3/4 by 3/16-inch angle steel. Guard rail is 1 1/4-inch flat steel. Complete balcony includes all bolts for fastening parts together but no bolts for attaching to pole.

Cat. No.	Type	Platform, In.	Weight Each, Lbs.
S-2342	9035	40x30	65

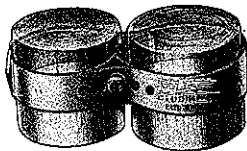
**Pole Seats**



All steel. Strong, rigid and light in weight, these seats were found capable of supporting  $\frac{3}{4}$  of a ton safely when tested under actual conditions of use. Steel frames and braces are made of one-inch by half-inch channel steel. Seat bars are of  $\frac{3}{8}$ -inch square steel, secured to the frame so as to leave no projecting ends. Riveted joints are relieved of all strain. Bars are placed corner up to prevent slipping. Mounted with lag screws.

Cat. No.	Seat Size, In.	Wt. Each, Lbs.
S-6768	12 x 13 $\frac{3}{8}$	14
S-6770	12 x 11	13

**Samson Pole Stubbing Clamps**  
**Hot Galvanized**



Samson Stubbing Clamps are designed with a heavy clamping band, two saddle plates and a special staple for fastening the loose end of the band to the pole or stub. Generally two clamps are used—one near the ground, the other near the top of the stub. Available in two sizes—the Giant and the Junior. The Giant band is 2 $\frac{1}{2}$  inches by eight feet. The Junior band is 2 $\frac{1}{2}$  inches by five feet, ten inches. Both sizes have  $\frac{11}{16}$  inch holes to permit use of  $\frac{5}{8}$  inch bolts.

Not furnished with bolts or washers—order separately. Bolt length should be slightly more than diameter of pole. (For bolts, washers see pages 10, 14.)

To simplify installation use the Samson installing wrench. This wrench is made of forged steel. One end is used for pulling the bands tight; the other (pointed) end is for lining up the holes.

Cat. No.	Description	Pole Size In.	Weight per 100, Lbs.
S-3538	Giant No. 1 Clamp	13 to 18	950
S-3540	Junior No. 2 Clamp	7 to 12	625
S-8050	Installing Wrench		1000

**Aluminum Letters and Numbers**



For pole numbering, transposition marking and cable terminal designation. Made of special 99% pure rolled aluminum, they will not rust, tarnish or corrode. Perfectly smooth, they will not catch, or hold dust and dirt.

Most widely used by telephone companies are two-inch and three-inch sizes. Others available run from half-inch to six inches.

Order according to sizes and numbers needed.

**Pole Tags**



For identification of poles and other properties, these convenient tags have found wide use among telephone companies. Available in standard and special designs, they are made with raised letters on pure aluminum plates. Standard style illustrated—other standard styles below. (Special designs can be quickly supplied on request.)

Cat. No.	Letter Size, In.	Plate Width, In.
78	$\frac{7}{8}$	1 $\frac{3}{4}$
787 (two lines)	$\frac{7}{8}$ and $\frac{7}{8}$	1 $\frac{3}{4}$
716	$\frac{7}{8}$	$\frac{3}{4}$
114	1 $\frac{1}{4}$	2 $\frac{1}{4}$
12 (Illustrated)	$\frac{1}{2}$	$\frac{3}{4}$

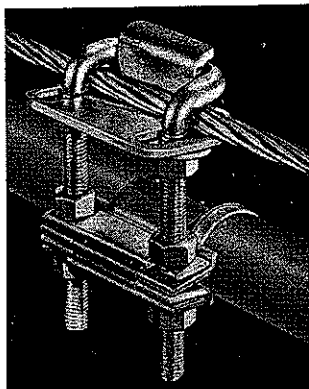
**Steel Girder Clamps**



Malleable iron clamps fitted with cup-pointed, case-hardened steel set-screws for use with type K or M bridle rings. Set screws are plated, electro-galvanized or sherardized.

Cat. No.	Type	Size, In.	Standard Tapping	Wt. per 100, Lbs.
S-7376	509	1	10/24	20

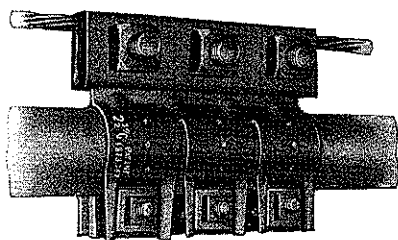
## Kearney Grade Clamps



Adjustable grade clamps designed to keep cable from slipping. They have a permanent, firm grip yet do not compress or injure cable in any way. Once the distance from the messenger to cable has been established by means of rings Kearney Grade Clamps can be installed and will maintain proper clearance indefinitely. All cable sizes, as listed below, are based on 22-gauge.

Cat. No.	Max. Cable Size, Pr.	Max. Cable Diam., In.	Wt. per 100, Lbs.
S-3406	100	1	106
S-3408	400	1 5/8	114
S-3409	900	2 5/8	122
S-3413	400	2 Cables 1 5/8 In. Ea.	173

## Diamond Grade Clamp



Made of cold-rolled steel strip, complete with three lower bolts for gripping to lead cable. The guy clamp shown is standard type but is not included as part of this clamp (see page 10).

Generally used two on each side of a pole to overcome the tendency of cables to slide when messenger is set on a grade. Flexible material used guards against damage to cable sheath.

Galvanized by the exclusive patented Diamond Process.

Cat. No.	Cable Diam., In.	Clamp Size, In.	Wt. per 100, Lbs.
S-3407	1 1/2	2 1/2	110
S-3425	1 1/8	2 1/2	112
S-3426	1 1/8	2 1/2	114
S-3427	2 1/8	3	130
S-3428	2 5/8	3 1/2	140
S-3429	3 1/4	4	165

## Cable Suspension Clamp

Hot Galvanized



The one-bolt type is used for light cables and on cable arms. The three-bolt types are for heavy cables and long spans. The one-bolt clamp is furnished without a bolt—a 5/8-inch Through Bolt is used both for attaching the clamp to the pole and tightening the clamp on the strand. Both take 1/4 to 7/16-inch strand.

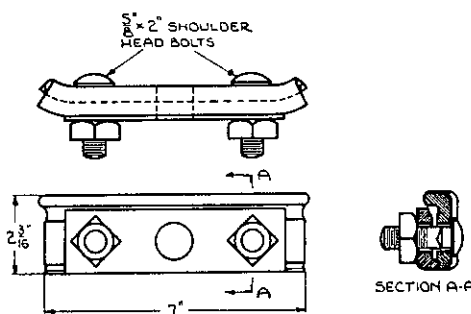
The three-bolt clamp is furnished with two 1/2-inch high-carbon steel bolts with the center hole left blank for a 5/8-inch through bolt.

In attaching to the pole a nut and square washer are placed between the pole and the clamp to provide clearance for the cable. Where cables are to be mounted on both sides of the poles, double arming bolts are used, instead of through bolts.

Cat. No.	Type	Center Hole, In.	Length, In.	Weight per 100, Lbs.
S-3416	One-Bolt	11/16	2 3/8	84
S-3418	Three-Bolt	11/16	5 5/8	224

## Cable Suspension Clamp, Curved

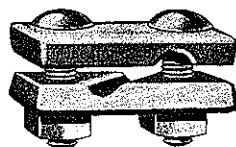
Hot Galvanized



Similar to the S-3418 three-bolt cable suspension clamp except that the messenger grooves are curved at either end to support and relieve strain on the strand when line is set at an angle or around corners. The messenger fits into, and pulls against the full length of, the groove, eliminating sharp angles. Has 1-3/32 inch hole for mounting. Use 3/4 inch through-bolt for 3/8 inch strand and smaller, 1 inch through-bolt for 7/16 inch strand.

Cat. No.	Overall Length, In.	Strand Size, In.	Wt. per 100, Lbs.
S-3420	5 5/8	1/4 to 7/8	224



**Crossover Clamp****Hot Galvanized**

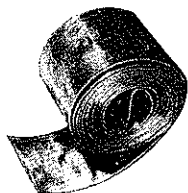
Used for joining two messenger cables when they cross at right angles. Also for telephone work where cables turn corners or where branch cables leave line at points distant from pole.

Cat. No.	Size, In.	Strand Size, In.	Wt. per 100, Lbs.
S-3506	$\frac{1}{2} \times 1\frac{1}{2} \times 3\frac{1}{4}$	$\frac{3}{8}$ to $\frac{1}{2}$	170

**Strand Ground Clamp**

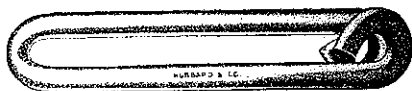
Used for grounding the sheath of overhead cables to the supporting messenger strand. Bolt turns against collar, giving added grounding surface.

Cat. No.	Wt. per 100, Lbs.
S-3465	34

**Lead Serving Tape**

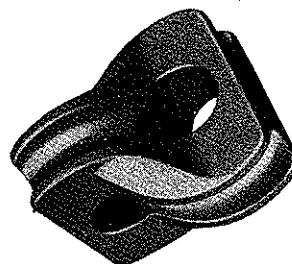
Used with grade clamps to protect cable sheath by wrapping under clamp, or, for building up sheath when too small for clamp. Standard one pound roll.

Cat. No.	Width, In.	Thickness, In.	Wt. per 100, Lbs.
S-7444	1 $\frac{1}{2}$	$\frac{3}{8}$	100

**Reinforcing Links****Hot Galvanized**

Used to relieve side strains at angles in the line. The links are fastened to the pole on each side of the cable suspension clamp by means of half-inch lag-screws. Made of half-inch open-hearth steel, they will take strains up to 4000 pounds.

Cat. No.	Length, In.	Wt. per 100, Lbs.
S-5260	8 $\frac{3}{8}$	107
S-5262	5 $\frac{3}{4}$	125

**Strand Connector****Hot Galvanized**

Designed to connect dead ends of messenger strands, when they occur between poles. The strands are looped around the connector and then held by guy clamps. For strand up to  $\frac{1}{2}$  in.

Cat. No.	Length, In.	Wt. per 100, Lbs.
S-3846	2 $\frac{3}{8}$	100

**Wall Straps****Hot Galvanized**

Used for attaching messenger or strand wires on buildings or walls. Supplied in two types, as illustrated. Loop type is used for dead ending against a flat surface, such as the face of a building. Guyeye types are used where the messenger fastens to the corner of the building. Both are  $\frac{1}{4}$ -inch steel with  $\frac{3}{8}$ -inch mounting holes.

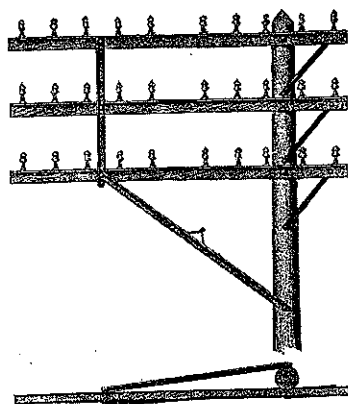
Cat. No.	Type	Length, In.	Width, In.	Wt. per 100, Lbs.
S-7318	Loop	8	1 $\frac{1}{4}$	105
S-7320	Guyeye	16 $\frac{3}{8}$	1 $\frac{1}{2}$	264
S-7322	Guyeye	24 $\frac{3}{8}$	1 $\frac{1}{2}$	351

**Alley Arm Braces****Hot Galvanized**

Used where it is necessary to support lines on one side of a pole only, or, where pole must be offset to avoid angle in line. Furnished with linemen's steps. Use half-inch lag screws for attaching to pole, half-inch machine bolts for attaching to cross arm.

Cat. No.	Length, Ft.	Angle Size, In.	Weight per 100, Lbs.
S-3023	6	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$ x $\frac{3}{8}$	1200
S-3026	7	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$ x $\frac{3}{8}$	1400

## Side Extension Fixtures



When it is necessary to clear buildings or trees these fixtures furnish a rigid and economical construction. Also used to offset cross arms to relieve strain from an angle in the line where lines follow country roads with bends and twists. Set consists of parts below:

**Vertical Brace** standard for cross arm construction. For three arms 12, two arms 24 inches apart. Additional arms accommodated by placing braces in series. Fastens with  $\frac{1}{2}$ -inch bolts (not included).  $1\frac{3}{4}$ -inch by  $1\frac{3}{4}$ -inch by  $\frac{1}{4}$ -inch angle steel.

**Diagonal Brace**—for six and ten-pin arms. Six inch step for line-man. Fastens by  $\frac{1}{2}$ -inch lag screw; to cross arm by  $\frac{1}{2}$ -inch bolt. Two-inch by two-inch by  $\frac{3}{16}$ -inch angle steel. Bolts not included.

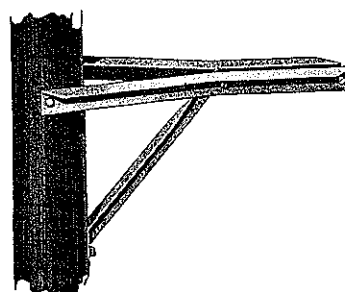
**Back Brace** — mounts from pole side opposite cross arm to cross arm. Fastens with  $\frac{5}{8}$ -inch through bolt; to cross arm by  $\frac{1}{2}$ -inch bolt. Two-inch by two-inch by  $\frac{1}{4}$ -inch angle steel. Bolts not included.

(Short braces shown are standard Flat Cross Arm Braces—See page 12.)

Cat. No.	Description	Overall Length In.	Weight per 100, Lbs.
S-3058	Diagonal Brace	83	1720
S-3032	Back Brace	$66\frac{7}{8}$	1720
S-3063	Vertical Brace	$30\frac{3}{8}$	720

## Cable Extension Arms

Hot Galvanized

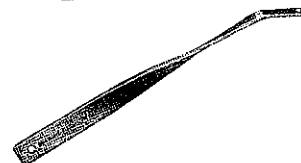


Used where it is necessary to support the cable at a distance from the pole. Attached at top by  $\frac{5}{8}$ -inch through bolt; lower brace is fastened by lag screws. Cables are attached by means of a  $\frac{5}{8}$ -inch machine bolt with washer under head and with three-bolt cable suspension clamp (see page 17) under the arm. Placed in flat position, suspension clamp holds cable firmly when the  $\frac{5}{8}$ -inch machine bolt is drawn tight.

Cat. No.	Extension from Pole to Center, In.	Angle Size, Inches	Weight per 100, Pounds
S-2171	26	3 x $2\frac{1}{2}$ x $\frac{1}{4}$	3050
S-2174	$44\frac{1}{2}$	$3\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{3}{8}$	6050

## Guard Arm Brace

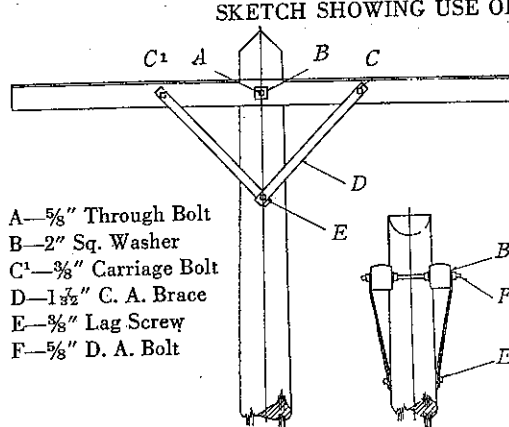
Hot Galvanized



Used for supporting guard-arms on pole where a cable is suspended. Shaped as indicated with half-twist, of  $1\frac{7}{32}$  by  $\frac{1}{4}$ -inch steel. 18 inches long.

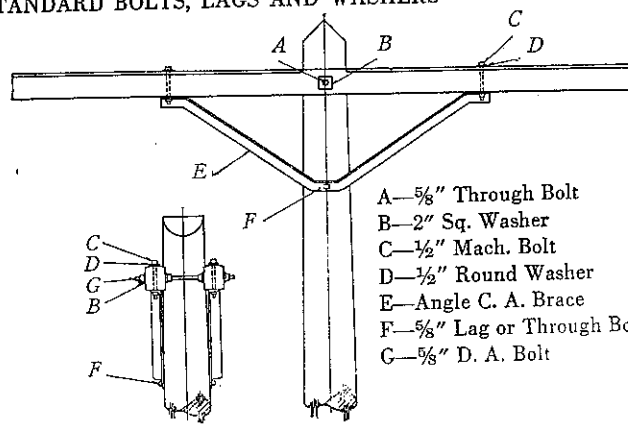
Cat. No.	Hole St. End, In.	Hole Bent End, In.	Wt. per 100, Lbs.
S-3060	$7\frac{1}{16}$	$9\frac{1}{16}$	170

## SKETCH SHOWING USE OF STANDARD BOLTS, LAGS AND WASHERS



A— $\frac{5}{8}$ " Through Bolt  
B—2" Sq. Washer  
C— $\frac{3}{8}$ " Carriage Bolt  
D— $1\frac{1}{2}$ " C. A. Brace  
E— $\frac{5}{8}$ " Lag Screw  
F— $\frac{5}{8}$ " D. A. Bolt

FLAT BRACE



A— $\frac{5}{8}$ " Through Bolt  
B—2" Sq. Washer  
C— $\frac{1}{2}$ " Mach. Bolt  
D— $\frac{1}{2}$ " Round Washer  
E—Angle C. A. Brace  
F— $\frac{5}{8}$ " Lag or Through Bolt  
G— $\frac{3}{8}$ " D. A. Bolt

DOUBLE ARMING

ANGLE BRACE

**W. U. Wood-Top Steel Pins****Hot Galvanized**

High-carbon steel. Threads and nuts are cleanly cut and smoothly finished to assure perfect fit. Furnished with high-quality wood cobs.

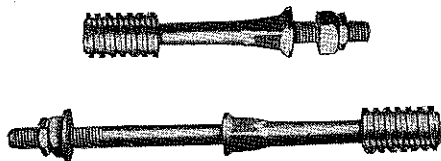
All pins are 4 $\frac{1}{4}$ -inch above cross arm. Long shank pins are for wood arms; short shank for steel, transposition brackets and break irons. Long shank pins furnished with square nuts and round washers. Both take standard insulators having one-inch pin holes.

**Long Shank Type**

Cat. No.	Diameter, In.	Below		Wt. per 100, Lbs.
		Shoulder, In.		
S-5696	$\frac{1}{2}$	5		88
S-5697	$\frac{5}{8}$	5		125

**Short Shank Type**

Cat. No.	Diameter, In.	Shoulder, In.	Wt. per 100, Lbs.
S-5698	$\frac{1}{2}$	1	55
S-5700	$\frac{5}{8}$	1	82
S-5730	$\frac{5}{8}$	1 $\frac{3}{8}$	102

**Steel Pins with Lead Threads****Hot Galvanized**

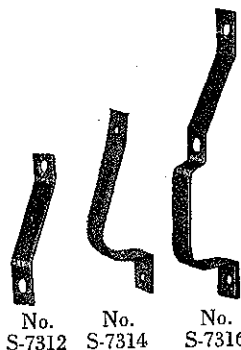
Equipped with one-inch lead thread for standard insulators having a one inch pin hole. Pins are half-inch diameter—long shanks for wood cross arms; short shanks for steel cross arms. Pins for steel cross arm furnished with spring locking washer.

Cat. No.	Type	Overall Length, In.	Wt. per 100, Lbs.
S-5694	Long	9 $\frac{3}{4}$	162
S-5695	Short	6	125

**Pole Dating Nails****Hot Galvanized**

Made of galvanized steel with two numerals on end. Used for indicating year poles are set or to indicate pole height. Special markings can be furnished in keg lots of 2000 pieces, or more.

Cat. No.	Length, In.	Wt. per 100, Lbs.
S-5414	2 $\frac{1}{4}$	4

**Reinforcing and Safety Straps****Hot Galvanized**

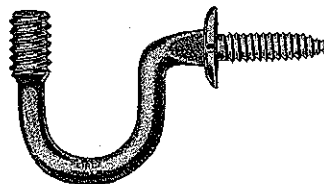
No. S-7312 is used to support the messenger bolt at points of extreme stress, such as long spans. No. S-7314 is a safety strap, to prevent the cables falling if the messenger gives way. The upper hole fits over the messenger bolt and the lower end fastens on the pole by a  $\frac{1}{2}$ -inch lag screw. No. S-7316 is a combination strap to serve both purposes.

Cat. No.	Description	Weight per 100, Lbs.
S-7312	Reinforcing Strap	40
S-7314	Safety Strap	79
S-7316	Combination Strap	122

**Guard Arm Hook****Hot Galvanized**

Used on guard arms as dead-ends for telephone services. Threaded for  $\frac{1}{2}$ -inch square nut, they bolt through the arm. Furnished with nut as illustrated.

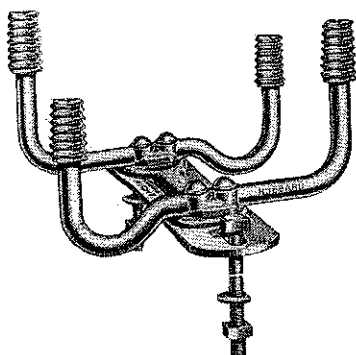
Cat. No.	Eye Diam., In.	Size, In.	Wt. per 100, Lbs.
S-4842	$\frac{7}{8}$	$\frac{1}{2} \times 5\frac{3}{8}$	45

**Hook Brackets****Hot Galvanized**

Drop-forged from open-hearth steel,  $\frac{5}{8}$ -inch square. Used for running secondaries on poles and for making service attachments on buildings. Furnished with lead threads for insulators having standard one-inch pin holes.

Cat. No.	Type	Height, In.	Overall, In.	Wt. per 100, Lbs.
S-3114	314	4 $\frac{5}{8}$	7 $\frac{3}{4}$	181

## Hubbard Transposition Brackets

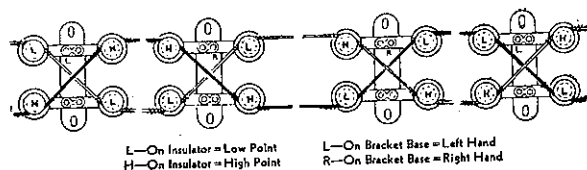


### Point-Type Transposition Brackets

Hubbard Point-Type transposition brackets are furnished in rights and lefts. They are a solid unit. The cross pins are riveted or welded to the base, which is channeled for additional strength. There are no pins to adjust or nuts to loosen.

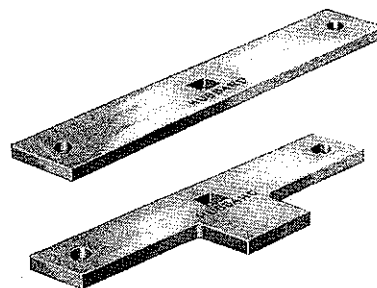
Furnished with one-inch wood cobs for standard insulators. Mounting slots are spaced to fit standard drilled ten-pin arms and have a 2-inch adjustment; two 1/2 by 6 inch crossarm bolts with clipped washers, are furnished with each bracket. Transposition takes place on a rigid bracket mounted above the arm, and wire spacing is maintained uniformly throughout the entire length of the span. There is no spiralling of wires about each other as in the case of ordinary transposing methods. In cases of damaged or destroyed lines where restoration of transpositions must be made, it is unnecessary to cut wires to straighten out tangles—simply untie the transposed wires and pull out the working lengths of line ready for restringing.

Diagram of Transposition System



To analyze the system of transposing on Hubbard Point-Type brackets, follow the black wire in relationship to the white wire in the above diagram noting the position of the high and low points.

Cat. No.	Type	Wt. per 100, Lbs.
S-3158	Right-Hand Bracket	900
S-3159	Left-Hand Bracket	900

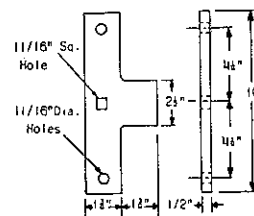
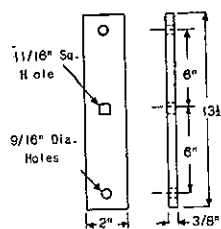


### Tandem Transposition Brackets

Hubbard Tandem Transposition Brackets are used in conjunction with transposition insulators. The transposed lines are crossed on a single bracket employing two pins, and mounted above the arm. Brackets are mounted sufficiently loose on the arm so they may swing freely during the operation of transposing the wires. Tighten them down and the job is finished.

Hubbard Tandem Transposition Brackets are used in lines having an average span length of 150 feet or more. Straight bracket No. S-3163 is recommended for straight sections and corners where the pull is 15 feet or less. Offset bracket No. S-3164 is used at corners where the pull is 15 to 50 feet.

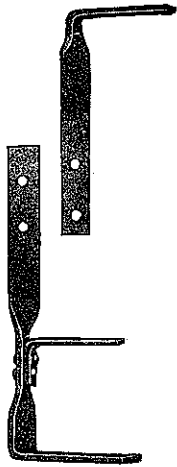
No. S-3164 is manufactured from 1/2 inch stock to better withstand the corner strains and for the same reason employs a slightly heavier pin. The leg is mounted toward the inside of the angle. No. S-3163 is manufactured from 3/8 inch stock.



Dimensions—Inches

Stock No.	Description	Use Pin No.	Size Steel	Pin Spacing	Approx. Shpg. Wt. Lbs. 100 Pcs.
S-3163	Straight	S-5698	13 1/2 x 2 x 3/8	12	280
S-3164	Corner	S-5730	10 x 1 3/4 x 1/2 (Offset)	8 1/2	300
S-2822	Mounting Bolt	(order 1 per bracket)			

### Two-Piece Transposition Brackets For Phantom Circuits

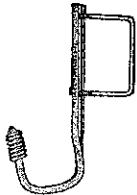


#### Hot Galvanized

Transposition brackets for four-wire circuits. They are fastened to the cross arm by two half-inch by  $4\frac{3}{4}$ -inch machine bolts, spaced  $2\frac{3}{8}$  inches apart. They have holes for half-inch pins. Furnished with two parts shown, the smaller of which projects above the arm. Bolts and pins not included—for bolts see S-2880 (page 13), for pins see S-5698 (page 20).

Cat. No.	Size Steel, In.	Cross Arm, In.	Wt. per 100, Lbs.
S-3157	$1\frac{1}{2} \times \frac{3}{8}$	$3\frac{1}{4} \times 4\frac{1}{4}$	797

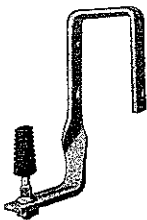
### Transposition Brackets Hot Galvanized



Single-point U-bolt mounting brackets, furnished with  $\frac{3}{8}$ -inch U-bolts. Brackets are threaded for insulators having standard one-inch pin holes.

Cat. No.	Crossarm Size	Wt. per 100, Lbs.
S-3144	$2\frac{3}{4} \times 3\frac{3}{4}$	101
S-3145	$3\frac{1}{4} \times 4\frac{1}{4}$	101

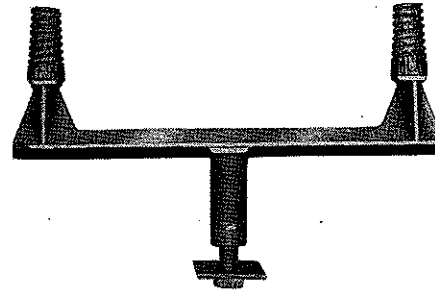
### Transposition Brackets Hot Galvanized



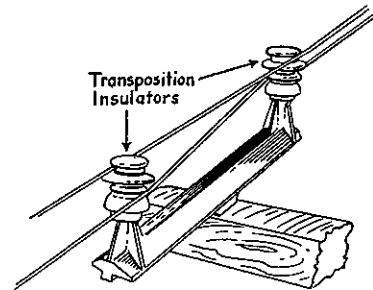
Two sizes, each furnished with  $\frac{3}{8}$ -inch round hole for a two-inch, No. 14 R. H. galvanized wood screw, used to prevent bracket pulling to one side of the cross arm. No. S-3149 clamps on cross arm with  $\frac{3}{8}$ -inch by four-inch carriage bolt; No. S-3155 uses  $\frac{3}{8}$ -inch by  $4\frac{1}{2}$ -inch carriage bolt. Both brackets have holes for half-inch insulator pins (shown on page 20). Pins are not included—if desired please specify.

Cat. No.	Size Steel, In.	Cross Arm, In.	Wt. per 100, Lbs.
S-3149	$1\frac{1}{4} \times \frac{7}{8}$	$2\frac{3}{4} \times 3\frac{3}{4}$	277
S-3155	$1\frac{1}{4} \times \frac{7}{8}$	$3\frac{1}{4} \times 4\frac{1}{4}$	284

### All-Aluminum Transposition Bracket



All-aluminum transposition brackets are made of an aluminum alloy having a strength comparable to steel. They are cast in permanent molds, are non-corrosive and come completely assembled with hot dip galvanized bolt, washer, and wood cobs, ready to install on the crossarm, saving additional assembly costs. Mounting Bracket fits in  $1\frac{1}{4}$  inch hole.



Method of mounting transposition bracket

In mounting, the brackets are allowed to swing freely during the transposing of the wires and tightened down after the wires have been transposed.

Aluminum transposition brackets are used on lines having an average span length of 150 feet or more and at corners where the pull is not more than 15 feet.

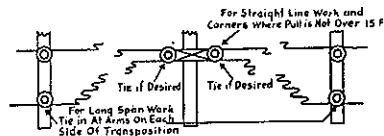
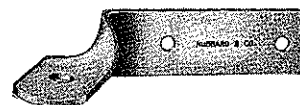


Diagram of Transposition System

Cat. No.	Wt. per 100, Lbs.
S-3154	250

### Corner Brackets Hot Galvanized

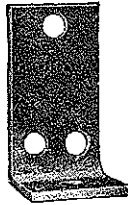


Used where the lead from the poles comes to a building at an angle, or, to carry leads around corners of buildings.

Cat. No.	Legs, In.	Steel Size, In.	Weight per 100, Lbs.
S-3100	$2\frac{1}{4} \times 4\frac{3}{8}$	$\frac{3}{2} \times 1\frac{7}{8}$	66
S-3102	$1\frac{5}{8} \times 8\frac{1}{2}$	$\frac{3}{2} \times 1\frac{7}{8}$	96

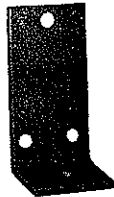
## Distributing Brackets

### Hot Galvanized Pole Bracket



For taking off telephone services, or for short runs on poles, the S-3116 bracket is used with one S-2858 machine bolt and one S-5126 knob. Two No. S-5126 knobs can be used when an S-2868 machine bolt is used. Not furnished unless specified.

Cat. No.	Legs, In.	Steel Size, In.	Wt. per 100, Lbs.
3-3116	2x4	1/4x2	97



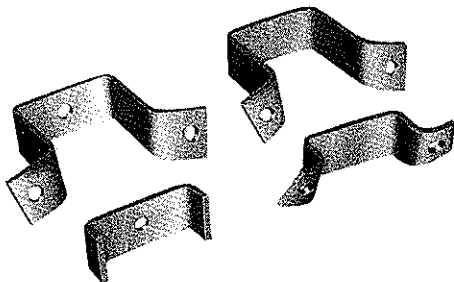
### House Bracket

Bracket for attaching drops to buildings, or for dead-ending twisted pairs. Use S-5118 knob and S-2930 Stove Bolt with this bracket. (Not furnished unless specified.)

Cat. No.	Legs, In.	Steel Size, In.	Wt. per 100, Lbs.
S-3112	2x3-7/16	3/16x1-3/4	56

## Bracket Straps and Clips

### Hot Galvanized



For use in carrying wood brackets bearing heavy loads—as in long-span construction using high-strength wires. Straps are generally fastened with two No. 20 galvanized nails (see page 24). Straps S-7244, S-7246 and clips S-3610 and S-3612 are of 14-gauge steel. CU and CL straps—S-7245, S-7247—are of 12-gauge steel. CU and CL are illustrated at right, above.

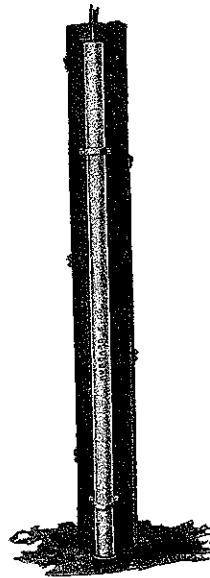
Cat. No.	Description	Width, In.	Wt. per 100, Lbs.
S-7244	Top Strap	1 1/2	17
S-3610	Bottom Clip	1 1/2	6
S-7246	Top Strap	2	20
S-3612	Bottom Clip	2	8
S-7245	CU Top Strap	2	25
S-7247	CL Bottom Strap	2	16

## U-Guards and Straps for Cable

### Hot Galvanized

Designed to protect cables on poles or sides of buildings, immediately above ground. Formed from 14-gauge flat steel pressed into a U-shape. Straps are shaped to fit cable guards.

Guard No. S-4516 has 2 1/8" inside diameter belled bottom to fit over conduit entering ground.



### U-Guards

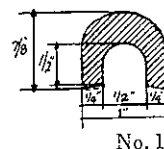
Cat. No.	Length, Ft.	Diameter, In.	Wt. per 100, Lbs.
S-4510	6	1 1/8	495
S-4511	8	1 1/8	850
S-4512	8	2 1/8	1408
S-4514	8	3 1/8	1925
S-4516	8	1 1/4	875

### Mounting Straps

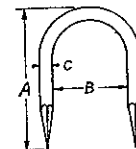
Cat. No.	For Guard No.	Hole Diam., In.	Wt. per 100, Lbs.
S-7304	S-4510*	3/8	19
S-7306	S-4512	3/8	23
S-7308	S-4514	1 1/8	61
S-7310	S-4516	3/8	19

\*(S-7304 Strap also fits S-4511)

## Ground Wire Moulding



No. 1

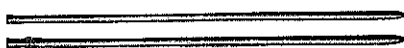


Kiln dried Douglas fir, highly resistant to weather, warping and twisting. Quantity per bundle is 200 feet. Can be installed with special moulding staple (as shown).

Staples illustrated are 3/8-inch wire, two inches long with a 1 1/8-inch spread. They must be ordered separately by catalog number below.

Cat. No.	Description	Weight, Lbs.
S-5334	Bundle of Moulding	12 per 100 feet
S-7168	Installing Staple	3 1/2 per 100 pieces

## Galvanized Ground Rods



Hot-galvanized open-hearth steel with long, sharp points for driving into any kind of ground with a minimum of resistance. Wired rods have a 12-NBS-104 copper wire firmly soldered to upper end. Unwired rods have hole drilled one inch from upper end for quick, easy attachment of ground wire. Holes are  $\frac{1}{8}$ -inch diameter in  $\frac{3}{8}$ -inch rod; five thirty-seconds in half-inch rods and three sixteenths-inch in the  $\frac{5}{8}$ -inch rods.

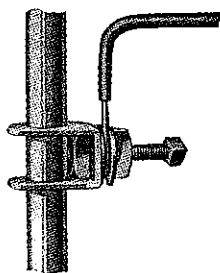
## With Copper Wire

Cat. No.	Diameter, In.	Length, Ft.	Wt. per 100, Lbs.
S-6240	$\frac{1}{2}$	5	320
S-6244	$\frac{1}{2}$	6	395
S-6250	$\frac{5}{8}$	6	595

## Without Copper Wire

Cat. No.	Diameter, In.	Length, Ft.	Wt. per 100, Lbs.
S-6234	$\frac{3}{8}$	5	185
S-6236	$\frac{3}{8}$	6	223
S-6238	$\frac{1}{2}$	5	300
S-6242	$\frac{1}{2}$	6	360
S-6246	$\frac{1}{2}$	7	420
S-6248	$\frac{5}{8}$	6	600
S-6252	$\frac{5}{8}$	8	800

## Kling Ground Clamps



Galvanized steel clamps for connecting ground wires to ground rods. Cup-pointed set screw bites a circle into rod, insuring good contact. Clamps usually attached before rod is driven. Used with copper or iron ground wires.

Cat. No.	For Rod Size		Wt. Per 100, Lbs.
	Max.	Min.	
S-5058	$\frac{1}{8}$	$\frac{3}{8}$	13½
S-5060	$\frac{5}{8}$	$\frac{1}{2}$	14½

## Adjustable Ground Clamps



Plain copper strips with adjustable screw attachment. Close fitting threads. Maximum clamp diameter,  $1\frac{1}{4}$  in.

Cat. No.	Pipe Size	Wt. Per 100, Lbs.
S-3412	$\frac{3}{8}$ " to $1\frac{1}{4}$ "	6

## Staples



Three sizes of staples most commonly used in telephone work.

No. S-7162 is the smaller size generally used for a ground wire staple; it is sold in one pound packages. The other sizes are sold in bulk—when ordering specify number of pounds.

Cat. No.	Size, In.	Description	Staples Per Lbs.
S-7164	$\frac{5}{8}$ x 2	Long Guy	37
S-7166	$\frac{1}{4}$ x $1\frac{1}{4}$	Standard	87
S-7162	$\frac{1}{4}$ x $\frac{5}{8}$	Small	1500

## Common Nails and Spikes



Standard flat head diamond point nails heavily galvanized. Can be supplied in the following sizes which are those most generally employed in telephone work. All sizes furnished in 100 lb. kegs.

Cat. No.	Size	Length, In.	Gauge	Approx. No. per Keg
S-5396	6d	2	11.5	17400
S-5398	8d	2½	10.25	10600
S-5400	10d	3	9	6900
S-5402	20d	4	6	3100
S-5404	30d	4½	5	2400
S-5406	40d	5	4	1800
S-5408	50d	5½	3	1400
S-5410	60d	6	2	1100
S-5411	60d**	3½	1	1500
S-5526	Strap Nail 3/16" Shank. 2" Long. Oval Head			

Following are some recommended uses of various size nails:

- 6D for nailing pins to crossarms.
- 8D for a general purpose nail.
- 10D for fastening strain plates.
- 20D lower nail for fastening No. 1 brackets to pole.
- 30D lower nail for fastening W.U. and No. 2 brackets to pole.
- 50D upper nail for fastening No. 1 brackets to pole.
- 60D upper nail for fastening W.U. and No. 2 brackets to pole.
- 30D lower nail for fastening pole steps.
- 60D upper nail for fastening pole steps.

\*\*Stub spike for use with creosoted pine poles to avoid striking heartwood.

## Pole Shims



Used to keep guy strand from cutting into pole. Nail holes are  $\frac{1}{4}$ -inch in diameter.

Cat. No.	Size, In.	Weight per 100, Lbs.
S-6812	1-7/32 x 7-3/32 x 8	57

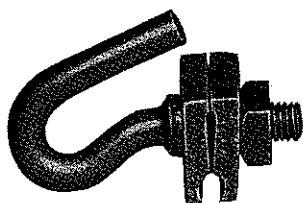
## Span Clamp



Used for service connections at points between poles. Span clamp is fastened to messenger cable, drop wire is fastened to knobs on span clamp.

Cat. No.	Insulator Spacing, In.	Wt. per 100, Lbs.
S-3424	5 3/4	152

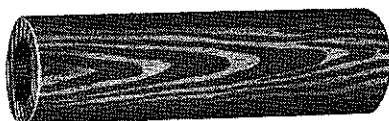
## Span Clamp



Used for service connections at points between poles. Adaptable for either suspended or lashed cable.

Cat. No.	Wt. Per 100, Lbs.
S-3421	41

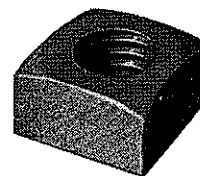
## Locust Pin Bushing



Used for plug of locust pin hole in cross arm when steel pin is used in place of wood pin. Bushing is 1 1/4 inches by 3 7/8 inches long.

Cat. No.	Hole Size	Steel Pin Size	Wt. per 1000, Lbs.
S-3219	11/16	5/8	150
S-3221	9/16	1/2	150

## Galvanized Nuts only for Machine and Double Arming Bolts

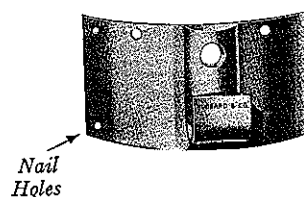


Cat. No.	Bolt Size In.	Wt. per 100, Lbs.
S-5542	1/2	8
S-5544	5/8	13
S-5551	3/4	24

## Galvanized Nuts only for Anchor Rods

Cat. No.	Rod Size In.	Wt. per 100, Lbs.
S-5555	1/2	8
S-5556	5/8	13
S-5557	3/4	24

## Guy Hook Strain Plate Hot Galvanized

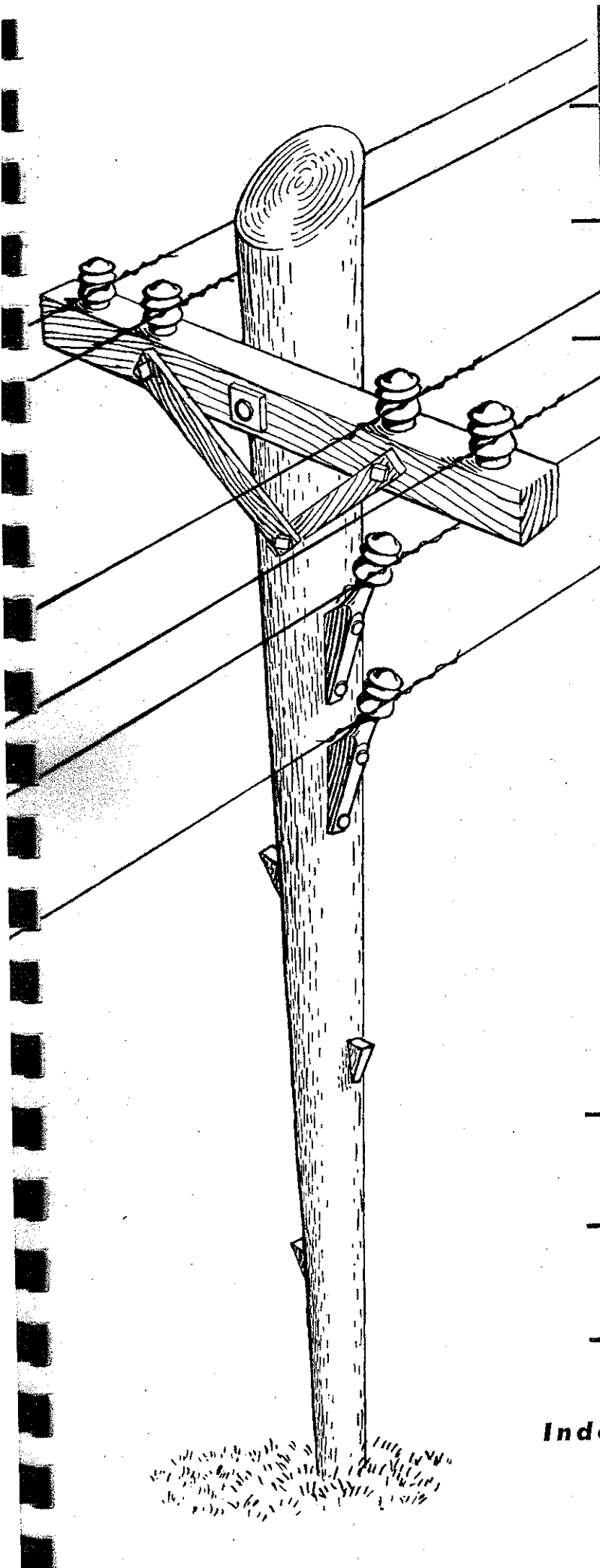


No. 5722

Has heavy welded hook. Serves the double purpose of protecting the pole and preventing the strand from slipping. Has one 11/16-inch guy hook hole, four 7/32-inch nail holes and two 7/16-inch lag screw holes. Size; 4 x 8 inches.

Cat. No.	Type	Wt. per 100, Lbs.
S-5722	With Hook	134
S-5720	Without Hook	95





PINE POLES

CEDAR POLES

VAPOR DRYING PROCESS

**2**

**Wood**

CROSS ARMS

PINS

POLE STEPS

Index for this section on reverse side



## ***Index for Section Two***

<b>Page</b>	<b>Item</b>	<b>Page</b>	<b>Item</b>
27....	Poles	36....	Poles
28....	Poles	37....	Vapor Drying Process
29....	Measurements	38....	Vapor Drying Process
30....	Measurements	39....	Crossarm Specifications
31....	Poles	40....	Crossarms
32....	Poles	41....	Crossarm Specifications Wood Insulator Pin Specifications
33....	Poles	42....	Pins Brackets Pole Steps
34....	Poles		
35....	Poles		

**AUTOMATIC  ELECTRIC**

## Telephone Poles—Pine and Cedar

Three species of wood are generally used throughout the country for telephone poles: Southern Yellow Pine (SYP), Western Red Cedar (WRC), and Northern White Cedar (NWC). These woods comprise about 90% of the poles currently in use with the remainder taken from various other woods. All three of these have definitely proved their fitness and, when selected and treated to proper specifications, will give a lifetime of satisfactory service. We are equipped to furnish all sizes and types of poles to meet your needs and preferences.

### Instructions for Ordering

Freight charges represent a large part of the cost of poles. It is imperative that complete information be given when ordering, or requesting quotation, to avoid errors and assure shipment of correct poles. Note carefully the following points for ordering.

1. **Quantity:** Be sure to order at least a minimum car. (See paragraph headed "Carload Quantities".)
2. **Sizes:** Give A.S.A. class and length.
3. **Species:** See sections headed "Creosoted Southern Pine Poles" and "Northern White and Western Red Cedar Poles".
4. **Treatment:** For cedar poles, state choice of treatment; poles cannot be shipped unless treatment is clearly specified. For pine poles, "eight-pound" treatment is standard, and will be supplied unless otherwise specified (for details, see section on "Treatments", on following pages).
5. **Framing Instructions:** Complete framing instructions are an aid to the prompt handling of pole orders. When order does not give framing instructions, cedar poles will be shipped without framing. Because creosoted pine poles should always be framed before treatment, poles with standard framing are furnished, unless otherwise specified (for details, see "Framing Specifications").
6. **Destination:** Give freight address and name of delivering railroad.

### Carload Quantities

Poles are almost invariably sold in carlots because of excessive freight penalties for less. It is very important to specify sufficient quantities to make full railroad minimums. Following weights apply for single and double carload.

#### Minimum Weights Single Carloads

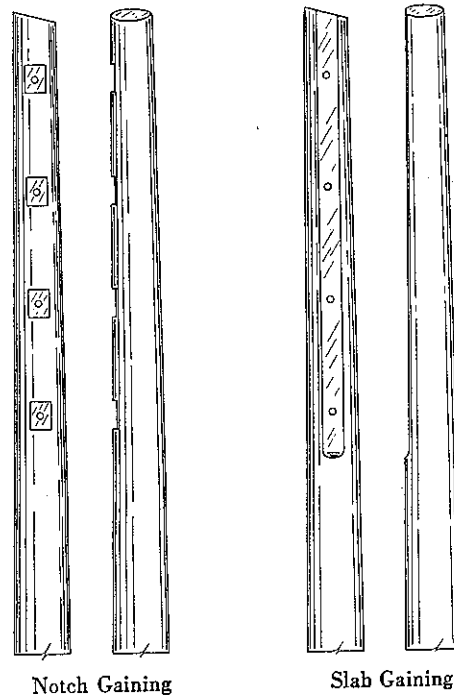
Poles 40 feet and under . . . . . 40,000 lbs.

#### Minimum Weights Double Carloads

Poles 40 feet and over . . . . . 60,000 lbs.

Approximate weights for Northern White, Western Red Cedar and Creosoted Yellow Pine Poles are shown on pages 28 and 29.

### Framing Specifications



Notch Gaining

Slab Gaining

In ordering poles be sure to specify number of gains and spacing between centers. For slab gains specify number of bolt holes and distance between centers. If no framing instructions are given, poles will be furnished with one-way roof, slab gain and bolt holes on 24-inch centers. Two gains will be placed on poles up to and including, 30 feet; three gains on longer ones. Notch gains are 1/2-inch deep and 4 3/4 inches wide. Slab gains are cut to 1/2-inch depth.

Prices quoted on pine poles include all framing. On cedar poles, however, an extra charge is made for all roofing and gaining. When ordering poles with special framing, give the following information:

1. No. of gains (all same size?).
2. Width and depth of gains.
3. Distance, apex of roof to center of first gain.
4. Spacing of gains, center to center.
5. Diameter through-bolt hole (21 32 inch unless specified).

### Creosoted Southern Pine Poles

Properly produced Southern Pine Poles have the unique advantage of retaining their high original strength for their full life. Average service life, varying somewhat with size of pole and location of installation, will range from 35 to 45 years under ordinary conditions.

This ability to retain original strength, given by full length pressure treatment, accounts for Creosoted Southern Pine Poles standing through ice and sleet storms, under extremely adverse conditions, where many other poles have failed.

In order to realize these service possibilities, however, it is necessary to exercise utmost care in selecting timber, in moving it rapidly to sterile storage yards after felling, in seasoning and applying adequate preservative treatment.

Pine is one of the strongest commercial timbers but is susceptible to rapid decay unless quickly and prop-

erly stacked in well drained yards, free from vegetation and debris and located well away from forest areas.

Combined with lasting strength and natural shapeliness is a symmetrical, smooth appearance obtained by machine trimming. The poles are clean and dry, with color ranging from brown to almost black. This is produced by use of highest grade creosote and a combination steam and vacuum bath after treatment.

Available in standard lengths, from 16 to 90 feet, Creosoted Southern Yellow Pine Poles graded according to A.S.A. dimensions are designated as "class" poles. A.S.A. specifications and shipping weights are in the following tables.

Pole timber is furnished in accordance with specifications which follow. Treatment is to a retention of eight pounds creosote per cubic foot of wood—in accordance with specifications following those for timber.

### Tables of Pole Weights and Measurements

Approximate Weights of Creosoted Yellow Pine Poles — A. S. A. Measurements

Length Feet	Class 1 (Lbs.)	2 (Lbs.)	3 (Lbs.)	4 (Lbs.)	5 (Lbs.)	6 (Lbs.)	7 (Lbs.)	9 (Lbs.)	10 (Lbs.)
16.....					234	202	165	138	110
18.....			380	326	275	234	188	151	133
20.....	710	564	467	394	330	284	234	202	160
22.....	825	674	559	463	398	339	284	234	188
25.....	990	811	674	573	490	422	344	289	235
30.....	1280	1082	921	784	660	550	454	371	
35.....	1567	1343	1155	1004	862	742	646		
40.....	1884	1622	1403	1219	1059	921	807		
45.....	2222	1911	1664	1444	1274	1114	976		
50.....	2585	2214	1925	1687	1494	1329	1169		

Approximate Weights of Western Red Cedar Poles—A.S.A. Measurements

Length Feet	Class 1 (Lbs.)	2 (Lbs.)	3 (Lbs.)	4 (Lbs.)	5 (Lbs.)	6 (Lbs.)	7 (Lbs.)	8 (Lbs.)	9 (Lbs.)	10 (Lbs.)
20.....	560	480	320	240	180	160	160	120	90	
25.....	560	480	400	320	240	180	160	160	120	90
30.....	680	575	490	385	320	255	200	205	180	120
35.....	800	680	585	490	400	335	280	295	225	
40.....	960	800	680	600	520	450	375	405		
45.....	1200	1040	880	720	640	560	560			
50.....	1440	1240	1040	920	800					
55.....	1600	1440	1240	1120	1040					
60.....	1840	1600	1400	1280	1280					
65.....	2080	1760	1600	1520						

## Approximate Weights of Northern White Cedar Poles—A.S.A. Measurements

	Class 1	2	3	4	5	6	7	8	9	10
Length Feet	(Lbs.)	(Lbs.)	(Lbs.)	(Lbs.)	(Lbs.)	(Lbs.)	(Lbs.)	(Lbs.)	(Lbs.)	(Lbs.)
16					230	190	135	135	105	85
18			540	350	300	230	190	190	130	100
20	720	600	540	350	300	230	190	190	130	100
22	1020	780	540	500	420	300	225	225	200	150
25	1020	780	600	515	420	300	250	250	200	150
30	1320	1170	870	630	520	420	350	350	275	
35	1620	1380	1060	820	720	510	450	450	350	
40	2040	1675	1280	1020	790	740				
45	2640	1970	1535	1215	1080	790				
50	3200	2640	1860	1470	1380	1080				

## A.S.A. Dimensions for Creosoted Yellow Pine Poles

Class	1	2	3	4	5	6	7	9	10
Min. Top Circ., In.—	27	25	23	21	19	17	15	15	12
Length of Pole Feet	Ground Line Dist. From Butt Feet	Minimum Circumference at Six Feet From Butt, In.							
16	3½				21.5	19.5	18.0	No Butt Require- ment	No Butt Require- ment
18	3½			26.5	24.5	22.5	21.0		
20	4	31.5	29.5	27.5	25.5	23.5	22.0		
22	4	33.0	31.0	29.0	26.5	24.5	23.0		
25	5	34.5	32.5	30.0	28.0	26.0	24.0		
30	5½	37.5	35.0	32.5	30.0	28.0	26.0		
35	6	40.0	37.5	35.0	32.0	30.0	27.5		
40	6	42.0	39.5	37.0	34.0	31.5	29.0		
45	6½	44.0	41.5	38.5	26.0	33.0	30.5		
50	7	46.0	43.0	40.0	37.5	34.5	32.0		
55	7½	47.5	44.5	41.5	39.0	36.0	33.5		
60	8	49.5	46.0	43.0	40.0	37.0	34.5		

## A.S.A. Dimensions for Northern White Cedar Poles

Class	1	2	3	4	5	6	7	8	9	10
Min. Top Cir., In.—	27	25	23	21	19	17	15	18	15	12
Length of Pole Feet	*Ground Line Dist. From Butt Feet	Minimum Circumference at Six Feet From Butt, In.								
16	3½				26.0	24.0	22.0	No Butt Require- ments†	No Butt Require- ments†	No Butt Require- ments†
18	3½		32.5	30.0	28.0	25.5	23.5			
20	4	39.5	37.0	34.0	31.5	29.0	27.0	25.0		
22	4	41.0	38.5	36.0	33.0	30.5	28.0	26.0		
25	5	43.5	41.0	38.0	35.5	32.5	30.0	28.0		
30	5½	47.5	44.5	41.5	38.5	35.5	33.0	30.5		
35	6	50.5	47.5	44.0	41.0	38.0	35.0	32.5		
40	6	53.5	50.0	46.5	43.5	40.0	37.0			
45	6½	56.0	52.5	49.0	45.5	42.0				
50	7	58.5	55.0	51.5	47.5	44.0				
55	7½	61.0	57.5	53.5	49.5	46.0				
60	8	63.5	59.5	55.5	51.5					

\*The figures in this column are intended solely for use whenever a definition of ground line is necessary in order to apply specification requirements relating to scars, straightness, etc.

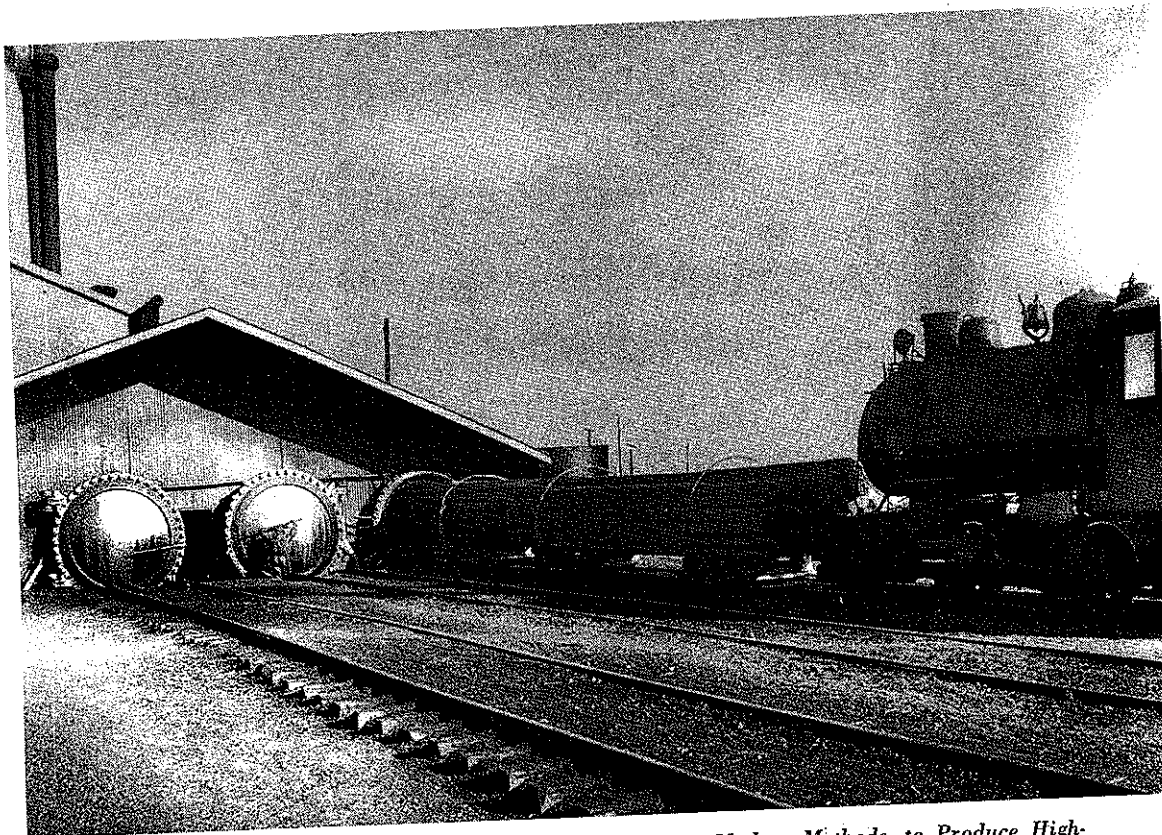
†Lines indicate length limits.

A.S.A. Dimensions for Western Red Cedar Poles

Class	1	2	3	4	5	6	7	8	9	10
Min. Top Cir., In.—	27	25	23	21	19	17	15	18	15	12
Length of Pole Feet	*Ground Line Dist. From Butt Feet									
16	3½				23.0	21.5	19.5			
18	3½		28.5	26.5	24.5	22.5	21.0			
20	4	34.5	32.0	30.0	28.0	25.5	23.5	22.0	No Butt Requirements†	No Butt Requirements†
22	4	36.0	33.5	31.5	29.0	27.0	25.0	23.0		
25	5	38.0	35.5	33.0	30.5	28.5	26.0	24.5		
30	5½	41.0	38.5	35.5	33.0	30.5	28.5	26.5		
35	6	43.5	41.0	38.0	35.5	32.5	30.5	28.0		
40	6	46.0	43.5	40.5	37.5	34.5	32.0			
45	6½	48.5	45.5	42.5	39.5	36.5				
50	7	50.5	47.5	44.5	41.0	38.0				
55	7½	52.5	49.5	46.0	42.5	39.5				
60	8	54.5	51.0	47.5	44.0					
65	8½	56.0	52.5	49.0	45.5					
70	9	57.5	54.0	50.5	47.0					
75	9½	59.5	55.5	52.0	48.5					
80	10	61.0	57.0	53.5	49.5					
85	10½	62.5	58.5	54.5						
90	11	63.5	60.0	56.0						

\*The figures in this column are intended solely for use whenever a definition of ground line is necessary in order to apply specification requirements relating to scars, straightness, etc.

†Lines indicate length limits.



Southern Yellow Pine Timber is Processed by the Most Modern Methods, to Produce High-Strength Long-Lasting Poles.

## Northern White and Western Red Cedar Poles

All Northern White and Western Red Cedar poles are carefully graded under the American Standard Associations Specifications. These specifications were sponsored by the A. S. A. telephone group and have met with wide acceptance by the telephone companies.

Our supplier of Northern White and Western Red Cedar poles, *Page and Hill Inc.*, have pioneered the specifications for treating of poles and recommend "P&H PENTA" poles which provide full-length treating with Pentachlorophenol.

## American Standard Specifications and Dimensions for Wood Poles

These American Standard Specifications and Dimensions for Wood Poles were developed by a sectional committee under the sponsorship of the ASA Telephone Group (Bell Telephone System and United States Independent Telephone Association). This sectional committee has been in existence since it was organized in December, 1924, and has produced revisions of the pole specifications from time to time as required.

The work on these new specifications and dimensions was initiated at a meeting of the committee held in Minneapolis, Minn., March 13-14, 1947. The specifications and dimensions were approved as American Standard on April 9, 1948. This new standard comprises all specifications and dimensions for wood poles which have been approved as American Standard up to this time.

## Scope and General

**Scope.** This standard consists of specifications and dimensions for wood poles that are to be given a preservative treatment.

**General.** The species, the length and class of poles, the type of treatment (including seasoning details, if seasoning is desired), and complete details for the roofing gaining, boring, and branding shall be given in the purchase orders.

Complete detailed instructions shall be given the supplier whenever the requirements of these specifications are modified to meet special conditions.

**Definitions.** For definitions of terms used in these specifications see Section 6.

## Specifications

### Material Requirements

**Species. Group I:** Fiber stress 3600 pounds per square inch Northern white (Eastern) cedar (*Thuja Occidentalis*)

**Group II:** Fiber stress 5600 pounds per square inch Western red cedar (*Thuja Plicata*)

**Group III:** Fiber stress 6000 pounds per square inch Ponderosa pine (*Pinus ponderosa*)

**Group IV:** Fiber stress 6600 pounds per square inch

Western firs (*true firs*)  
California red fir (*Abies Magnifica*)  
Grand fir (*Abies grandis*)  
Noble fir (*Abies nobilis*)  
Pacific silver fir (*Abies amabilis*)  
White fir (*Abies concolor*)  
Lodgepole pine (*Pinus contorta*)  
Northern pines  
Jack pine (*Pinus banksiana*)  
Red (Norway) pine (*Pinus resinosa*)

**Group V:** Fiber stress 7400 pounds per square inch

Douglas fir—all types (*Pseudotsuga taxifolia*)  
Western hemlock (*Tsuga heterophylla*)  
Southern pines  
Longleaf pine (*Pinus palustris*)  
Shortleaf pine (*Pinus echinata*)  
Loblolly pine (*Pinus caribaea*)  
Pond pine (*Pinus rigida serotina*)

**Group VI:** Fiber stress 8400 pounds per square inch

Western larch (western tamarack)

## Prohibited Defects

Cross-breaks (cracks)

Bird holes

Plugged holes, except increment borer holes

Hollow butts or tops, except as permitted under "Hollow Pith Centers" and "Defective Butts"

Marine borer damage

Splits or through-checks in the top

Decay, except as permitted under "Firm Red Heart," "Dead Knots," and "Defective Butts"

Nails, spikes, and other metal not specifically authorized by the purchaser

## Permitted Defects

**Sap Stain.** Sap stain that is not accompanied by softening or other disintegration (decay) of the wood is permitted.

**Firm Red Heart.** Firm red heart not accompanied by softening or other disintegration (decay) of the wood is permitted.

**Spiral Grain.** Spiral grain (twist grain) is permitted as follows:

<i>Length of Pole</i>	<i>Maximum Twist of Grain Permitted</i>
Less than 30 Feet	1 complete twist in any 10 feet
35 to 45 Feet	1 complete twist in any 16 feet
Over 50 Feet	1 complete twist in any 20 feet

**Hollow Pith Centers.** Hollow pith centers in the tops or butts and in knots are permitted in poles that are to be given full-length treatment.

### Limited Defects

**Checks and Splits in Butts.** Through-checks or splits in the butt surface are permitted, provided that their height from the butt along the side surface does not exceed 2 feet.

**Shakes.** Shakes in the butt surface extending through an arc of not more than 90 degrees are permitted. Shakes extending through an arc of more than 90 degrees are permitted when they are inside of a circle the center of which corresponds to the center of the butt surface and the diameter of which is not greater than one-half the average butt diameter.

Shakes in the top surface are permitted in poles that are to be given full-length treatment provided that the width of the shake does not exceed 1/16 inch and provided that the diameter of the shake is not greater than one-half the diameter of the top of the pole.

**Insect Damage.** Insect damage consisting of holes 1/16 inch or less in diameter, or surface scoring or channeling are permitted. All other forms of insect damage are prohibited, except that associated with hollow heart in cedar poles.

**Knots.** The diameter of any single knot or the sum of the diameters of all knots in any 1-foot section shall not exceed the limits set up in the following table. Knots 1/2 inch or less in diameter shall be ignored in applying the limitations for the sum of diameters.

Limitations of Knot Size

<i>Length of Pole, (Feet)</i>	<i>Diameter of Any Single Knot, (Inches) Classes</i>		<i>Sum of Diameters of All Knots in Any One-Foot Section, (Inches)</i>
	<i>1 to 3</i>	<i>4 to 10</i>	
45 and shorter	4	3	8
50 and longer	5	5	10

**Dead Knots.** Decay is permitted in knots provided it is not associated with heart rot.

**Scars.** No pole shall have a scar or turpentine face (southern pine) located within 2 feet of the ground line. Turpentine scars need be trimmed only to the extent necessary to examine for evidence of fungus infection and insect damage. Other sound scars are permitted elsewhere on the pole surface, provided they are smoothly trimmed and do not interfere with the cutting of any gain, and provided:

(a) That the circumference at any point on trimmed surfaces located between the butt and 2 feet below the ground line is not less than the minimum circumference specified at 6 feet from the butt for the class and length of the pole; and

(b) That the depth of the trimmed scar is not more than 2 inches, if the diameter is 10 inches or less, or one-fifth of the pole diameter at the location of the scar if such diameter is more than 10 inches.

**Dead Streaks.** Sound dead streaks, not wider than one-fourth of the circumference of the pole at the point of measurement, are permitted.

**Compression Wood.** The outer 1 inch of all poles shall be free from compression wood.

**Defective Butts.** Hollowing in the butt caused by "splinter-pulling" in felling the tree is permitted, provided that the area of such a hollow is less than 10 percent of the butt area. Hollow heart is permitted in cedar poles only, provided that the area of the hollow does not exceed 10 percent of the butt area, and that the depth of the hollow does not exceed 2 feet measured from the butt surface.

Decay is permitted in the butt of cedar poles only, provided that the aggregate area of decay and hollow heart does not exceed 10 percent of the entire butt surface.

**Shape.** Poles shall be free from short crooks.

A pole may have sweep subject to the following limitations:

(a) Where sweep is in one plane and one direction only, a straight line joining the surface of the pole at the ground line and the edge of the pole at the top shall not be distant from the surface of the pole at any point by more than 1 inch for each 6 feet of length between these points, except in northern white cedar poles.\*

(b) Where sweep is in two planes (double sweep), except in northern white cedar poles,† or in two directions in one plane (reverse sweep), a straight line connecting the mid-point at the top shall not at any intermediate point pass through the surface of the pole.

### Dimensions

**Length.** Poles less than 50 feet in length shall be not more than 3 inches shorter or 6 inches longer than nominal length. Poles 50 feet or more in length shall be not more than 6 inches shorter or 12 inches longer than nominal length.

Length shall be measured between the extreme ends of the pole.

\*For northern white cedar poles the straight line between the edge of the top and the ground line shall not be distant from the surface of the pole at any point by more than 1 inch for each 4 feet of length between those points.



**Circumference.** The minimum circumferences at 6 feet from the butt (except for Classes 8, 9, and 10) and at the top, for each length and class of pole, are listed in the tables of dimensions. The circumference at 6 feet from the butt of poles in Classes 1 to 7, inclusive, shall be not more than 7 inches larger than the specified minimum.

The top dimensional requirement shall apply at a point corresponding to the minimum length permitted for the pole.

**Classification.** The true circumference class shall be determined as follows:

Measure the circumference at 6 feet from the butt. This dimension will determine the true class of the pole, provided that its top (measured at the minimum length point) is large enough. Otherwise the circumference at the top will determine the true class, provided that the circumference at 6 feet from the butt does not exceed the specified minimum by more than 7 inches.

## Manufacturing Requirements

**Bark Removal.** Outer bark shall be completely removed from all poles.

On all poles no patch of inner bark more than 1 inch wide shall be left on the pole surface between the butt and 2 feet below the ground line.

On poles that are to be full-length treated, no patch of inner bark larger than 1 inch wide and 6 inches long shall be left on the pole surface between the top and 2 feet below the ground line.

On poles that are to be butt treated, no patch of inner bark larger than 1 inch wide and 6 inches long shall be left on the pole surface between points 1 foot above and 2 feet below the ground line.

**Sawing.** All poles shall be neatly sawed at the top (unless otherwise ordered) and at the butt along a plane which shall not be out of square with the axis of the pole by more than 2 inches per foot of diameter of the sawed surface. Beveling at the edge of the sawed butt surface not more than one-twelfth of the butt diameter in width, or an equivalent area unsymmetrically located, is permitted.

**Trimming.** Completely overgrown knots rising more than 1 inch above the pole surface, branch stubs, and partially overgrown knots shall be trimmed close. Completely overgrown knots less than 1 inch high need not be trimmed. Trimming may be done by shaving machine or by hand.

**Framing.** All poles that are to be given a full-length preservative treatment shall be roofed, gained,

and bored in accordance with the terms of the purchase order before treatment.

All gains (mortise or slab type) shall be cut on the face of the pole; and the gained surfaces shall be in approximately parallel planes.

**Marking.** The following marks shall be stamped or branded legibly on the face and the butt of each pole (see note below):

- The supplier's code or trade-mark;
- The plant location and the year of treatment;
- Code letters denoting the pole species and preservative used;
- The true circumference class numeral and numerals showing the length of the pole. The letter "C" shall circumscribe the true class numeral on the butt.

NOTE: The suppliers' code or trade-mark, the plant location and year of treatment (a) and (b) above may be omitted from the butt by agreement of supplier and purchaser.

The code letters, not less than 5/8 inch high, designating the pole species and preservative used shall be as follows:

Species	Species and Preservative (Creosote) Code Letters
Northern white (eastern) cedar	ECC
Western red cedar	WCC
Western firs	WFC
California red fir	
Grand fir	
Noble fir	
Pacific silver fir	
White fir	
Douglas fir	DFC
Western hemlock	WHC
Western larch (Western tamarack)	WLC
Lodgepole pine	LPC
Northern pines	NPC
Jack pine	
Red pine	
Southern pines	SPC
Longleaf pine	
Shortleaf pine	
Loblolly pine	
Slash pine	
Pond pine	
Western pine	WPC
Ponderosa pine	

The appropriate preservative code letter shall be chosen from the following list:

- C = Creosote  
T = Creosote-coal-tar solutions  
X = Creosote-petroleum solutions

† The double sweep limitation for northern white cedar poles shall be as follows:

"Where sweep is in two planes (double sweep), the sum of the sweeps in the two planes (each sweep being measured as shown on Diagram 1 of the subsidiary drawing) shall be not greater than the allowance for sweep in one plane and one direction for a pole of the same length."

**N**=Copper naphthenate solutions

**P**=Pentachlorophenol solutions

**S**=Salt solutions (any type)

Code letters designating preservatives other than those listed, or modifications of the letters listed with a view to designating specific types rather than broad classes of solutions, may be used on agreement between supplier and purchaser.

On the face of the pole the brand or mark shall be placed squarely and so located that the bottom of the brand or mark will be at a point designated by the purchaser.

If the supplier's name, plant location, and year of treatment are included, the arrangement and order of the code letters and figures shall be as follows:

#### Interpretation

<b>PCC</b>	Supplier's code or trade-mark Pole Creosoting Company
<b>C-48</b>	Plant location and year of treatment City Year, as 1948
<b>SPC</b>	Species and preservative code Southern pine, Creosote
<b>5-35</b>	Size Class 5 — 35-foot pole

On the butt of the pole the brand or mark may be the same as that placed on the face of the pole, in which case the class numeral need not be circumscribed with a C; or the code letters for species and preservative may be stamped into the butt with a die or hammer.

#### Storage and Handling

**Storage.** When it is necessary to hold poles in storage, they shall be stacked on treated skids of such dimensions and so arranged as to support the poles without producing noticeable distortion of any of them. The height of the piles shall be limited so as to avoid damage to poles on the bottom layers.

**Handling.** Treated poles shall not be dragged along the ground. Cant hooks, pole tongs, or other tools shall not be applied to the ground line section of any pole.

#### Definition of Terms

The following definitions shall apply in these specifications.

**Check.** A check is a separation of the wood along the grain, the greater part of which occurs across the rings of annual growth. A through check extends from surface to surface of the pole, usually through the pith center.

**Compression Wood.** Compression wood is abnormal wood that often forms on the lower side of branches and inclined trunks of coniferous trees. Compression wood is:

(a) Characterized by relatively wide annual rings, usually eccentric;

(b) Has a relatively high proportion of summerwood (frequently more than 50 per cent of the width of the annual rings in which it occurs);

(c) Exhibits but little contrast in color between springwood and summerwood; and

(d) Shrinks excessively lengthwise as compared with normal wood.

**Cross-break (Crack).** A cross-break is a separation of the wood cells across the grain. Such breaks may be due to internal strains resulting from unequal longitudinal shrinkage or to external forces.

**Dead Knot.** A dead knot is a knot left by a branch that dies before the tree is cut. An encased knot is a dead knot in which the growth layers are not intergrown with those of the surrounding wood. Dead knots may contain soft fibers (decay) that usually do not extend deeper than an inch or two from the pole surface. They are distinct from rotten or decayed knots in which the loose or soft fibers (decay) may extend the full length of the knot into the pole, and which are frequently associated with heart rot.

**Dead Streak.** A dead streak is any portion of the sapwood in which the life processes had ended prior to the cutting of the tree. A dead streak starts from the butt and differs from a wound, such as a cat face or scar, where the growth of new wood shows that life processes are still acting to repair the injured part.

**Decay.** Decay is the disintegration of wood substance due to the action of wood-destroying fungi. Rot and dote mean the same as decay.

**Face of Pole.** The face of a pole is the concave side, or the side of greatest curvature in poles having reverse or double sweep, between the ground line and top.

**Ground Line Section.** The ground line section is that portion of a pole between 1 foot above and 2 feet below the ground line as defined in the pole dimension tables.

**Hollow Heart.** A hollow heart is a hollow in the heartwood of a living tree caused by insects or fungi.

**Hollow Pith Center.** A hollow pith center is a small hole at the pith center of the trunk or of a knot, caused by disintegration of the pith (small soft core occurring in the structural center of a tree or branch).

**Insect Damage.** Insect damage is the result of boring in the pole by insects or insect larvae. Scoring or channeling of the pole surface is not classed as insect damage.

**Knot Diameter.** A knot diameter is the diameter of a knot on the surface of the pole measured in a direction at right angles to the lengthwise axis of the pole.

**Red Heart.** Red heart is caused by a fungus, *Fomes pini*, that occurs in the living tree. It is characterized in the early stages of infection by a reddish or brownish color in the heartwood. This is known

as "firm red heart." Later the wood in the case of the living tree disintegrates (decays) in small, usually distinct, areas that develop into white-line pockets.

**Sap Stain.** Sap stain is a discoloration of the sapwood caused by the action of certain molds and fungi that is not accompanied by softening or other disintegration of the wood.

**Scar (Cat Face).** A scar is a depression in the surface of the pole resulting from a wound where healing has not re-established the normal cross section of the pole.

**Shake.** A shake is a separation along the grain, the greater part of which occurs between the rings of annual growth.

**Short Crook.** A short crook is a localized deviation from straightness which, within any section 5

feet or less in length, is more than one-half the mean diameter of the crooked section.

**Spiral Grain (Twist Grain).** Spiral grain is a type of growth in which the fibers take a spiral course about the bole of a tree instead of the normal vertical course. The spiral may extend right-handed or left-handed around the tree trunk. The amount of spiral grain in a pole is measured as the distance in feet, along the axis of the pole, in which one complete twist of the spiral occurs, and is expressed as, for example, 1 in 10.

**Split.** A split is a lengthwise separation of the wood due to the tearing apart of the wood cells, extending from surface to surface of the pole.

**Sweep.** Sweep is the deviation of a pole from straightness.

## The Preservative Treatment of Southern-Pine Poles by Pressure Processes (A.W.P.A. 36C)

### General Requirements

The following requirements apply to each of the treatment processes. If these requirements are to be modified to meet special conditions, complete detailed instructions shall be given.

**Plant equipment.** Treating plants shall be equipped with the thermometers and gauges necessary to indicate and record accurately the conditions at all stages of treatment, and all equipment shall be maintained in acceptable, proper working conditions. The apparatus and chemicals necessary for making the analyses and tests required by the purchaser shall also be provided by plant operators, and kept in condition for use at all times.

**Conditioning.** Poles shall be conditioned by air-seasoning or by steaming or by a combination of both as agreed upon, in such a manner as will not cause injurious checking, splitting or warping.

When air-seasoning is employed the material shall be treated before it begins to decay.

When steam conditioning is employed poles shall be steamed in the cylinder at temperatures between 254 deg., F., and 259 deg., F. (approximately 20 lb. pressure per sq. in.) for not less than 6 hr. and not more than 15 hr., which temperature maximum shall not be reached in less than 1 hr. The cylinder shall be provided with vents to relieve it of air and insure proper distribution of steam. After steaming is completed, a minimum vacuum of 24 in. at sea level shall be maintained for not less than 1 hr. The cylinder shall be relieved continuously or frequently enough to prevent condensate from accumulating in sufficient quantity to reach the wood. Before the preservative is introduced the cylinder shall be drained of condensate.

**Sorting.** Whenever it is practicable, poles should be sorted into size and seasoning groups, and the treatment of large and small pieces or green and seasoned pieces in the same charge should be avoided.

**Framing.** So far as practicable all surfacing, framing, and boring shall be done prior to treatment; but gaining and boring bolt holes and step holes shall be permitted after treatment on poles with 100 per cent sapwood penetration, provided the surfaces of such gains and holes are painted or swabbed with hot preservative.

### Treatment Oil Treatment

**Manner of Treatment.** Following the conditioning period, the poles shall be treated by an empty-cell process whenever practicable, in order to obtain as deep and uniform penetration as possible with the retention of preservative stipulated. Poles shall be treated by the full-cell process only when the maximum net retention is desired and where pressure is held to refusal, or when the stipulated retention is greater than can be obtained by the use of an empty-cell process. The ranges of pressure, temperature and time duration shall be controlled so as to get the maximum penetration by the quantity of preservative injected.

### Standard Processes Empty-cell... Rueping

Poles shall be subjected to initial air pressure of the necessary intensity and duration. The preservative shall be introduced until the cylinder is filled, the

air pressure being maintained constant during the filling operation. The pressure shall be raised to not more than 200 lb. per sq. in. Poles shall be held under pressure until there is obtained the largest practicable volumetric injection that can be reduced to the stipulated retention by ejection of surplus preservative from expansion of the air and by a quick high vacuum.

The temperature of the preservative immediately after the cylinder is filled and during the entire pressure period shall be not more than 210 deg., F., and shall average at least 180 deg., F.

After pressure is completed the cylinder shall be emptied speedily of preservative, and a vacuum of not less than 22 in. at sea level shall be created promptly and maintained until the wood can be removed from the cylinder free of dripping preservative.

## Results of Treatment

**Retention of preservative.** The net retention in any charge shall be not less than 95 per cent of the quantity of preservative that may be specified; but the average retention by the material treated under any contract or order and the average retention of any five consecutive charges shall be at least 100 per cent of the quantity specified. The amount of preservative retained shall be calculated from readings of working tank gauges, or scales, or from weights before and after treatment of loaded trams on suitable track scales.

The volume of preservative shall be calculated on the basis of 100 deg., F. Calculations of volume or weight shall be made by the use of temperature or specific gravity factors contained in the Volume and Specific Gravity Correction tables of the American Wood-Preservers' Association.

The amount of preservative retained shall be as follows, depending upon use requirements, and as stipulated in purchaser's order and in accordance with Section 3.1:

- 3.21 8 lb. of creosote per cu. ft. of wood in charge, or
- 3.22 10 lb. of creosote per cu. ft. of wood in charge, or
- 3.23 12 lb. of creosote per cu. ft. of wood in charge.

## Penetration

The penetration in any pole treated to an 8-lb. retention shall be not less than 2.5 in. unless 85 per cent of the sapwood is penetrated.

The penetration in any pole treated to a 10-lb. retention shall be not less than 3 in. unless 90 per cent of the sapwood is penetrated.

The penetration in any pole treated to a 12-lb. retention shall be not less than 3.5 in. unless 90 per cent of the sapwood is penetrated.

**Determination of Penetration.** To facilitate inspection for conformance to the penetration requirements poles should be considered as divided into the classes and lengths.

**Grouping poles for penetration inspection.** Poles shall be divided for inspection for the penetration requirements into two groups, viz:

**Group A.** Small poles, of the following classes and lengths:

- Class 1, 25 ft. and shorter
- Class 2, 30 ft. and shorter
- Class 3, 35 ft. and shorter
- Class 4, 45 ft. and shorter
- Class 5, 55 ft. and shorter
- 6 to 10, all lengths

This group includes all guy stubs, reinforcing stubs and push braces.

**Group B.** Large poles, including all classes and lengths not in Group A.

**Poles in Group A.** An increment borer core shall be taken approximately midway between the butt and top of each of 20 poles in each charge.

If 18 of the 20 borings meet the penetration requirements, the charge as a whole shall be considered as conforming.

If 16 or 17 of the 20 borings meet the penetration requirements each pole in the charge shall be bored as previously indicated and only those poles that meet the penetration requirements shall be considered as conforming.

If less than 16 of the 20 borings meet the penetration requirements the charge as a whole shall be considered as nonconforming.

**Poles in Group B.** An increment borer core shall be taken approximately midway between the butt and top of all poles in Group B, and only those poles that meet the penetration requirements shall be considered as conforming.

Note: If the poles are not handled on the class and length basis shown in the table an approximately comparable division may be made by listing all poles with circumferences at 6 ft. from the butt less than 37.5 inches as Group A poles, and all poles with circumferences at 6 ft. from the butt of 37.5 inches or more as Group B poles.

**Plugging Increment Borer Holes.** All holes made with an increment borer for determining penetration shall be plugged tightly with creosoted plugs or with untreated plugs of durable heartwood approved by the purchaser.

## Preservatives

The Preservative used shall conform to the American Wood-Preservers' Association Standard 4e — Standard Specification for Creosote.

## Inspection

Inspection of poles for conformity to the requirements of this specification shall be in accordance with American Wood-Preservers' Association Standard 33, amplified by above.

## Retreatment

Poles not conforming to the stipulated minimum requirements may be retreated and may be reoffered for acceptance but retreatment should be avoided so

far as practicable. If retreatment is necessary it shall be under the following conditions:

The maximum limits for temperature of steam or preservative and the maximum limit for preservative pressure, that apply to original treatments, shall not be exceeded during retreatment.

When a charge to be retreated is made up entirely of black non-conforming or rejected poles, the amount of preservative retained in the retreatment shall be at the discretion of the creosoter, provided

the total net retention does not fall below the minimum requirements.

When it is necessary to retreat black poles in the same charge with white untreated poles, the number of black poles in the charge shall not exceed 5 per cent of the total poles in the charge.

In the computation of the required minimum net retention in any charge containing both black and white poles, all poles in charge shall be considered as untreated.

## The Taylor-Colquitt Vapor-Drying Process



The Taylor-Colquitt Co. after years of intensive research has developed a method of artificially seasoning wood products. This process known as *Vapor-Drying* has solved many of the problems of steam seasoning of poles in that it eliminates seasoning defects and offers generally better impregnation.

Poles dried by the Vapor-Drying process retain the original strength of green poles which increases the breaking strength over steam dried poles by 20 per cent. The weight of Vapor-Dried poles is approximately 4 pounds per cu. ft. less than green steam seasoned poles. Vapor-Drying also eliminates bleeding because a higher percentage of the preservative is retained deeper in the sapwood.

Seasoning by means of Vapor-Drying is accomplished through exposure of wood in a closed vessel to the action of vapors from boiling suitable organic liquids at atmospheric or sub-atmospheric pressures. The vapor is introduced into the bin containing the poles in sufficient quantity to maintain a high concentration of the chemical in the atmosphere of the drying vessel. The mixture of steam and vapor is discharged to a condenser and the liquids are separated by gravity, the water measured and discharged and the water-free drying agent returned to the evaporator to be used again. For purposes of wood preservation the drying agents used are coal tar or petroleum fractions having narrow boiling ranges with the initial boiling point between 212° and 400° F.

Several factors involved in the operation of the process make it possible to utilize this high temperature range without detrimental effect to the wood, viz.,

- (1) The chemicals used are inert with respect to any injurious reaction with the wood.
- (2) Oxygen is excluded from the system by dis-

placing it with the organic vapor, preventing oxidation.

(3) While the wood still contains water, elevation of its temperature much beyond that of the boiling point of water is prevented since the contained water is free to vaporize at approximately its atmospheric boiling point; and steam evolved from the wood, mixing with the surrounding highly heated vapor, is kept at a very low concentration so that hydrolysis is negligible.

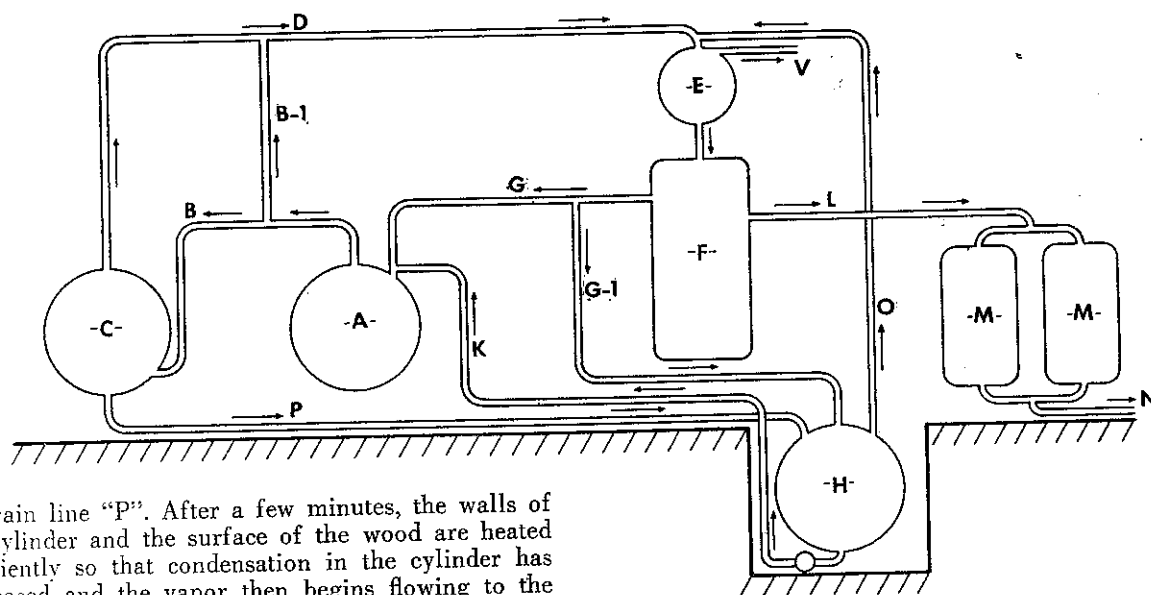
(4) The duration of exposure required to effect drying is relatively short, and time is a more important factor than is temperature in producing thermal changes in the temperature range which actually obtains in the wood under the conditions of operation, therefore injury from thermal action is inappreciable.

## The Vapor-Drying Process

The Vapor-drying process employs many of a large number of organic drying agents that are immiscible with and lighter than water, thus a simple gravity separation of water and drying agent is secured. In selecting drying agents, several factors must be considered. One of major importance is the working temperature available in the plant for boiling the drying agent; since in most cases the source of the heat will be saturated steam, the criterion for this factor is boiler pressure. The drying agent should have sufficient compatibility with the preservatives used to prevent the formation of insoluble resinous products that would be deposited on the evaporator heating surfaces, thereby reducing the rate of heat transfer.

## Drying Operation

The accompanying diagram illustrates the method of operation. The drying agent is boiled in an evaporator "A"; after the wood has been placed in retort "C", the dry organic vapor is introduced through pipe "B". Pipe B-1 is a by-pass from the evaporator to the condenser and is used when heating the drying agent preparatory to beginning the drying cycle. The entering vapor immediately condenses on contacting the cool wood and the walls of the cylinder; the resultant condensate returns to tank "H" by means



of drain line "P". After a few minutes, the walls of the cylinder and the surface of the wood are heated sufficiently so that condensation in the cylinder has decreased and the vapor then begins flowing to the condenser "E" through line "D". The air in the cylinder is displaced and escapes through vent "V" to the atmosphere. By the time the vapor is passed over to the condenser it will contain a substantial amount of water vaporized from the wood which has been heated by the condensing vapor. This first condensate will be composed of approximately  $\frac{1}{2}$  water and  $\frac{1}{2}$  organic drying agent. As the heating continues the percentage of water decreases sharply although the actual amount delivered to the condenser remains about the same. This is occasioned by the fact that as the cylinder walls and contents are heated, less of the organic drying agent condenses in the cylinder and, since the heat in-put remains about the same, more of the drying agent will pass over to the condenser.

The amount of organic agent in the vapor entering the condenser is allowed to increase to a point between 65% and 90% and this range is maintained by controlling the heat in-put to the evaporator. This control is governed by temperature of the effluent vapors; the partial pressure of the drying agent establishes the percentage composition of the effluent vapors, since the water vapor component behaves as a fixed gas. At organic agent concentrations below 65% the drying rates decrease rapidly, while above 90% they increase but little, even though the heat in-put required to maintain the higher concentrations rises sharply.

At the condenser, the vapor mixture is cooled to about 180° F. and the resultant condensate passes downward into tank "F" where gravity separation takes place, the water-free drying agent returning to the evaporator through pipe "G". Line "G-1" is a bypass for the water-free agent from the separator to the return tank. The water passes through "L" into the drain tanks "M" for measurement and is then discharged to the drain through line "N". Reboil line "O" is to carry off any steam to the condenser that

has formed in the return tank. Dry organic liquid is pumped from the condensate tank through "K" to the evaporator. Stable operating conditions are established when the effluent vapor temperature indicates that the composition with respect to organic agent in the vapor discharging from the cylinder is at the desired level; the water removal will then have reached a maximum. A period of about 30 minutes is required to reach this point, but from there on the amount of water removed decreases as drying progresses.

### Vacuum Cycle

During the period of heating in vapor, much of the drying agent that condenses to supply heat is absorbed by the wood, although the amount is not as great as the quantity of water being lost. When the moisture content of the wood has been reduced to the desired level which is determined by measuring the water in the drain tanks, the evaporator is shut off from the cylinder and a vacuum is impressed on the system to recover the drying agent that has condensed in the wood. Duration of the vacuum varies from 30 minutes to 2 hours depending on the size of the poles, and its depth reaches 22 to 26 inches of mercury. For poles that are dried preparatory to preservative treatment, the final moisture content usually ranges from 25% to 40%.

During the vacuum some water is removed from the poles along with the drying agent. This requires the twin water tanks "M" in order that one tank may be draining while the other is filling. The amount of water recovered in the vacuum is usually 10% to 20% of the total removed from the charge during the heating cycle. The amount of drying agent finally retained by the wood ranges from 0.25 to 0.50 lbs per cu. ft. following the vacuum in woods that are dried preparatory to impregnation.

## Rainier Crossarms

Indispensable characteristics in crossarms are strength and durability. Strength is necessary to carry the dead load of conductors, to withstand sleet and wind, and to stand shock any combination of these two duties impose on the arm in service. Durability is necessary because the arm is intended for years of service and the cost of replacing an arm in the line is more than the price of the arm itself.

Weight is also important. The lighter arms cost less to transport and install and place less burden on pole structures.

Rainier fir crossarms meet these requirements. They are carefully graded, with strength reducing defects eliminated. They are seasoned to approximately equilibrium moisture content which adds to the strength. They are seasoned slowly and under such control that, from the start to the finish of the seasoning process, the moisture content of the interior is substantially the same as at the surface of the arm. Microscopic, as well as visible, checking is held to a minimum, in order that finished arms are sound and solid and will not readily soak up moisture nor admit decay fungi to the interior.

The largest factory is at Chehalis, Washington, where the finest dry kilns and kiln control equipment is located. The dry kiln operations are supervised by men who are specialists and experts in the drying of crossarm sizes of Douglas fir. Carload orders can be shipped economically from Chehalis to all parts of the United States.

For the benefit of customers who desire LCL quantities of crossarms, particularly with drillings of non-standard sizes or specially spaced, and to provide immediate delivery of any quantities in emergencies, factories are maintained at Chicago, Illinois; Kansas City, Missouri; Texarkana, Texas; Newark, New Jersey; and Minneapolis, Minnesota. These factories are fully provided with manufacturing equipment and are heavily stocked with crossarm lumber which permits prompt attention to the needs of users in all parts of the country. Kiln drying at these factories is not economical due to the cost of fuel, but each point carries a reasonable stock of blanks, kiln dried on the West Coast, for customers who ask for kiln dried arms. All these factories have well designed drying sheds in which the ventilation is controlled. Also they are equipped with the instruments necessary to check the character of drying while the lumber is being conditioned, and they observe the same high standards for grading lumber and eliminating inferior pieces, as the organization at Chehalis.

Southern yellow pine when properly graded is rated equal in strength to Douglas fir. With proper care before treatment, then with pressure treatment under the recognized standards with high grade creosote oil,

there can be no question of such arms lasting as long as any other part of the line structure. Pine arms are considerably heavier than fir, but are preferred in a good many localities, due to shorter distances from the source of supply and consequent saving in freight rates. Creosoted yellow pine crossarms are produced at Texarkana, Texas, and we can vouch that these arms will conform to our high standards of quality in every respect.

## Rainier Clear Douglas Fir Crossarm Specifications

### General

This specification covers clear Douglas fir crossarms in sizes five by six-inch cross-section and smaller.

**Dimensions.** All arms furnished shall conform to the design and dimensions specified by the purchaser. Where allowable variations are not shown, approximate conformity to the dimensions given, consistent with good commercial practice, is required.

**Seasoning.** The average moisture content in any lot of arms shall be not less than 12% nor more than 20% of the oven dry weights. The difference between the moisture content of a one-inch cube cut from the center and that of a slab one-half-inch thick cut from the outer surface of any cross-section, shall be not more than four percent.

**Annual Rings.** Not less than eight annual rings per inch on each end of the piece, except that arm having 33⅓% summer-wood may have not less than six rings per inch.

**Checks, Shakes and Splits.** No arm shall contain shakes or splits. On top of arm, no checks more than six inches long. No checks anywhere shall measure more than one-third the length of the arm nor more in depth than one-fourth the distance to the opposite face.

**Grain.** Except in deviations at knots and pitch-pockets, arms shall be free from spiral or diagonal grain with a slope of more than one-inch in 12 inches.

**Knots.** No knots in clusters. No knot exceeding 1⅞ inches in any part of the arm. No six-inch section in the middle half shall contain plurality of knots of which the diameters added together exceed one inch and no 12-inch section elsewhere shall contain knots of which the diameters added together exceed 1¼ inches.

No knot exceeding one-half inch shall intersect any pin or bolt hole, and no knot exceeding ¾ inch shall be closer than its own diameter to any hole bored for a wood pin.

The size of any knot shall mean its measurement across the smallest diameter.

**Pitch Pockets.** No pitch pocket on top of an arm more than four inches in length, nor more than eight inches in length elsewhere.

**Sapwood.** Not over 25% on any cross-section.

**Loose Heart or Boxed Heart.** No loose heart nor heart centers.

**Rot.** No stain, rot or decay.

**Wane.** No wane within  $\frac{1}{4}$  inch of pin or bolt hole or on more than one edge. No wane surface more than  $\frac{3}{4}$  inch wide within 12 inches of the middle bolt hole, or  $1\frac{1}{2}$  inches elsewhere.

**Warp.** A straight edge laid lengthwise on the concave surface of an arm shall show no offset for the arm greater than 1/10-inch per foot of length. No arm shall be twisted nor bent in more than one direction.

**Finish.** Arms shall be planed smooth on all four sides, cut accurately to length, ends coated with transparent but moisture-resistant gloss oil compounds, bored and roofed as ordered.

Pin and bolt holes shall be bored so as to take steel gauges as follows: W, pin holes,  $1\frac{1}{4}$ -inch gauge without forcing, but not  $1\frac{1}{2}$ -inch gauge; Y, brace bolt holes,  $\frac{3}{8}$ -inch gauge without forcing; and Z, middle bolt hole,  $\frac{5}{8}$ -inch gauge without forcing.

## Size, Spacing and Weight of Standard Fir Arms

### $3\frac{1}{4} \times 4\frac{1}{4}$ —Standard Cross Arms

Cat. No.	Type	Pole Pins In.	Side Pins In.	Brace Bolts In.	Weight per 100, Lbs.
<b>120-Inch Length—10 Pin</b>					
S-2183	A	16	12	42	3540
S-2184	B	32	10	42	3540

### 102-Inch Length—10 Pin

S-2185		16	9 $\frac{3}{4}$	32	3009
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### "Six-Foot, Six Pin"

S-2186		16	12	32	2124
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### $2\frac{3}{4} \times 3\frac{3}{4}$ —Pony Cross Arms

Cat. No.	Pin Holes	Length, In.	Center Space In.	Side Pins In.	Brace Bolts In.	Wt. per 100, Lbs.
S-2180	10	102	16	9 $\frac{3}{4}$	28	2295
S-2179	8	82	16	9 $\frac{3}{4}$	28	1845
S-2178	6	62	16	9 $\frac{3}{4}$	28	1395
S-2177	4	42	16	9 $\frac{3}{4}$	28	945

NOTE: Above specifications and dimensions pertain to Fir Crossarms. Table below gives additional information and comparative weights and measurements of Fir and Pine Crossarms.

## Comparative Dimensions of Standard Cross Arms

Size and Length	Pin Hole Spacings			Pin Center Bolt		Brace	Use	Weight	Weight
	Center	Sides	Ends	Hole Size	Hole	Bolt Spacing	Length Brace	Per Arm Fir, Lbs.	Per Arm Pine, Lbs.
Standard Telephone Arms									
3 1/4 x 4 1/4									
16 1/2 in. 2 pin	10	---	3 1/2	1 3/8	5/8	7	20	5.00	7.50
6 ft. 6 pin	16	12	4	1 3/8	5/8	32	24, 26	21.24	30.48
8 ft. 8 pin	16	12	4	1 3/8	5/8	32	24, 26	28.32	40.64
8 1/2 ft. 10 pin	16	9 3/4	4	1 3/8	5/8	32	24, 26	30.09	43.18
10 ft. 10 pin	16	12	4	1 3/8	5/8	42	30, 32	35.4	50.80
10 ft. 12 pin	16	9 5/8	3 7/8	1 3/8	5/8	42	30, 32	35.4	50.80
Pony Telephone Arms									
2 3/4 x 3 3/4									
42 in. 4 pin	16	9 1/2	3 1/2	1 3/8	5/8	28	22	9.45	13.13
62 in. 6 pin	16	9 3/4	3 1/2	1 3/8	5/8	28	22	13.95	19.38
82 in. 8 pin	16	9 3/4	3 3/4	1 3/8	5/8	28	22	18.45	25.63
102 in. 10 pin	16	9 3/4	4	1 3/8	5/8	28	22	22.95	31.88
120 in. 12 pin	16	9 5/8	3 7/8	1 3/8	5/8	28	22	27	37.50

### Dead End Cross Arm, C. Y. P.

Length	Dimensions	Weight, Lbs.
6'	3 $\frac{3}{4}$ "x5"	40

### Guard Arm, Fir

Length	Dimensions	Weight, Lbs.
4'	3 $\frac{1}{4}$ "x4 $\frac{1}{4}$ "	14



Specially manufactured arms to meet particular requirements and arms for high voltage transmission lines can be furnished promptly from the mill; not returnable.

Ordinarily no extra charge is made for arms bored for special requirements.

Care should be taken in ordering arms with special boring or spacing of holes. Working drawing should accompany order.

Unless otherwise ordered, all arms will be bored for 1 1/4-inch pins and roofed or rounded on top to shed water.

## Rainier Pine Crossarm Specifications Pressure Treated—For Telephone Use

This specification covers Southern yellow pine cross-arms, pressure creosoted for telephone use.

**Defects Prohibited.** No shakes, through checks, splits, pitch seams, cracks, rot, red-heart, decayed knots, or unsound knots.

**Grain.** Except in the case of deviations at knots and pitch pockets the general direction of the grain shall not slant from the lengthwise edge of an arm by more than one inch to 12 inches.

**Knots.** The maximum size of single sound knots measured across the smallest diameter including permissible and incased knots that are permitted in the tops or sides of the arms. Sound knots appearing only on the bottom of an arm may have a diameter 50% greater, provided that the diameter of any knot does not exceed two inches. Loose knots not greater in diameter than sound knots permitted in the top of the arm, are permitted in the bottom of an arm only.

**Pitch Pockets.** Pitch pockets shall not be over 1 1/2 inches deep. Pitch pockets entering pin holes may be four inches long, provided they are not more than 1/4 inch in width.

Pitch pockets up to and including 1/8 inch in width, shall not be more than eight inches long in any part of the arm, over 1/8 inch and up to 3/8 inch the length shall be reduced proportionately, so that a 3/8 inch pitch pocket, the maximum width allowed anywhere, shall not exceed four inches in length.

**Checks.** Checks in the pin holes of crossarms shall be not more than two inches long. Checks in pin holes shall not appear along the same line of grain at adjacent pin holes. Checks that do not intersect pin holes shall be not more than 1/2 inch deep in the top surfaces nor more than 3/4 inch deep in the sides and bottom surfaces. The length of such checks shall not exceed 12 inches divided by the depth of the checks.

**Wane.** Wane shall not appear on more than two edges of a crossarm nor shall it approach a pin hole closer than 1/4 inch nor extend across the full width of either side surface.

**Insect Damages.** Insect damages are prohibited in the middle half of the crossarm.

**Warp.** Warp is permitted in one direction only. When a straight-edge is laid full length on the concave side of a warped arm, the offset shall not exceed 1/10 inch for each foot of arm length.

**Finish.** All lengthwise surfaces of the arm shall be dressed or planed, except that one side or bottom may be rough sawn on not more than three percent of a lot or shipment. Pin and bolt holes shall be reasonably smooth inside and shall not intersect. The arms shall not be splintered to a depth of more than 1/4 inch on the side or bottom where the bits break through.

**Treatment.** Specifications governing the quality of the coal tar creosote, the preparation of the arms for impregnation, and the treatments, shall be those adopted as standard by the American Wood Preservers' Association and published in its manual of recommended practice for the empty cell process with initial air pressure and a final retention of not less than eight pounds of creosote per cubic foot of timber.

## Rainier Wood Insulator Pin Specifications

### Scope

This specification covers wood pins made of yellow locust (sometimes called black locust from the color of its bark).

### General

The specification and drawings are intended to include all instructions necessary for the guidance of the manufacturer in his work. They are intended to supplement each other and any details indicated in one and not in the other shall be executed the same as if indicated in both.

**Dimensions.** Pins shall be of the style and dimensions shown, and allowable variations must not be exceeded. Pins and threads shall be smoothly and accurately formed. Figures on the drawing shall be followed in preference to scale measurements.

**Seasoning.** Pins manufactured from green or partially seasoned wood shall, when seasoned, conform to the requirements of this specification.

**Material.** Finished pins shall not contain any of the following defects, and, where any of these defects are present, they shall be cause for rejection.

**Annular Rings.** Rings which depart from parallelism with the center line of pin by a sufficient amount to allow a ring starting at the center of the bottom of the pin to run out of the side below the lower thread.

**Checks.** Checks exceeding three inches in length or  $\frac{1}{16}$  inch in width.

**Knots.** Loose or unsound knots. Sound knots exceeding  $\frac{1}{8}$  inch in diameter above the shoulder or exceeding  $\frac{1}{4}$  inch in diameter below the shoulder. The least diameter of a knot shall be considered its diameter for the purpose of this specification.

**Loose Heart**

**Pitch Pockets**

**Rot**

**Sapwood.** Sapwood exceeding  $\frac{1}{8}$  inch in thickness except on the shoulder of the pin.

**Shakes.** Cracks or splits concentric to the annular rings of the wood.

**Wane.** Wane or bark above the shoulder.

**Worm Holes.** Worm holes in the top seven-inch section of the pin.

### Allowable Variations

#### 8-Inch and 9-Inch

Dimension	Base of Thread	Base of Flange	Shank Length
Over, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{4}$
Under, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{8}$

Taper of threaded portion shall not be more than 1.25-inch or less than .95-inch per foot.

### Wood Pins



#### Standard

Cat. No.	Size In.	Std. Bag	Diam. Top In.	Wt. per 1000, Lbs.
S-5676	1 $\frac{1}{4}$ x8	300	1	325
S-5678	1 $\frac{1}{2}$ x9	200	1	480

#### Transposition

S-5680	1 $\frac{1}{4}$ x9		1	400
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### Rainier Wood Insulator Bracket Specifications

**Scope.** This specification covers wood brackets made of oak.

**General.** Brackets shall be free from cracks, shakes, brashy wood and all other imperfections, except as hereinafter specified.

**Seasoning.** The maximum moisture content of seasoned brackets shall be 20%.

**Checks.** The presence of checks is permitted provided that they do not extend into the threaded section of the bracket or intersect any nail hole and are not greater than two inches in length.

**Grain.** The grain shall be straight and shall be practically parallel to the axis of the threaded portion of the bracket. The grain at either of the right-angled corners at the end of the bracket shall not run out below the bottom thread on the opposite side of the bracket.

**Insect-Holes.** In wood otherwise sound, a few small insect-holes not exceeding  $\frac{1}{8}$  inch in diameter may be present, provided that they are scattered and appear only in the portion of the bracket between the turned section and the small nail hole. No more than five percent of the brackets furnished shall contain such insect-holes.

**Knots.** Brackets shall be free from loose or unsound knots. Sound knots are permitted in the turned section of the bracket up to a diameter not greater than  $\frac{1}{4}$  inch, provided that the distance between any two knots is not less than one inch. Sound knots are also permitted in the portion between the turned section and the small nail hole up to a diameter not greater than  $\frac{1}{2}$  inch, provided that not more than three knots are present in this portion of the bracket and that all such knots are at least  $\frac{1}{4}$  inch distant from either nail hole.

**Sapwood.** Brackets may contain sapwood along any edge provided it does not appear on any face to a distance greater than  $\frac{1}{4}$  inch from the edge.

### Standard Unpainted Wood Brackets



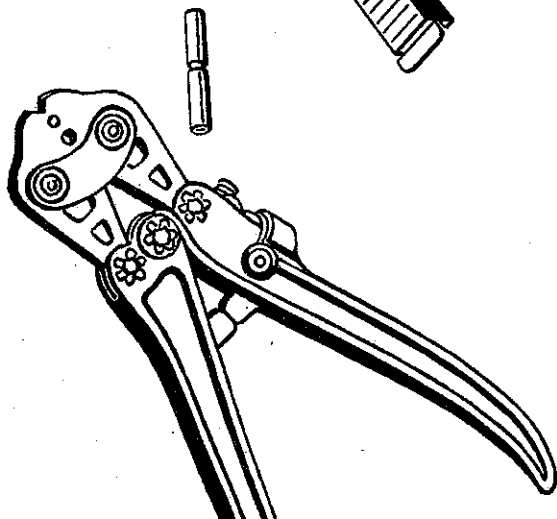
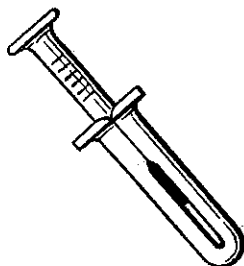
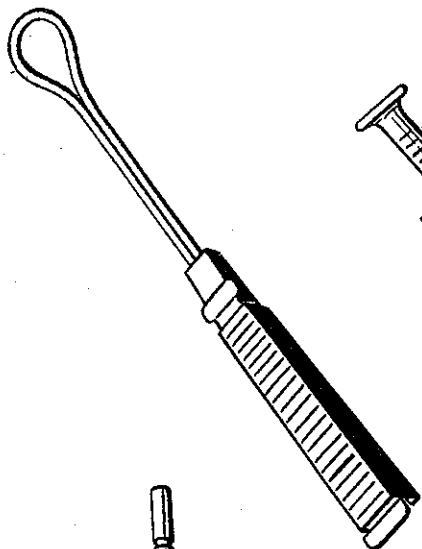
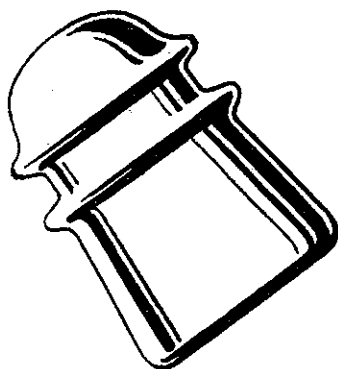
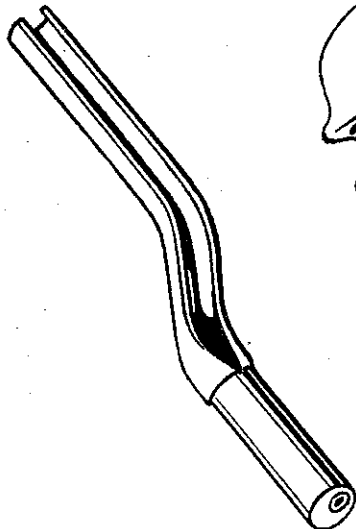
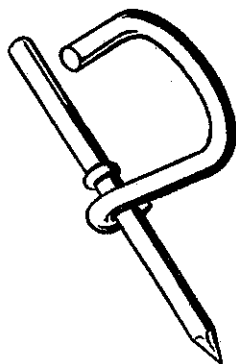
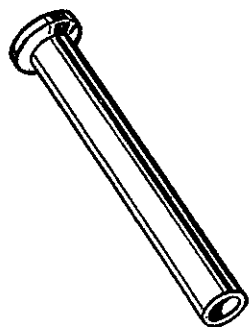
Cat. No.	Type	Size Inches	Wt. per 1000, Lbs.
S-3136	5	1 $\frac{1}{2}$ x2 x12	800
S-3140	WU	2 x2 $\frac{3}{8}$ x12	1000
S-3143	Hi Tensile	2 x2 $\frac{3}{8}$ x12 $\frac{1}{4}$	1000

Creosoted brackets are available on order.

### Standard Wood Pole Steps



Cat. No.	Size, In.	Wt. per 1000, Lbs.
S-7206	1 $\frac{3}{4}$ x2 $\frac{3}{4}$ x7	700



INSULATORS

PLASTIC TUBES

NICOPRESS SLEEVES and TOOLS

**3**

# Insulators and Fixtures

P CLAMPS

BRIDLE RINGS

FLOOR DUCT

Index for this section on reverse side



## ***Index for Section Three***

<b>Page</b>	<b>Item</b>
43 . . .	Hemingray Glass Insulators
44 . . .	Armstrong Glass Insulators
45 . . .	Porcelain Knobs Guy Strain Insulators
46 . . .	Dead End Brackets Insulated Forks Insulated Fork Bolts Distributing Racks Wireholders
47 . . .	Kearney Connectors Reliable Connectors House Hooks Perforated Hanger Iron Drive Rings Toggle Bridle Rings
48 . . .	Bridle Rings Toggle Bolts Drop Wire Clamps Toggle Bolt Clamp
49 . . .	Wiring Nails Ground Wire Staples Insulated Staples Ground Wire Clamps and Nails

<b>Page</b>	<b>Item</b>
50 . . .	Kearney Snub-R-Grip Drop Wire Hook Drive Hooks Pole Hooks Lag Expansion Shield Hammer Drive Anchors
51 . . .	Florduct Florduct Fittings
52 . . .	Lead Wood Screw Anchors Conduit and Cable Straps Cable Clamps Drop Wire Clip
53 . . .	Dry Spot Insulators Insulated Screw Eyes Porcelain Tubes Plastic Tubes
54 . . .	Nico Press Tools Nico Press Tool Holster
55 . . .	Nico Press Sleeves
56 . . .	Nico Press Sleeves
57 . . .	Nico Press Sleeves
58 . . .	Double Tube Sleeves Knob Adapter CR Service Connectors Angle Screw Fixtures
59 . . .	Plastic Wire Guards

**AUTOMATIC**



**ELECTRIC**

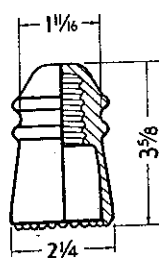
## Hemingray Glass Insulators

Hemingray Glass Insulators—used by telephone companies for more than 50 years—are manufactured by the Hemingray Division of the American Structural Products Company. They are fabricated from a colorless glass which is non-porous, of high dielectric strength, and is highly resistant to temperature changes.

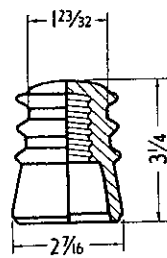
To give the most efficient service in conjunction with this glass the entire line of Hemingray Insulators is

constantly being improved. Extra strength has been incorporated, sharp corners have been eliminated, and special attention has been given to the shape and thickness of the petticoats and the distribution of mass in the body of each insulator.

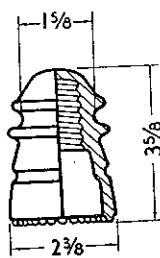
Supplied in clear glass only and packed in corrugated cardboard containers with each insulator in a separate compartment.



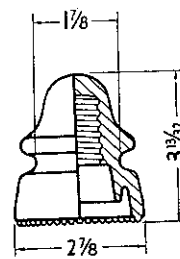
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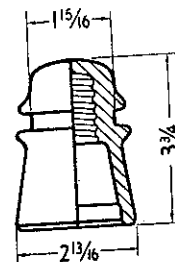
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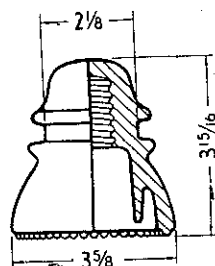
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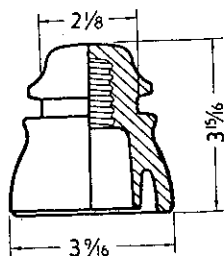
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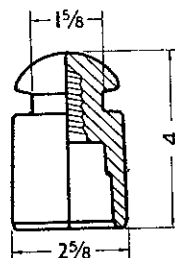
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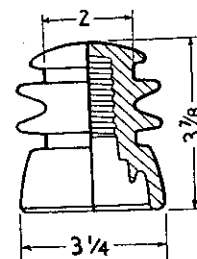
S-4916



S-4902



S-4918



S-4927

Cat. No.	Type	Diameter of Groove	Weight	Quantity Per Box	Weight Per Box
S-4910	9 Pony	3/8 In.	9 oz.	50	29 Lbs.
S-4901	10 Exchange Line	3/8 In.	10 oz.	50	35 Lbs.
S-4912	12 Double Groove Pony	3/8 In.	10 oz.	50	35 Lbs.
S-4914	14 Single Groove Double Petticoat	3/8 In.	12 oz.	50	35 Lbs.
S-4915	16 Long Distance	3/8 In.	15 oz.	50	53 Lbs.
S-4916	42 Double Petticoat	5/16 In.	24 oz.	40	66 Lbs.
S-4902	45 Double Petticoat	5/16 In.	24 oz.	40	65 Lbs.
S-4918	22 Carrier Circuit	1/2 In.	16 oz.	50	55 Lbs.
S-4927	56 Transposition	3/8 In.	22 oz.	40	59 Lbs.

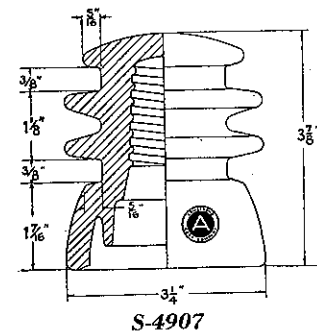
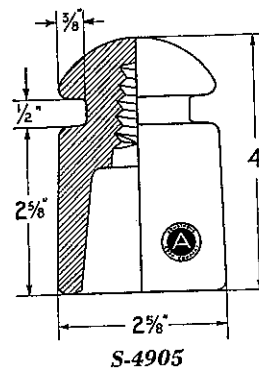
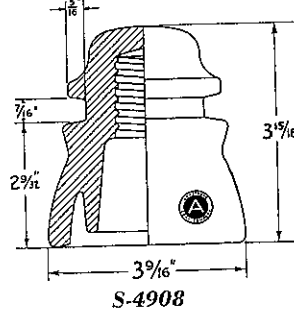
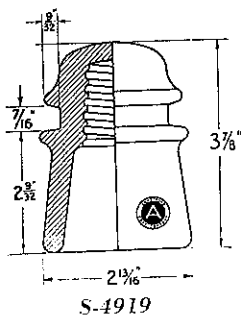
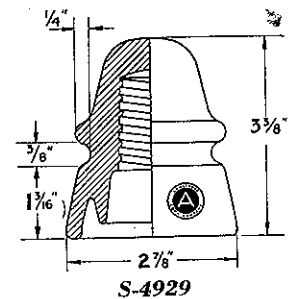
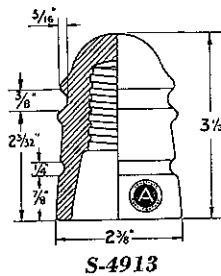
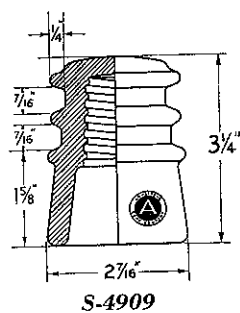
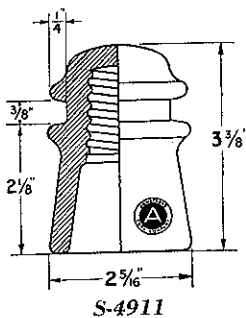
### Equivalent Chart for Armstrong and Hemingray Glass Insulators

Manufacturer	Brand Name	Catalog Number							
		1	2	3	CSC	TW	9	13	14
Armstrong	Whitall Tatum								
Amer. Structural Prod.	Hemingray	42-45	16	10	22	56	9	12	14

## Armstrong Glass Insulators

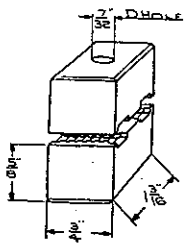
Constant research has greatly improved the quality of glass insulators over those made some years ago. For example, a new industrial glass is more chemically resistant than the glass previously used. This means that Armstrong glass insulators now have even greater resistance to weathering, and consequently a greater resistance to surface leakage. Newer and more accurate instruments control the mixing and melting of the basic glass. Precise control over the temperature of the glass as it passes through various steps in the molding operation and also as it passes through the tempering ovens, gives a much clearer and more

uniform insulator. In both laboratory tests and actual use, Armstrong glass insulators have proven stronger than their supporting pins. They withstand the strain of long spans or ice loaded lines. Made of clear glass, Armstrong insulators discourage malicious breakage because they're harder to see—harder to hit. Armstrong insulators are a special development of research in industrial glass, designed to withstand thermal shock, transparent to reduce breakage and smoothly molded to insure easier handling. You are assured of long, economical and satisfactory service when you install Armstrong glass insulators.

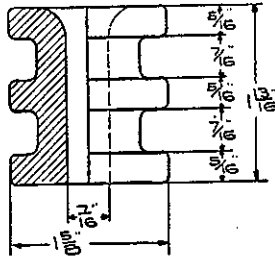


Cat. No.	Type	Diameter of Groove	Quantity Per Box	Weight Per Box
S-4911	9 Pony	3/8 in.	50	31 lbs.
S-4909	3 Exchange Line	7/16 in.	50	36 lbs.
S-4913	13 Double Groove Pony	3/8 in.	50	32 lbs.
S-4929	14 Deep Groove D. P. Pony	3/8 in.	50	41 lbs.
S-4919	2 Toll Line	7/16 in.	50	54 lbs.
S-4908	1 Double Petticoat	7/16 in.	40	65 lbs.
S-4905	CSC Carrier Service	1/2 in.	50	56 lbs.
S-4907	TW One-Piece Transposition	3/8 in.	40	64 lbs.

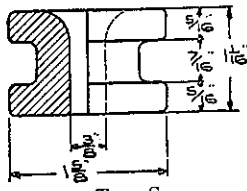
## Types "C," "S," "T" Knobs



Type C



Type T

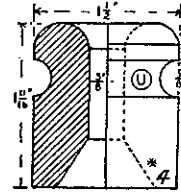
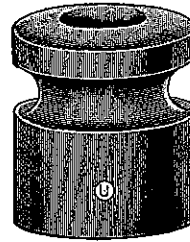


Type S

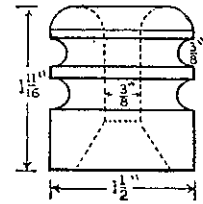
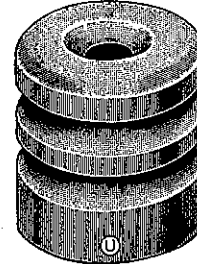
Cat. No.	Type	No. per Carton	Wt. per 1000, Lbs.
S-5090	C	100	90
S-5092	S	100	160
S-5094	T	100	240

(For Mounting Screws see page 14.)

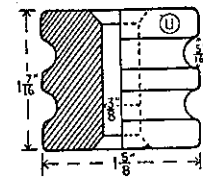
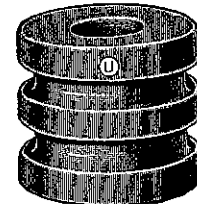
## Standard Telephone Knobs



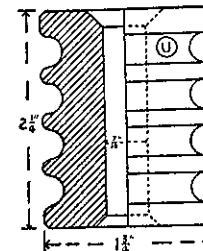
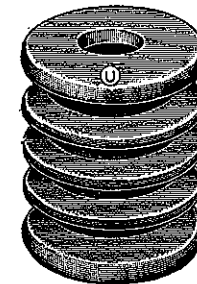
Type 4



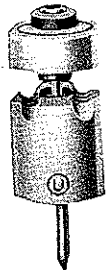
Type 4



Type 6061



Type 6062

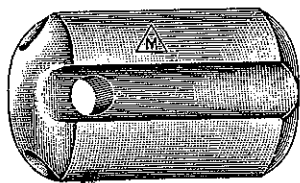


## Nail Knobs

Also known as "Nail It" knobs. Furnished as shown, with three-inch nails and washers, complete. Packed in cartons of 100. Approximate weight per 1000 is 165 pounds.

Cat. No.	Diam., In.	Height, In.	Hole, In.	Groove, In.
S-5106	1 1/8	1 3/4	1/4	1/4

## Guy Strain Insulators



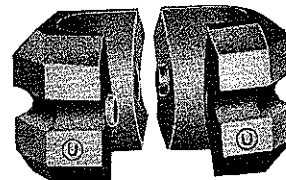
No. S-4932, Type 500, is made by dry-process. The others are standard type, wet process porcelain. Non-porous, of high mechanical and dielectric strength. For use in insulating guy wires and dead-ending distribution circuits. Standard glaze is brown.

Cat. No.	Type No.	Size, In.	Std. Pkg.	Wt. per 100, Lbs.
S-4932	500	1 1/2 x 2 1/4	100	24
S-4934	502	2 1/2 x 3 1/4	50	128
S-4936	504	2 3/8 x 4 1/4	50	178
S-4938	506	3 1/2 x 5 3/8	25	368

Four sizes—dimensions are given with illustrations above. Order by catalog number.

Cat. No.	Type No.	Grooves	Cartons	Wt. per 1000, Lbs.
S-5100	4	Single	100	230
S-5102	4	Double	100	225
S-5118	6061	Double	100	210
S-5126	6062	Four	50	400

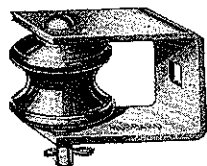
## Victor Split Knobs



Furnished as illustrated. Packed 50 to carton. Approximate shipping weight 18 pounds per carton.

Cat. No.	Diam., In.	Height, In.	Hole, In.	Groove, In.
S-5114	2 1/8	1 3/4	1 1/4	3/8

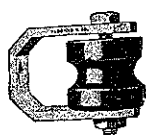
## Hubbard Dead End Brackets and Insulators



Hubbard Dead End Brackets are used for dead ending on crossarms. The brackets are made from  $\frac{1}{8}$  inch by  $1\frac{1}{2}$  inch flat steel. Attachment is made by a carriage bolt through a  $\frac{13}{32}$  inch square hole. Insulators are made from wet-process porcelain with brown glaze finish.

Cat. No.	Description	Lbs., Per 100 Pcs.
S-3132	Dead End Bracket only	50
S-4925	Insulator	28

## Insulated Forks Hot Galvanized



By the addition of a standard machine bolt this fork converts into an insulated fork bolt. Made of  $1\frac{1}{2}$ -inch by  $\frac{1}{4}$ -inch flat steel. Formed so head of  $\frac{5}{8}$ -inch machine bolt will not turn while tightening.

Cat. No.	Size Mtg. Hole, In.	Wt. per 100, Lbs.
S-4248	$1\frac{1}{16}$ Round	131

## Insulated Fork Bolt Hot Galvanized



Used as span wire supporters. Forged open-hearth steel. Insulator bolt is  $\frac{3}{8}$ -inch diameter. Installing bolt has six-inch thread. The length is measured from insulator center to end of bolt.

Cat. No.	Ins. Bolt Diameter, In.	Length, Inches	Weight per 100, Pounds
S-4242	$\frac{1}{2}$	10	191
S-4244	$\frac{1}{2}$	12	205

## Distributing Racks



For running twisted-pair telephone wires along poles and attaching service take-off wires. Two solid steel points, or eyes, are riveted to a  $1\frac{3}{4} \times \frac{5}{8} \times \frac{1}{8}$ -inch channel back. The racks are furnished in three lengths, for four, six, or eight, insulators and have  $\frac{9}{16}$ -inch holes in each end for mounting with  $\frac{1}{2}$ -inch lag screws. (Knobs, or insulators, included.)

Cat. No.	Length, In.	No. Insulators	Wt. per 100, Lbs.
S-6028	$10\frac{5}{8}$	4	308
S-6030	$13\frac{3}{4}$	6	418
S-6032	$16\frac{7}{8}$	8	511

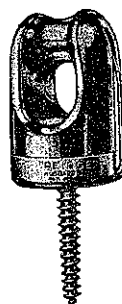
## Peirce Wireholders



Two types—the No. S-8018 is a single groove style while the No. S-8020 is a double-groove oval-hole insulator. Furnished as illustrated with full-length hot-galvanized screw. Both are designed with extra strength and compactness. Screw size is No. 20,  $2\frac{1}{4}$  inches long.

Cat. No.	Size Wire Hole, In.	Weight per 100, Lbs.
S-8018	$\frac{5}{8}$ diam.	65
S-8020	$9/16 \times \frac{3}{4}$	65

## Peirce Wireholder



A porcelain wireholder with metal reinforcement to absorb strain—the Peirce “Metal in tension—porcelain in compression” principle which assures electric characteristics and qualities of exceptional satisfaction.

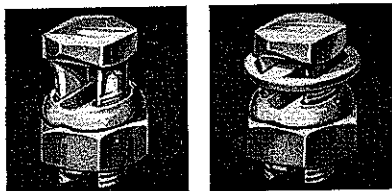
No pockets to collect or hold dirt. Screws are sharp pointed and smooth for easy starting and are full threaded to hold maximum loading.

The 4-11-44 will accommodate all normal sized wires or cables. Screw size is No. 22,  $2\frac{1}{4}$  inches long.

Cat. No.	Type	Wire Hole Size, In.	Weight per 100, Lbs.
S-8022	4-11-44	$\frac{7}{8} \times 1$	65



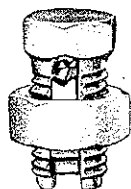
## Kearney Connectors



Provide a simple, inexpensive and reliable means of making bridge or test connections. Galvanic action between iron and copper is eliminated by the use of a plated separating washer which places like metals together. Standard package is 100, weight two pounds.

Cat. No.	Type	No. Washers	Max. Wire Size
S-3824	Cop. to Cop.	1	12 NBS—10 B&S
S-3826	Cop. to Cop.	2	12 NBS—10 B&S
S-3830	Iron to Iron	1	12 BWG
S-3828	Iron to Iron	2	12 BWG
S-3832	Iron to Cop.	2	12 BWG—12 NBS

## Reliable Bridging Connectors



Made of high-strength bronze. They are readily re-usable and will not "season crack". Accurately cut threads reduce friction, giving increased pressure and a joint of constant resistance.

Connectors for galvanized iron wire have a weather-resisting coating which minimizes galvanic corrosion.

All edges are rounded to prevent line-wire damage (nicks). Vibration-proof threads eliminate loose connections. Standard package is 100.

Cat. No.	Type	Maximum Wire Size		Wt. Per 100, Lbs.
		Steel BWG	Copper B & S	
S-3844	9F (Bronze Cop. to Cop.)	---	9	2
S-3840	109 (Plated) Iron to Iron	12	---	2
S-3842	109 W (Plated) Iron to Cop.	12	---	2½

## House Hooks

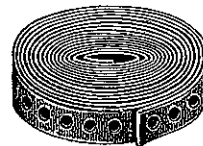
Hot Galvanized



Widely used for attaching drop-wires to buildings in conjunction with clamps, drop-wire clips or other drop-wire fixtures.

Cat. No.	Length, In.	Wt. per 100, Lbs.
S-4846	4	10

## Perforated Hanger Iron



Consists of ¾ inch by 22 Ga. iron strip, cadmium plated and perforated as illustrated. Used for cable and conduit support, etc. Furnished in 10-foot roll.

Cat. No.	Weight, Each
S-7350	¾ Lbs.

## Miniature House Hook

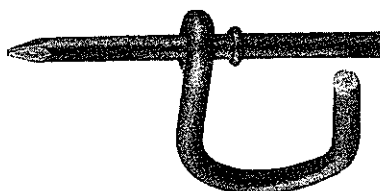


Light type galvanized house hook used in conjunction with "P" clamps, drop wire clips or other drop wire fixtures. 1 inch rolled woodscrew thread.

Cat. No.	Length	Wt. per 100, Lbs.
S-4847	3 inches	3

## Two-Piece Drive Rings

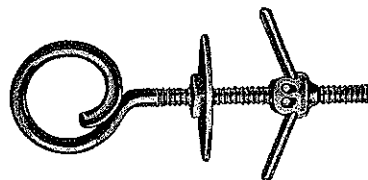
Hot Galvanized



Made in two-pieces with the ring crimped to the nail. Also serve the same purpose as the standard bridle rings and drive rings. Nail in with hammer.

Cat. No.	Eye Diam. In.	Hammer Drive Anchor	Wt. Per 100, Lbs.
S-6090	½	3/16x7/8	2
S-6086	5/8	1/4x1	3
S-6088	7/8	1/4x1	5½

## Toggle Bridle Rings—Spring Type



For distributing wires on hollow construction such as magnesium block, wall-board, lath, plaster, hollow-tile and similar materials. Furnished with round washer and square nut. Standard package, 50.

Cat. No.	Screw Size, In.	Eye Diam., In.	Wt. per 100, Lbs.
S-6096	⅝ x 4	5/8	8½
S-6098	¾ x 4	1¼	17¼

## Bridle Rings



Bridle rings are easily installed and afford an inexpensive method of distributing wires. Furnished either hot galvanized or enameled. Styles K and M have 10/24 machine screw threads and are used with insulator supports.

## Galvanized, Wood Screw

Cat. No.	Style	Eye, In.	Shank, In.	Wt. per 1000, Lbs.
S-6066	E	$\frac{5}{8}$	$\frac{7}{8}$	35
S-6068	C	$1\frac{1}{4}$	$1\frac{1}{4}$	95
S-6070	A	$1\frac{5}{8}$	$1\frac{1}{4}$	115
S-6072	F	3	$1\frac{1}{4}$	300

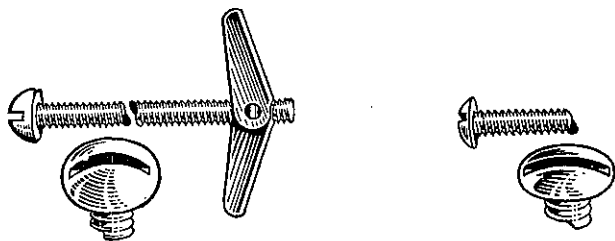
## Enameled, Wood Screw

S-6074	E	$\frac{5}{8}$	$\frac{7}{8}$	50
S-6076	C	$1\frac{1}{4}$	$1\frac{1}{4}$	125
S-6078	A	$1\frac{5}{8}$	$1\frac{1}{4}$	150
S-6080	F	3	$1\frac{1}{4}$	335

## Galvanized, Machine Screw

S-6081	K	$\frac{3}{4}$	$\frac{3}{4}$	40
S-6083	M	$1\frac{1}{4}$	$\frac{3}{4}$	75

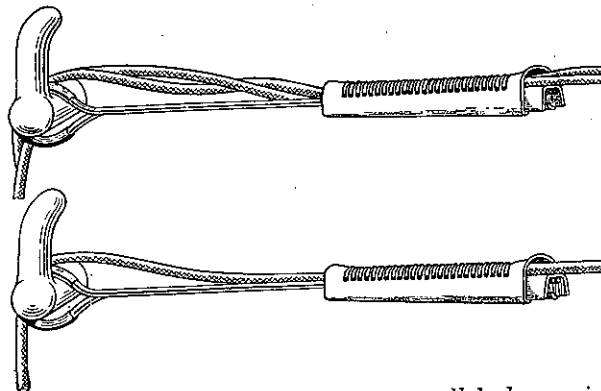
## Paine "Spring-Wing" Toggle Bolts



For fastening telephone equipment to hollow walls, floors and ceilings. Equally effective in brick, tile, lath and plaster, sheet rock and gypsum partitions. Wings compress easily when pushed through bolt hole. Each wing springs automatically to an anchoring position, making the toggle effective where either or both wings can be used. When tightened, wing edges engage bolt thread firmly, preventing bolt from turning or working loose. Cadmium plated. Standard packages of 50. Round head shown at left, button head at right.

Cat. No.	Size, In.	Head Style	Wt. per 100, Lbs.
S-2954	$\frac{1}{8}$ x 3	Button	$1\frac{1}{2}$
S-2957	$\frac{1}{8}$ x 4	Button	$1\frac{5}{8}$
S-2960	$\frac{1}{8}$ x 3	Button	$3\frac{3}{4}$
S-2963	$\frac{1}{8}$ x 4	Button	$4\frac{1}{2}$
S-2966	$\frac{1}{8}$ x 5	Button	$5\frac{1}{8}$
S-2964	$\frac{1}{8}$ x 6	Button	$5\frac{3}{4}$
S-2969	$\frac{1}{4}$ x 3	Round	6
S-2972	$\frac{1}{4}$ x 4	Round	7
S-2974	$5/16$ x 4	Round	12

## Reliable "P" Drop-Wire Clamps



For attaching twisted pair or parallel drop wire to poles and buildings. "P" clamps prolong life of drop wire, permit free swinging at the tie, place all wear on hardware and eliminate sharp bends. "P" clamps are wedge-shaped, with a copper wire loop at one end for hooking over common drive hook, masonry hook or porcelain knob. To remove clamp shell, place screwdriver bit against outer edge of shell and drive back off of wire and wedge. "PS" clamps have shim added to wedge to stop insulation from flowing into grooves on wedge.

Cat. No.	Type	Wt. per 100, Lbs.
S-3390	P	11
S-3394	PS	12

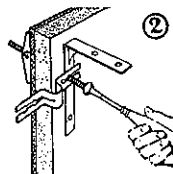
## "PC" Drop Wire Clamps



"PC" clamps are designed for attaching 14 B & S Twisted Pair drop wire to poles and buildings.

Cat No.	Wt. per 100, Lbs.
S-3392	15

## Paine Toggle Bolt Clamps



Provides most up-to-date method of toggle bolt installation and saves tedious, finger-wearing labor. It holds toggle tight against inside of floor, wall or ceiling so bolt can be tightened with a screw driver. This clamp is included in your order without extra cost.

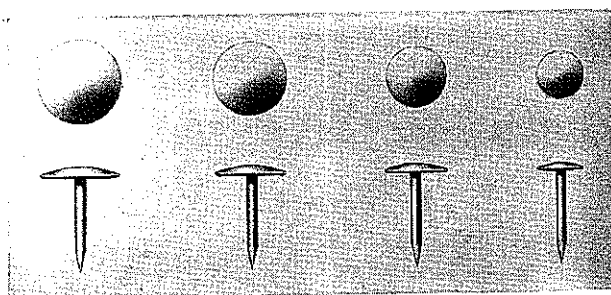
## Milonite or Perfection Nails



For installing twisted-pair interior wire. Insulated head, waterproof, dielectric finish on shank. Packed 100 per box, 10 boxes per carton. Weight,  $1\frac{3}{4}$  lbs. per carton.

Cat. No.	Size	Color
S-5454	$\frac{1}{2}$	Green
S-5458	$\frac{1}{2}$	Brown
S-5459	$\frac{1}{2}$	Ivory
S-5462	$\frac{5}{8}$	Brown
S-5468	$\frac{5}{8}$	Green
S-5470	$\frac{5}{8}$	Ivory
S-5474	$\frac{3}{4}$	Brown
S-5478	$\frac{3}{4}$	Green
S-5479	$\frac{3}{4}$	Brown
S-5480	$\frac{3}{4}$	Ivory

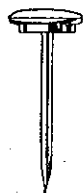
## Steel Inside Wiring Nails



Widely used for fastening inside wires to wood or plastered surfaces in substation wiring. Button-head type, uniformly finished and free from burrs. Accurately centered and sharp points. Packed 100 per box, 10 boxes per carton. Weight,  $1\frac{3}{4}$  lbs. per carton.

Cat. No.	Length, In.	Color
S-5488	$\frac{1}{2}$	Brown
S-5490	$\frac{1}{2}$	Ivory
S-5492	$\frac{5}{8}$	Olive Green
S-5494	$\frac{5}{8}$	Brown
S-5496	$\frac{5}{8}$	Ivory
S-5498	$\frac{7}{8}$	Brown
S-5500	$\frac{7}{8}$	Ivory

## Insulated Wiring Nails



This washer-type nail fills the need for an insulated single-head nail. The steel head is drawn over a specially prepared tough fiber in such a way as to form a permanent washer below the steel. Finish is waterproof and dielectric. Packed 100 per box, 10 boxes per carton. Weight,  $1\frac{3}{4}$  lbs. per carton.

Cat. No.	Size	Color
S-5504	$\frac{1}{2}$	Brown
S-5506	$\frac{1}{2}$	Ivory
S-5508	$\frac{7}{8}$	Brown
S-5510	$\frac{7}{8}$	Ivory

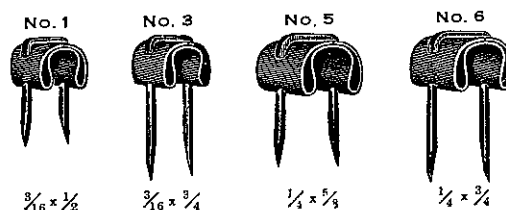
## Ground Wire Staples



Special galvanized staples with single shank and flat head designed for attaching ground wires. Easy to drive. Size,  $\frac{5}{8}$ " x No. 14.

Cat. No.	St. Pkg.	Wt. per 1000
S-5524	1 Lb.	$2\frac{1}{2}$ Lbs.

## Blake Insulated Staples



Double fiber insulation protects wire from contact with metal part of staple. May be driven over several wires without danger of grounding. Nos. 1, 5 and 7 are for use with hard wood; Nos. 3 and 6 are for general use. Nos. 1 and 3 are for twisted pair and single wire; Nos. 5, 6, and 7 are for heavier wires. Packed 100 to the container—10 containers to carton. The illustrations are *actual size*.

Cat. No.	Type No.	Size, In.	Carton Wt., Lbs.
S-7152	1	$\frac{1}{8}$ x $\frac{1}{2}$	$1\frac{1}{2}$
S-7150	3	$\frac{1}{8}$ x $\frac{3}{4}$	$2\frac{1}{4}$
S-7154	5	$\frac{1}{4}$ x $\frac{5}{8}$	$2\frac{1}{4}$
S-7156	6	$\frac{1}{4}$ x $\frac{3}{4}$	$2\frac{1}{2}$
S-7158	7	$\frac{1}{4}$ x $\frac{7}{8}$	3

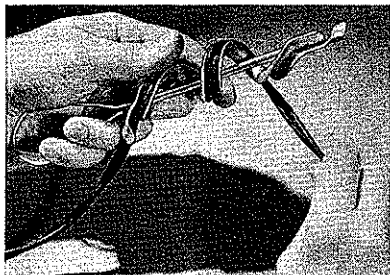
## Ground Wire Cleats and Nails

### Hot Galvanized



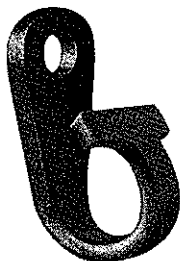
Better holding power with these cleats. 1-inch nail holds cleat firmly in place. Maximum wire size— $\frac{3}{16}$  inch.

Cat. No.	Description	Wt. per 100
S-3456	Ground Wire Cleat	1 Lb.
S-5390	Nail	4 Oz.

**Kearney Drop-Wire Snub-R-Grip**

Design of grip affords a positive snub-grip action, easy to install and adjust. Spiral channel is smooth and preserves the insulation as the strain is evenly distributed throughout its length. Used with both twisted-pair and parallel drop-wire. After the clamp is in place the drop can be slacked off, or pulled up, by pushing through the spiral.

Cat. No.	Wt. per 100, Lbs.
S-4470 .....	12

**Drop Wire Hook****Hot Galvanized**

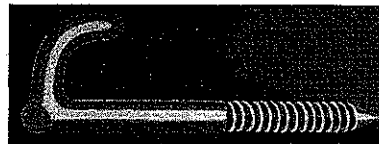
Used in conjunction with Type P clamps and similar fixtures, for intermediate attachments of drop wire. Hook projects  $1\frac{1}{8}$  inches from mounting surface and is fastened with  $\frac{5}{16}$ -inch by  $2\frac{1}{2}$ -inch lag screw, No. 18 round head wood screw or  $\frac{5}{16}$ -inch by  $1\frac{3}{4}$ -inch hammer drive anchor.

Cat. No.	Wt. per 100, Lbs.
S-4824 .....	10

**Drive Hooks****Hot Galvanized**

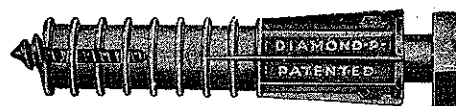
Used for wire clamp attachments on poles, arms or buildings. They have fether drive threads and a drive head.

Cat. No.	Length, In.	Diameter, In.	Wt. per 100, Lbs.
S-4822	$5\frac{1}{8}$	$\frac{7}{8}$	29

**Kearney Pole Hooks**

Used for wire clamp attachments on poles, arms or buildings.

Cat. No.	Type	Thread	Wt. Per 100, Lbs.
S-4823	6766-1	$\frac{1}{8} \times 3\frac{1}{2}$	10

**Lag Expansion Shield**

The inclined surfaces cause a powerful wedge expansion with exceptional holding qualities. The greater the load the tighter the hold. Threaded side of shield fits all standard lag screws. Lag screws must be ordered separately—see page 15.

Cat. No.	Lag Size, In.	Length, In.	Drill Size, In.	Wt. per 100, Lbs.
S-6807	$\frac{1}{4}$	$1\frac{1}{2}$	$\frac{1}{2}$	4
S-6813	$\frac{5}{16}$	$1\frac{3}{4}$	$\frac{9}{16}$	5
S-6814	$\frac{3}{8}$	$2\frac{1}{4}$	$\frac{5}{8}$	9
S-6815	$\frac{1}{2}$	$3\frac{1}{2}$	$\frac{3}{4}$	17

S-6814 and S-6815 are Galvanized.

**Hammer Drive Anchors**

Made of aluminum alloy with hot-galvanized steel nails. Holds a greater load when fastened into stone than a wood screw of the same diameter fastened into wood. No special tools needed. Just drill hole, insert shield through hardware hole, and drive nail with hammer. Furnished with nails.

Cat. No.	Size, In.	Drill Size, In.	Wt. per 100, Lbs.
S-2115	$\frac{3}{16} \times \frac{7}{8}$	$\frac{3}{16}$	1
S-2118	$\frac{3}{16} \times 1\frac{1}{4}$	$\frac{3}{16}$	1
S-2121	$\frac{1}{4} \times 1$	$\frac{1}{4}$	$1\frac{1}{2}$
S-2124	$\frac{1}{4} \times 1\frac{1}{4}$	$\frac{1}{4}$	2
S-2127	$\frac{1}{4} \times 1\frac{1}{2}$	$\frac{1}{4}$	2
S-2130	$\frac{5}{16} \times 1\frac{1}{4}$	$\frac{5}{16}$	$2\frac{3}{4}$
S-2133	$\frac{5}{16} \times 1\frac{3}{4}$	$\frac{5}{16}$	$3\frac{1}{2}$
S-2136	$\frac{5}{16} \times 2\frac{1}{4}$	$\frac{5}{16}$	$4\frac{1}{2}$
S-2140	$\frac{3}{8} \times 2$	$\frac{3}{8}$	$6\frac{1}{2}$
S-2143	$\frac{3}{8} \times 3\frac{1}{4}$	$\frac{3}{8}$	8

## Metal Florduct



A metal service conduit for use in extending telephone wiring from wall to center of room. Smooth, flat and sturdy—saves floors, saves time.

Two pieces—base and capping—which snap together, with concealed fastenings. Capping is only 5/16-inch high and 1½ inches wide. It is tapered on the sides to fit flush with the floor. Assembly furnished in five-foot lengths.

Cat. No.	Type	Wt. per 100 Ft., Lbs.
S-4086	711-A	39

## Outlet Extension Cap



Used as junction fitting between Florduct and the outlet from which extension is made. Arranged for mounting on wood floor. May be also used as a flat elbow or junction of Florduct.

Cat. No.	Type	Wt. per 100, Lbs.
S-4206	766B	20

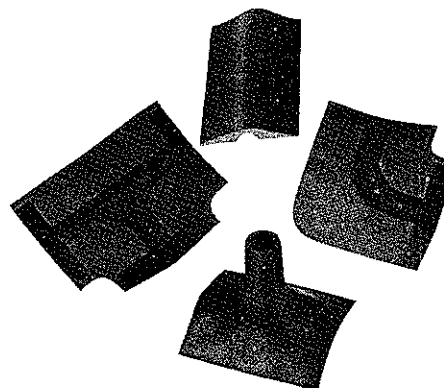
## Florduct Service Fitting



Designed for the 711-A Florduct to be used at new outlet location for protecting wires leaving floor duct and extending to apparatus on desks or tables, etc. Equipped with four double twistouts. Used at ends, for through runs or for right angle brackets.

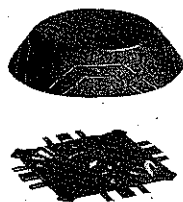
Cat. No.	Type	Wt. per 100, Lbs.
S-4204	750	42

## Flexiduct



Flexiduct is a superior floor duct made of rubber. It is quickly and easily applied in any desired length, simply by cementing to the floor. Noisy and expensive installations are completely eliminated. Wiring in Flexiduct is completely protected from all usual hazards; brooms, sweepers and mops can be used with complete safety, and typewriters and other equipment on casters can be rolled over it without damage. Flexiduct is 2¾ inches at the base—only 7/16 inches high. Wire chase is ½ inch by ¼ inch and will accommodate from 2 to 8 conductors. "L" and "T" fittings and risers are also made of rubber and are designed for easy installation.

## Florduct Adapter



A small internal adapter for making bends from 711-A Florduct on floor to open wiring or extension duct on baseboard. Furnished with fiber bushing to be used with open wiring. Especially designed for the 711-A duct. Standard package is 20.

Cat. No.	Type	Wt. per Pkg.
S-2000	738B	3 lbs.

## Florduct Strap



Used for holding Florduct flush to the surface of a wavy or uneven floor.

Cat. No.	Type	Wt. per 100, Lbs.
S-4205	715	2

Cat. No.	Description	Weight
S-4084	Flexiduct, 6 ft. Length	2 lbs.
S-4081	"L" Fitting	4 oz.
S-4082	"T" Fitting	4 oz.
S-4079	Riser	4 oz.
S-4083	Cement, 5 oz. tube for approx. 30 ft. of duct	6 oz.

## Lead Wood Screw Anchors



Lead shields for anchoring wood screws in cement, brick, glass, tile and similar substances. Screws furnished separately (for correct size see screw listing on page 14).

Cat. No.	Size, In.	Drill Size, In.	Wt. Per 100, Lbs.
S-2148	6-8 x 3/4	1/4	1
S-2151	6-8 x 1 1/2	1/4	1 3/4
S-2154	10-14 x 1	5/16	1 3/4
S-2155	10-14 x 1 1/2	5/16	2 1/2
S-2158	16-18 x 1	3/8	2 3/4
S-2159	16-18 x 1 1/2	3/8	4
S-2160	20-24 x 1 3/4	7/16	5 1/4

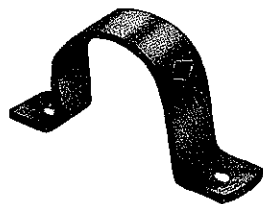
## One-Hole Steel Cable Clamps



Made of cold-rolled mild steel, annealed and hot-galvanized. Furnished as illustrated.

Cat. No.	Type No.	Cable Size, Inches	Reg. Pipe Size, In.	Mtg. Hole Size, In.	Wt. Per 100, Lbs.
S-3456	L3	3/16		7/32	1
S-3466	L4	1/4		7/32	1
S-3468	L5	5/16		7/32	1
S-3472	L6	3/8	1/8	7/32	1 1/4
S-3474	L7	7/16	1/4	7/32	1 1/4
S-3476	L8	1/2	1/4	7/32	1 1/4
S-3477	L9	9/16		7/32	1 1/4
S-3478	L10	5/8		9/32	4
S-3479	L11	11/16	3/8	9/32	4 1/2
S-3480	L12	3/4	1/2	9/32	5
S-3481	L14	7/8		9/32	7
S-3482	L16	1	3/4	9/32	15
S-3485	L20	1-1/4	1	9/32	16
S-3484	L24	1-1/2		9/32	17
S-3483	L26	1-5/8	1 1/4	9/32	19
S-3487	L28	1-3/4	1 1/2	9/32	20
S-3489	L30	1-7/8	1 1/2	9/32	20

## Two-Hole Conduit and Cable Straps



Made of extra-heavy galvanized steel. Designed to withstand heavy strains and vibrations. Because of their great strength fewer straps are needed on conduit or cable run.

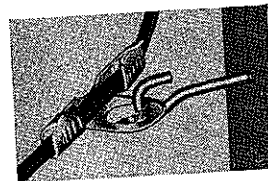
Cat. No.	Type	Cable Size, Inches	Pipe Size, Inches	Mtg. Hole, Inches	Wt. Per 100, Lbs.
S-7305	T7	7/16	1/8	13/64	1 1/2
S-7307	T10	5/8	1/4	7/32	2
S-7309	T11	11/16	3/8	9/32	3
S-7311	T12	3/4		9/32	4
S-7313	T14	7/8	1/2	9/32	4 1/2
S-7315	T16	1		9/32	7
S-7317	T18	1-1/8	3/4	9/32	7 1/2
S-7319	T20	1-1/4	1	9/32	13 1/2
S-7321	T24	1-1/2		9/32	15 1/4
S-7323	T26	1-5/8	1 1/4	9/32	16 1/2
S-7324	T28	1-3/4		9/32	17
S-7325	T30	1-7/8	1 1/2	9/32	19
S-7326	T40	2-1/2	2	11/32	26
S-7327	T46	2-7/8	2 1/2	11/32	31
S-7329	T56	3-1/2	3	11/32	35

Enameled One-Hole Cable Clamps  
Offset Type

Similar to the one-hole steel clamp except that it is finished in brown, or ivory, enamel for interior work. Order color from listing below.

Cat. No.	Color	Cable Size, In. Min.	Max.	Mtg. Hole, Inches	Wt. per 100, Lbs.
S-3499	Brown	5/32	to 7/32	9/64	1/2
S-3457	Ivory	5/32	to 7/32	9/64	1/2
S-3500	Brown	5/16	to 3/8	7/32	5/8
S-3458	Ivory	5/16	to 3/8	7/32	5/8
S-3501	Brown	3/8	to 1/2	7/32	3/4
S-3501	Ivory	3/8	to 1/2	7/32	3/4
S-3459	Brown	1/2	to 9/16	7/32	3/4
S-3502	Ivory	1/2	to 9/16	7/32	3/4

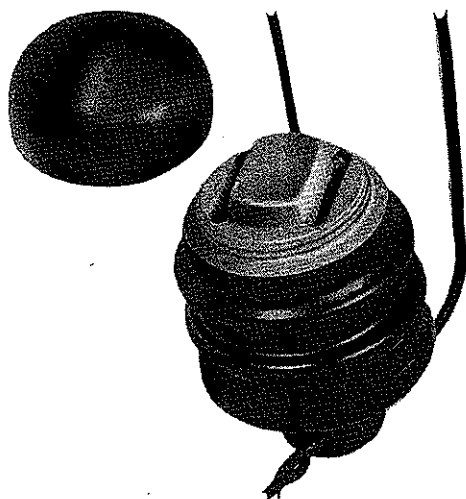
## Drop Wire Clip



Bronze clip used for intermediate attachments of drop wire. Fits all hooks and knob adapters. Clip crimps over wire; grips wire firmly but will not injure insulation. Type "S" drop wire clip (right) is used for fastening drop wire to fixture and for holding tree guards in place.

Cat. No.	Description	Wt. per 100, Lbs.
S-3690	Type 6296	6
S-3688	Type "S"	3

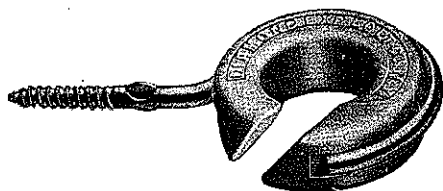
## Dry Spot Insulators



Dry Spots solve the wet-weather current leakage problem over take-off conductors from open-wire circuits. They are designed with a porcelain body which may be screwed on standard pins, and porcelain cap to provide a dry chamber. Two line wires are looped through the body and the cap then screwed on. 1½ inches of dry porcelain between conductors and a drip skirt about bottom of insulators assures maintenance of insulation resistance between wires and wires and pin. Extra strong, they grip take-off wires so they may be dropped directly from insulator without extra bracket and insulator. Furnished with brown glaze.

Cat. No.	Description	Std. Pkg.	Wt. Per Std. Pkg.
S-4906	Insulator	12	30
S-3274	Cap Only	12	4½

## Insulated Screw Eyes



A convenient small insulator that is easy to install. The porcelain ring has a diagonal opening, as illustrated, allowing insertion of wires, which when pulled taut cannot slip out of the ring. The porcelain is glazed on the inside of the ring and in the slot. The screw eye is made of galvanized steel. Packed 100 to carton.

Cat. No.	Type, In.	Eye, In.	Shank, In.	Wt. per 1000, Lbs.
S-6470	5/8 Short	5/8	1	85
S-6472	5/8 Long	5/8	2	95
S-6478	1 Short	1	1 1/8	175
S-6476	1 Long	1	2 1/8	200

## Porcelain Tubes



Made of unglazed porcelain. Furnished in two sizes as indicated in chart below. Order by catalog number. Larger sizes can be furnished on request. 250 per carton.

### 5/16 In. Hole Size—9/16 Inch Outside Diam.

Cat. No.	Length, In.	Wt. per 1000, Lbs.
S-7582	3	63
S-7584	4	80
S-7586	6	117
S-7588	8	160

### 3/8-In. Hole Size—11/16 Inch Outside Diam.

Cat. No.	Length, In.	Wt. per 1000, Lbs.
S-7590	3	90
S-7592	4	117
S-7596	6	180
S-7598	8	238
S-7600	10	265

## Plastic Tubes



Made of thermoplastic material, non-inflammable and practically unbreakable. Plastic tubes have smaller outside diameter than porcelain tubes and are lighter in weight. ½ inch outside diameter. Tubes packed in individual boxes, 5 pc. per box. Approximately 200 pc. per carton.

Cat. No.	Size, In.	Wt. Per 1000, Lbs.
S-7583	3/8 x 4	19
S-7585	3/8 x 6	25
S-7587	3/8 x 8	32
S-7589	3/8 x 12	44

## Nicopress Sleeves and Tools

Nicopress sleeves and tools are a compression method of splicing and dead-ending communication line wires. Each size and type of sleeve is designed to accomplish a full tension splice that assures perfection in physical and electrical requirements. Each type of tool is designed to quickly and easily compress the appropriate sleeve. The universal use of Nicopress sleeves and tools in the communication field is ample proof of the superior characteristics of the splice.

### Explanation of Nicopress Sleeve Numbers

Every Nicopress sleeve has a number or legend. The numbers, in general, consist of three parts. For example:

**5       -       109       -       C**

*Sleeve Material                  Wire Diameter                  Tool Groove*

5—The first figure signifies the material of which the sleeve is made.

1=Copper

2=Galvanized Copper

3=Bronze

4=Galvanized Bronze

5=Galvanized Steel

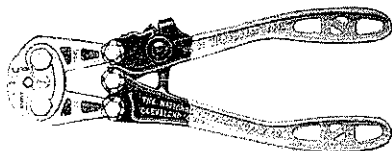
109—the next three numerals, represent the decimal equivalent of the diameter of the wire to be spliced, for example: 109 equals the decimal equivalent of the diameter of 12 BWG Galvanized Iron Wire.

C—the letter at the end of the stock number, denotes the tool groove in which the sleeve must be compressed. For example, "C" at the end of the number indicates that the sleeve must be compressed in a tool having a "C" groove. The grooves in Nicopress tools are also marked with letters, corresponding to the last letter on the sleeve stock number.

The stock numbers for Nicopress dead-ends, repair sleeves, and nicotaps are the same as for the splicing sleeves, except they have a prefix as follows:

Number or Letter	Example
9 for Offset Dead-end	91-162 J
R for Repair Sleeve	R1-162 J
T for Nicotap	T2-109 x 045 D

### Nicopress Splicing Tools



Nicopress tools for splicing and dead-ending are designed to meet certain definite requirements of actual field work. They are convenient in size and handle easily on poles among wires or on the ground. They are light-weight and can be carried with minimum burden in a lineman's belt.

Illustration shows the No. 31 DC two-grooved tool. These tools are available in three different groove combinations—the one shown and the No. 31CJ and 31 DJ. Weight of each tool is two pounds, length 11 or 11½ inches.

Cat. No.	Type
S-7527	31DC
S-7518	31DJ
S-7519	31CJ

Type number 31 single groove tools available in C, D and J groove.

### Nicopress 17-2 Tool



Especially designed for splicing drop, bridle and inside wires. Small, light and compact, it weighs only nine ounces and is eight inches long.

Cat. No.	Type
S-7530	17-2

### Nicopress Tool Holster

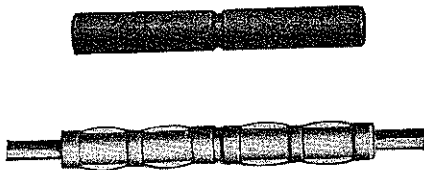
Leather holster for conveniently carrying No. 31 Nicopress tool. Attaches to the lineman's belt.



Cat. No.	Wt. per Doz., Lbs.
S-4810	4



## Nicopress Splicing Sleeves for Communication Lines



The Nicopress Compression method of splicing and dead-ending has been proved by years of service. Line splices and dead-ends made with Nicopress Sleeves and tools are quiet and strong — they equal or exceed the rated breaking strength of the wire itself.

They are tight as a weld and the conductors can not pull out. They have a lasting high-conductivity and withstand vibration strains to a high degree.

Nicopress splices are easily made. All that is necessary is to push the ends of the wire into the sleeve and make the necessary compression with the convenient Nicopress tool.

Nicopress sleeves are made only of the finest materials and are formed to exact size. Order according to the following listing:

### Copper Sleeves for Copper Wire

Cat. No.	B&S Gauge	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7030	14	17-2	3-064B	½
S-6859	14	C	1-064C	1½
S-7014	12	C	1-080C	1½
S-6860	12	D	1-080D	1½
S-7016	10 (or 12NBS)	C	1-102C	1¼
S-7017	10 (or 12NBS)	D	1-102D	1½
S-6863	9	D	1-114D	1½
S-6864	9	J	1-114J	3¾
S-6865	8	J	1-128J	4½
S-6867	6	J	1-162J	4½

### Copper Sleeves for Copperweld Wire

Cat. No.	AWG	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-6859	14	C	1-064C	1½
S-6860	12	D	1-080D	1½
S-6862	10	J	1-102J	5
S-6864	9	J	1-114J	3¾

### Galvanized Steel Sleeves for BB Galvanized Wire

Cat. No.	BWG	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7026	14	C	5-083C	1½
S-7020	12	C	5-109C	1½
S-7040	12	D	5-109DBB	1¾

### Galv. Copper Sleeves for BB Galv. Wire

Cat. No.	BWG	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7028	14	C	2-083C	1½
S-6873	14	D	2-083D	1¾
S-7022	12†	C	4-109C	1¼
S-7024	12	D	2-109D	1¾
S-7003	12*	C	2-102C	1¼
S-6875	10	J	2-134J	3
S-6877	9	J	2-148J	4½
S-6879	8	J	2-165J	4½

\* For use with rusty No. 12 BB wire.

†Galvanized Bronze Sleeve

### Galv. Steel Sleeves for "85" Galv. Wire

Cat. No.	BWG	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7026	14	C	5-083C	1½
S-7025	12	D	5-109D85	2

### Galv. Copper Sleeves for "85" Galv. Wire

Cat. No.	BWG	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7028	14	C	2-083C	1½
S-6873	14	D	2-083D	1¾
S-6881	10	J	2-134J85	4½
S-6877	9	J	2-148J	4½

### Galv. Steel Sleeves for "135" Galv. Wire

Cat. No.	BWG	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7041	12	D	5-109D135	2½

### Galvanized Copper Sleeves for Spinning Wire

Cat. No.	Diameter	Use Tool Groove	Type No.	Wt. Per 100, Lbs.
S-6885	.091	C	2-091-C	5/8
S-6887	.061	C	2-061-C	¾

## Nicopress Offset Dead-Ends



Nicopress Offset Dead-Ends provide simplicity and speed of installation. Their maximum tightness and strength equals or exceeds the rated breaking strength of the wire itself. They withstand vibration to a remarkable degree and make provision for a tail of any desired length.

With Nicopress Offset Dead-Ends you quickly make strong, tight open-wire terminations, provide a means for attaching jumpers and install line tap-offs with Nicopress Reducing Sleeves. Nicopress is one of the most satisfactory and practical answers to dead-end problems. Order from listing on following page.

## Copper Dead-Ends for Copper Wire

Cat. No.	B&S Gauge	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-6888	14	C	91-064C	2
S-6889	12	D	91-080D	1 1/4
S-7015	12	C	91-080C	1 1/2
S-7011	10 (or 12 NBS)	C	91-102C	1 1/2
S-6891	10 (or 12 NBS)	D	91-102D	1 1/2
S-6893	9	D	91-114D	1 1/2
S-6897	6	J	91-162J	4 1/2
S-6895	8	J	91-128J	5 1/2

## Copper Dead-Ends for Copperweld Wire

Cat. No.	AWG	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-6888	14	C	91-064C	2
S-7015	12	C	91-080C	1 1/2
S-6889	12	D	91-080D	1 3/4
S-6892	10	J	91-102J	5 3/4
S-6894	9	J	91-114J	5 1/4

## Galv. Copper Dead-Ends for Galvanized Wire

Cat. No.	BWG Gauge	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7029	14	C	92-083C	1 1/2
S-7023	12†	C	94-109C	1 1/2
S-6899	10	J	92-134J	5 1/4
S-6901	9	J	92-148J	5
S-6903	8	J	92-165J	5

† Indicates Galvanized Bronze sleeve.

## Galv. Steel Dead-Ends for BB Galvanized Wire

Cat. No.	BWG Gauge	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7027	14	C	95-083C	1 1/4
S-7021	12	C	95-109C	1 1/2

## Galvanized Copper Dead-Ends for "85" Galvanized Wire

Cat. No.	BWG Gauge	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7029	14	C	92-083C	1 1/2
S-6899	10	J	92-134J	5 1/4
S-6901	9	J	92-148J	5

## Galvanized Steel Dead-Ends for Galvanized "85" Wire

Cat. No.	BWG Gauge	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7027	14	C	95-083C	1 1/4
S-7007	12	D	95-109D85	1 1/2

## Galv. Steel Dead-Ends for Galv. "135" Wire

Cat. No.	BWG Gauge	Use Tool Groove	Type No.	Wt. per 100, Lbs.
S-7009	12	D	95-109D135	2 1/2

## Nicopress Reducing Sleeves



Used for splicing two wires of different sizes. Reductions and tool grooves are listed below.

## For Copper Wire to Drop, Bridle, Inside and Line Wire

Cat. No.	Gauge B&S to B&S	Use Tool Groove	Type	Wt. per 100, Lbs.
S-6842	17 to 19,20,22	C	2-045x036 B	1 1/2
S-6943	14 to 19,20,22	C	1-064x036 C	1 1/2
S-6945	14 to 17,18	C	1-064x045 C	1 1/2
S-6947	12 to 19,20,22	C	1-080x036 C	1 1/2
S-6949	12 to 17,18	C	1-080x045 C	1 1/2
S-6951	12 to 16	C	1-080x051 C	1 1/2
S-6953	12 to 14	C	1-080x064 C	1 1/2
S-6955	10 to 19,20,22	C	1-102x036 C	1 1/2
S-6957	10 to 17,18	C	1-102x045 C	1 1/2
S-6959	10 to 16	C	1-102x051 C	1 1/2
S-6961	10 to 14	C	1-102x064 C	1 1/2
S-6963	10 to 12	C	1-102x080 C	1 1/2
S-6965	9 to 19,20,22	D	1-114x036 D	1 3/4
S-6967	9 to 17,18	D	1-114x045 D	1 3/4
S-6969	9 to 16	D	1-114x051 D	1 3/4
S-6971	9 to 14	D	1-114x064 D	1 3/4
S-6973	9 to 12	D	1-114x080 D	1 3/4
S-6975	9 to 10	D	1-114x102 D	1 3/4
S-6977	6 to 14	J	1-162x064 J	3 1/2
S-6979	6 to 10	J	1-162x102 J	3 1/4
S-6981	6 to 9	J	1-162x114 J	3 1/4
S-6985	6 to 8	J	1-162x128 J	3 1/4

## For Galvanized BB Line Wire

Cat. No.	Gauge BWG to BWG	Use Tool Groove	Type	Wt. per 100, Lbs.
S-6987	12 to 14	C	4-109x083 C	1 1/2
S-6989	12 to 14	D	2-109x083 D	2
S-6991	10 to 14	J	2-134x083 J	3
S-6993	10 to 12	J	2-134x109 J	3
S-6995	9 to 12	J	2-148x109 J	5

## Reducing Sleeves for Galvanized Line Wire to Drop, Bridle and Inside Wires

Cat. No.	Gauge BWG to B&S	Use Tool Groove	Type	Wt. per 100, Lbs.
S-6997	14 to 19,20,22	C	2-083x036 C	1 1/2
S-6999	14 to 17,18	C	2-083x045 C	1 1/2
S-7004	14 to 16	C	2-083x051 C	1 1/2
S-7005	12 to 17,18	C	4-109x045 C	2
S-7032	12 to 17,18	D	2-109x045 D	2
S-7033	12 to 16	C	4-109x051 C	2
S-7035	12 to 16	D	2-109x051 D	2
S-7037	12 to 14	C	4-109x064 C	2
S-7043	12 to 14	D	2-109x064 D	2
S-7045	10 to 16	J	2-134x051 J	5
S-7047	10 to 14	J	2-134x064 J	4 3/4
S-7048	9 to 14	J	2-148x064 J	5 1/2
S-7049	8 to 14	J	2-165x064 J	5 1/2

## Nicopress Repair Sleeves



Whenever it is necessary to cut out old, noisy line joints Nicopress Repair Sleeves are recommended. These sleeves make it easy to maintain initial sag and eliminate entirely cutting-in of new sections of wire.

Complete splices are strong and tight and exceedingly neat. They are easily made with the same tool used for line splices, No. 31, (shown on page 54).

### For Copper Wire

Cat. No.	B&S Gauge	Use Tool Groove	Length, In.	Wt. per 100, Lbs.
S-7050	12	C	7	6
S-7051	12*	D	7	7½
S-7053	10	C	7½	5½
S-7065	10*	D	7½	7¼
S-7071	9	D	8	7
S-7083	6	J	10	16

### For Galvanized BB Wire

Cat. No.	BWG	Use Tool Groove	Length, In.	Wt. per 100, Lbs.
S-7085	14	C	7	6
S-7001	12	C	7½	5½
S-7086	12	D	7½	7
S-7087	10	J	8½	16
S-7091	9	J	9	16
S-7093	8	J	10	16

\*Indicates larger outside diameter for use in larger tool groove.

## Nicopress Splicing Sleeves for Drop, Bridle and Inside Wires

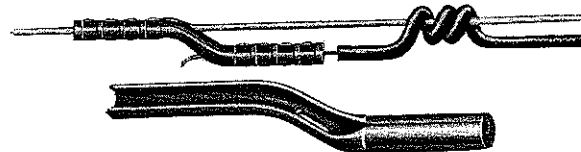
Illustration of a Nicopress Splicing Sleeve.



A practical, economical and easy method of splicing drop, bridle and inside wires. Using these sleeves is much faster and neater than making soldered joints. They eliminate muss, assure positive joints and easier handling. Applied with the Nicopress No. 17-2 Tool (shown on page 54). This is a simple, inexpensive one-hand tool, consequently saving time, effort and money and greatly simplifying the splice.

Cat. No.	Wire Sizes	Type No.	Wt. per 100, Lbs.
S-7036	19, 20, 22 B/S Copper	3-036A	½
S-7018	17, 18 AWG Copperweld, 17 B&S Bronze, 17, 18 B&S Copper	3-045B	¾
S-7031	16 B&S Copper, and 16 AWG Copperweld	3-051B	¾
S-7030	14 B&S Copper	3-064B	¾
S-7034	18, 19 BWG Galv. Iron	4-049B	¾

## Nicotap Sleeves



Nicotap sleeves are designed and engineered for fast efficient tap-off connections. No need to cut the line—the Nicotap is split so that it will easily slip over the wire.

Nicotaps are available in a variety of sizes for copper and steel wire and for tapping off a wire from another of a different size.

### For Copper, Copperweld and Bronze

Cat. No.	Gauge B&S AWG to B&S AWG	Use Tool Groove	Wt. Per 100, Lbs.
S-6832	17, 18, 19 to 17, 18, 19	17-2	½
S-7251	12 to 17, 18	C	2
S-7253	12 to 16	C	2
S-7254	12 to 14	C	2
S-7249	12 to 12	C	2
S-7257	10 to 17 or 18	D	2½
S-7259	10 to 16	D	2½
S-7262	10 to 14	D	2½
S-7397	10 to 12	D	2½
S-7255	10 to 10	D	2½
S-7265	9 to 17 or 18	D	2½
S-7267	9 to 16	D	2½
S-7269	9 to 14	D	2½
S-7263	9 to 9	D	2½
S-7398	8 to 16	J	3¼
S-7271	8 to 14	J	3¼
S-7270	8 to 8	J	3
S-7276	6 to 14	J	3
S-7275	6 to 8	J	3
S-7273	6 to 6	J	3

### For Steel to Copper, Copperweld and Bronze

Cat. No.	Gauge BWG to B&S	Use Tool Groove	Wt. Per 100, Lbs.
S-6841	14 to 17 or 18	C	2
S-7277	14 to 12	C	2
S-6839	12 to 17 or 18	D	2½
S-7279	12 to 16	D	2½
S-7281	12 to 14	D	2½
S-6837	12 to 10	D	2½
S-7335	10 to 17 or 18	J	3¼
S-7337	10 to 16	J	3¼
S-7382	10 to 14	J	3¼
S-7391	9 to 17 or 18	J	3¼
S-7392	9 to 16	J	3¼
S-7393	9 to 14	J	3¼
S-7396	8 to 14	J	3¼
S-7395	8 to 12	J	3¼

### For Steel to Steel

Cat. No.	Gauge BWG to BWG	Use Tool Groove	Wt. per 100, Lbs.
S-7277	14 to 14	C	2
S-6837	12 to 12	D	2½
S-7283	12 to 14	D	2½
S-7343	10 to 10	J	3
S-7383	9 to 9	J	3
S-7394	8 to 8	J	3

## Double Tube Splicing Sleeves



Sleeves provide convenient, economical means of making straight-line splices. We recommend the use of plain copper sleeves for copper wire, tinned steel or tinned copper sleeves for use on iron wire. Use B&S gauge for specifying size of copper sleeves and BWG gauge for tinned steel or tinned copper sleeves.

### Copper Sleeves

Cat. No.	B&S Gauge	Standard Length, Inches	Weight of Full Length, per 1000, Lbs.
S-6910	8	5½	68
S-6914	10	4¾	35
S-6956	12NBS.104	4¾	35
S-6920	12B&S.080	4½	29
S-6926	14	4	20
S-6928	17	Half Length Only	8

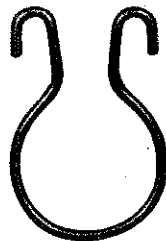
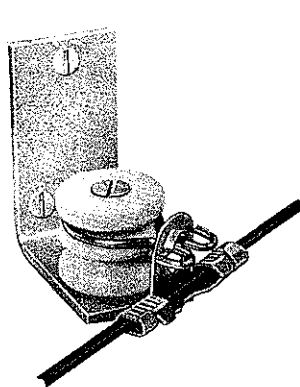
### Tinned Copper Sleeves

	BWG Gauge		
S-6938	9	5¾	68
S-6936	10	5½	53
S-6944	12	4¾	38
S-6948	14	4½	30

### Tinned Steel Sleeves

	BWG Gauge		
S-6941	9	5¾	68
S-6940	10	5¾	53
S-6946	12	4¾	38
S-6952	14	4½	30

## Knob Adapter



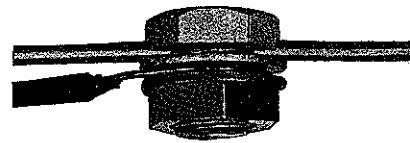
Above: Knob Adapter as Furnished

Left: Showing Use with Drop Wire Clip S-3690

Used when replacing twisted pair drop-wire with parallel drop-wire. This permits the use of existing fixtures.

Cat. No.	Wt. Per 100
S-5136	2½ Lbs.

## C-R Service Connectors

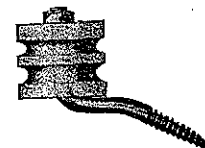


For connecting Copperweld, copper or bronze drop-wire to line, or interior wire; house wire to service drop wire; for multiple service and party-line connections; pole jumper wires, ground wire connections and many other uses.

Made in nickel-plated brass, plain brass and tinned brass. Plain or nickel-plated brass is used on copper-to-copper connections. Tinned types are used for iron-to-copper, or iron-to-iron, connections. Type 3A has ⅜-inch brass bolt with ½-inch hexagon head. Type 3 has 7/16-inch brass bolt with ⅝-inch hexagon head. Type 3A has the same capacity as Type 3 but is lighter in construction. Order by catalog number as shown below.

Cat. No.	Type	Material	Max. Wire Size B&S	NBS	BWG	Type Connection
S-3800	1	Brass N.P.	14	16		Copper to copper
S-3802	2	Brass	12	14		Copper to copper
S-3804	2	Brass Tin.	12	14	14	Iron to copper
S-3806	2	Brass Tin.			14	Iron to iron
S-3808	3A	Brass	10	12		Copper to copper
S-3810	3A	Brass Tin.	10	12	12	Iron to copper
S-3812	3A	Brass Tin.			12	Iron to iron
S-3814	3	Brass	10	12		Copper to copper
S-3816	3	Brass Tin.	10	12	12	Iron to copper
S-3818	3	Brass Tin.			12	Iron to iron

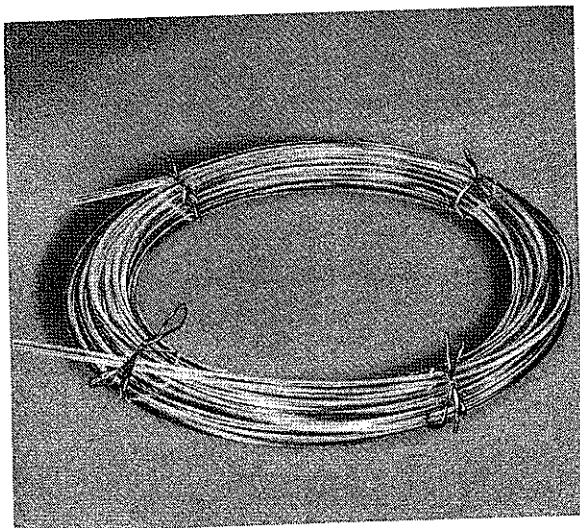
## Angle Fixture Screw



Simple, convenient fixtures for drop wire attachments to frame or brick buildings. By inclining angle of screw, knob may be placed at any desired angle.

Cat. No.	Type	Length Screw, In.	Shank, In.	Wt. per 100, Lbs.
S-4212	⅝	2¼	2¼	12
S-4214	¾	2	3½	20

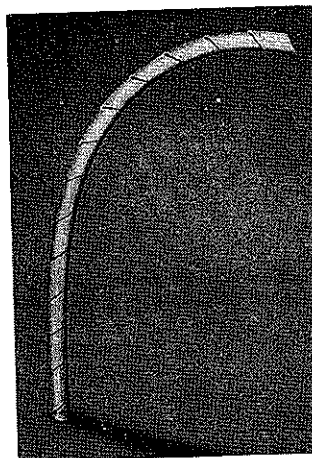
## Plastic Wire Guard



Clear, plastic tubing used for insulating line and station wires. This material is extremely rugged, resistant to abrasion and treated with a violet ray inhibitor to withstand severe weather conditions. Types L and LL are for use in insulating line wires. Type LL inside diameter is approximately 5/16 inch. Type E is for protection of station wires where attached to walls or passed through partitions.

<i>Cat. No.</i>	<i>Type</i>	<i>Size</i>	<i>Ft. Per Coil</i>	<i>Wt. Per Coil, Lbs.</i>
S-4520	L	3/16" I.D. x .037" Wall	100	1.6
S-4550	E	1/4" I.D. x .040" Wall	50	1
S-4552	LL	3/8" O.D. x .035" Wall	100	2

## Plastic Tree Wire Guards



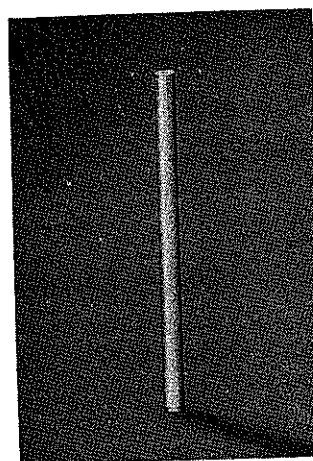
Type P plastic guard is wound into a close helix and can be easily spiraled on existing drops. 36" long.

*Cat. No.*  
S-4519

*Size*  
7/16" I.D. x .045" Wall

*Wt. Per 100, Lbs.*  
14

## Plastic Tree Wire Guard

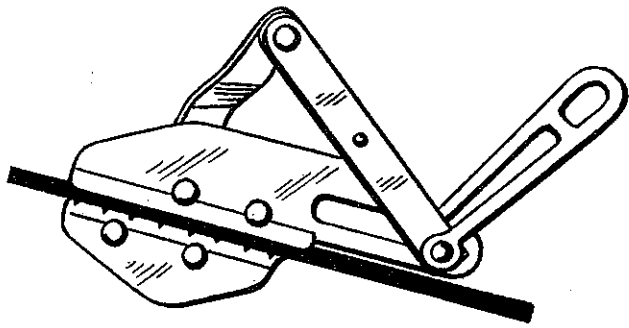


Type S plastic wire guard is extruded into a solid tube. Used on new drops and installed by threading over free end of wire. 36" long.

*Cat. No.*  
S-4517

*Size*  
7/16" I.D. x .045" Wall

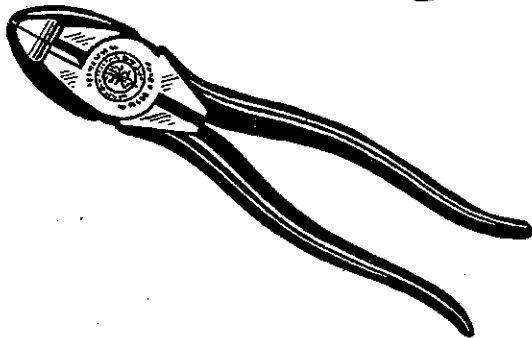
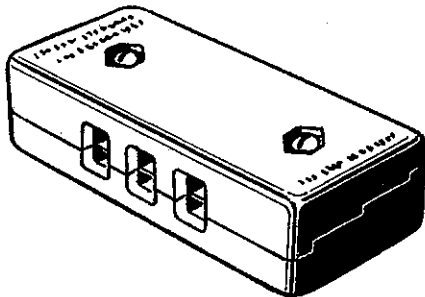
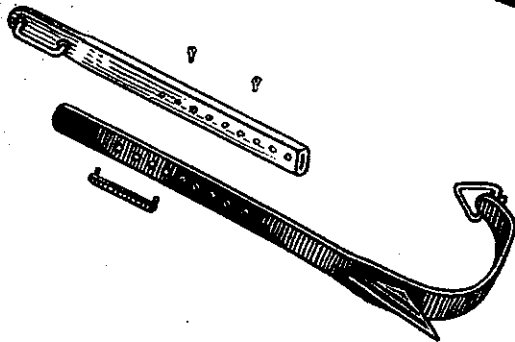
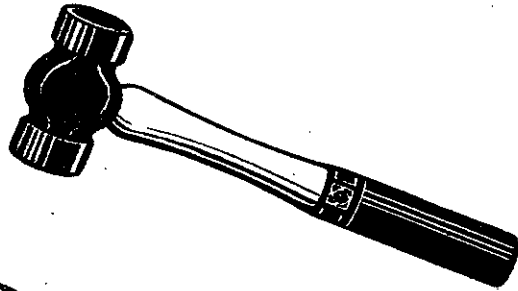
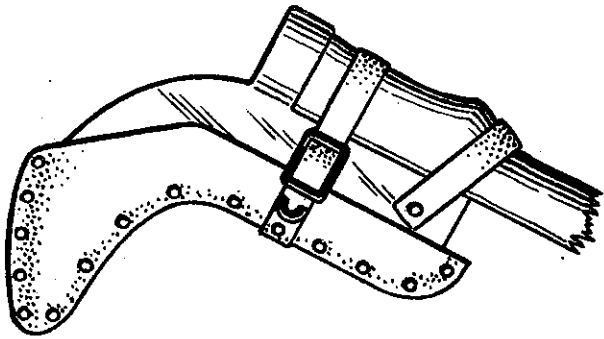
*Wt. Per 100, Lbs.*  
14



DRILLS

HAMMERS

TOOL BELTS



# 4

## Small Tools

CLIMBERS

PLIERS

SOLDERING IRONS

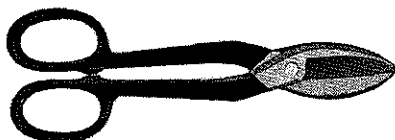
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## ***Index for Section Four***

<b>Page</b>	<b>Item</b>	<b>Page</b>	<b>Item</b>
61 . . .	Tinners' Snips Howe's Wire Tool Dicke Grips	79 . . .	Hammers Hatchet Axe
62 . . .	Cable Grips	80 . . .	House Axe Tool Boxes Lineman's Pouch Inspectors Tool Kit Tool Pouches
63 . . .	Cable Grips	81 . . .	Tool Bags Repairman's Tool Case Miscellaneous Material Bag Hip Pocket Tool Case
64 . . .	Havens Grips Wire Grips Cable and Strand Grips Brooks Adjustable Climbers Tree Climbers Climber Gaff Guards	82 . . .	Canvas Buckets Installer's Canvas Pouch Bolt Cutters
65 . . .	Climbers	83 . . .	Fish Tape Reel and Wire Snap Lock Plier Wrench Pliers
66 . . .	Climber Straps and Pads	84 . . .	Pliers
67 . . .	Tool Belts Safety Straps	85 . . .	Pliers
68 . . .	Parallel Wire Slitter Spring Joint Rule Tapes, Steel and Linen	85 . . .	Pliers
69 . . .	Micrometer Calipers B & S Wire Gauge Thickness Gauges Tool Guards	86 . . .	Pliers Protecto Grips Splicing Clamps
70 . . .	Klein Kord Dressing Lineman's Leather Gloves Electrician's Scissors Pruning Shears Saws	87 . . .	All Way Master Saw Screwdrivers
71 . . .	Saws	88 . . .	Screwdrivers Soldering Copper Handle Soldering Coppers Weller Soldering Gun Quick-Shot Soldering Iron
72 . . .	Vise Crestoloy Wrenches Lineman's Wrench Aluminum Levels Spintite Socket Wrenches Ranging Rod	89 . . .	Temperature Regulating Stand G.E. Soldering Iron American Beauty Soldering Irons Tips and Elements Holder, Soldering Iron
73 . . .	Files Knives	90 . . .	Prest-O-Lite Appliances
74 . . .	Dillon Bisector Bits	91 . . .	Furnaces Wind Shield
75 . . .	Hamrtwist Drill Points Drill Holder Push Drills Hand Drills	92 . . .	Chicago Steel Tapes Blow Torches
76 . . .	Breast Drill Ratchet Braces Corner Bit Brace Star or Four Point Drills Paine Rotary Drill Points Portable Electric Drill	93 . . .	Pres-To-Oiler Wrecking Bars Steel Letters and Figures Heller Stapling Gun Bench Grinder
77 . . .	Bit, Extension Bell Hanger Drills Borchest Set Drill Points Straight Shank Twist Drills Cold Chisels	94 . . .	Electric Drills Metal Scratch Brush Non Metallic Brushes Socket Framing Chisels
78 . . .	Estwing Tools Tack Hammer	95 . . .	Fish Tape Puller Angle Screw Driver Ungar Solder Pencil Hand Line Pliers Strand Holder

## Tinner's Snips



General utility tinner's snips of inlaid blade construction. Snips are 12 inches overall, with 2½-inch cutting jaws.

Cat. No.	Weight, Lbs.
S-7095 .....	1½

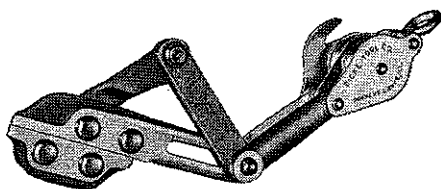
## Howe's Wire Tool



The swivel hook is steel with an opening large enough to go over an insulator pin. The forward end has a locking device to hold the load at any distance. It is arranged so that a grip can be attached. Strap 1¼ inches wide, 7 feet long.

Cat. No.	Type	Weight, Lbs.
S-7520	1702-20	2½

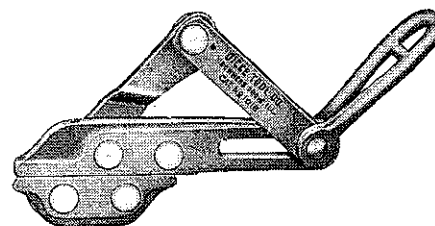
## Dicke Grips



### Dicke Wire Grip for Bare Wire

Made of cadmium-plated, heat-treated alloy steel. Has built-in lightweight pulley, and rope-snubbing attachment. Lathe-turned sheaves for ⅜-inch rope. Safe load is 1750 lbs.

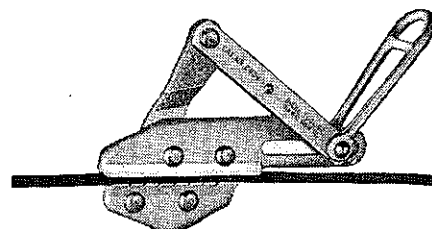
Cat. No.	Capacity	Weight, Lbs.
S-4507	6 B&S Solid (.162) 12 B&S Solid (.080)	2¼
S-4491	0 B&S Strand (.373) 10 B&S Solid (.102)	3¾



### Dicke Wire Grip for Bare Wire

Made of cadmium-plated heat-treated alloy steel. Has safe load of 1750 lbs.

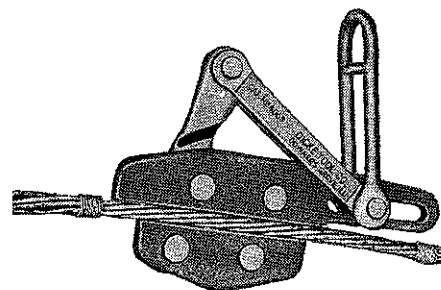
Cat. No.	Capacity	Weight, Lbs.
S-4506	6 B&S	1½
S-4508	0 B&S	3



### Dicke Grips for Insulated Wire

Made of heat-treated alloy steel. Safe load, 2500 lbs.

Cat. No.	Capacity	Weight, Lbs.
S-4492	4 B&S Weather-proof Solid (.391) 10 B&S Weather-proof Solid (.250)	3¼
S-4493	1 B&S Weather-proof Solid (.500) 6 B&S Weather-proof Solid (.313)	3½



### Dicke Grip for Galvanized Steel Strand

Made of cadmium-plated, heat-treated alloy steel. Has safe load of 15,000 lbs.

Cat. No.	Capacity	Weight, Lbs.
S-4509	5/16" to 5/8" Galvanized Steel Strand. 4/0 to 2/0 ACSR Aluminum Cable	15½



## Reliable Cable Grips

A line of well-designed grips to meet all standard requirements. Careful engineering means long wear because all wires pull with evenly distributed load.

Pulling grips for aerial cable or underground cable, luffing grips for pulling slack or removing old cables, split grips for moving cables where an end is not accessible—all supplied in a full range of sizes.

### Reinforced Flexible Pulling Grips



For pulling underground cables. Reinforcement protects wires of the grip at shoulder where wear is greatest. Eye is formed of the wires themselves and reinforced. There is no joint at the working end of the grip, no loss of strength.

Cat. No.	For Cable Diam., Inches	Length, In.
1023	1 to 1½	24
1024	1½ to 1¾	24
1025	2 to 2¾	24
1026	2½ to 2¾	24
1027	3 to 3¾	24
1028	3½ to 3¾	24
1033	1 to 1¾	36
1034	1½ to 1¾	36
1035	2 to 2¾	36
1036	2½ to 2¾	36
1037	3 to 3¾	36
1038	3½ to 3¾	36
1043	1 to 1¾	48
1044	1½ to 1¾	48
1045	2 to 2¾	48
1046	2½ to 2¾	48
1047	3 to 3¾	48
1048	3½ to 3¾	48

### Plain Flexible Pulling Grips



Single weave grips are for pulling aerial cables and feeding them through rings without displacing the rings. Also used for small underground cables where ducts are clean, or soil is not gritty.

Double grips are for pulling underground cables where wear is light and use of reinforced grips is not warranted.

### Single Weave

Cat. No.	For Cable Diam., Inches	Length, In.
821	½ to ¾	18
822	¾ to 1	24
823	1 to 1½	24
824	1½ to 1¾	24
825	2 to 2¾	24
826	2½ to 2¾	24
827	3 to 3¾	24
828	3½ to 3¾	24

### Double Weave

Cat. No.	For Cable Diam., Inches	Length, In.
933	1 to 1¾	36
934	1½ to 1¾	36
935	2 to 2¾	36
936	2½ to 2¾	36
937	3 to 3¾	36
938	3½ to 3¾	36

### Hard Wire Pulling Grips

These grips are very tough and rather stiff but withstand great wear. Used with great success by companies that pull a large amount of underground cable of one size. The grip must fit exactly for proper performance.

For swabbing ducts these grips can be heavily loaded with waste and are very satisfactory.

Cat. No.	For Cable Diam., Inches	Length, In.
801	½ to ¾	18
802	¾ to 1	22
803	1 to 1½	22
804	1½ to 1¾	22
811	½ to ¾	24
812	¾ to 1	30
813	1 to 1¾	30
814	1½ to 1¾	30
805	2 to 2¾	22
806	2½ to 2¾	30
807	3 to 3¾	30
808	3½ to 3¾	30
815	2 to 2¾	30
816	2½ to 2¾	45
817	3 to 3¾	45
818	3½ to 3¾	45

## Double-Eye Luffing Grips



For pulling slack or removing old cables. Shortest body permits longest pull in cramped quarters. Pull is distributed as evenly as possible on all wires, which results in a very fine long wearing grip.

If pull is light the short single-weave grip is satisfactory in all sizes. If extra heavy the longer, double-weave-grip is recommended.

Single Weave		
Cat. No.	For Cable Diam., Inches	Length, In.
842	$\frac{3}{4}$ to $\frac{7}{8}$	18
843	1 to $1\frac{3}{8}$	18
Double Weave		
Cat. No.	For Cable Diam., Inches	Length, In.
954	$1\frac{1}{2}$ to $1\frac{7}{8}$	24
955	2 to $2\frac{3}{8}$	24
956	$2\frac{1}{2}$ to $2\frac{7}{8}$	24
957	3 to $3\frac{3}{8}$	24
958	$3\frac{1}{2}$ to $3\frac{7}{8}$	24

## Single Eye Luffing Grips

This design is favored by some operating people because the eye lies flat against the cable when strain is applied.

Single Weave		
Cat. No.	For Cable Diam., Inches	Length, In.
1842	$\frac{3}{4}$ to $\frac{7}{8}$	18
1843	1 to $1\frac{3}{8}$	18
Double Weave		
Cat. No.	For Cable Diam., Inches	Length, In.
1954	$1\frac{1}{2}$ to $1\frac{7}{8}$	24
1955	2 to $2\frac{3}{8}$	24
1956	$2\frac{1}{2}$ to $2\frac{7}{8}$	24
1957	3 to $3\frac{3}{8}$	24
1958	$3\frac{1}{2}$ to $3\frac{7}{8}$	24

## Split Grips



These cable grips are for moving working cables, or any cables where the end is not accessible. A special arrangement of strong hooks makes the grip very easy to fasten.

## Double Eye Split Grips

Single Weave		
Cat. No.	For Cable Diam., Inches	Length, In.
862	$\frac{3}{4}$ to $\frac{7}{8}$	18
863	1 to $1\frac{3}{8}$	18
Double Weave		
Cat. No.	For Cable Diam., Inches	Length, In.
974	$1\frac{1}{2}$ to $1\frac{7}{8}$	24
975	2 to $2\frac{3}{8}$	24
976	$2\frac{1}{2}$ to $2\frac{7}{8}$	24
977	3 to $3\frac{3}{8}$	24
978	$3\frac{1}{2}$ to $3\frac{7}{8}$	24

## Single Eye Split Grips

Eye lies flat against cable when strain is applied.

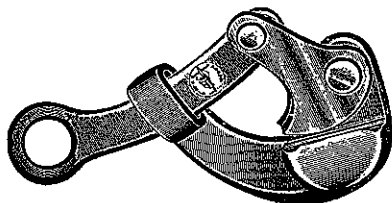
Single Weave		
Cat. No.	For Cable Diam., Inches	Length, In.
1862	$\frac{3}{4}$ to $\frac{7}{8}$	18
1863	1 to $1\frac{3}{8}$	18
Double Weave		
Cat. No.	For Cable Diam., Inches	Length, In.
1974	$1\frac{1}{2}$ to $1\frac{7}{8}$	24
1975	2 to $2\frac{3}{8}$	24
1976	$2\frac{1}{2}$ to $2\frac{7}{8}$	24
1977	3 to $3\frac{3}{8}$	24
1978	$3\frac{1}{2}$ to $3\frac{7}{8}$	24

## Multiple Wire Pulling Grips

Grips used for pulling any number of insulated wires through conduits.

Cat. No.	No. 14	No. 12	No. 10	No. 8	No. 6
205	2-5	2-4	2-3	2	...
407	4-7	3-7	2-5	2-4	2
509	5-9	5-9	3-7	2-5	2-3
712	7-12	7-12	4-9	4-7	2-4
1220	12-20	11-19	8-13	7-11	3-6
2030	20-30	18-28	10-16	5-10	6-8

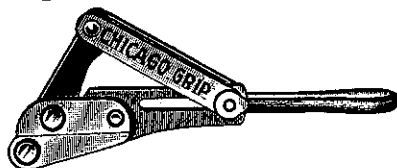
### Haven's Steel Grips



Handy grip for all around work. Forged from alloy-tool steel heat treated. The eccentric or dog is hand cut.

Cat. No.	Type No.	Size	Safe Load, Wt.,	
			Lbs.	Lbs.
S-4472	1604-10	No. 4 Wire and finer	2500	1
S-4474	1604-20	½ inch Wire and finer	5000	2¼
S-4490	1625-20	No. 6 to ¾ inch Wire	8000	3½

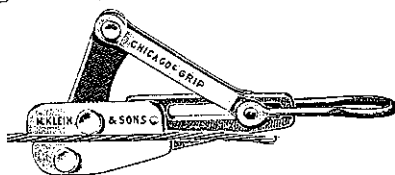
### Chicago Grips for Bare Wire



Main body piece and lever are forged steel with draw parts of wrought steel. Gripping jaws are machined smooth and the rivets are machine turned. The harder the pull, the tighter the hold. It pulls straight without leaving kinks in the wire. Handy to put on and holds itself in place by means of a spring acting on the compressing lever. The draw link is so arranged that it does not hang down at right angles and is not in the way of line when grip is put on.

Cat. No.	Type No.	Wire Size	Max. Open., Wt.,	
			In.	Lbs.
S-4484	1613-30	No. 6 Wire and smaller	¾	1½
S-4486	1613-40	No. 0 Wire and smaller	⅞	3

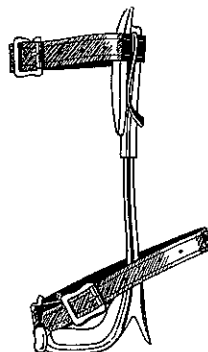
### Chicago Grips for Cable and Strand



A larger grip for use on heavy loads in connection with messenger stand and cable. The grip is strong and positive. The harder the pull the tighter the hold. It pulls straight and cannot leave kinks or injure the strand. Jaws must be kept free of grease or spelter from strand.

Cat No.	Type No.	Safe Load,		Min. Open., In.	Weight, Lbs.
		Lbs.			
S-4494	1628-5	6,000	¾	6	
S-4496	1628-6	8,000	⅞	8½	
S-4498	1628-16	15,000	⅞	15½	

### Brooks Adjustable Climber



One size fits all men securely and comfortably. Gaffs are interchangeable with either 1½ or 2 inch points to meet any climbing conditions. Gaffs are securely fastened with locking buckle and steel taper pin. Gaffs and shanks are made of drop forged alloy and manganese steels. Straps and pads are made of high quality leather.

Cat. No.	Description	Wt., Lbs.
S-3589	Climber with 1½" gaffs, straps and pads	3¼
S-3591	1½" gaffs only, pair	½
S-3593	2" gaffs only, pair	½
S-7296	Set of straps and pads	1½

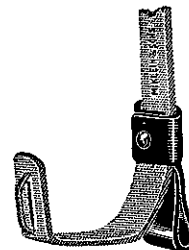
### Klein's Tree Climbers—Type 1907



Similar to the Klein No. 1901 Pole Climbers (page 65) but with extra long 5½-inch gaffs for penetrating tree bark. These gaffs are set high on the leg iron to clear ground when walking. Weight per pair is four pounds.

Cat. No.	Length, In.	Cat. No.	Length, In.
S-3553	15	S-3559	17
S-3554	15½	S-3561	17½
S-3555	16	S-3563	18
S-3557	16½		

### Klein's Climber Gaff Guards



Made of harness leather. The wings are fitted over the gaff as illustrated and snap on. A simple but important safety device.

Cat. No.	Wt. per Doz. Prs., Lbs.
S-4515.....	1¾

## Buckingham Offset-Gaff Climbers



Offset gaff climbers are specifically designed for the right and left foot and are so marked. They relieve leg strain and overcome the tendency of the climber to slip back and twist on a lineman's leg. Lightweight Climbers (Type 9227) weigh only 3 pounds, 2 ounces, on the average. Order by size as listed below.

Buckingham Featherweight Climbers or Medium Weight Climbers are available on order.

Cat. No.	Length, In.
S-3590	15
S-3592	15½
S-3594	16
S-3596	16½
S-3598	17

## Klein's Climbers



Safe, dependable and comfortable. Gaff, or spur, is of tool steel, individually tested and tempered and set at the correct angle. The shank, or leg iron, is forged from spring steel insuring the greatest strength and allowing it to yield to the pressure of the leg. The gaff and shank are riveted by hand and thoroughly tested.

Furnished less strap unless otherwise specified. In ordering for length measure from instep to end of shank.

### Type 1901M—Standard Riveted Strap Loops

Cat. No.	Length, In.	Cat. No.	Length, In.
S-3562	15	S-3569	17
S-3564	15½	S-3572	17½
S-3566	16	S-3573	18
S-3568	16½		

### Type 1903—Lightweight Riveted Loops

Cat. No.	Length, In.	Cat. No.	Length, In.
S-3576	15	S-3584	17
S-3578	15½	S-3586	17½
S-3580	16	S-3588	18
S-3582	16½		

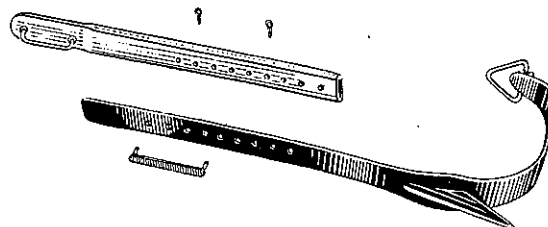
## Klein's 1939 Streamlined Climbers



All unnecessary metal has been carefully eliminated. Leg irons are flexible and tapered without sacrificing strength. Point of greatest strain—from three inches above gaff to halfway across stirrup—has been held to maximum needed strength. Gaffs are slender type preferred on treated poles; wrought iron ring carries ankle strap. These are about 30% lighter than standard climbers yet they offer a full measure of comfort and safety. Weight per pair is 2½ pounds.

Cat. No.	Length, In.	Cat. No.	Length, In.
S-3604	15	S-3603	17
S-3600	15½	S-3605	17½
S-3601	16	S-3607	18
S-3602	16½		

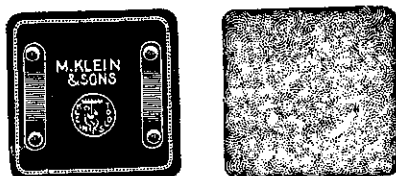
## Klein Adjustable Climbers



Adjustable climbers may be quickly adjusted to fit any lineman. Made of forged steel, each climber is individually tempered and tested. Sliding portion of leg iron is made of steel. Gaff and leg iron are one-piece construction, permitting adjusting climber to 15, 15½, 16, 16½, 17, 17½ and 18 inches. Leg iron is attached to shank by means of steel fastening bracket and secured with cotter pins.

Cat. No.	Type	Description	Weight, Lbs.
S-3565	1945 Adj.	Pole Master climbers. Matched pairs. Triangular strap rings at ankle. 3½" gaffs.	3¼
S-3567	1939 Adj.	Streamlined climbers. Triangular strap rings at ankle. 3½" gaffs.	2⅞
S-3570	1901 Adj.	Standard climbers. Riveted strap loops. 3½" gaffs.	3¾
S-3571	1903 Adj.	Lightweight climbers. Lighter leg irons. Riveted strap loops. 3½" gaffs.	3⅜
S-3575	1907 Adj.	Tree climbers. Extra long gaffs for tree climbing. Riveted strap loops.	4¼

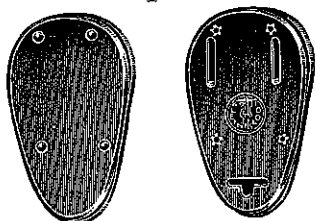
### Pads for Eastern Climbers



Made of select plain leather or lined with sheep-skin or felt, with loops for climber straps. Pads are four inches square. Weight per dozen pads is four pounds.

Cat. No.	Type No.	Description
S-5600	8200	Sheep Lined
S-5602	8201	Felt Lined
S-5604	8202	Plain

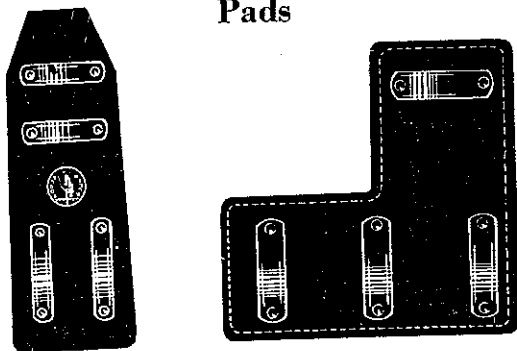
### Klein's Pear-Shaped Climber Pads



Made of two thicknesses of select harness leather securely riveted together. Outer piece is slotted for passage of climber strap and leg iron. All edges are rounded to assure comfort. Sold in pairs only.

Cat. No.	Size, In.	Wt. per Doz. Prs., Lbs.
S-5609	3½ x 6	4½

### Long Type and Angle Shape Climber Pads



Long type pads are made of harness leather with riveted loops. Angle Shape pads are made of padded latigo leather.

Cat No.	Weight per Doz. Prs., Lbs.
S-5595	12
S-5596	5
S-5597	6
S-5598	6

Angle Shape	Long Type—Plain Leather	Long Type—Sheep-lined	Long Type—Felt-lined

### Klein's Straps and Pads for Climbers



Set consists of two upper straps with four-inch square plain leather pads with two lower straps made of select harness leather, oak tanned. Extra heavy drop-forged roller buckles. Heel straps are 22 inches long by 1¼ inches wide.

Cat. No.	Description	Wt. per Doz., Lbs.
S-7286	Plain Pads and Straps	20
S-7288	Straps with Sheep-Lined Pads	20
S-7290	Straps with Felt Lined Pads	20

### Klein's Climber Straps with Pads



Upper, or calf, straps with plain pads. Pads are four inches square; straps 1¼ by 22 inches. Set consists of one pair (two straps) and two pads.

Cat. No.	Type	Wt. per Doz. Prs., Lbs.
S-7293	5301-5	12

### Klein's Climber Straps



Plain straps of select oak-tanned leather. Buckle is roller style, of extra heavy drop-forged steel. Set consists of one pair—two straps.

Cat. No.	Type	Dimension, In.	Wt. per Doz. Prs., Lbs.
S-7292	5301-4	1¼ x 22	8
S-7295	5301-14	1¼ x 26	9

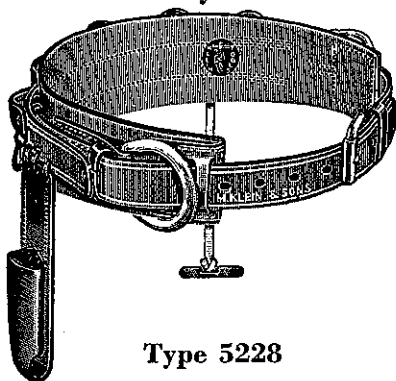
### Ankle Straps



Lower, or ankle, straps for ring attachment on Klein's 1939 Streamlined Climbers and Brooks Climbers. Made in two pieces and furnished with rivets and burrs, punched ready for attachment. Sold in pairs only.

Cat. No.	Type	Dimension, In.	Wt. per Doz. Prs., Lbs.
S-7302	5301-16	1¼ x 24	10
S-7301	5301-26	1 x 24	10

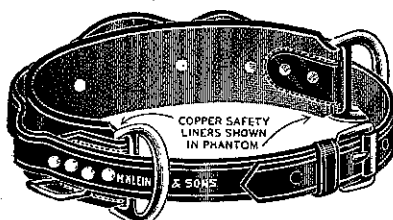
## Klein's Safety Tool Belts



**Type 5228**

Cushion is 4½" in back and 3½" in front. Equipped with leather plier pocket, knife snap and tape thong.

Cat. No.	Size, In.	Weight, Lbs.
S-2457	38	4
S-2458	40	4
S-2459	42	4
S-2460	44	4

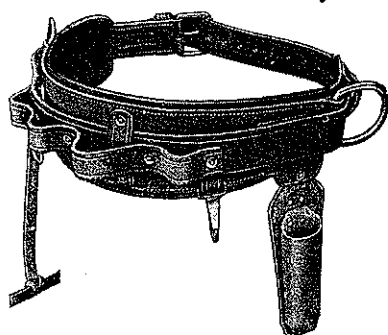


**Type 5204**

3½" cushion in back. Equipped with knife snap and tape thong.

Cat. No.	Size, In.	Weight, Lbs.
S-2427	38	3
S-2428	40	3
S-2429	42	3
S-2430	44	3

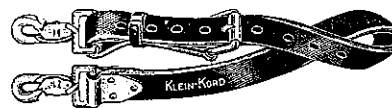
## Buhrke Safety Tool Belts



Floating type belt made of harness leather. Cushioned with elk leather rolled along the edges. All rivets and burrs made of copper. Nylon sewing.

Cat. No.	Size, In.	Weight, Lbs.
S-2462	38	4
S-2463	40	4
S-2464	42	4
S-7297	Safety Strap	3

## Klein's Safety Straps

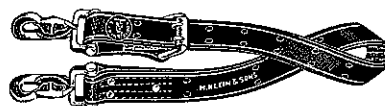


**Type 5233—"Klein Kord"**

"Klein Kord" is made of four plies of heavy, closely-woven, long-fiber cotton laid in rubber and vulcanized. This produces a strong, flexible long-wearing strap. Cross cords permit the use of tongue-type buckles without danger of ripping or slitting under severe tension. Tests show that "Klein Kord" will withstand a load of 2400 pounds, or about 25% greater than high quality leather straps.

Belt is 1¾ inches wide by five feet, eight inches long. Has a red center ply for identification.

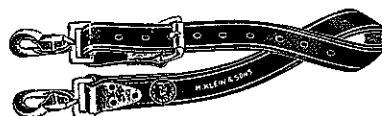
Cat. No.	Snap	Wt., per Doz., Lbs.
S-7248	Standard	36



**Type 5257 S**

Klein's safety strap of first quality harness leather with metal parts of drop-forged steel. Solid copper rivets are hand burred. Free adjustment of strap to length desired. Furnished in two-inch width with roller snaps.

Cat. No.	Snap	Wt., per Doz., Lbs.
S-7280	Standard Roller	39

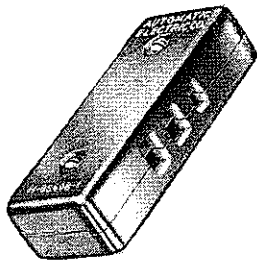


**Type 5250**

Standard 1¾ inch width for general use. Made of first quality leather with solid copper rivets set with burrs. Securely sewed with harness thread, hot waxed and lock stitched. Galvanized roller snaps and buckles are drop-forged and individually tested to 1500 pounds. An easy adjustment of the buckle shortens or lengthens the belt. Reinforced at both ends with safety clips of stainless steel riveted through double thickness of leather.

Cat. No.	Snap	Wt., per Doz., Lbs.
S-7260	Standard	32½

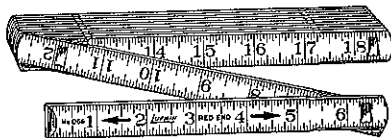
### Autelco Parallel Wire Slitter



Designed for use with Genacel, Neotel and other tough jacketed wires. Light weight, vest pocket size—uses safety-razor blade for knife. 3 different size ports accommodate different size wires. Furnished with blade.

Cat. No. S-7508 ..... Weight, Each 2 Oz.

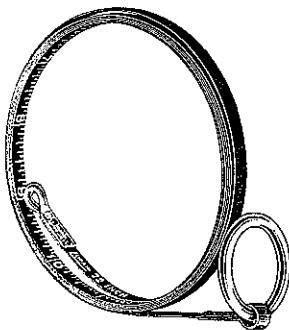
### Spring Joint Rule



Finished in white enamel with red ends. Marked consecutive inches to sixteenths, both edges of both sides. Lock joints, strike plates and mounting are solid brass.

Cat. No.	Length, Ft.	Wt. per Doz., Lbs.
S-6272	6	3½

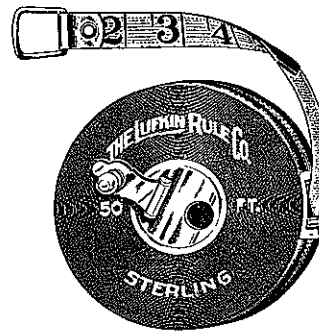
### Pole Tapes



Very useful tapes for telephone companies. Consist of extra heavy ¼-inch wide tape with heavy metal eye on one end, and one-inch harness ring on the other end for circumference and diameter measurement.

Cat. No.	Length, In.	Wt. per Doz., Lbs.
S-7406	72	4

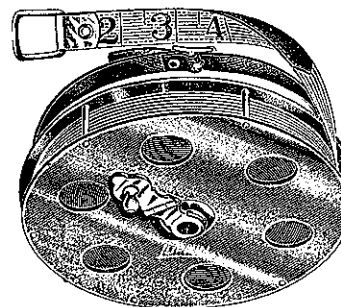
### Sterling Linen Tapes



A high grade measuring tape for general telephone work. Similar to other tapes in general construction but does not have the metallic warp. 5/8-inches wide, with large, distinct markings in feet and inches. Leather reinforced end. Genuine leather case, metal lined, with flush folding handle and nickel plated trimmings.

Cat. No.	Length, Ft.	Wt. per Doz., Lbs.
S-7448	50	9
S-7450	100	17

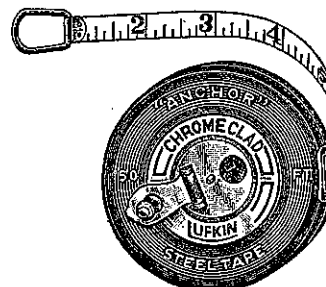
### Linen Tape on Metal Reel



Used by pole line and construction crews. High grade linen line, non-metallic, 5/8-inch wide. Leather reinforcement first end. Marked with feet, inches and half inches in prominent figures. Perforated metal disk reel, heavily nickel-plated. Folding winding handle.

Cat. No.	Length, Ft.	Wt. per Doz., Lbs.
S-7408	150	36

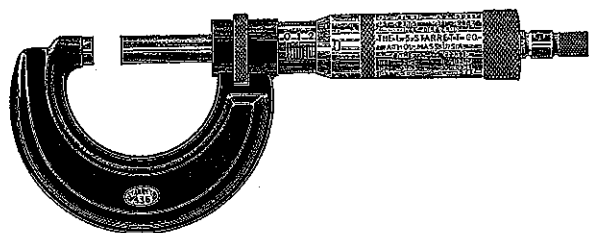
### "Anchor" Chrome Clad Steel Tapes



For all around telephone work. Jet black, easy to read markings against satin-chrome surface that will not crack, chip or peel. 3/8 inch wide line, marked in feet, inches and eighths. Genuine leather case. Folding flush handle opened by push pin. Mountings nickel plated.

Cat. No.	Length, Ft.	Wt. per Doz., Lbs.
S-7409	50	11
S-7411	100	19

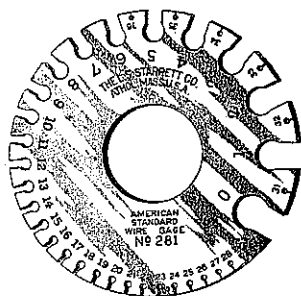
## Micrometer Calipers



High-quality, moderately priced tool for general use. Frame is cut out for use in small places where ordinary frame could not be inserted. English measure —0 to 1-inch—by thousandths. Equipped with ratchet stop. (For metric calipers order specially.)

<i>Cat. No.</i>	<i>Weight</i>
S-5320.....	5 Oz.

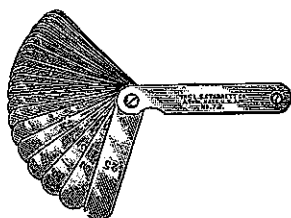
## B&S Wire Gauge



American standard—the standard measurement for copper wire. Gauge numbers are stamped on one side and decimal equivalent on the reverse side.

<i>Cat. No.</i>	<i>Gauge Numbers</i>	<i>Weight</i>
S-4422	0 to 36	3 oz.

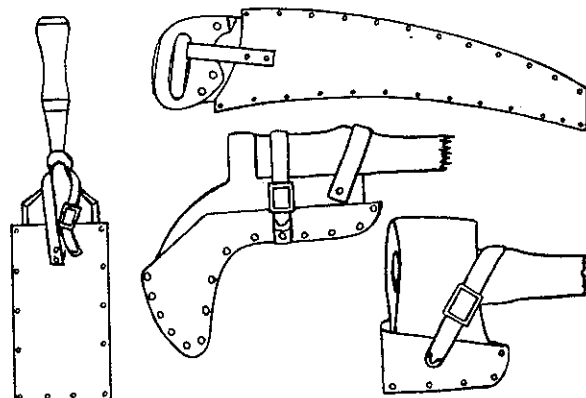
## Thickness Gauges



Used for spring contact adjustment and for gauging the stroke of relay armatures. Two types: No. 72 from .004 to .025 by the thousandths of an inch, and No. 172A for .0015, .002, .003, .004, .006, .008, .010, .012 and .015.

<i>Cat. No.</i>	<i>Type</i>	<i>Blades, No.</i>	<i>Weight</i>
S-4418	72	22	2 oz.
S-4420	172A	9	2 oz.

## Tool Guards



<i>Cat. No.</i>	<i>Style and Use</i>	<i>Wt. per Doz., Lbs.</i>
S-4527	Fibre, Tuttle Tooth Saw—Fits Saws S-6336, S-6338	12
S-4528	Fibre, Chopping Axe—Fits Axes S-2310, S-2311, S-2312, S-2314, S-4740	2 1/4
S-4529	Fibre, 30" Docking Saw—Fits Saw S-6359	19
S-4530	Fibre, 2" Chisel or Smaller—Fits Chisels S-3330, S-3332, S-3334, S-3336, S-3338	3
S-4532	Fibre, Curved Pruning Saw—Fits Saw S-6318	10 1/2
S-4533	Fibre, Saw—Fits Saws S-6342, S-6346, S-6348	15
S-4534	Fibre, Pole Pruning Saw—Fits Saw S-6324	6
S-4538	Fibre, Bush Hook—Fits Bush Hook S-4511	4 1/2
S-4539	Fibre, Cable Saw—Fits Saw S-6332	4 1/2
S-4540	Fibre, Brush Knife & Machete—Fits Machete S-5311	9
S-4541	Leather, Cable Sheath Splitting Knife—Fits Knife S-5082	1 1/2
S-4542	Leather, No. 11 Tree Trimmer Head—Fits Tree Trimmer S-7572	3
S-4543	Leather, No. 12 Tree Trimmer Head—Fits Tree Trimmer S-7574	3 3/4
S-4544	Fibre, Backsaw—Fits Saw S-6316	1 1/2
S-4545	Fibre, Compass Saw—Fits Saw S-6322	4 1/2
S-4546	Fibre, One Man Saw 4 ft.—Fits Saw S-6356	21
S-4547	Fibre, Cant Hook—Fits Cant Hooks S-4812, S-4813, S-4814	3/4
S-4548	Leather, Shave Hook—Fits Shave Hooks S-4862, S-4864	1 1/2
S-4549	Fibre, Draw Knife—Fits Draw Knife S-5070, S-5072	1 1/2



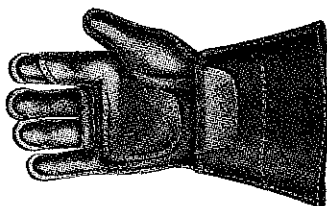
### Klein Kord Dressing



A preservative and protective dressing for Klein Kord. Furnished in 1/4-pint cans for convenient carrying and use. Made especially by Klein for Klein-Kord.

Cat. No.	Wt. per Doz., Lbs.
S-3952	4 3/4

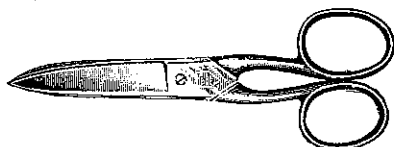
### Lineman's Horsehide Leather Glove



Heavy, durable glove with extra leather tip on all fingers and around thumb. Wide heavy welt protects all seams. Has double reinforcement on palm, which extends completely around index finger. Cuff is lined, with double stitching for extra strength. Extra heavy puller and sturdy cuff for added wear and satisfaction.

Cat. No.	Size	Wt. per Doz., Lbs.
S-4449	10	6

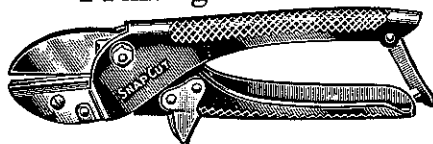
### Electrician's Scissors



These are high grade, well constructed scissors. Especially adapted to telephone work.

Cat. No.	Length, In.	Brand	Wt. per Doz., Lbs.
S-6374	5	Standard	1 1/2
S-6376	5	Wiss	1 1/2

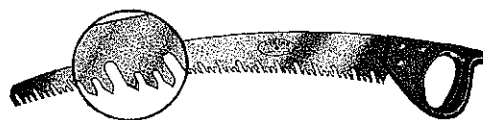
### Pruning Shears



Small, compact shears for pruning small limbs and twigs. Long cutting blade made of high grade alloy steel. Fitted with handle lock so that it can be safely carried in pocket. Features "one-hand" spring catch that can be opened and closed by rubbing against line-man's thigh—a big advantage when working with heavy gloves. Can be folded out of the way inside handle. Chromium finish. Net weight, 10 oz.

Cat. No.	Length, In.
S-6790	8

### Curved Pruning Saw



The new "Silver Flash" pruner—a fast, smooth, curved saw designed to give the correct stroke for a full, easy cut. Large comfortable handle set at proper angle for minimum effort. Blade is silver-steel, handle is beech. Its light weight makes it easy to operate. For sharpening we recommend the new No. 0 Jointer—especially designed for the Silver Flash.

Cat. No.	Description	Type	Length, In.	Wt. per Doz., Lbs.
S-6318	Saw	3-14	26	17
S-6319	Jointer	No. 0		2 1/4
S-4532	Fibre Guard			10 1/2

### Docking Saw



Special steel skew-back saw for rough, fast sawing in general construction work. Full breast, tempered blade, ground 18 by 20 gauge polished, ribbon edge. 4 1/2-point peg teeth, filed and set. Malleable iron handle, tinned and securely riveted.

Cat. No.	Type	Length, In.	Weight per Doz., Lbs.
S-6359	590	30	37
S-4529	Fibre Guard		21

### One Man Saw



Indispensable around a telephone plant when considerable pole work is involved. High grade silver steel with a very keen cutting edge. Holds edge and sharpens easily to same keenness. Recommended as the finest saw of its kind available.

Cat. No.	Type	Length, Feet	Wt., Lbs.
S-6356	390-C	4	4 1/2

## Hand Saws



Made of special hand-saw steel—hand smithed—oil tempered. Designed for hard and constant service. Crosscut or rip as follows:

Cat. No.	Description	Length, Wt. per	
		In.	Doz., Lbs.
S-6342	51—Rip	26	23
S-6346	65—Crosscut—8 Pt.	24	20
S-6348	65—Crosscut—8 Pt.	26	24
S-4533	Fibre Guard		15

## Tuttle Tooth Pruning Saw



A high grade saw steel blade with tuttle-tooth pattern. Handle of air dried beech, Davey pattern. Extra large, roomy grip reinforced with dowel pin.

Cat. No.	Description	Length, Wt. per	
		In.	Doz., Lbs.
S-6338	40-B	24	21
S-4527	Fibre Guard		12

## Tree Saw



Designed for cutting limbs up to 4 inches in diameter. Blade is made of the finest Swedish steel and is 36 inches long. Overall length is four feet.

Cat. No.	Description	Weight, Lbs.
S-6328	Tree Saw, less handle	3
S-5923	5' center extension handle	2
S-5929	5' end extension handle	2

## Seymour Smith Pruning Saw



For line-clearing work in cutting limbs too large for tree pruners. High-quality 16-inch replaceable blade with fast-cutting teeth. Blade adjusts to six different angles. Designed so head is equipped with paint-brush holder for painting over cuts. Head uses same poles described in Tree Pruner No. S-7572. Guard is available for saw blade. If poles are desired, order separately (see page 107).

Cat. No.	Description	Wt. per	
		Doz., Lbs.	
S-6324	Pruning Saw	9	
S-6326	Saw Blade Only	3	
S-4534	Fibre Guard	6	

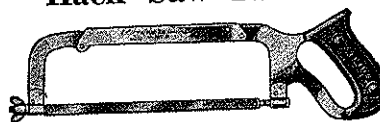
## Compass Saw



Extra heavy blade for telephone work. Ground 16 x 17 gauge; nine point, filed and set. Blades slotted and punched. If hole only, to eliminate detachable feature, is desired, please specify. Interchangeable beech handle. Nickeled wing nut and screw.

Cat. No.	Description	Length, Wt. per	
		In.	Doz., Lbs.
S-6322	Compass Saw	12	6
S-4545	Fibre Guard		4½

## Hack Saw Frames



A substantial cast steel hack saw frame with "pistol grip" handle. Will take 8-, 10- or 12-inch blades

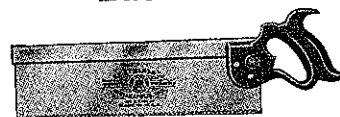
Cat. No.	Description	Wt. per	
		Doz., Lbs.	
S-4254			24

## Hack Saw Blades

Made of highest quality tungsten steel—½-inch wide and .025 inch thick—18 teeth to the inch. Furnished in packages of one dozen.

Cat. No.	Length In.	Wt. per	
		Gross, Lbs.	
S-2556	10		4¾
S-2557	12		5¾

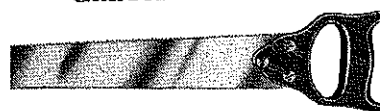
## Back Saw



Blade is made of silver-steel. Handle of beechwood is secured to blade with three screws. Backs are made of tempered steel and hold the blade rigid and true. Filed and set, 14 points to the inch.

Cat. No.	Description	Wt. per	
		Doz., Lbs.	
S-6316	Back Saw—14" Long		17
S-4544	Fibre Guard		1½

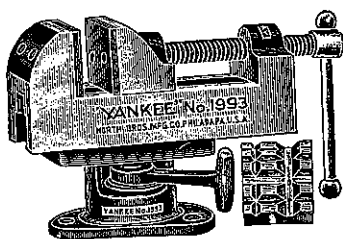
## Cableman's Saw



A saw with coarse teeth on one side for cutting through lead sheath and fine teeth on the other side for cutting the wire core.

Cat. No.	Description	Wt. per	
		Doz., Lbs.	
S-6332	Cableman's Saw—16" Long		9
S-4539	Fibre Guard		4½

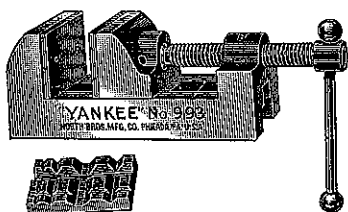
## Vises



Swivel Style\*

Equipped with swivel base, they are easily and firmly locked or released by a short movement of the lever at one side of the base.

Cat. No.	Base Dia., In.	Height, In.	Wt. Each, Lbs.
S-7666	4 1/2	6 3/4	13 1/2



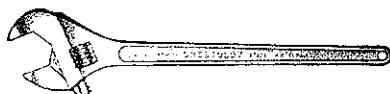
Stationary Style\*

Built to the same specifications as the swivel style except vise cannot be turned. Also equipped with V-slotted steel plate for holding round stock.

Cat. No.	Height, In.	Weight Each, Lbs.
S-7667	3	9 1/4

\*NOTE: Specifications common to both types of vises: Base length, 7 1/4"; Base width 2 3/4"; Jaw opening 3 1/8"; Jaw depth 1 7/8"; Jaw width 2 3/4"; Overall length 8 3/4".

## Crestoloy Wrenches



High-quality extra-strength, adjustable wrenches of special alloy steel. Carefully hardened and precision machined they offer a maximum of dependability and long life. Chromium plated with satin-finish handles to prevent slipping. 12-inch size is illustrated.

Cat. No.	Capacity, In.	Length, In.	Wt., ea.
S-8057	1 1/8	10	13 oz.
S-8058	1-5/16	12	24 oz.

## Lineman's Wrench



This wrench is forged of select bar steel and is of the open end type with two openings of different sizes at each end.

Openings at larger end are 1 1/8 inch and 1 3/8 inch, the smaller end 1 1/8 inch and 5/8 inch. There is a hole provided at the larger end so that the wrench may be used for turning in standard pole steps.

Cat. No.	Length In.	Wt., per Doz., Lbs.
S-8034	13	23

## Aluminum Levels



Die-cast aluminum levels finished in gray enamel. Precision ground and buffed working faces. Two level and four plumb vials are accurately set in large wells that provide excellent visibility.

Cat. No.	Size	Wt., Lbs.
S-5866	24" x 2 1/4" x 1"	2 1/4

## Spintite Socket Wrenches



Built like a screw driver with a hollow hexagon socket on the end which reaches down over bolt end and grips the nut.

Cat. No.	Hexagon Size, In.	Overall Length, In.	Wt. per Doz., Lbs.
S-8040	5/16	6	3
S-8042	3/8	6	3
S-8044	7/16	6	3

## Telephone Ranging Rod



Perfectly suited to all telephone surveying work. Selected Sitka spruce, remarkably light and strong, in two sections. Colorfully finished with two coats red and white enamel. Eight feet long assembled. Locked together by spring catch and locking pin.

Cat. No.	Description	Weight Each, Lbs.
S-6254	Ranging Rod	3 1/2

## Telephone Files

A complete line of files for telephone construction work. Best quality steel, designed to do specific jobs, they'll stay sharp and last indefinitely. Made from one piece of metal with the handles formed to fit the hand comfortably. Handles are 4" long.

### Lineman's File



Cat. No.	Size In.	Cut	Weight, per Doz., Lbs.
S-4193	10 x 1	Double, both sides	8

### Combination File



Cat. No.	Size In.	Cut	Weight, per Doz., Lbs.
S-4192	8 x 1	Single one side, Double one side	6

### Splicer's Rasp



Cat. No.	Size In.	Cut	Weight, per Doz., Lbs.
S-4194	10 x 1	Float cut, both sides	10

### Rat Tail File



Cat. No.	Size In.	Cut	Weight, per Doz., Lbs.
S-4197	6 x 7/32 Diam.	Double	1 1/2

### Flat Mill File



Highest quality tools with fine cut. Sizes listed below meet all ordinary needs.

Cat. No.	Size, In.	Wt. per Doz., Lbs.
S-4196	10	7 1/4
S-4198	12	12

## Klein's Skinning Knife



A specially designed knife forged from first quality cutlery steel individually tempered and with blade shaped for utmost safety. Moulded rubber handle is shouldered at blade to prevent accidents.

Cat. No.		Wt. per Doz., Lbs.
S-5084	Skinning Knife	14 1/4
S-5871	Knife Pocket	4

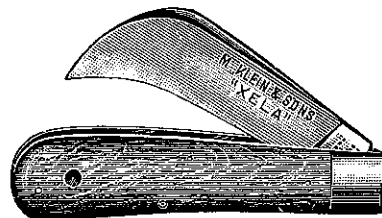
## Electrician's Knife



Handy combination knife suitable for all electrical work. Has screw-driver with cutting edge for stripping or cutting wire. Knife blade is of highly-tempered steel. When open, screw driver blade locks and is released by pressure on knife blade.

Cat. No.	Blade Length, In.	Weight per Doz., Lbs.
S-5066	2 1/2	2 1/8

## Lineman's Knife



A husky convenient knife all linemen should have. Heavy hawk-bill blade, iron bolster and cocobolo handle. Glazed finish. Dependable and lasting.

Cat. No.	Blade Length, In.	Weight per Doz., Lbs.
S-5086	2	4 1/2

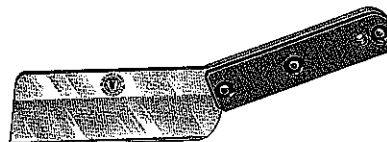
## Draw Knives



Made from solid steel with blade 1 3/8-inch wide. Shanks extend through handles and are securely riveted on nickel-plated caps. High-polish finish, sharpened ready for use.

Cat. No.	Blade Length, In.	Wt. per Doz., Lbs.
S-5070	10	18
S-5072	12	18 1/2
S-4549	Fiber Guard	1 1/2

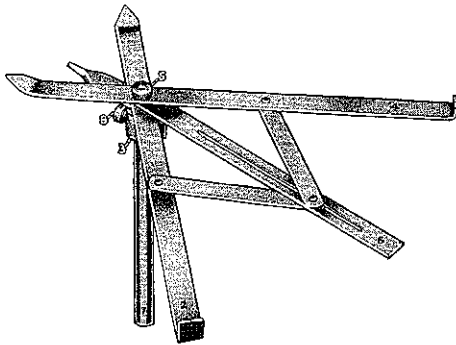
## Cable Sheath Splitting Knife



Blade is tempered and ground to keen cutting edge. Securely riveted leather handle. A sturdy knife built for years of service.

Cat. No.	Length, In.	Wt. per Doz., Lbs.
S-5082	9 1/4	13
S-4541	Leather Guard	1 1/2

### Dillon Bisector



The Dillon Bisector is a scientifically designed anchor-hole locator. It quickly locates the correct position for an anchor. It automatically bisects the angle where the corner, or other pole anchor, is to be located. The Bisector eliminates all guesswork, does away with all figuring. There are no complicated mathematics—a child can operate it. The instrument points to the exact bisected point where the anchor is to be put. It can be thrust into a pole or placed on a ground rod at the survey stake and the anchor hole spotted in one minute. The Bisector is only 12½ inches long, 1⅝ inches deep and ⅞-inch wide. Furnished complete with instructions for use.

Cat. No.	Wt., Lbs.
S-2475 .....	¾

### 162T Bluwin Mainbor Auger Bits



General purpose bits made from special bit steel, heat-treated and tempered full length. Medium-fast screw pitch with clear, open throat for all around use and fast chip clearance. Blue finish.

Cat. No.	Size, In.	Approx. Length Overall, In.	Wt. per Doz., Lbs.
S-2480	1/4	7¼	1
S-2482	5/16	7⅝	1
S-2484	3/8	7¾	1
S-2486	7/16	7⅞	2
S-2488	1/2	8	2
S-2490	9/16	8½	2
S-2492	5/8	8¾	3
S-2494	11/16	8⅞	3
S-2498	3/4	8½	4
S-2501	13/16	8⅝	4
S-2504	1	9	6
S-2507	1-1/4	9¼	6

### 165T Bluwin Car Bits



Standard 18-inch drills for pole work. Forged from molybdenum alloy tool steel. Heat treated entire length and finished in heat treatment blue, with polished edges. Durable double cutter head. 12" twist, 18" overall.

Cat. No.	Size, In.	Wt. per Doz., Lbs.
S-2512	¼	3
S-2515	⅝	3
S-2517	¾	4
S-2519	⅞	4
S-2521	1½	5
S-2523	1⅞	6
S-2525	5/8	7
S-2527	1½	7
S-2529	¾	8
S-2531	1½	9
S-2535	1¾	13

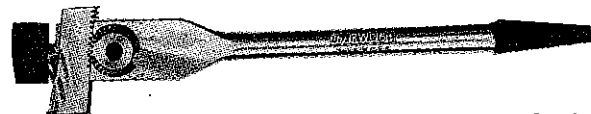
### 315T Electrician's Bit



High speed bit for electricians, utility workers, etc. Made from special bit steel, single twist, heat treated full length and oil finished. Electricians' head with single cutter. Overall length 18 inches with 12" twist.

Cat. No.	Size, In.	Wt. per Doz., Lbs.
S-2559	5/16	2¾
S-2552	3/8	3¼
S-2549	1/2	5¼
S-2560	5/8	7¾
S-2550	11/16	9¾
S-2561	3/4	10
S-2551	13/16	12

### Micro-Dial Expansive Bits



Adjustable drills for hair-line precision boring. Made from special bit steel, heat treated full length. Brilliant Hi-Lite finish. Special depth-gauge on back. Two cutters furnished with each size bit. Extra dials, cutters and screws (for replacement purposes) available on order.

Cat No.	Type No.	Size Range, In.	Wt. per Doz., Lbs.
S-2540	21-Small	5/8 to 1¾	4¼
S-2542	22-Large	7/8 to 3	6½

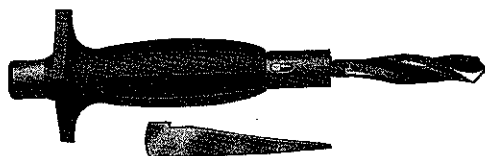
## Hamrtwist Drill Points



Fast-cutting tool for concrete, brick, or stone. Point can be easily resharpened on grinding wheel. For use in S-4806 drill holder.

Cat. No.	Diameter, Inches	Wt. per Doz., Lbs.
S-4040	3/16	1/2
S-4042	7/32	1/2
S-4044	1/4	1/2
S-4045	9/32	3/4
S-4046	5/16	1
S-4048	11/32	1
S-4050	3/8	1 1/2
S-4052	7/16	1 1/2
S-4054	1/2	2
S-4056	9/16	2
S-4058	5/8	3

## Drill Holder



Drill holder has rubber grip with flange to protect the hand. Made of vanadium steel. Complete with ejector pin.

Cat. No.	Description	Wt. per Doz., Lbs.
S-4806	Rubber Holder and Pin	10
S-5679	Pin Only	3/4

## Standard Push Drill



All metal parts chrome plated. Furnished with 8 drill points, from 1/16 to 11/64 inch, that fit in magazine in handle. Drill points exposed for quick, easy selection when magazine is open.

Cat. No.	Type No.	Length, In.	Weight Per Doz., Lbs.
S-3964	41	11	8 1/4

## Greenlee Automatic Push Drills

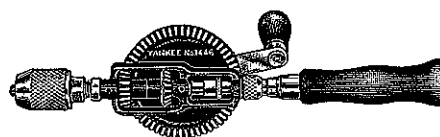


Spring controlled hand-drills with transparent plastic handles. All exposed metal parts are chromium plated, highly polished.

Handle serves as magazine for extra drills. 8 drills from 1/16" to 11/64" included with drill. Tools are well proportioned and well balanced. All working parts are enclosed and protected from dust and dirt. Each tool is individually packaged.

Cat No.	Description	Wt. per Doz., Lbs.
S-3963	No. 483 Push Drill	6 3/4
S-3978	Set 8 Drill Points	1 1/4

## Yankee Drill

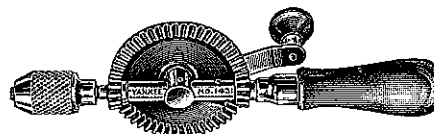


Two speed adjustable brace. Can also be locked by sliding knurled collar on spindle. Malleable iron frame finished in dead black, hardwood handle with magazine for drills. Roller bearing on chuck end of spindle—three jaw chuck for round shank drills. All bright parts are chrome plated. For drills 0 to 3/8".

Cat. No.	Type	Length, In.	Weight, Lbs.
S-3985	1446	14 1/2	2 3/4

## Hand Drills

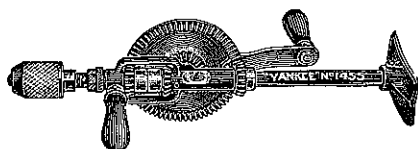
### Type 1431, Single-Speed Plain



Well-balanced, small, powerful drill with fast four-to-one gear ratio. Three jaw chuck takes round shank drills up to 9/32-inch.

Cat. No.	Length, In.	Weight, Lbs.
S-3980	9 3/8	1 1/4

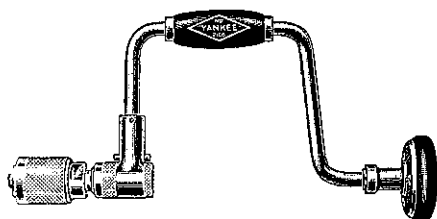
### Breast Drill Type 1455, Plain Two-Speed



Frame is of malleable iron. Adjustable ball bearings, steel spindle, gears with cut teeth. Large gear five inches, small gear  $1\frac{7}{8}$  inches. Breast plate is adjustable and has polished face. Furnished with three-jaw chuck which holds round shank drills up to  $\frac{1}{2}$ -inch.

Cat. No.	Length, In.	Weight, Lbs.
S-3986	16½	6

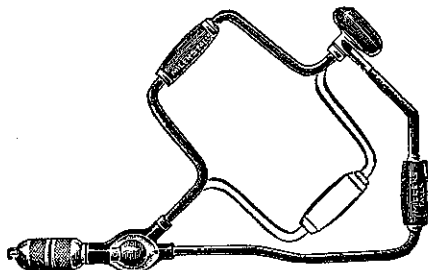
### 2101 Ratchet Braces



A tool of the highest quality, accuracy, efficiency, and durability. The ratchet works easily and noiselessly. The ratchet case is dust and moisture proof. Equipped with quick centering ball bearing chuck, holds any bit with shank up to  $\frac{1}{2}$  inch in diameter. The handles are made of unbreakable rubber. The patented sweep handle eliminates excessive play.

Cat. No.	Sweep, Ins.	Weight, Lbs.
S-3075	8	3
S-3076	10	3½
S-3077	12	3¼

### Corner Bit Brace



A time and labor saver for boring in corners against walls and beams and similar places. Chuck takes square taper or round shanks from  $\frac{1}{8}$  to  $\frac{1}{2}$ -inch. Gears are case-hardened, machine-cut and fully enclosed. Ball-bearing thrust, ball bearing head. Handles have inserted metal rings. Head and handles mahogany-finished hardwood, frame black enameled, exposed metal nickel plated. Length 17 inches.

Cat. No.	Type No.	Sweep, In.	Weight, Lbs.
S-3085	502	10	4

### Star or Four-Point Drills



For drilling holes in brick, stone or concrete. Of highest quality hardened steel. Standard length 12 inches. If longer drills are desired they may be obtained on special order.

Cat. No.	Diameter, In.	Wt. per Doz., Lbs.
S-4062	$\frac{1}{4}$	1¾
S-4064	$\frac{5}{16}$	2¼
S-4066	$\frac{3}{8}$	3¼
S-4068	$\frac{7}{8}$	4¾
S-4072	$\frac{1}{2}$	8½
S-4074	$\frac{3}{4}$	10½
S-4075	1	19

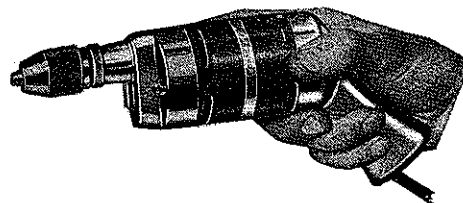
### Paine Rotary Drill Points



Used for making anchor holes in non-metallic materials such as brick, concrete, marble, stone, etc. Special design automatically ejects dust. Made of tool steel with carbide tipped cemented-carbide point. Can be used continuously without a cooling agent. Can be used in any hand or slow speed portable drill, not over 700 R.P.M.

Cat. No.	Drill Diam., In.	Shank Diam., In.	Lgth.	Wt. per Doz., Lbs.
S-3989	3/16	5/32	3	5½
S-3990	1/4	3/16	4	7½
S-3991	5/16	1/4	4	1¼
S-3992	3/8	5/16	4	1¾
S-3993	7/16	3/8	6	2½
S-3994	1/2	3/8	6	2¾
S-3995	9/16	7/16	6	3½
S-4076	5/8	1/2	6	4¼
S-3996	3/4	1/2	6	5¼
S-3997	7/8	1/2	6	7½

### Portable Electric Drill



Well built portable electric drill with precision die-cast gear housing and pistol-grip handle. 110-120 V. AC-DC motor with self-aligning porous bronze bearings. Heat-treated, cut steel double-reduction gears for a free-load speed of 1000 R.P.M. and a normal load speed of 600 R.P.M. Complete with snap-release chuck and 6 feet of cord.

Cat. No.	Size	Type	Wt., Lbs.
S-3968	$\frac{1}{4}$ "	69	3
S-3966	$\frac{3}{8}$ "	79J	4

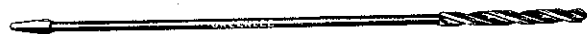
## Seru-Lok Bit Extension



Extends bit and holds it securely in place while boring or removing. Positive locking device prevents all chance of losing bit in hole. Precision made, high-grade forged tool steel. Highly finished. Takes any size bit from 11/16-inch up. Will also accommodate smaller bits but extension will not enter hole smaller than 11/16-inch.

Cat. No.	Length, In.	Weight, Lbs.
S-2545	15	1
S-2547	18	1 1/8
S-2548	24	1 3/8

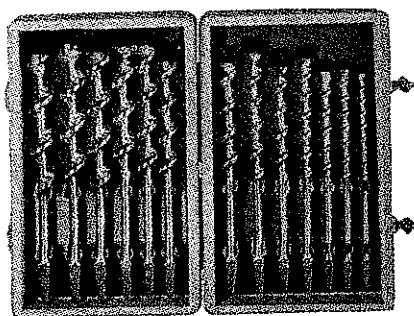
## Bell Hanger Drills



All purpose drill for installers and wiremen for inside or outside work. Will cut through hollow tile, expanded metal, flooring, walls and similar materials. 3 3/4-inch twist and 18-inch length are standard. Other lengths can be supplied on special order.

Cat. No.	Diameter, In.	Wt. per Doz., Lbs.
S-4004	3/16	1 3/4
S-4006	1/4	2 1/2
S-4008	5/16	2 7/8
S-4010	3/8	3
S-4012	7/16	3 3/4
S-4014	1/2	6
S-4016	9/16	6 1/4
S-4018	5/8	6 1/2
S-4020	11/16	6 3/4
S-4022	3/4	7

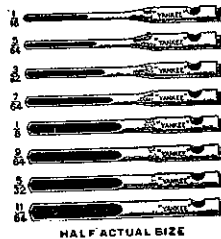
## Borchest Set



Carpenter's set of 13 bits in substantial, well-finished wood case. Bits are held by spring clips. A handy way to carry and keep track of your bits. Each chest equipped with strong hinges and fastener. Set includes every size bit from 1/4-inch to one-inch.

Cat. No.	Description	Weight, Lbs.
S-2528	Borchest Set DM 62T	4 3/4

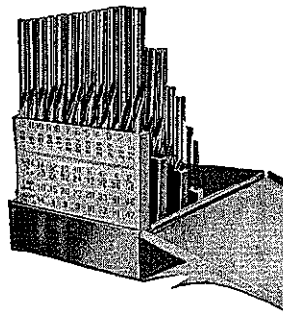
## Drill Points



Eight sizes from 1/8 to 11/64 inch in round wooden case. Used for drilling mounting holes in molding, wall board, plaster, etc. Primarily for use in type 41 Yankee Automatic Drill and Greenlee Push Drill No. 483, but they can be used in 30A and 130A Yankee Ratchet Screwdriver by using chuck adaptor.

Cat. No.	Description	Wt. per Doz., Lbs.
S-3978	Drill Point Set	1 1/4
S-3352	Chuck Adaptor	3/4

## Standard Straight Shank Twist Drills



Made of cadmium plated steel, assembled in handy metal container. Compact, durable — these sets can easily be carried in tool kits or boxes. Die cast holes in hinged panels hold the drills. They are marked with drill sizes for quick identification.

Cat. No.	Drills Per Set	Size Range, In.	Wt., per set
S-4059	13	1/16 to 1/4 by 64ths	6 Oz.
S-4060	29	1/16 to 1/2 by 64ths	3 1/2 Lbs.
S-4061	60	Nos. 1 to 60 Inc.	1 1/8 Lbs.

## Vaughan Cold Chisels

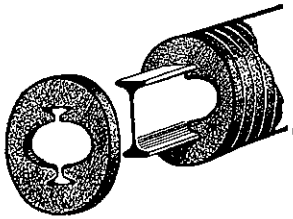


Special Vaughan No. 25 alloy for hardness. Tapered and polished black body. Designed especially for hard work and long service. Order by number and diameter.

Cat. No.	Dia., Steel, In.	Cut, In.	Lgth., In.	Wt., per Doz. Lbs.
S-3342	3/8	7/16	5 1/2	2 1/4
S-3344	1/2	5/8	6	3 3/4
S-3339	5/8	3/4	7	6 3/4
S-3340	3/4	7/8	7 1/2	10 1/2
S-3341	1	1-1/8	8 1/2	21



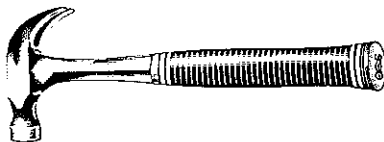
## Estwing "Unbreakable" Tools



Each Estwing tool is forged of one piece of fine tool steel, with the shank made in the form of an I-beam, giving great strength with least weight. Proper distribution of weight assures perfect balance, and an easy-handling tool. And Estwing tools are unbreakable—the head can't loosen or fly off.

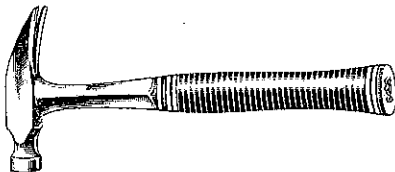
The handle of an Estwing tool consists of genuine sole-leather washers pressed and riveted onto the handle shank, as shown in this illustration. A circular opening through the center of each washer provides a comfortable cushioned grip. The leather handle is polished, and finished with two coats of waterproof lacquer, and the head and shank have high polish, or velvet black lacquer finish, as listed below.

### Estwing Curved-Claw Hammer



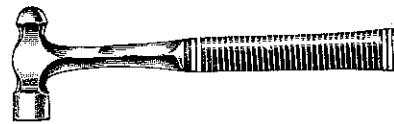
Cat. No.	Finish	Weight, Head, Oz.
S-4578	High Polish	12
S-4580	High Polish	16
S-4582	High Polish	20
S-4584	High Polish	28
S-4558	Velvet Black	16
S-4560	Velvet Black	20
S-4562	Velvet Black	28

### Estwing Straight-Claw Hammer



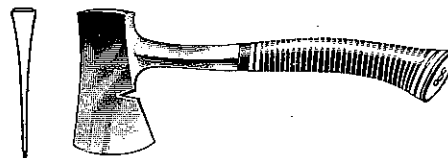
Cat. No.	Finish	Weight, Head, Oz.
S-4588	High Polish	12
S-4590	High Polish	16
S-4592	High Polish	20
S-4594	High Polish	28
S-4566	Velvet Black	16
S-4568	Velvet Black	20
S-4570	Velvet Black	28

### Estwing Ball Pein Hammer



Cat. No.	Finish	Weight, Head, Oz.
S-4597	High Polish	16
S-4598	High Polish	24
S-4599	High Polish	32

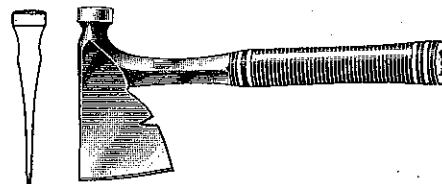
### Estwing Hunting Ax



Blade of finest temper, with thin easy-cutting edge. 13½ in. long. Leather belt sheath included.

Cat. No.	Finish	Weight, Head, Oz.
S-2302	High Polish	24
S-2296	Velvet Black	24

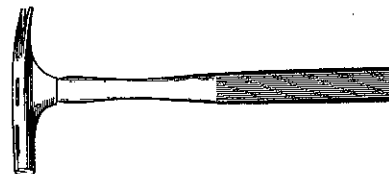
### Estwing Carpenter's Hatchet



Large head and thin bit cuts easily and is easy to regrind. 3¾ in. head, 13½ in. long. High polish finish.

Cat. No.	Weight, Lbs.
S-2300	2¼

### Vaughan Supersteel Tack Hammer

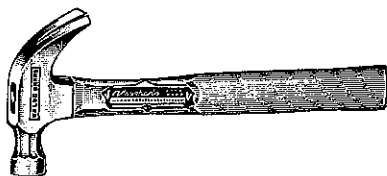


Head has magnetic driving face and claw. Made of vanadium steel with second growth, white hickory handle. Polished finish.

Cat. No.	Wt., Oz.
S-4610	4

## Vaughan Supersteel Hammers

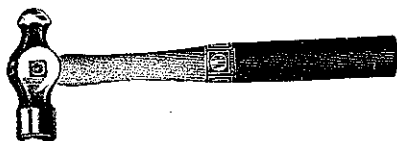
### Bell Nail Face



Has non-slip claws and specially designed head to hold handle firmly in place. Polished head and hickory handle.

Cat. No.	Length, In.	Weight, Oz.
S-4614	13	16
S-4615	14	20

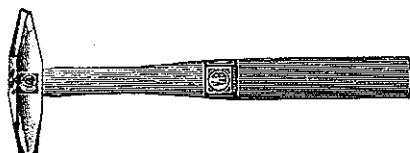
### Ball Pein



Polished steel head and two-tone hickory handle.

Cat. No.	Length, In.	Weight, Oz.
S-4617	14	12
S-4619	16	24
S-4621	17	32

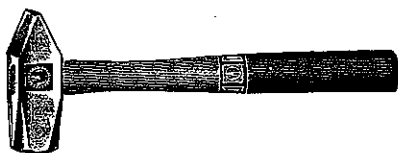
### Machinist's Riveting



Polished head and two-tone hickory handle.

Cat. No.	Length, In.	Weight, Oz.
S-4631	13	9
S-4633	14	12

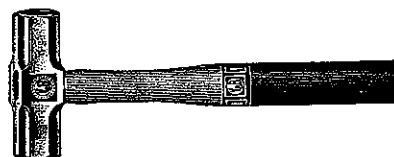
### Blacksmith's Hand



Polished head and two-tone hickory handle.

Cat. No.	Length, In.	Weight, Oz.
S-4641	16	40
S-4643	17	48

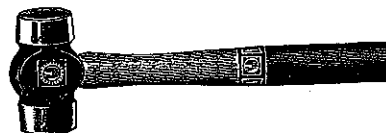
### Engineer's Double-Faced



Polished head and hickory handle. Available in one size only.

Cat. No.	Length, In.	Weight, Oz.
S-4616	16	40

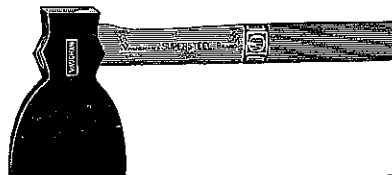
### Lineman's Double-Face



Polished heads and black body with two-tone hickory handle.

Cat. No.	Length, In.	Weight, Oz.
S-4612	15	36
S-4662	Handle	8

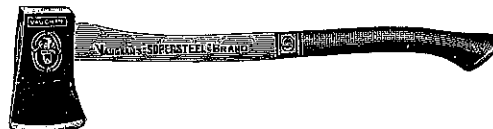
## Vaughan Supersteel Broad Hatchet



Drop-forged from high-grade bar-steel. Tough second-growth hickory handles.

Cat. No.	Cut, In.	Length, In.	Weight, Oz.
S-4740	4½	14½	28
S-4528	Fiber Guard		3

## Vaughan Supersteel Axe—"Dayton"



Head and blade are forged separately and then joined, creating a blend of the steel best suited for each part of the axe. Keen, true edged, long lived.

Cat. No.	Weight, Lbs.
S-2310	3½
S-2311	4
S-2312	4½
S-4528 Fiber Guard	¼
S-4664 Axe Handle	1¼

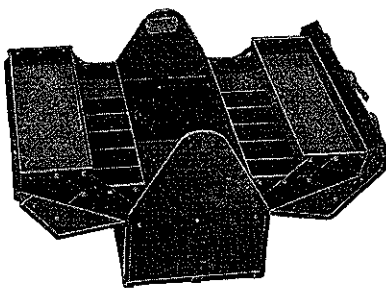
### Vaughan Supersteel House Axe



Built to last and give good service. Retains its keen cutting edge and temper.

Cat. No.	Handle Length, In.	Wt., Lbs.
S-2314	19	2 1/4

### Metal Tool Box

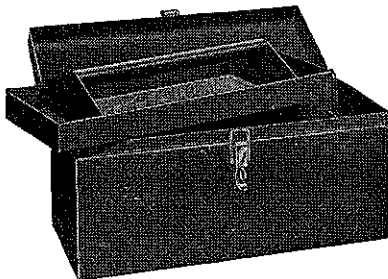


Heavy duty kit for general plant work. Has four trays linked to lids. Fitted with leather handle, lock and side catches. Three skidrails are welded to bottom. Finished in brown

baked enamel with green baked enamel trays.

Cat. No.	Size	Wt., Lbs.
S-3018	18x10x12	17 1/2

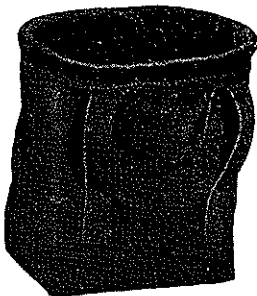
### Flat-Top Tool Box



All purpose tool kit especially suited for telephone work. Convenient divided carrying tray is supported by sides of box. All-steel construction with protective irons on all corners. Fitted with hasp and staple catch and metal handle. Green baked-enamel finish.

Cat. No.	Size	Wt., Lbs.
S-3014	21x8x9	11

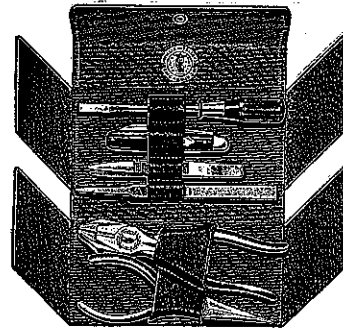
### Lineman's Pouch



Made of 12 oz. olive green amertite waterproof material, with a 3/8-inch rope sewed in the top. Top is eight inches in diameter, depth is nine inches. When attached to belt it makes an ideal pouch for carrying small articles.

Cat. No.	Wt., Oz.
S-5952	5

### Klein's Inspector's Tool Kit

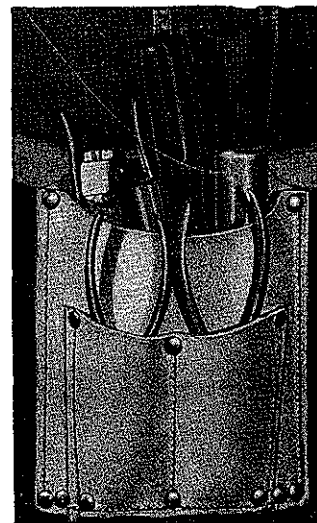


A very handy assortment to fit the pocket. Consists of:

1 Pr. No. 201-6 Side Cutting Pliers	1 Special File
1 Pr. No. 301-5 Long Nose Pliers	1 Special Screwdriver
1 Pr. Electrician's Tweezers	1 Electrician's Knife

Cat. No.	Wt., per Doz., Lbs.
S-5054	Complete with tools..... 1 1/4

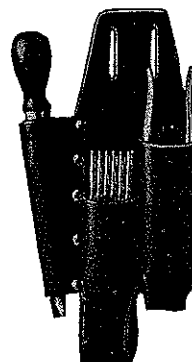
### All-Leather Tool Pouches



Natural russet leather pouches, designed to hang from waist belt (listed below), for carrying small tools. No. S-5946 has individual compartments for seven tools. No. S-5948 (illustrated) has two plier pockets and one large pocket which will hold about four tools. Order belt separately.

Cat. No.	Description
S-5946	Tool Pouch —Large
S-5948	Tool Pouch —Small
S-2461	Waist Belt

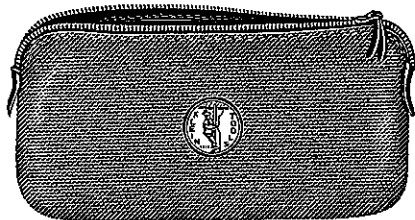
### Combination Pocket



Has individual compartments for carrying screwdriver, rule and pliers. Made of full-grain harness leather. Pockets are formed to fit the tools for which they were designed.

Cat. No.	Wt. per Doz., Lbs.
S-5873	7

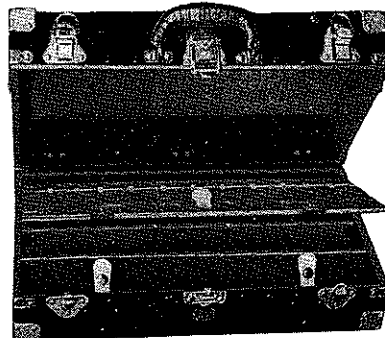
## Klein's Canvas Tool Pack



Heavy brown canvas bag, approximately six by 12 inches. Sturdy zipper instantly closes, or opens, full length mouth. Especially designed to keep a selection of small, frequently used tools where they can be reached easily and in a hurry. For pliers, drill points, screwdrivers, small wrenches and similar tools.

<i>Cat. No.</i>	<i>Wt. per Doz., Lbs.</i>
S-7531 .....	3

## Repairman's Tool Case



Heavy-duty case made of kiln-dried, 3-ply fir covered with heavy-gauge fiber. Metal-reinforced corners. High quality brass hardware with lock and key. Comfortable leather handle. Two compartments with separator, equipped to hold small tools.

<i>Cat. No.</i>	<i>Size</i>	<i>Weight, Lbs.</i>
S-3295	20x6½x1¼ inches	10½

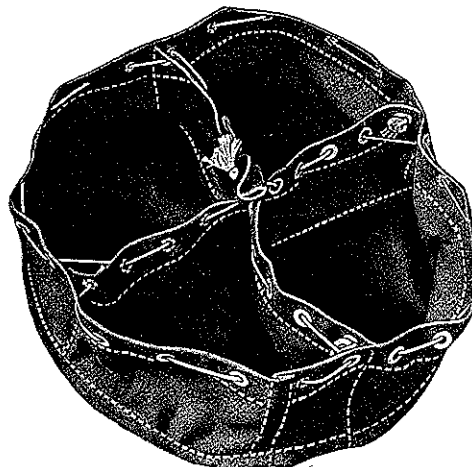
## Klein's Canvas Tool Bags



Made of one-piece of white duck, this bag is reinforced with heavy leather on the bottom and 3½ inches up the sides. Mouth is formed by a 12-gauge steel frame. Has harness leather handles and two retaining straps with buckles.

<i>Cat. No.</i>	<i>Size, In.</i>	<i>Weight, Lbs.</i>
S-2323	12	2¼
S-2327	18	3¼
S-2328	20	3½
S-2331	24	4

## Miscellaneous Material Bag



Sturdy eight ounce khaki duck bag, 11 inches in diameter and three inches deep. It is divided into four compartments for separating and storing miscellaneous small materials. Well sewn throughout, with draw-string top for closing.

<i>Cat. No.</i>	<i>Wt. per Doz., Lbs.</i>
S-2340 .....	3

## Lineman's Tool Bag



Sturdy No. 8 canvas with leather bottom and one-piece construction. Length 20 inches, height 15½ inches, width 5½ inches. Straps at top keep bag closed when not being carried. Convenient for carrying all necessary lineman's tools.

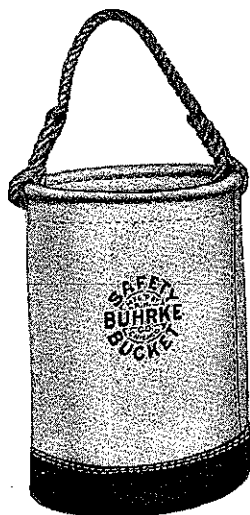
<i>Cat. No.</i>	<i>Weight, Lbs.</i>
S-2320 .....	2½

## Klein's Hip Pocket Tool Case



For carrying pliers or other tools in hip pocket. Prevents injury to person and cutting of clothes. Made of black high-quality leather.

<i>Cat. No.</i>	<i>Size, In.</i>	<i>Wt. per Doz., Lbs.</i>
S-5874	5 x 7	2½

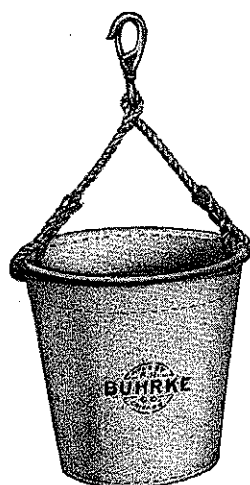


### Non-Metallic Bucket

Round style, of No. 1 canvas with 12-inch top and bottom. 17 inches high. Bottom is full-grain harness leather extending up sides three inches. Handle is half-inch rope spliced to bucket through leather reinforcements. Non-metallic ring in top.

Cat. No.  
S-3184

Weight,  
Lbs.  
3



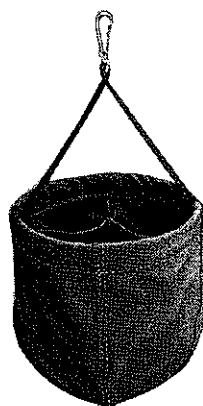
### Canvas Bucket

Has 1/4-inch steel ring in top, 12 inches in diameter. Bottom is eight inches, height 12 inches. Leather 1/8-inch thick, hardened and waterproofed forms the bottom. Equipped with spliced 3/8-inch rope handle with heavy, galvanized marine swivel snap inserted for hoisting, suspending, etc.

Cat. No.  
S-3186

Weight, Lbs.  
2 1/2

### Installer's Canvas Pouch



Cat. No.  
S-5954

Made of No. 10 (15 oz.) olive drab canvas. 6 1/2" in diameter and 8" deep. Vulcanized hard-fibre ring in top. Web strap and snap securely attached for easy hanging to Dee ring on belt. 2 small pockets on the inside for small parts. Bottom is pointed so that the small parts stay in the center of the bag for easy location.

Wt., Oz.  
5

### Bolt Clippers



Made of highest quality steel with long handles, for plenty of leverage, and extra strong cutting edges. Cut nuts, bolts, wires with little pressure.

Cat. No.	Type	Length, In.	Will Cut Bolt, In.	Weight, Lbs.
S-3896	0	18	1/8	3
S-3898	1	24	3/8	5 1/4
S-3900	2	30	1/2	9
S-3902	3	36	5/8	13

### Carolus Type Bolt Cutters



Jaws are made of drop forged, special tool steel. Handles and adjusting links are malleable iron. The jaws are held firmly in place by high-carbon spring-steel plates.

#### Type B (without Nut Splitter)

Cat. No.	Size	Cap. (Rods)	Weight, Lbs.
S-3897	24"	5/16"	6 1/4

#### Type N (with Nut Splitter)

Cat. No.	Size	Cap. (Rods)	Weight, Lbs.
S-3899	24"	5/16"	6 1/4

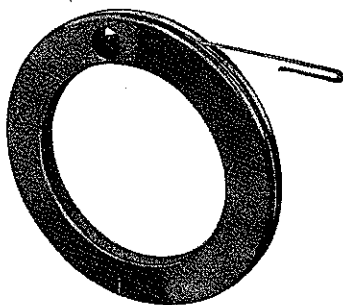
### Manco Jr. Bolt Cutter



Tool-kit-size bolt cutter for cutting up to 1/4 inch mild steel. Excellent for cutting screws, nails, rivets, wire. Cutting jaws are made of heat-treated tool steel.

Cat. No.	Length	Weight, Lbs.
S-3910	12 inches	1 1/4

## Fish Tape Reels and Wire



Highest grade tempered spring steel wire. Non-curling, flexible, easy to use on long conduits having several bends. Reels serve as handle for pulling wire. Keeps tape coiled and ready for use. Tape dimensions are  $\frac{1}{8} \times 1/16$  inch.

Cat. No.	Description	Tape Length, Ft.	Wt., Lbs.
S-7998	Coil of Wire	200	5
S-6048	Reel and Wire	100	4 $\frac{1}{2}$
S-6050	Reel and Wire	200	7

## Snap-Lock Plier-Wrench



An improved hand tool with a variety of uses. Made of heavy gauge pressed steel. Jaws are made of hardened tool steel. Swivel lower jaw is designed to grip irregular shaped pieces. Handles are finished in black enamel with scoring for non-slip grip. Lock release is operated with finger touch. Markings on handle indicate size of jaw openings. The Snap-lock plier-wrench is indispensable around the plant and in the field.

Cat. No.	Size	Weight Per Doz., Lbs.
S-8066	7 inches	9
S-8068	10 inches	14

## Klein's Round Nose Side-Cutting Pliers



Round Nose style with an opening suitable for twisting double sleeve joints. Full clearance back of knife. Narrow construction to permit use in limited space. "Streamlined" styling.

Cat. No.	Type No.	Size, In.	Wt. per Doz., Lbs.
S-5791	212-6NE	6	5
S-5792	212-7NE	7	7
S-5793	212-8NE	8	11

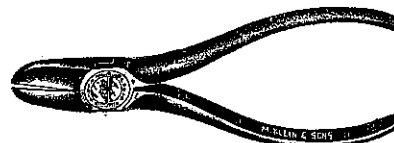
## Klein's Round Nose Side Cutting Pliers



Similar to the S-5744 (page 84) pliers except that the nose is round to permit easier working in confined space and all edges are rounded to prevent nicking the wire. Full clearance back of the knife permits use on insulated wire.

Cat. No.	Type No.	Size, In.	Wt. per Doz., Lbs.
S-5749	201-5NE	5	3
S-5750	201-6NE	6	5
S-5752	201-7NE	7	7
S-5754	201-8NE	8	11
S-5756	201-9NE	9	13 $\frac{1}{2}$

## Klein's Oblique Cutting Pliers



A close cutting plier with narrow head that permits working in confined places. Perfect fitting knives that meet accurately at all points. Has lap joint.

### Standard Type

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5760	202-5	5	3 $\frac{3}{4}$
S-5766	202-6	6	4

### With Wire Stripping Notch

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5794	240-5	5	3 $\frac{3}{4}$
S-5796	240-6	6	4

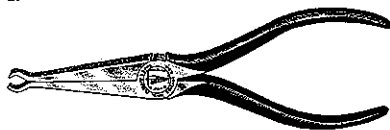
## Klein's Long Flat Nose Pliers



The long, wide, flat nose makes this an ideal general utility plier. Especially hardened and tempered, the jaws will not spring when pressure is applied. Adaptable for all work on switchboards and telephones, and a very handy tool on spring adjustment.

Cat. No.	Type No.	Size, In.	Wt. per Doz., Lbs.
S-5822	305-6	6	3 $\frac{1}{2}$

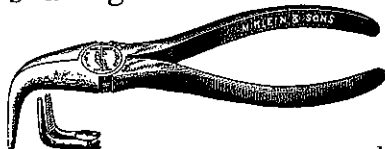
### Klein's Heat Coil Plier



Particularly adapted for removing heat coils from switchboards, and telephone terminals. The points of the nose are shaped to fit the coils. Also used for removing battery caps, binding posts and other cylindrical objects.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5828	313-6	6	3 3/4

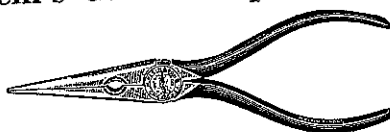
### Klein's Long Curved Nose Pliers



The ability of this tool to reach into otherwise inaccessible places, makes it almost indispensable in work around switchboards, terminals and telephones. The angle is arranged to give full clearance and prevent skinning the knuckles.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5814	302-6	6	3 1/4

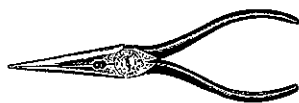
### Klein's Cord Crimping Pliers



A long nose plier with an oval groove for crimping telephone cords. Point is 3/32-inch round.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5808	301-C	6	3 3/4

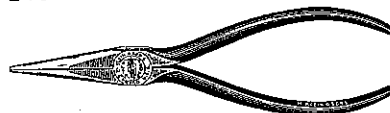
### Klein's Long Nose Plier



Extra long reach of the jaws permits getting into difficult places. Tool is especially hardened and tempered to insure positive grip at point of nose when pressure is applied. Point is 3/32 inch round. Has sleeve opening for twisting No. 17 N.B.S. and smaller copper sleeves.

Cat. No.	Type	Size, In.	Wt. per Doz., Lbs.
S-5832	316-S	6	3 3/4

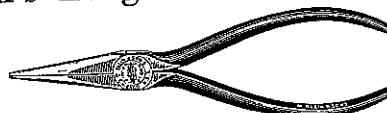
### Long Nose Pliers—Without Cutters



A special style of plier that has been perfected to meet the requirements of telephone work. Special features are its adaptability to stripping the ends of insulated wire and the extra long reach of the jaws.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5810	301-5	5	3 1/4
S-5812	301-6	6	3 3/4

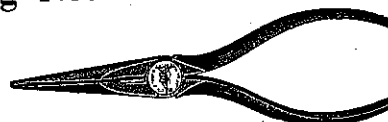
### Klein's Long Needle Nose Pliers



This tool has all the features of the No. 301 shown above, with the exception of the points of the nose. The needle-like points make these pliers more useful for the general class of work done in central offices.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5816	303-6	6	3 3/4

### Long Nose Side Cutting Pliers



Has the same features as the No. S-5810, shown above, with the addition of cutting knives.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5772	203-5	5	3 1/4
S-5774	203-6	6	3 3/4
S-5775	203-7	7	4 1/4

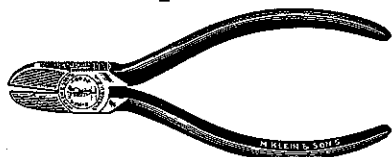
### Klein's Side Cutting Pliers



For use on bare and insulated wire. Powerful leverage and keen reinforced cutting knives make this plier adaptable for heavy cutting in telephone work.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5742	201-7	7	7 1/4
S-5744	201-8	8	11 3/4
S-5746	201-9	9	14

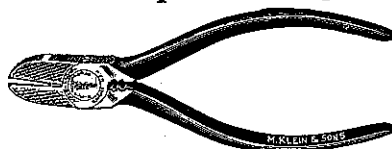
## Klein's Oblique Cutting Pliers



Measure exactly five inches in length. This style is similar to the S-5760 (page 83) except that they are smaller in all dimensions. Has lap joint.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5804	245-5	5	3

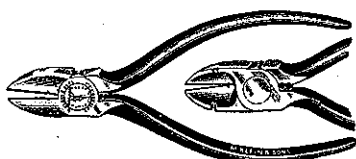
## Klein's Oblique Cutting Pliers



Also similar to the S-5760 (page 83) series but has a stripping notch and openings for twisting sleeves. Notch may be used for crimping .032 and .025 single-tube copper sleeves. Made in one size only.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5795	240-5S	5	4

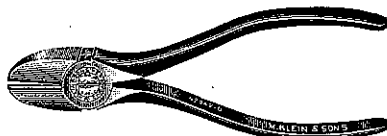
## Klein's Oblique Cutting Plier



With "W" notch, sleeve openings and skinning hole. "W" notches will slit acetate cellulose insulation. Sleeve openings in handles can be used for crimping .032 and .025 single tube copper sleeves.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5764	202-5SW	5½	3¾

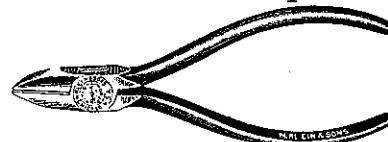
## Oblique Cutting Pliers—Heavy Type



Similar in construction to S-5766 but made heavier to meet the requirements of those desiring a stronger cutter for general work.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5800	242-6	6	4¼

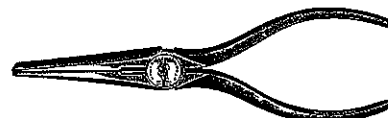
## Narrow Nosed Oblique Pliers



A new and popular plier with a narrow hinge and pointed nose enabling convenient use in confined space. Knives are perfectly matched for clean cutting.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5762	202-5-A	5	3¾
S-5768	202-6-A	6	4

## Klein's Flat Nose—Side Cutting Pliers



Same as No. 305 (page 83), with cutting knives added.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5780	206-6	6	3½

## Klein's Spring Adjusting Pliers



A specially designed flat nose plier formed to reach between and grasp springs easily. Makes rapid, accurate adjustments possible. Jaws are smooth inside.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5826	311	5½	3¼

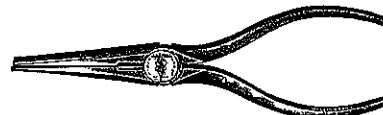
## Klein's Long Duck Bill Pliers



This plier is fitted with wide, heavy jaws for a firm gripping surface.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5820	304-6	6	3¼

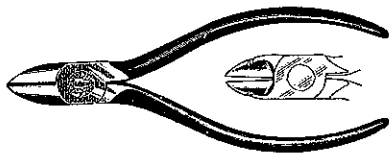
## Klein's Duck Bill Side Cutting Pliers



The same as the No. 304, shown above, with addition of cutting knives.

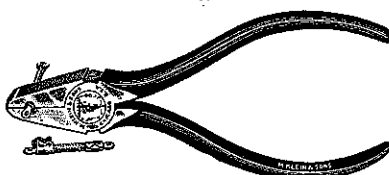
Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5778	205-6	6	3



**Diagonal Pliers With "W" Notches**


Pliers have two "W" shaped stripping notches at back of head. These notches are specially designed to strip the cellulose acetate jumper wire. Also effective for stripping other wires with outside diameters ranging from .050" to .058".

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5802	245-5W	5	3

**Klein's Cord-Tip Closing Plier**


The jaws of this tool are of sturdy design to permit use as a hand-press in closing cord tips. Circular opening in jaws is correctly sized to assure perfect connection when closure is completed.

Cat. No.	Type No.	Size, In.	Wt., per Doz., Lbs.
S-5734	39	5	3

**Protecto Grips**

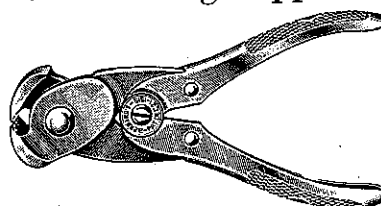

Designed for linemen's pliers, these plastic grips make pliers easier to handle on all jobs. The dielectric quality of the plastic adds a measure of safety but they are not intended as a substitute for rubber gloves. The grips will not slip or creep once they are installed.

Cat. No.	Size	Wt. per Pair, Oz.
S-4501	6	2
S-4502	7	2
S-4503	8	2

**Combination Slip-Joint Pliers**


Full forged from nickel-alloy steel. Long, narrow, serrated jaws with cutters and concave grips. Heavy pin rivet accurately fitted. Blue steel finish.

Cat. No.	Length, In.	Wt. per Doz., Lbs.
S-5833	7	6

**End-Cutting Nippers**


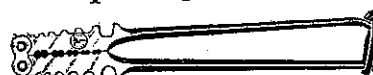
Nickel-chrome alloy steel cutter jaws are drop-forged and heat treated. Polished steel heads and black enamel shanks. Strip steel handles.

Cat. No.	Length, In.	Wt. per Doz., Lbs.
S-5530	6	8

**Sheath Cutting Pliers**


Drop-forged steel pliers for cutting cable sheath. Jaw edge is especially hardened and stays sharp. 8½ inches long with jaw designed to cut lead cable sheaths up to 1¼ inches in diameter. Cutting edge leaves smooth bevel for wiping joints.

Cat. No.	Wt. per Doz., Lbs.
S-5841	8

**Splicing Clamps**


Combination wire and sleeve clamp. Has five round holes for twisting bare wire—copper Nos. 4, 6, 8, 10, 12 B & S Gauge or iron Nos. 6, 8, 10, 12, 14 B. W. G. One oval hole for guy strand. Reverse side has five double chambers for twisting sleeves. Copper sleeves Nos. 6, 8, 10, 12, 14, 17 B & S Gauge. Iron sleeves Nos. 8, 10, 12, 14, 16, 19 B. W. G. Oval hole .437x.624 inches.

Cat. No.	Type No.	Length, In.	Wt. per Doz., Lbs.
S-3450	132-15	11¼	18

## All-Way Master Saw



All-steel saw with three blades—keyhole, compass and stub—for all utility sawing purposes. Cuts tubing, conduit, wood, lath, bolts, armored cable, nails, pipe, angle iron, etc. Blades are easily detached and replaced and handle is designed to permit placing blades on top or side so that cutting may be done at any angle without changing natural position of hand. Fastens automatically with positive lock—there are no screws to tighten. An indispensable saw for all telephone men.

Cat. No.	Wt. Per Doz., Lbs.
S-6321 .....	12

## Machinist Screwdrivers



Irwin screwdrivers with insulated handles of crystal-clear amber Irwinoid (plastic) — indestructible, shock-proof. Hammering, hard-usage, grease or oil won't hurt them. Round shank of alloy tool steel, tempered and hardened. Highly polished.

Cat. No.	Blade Size, In.	Wt. per Doz., Lbs.
S-6427	7/32x3	1 1/4
S-6433	5/16x6	3 1/2
S-6437	3/8 x8	6

## Irwinoid Cabinet Screwdriver



Similar to the Irwinoid Machinist in construction—has the same amber plastic handle which withstands blows, oil, grease and other solvents. Insulated and shock proof. Alloy tool steel blades, highly tempered. Sides of blade in line with shank—especially adapted to electrical work. Convenient for countersunk screws.

Cat. No.	Blade Size, In.	Wt. per Doz., Lbs.
S-6449	3/16x3	1 1/4
S-6455	3/16x6	1 1/2
S-6459	3/16x8	2

## Spiral Ratchet Screwdrivers

Improved spiral ratchet screwdrivers. Drives or draws screws by pushing on handle for ratchet movement or, can be locked rigid if desired. Compact, simple, strong, durable. Accepted as standard for years.

### No. 135 Quick Return Type



Cat. No.	Style	Length Open	Length Closed	Wt. per Doz., Lbs.
S-6418	Light	13 1/4"	10 1/4"	8 1/4

### No. 130-A Quick Return Type



Cat. No.	Style	Length Open, In.	Length Closed, In.	Wt. per Doz., Lbs.
S-6414	Standard	20	14 3/4	15

## Plain Screwdrivers

Strong, durable, well-balanced. Blade and handle are almost impossible to loosen. Blades and ferrules highly polished, hard-wood handles finished in dull black. Thoroughly tested and guaranteed.

### Type 90 Standard



Cat. No.	Blade Length, In.	Overall, In.	Wt. per Doz., Lbs.
S-6422	1 1/2	4 1/4	1 1/8
S-6424	2	5 3/4	1 1/2
S-6426	3	5 3/4	2
S-6428	4	9 1/4	3
S-6430	5	10 1/2	4 1/4
S-6432	6	11 3/4	4 1/2
S-6436	8	14	7
S-6438	10	16 3/8	10 1/8
S-6440	12	18 1/4	11 1/2
S-6442	15	21 3/8	13 1/4

Type 95 Cabinet Screwdriver



Cat. No.	Blade Length, In.	Overall, In.	Wt. per Doz., Lbs.
S-6446	2½	6¼	1½
S-6448	3½	7¼	1½
S-6450	4½	8¼	1½
S-6452	5½	9¼	1¾
S-6454	6½	10¼	2
S-6458	8½	13	2¾
S-6460	10½	15	3½
S-6462	12½	17	3½
S-6464	15½	20	4

Yankee Phillips Screwdriver



Straight screwdriver with special blade for Phillips recessed head screws. Black hardwood handle, chromium plated metal parts.

Cat. No.	Length of Blade, In.	Drives Screws No.	Wt. per Doz., Lbs.
S-6465	3	2-3-4	1½
S-6467	4	5-6-7-8-9	3
S-6468	6	10-12-14-16	4½
S-6469	8	18-20	6¾

Yankee Offset Screwdriver



A vest-pocket tool, only 3⅞" long. Available for Phillips screws Nos. 5 to No. 12, and ordinary screws up to No. 14.

Cat. No.		Wt. per Std. Pkg. of 6 Lbs.
S-6421	For Phillips Screws	¾
S-6419	For Plain Screws	¾

Soldering Copper Handle



A safe handle with air space around the shank to keep it cool. There is no danger of wood in handle charring for there is no contact with metal except at extreme point. Grips copper firmly—doesn't loosen. To attach simply drive handle over pointed shank of copper.

Cat. No.	Length, In.	For Shank Size, In.	Wt. per Doz., Lbs.
S-4700	5¾	7/32 to 3/8	3
S-4702	6	3/8 to 1/2	4

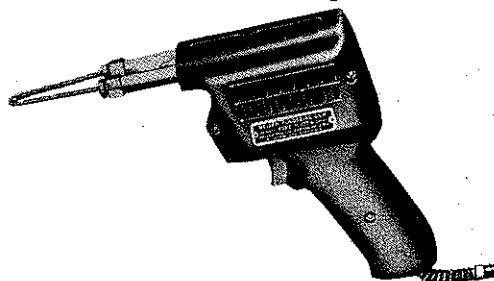
Soldering Coppers



Soldering coppers are marked with the weight of a pair. To order one only, ask for a copper double its actual weight. For example; to obtain a copper of one pound actual weight, ask for one only, two pound soldering copper. Furnished without handle.

Cat. No.	Weight
S-3866	3 Lbs. to pair
S-3864	2½ Lbs. to pair
S-3862	2 Lbs. to pair
S-3860	1½ Lbs. to pair
S-3858	1 Lb. to pair

Weller Soldering Gun



The ideal soldering iron for switchboards, carrier equipment and all small, hard-to-get-at places. Pistol grip and trigger switch makes for convenient handling. Prefocused "solder-lite" locates and illuminates work. Weller Soldering Guns are 115 V., 60 cycle and are shipped complete with tip.

Cat. No.	Model	Description	Weight
S-4993	WS-200	Single Heat 200 Watts 5¼" Reach	3 Lbs.
S-4995	WD-250	Dual Heat 200-250 Watts 5¼" Reach	3 Lbs.
S-4987	S-107	Single Heat 100 Watts 4" Reach	3 Lbs.
S-4989	S-207	Dual Heat 100-135 Watts 4" Reach	3 Lbs.
S-5887		Durapip 2 Per Pkg. For S-4987 and S-4989	1 Oz.
S-5889		Rigid-Tip 2 Per Pkg. For S-4993 and S-4995	1 Oz.

Quik-Shot Soldering Iron

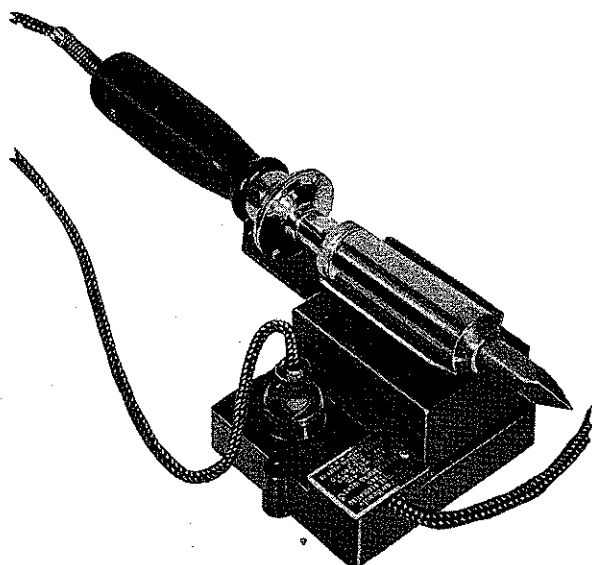


Quik-Shot soldering iron heats to a working temperature in 5 seconds and maintains 850°F. for 6 to 8 minutes. Easy to use — just insert cartridge and snap spring-rod in end of handle. Quik-Shot cartridges contain mixture of certain magnesium type powders which are sealed in a steel shell. The cartridges are non-flammable and non-explosive.

Each Quik-Shot Soldering iron is shipped complete with 4 cartridges.

Cat. No.		Weight, Lbs.
S-4994	Iron with ⅜" chisel-type tip	1¼
S-3285	Package of 4 cartridges	½

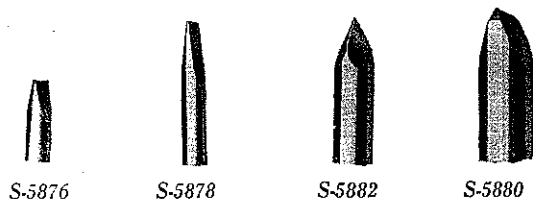
## Temperature Regulating Stand



American Beauty stand designed to regulate and keep temperature constant on soldering irons. Consists of a thermostatically controlled switch, for turning current on or off automatically. Connects to an ordinary wall plug and has receptacle into which iron plugs. Body of stand is of moulded plastic. Soldering iron holder proper is of copper. For use with irons using up to 660 watts and circuits up to 240 volts, A.C.

Cat. No.	Wt., Lbs.
S-7147	2

## American Beauty Tips and Elements



Replacement tips and elements are immediately available for all American Beauty Irons. Order tips and elements from following listing:

TIPS		120 Volt Elements		FITS IRON	
Cat. No.	Diam., In.	Cat. No.	Cat. No.	Type	
S-5876	$\frac{1}{8}$	S-4106	S-4973	S-76	
S-5878	$\frac{3}{8}$	S-4108	S-4966	3138	
S-5882	$\frac{5}{8}$	S-4114	S-4970	3158	
S-5880	$\frac{7}{8}$	S-4116	S-4974	3178	
S-5884	$1\frac{1}{8}$	S-4118	S-4975	3198	

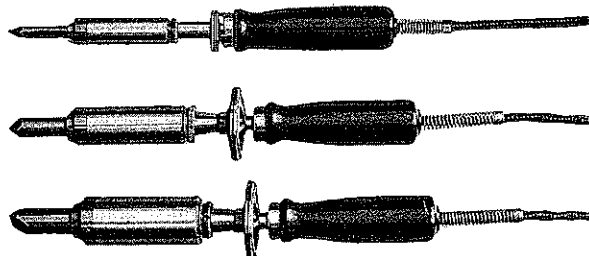
## General Electric Soldering Iron



Lightweight, high-speed soldering iron for telephones, switchboards, meters and instruments. Excellent for service and repair men. Has 100-watt element and iron-clad tip. Tip and element are easily changed by removing retaining pin and disassembling iron.

Cat. No.	Description	Wt., Oz.
S-4945	Iron With $\frac{1}{2}$ " Iron-Clad Tip	26
S-4946	$\frac{1}{2}$ " Iron-Clad Tip	6
S-4120	100-Watt Heating Element	4

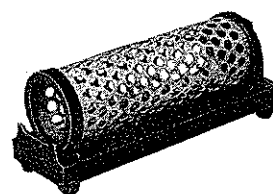
## American Beauty Soldering Irons



High quality soldering irons with heating element cores of solid steel rod, chrome nickel heating element, sturdy super-flexible cord and many other features. All are equipped with baffle plate construction to keep handle cool. All have special non-oxidizing tips which are easily replaced or exchanged for a different style tip. Tips are pure drawn copper rod. Irons are for 115V.

Cat. No.	Type No.	Tip Diam., In.	Watts	Length, In.
S-4966	3138	$\frac{3}{8}$	100	$12\frac{7}{8}$
S-4970	3158	$\frac{5}{8}$	100	$13\frac{3}{8}$
S-4974	3178	$\frac{7}{8}$	300	$14\frac{3}{8}$
S-4975	3198	$1\frac{1}{8}$	550	15

## Vulcan Soldering Iron Holder

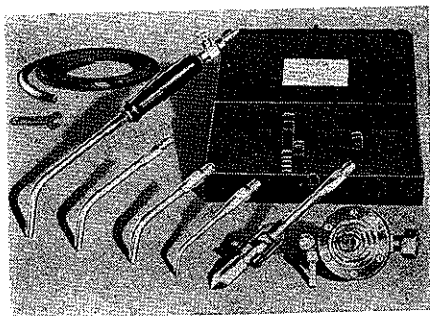


Constructed for use with all soldering irons to prevent marring surfaces and danger from fire. Equipped with rubber feet. Hollow and ventilated as shown.

Cat. No.	Wt., Lbs.
S-4800	3

## Prest-O-Lite Air-Acetylene Appliances

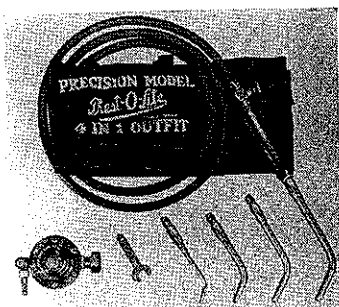
### 5-in-1 Outfit



Compact kit designed for all telephone jobs. 4 handy torch stems and 1 soldering iron stem for all brazing and soldering. Stems are easily attached to handle. Pressure regulator for delivering gas at the correct working pressure regardless of tank pressure. Kit includes stems, hose, regulator, wrench and metal carrying case. MC tank not included.

Cat. No.	Type	Wt., Lbs.
S-7555 With Regulator	09P85	5
S-7556 Without Regulator	6109	4

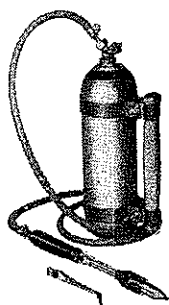
### 4-in-1 Outfit



Smaller outfit includes 4 torch stems, wrench, hose and regulator. Durable weather-fabric roll carrying case has pockets for each part. MC tank not included.

Cat. No.	Type	Wt., Lbs.
S-7561 With Regulator	09P87	4
S-7557 Without Regulator	6343	3

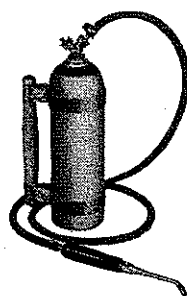
### Lineman's Outfit Type 0-6119



The Type 0-6119 lineman's outfit is a combination of soldering copper head, open-flame torch stem with an interchangeable torch handle and a handle for carrying an MC tank. Weighs 3½ lbs. MC tank not included.

Type 0-6119 Outfit includes:

1 S-4992	Type 06P64 Soldering iron
1 S-7197	Type A6086 Stem and mixer assembly
1 S-4696	Type A3321 MC handle assembly
1 S-7656	Type A3881 MC tank union
S-7618	Type Z-54 Fabric hose, 6 feet
2 S-2351	Type A963 Hose bands



### Type 0-6120

The Type 0-6120 lineman's outfit is ideal for use where open-flame work only will be encountered. Weighs 3 lbs. MC tank not included.

#### Type 0-6120 Outfit includes:

1 S-7554	Type A6103 Torch
1 S-4696	Type A3321 MC handle assembly
1 S-7656	Type A3881 MC tank union
S-7618	Type Z-54 Fabric hose 6 ft. long
2 S-2351	Type A963 Hose bands

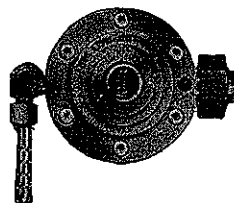
## Prest-O-Lite Appliances and MC Tank



Not included with outfits, but to be ordered separately.

Cat. No.	Weight
S-7404 MC gas tank (filled). L505 key	10 Lbs.
S-5254 Type A3710 Friction lighter	2 Oz.
S-5256 Type L3711 Tip for lighter	2 Oz.
S-5034 Type L505 MC tank key	1 Oz.

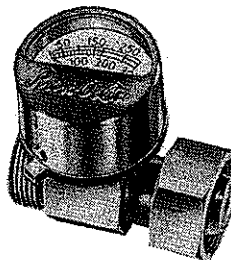
## Prest-O-Lite Regulators



Regulator enables user to obtain exact flame desired without intermittent adjustment of tank valve. Available in 5- or 10-pound types.

Cat. No.	Type	Pressure, Lbs.	Wt. Lbs.
S-6056	05P91	5	1¼
S-6057	05P92	10	1¼

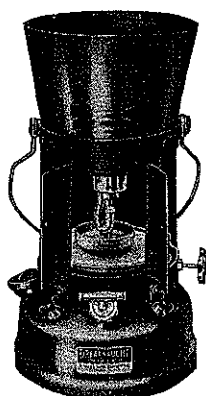
## Pressure Gauge Adaptors



Adaptor mounted between regulator and tank valve shows at a glance the approximate amount of gas in the tank. For MC tank only.

Cat. No.	Type	Wt., Lbs.
S-2108	18R93	¼

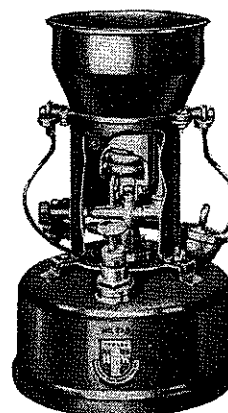
## Wall Big-Brute Furnace



Gives years of complete satisfaction. Brazed and welded construction throughout with entire flue hinged for quick accessibility. Tank is special steel, pump shell is seamless brass held to forged steel pump housing with brass nut. Burner has special heat dissipator. Tested under 100 pounds pressure.

Cat. No.	Fuel	Capacity	Wt., Lbs.
S-4263	Gasoline	1 Gallon	27
S-4265	Kerosene	1 Gallon	27

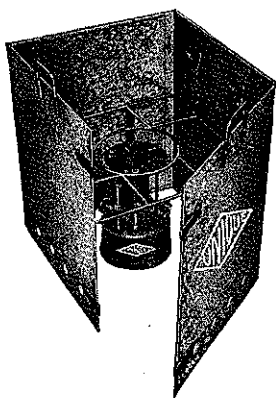
## Turner Low Pressure Fire Pot



A high quality fire pot that quickly melts lead, tin, zinc, rosin, paraffin and other materials and keeps them molten for hours with a minimum quantity of fuel. It eliminates coil replacements, costly repairs and job tie-ups. Exclusive "Carburetor Control" enables pot to operate efficiently at pressures of only 20 to 30 lbs. Burner coil is extra-heavy seamless steel tubing. Pump is heavy blow-proof brass.

Cat. No.	Type No.	Fuel Capacity	Wt., Lbs.
S-4266	275	9 Pints	13

## Folding Safety Windshield



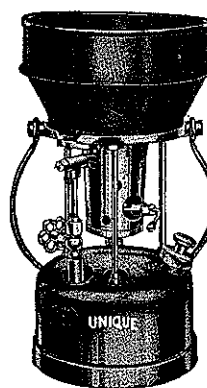
Made of galvanized iron with reinforced edges. Metal handles for carrying when folded.

No. S-7757—Convenient, durable shield with welded steel grate for supporting pots, pans, kettles, etc.

No. 7759 is the same in construction but has only three sides and no grate.

Cat. No.	Folded Dimensions, In.	Wt., Lbs.
S-7757	23 x 17½ x 2	27
S-7759	23 x 17 x 1½	15

## Unique Furnaces



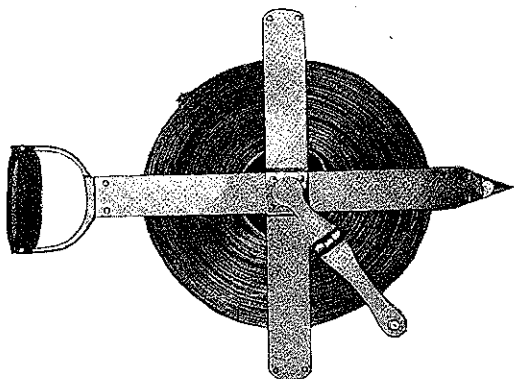
Units built for heavy duty. Tank shell made of 16 gauge steel with fittings and bottom welded in. Steel protecting ring at base to take wear.

Patented generator gives intense heat that melts 50 lbs. of solder in ten minutes. Operates satisfactorily in the strongest wind and in sub-zero weather. Equipped with heavy duty pump.

The orifice is cleared of foreign particles by merely turning the cleaner handle. To remove the generator coil, the top plate is swung to one side and the unit can be lifted out without dismantling the furnace. The 7" top plate and windshield will accommodate metal pots of 8" diameter.

Cat. No.	Type No.	Fuel	Capacity	Wt., Lbs.
S-4262	53	Gasoline	1 Gal.	13½
S-4264	55	Kerosene	1 Gal.	13½

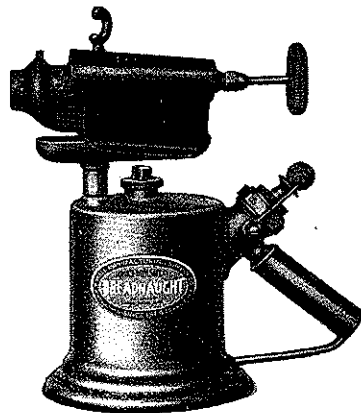
### Chicago Steel Tapes



Will withstand rough usage and are recommended for hard service. The line, 5/16-inch wide, is of extra tough steel with white metal coating. Furnished with leather thongs at end. Graduations in feet and tenths stamped in babbitt. Reel has nickel-plated metal sides with hardwood handle and folding winding handle.

Cat. No.	Length, Feet	Wt., Lbs.
S-7446 (Fig. "8" Frame)	100	3
S-7447	150	5
S-7449	200	6
S-7452	300	9
S-7453	500	11

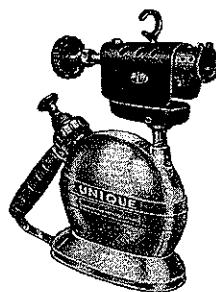
### Wall Dreadnaught Blow Torch



Drawn steel tank combines safety with light weight. Seamless brass pump shell is held on forged pump housing with brass nut. All brazed and welded for long service life. Automatic cleaning needle keeps orifice clean. Convenient angle handle. Tested under 100 pounds pressure. Burns unleaded gasoline.

Cat. No.	Capacity	Wt., Lbs.
S-7539	1 qt.	5

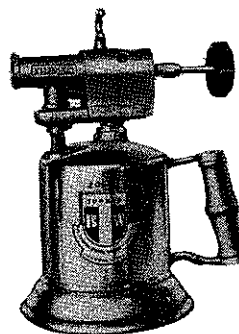
### Unique Flat Blow Torch



A safe, compact torch for the tool kit. Pleasingly designed and finished in brass, red and black. For all general utility uses and smaller work. Excellent for use in close quarters. Burns in any position—in any weather. Flame can be adjusted down to a fine pointed jet. Needle, orifice block and channel plugs are removable. Welded steel tank is natural pressure shape to withstand high pressure. Pump is seated on neoprene gasket. Tank size, 2½ by five inches.

Cat. No.	Capacity	Weight, Lbs.
S-7547	1 Pint Gasoline	3

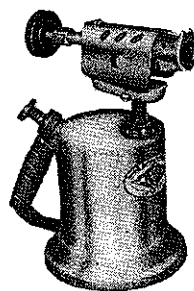
### Turner Blowtorch No. 206-A



A powerful and moderate priced torch. Heavy improved burner gives high heat and superior service in any weather. Removable wire needle tip and orifice block may be easily replaced after long wear. Air syphoning tube permits perfect combustion adjustment. Cool composition valve wheel. Seamless brass tank with trouble-free pump. Gasoline fuel.

Cat. No.	Type No.	Fuel Capacity	Weight, Lbs.
S-7545	206-A	1 Quart	4¾

### Unique No. 3 Blowtorch

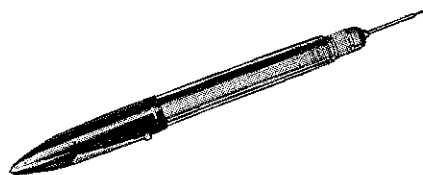


A sturdy, well-balanced, non-tilting gasoline torch for heavy duty work. Generating veins are directly under the flame—insuring complete vaporizing and producing a flame of intense heat which can be throttled down fine. The orifice is kept clear of foreign particles by means of a steel needle.

Fitted with a dependable pump of short stroke. Angular restful handle for easy gripping. Regularly furnished for gasoline but can be supplied for kerosene on special order.

Cat. No.	Type No.	Capacity	Dimensions, In.	Wt., Lbs.
S-7546	3	1 qt.	5½x5½	4¾

## Pres-To-Oiler



A new fountain-pen-like light oil dispenser with plunger point and transparent reservoir. By pressing once on point you deliver 1/10-drop of oil to exact spot you want it. Eliminates overloading with oil, or flooding. No smear, no drip, no waste. Gets into small out of the way places easily. Saves time and labor.

Cat. No. Wt., Oz.  
S-5592 ..... 2

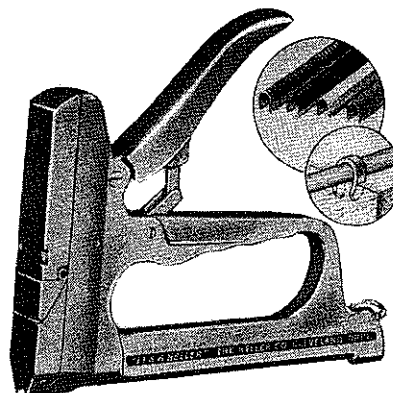
## Wrecking Bars



A new strong gooseneck pattern with longer and narrower slot for pulling nails. Painted black and red. The back of the claw is flat for ripping purposes.

Cat. No.	Length In.	Dia. of Steel, In.	Wt., per Doz., Lbs.
S-2371	24	3/4	42
S-2372	30	3/4	51
S-2358	36	3/4	62

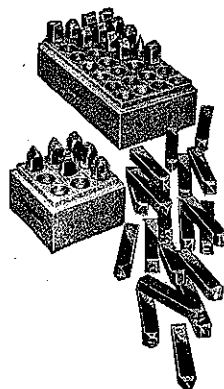
## Heller Stapling Gun



This ideal installation tool will staple braided, rubber-coated, single- and double-strand wire rapidly and efficiently. The specially designed staples cannot injure wire and will hold in hard or soft wood, plaster and composition board. Easy to use—the Heller stapling gun operates with one hand and is designed to operate around difficult angles or corners. Designed for constant usage and easy staple insertion with accessible gate opened in seconds without special tools.

Cat. No.	Description	Weight
S-7167	Gun only	2 Lbs.
S-7177	Staples, Brown (1000)	8 Oz.
S-7179	Staples, Ivory (1000)	8 Oz.

## Steel Letters and Figures



Complete sets of steel figures and letters put up in separate dust-proof covered boxes. For stamping on all metals except hardened and tempered steel. Full sets (27 pieces) of letters A to Z and period. Figures (9 pieces) 0 to 9. Gothic style letter.

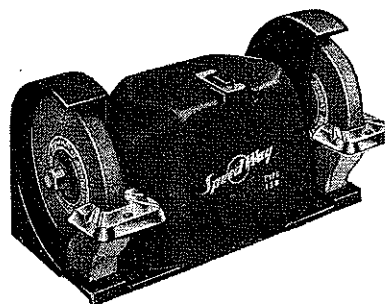
### Letters

Cat. No.	Size, In.	Steel Length, Size, In.	In.	Wt. per Set, Lbs.
S-7191	1/8	1/4	2 1/4	1 3/4
S-7192	3/16	5/16	2 1/2	2 1/2

### Figures

Cat. No.	Size, In.	Steel Length, Size, In.	In.	Wt. per Set, Lbs.
S-7193	1/8	1/4	2 1/4	1 1/2
S-7194	3/16	5/16	2 1/2	3/4

## 1/4 HP Bench Grinder



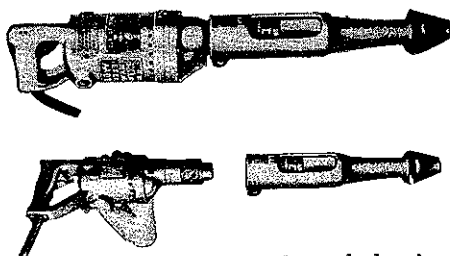
Equipped with 50-60 cycle, 110-120 Volt AC motor. Self-aligning, oil-impregnated bearings. Cast-aluminum housing. Wheels are 6x3/4 inch with one 46 grit and one 60-80 grit. Fully adjustable tool rests with pre-set-angle drill sharpener. Rubber grommets provide shock absorbing feet and have holes for permanent vibration-free mounting. Blue crackle finish.

Cat. No.	Wt., Lbs.
S-4452	44

1/2 H.P. Grinder available on order



### Wodack Combination Electric Hammer and Drill



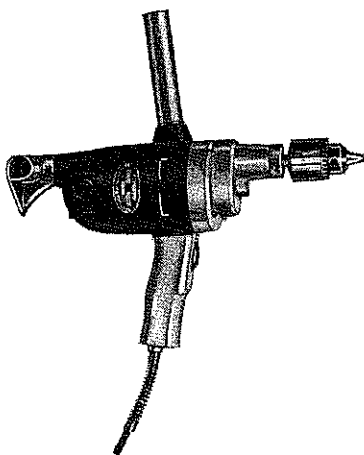
Improved power tool for drilling holes in concrete and masonry. When hammer member is taken off the tool becomes an electric drill.

Hammer strikes 2400 blows a minute, drilling holes under  $\frac{3}{4}$ -inch diameter. Maximum capacity in concrete is  $1\frac{1}{2}$  inches diameter. Will operate chisels, bull points, bush hammers and other concrete working tools.

Full ball-bearing construction available with standard 115-V. or 230-V. universal motor (as specified). Hammer is easily taken apart for servicing. Equipment includes guard, rubber tool retainer, 15-foot three-conductor cord with ground connection, turning wrench and one star drill. Specify voltage wanted and diameter of star drill.

Cat. No.	Model	Length, In.	Wt., Lbs.
S-3973	MDH Complete	23	15

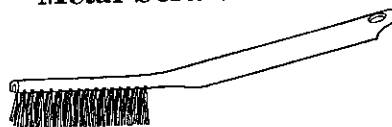
### $\frac{1}{2}$ " Portable Electric Drill



Designed for heavy duty maintenance work. Powerful universal motor with self-aligning bronze bearings and over-size felt oil retainers. Hardened, cut steel, triple reduction gears for a free load speed of 500 R.P.M. and a normal load speed of 300 R.P.M. Strong, light housing with "in line" handles and breast plate. Side handle easily removed for close-quarter work. Complete with Jacobs chuck.

Cat. No.	Description	Wt., Lbs.
S-3970	Drill Type 89J	12
S-7151	Drill Stand for S-3970	23

### Metal Scratch Brush



Useful for removing rust, corrosion or scale on metal, in soldering work. Can be used under torch when necessary. As brush wears down steel bristles can be cut off uniformly.

Cat. No.	Wt. per Doz., Lbs.
S-3176	2 $\frac{1}{4}$

### Non-Metallic Brushes



Fiber-bound brushes for general cleaning purposes. Bristles are cleaned and sterilized and vulcanized in rubber. Fiber binding will not crack or chip, rust or soften. No metal parts to corrode or rust—no nails to loosen and come out. Handles are finished in clear lacquer.

Two types—round or flat. Round brushes are used for cleaning, dusting around switchboards, wiring and cabinet terminals. Flat brushes are for general cleaning purposes. Lengths given are of bristles outside ferrule.

Cat. No.	Width, In.	Length, In.	Wt. per Doz., Lbs.
			Flat Type
S-3165	1	1 $\frac{1}{2}$	$\frac{3}{4}$
S-3166	2	2 $\frac{1}{8}$	1 $\frac{1}{2}$
S-3167	3	2 $\frac{3}{8}$	2 $\frac{1}{4}$
S-3168	4	2 $\frac{7}{8}$	3 $\frac{3}{4}$

Cat. No.	Diameter, In.	Length, In.	Wt. per Doz., Lbs.
			Round Type
S-3169	9/16	1 $\frac{7}{8}$	$\frac{3}{4}$
S-3170	11/16	2 $\frac{3}{8}$	1 $\frac{1}{2}$
S-3171	15/16	2 $\frac{1}{2}$	2 $\frac{1}{4}$

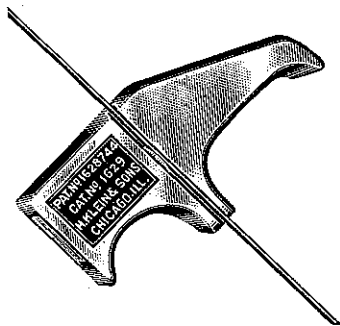
### Socket Framing Chisels



These chisels are of high-quality tempered steel with a highly polished finish. Beveled edges, quality hardwood handles fitted with nicked pressed steel rings, add to their length of life. Blades are eight inches long, overall length varies from 16 to 17  $\frac{1}{2}$  inches.

Cat. No.	Size, In.	Wt. per Doz., Lbs.
S-3330	$\frac{3}{4}$	11
S-3332	1	13 $\frac{1}{2}$
S-3334	1 $\frac{1}{4}$	16
S-3336	1 $\frac{1}{2}$	18
S-3338	2	24
S-4530 Chisel Guard		3

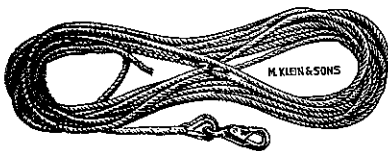
## Klein's Chicago Fish Tape Puller



A simple, husky pulling handle for fish tape. Tape fits into slot and slight forward motion, while pushing tape deeper into slot, engages ratchet and forms unbreakable grip. Won't injure tape. Only  $3\frac{3}{4}$  inches long for convenient pocket size.

Cat. No.	Wt. per Doz., Lbs.
S-6008	2½

## Klein's Hand Line



Designed for maximum safety. The rope is of best quality and does not twist. Spliced to eye of snap hook with galvanized steel thimble. The snap hook is drop-forged with round edge and has a safe load rating of 2000 pounds.

Cat. No.	Description	Wt., Lbs.
S-4660	75-Foot Hand Line	½

## Klein's Strand and Wire Holder



Strand and wire-holding tool which serves as temporary clamp for holding two wires, or strand, while placing permanent clamps in place, splicing or serving. Openings will fit  $\frac{1}{8}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$  and  $\frac{3}{4}$  inch strands;  $\frac{1}{4}$ -inch solid No. 12 BWG iron wire, or, No. 10 B&S copper wire;  $\frac{1}{8}$  solid No. 13 BWG iron, or, No. 11 B&S copper wire.

Cat. No.	Type No.	Length, In.	Wt., per Doz. Lbs.
S-3451	132-32	11¼	18

## Angle Screw Driver



Used to simplify installation of angle screws. Driver has specially designed hole and groove to hold  $\frac{5}{16}$ " angle screw; chuck-end fits ordinary brace.

Cat. No.	Wt., Oz.
S-4078	4

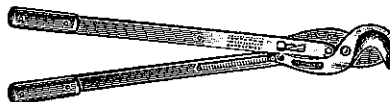
## Ungar Solder Pencil



Ideal for light soldering on switchboards and carrier equipment. Has 20 watt, continuous flow heating element in tip. Handle is made of cool, durable molded plastic. Furnished without tip.

Cat. No.	Description	Wt., Oz.
S-4976	Soldering Pencil	4
S-4977	$\frac{3}{8}$ " Chisel tip	1
S-4961	$\frac{3}{8}$ " Pyramid tip	1
S-4962	$\frac{1}{8}$ " Pencil tip	1
S-4963	$\frac{1}{8}$ " Chisel tip	1

## Cable Cutter



Heavy-duty shear-type Forester cable cutter of tempered steel. Long handles give exceptional leverage. Handles have extra mold riveted on for comfortable grip.

Cat. No.	Length, Ft.	Wt., Lbs.
S-3904	2	5½

## Chain Nose Pliers



Designed for use where a shorter nose is desirable. Length is 6 inches.

Cat. No.	Type No.	Description	Wt. per Doz., Lbs.
S-5834	317-6	Without Cutters	3½
S-5787	217-6	With Cutters	3½

TREE TRIMMERS

TAMPING BARS

SHOVELS

SHOVELS

5

## Large Tools

HOISTS

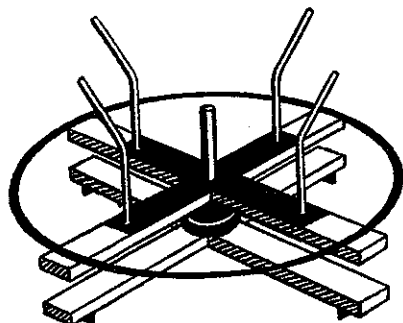
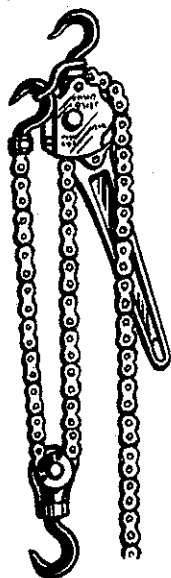
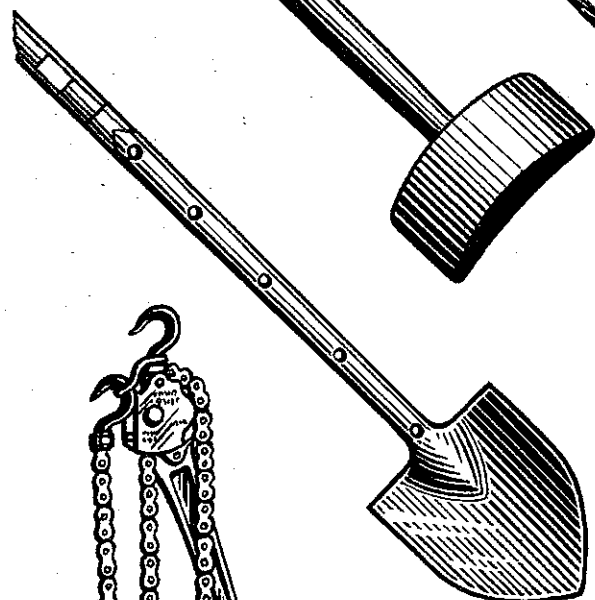
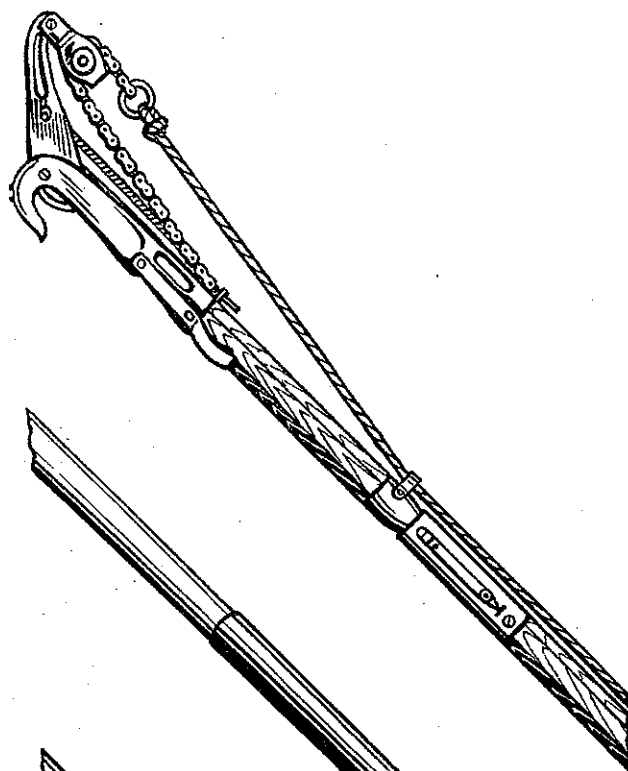
HOISTS

WIRE ROES

JACKS

JACKS

Index for this section on reverse side



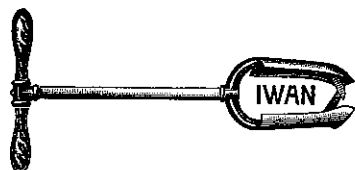
## ***Index for Section Five***

<b>Page</b>	<b>Item</b>
97 . . .	Iwan Augers Hercules Digger Telescoping Trip Auger
98 . . .	Shovels
99 . . .	Shovels Ditching Spade Standard Deadman Log Chain Sling Chain Carrying or Lug Hooks
100 . . .	Peavies Cant Hooks Pike Poles Electric Tamping Bar
101 . . .	Tamping Bars Digging Bars Digging Spud
102 . . .	Coffing Hoists Coffing Load Binders Midget Puller Power Pike Pole Capstan Pulley Block

<b>Page</b>	<b>Item</b>
103 . . .	Block Tackle Anchor Hook for Tackles Steel Snap Snatch Block Pulley Block
104 . . .	Maritime Manila Rope Iron Block Pulleys Pole Jacks
105 . . .	Cable Reel Jacks Pipe Pusher Minneapolis Wire Meter
106 . . .	Pay Out Reels Jumper Wire Reels Take Up Reels Barrow Reels Pin Guard Shield PR Reel
107 . . .	Folding Jenny Supports Wire Raising Tool Machete Wire and Cable Cutter Tree Trimmers
108 . . .	Bush Scythe and Snath Universal Line Pole Long Handle Pruner Bush Hook

**AUTOMATIC  ELECTRIC**

## Iwan Augers



Only slight pressure is necessary to operate this handy post-hole auger. Two sharp cutting edges are so formed as to cut and hold earth at the same time, and leave a round clean-cut hole.

Standard Iwan Auger handles are made of  $\frac{3}{4}$ -inch pipe. For deeper holes, auger bottoms can be supplied for use with Blackburn extension handles; hole can be started with a short handle and handle lengthened as depth of hole increases. No. 8 Blackburn handle is four feet and extends to eight feet. No. 10 Blackburn handle is five feet and extends to 10 feet. Regular handles are four feet.

Unless otherwise ordered regular handles will be shipped.

### Standard Iwan Augers—4'

Cat. No.	Bottom Size, In.	Wt., Lbs.
S-2270	3	6½
S-2271	4	7
S-2272	5	7½
S-2273	6	8
S-2275	8	9
S-2277	10	10

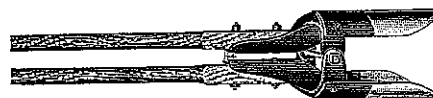
### Iwan Auger Bottoms Only

Cat. No.	Bottom Size, In.	Wt., Lbs.
S-2280	3	3
S-2281	4	4
S-2282	6	6
S-2283	8	7
S-2285	10	8

### Blackburn Extension Handles

Cat. No.	Extension Size	Wt., Lbs.
S-2288	4' to 8'	17
S-2291	5' to 10'	20

## Iwan Hercules Digger



Widely used two-handled digger. Construction, with bolts passing through center of castings from outside, offers unusual strength and rigidity. Blades are five inches by nine inches.

Cat. No.	Length of Handle	Overall Length	Wt., Lbs.
S-3932	4 Ft.	4 Ft. 9 In.	9
S-3934	7 Ft.	7 Ft. 9½ In.	11

### Replacement Handles

Handles for Hercules diggers are the same as the original handles furnished with tool. Strong hardwood, smoothly finished and straight grained. Furnished in pairs.

Cat. No.	Length, Ft.	Wt. per pr., Lbs.
S-4668	7	6

## Telescoping Trip Auger



The Chance Telescoping Trip Auger is an efficient, economical tool for boring holes for poles and guy anchors. It enables one man to bore a hole in the ground easily and quickly at minimum time and labor costs. Every twist of the handle pushes the high-strength steel blades into the ground like a carpenter's auger in wood. Highly tempered steel blades are sharpened along the cutting edges; small roots and other obstructions offer little resistance. The handle is seasoned second-growth hickory, and castings are malleable iron. A trip mechanism on the handle operates a movable blade which opens easily for emptying the auger. The blade closes and locks automatically after dirt has been released. Separate expansion blade on the No. 812 is adjustable to diameters from 8 to 12¾ inches, making it possible to bore seven different-size holes to a depth of 8 feet. Length of the auger when closed is five feet, telescoping to a little more than 8 feet. Extension rod locks at 6-inch intervals.

Cat. No.	Type	Diam. of Hole	Wt., Lbs.
S-2266	610	6½" to 8½"	26
S-2267	812	8" to 12¾"	28

## Long Handle Telegraph Shovels

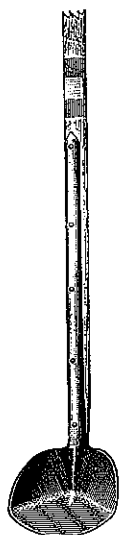


Strong well-balanced shovels. Plain back construction — 24 inch straps, with electrically-welded seams stronger than the steel itself. Resist shock and strain. Even distribution of weight adds to shoveling ease. Heat treated, 13 gauge blades in natural finish. Handles are straight-grain white ash free from blemishes, of tough texture in natural color running from white to lightest red. They are carefully sanded, waxed and polished.

Cat. No.	Handle, Feet	Wt. per Doz., Lbs.
S-6834	7	126
S-6836	8	133
S-6838	9	135
S-6840	10	145

NOTE: Shovels described above are straight shank type. Bent shank shovels, same dimensions and specifications, can be supplied on special order.

## Long Handle Telegraph Spoons



Heat-treated, 13 gauge steel with electrically welded straps. Evenly balanced, strain and shock resistant. Natural finish. Handles are selected white ash, sanded, waxed and polished. Two styles available — Eastern and Western pattern. Eastern blade is  $8\frac{3}{4}$  inches by  $10\frac{7}{8}$  inches. Western pattern blade is  $9\frac{5}{8}$  inches by  $8\frac{3}{4}$  inches. Standard length 24-inch straps for both patterns.

### Western Pattern (Left)

Cat. No.	Handle, Feet	Wt. per Doz., Lbs.
S-7136	7	126
S-7138	8	133
S-7142	9	135

### Eastern Pattern (Right)

S-7134	7	126
S-7140	8	133
S-7143	9	135

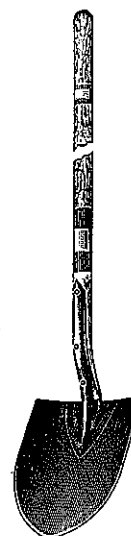
NOTE: Sizes listed above are most popular and widely sold. Other length handles may be obtained on special order.

## Handles For Telegraph Shovels and Spoons

Repair handles are the same as original handles furnished with shovels and spoons. Selected white ash, straight grained, free from blemishes. Waxed, sanded, polished in natural color (running from white to lightest red). Furnished in straight or bent shank type. Straight type will be furnished unless otherwise specified.

Cat. No.	Length, Feet	Wt., Lbs.
S-4686	7	4
S-4688	8	5
S-4690	9	6
S-4692	10	7

## Long Handle Standard Shovels



Highest quality plain-back, strap-type shovels. Blades are heat treated and built to withstand shocks and strains. Light weight, easy to handle yet exceptionally durable. Handles are selected white ash, straight grained and free from blemishes, smoothly sanded, waxed and highly polished. Standard handle length is 51 inches. Round or square point shovels available as listed below.

Cat. No.	Description	Blade Size, In.	Wt., Lbs.
S-6826	Square Point	$9\frac{3}{4} \times 11\frac{3}{4}$	$4\frac{1}{2}$
S-6830	Round Point	$9 \times 11\frac{3}{4}$	$4\frac{1}{2}$

## Replacement Handles

Replacement handles are the same specifications as original handles. White ash—clean, straight growth and well finished. They are strong and durable. Handle fits either type of blade.

Cat. No.	Length Handle, In.	Wt., Lbs.
S-4684	51	2

## D-Handle Standard Shovels



Plain back, light weight shovels of unusual strength and durability. Electrically welded straps, ABW Armor-D handles, straight-grain, blemish-free white ash shafts, natural finish blades are regular features. Armor-D handles are constructed with an armor of steel surrounding the wood fork. Patented clips lock the smooth wood grip. There are no projections or edges. Shaft is sanded, waxed and polished. Standard size blade is nine inches by 11 $\frac{3}{4}$  inches.

Cat. No.	Length Handle, In.	Wt., Lbs.
S-6828	27	5

## "D" Handle Ditching Spade



Used for digging narrow trenches or post holes. Ideal for digging trenches for cable or conduit. Blade is made of special alloy steel and is 6 $\frac{1}{4}$  by 16 inches.

Cat. No.	Wt., Lbs.
S-7157	5

## Mule or Deadman Pole Support



Made of clear straight-grained Douglas Fir, 2 $\frac{1}{2}$ "x 3 $\frac{1}{2}$ ", with one-piece forged steel fork and spike. Fitted with steel bands at each end to prevent splitting. Fork is securely fastened by rivet through band. This support is adapted to the heaviest kind of work. Finished in gray.

Cat. No.	Length, Ft.	Wt., Lbs.
S-3919	8	24

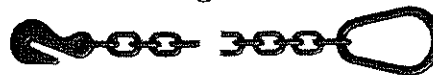
## Log Chain



Ideal chain for general use in lifting, towing and similar uses. Furnished with grab-hook at one end, slip-hook on other end.

Cat. No.	Steel Size, In.	Inside Dimen. Links, In.	Length, Ft.	Wt., Lbs.
S-3298	5/16	1- $\frac{1}{4}$ x $\frac{1}{2}$	14	11
S-3299	3/8	1- $\frac{1}{4}$ x $\frac{5}{8}$	14	26

## Sling Chain



Used by line crews as a sling for anchoring snatch blocks, snaking poles, binding poles on trailers, etc. 5/16 inches by 52 inches long.

Cat. No.	Wt., Lbs.
S-3307	7

## Carrying or Lug Hooks Standard Type



For handling poles, ties or heavy timbers. Handles are of selected 2 $\frac{1}{2}$ -inch air-seasoned hickory, sanded and finished in clear lacquer. Hooks are crucible steel with duck-bill points, hung in heavy malleable-iron clasp and swivel. Metal parts are painted black.

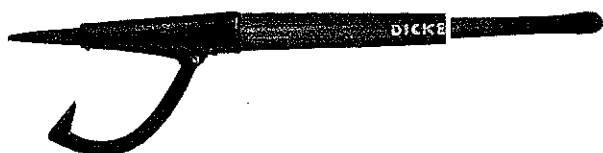
Cat. No.	Length, Ft.	Wt., Lbs.
S-4817	4	7
S-4816	4 $\frac{1}{2}$	8
S-4818	5	9

## Carrying or Lug Hook Handles

Identical to handles originally furnished in tools.

Cat. No.	Diam., In.	Length, Ft.	Wt., Lbs.
S-4681	2 $\frac{1}{2}$	4	3
S-4682	2 $\frac{1}{2}$	4 $\frac{1}{2}$	4
S-4680	2 $\frac{1}{2}$	5	5

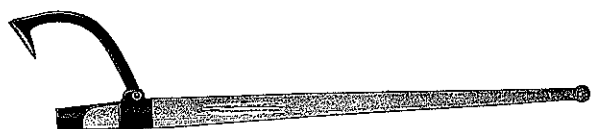
### Peavies



Handles are selected 2½-inch air-seasoned hickory with hand-turned knobs, smoothly sanded and finished. Malleable iron sockets and crucible steel hooks with duck-bill points. Pikes are of crucible steel securely driven in. Metal parts painted black.

Cat. No.	Length, Ft.	Wt., Lbs.
S-5670	4	8
S-5671	4½	9

### Cant Hooks



Handles of selected 2½-inch hickory or hard maple with hand-turned knobs, smoothly sanded. Hooks are crucible steel with duck-bill points, hung in heavy malleable iron clasps. Metal parts painted black.

Cat. No.	Length, Ft.	Wt., Lbs.
S-4812	4	7½
S-4814	4½	8

### Cant Hook



Smaller size cant hook especially designed to handle smaller pine poles. Sturdy, convenient—with 2½ inch hickory handles, smoothly sanded and lacquered. Hook is alloy tool steel, heat treated for strength.

Cat. No.	Length, Ft.	Wt., Lbs.
S-4813	4	7

### Cant Hook and Peavie Handles

These handles are the same high-quality used in original handles—selected, air-seasoned hickory or hard maple, with hand-turned knobs, smoothly finished.

Cat. No.	Length, Ft.	Wt., Lbs.
S-4677	4	3½
S-4678	4½	4

### Pike Poles

#### Standard Straight Handle Type



Selected Douglas fir, free from all defects. Pikes are of 13/16-inch round crucible steel with collar pike design with sharp points and are set in creosote. Ferrules are steel tubing, securely riveted. Rivets go through ferrule and pike holding pike firmly in pole. Poles are two inches in diameter, smoothly sanded and finished in clear lacquer.

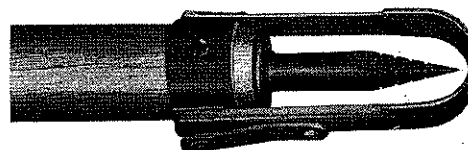
Cat. No.	Cat. No.	Length, Ft.	Wt., Lbs.
Without Guard	With Guard		
S-5894	S-5895	10	8
S-5896	S-5897	12	10
S-5898	S-5899	14	12
S-5900	S-5901	16	14

#### Heavy Duty Tapered Type

Same general construction as the standard pattern described above, except that pole is tapered from 2½ inches at center to two inches at ends.

Cat. No.	Cat. No.	Length, Ft.	Wt., Lbs.
Without Guard	With Guard		
S-5904	S-5902	12	13
S-5906	S-5903	14	15
S-5908	S-5939	16	17
S-5910	S-5941	18	20
S-5912	S-5945	20	22

### Pike Pole Guard



Pike pole guards are installed at the factory. When ordering pike poles with guards use the Catalog No. under "Pike Poles with Guards". Guards are made of special steel.

### Electric Tamping Bars



Steel Tubing with malleable-iron tamping shoes. Painted black. Large shoe is 3½ by 2½ inches, oval shaped and small one is 2½ inches, round.

Cat. No.	Length, Ft.	Wt., Lbs.
S-2354	7½	18



### Octagon Tamping and Digging Bars



Double beveled cutting blade at one end, fitted with heavy iron tamping shoe at the other end. Made of special alloy heat-treated tool steel.

Cat. No.	Size, In.	Length, Ft.	Wt., Lbs.
S-2363	1	8	23
S-2364	1 1/8	7	26
S-2369	1 1/8	8	31

### Octagon Crow and Digging Bars



Double beveled cutting blade at one end, pointed at other end. Made of special alloy heat-treated tool steel.

Cat. No.	Size, In.	Length, Ft.	Wt., Lbs.
S-2352	1	7	20
S-2353	1	8	23
S-2357	1 1/8	8	29
S-2359	1 1/8	9	31

### Slick, or Loy, Digging Tool



Select hardwood handle, two inches in diameter, tapered at lower end; fitted with extra heavy tool steel blades four inches by 1/2-inch, with sharp cutting edge held securely in place by two extra-large-head rivets. Blade painted gray, handles smoothly sanded and lacquered.

Cat. No.	Handle, Ft.	Wt., Lbs.
S-3931	8	17

### Electric Digging Spud With Tamper



High-carbon steel tubing with malleable-iron tamping shoe and one-piece alloy tool-steel, heat treated blade. This tool is well balanced and the broad blade makes digging easy. A very serviceable tool for all general use.

Cat. No.	Length, Ft.	Wt., Lbs.
S-7146	9	23

### Light Shoe Tamping Bars



Select ash handle, 1 3/4 inches in diameter, tapered at lower end, fitted with one-piece steel shoe with a 1 3/4 by 4-inch face. Securely riveted handles are smoothly sanded and lacquered.

Cat. No.	Handle, Ft.	Wt., Lbs.
S-2365	7	10
S-2366	8	11

### Heavy Shoe Tamping Bars



Select ash handles, 1 5/8 inches in diameter, tapered at lower end, fitted with extra heavy one-piece shoe with a tamping face 1 1/2 x 3 1/2 inches. Rivets with countersunk heads passing through the handle and shoe, hold the shoe firmly in place.

Cat. No.	Handle, Ft.	Wt., Lbs.
S-2367	7	11
S-2368	8	12

### Curved Head Tamping Bar



Curved head fits the hole and around the pole. Tamping face is crescent shaped, 7 inches long and 1-5/16 inch thick at the thickest point. Long tapered shank strengthens the handle at point of greatest strain. White ash handle.

Cat. No.	Length of Handle	Wt., Lbs.
S-2349	8 Ft.	12 1/2
S-2350	10 Ft.	13 1/2

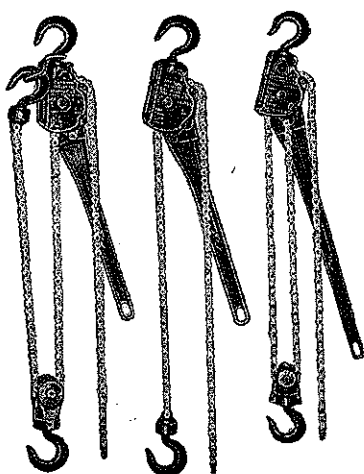
### Expanding and Tamping Bar



Used for installing expanding anchors. Hooks wrap around anchor rod to keep from slipping off onto top plate. Base casting is ideal for tamping in dirt above the anchor.

Cat. No.	Length, Ft.	Wt., Lbs.
S-2361	10	21

### Coffing Hoists



For pulling guys and similar telephone work where a lift or pull is needed. Models FG and FTG are similar except that an iron block and five feet of chain are added to give FTG additional capacity. Types AG and ATG are also similar except for this additional capacity.

Cat. No.	Type	Capacity, Tons	Wt., Lbs.
S-4792	Model AG	$\frac{3}{4}$	14
S-4794	Model FG	$1\frac{1}{2}$	25
S-4793	Model ATG	$1\frac{1}{2}$	17
S-4795	Model FTG	3	34

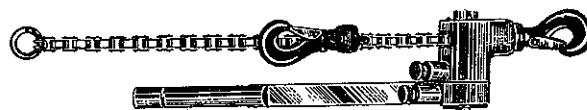
### Coffing Load Binder



Light and powerful, extremely useful in telephone work. Operates on straight ratchet principle featuring free chain for quick load-chain adjustment.  $\frac{5}{8}$ -inch uptake per stroke eliminates second-hitch in pulling load up tight. Model A will take a load up to 3,000 lbs.; Model F will take load of 6,000 lbs. Equipped with 9/16-inch grab hook and 24-inch load chain. (Extra load chain available by the foot on special order.)

Cat. No.	Model	Capacity, Lbs.	Wt., Lbs.
S-5280	A	3,000	24
S-5282	F	6,000	$11\frac{1}{2}$

### "Mighty Midget" Puller



A compact, light-weight, fast-action puller; lifts 500 lbs. with only 28 lbs. of pressure. Puller has a 50% overload factor, and "safety-load" handle will bend before any other part of puller will fail. Handle can be used as either a crank or lever. Light weight makes the "Mighty Midget" ideal for work on the pole. Small size—can easily be carried on lineman's belt.

Cat. No.	Capacity, Lbs.	Wt., Lbs.
S-4790	500	$6\frac{1}{2}$
S-4791	1000	$9\frac{1}{2}$

### Coffing Power Pike Pole



Constructed of two pieces of galvanized pipe, one telescoping into the other. Power is obtained through use of a load binder or hoist. The Power Pike Pole has a heavy steel base, and top is so constructed that it cannot slip off pole. Minimum height eight feet, two inches; maximum height 11 feet, seven inches. Hoists or load binders must be ordered separately.

Cat. No.	Wt., Lbs.
S-5890	32

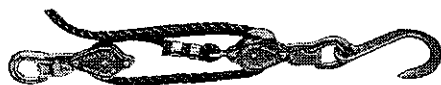
### Capstan Pulley Block



Meets the general demand for a rope pulley block with which one man can exert a direct pull or lift to 4000 pounds. Ideal for attaching guys, pole raising and placing, cable pulling and general work in line construction.

Cat. No.	Rope Furnished	Capacity, Lbs.	Wt., Lbs.
S-2718	33 ft. of $\frac{1}{2}$ -inch	2000	15
S-2720	33 ft. of $\frac{3}{4}$ -inch	4000	25

## Self-Locking Block Tackle



Designed for use with wire grips. To lock load, pull luff rope under hook. To release, simply pull rope. When pulling-up wire to make a splice it may be used with two grips attached to snaps, or with the drop forged hook (shown in illustration) to anchor to an insulator-pin or other convenient anchorage.

Cat. No.	Type	Rope	Wt., Lbs.
S-2712	1802-30	25 ft. Manila	3

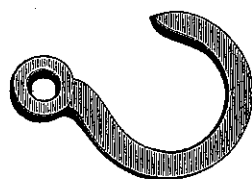
## Heavy Type Block Tackle



Consists of two special double-sheave blocks with high-quality, four-strand Manila rope spliced to eye block with galvanized thimble. Runs free and won't twist.

Cat. No.	Type No.	Rope	Wt., Lbs.
S-2714	1802-40	30 ft., 1/2-inch	15 1/2

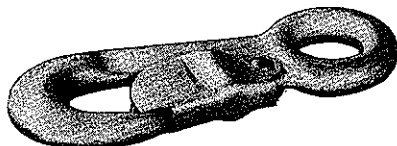
## Anchor Hook for Tackles



Solid drop-forged steel. Approximately 5 1/2 inches long and 3 1/4 inches across hook. Eye has inside diameter of 5/8-inch to engage with snap on tackles. Galvanized finish.

Cat. No.	Wt. per Doz., Lbs.
S-4826	4

## Drop Forged Steel Snap



Heavy utility snap for general use with tackle, guys, hand lines, etc. High quality steel, smoothly finished with extra strong bronze spring in snap. Snap has shield to protect and hold spring. Overall length five inches.

Cat. No.	Eye Size, In.	Weight per 100, Lbs.
S-7080	3/4	30

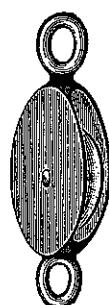


## Wrought Iron Snatch Block

For manila rope. Wrought iron straps, safety-locking link; smooth round edges to prevent chafing rope. Malleable iron hollow shell. Extra-heavy drop-forged flatted stiff swivel hooks. Roller bushed.

Cat. No.	Rope Dia., In.	Length Shell, In.	Wt., Lbs.
S-2695	7/8	6	9
S-2697	1	8	16

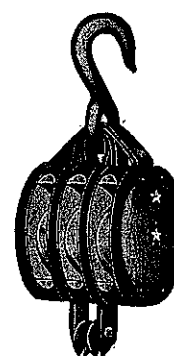
## Malleable Iron Pulleys



Lightweight, inexpensive pulleys with 2 3/8-inch shells for 3/8-inch rope. Sizes and styles shown are most widely used.

Cat. No.	Type	No. Sheaves	Wt., Lbs.
S-2622	Eye and Eye	Single	3/8
S-2625	Eye	Single	3/8
S-2627	Eye	Double	5/8
S-2629	Hook and Eye	Double	7/8
S-2631	Eye and Eye	Double	5/8

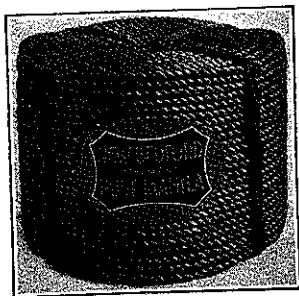
## Wood Block Pulleys



For manila rope. Loose side hooks. Supplied with roller bushings.

Cat. No.	Sheaves	Sheave Size, In.	Shell Size, In.	Rope Dia., In.	Wt., Lbs.
S-2646	Double	1 3/4 x 1/2	3	3/8	1 1/8
S-2648	Double	2 1/4 x 5/8	4	1/2	2 1/2
S-2653	Double	3 x 3/4	5	5/8	4 1/4
S-2654	Double	3 1/2 x 1	6	3/4	6 1/2
S-2657	Triple	1 3/4 x 1/2	3	3/8	2 1/8
S-2659	Triple	2 1/4 x 5/8	4	1/2	3 3/8
S-2660	Triple	3 x 3/4	5	5/8	6 3/4
S-2662	Triple	3 1/4 x 1	6	3/4	9

## Maritime Manila Rope

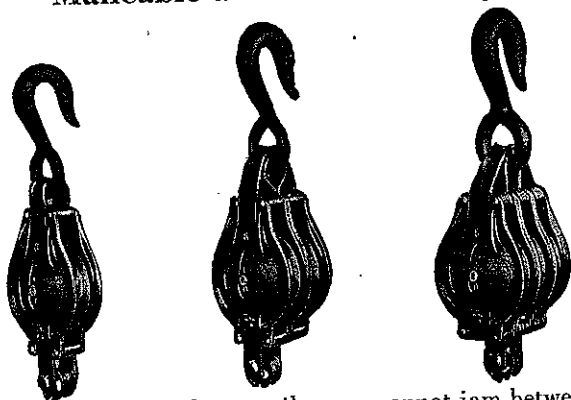


Extra high-quality manila rope. It is waterproofed and rot-proofed. It stays flexible, wet or dry, and is free from kinking.

Full coils run approximately 1200 feet per coil, half coils about 600 feet. For greater economy rope should be ordered in half or full coils.

Cat. No.	Diameter In.	Ft. per Lb.	Wt. per Half Coil, Lbs.	Wt. per Coil, Lbs.
S-6260	$\frac{3}{8}$	26	33	65
S-6262	$\frac{1}{2}$	13.3	45	90
S-6264	$\frac{5}{8}$	7.52	80	160
S-6266	$\frac{3}{4}$	6	100	200
S-6268	1	3.71	160	320

## Malleable Iron Block Pulleys



Constructed so that manila rope cannot jam between shell and sheaves. Hooks are drop-forged of special steel. Roller bushed.

### Single Sheave

Cat. No.	Sheaves Size, In.	Shell Size, In.	Rope Diam. In.	Wt., Lbs.
S-2669	$1\frac{3}{4} \times \frac{1}{2}$	3	$\frac{3}{8}$	$1\frac{1}{4}$
S-2671	$2\frac{1}{4} \times \frac{5}{8}$	4	$\frac{1}{2}$	$2\frac{1}{8}$
S-2673	$3 \times \frac{3}{4}$	5	$\frac{5}{8}$	$3\frac{1}{2}$
S-2675	$3\frac{1}{2} \times 1$	6	$\frac{3}{4}$	$5\frac{3}{4}$

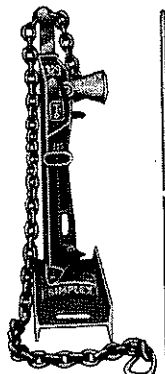
### Double Sheave

Cat. No.	Sheaves Size, In.	Shell Size, In.	Rope Diam. In.	Wt., Lbs.
S-2679	$1\frac{3}{4} \times \frac{1}{2}$	3	$\frac{3}{8}$	2
S-2680	$2\frac{1}{4} \times \frac{5}{8}$	4	$\frac{1}{2}$	$3\frac{1}{2}$
S-2681	$3 \times \frac{3}{4}$	5	$\frac{5}{8}$	$5\frac{1}{2}$
S-2682	$3\frac{1}{2} \times 1$	6	$\frac{3}{4}$	$9\frac{3}{4}$

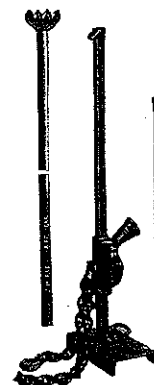
### Triple Sheave

Cat. No.	Sheaves Size, In.	Shell Size, In.	Rope Diam. In.	Wt., Lbs.
S-2687	$1\frac{3}{4} \times \frac{1}{2}$	3	$\frac{3}{8}$	$2\frac{7}{8}$
S-2688	$2\frac{1}{4} \times \frac{5}{8}$	4	$\frac{1}{2}$	$4\frac{3}{4}$
S-2689	$3 \times \frac{3}{4}$	5	$\frac{5}{8}$	$8\frac{3}{8}$
S-2690	$3\frac{1}{2} \times 1$	6	$\frac{3}{4}$	$13\frac{1}{4}$

## Pole Jacks



Type No. 329



Type No. 325

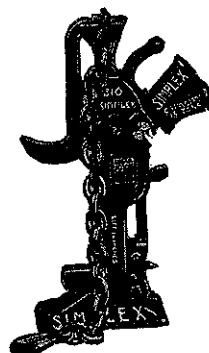
These pole jacks enable one or two men to pull or straighten poles, pull butts or move loaded poles, regardless of size or depth, without digging around them or interrupting service.

The No. 329 is a strong powerful jack built to pull or straighten the heaviest poles. Will pivot on its base to any angle within  $30^\circ$  of vertical. Single acting—automatic in raising and lowering—will not trip. Equipped with eight foot steel chain, five foot steel lever bar and steel I-beam base.

The No. 325 is a light but strong jack designed for pulling 25 and 30 foot poles. Also valuable for tightening guy wires, taking up slack in messenger wire and for pulling underground cable. Furnished with pike pole, steel chain, detachable base and steel lever pole.

Cat. No.	Type No.	Capacity, Tons	Ht., In.	Lift, In.	Wt., Lbs.
S-5006	329	15	$37\frac{3}{4}$	21	193
S-5007	325	5	50	37	98

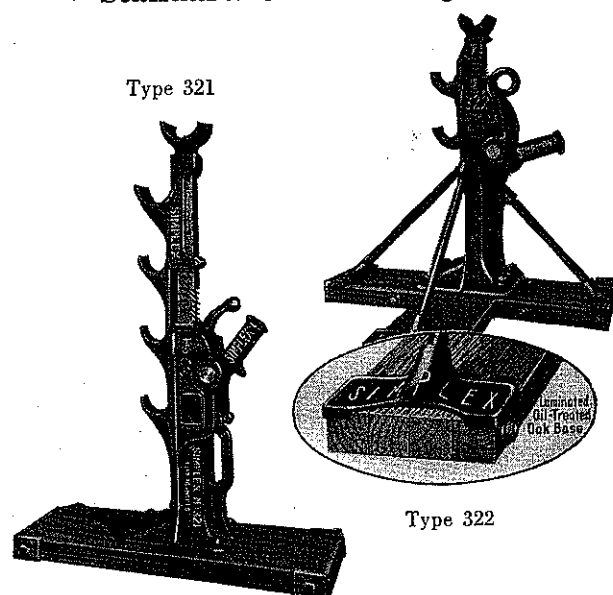
## General Utility Jack



Single acting, automatic in raising and lowering and cannot be tripped. An especially desirable jack for smaller telephone poles and general work around the exchange. Furnished with 5 ft. steel chain, steel auxiliary shoe and 5 ft. steel pinch bar.

Cat. No.	Type	Capacity, Tons	Lift, In.	Ht., In.	Wt., Lbs.
S-5009	310-A	15	14	22	109

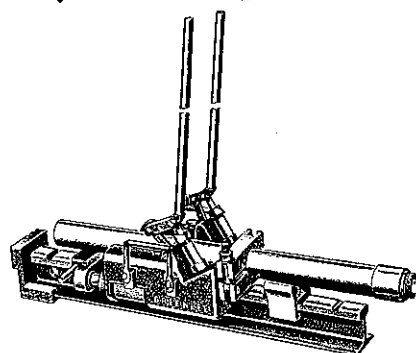
## Standard Cable Reel Jacks



No. 322 is a double-acting, automatic-lowering jack designed for reels from 36 to 84 inches in diameter. Furnished in pairs. No. 321 is a single-acting jack for reels from 20 to 96 inches in diameter. No. 320-A, also a single-acting unit, is for reels from 20 to 60 inches in diameter.

Cat. No.	Type	Capacity, Tons	Ht., In.	Lift, In.	Wt. Lbs.
S-5001	322	10	29	13 3/4	104
S-4997	321	10	34 1/4	15	108
S-4998	320-A	5	21	10	48

## Hydraulic Pipe Pusher

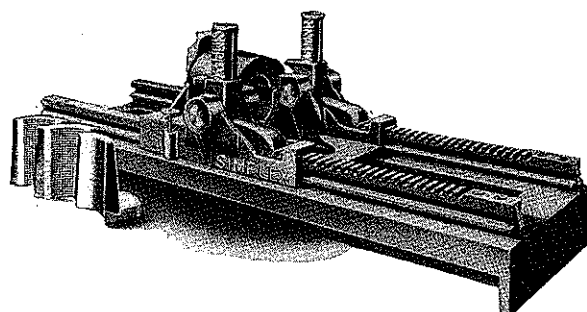


Compact, easily-handled tool means savings in underground installations of all pipe. Six speeds, for varying soil conditions, give pressures from 6500 pounds to 40,000 pounds.

Complete outfits consist of power unit, steel base and pipe clamps which must be ordered separately. Pusher has a capacity for pipes from 1 1/4 to four inches in diameter. A separate clamp must be used for each pipe size. Order clamps in following sizes: 1 1/4, 1 1/2, two, 2 1/2, three, 3 1/2 and four inches.

Description	Length Push, Ft.	Wt., Lbs.
790 Power Unit	..	160
5 1/2 Ft. Base	4	145
6 1/2 Ft. Base	5	165
7 1/2 Ft. Base	6	185
8 1/2 Ft. Base	7	205

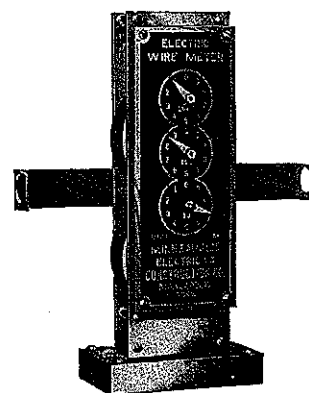
## Double-Leverage Pipe-Pushing Jacks



Used for pushing pipe under streets, sidewalks, lawns, etc. Double levers and double tracks offer more power and accuracy. Reversible carriages eliminate reversing jack to pull pipe. Jack is furnished complete with one set of tapered jaws, one pilot, two 4-ft. steel lever bars and two steel pipes for extending lever bars. When ordering, specify size of jaws and pilot.

Cat. No.	Jack No.	Capacity	Pipe Size	Wt., Lbs.
S-5014	R-332R	15 Tons	3/4 to 2"	218
S-5016	R-334R	25 Tons	2" to 4"	321
S-2109	Adapter enables S-5016 to push 3/4" to 2" pipe.			

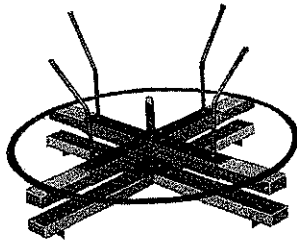
## Minneapolis Wire Meter



Used for measuring wire and cordage of all sizes. The meter is movable, and occupies small space. Will measure in feet all sizes of wire up to 3/4-inch diameter. Can be supplied to read in metric measurements, on order. For meter on frame with reel order FSA.

Cat. No.	Description	Wt., Lbs.
CI	Wire Meter	14
FSA	Meter and Reel on Frame	65

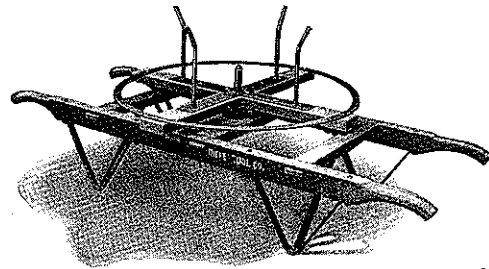
### Pay-Out Reel



This reel is of hardwood, reinforced and braced throughout with metal strips. The pins are adjustable for 12, 18 and 24-inch coils. Wood painted gray, metal parts black.

Cat. No.	Description	Weight, Lbs.
S-6054	Pay-Out Reel Type 132	40

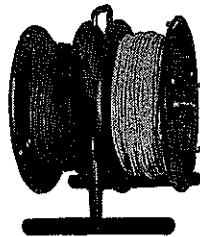
### Barrow Reel



Made of hardwood and is of strong, durable construction, designed to withstand heavy work. Two large metal disks are designed to form a bearing surface around center pin. Reel pins are adjustable for 12, 18 or 24-inch coils.

Cat. No.	Description	Weight, Lbs.
S-6049	Barrow Reel Type 130	90

### Jumper Wire Reels



Double unit reels that permit reeling from any angle—top or bottom. Never kink, never snarl. Turn easily but never coast because of adjustable tension brake.

When loading, reel is placed on side and tension-cone face plate removed. Center pins are adjustable for coil eyes from 4½-inches to 12½-inches, on 6½-inch wide coil. When loaded, tension is adjusted and face plate replaced. Hole in face plate provided to anchor free end of wire. Standard finish, black enamel.

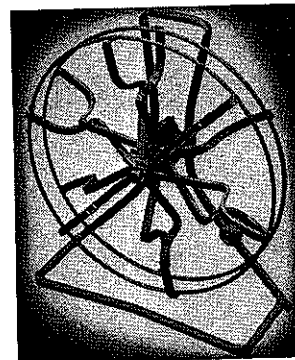
Cat. No.	Size, In.	Weight Each, Lbs.
S-6046	15	30

### Pay-Out Reel Pin Guard Shield

Shield fits over old pin forming a wide, smooth surface that will not chafe wire. Shield swivels on pin to adjust outer surface to contour of roll. Size, 8 inches by 12 inches.

Cat. No.	Wt. per Set of 4, Lbs.
S-6035	13

### Type PR Drop Wire Reel



The Type PR Reel was primarily designed to pay-out drop wire, but it can be used as a take-up reel. It is demountable and can be used in a vertical or horizontal plane when removed from the vehicle. The outer spider is removable and adjustable with a plunger type lock. It is equipped with a variable tension brake. Made of malleable castings and high grade steel.

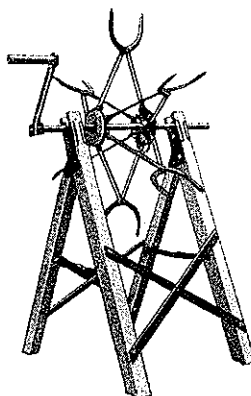
Cat. No.	Wt., Lbs.
S-6040	32

### Truck Mounting Brackets

For mounting PR Reel on side of installation-body truck.

Cat. No.	Wt., Lbs.
S-3124	12

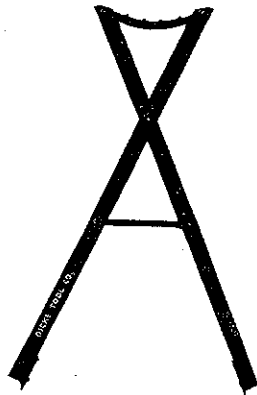
### Folding Take-Up Reel



This reel is of the collapsible type, composed of two parts—wooden stand and metal reel. The stand is of selected hardwood, mortised and tenoned and reinforced with steel. Reel is malleable iron and steel. Finish is gray.

Cat. No.	Type, No.	Weight, Lbs.
S-6055	141	42

## Folding Jenny Supports



Made of best selected hardwood. The fork is of crucible steel with heavy braces and bolts for extra service. Spikes are bolted to each leg to avoid slipping. Entire support easily folded into compact bundle yet it is strong and rigid when set up. Painted gray.

Cat. No.	Length, Ft.	Wt., Lbs.
S-5010	6	23
S-5012	8	35

## Wire Raising Tool



Used for threading drop wire through trees or for placing drop wire or open wire on crossarms or brackets. Small hooks are for supporting wire and large hook for pulling down tree branches. The two small hooks are arranged so that a pair of wires can be raised at a time. Wire raising tool is made of bronze and fits Pole Extension Section S-5916, listed at right.

Cat. No.	Description	Wt., Lbs.
S-7516	Wire Raising Tool	1 1/4

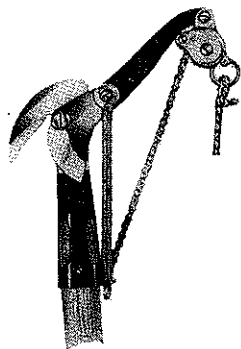
## Machete



Used for cutting brush and tall grass around poles. High quality steel blade and wooden handle.

Cat. No.	Description	Wt., Lbs.
S-5311	Machete	1 1/2
S-4540	Fibre Guard	1

## Wire and Cable Cutter



Safe, quick way to cut copper or steel open wire and one-inch or smaller cable. Drop-forged steel construction with tempered steel blade. Head section and extension poles are the same as used on S-7572 Type 111-18 Tree Trimmer (at right).

Cat. No.	Description	Wt., Lbs.
S-3905	Cutting Head Only	1 1/2
S-5924	Pole—6 ft. head section	1 1/4
S-5916	Pole—6 ft. extension	2

## Tree Pruners



These pruners have won wide popularity among telephone companies. Simple cutting head has only two moving parts. Blade is highest quality tool steel and spring is special vanadium steel. The sectional poles are Sitka spruce with simple locking joints made of brass.

The light trimmer is used for all but the heaviest work. It will cut limbs up to one-inch diameter and can be carried up trees easily. For heavier work and limbs up to 1 1/2 inches the S-7574 Trimmer should be used.

Complete trimmer consists of pruner head with rope, one six-foot head section and two six-foot extension sections. Individual items can be ordered separately if desired.

### Light Trimmer Type 111-18

Cat. No.	Description	Wt., Lbs.
S-7572	Complete Trimmer 18-feet in Length.	10
S-4744	Pruner Head Only.	1 1/2
S-5924	Pole Head Section 1 1/4 In. Dia., six-ft. Long.	1 1/4
S-5916	Pole Extension Section 1 1/4 In. Dia., six-ft. Long.	2
S-2568	Cutting Blade.	1/2
S-7124	Spring With Eye Rod.	1/4
S-3287	Chain.	1/2



### Heavy Trimmer Type 12-18

Cat. No.	Description	Wt., Lbs.
S-7574	Complete Trimmer, 18-ft. in Length.	19
S-4746	Pruner Head Only.	4
S-5928	Pole Head Section 1 1/4 In. Dia., six-ft. Long.	4
S-5920	Pole Extension Section 1 1/4 In. Dia., six-ft. Long.	5
S-5932	Pole Tapered Head Section, six-ft. for use with Heavy Type 12 Trimmer when saw S-6324 is used with Heavy Trimmer.	3
S-2564	Cutting blade.	1 1/2
S-7128	Spring With Eye Rod, Note: Two required for Type 12 Pruner.	1/2
S-3288	Chain.	1 1/2

## Bush Scythe and Snath



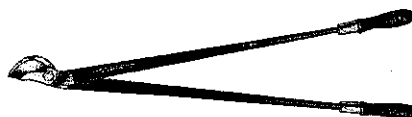
A sharp, heavy bush scythe for trimming roadside growths and controlling scrub along your right-of-way. Highly-polished crucible-steel blade holds its cutting edge through hard usage. Is easily sharpened when necessary. For heavy work, but light enough in weight to handle easily. Handle (snath) must be ordered separately. Type shown is Seymour Ironclad — exceptionally strong and dependable, with four holes for adjusting blade.

Cat. No.  
S-6766  
S-7082

Description  
Bush Scythe  
No. 125 Ironclad Handle

Wt. per  
Doz., Lbs.  
25  
63

## Long-Handle Pruner

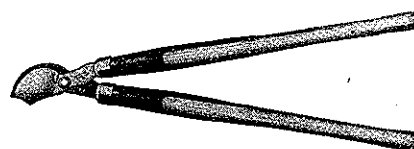


Dual-cutting-action pruner made of tempered steel forgings. Blades and handles are one piece. Hardwood hand grips. Overall length is 28 inches.

Cat. No.  
S-5990

Wt., Lbs.  
3

## "Ezy-Cut" Long-Handled Pruner

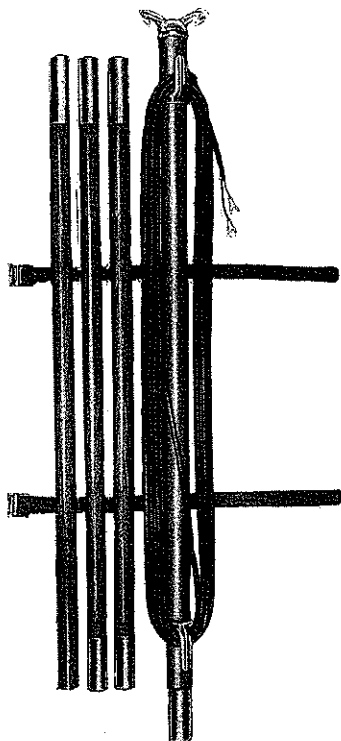


A rugged performer for all tough clearing and brush cutting jobs. Drop-forged, tempered steel cutting parts. Selected ash handles with heavy ferrules. Cuts up to 2 inch brush and limbs. Overall length is 28 inches.

Cat. No.  
S-5988

Wt., Lbs.  
4

## Universal Line Pole



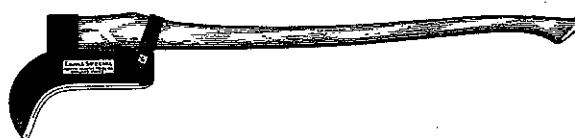
For quickly connecting portable telephones or test sets to line wires. Small head fits easily between wires. Connects to wires of varying heights up to 33 inches apart. Needle-sharp connectors cut through surface corrosion to insure low-resistance connections. Head is made of tough fiber. Pole sections are formed of two half-round strips of cross-grained wood cemented together for exceptional strength. All metal parts are corrosion-proofed.

Cat. No.  
S-5935  
S-5933  
S-2338

Description  
Pole complete—four 36" sections  
Additional 36" intermediate section  
Canvas carrying bag

Weight, Lbs.  
9  
1½  
1¼

## Bush Hook



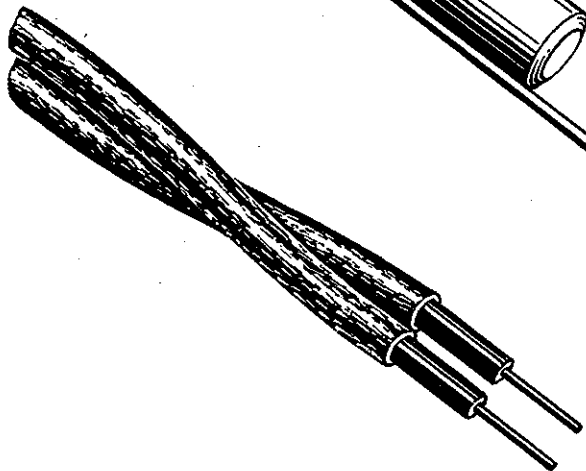
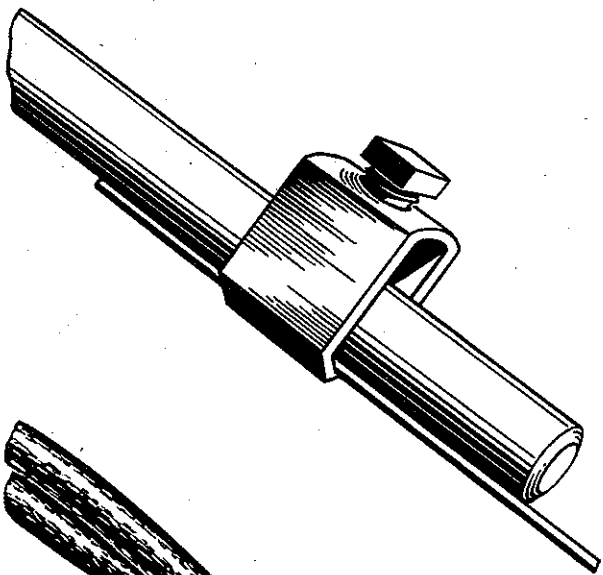
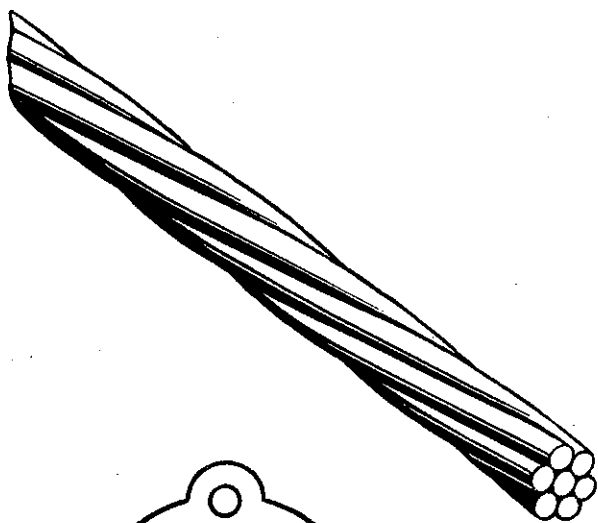
A strong, sturdy tool for roadside clearance, right-of-way maintenance, scrub-growth removal and control. Designed with sharpened edge on inside of curved crucible steel blade. Blade is 11¼ inches long. Stout hickory handle is 36 inches long.

Cat. No.  
S-4811  
S-4538

Description  
Earle Special Bush Hook  
Fibre Guard

Wt. per  
Doz., Lbs.  
65  
4½





STRAND

GROUND CLAMPS

GROUND WIRE

**6**

**Wire**

GROUND CLAMPS

GROUND WIRE

STRAND

Index for this section on reverse side



## ***Index for Section Six***

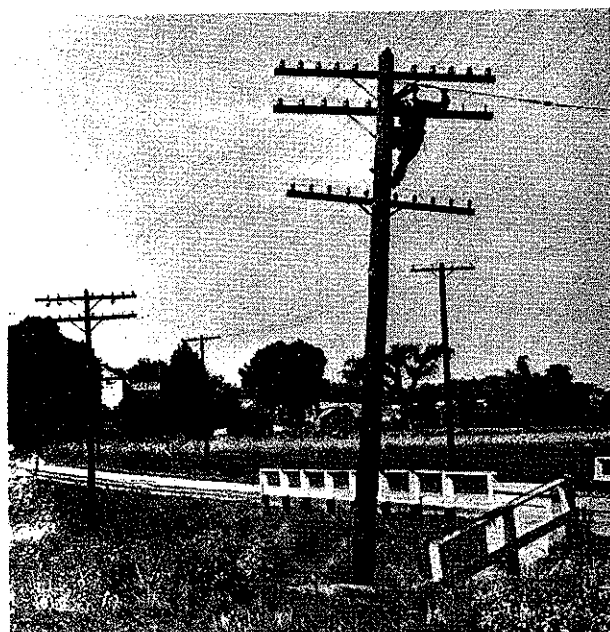
<b>Page</b>	<b>Item</b>	<b>Page</b>	<b>Item</b>
109....	Steel Strand	114....	Copperweld Products
110....	Telephone and Telegraph Wire	115....	Copperweld Line Wire
111....	Ametel 135 Wire Ametel 85 Wire Bare Copper Line Wire Galv. Iron Tie Wire Copper Tie Wire	116....	Copperweld Strand
112....	Copperweld Grip-Flex Ties Diamond Tie Splints Weatherproof Iron Wire Gencaseal Interior Wire Gencaseal Conduit Wire Gencaseal Jumper Wire Neoprene Copper Drop Wire Neoprene Bridle Wire	117....	Copperweld Ground Rods and Clamps
113....	Copperweld Products	118....	Copperweld Cable Rings Copperweld Staples Copperweld Nails
		119....	Neotel Drop Wire
		120....	Gencatel Drop Wire
		121....	Conduit or Duct Wire Ground Wire Copper Drop Wire Monotype Interior Wire Bridle Wire
		122....	Monotype Jumper Wire Comparison of Wire Gauges

**AUTOMATIC  ELECTRIC**

## Amerstrand Steel Strand



For messenger strand and for pole guying Amerstrand Steel Strand offers maximum dependability and long life. It is offered in all sizes in the following grades: Specification or Utilities Double Galvanized, Siemen's-Martin, High Strength, Extra High Strength.



In every grade Amerstrand is made of the highest quality materials, processed by the latest improved methods. It provides high tensile strength, offers specialized sizes and grades, and assures long, trouble free service on the job.

Because of the combination of these important features, because each grade is designed and produced for special service, Amerstrand offers true economy. It makes possible rigid control of initial and replacement costs on any job.



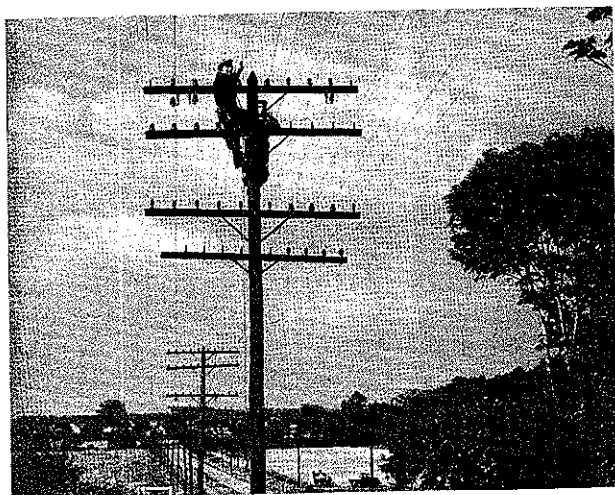
Specify Amerstrand Steel Strand. A complete table of the physical properties below gives the specifications for all grades and all sizes. Utilities or specification grade are used principally by communication and power and light industries. Be sure to give complete description when ordering.

### Amerstrand Steel Strand Properties

No. Wires in Strand	Nominal Dia. Strand, In.	Minimum Breaking Strength, Lbs.					Approx. Wt. per 1000 Ft., Lbs.
		Utilities	Double Galv.	Siemens-Martin	High Strength	Extra High Strength	
7	3/16		1150	1900	2850	3990	72.9
7	3/16	2400					80.3
7	1/4		1900	3150	4750	6650	121
7	9/32	4600		4250	6400	8950	164
7	5/16		3200	5350	8000	11200	205
7	5/16	6000					225
7	3/8	11500	4250	6950	10800	15400	273
7	7/16	18000	5700	9350	14500	20800	399
7	1/2	25000	7400	12100	18800	26900	517

## Amertel Telephone and Telegraph Wires

## EBB-BB-Steel Grades



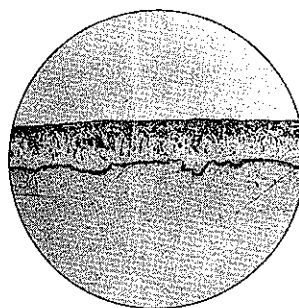
Amertel Telephone wires are made in three grades for every commercial purpose. They are manufactured of the finest materials, under strict supervision to assure utmost satisfaction and long life.



The three grades which are in general commercial use are: Extra Best Best—known as EBB; Best Best—known as BB, and Steel.

Because of their quality they lower maintenance costs and replacement costs considerably. They have proved their ability to withstand severe strains imposed by climatic conditions in various locations.

Amertel Telephone wires are evenly and heavily coated with commercially pure zinc. This protective layer is applied by the "hot dip" process which assures a uniform chemical bonding between the metals. The coating of zinc has no weak point of contact with the steel—there is a complete union which prevents flaking and also makes the coat ductile, strong and corrosion resistant.



The small cross section drawing shows the perfect bonding of the zinc coat with the steel base. There is a chemical blending of metals—pure zinc on the outside and an alloy of iron and zinc increasing in iron content as it approaches the steel base.

Complete information of the physical and electrical characteristics of Amertel wire is given below.

## Electrical and Physical Characteristics of Amertel Telephone Wires

(\*EBB (Extra Best Best), BB (Best Best), Steel)

Size BWG	Resistance in Int'l Ohms per Mile, 68 Degrees, F.			Minimum Breaking Weight, Pounds			Wt. per Mile	Approx. Wt. Lbs., 1000 Ft.	Coils	
	EBB.	BB.	Steel	EBB.	BB.	Steel			Lgth., Mi.	Wt., Lbs.
4	5.98	7.15	8.32	2028	2271	2433	811	153	1/4	203
6	8.22	9.83	11.44	1475	1652	1770	590	112	1/3	197
8	12.43	14.87	17.31	975	1092	1170	390	74	1/2	195
9	15.44	18.47	21.50	785	879	942	314	60	1/2	149
10	18.79	22.48	26.16	645	722	774	258	49	1/2	129
11	23.54	28.16	32.77	515	777	618	206	39	1/2	103
12	28.52	34.12	39.71	425	476	510	170	32	1/2	85
14	48.98	58.59	68.18	247	276	297	99	19	1/2	49

(Weight of individual coils will not vary more than 10% from weight shown)

### Amertel 135 Telephone Wire

Amertel 135 offers an exceptionally fine combination of tensile strength and transmission qualities. Its tensile strength is approximately  $2\frac{1}{2}$  times that of B. B. grade, its transmission qualities far superior.

With Amertel 135 long-span construction is not only possible but practical. Maximum span in heavy loading districts, 350 feet; medium loading districts, 450 feet, and in light loading districts 500 feet. The extra strength gives a greater safety factor in withstanding heavier ice loads and wind. Construction costs consequently are lower.

Because of its strength and superior transmission qualities and heavy galvanized coating Amertel 135 is an ideal conductor for rural and short toll lines.

Cat. No.	Description
S-7306	Amertel 135 Wire 12 BWG
Normal Diameter in Inches	0.109
Minimum Breaking Strength, pounds	1213
Resistance per Mile, ohms	38.23
Approximate Weight per Mile, pounds	170
Approximate Weight per Coil, pounds	150
Approximate Minimum Weight per Coil, pounds	140
Approximate Maximum Weight per Coil, pounds	160
Approximate Length per Coil, feet	4659
Approximate Minimum Length per Coil, feet	4348
Approximate Maximum Length per Coil, feet	4970

NOTE: Galvanized steel compression sleeves are recommended for splicing Amertel 135 Telephone Wire.

### Bare Copper Line Wire

Supplied in soft, medium hard or hard drawn grades. Standard for toll line construction is hard drawn grade and unless otherwise specified, this will be shipped on all orders. When ordering use B. & S. or N. B. S. gauge for specifying size.

Size	Diam. In.	Area Circular Mills	Breaking Strength Lbs. (Hard Drawn)	Weight per Mile, Lbs.
8 B&S	.128	16510	826	264
10 B&S	.102	10380	529	166
12 B&S	.081	6530	337	104
14 B&S	.064	4107	213	66
8 N.B.S.	.160	25600	1280	409
10 N.B.S.	.128	16384	826	262
12 N.B.S.	.104	10816	529	173
14 N.B.S.	.080	6400	337	102

### Amertel 85 Galvanized Wire

Amertel 85 is a telephone wire combining great tensile strength and low resistance. It offers a satisfactory answer to the demands of telephone engineers for a galvanized wire with these advantages. Its three outstanding features are:

(A) Minimum tensile strength approximately 90% greater than EBB; 65% greater than BB grade and 55% greater than steel.

(B) Effective resistance at voice frequencies, with currents of normal magnitude for these frequencies, substantially equal to the best grade of iron wire.

(C) Galvanizing which assures controlled bonding of zinc with the steel base.

Amertel 85 represents increased economy and efficiency in construction and maintenance. It will sustain unusually heavy ice loads and wind in standard spans because of its greater breaking strength, and can be used successfully in long span construction for greater savings.

It is available in half-mile coil lengths. Complete electrical and physical characteristics are given below.

Cat. No.	Size, BWG	Diam., In.	Min. Breaking Load, Lbs.	Max. Ohms per Mile	Approx. Wt. per Mile, Lbs.
S-7802	12	.109	793	34.12	170
S-7803	14	.083	460	58.59	99

NOTE: Galvanized steel Compression-type sleeves are recommended for splicing Amertel 85 Telephone Wire.

### Amertel Galvanized Iron Tie Wire

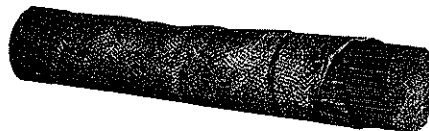
S-8015 for use in making standard horseshoe tie.

S-8016 for use in making armor tie.

S-8003 for use with S-8002 tie splint.

Cat. No.	Gauge	Length, In.	Approx. No. Pieces	Standard Bundle Wt., Lbs.
S-8015	12 BWG	14	675	25
S-8016	12 BWG	44	430	50
S-8003	12 BWG	30	600	50

### Copper Tie Wires



Made of pure copper annealed wire. Order by catalog number and size. Tie wires are sold by the pound.

Cat. No.	Gauge	Length, In.	Wt. Per 100 Pcs., Lbs.
S-8006	10 B. & S. or 12 N.B.S.	22	5 3/4
S-8008	10 B. & S.	18	4 3/4
S-8000	12 B. & S.	18	3
S-8004	12 B. & S.	21	3 1/2