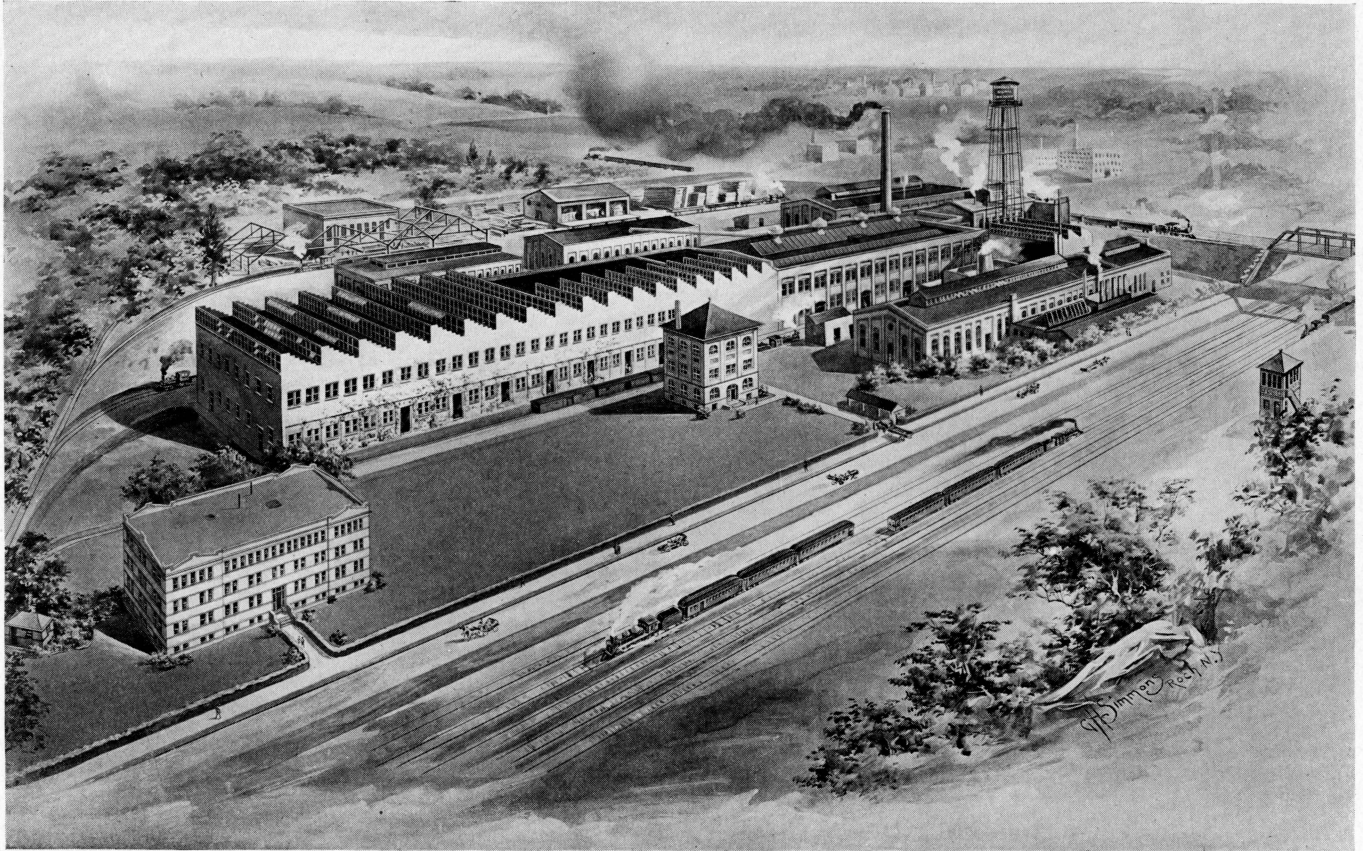


GENERAL RAILWAY SIGNAL COMPANY

1908

SECTION 5

AUTOMATIC BLOCK SIGNALING FOR STEAM ROADS



MAIN OFFICE AND FACTORY OF THE GENERAL RAILWAY SIGNAL CO. AT ROCHESTER, N. Y.

# GENERAL RAILWAY SIGNAL COMPANY

MAIN OFFICE AND WORKS, ROCHESTER, N. Y.

CHICAGO  
1339 MONADNOCK BLOCK

NEW YORK  
NIGHT AND DAY BANK BUILDING

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**BLOCK SIGNALS**  
AUTOMATIC  
SEMI-AUTOMATIC  
CONTROLLED MANUAL  
FOR  
STEAM AND ELECTRIC ROADS

---

**INTERLOCKING**  
ELECTRIC  
PNEUMATIC  
ELECTRO-PNEUMATIC  
MECHANICAL  
OR COMBINATIONS OF ABOVE  
TO MEET ALL CONDITIONS

---

**TUNNEL SIGNALS**  
THE MOST EFFICIENT AND COMPACT MADE

---

**CROSSING GATES**  
MECHANICAL AND ELECTRIC

---

PLANS, ESTIMATES, PROPOSALS, AND  
DESCRIPTIONS UPON REQUEST

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THE  
MATTHEWS-NORTHRUP  
WORKS  
BUFFALO CLEVELAND AND NEW YORK



**AUTOMATIC BLOCK SIGNALING  
FOR STEAM ROADS**

**SECTION 5**

## PREFACE

ON August 20, 1872, there issued to William Robinson United States Letters Patent No. 130,661, covering the "closed track circuit" which forms the basis of all modern systems of Automatic Block Signaling. This invention, simple as it seems to-day, was in reality a wonderful achievement since it involved the conception of the possibility and ultimate practicability of economically energizing a distant electro-magnet by means of a feeble electric current transmitted for a considerable distance through one grounded conductor, through the coils of an electro-magnet, and the return of this electric current through another grounded conductor parallel with the first and distant from it less than five feet; these two grounded conductors being the two running rails of a railway track; and it further involved the conception of the possibility and practicability of having each pair of wheels of a train afford, in combination with the track circuit, the means for making and breaking a signal circuit as required.

Robinson made a number of small installations of his system in various parts of the country, and amongst others, one at Irvineton and another at Ridgeway, Pa., on the Philadelphia & Erie R. R., both of which, fortunately for the future of Automatic Signaling, were inspected on October 24, 1873, by a party of Pennsylvania R. R. officials, amongst whom were A. J. Cassatt, Frank Thomson, and Robert Pitcairn.

In 1875 there was installed at Newark Junction, on the New York Division of the Pennsylvania Railroad, an interlocking machine, purchased, with all its signals and connections, from Saxby & Farmer of London, which company later exhibited their interlocking and other signaling devices at the Centennial Exhibition in Philadelphia — all of which were examined with great intelligence and appreciation by the above named and other officers of the Pennsylvania Railroad, with the result that through their representations, a group of capitalists became interested in the subject of signaling and in 1882 organized a company to exploit the Saxby and Farmer and Robinson inventions. The first large installations of Automatic Signals were made by this Company in 1884; 434 of the "Clock Work" discs and sixty-five "Electro-Pneumatic" semaphores having been put in service that year.

The Robinson "closed track circuit" patent expired August 20, 1889, up to which time there had been installed 811 "Clock Work"

discs and 110 "Electro-Pneumatic" semaphore signals, a total of 921 automatic signals. In view of the great merit of the Robinson invention and of the further fact that practically every important principle now employed in automatic signaling was known years before the expiration of the Robinson patent, it may now seem surprising that during the seventeen years of life of that patent it should have been so little used. For example, Spang had, as early as 1873, disclosed the means for providing, in combination with the Robinson invention, a polarized, wireless, distant signal circuit; Pope had patented the identical scheme, which almost a generation later, was again patented, for placing home and distant signal control relays of widely different resistances, in series, and having the home signal, when at "proceed" cut in a low resistance "holding" coil, thus allowing the distant control relay to be energized; the Gassett overlap and the Robinson "Relayed track circuits" had both been used; Gassett had further patented the identical means, which many years afterwards were again patented and have been largely exploited, for converting a "normal clear" into a "normal danger" system.

But, while the above and many other principles now largely used in automatic block signaling, were well known in the art long before the expiration of the Robinson patent, it should be remembered that until the expiration of that patent there was lacking the one element most essential to its successful development, and that element was "Competition."

The Robinson "closed track circuit" being basic and fundamentally indispensable in any system of automatic block signaling and no satisfactory or adequate equivalent or substitute having been found, it was impossible that there should be any real competition until this controlling patent had expired and means had been found for successfully avoiding infringement of other minor but important patented features of track circuit block signaling — such as the "Gassett overlap." Such means were found about 1892 and thereafter track circuit control, which had theretofore been beautiful in theory but very unsatisfactory in practice, was rapidly improved. The old buttonhead rivet track wires gave way to the channel pin; cheap forms of track batteries having high internal resistance were replaced by low resistance cells of much larger current discharging capacity; upon the advent of the Weber insulated joint the wooden splice bars and fibre insulated iron bars were relegated to the scrap heap or placed on side tracks; long runs of No. 14 B. & S. wire between rails and battery or relay, or about switches and crossings,

were shortened as much as possible and wires of suitable gauge were employed; small, delicately adjusted, high resistance relays gave way to others that were larger, better built, of low resistance, and of relatively high efficiency; better battery and relay housings were furnished — and, in short, under the stimulus of competition, each and every detail entering into the construction of a track circuit section, was rapidly improved. Similar improvement was made in the signal mechanisms themselves and the railways, quick to appreciate the advantages of a practical, usable, automatic, block system, began to order it, chiefly for use on their busiest lines. By the end of 1899, there were in use 1,055 “Clock Work” disc, 2,263 “Electro-Pneumatic” semaphores, 2,974 “enclosed discs,” and 204 “electric” semaphores, a total of 6,496 automatic signals, as against 921 at the end of 1889.

Five years later, there were in use 1,165 “Clock Work” discs, 6,000 “Electro-Pneumatic” semaphores, 4,697 “Enclosed Discs,” 6,933 “Electric” semaphores, and 1,934 “Electro-Gas” semaphores, a total of 20,729.

While figures are not available to show the exact number of automatic signals installed in 1905, 1906, and 1907, it is known that within that period, while there has been a small decrease in the number of “Clock Work” disc signals employed and only a small increase in the number of “Enclosed Disc,” “Electro-Pneumatic,” and “Electro-Gas” semaphores, there has been an enormous increase in the number of “Electric” semaphores, more signals of this type having been sold in these three years than were installed of all types in the prior twenty-five years.

In the following table is shown the number of years that have elapsed since each of the several types of automatic signals now in use was first installed, and the number of miles and percentage of total mileage equipped with each type as of January 1, 1908:

TYPE	Number of Years Since First Installed	Mileage, January 1, 1908	Percentage of Total Mileage
Clockwork Disc, . . . . .	25	894	4.8
Electro-Pneumatic Semaphore, . . . . .	24	1,334	7.2
Enclosed Disc, . . . . .	17	3,695	19.9
Electric Semaphore, . . . . .	11	10,686	57.7
Electro-Gas, . . . . .	6	1,925	10.4
Total, . . . . .	....	18,534	100.0



The "Clock Work" disc, the "Electro-Pneumatic," and the "Electro-Gas," are each of the "Two-power" type, using one kind of power for the operation of the signal and another for its control; they have been in use for an average of more than eighteen years and altogether they to-day perform only 22.4 per cent. of the automatic block signaling of the country, as against 77.6 per cent. performed by the "one-power" systems, the "Enclosed Disc" and the "Electric" semaphores, which have been in use for an average of only fourteen years. It is, therefore, evident that in automatic block signaling, as in power interlocking, in which 80 per cent. of all power levers are of the electric type, as against about 20 per cent. of the electro-pneumatic type, experience has amply demonstrated that the "one-power" signal system is preferable to the "two-power"; that the preferred power is "electricity"; and the preferred type of signal is the "semaphore."

In the executive, engineering, manufacturing, and installation departments of the General Railway Signal Company are a number of men who have taken a leading part in the development and improvement of automatic block signaling during the past twenty years, and whose knowledge of the subject, whether in respect to design, manufacture, installation, operation, or maintenance, is unexcelled. When early in 1904 this Company decided to engage in automatic block signal work, it was found to be the unanimous opinion of these men, as well as that of a number of leading Railway Signal Engineers, that long, practical experience had demonstrated the superiority of the electric semaphore to all other existing types of automatic block signals and that the General Railway Signal Company should manufacture this type of signal. On the other hand it was believed that the electric semaphore signals then on the market were too complicated and that, with a view to securing extremely low battery consumption, they required too delicate adjustment and were, in a number of other important respects, susceptible of very material improvement. Similar defects were known to exist in many other devices forming an essential part of an automatic block signal system, such, for example, as the relays, indicators, switchboxes, etc. It was, therefore, decided by the General Railway Signal Company to devise, develop, and manufacture a line of apparatus for automatic block work that would excel any then on the market. It was further decided that until we had fully demonstrated the actual superiority of our devices, we should not seek to introduce

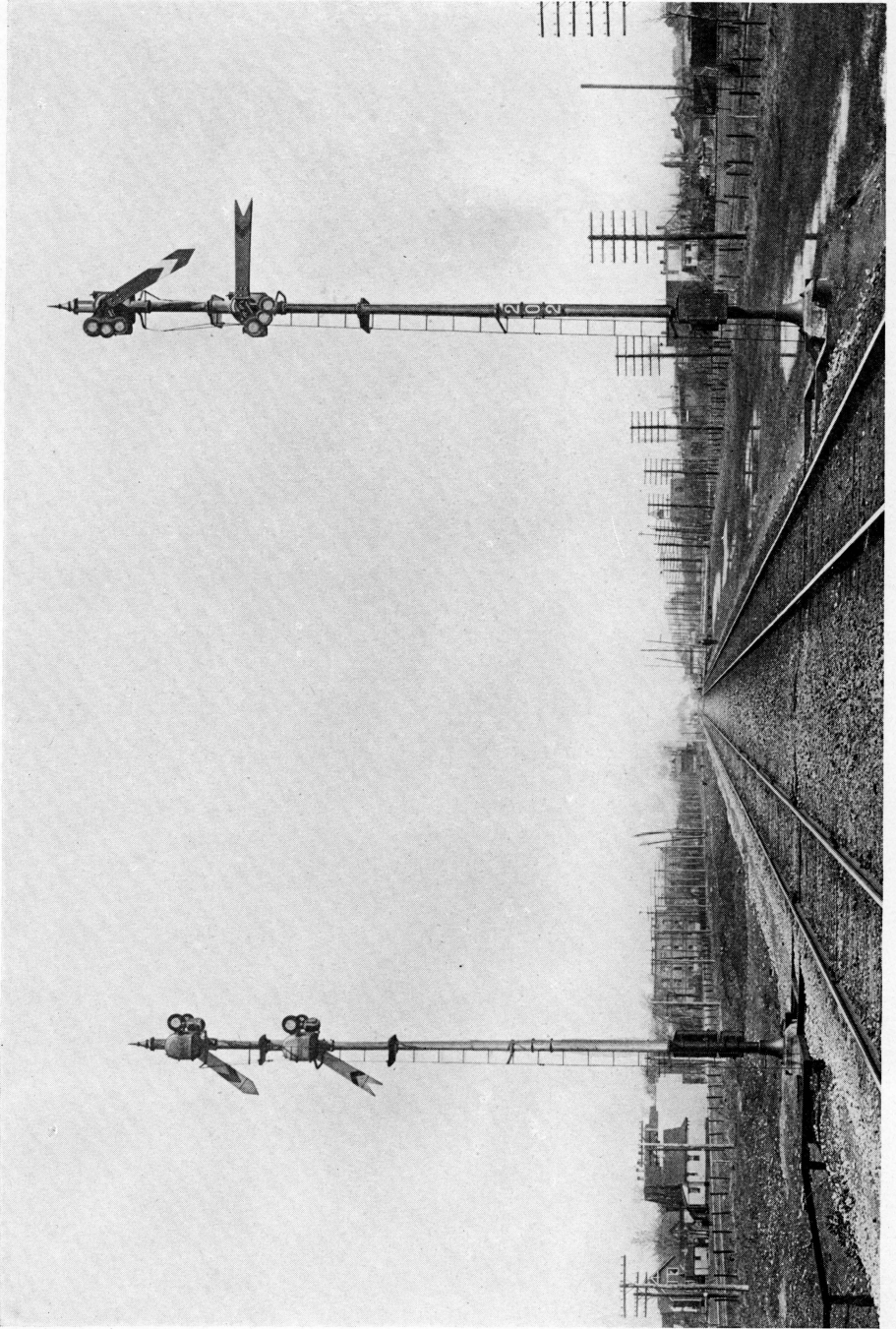
them to an extent greater than was necessary for such demonstration. This policy, which would have been commercially impracticable or impossible for the other signal companies whose sole or chief business was in this field, has been strictly carried out, until at this time the General Railway Signal Company is warranted in claiming that its Model 5 signal mechanisms, its relays, indicators, switch-boxes, battery and relay housings are by far the best ever offered.

In achieving this result it has been necessary for us to originate and advocate certain novel features of construction, which, when first brought to the attention of some Signal Engineers have met with opposition. For example, some Signal Engineers, when they first heard of our "top of post" signal mechanism, expressed themselves unfavorably, assuming that it would be more difficult to inspect such a mechanism than to inspect one placed at the base of the signal post. Such an assumption was based primarily upon their experience in making inspections and adjustments of certain old types of electro-mechanical slots, which were so located and constructed as to require for the doing of such work in comfort that the maintainer should be possessed of as many arms as the nautilus and of as many legs as a centipede. But later it was found by them that our Model 5 signal was provided with a suitable platform on which the maintainer could stand as comfortably as on the ground; that the parts of the signal operating mechanism were fewer, simpler and less liable to disorder than in any other signal; that there were no "up and down" rods, which, unguided, buckled and which, guided, were likely to stick, giving false signal indication; that, with the spindle-operated mechanisms there were no cranks to be pushed or pulled at such angles as to greatly decrease the efficiency of the power transmission; that the motor commutator and circuit breaker contacts placed at a considerable height above the ground were far less subject to frost troubles and dust; that the maintainer, having from time to time to inspect the signal-operating mechanism, would then be able to readily and properly inspect the signal glasses, blade grip fastenings, etc., which might otherwise never be examined by him, except from the ground. With the realization of these advantages and of the further fact that each and every part of the mechanism was mechanically and electrically far more perfect than heretofore produced in the art, the most skeptical of the Engineers using the device have become its warmest and firmest advocates and we understand that certain of our competi-

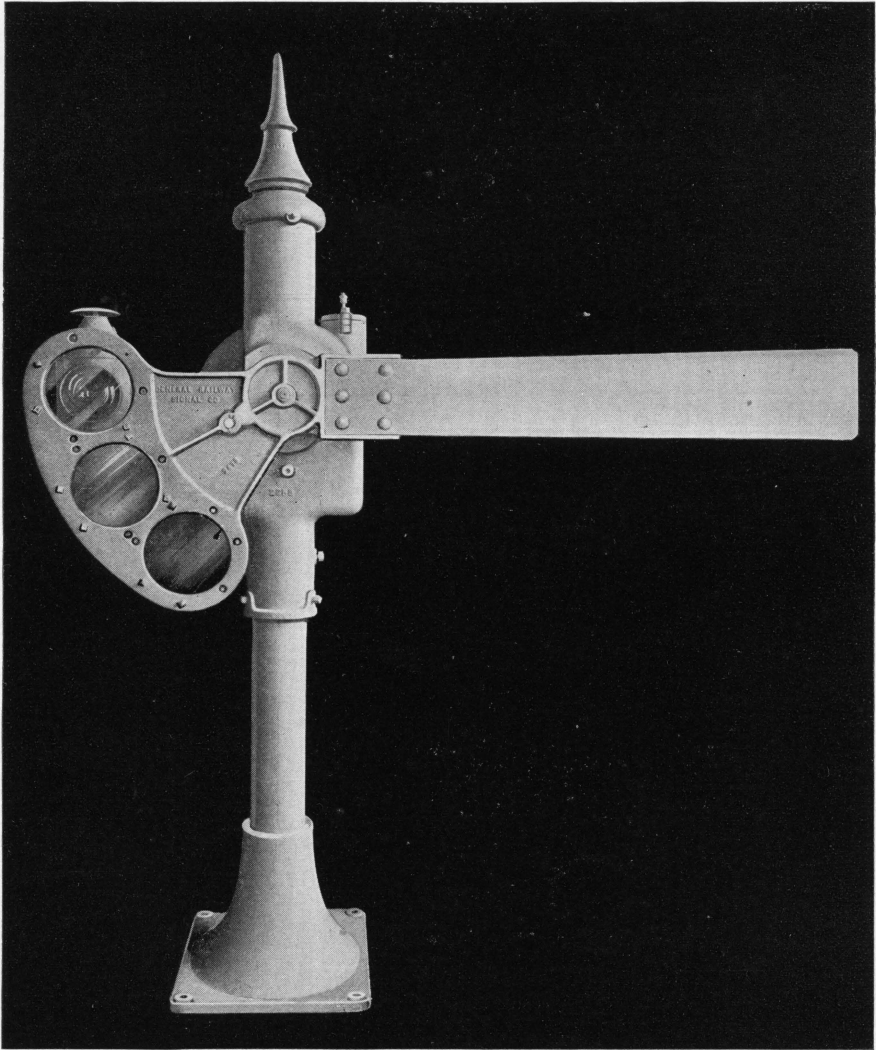
tors have paid us the compliment of adopting the spindle-operated type of signal and that certain others are likely soon to do so, unless deterred by the fear of infringing the Keeler Slot Patent owned by this Company. In the Signal Field it is now beginning to be quite generally recognized that the spindle type of mechanism is as much superior to the "base of post" mechanism as the latter mechanism is superior to the "outside connected" mechanism first installed. The principal difference between the "base of post" and the "outside connected" mechanism is that one is "inside" the post and the other is "outside"; but the objection to the useless and dangerous mechanism itself remains — nor does placing it inside the post make it free from atmospheric influences — since moist, warm air will and does condense and precipitate moisture just as readily on the chilled surfaces inside of a signal post as on the outer surfaces. However, where our customers require a base of pole mechanism we will furnish our Model 5 Signal movement in a suitable case at the base of the pole.

In the following pages will be found illustrations and descriptions of a number of the principal devices of our manufacture used in automatic signaling. It should, in fairness to this Company, be stated that it does not advertise or publish bulletins or catalogues descriptive of experimental devices. When we have developed and built a device or system which we believe to be good, we take it to one or more railways, tell them that we consider it experimental, ask permission to try it out, and after a trial on a large scale, usually lasting from two to three years and covering all known working conditions, if we find the thing wholly satisfactory we push its sale as best we can; if we find it unsatisfactory we improve it or discard it. We have never advertised nor offered commercially any of the crude, immature schemes sometimes met with in signaling. Therefore, when we advertise any device or system it means it has been thoroughly tested and found suited to its intended purpose.

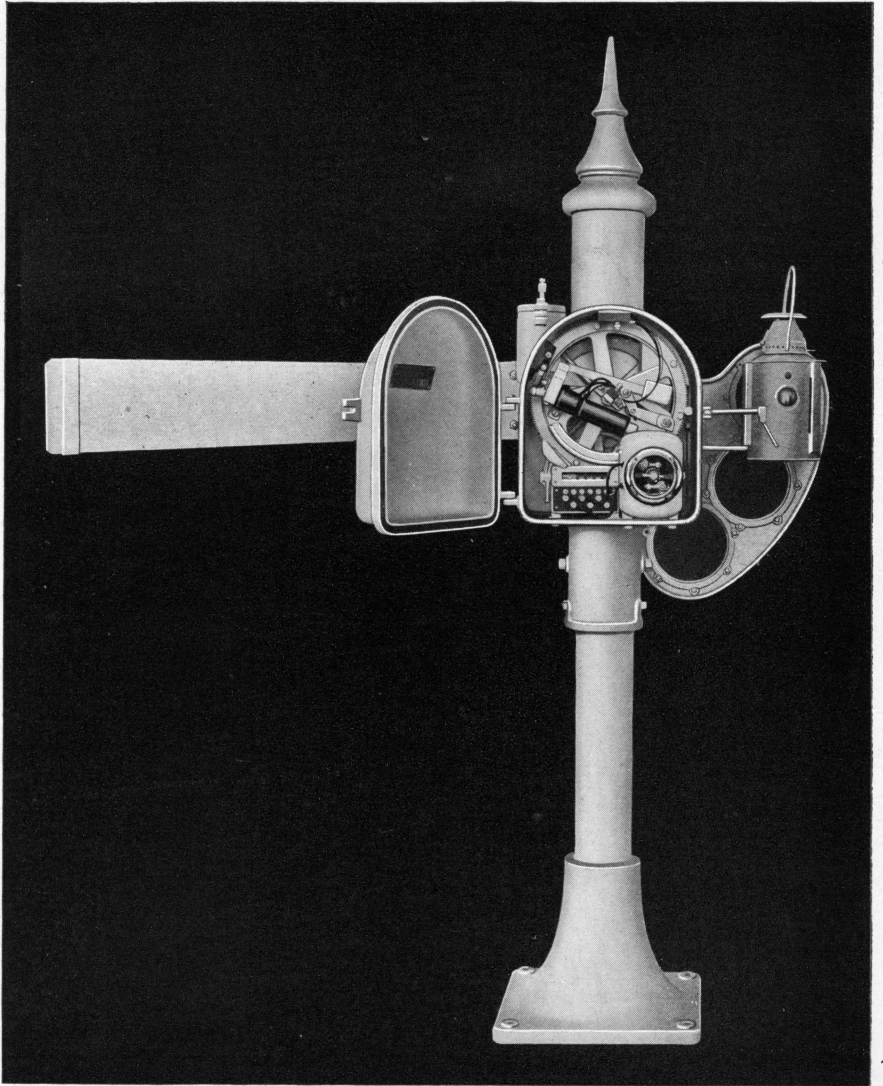
GENERAL RAILWAY SIGNAL CO.



MODEL 5 SIGNALS ON THE ILLINOIS CENTRAL R. R.



MODEL 5 TWO POSITION SIGNAL



MODEL 5 TWO POSITION SIGNAL, REAR VIEW

## MODEL 5 SIGNAL

**T**HE foremost consideration in the design and construction of any automatic device is to secure: First, uniformity and reliability of action; and second, economical installation and maintenance.

With the above points constantly in mind, we have in our Model 5 mechanism eliminated all unnecessary connecting members between the source of energy and the operated semaphore, and thus have obviated the necessity for any movements not in harmony with the movement of the semaphore which is rotative in its action.

The location of this mechanism at the semaphore spindle rather than at the base of the pole offers the following advantages:

*First* — A minimum number of working members is employed, reducing in a large measure the chances for failure due to friction, wear, and breakage, and in addition insuring economy in the consumption of energy.

*Second* — Placing the machine at a considerable distance from the ground prevents trouble so often found in base of pole mechanisms due to the accumulation of frost and to the dripping down and freezing of moisture on the machine.

*Third* — A change from a one-arm to a two-arm signal can be quickly and easily made, as all that is required is an additional mechanism, a piece of pipe, and a ladder section with platform.

*Fourth* — The machine, being completely wired and tested before leaving the factory, is not subject to misadjustment when erecting, as is the case when connecting rods with their guides, etc., have to be installed in the field.

All parts of Model 5 Signal are of simple design and action and of unusually rugged construction, and while the signal mechanism is compact, strength has not been sacrificed to gain this end, and ample room has been allowed for quick inspection and oiling of any part.

Over one thousand of these machines are now in successful service on various railroads.

A detailed description follows:

The **MAIN CASE** and **SUPPORTING FRAME** are combined, making a strong and weather-tight construction and insuring the proper relative location of the various members.

The **SPINDLE** carrying the semaphore casting rotates in phosphor-bronze bushings of ample proportions. The outer end of the spindle

bearing is protected from moisture by a packing washer held in place by a metal shield. A recess is left in the casting between the bearing bushings to provide a pocket for oil.

The **SLOT CARRIER** is fixed on the square inner end of the spindle and held in place by a suitable check nut and lock washer. This carrier, in addition to carrying the slot rig, has at its periphery a projecting ledge which engages with the lock dog, preventing the movement of the signal by hand from the outside.

The **MAIN GEAR** has a series of phosphor-bronze rollers arranged about its periphery, which pass through the path of the slot dog, and in connection with the slot rig connect the gearing to the semaphore spindle when the slot coils are energized.

A free movement of the main gear before the acting slot roller comes into contact with the slot dog, allows this roller to first come in contact with a projecting lug on the inner surface of the locking dog, moving it out of engagement with the slot carrier.

The main gear is actuated by the motor and a train of gears. The pinion of this train of gears, which is driven by the motor, has fixed to its shaft a ratchet which engages with a pawl mounted on a stud fixed to the main case, preventing backward rotation of the main gear.

The **SLOT COILS** are in two pairs, known as "Working Coils" and "Retaining Coils." They are exceptionally large and the working coils which are in series with the motor are of very low resistance (less than .1 Ohm), thus giving a very strong slot while the signal is clearing.

The retaining coils are of 800 Ohms resistance and will hold the signal clear with four volts across their terminals, releasing the slot when the voltage drops to two volts, thereby making ample provision against the slot sticking due to residual magnetism.

The **SLOT COIL LEADS** are of extra heavy insulated wire and are fastened to large terminal studs mounted on a block of insulating material which is carried on a bracket fastened to the slot carrier with screws and lock washers.

**FLEXIBLE CONNECTIONS**, properly insulated, are carried from these terminal studs to the terminal block proper, mounted in the top of the case. All incoming wires are led directly to the circuit breaker terminals or through cleats to the terminal block above mentioned.

The **SLOT LEVER** is so proportioned that a pull of about four pounds at the armature will hold the signal in the clear position. It is con-



structed of a steel forging mounted on a phosphor-bronze bearing stud, and the slot dog rides on a phosphor-bronze roller. All screws and studs for the slot rig are properly locked to prevent working loose.

The **CIRCUIT BREAKER** is positively actuated both ways by a roller (mounted on a bracket at the end of the slot cores) engaging between the faces of a double cam which is fixed to the circuit breaker commutator shaft. Only a small portion of the movement is utilized in tripping over the circuit breaker, thus insuring a quick, positive action.

The **CIRCUIT BREAKER CONTACTS** are large and of the very best materials. They are housed in a dust-proof case provided with a glass cover. The tension of the contact springs is readily adjustable from the outside, and the commutator contacts are accessible for adjustment by the removal of four screws which hold the cover.

An **INDICATION CONTACT** of phosphor-bronze is mounted on an insulated block located just above the circuit breaker operating roller. When the semaphore is fully back to the stop position, this contact bridges across the two indication contact springs mounted on an insulated block fastened to the main case.

The **MOTOR** for this movement was especially designed for the work it has to perform. Its neat, compact, and clean-cut appearance goes hand in hand with the fine material and workmanship employed in its construction. The commutator end of the motor is enclosed by a sheet-brass cover, containing a clear glass front to allow inspection of the brushes. The cover is fastened to the motor case proper by a bayonet joint and can be easily and quickly removed. The brush holders are mounted in insulated bushings contained in a cast-brass brush holder ring. This ring is readily adjustable or removable by loosening two screws. Copper gauze brushes of suitable cross section are provided. The spring tension for the brush holders is adjustable by loosening a slotted nut and moving the corrugated washer which carries one end of a coil spring. Three types of motors are furnished with this machine; two for low-voltage work, known as the "15-150" and the "10-100," and one for 110 volt work. The 15-150 motor, which is usually furnished, will clear a 60-degree signal in six seconds with a peak load of  $2\frac{1}{4}$  amperes. The 10-100 motor will clear a 60-degree signal in four seconds with a peak load of  $3\frac{1}{4}$  amperes.

All of the motors are plainly marked with the above designations on the motor castings. The 15-150 motor will clear an ordinary signal

with an E. M. F. of as low as four volts. It is not intended, however, that this low voltage shall be used; the above fact being mentioned only to illustrate the extremely high efficiency of the motor and mechanism.

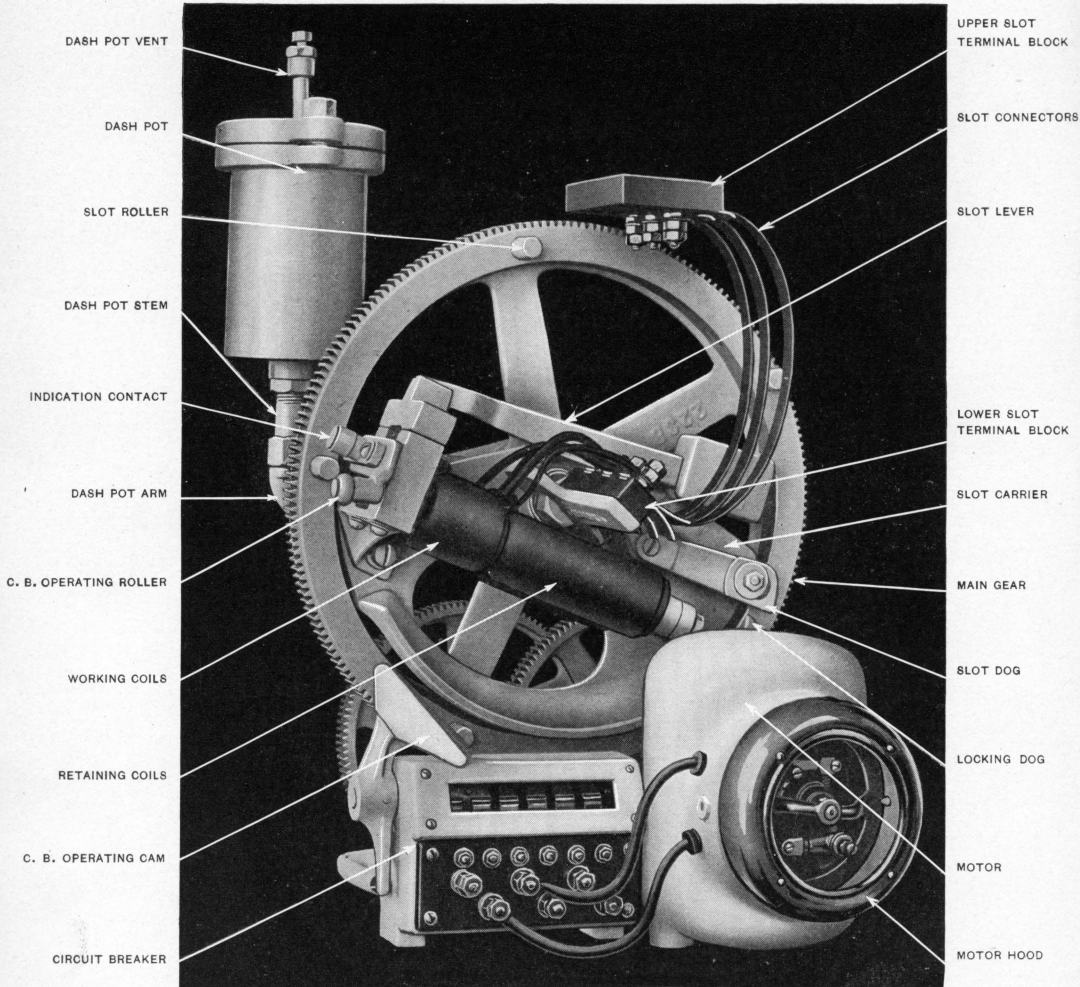
The **BUFFER DASH POT** is of ample proportions and constructed of non-corrosive metals. This dash pot is fitted with an adjustable vent so constructed as to be proof against weather. The escapement feature is provided in order to allow the semaphore to have an absolutely free initial run back to the stop position before encountering resistance to its backward movement.

Only **FORM WOUND COILS** are used in this mechanism, and after being taped these coils are subjected to a vacuum drying and impregnating process which leaves a layer of insulating material around each individual wire, making the coils moisture proof, and, in addition, providing a strong mechanical protection against injury; coils constructed in this manner can, in case of need, be easily and quickly removed or replaced.

While the machine is not designed with a view to making speed records in disassembling, the fact that economical assembling in the factory was taken into consideration when designing it, makes the reverse operation simple, and any of the main members can be disassembled without disturbing the balance of the machine.

A neat **PLATFORM** and **HAND RAIL**, which form braces for the ladder, are furnished with each signal to facilitate inspection.

The purchaser, when ordering, should specify the height from base of pole to first arm, center to center distance of arms, spectacle and lamp to be used, whether 10-100, 15-150, or 110 volt motor, and if indication contact and counter are required.



MODEL 5 SIGNAL MACHINE  
Showing Names of Principal Parts

## MODEL 5 SIGNAL

**T**HE OPERATION OF THE MODEL 5 SIGNAL is as follows:

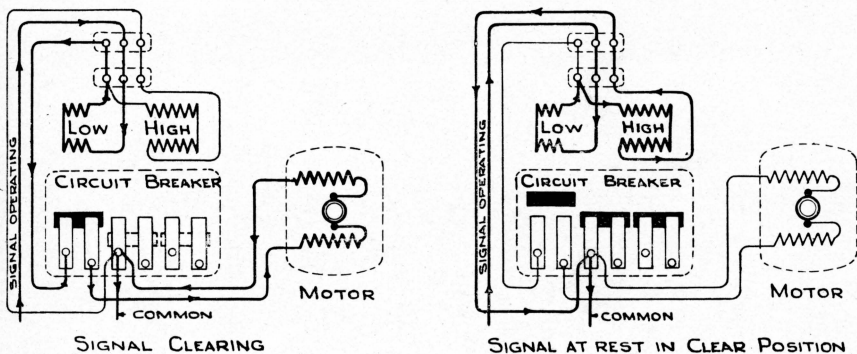
Current applied to the motor first passes through the working coils of the slot, holding the armature to the slot magnet and the slot dog in the path of the slot rollers on the main gear, and rotating the main gear in counter clockwise direction.

The first movement of the main gear brings the acting slot roller in contact with a lug on the inner side of the lock dog, carrying it out of the path of the slot carrier, and then the roller comes in contact with the slot dog moving the slot carrier, the spindle and semaphore in unison with the main gear.

During the last part of this movement the circuit breaker operating roller engages between the lips of the circuit breaker operating cam, breaking the circuit for the motor, and current then flows through the working and retaining coils of the slot in series, holding the signal in its clear position until the said circuit is broken by being opened by the controlling relay or signal.

When the slot circuit is broken the slot armature is released from the slot magnet, thus allowing the slot dog to unlatch from the slot roller on the main gear, and the slot carrier with its spindle and semaphore then returns to the stop position, being driven back by the counterweight of the spectacle and being checked in their backward movement by the dash pot.

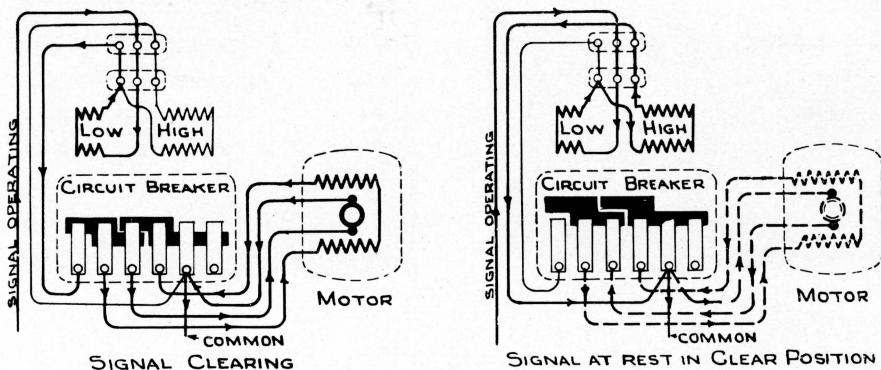
The cuts on page 23 clearly illustrate the different positions the mechanism assumes.



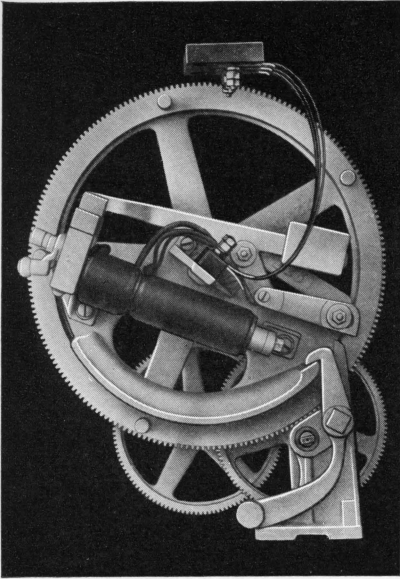
WIRING DIAGRAM FOR MODEL 5 TWO POSITION SIGNAL

## 110 VOLT MODEL 5 SIGNAL

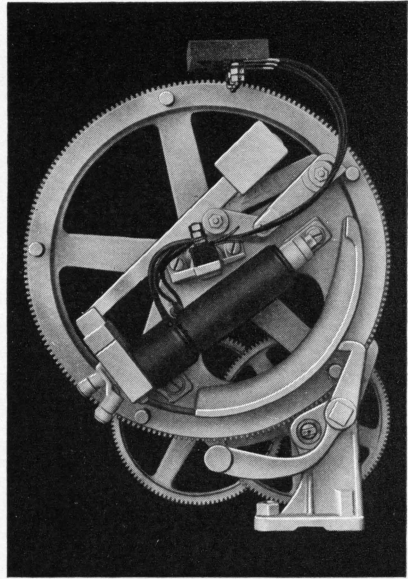
**T**HE operation of the 110 volt Model 5 Signal is identical with that of the low voltage machine, except when the circuit breaker (20903) snaps over a local closed circuit is set up in the motor with the direction of the current flow reversed in the armature from its direction when clearing the signal, thus snubbing the motor and acting as a brake. This feature is provided on account of the much higher speed at which the 110 volt signal clears.



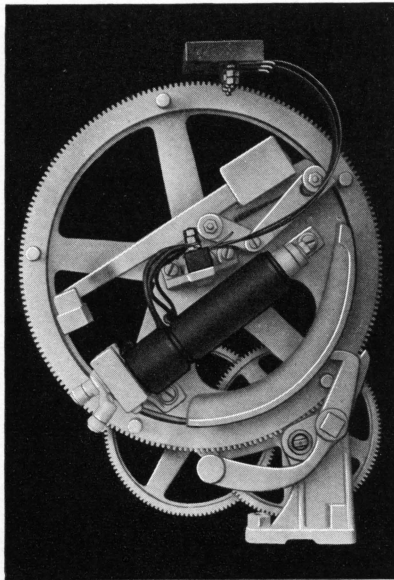
WIRING DIAGRAM FOR 110 VOLT TWO POSITION SIGNAL



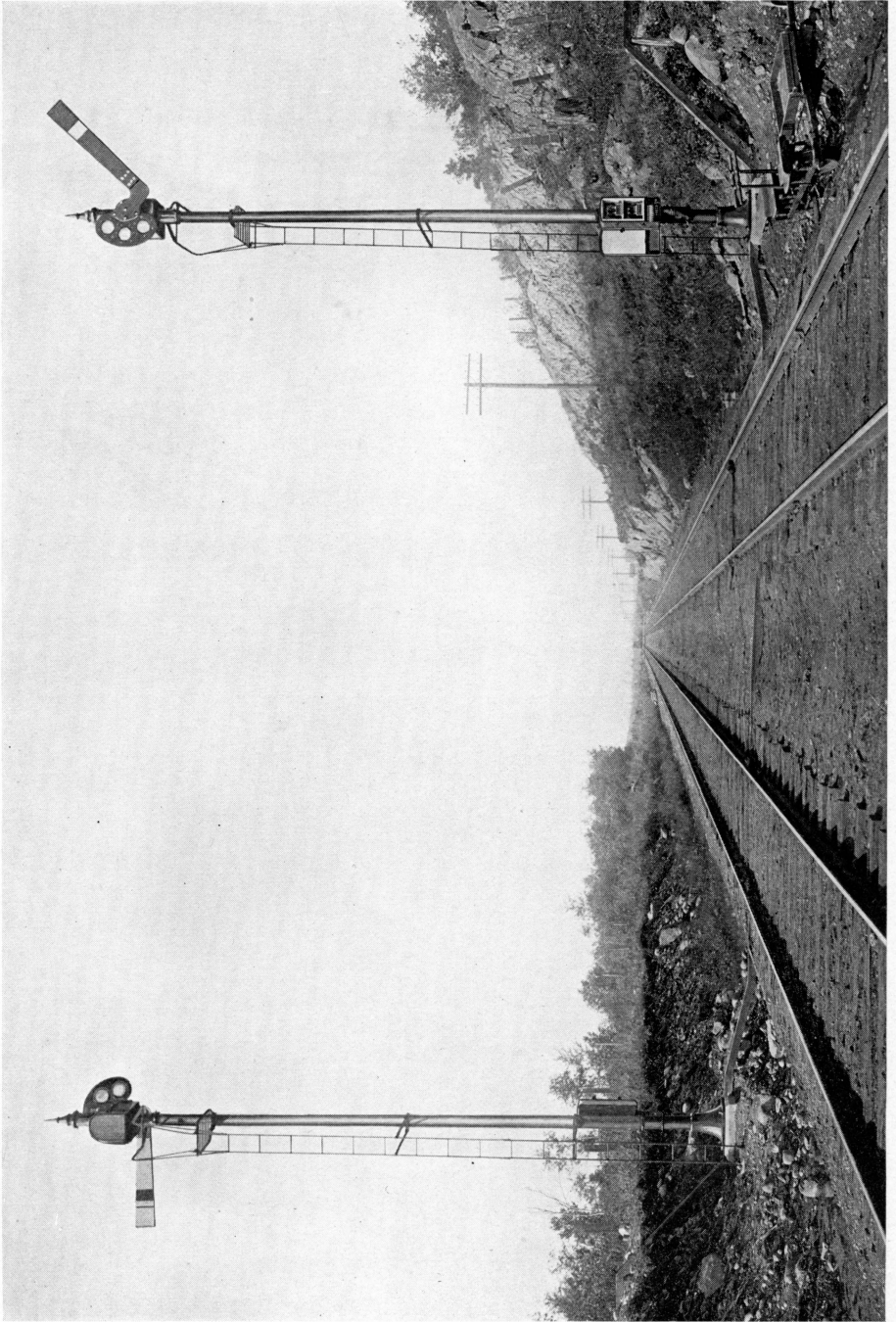
STOP POSITION



CLEAR POSITION



SLOT RELEASING



MODEL 5 THREE POSITION SIGNALS ON THE GREAT NORTHERN R. R.

### MODEL 5 UPPER QUADRANT THREE POSITION SIGNAL

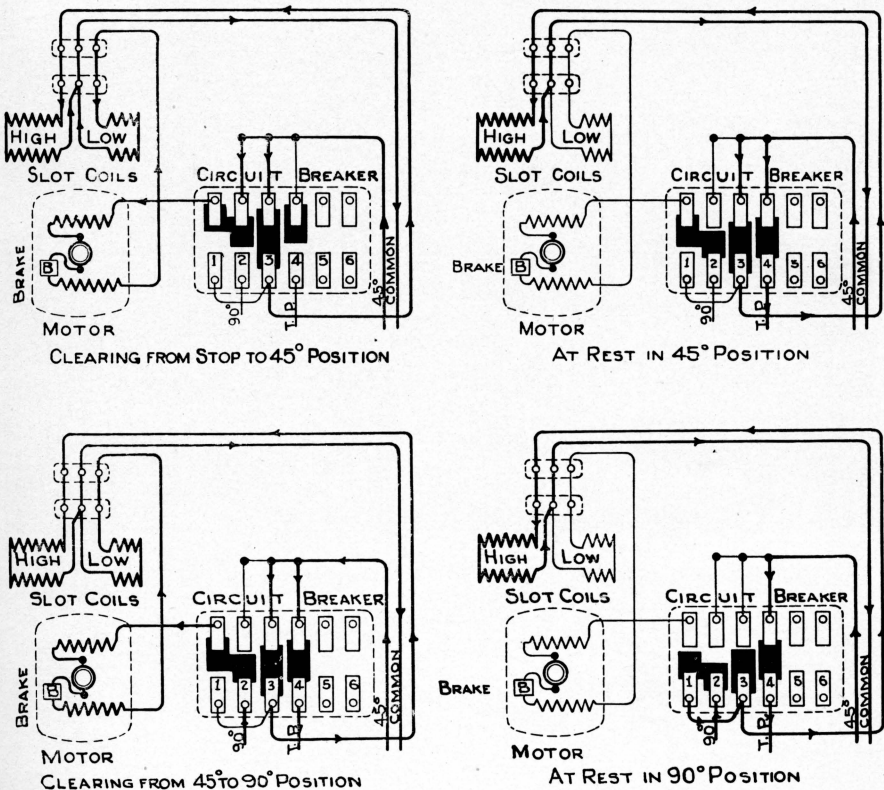
OUR MODEL 5 THREE POSITION UPPER QUADRANT SIGNAL MECHANISM is the same in all of its principal features as our Model 5 Two Position Machine; only such modifications having been made as the nature of the work demanded.

A STRONG BRAKE, neatly housed in the forward end of the motor and covered by a brass cap, always stops the semaphore in exactly the same position.

The CIRCUIT BREAKER has additional contacts provided to take care of the additional circuits required for three-position work.

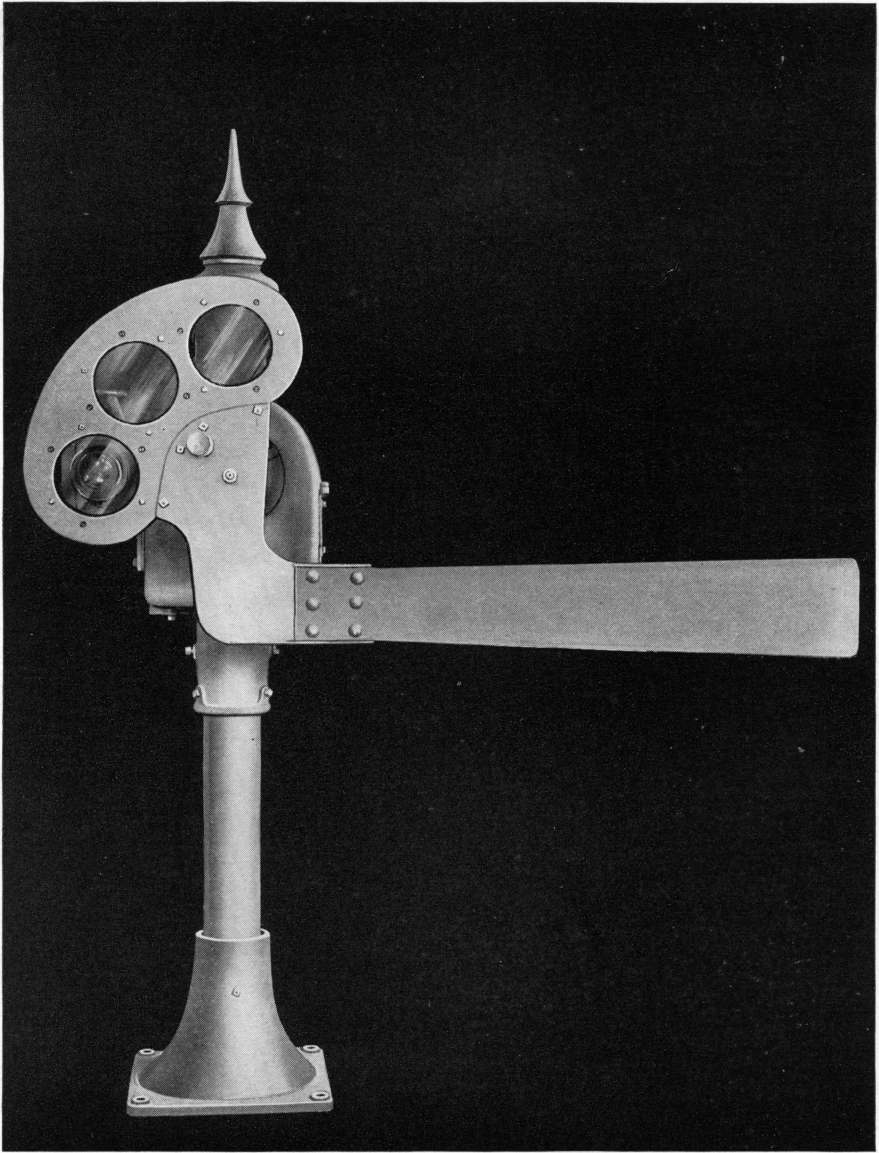
An OIL DASH POT is furnished, and is so arranged that it allows the signal to start back rapidly, slowing it down just before it comes to the 45-degree and the stop positions.

The NEUTRAL OIL used in this dash pot has been found to operate in an absolutely satisfactory manner in temperatures varying all the way from 110 degrees above to 45 degrees below zero, Fahrenheit.

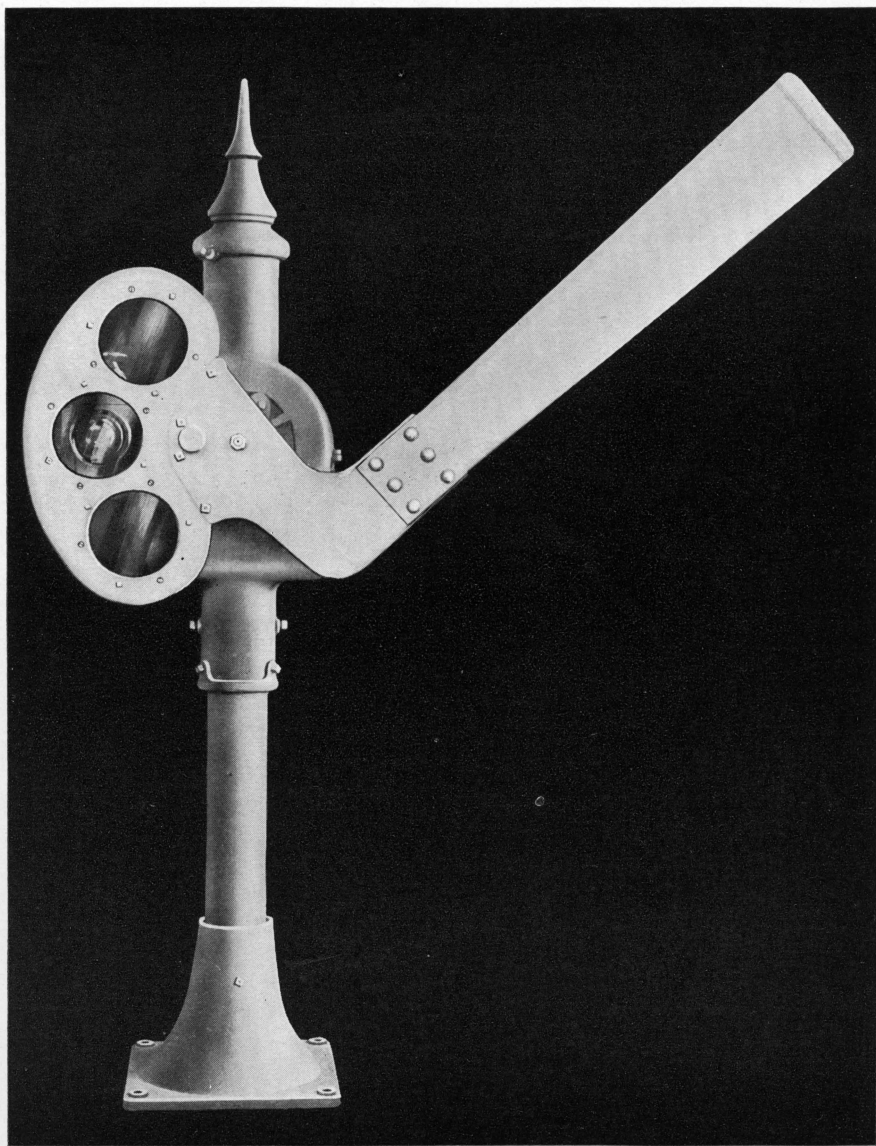


WIRING DIAGRAM FOR THREE POSITION SIGNAL

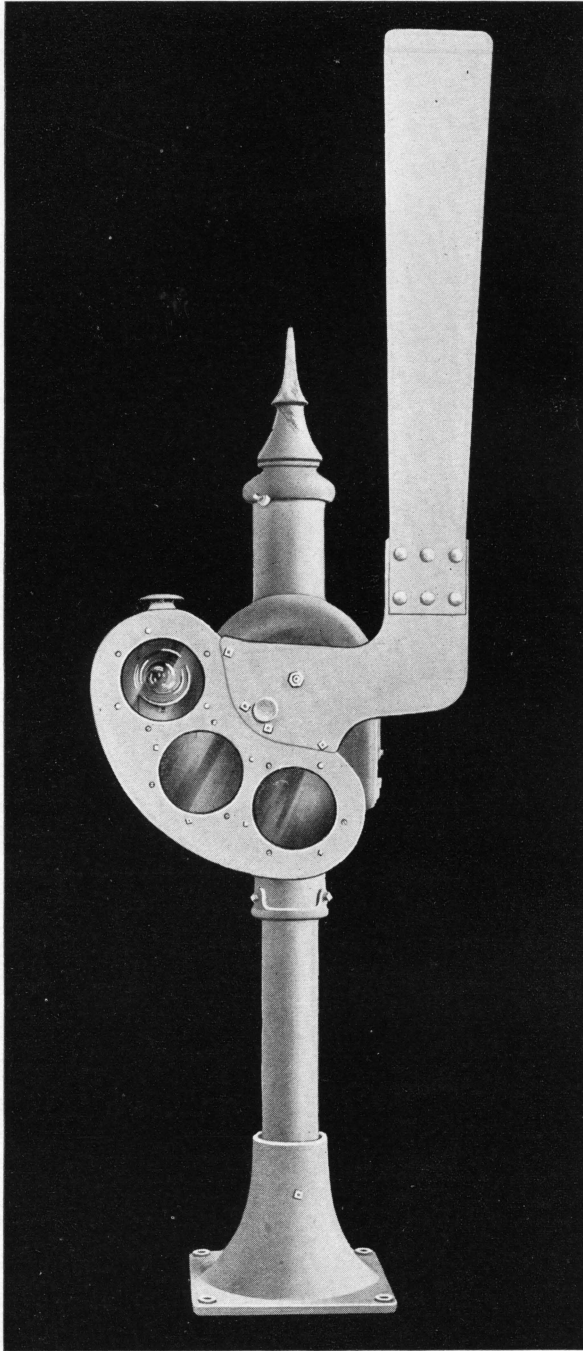




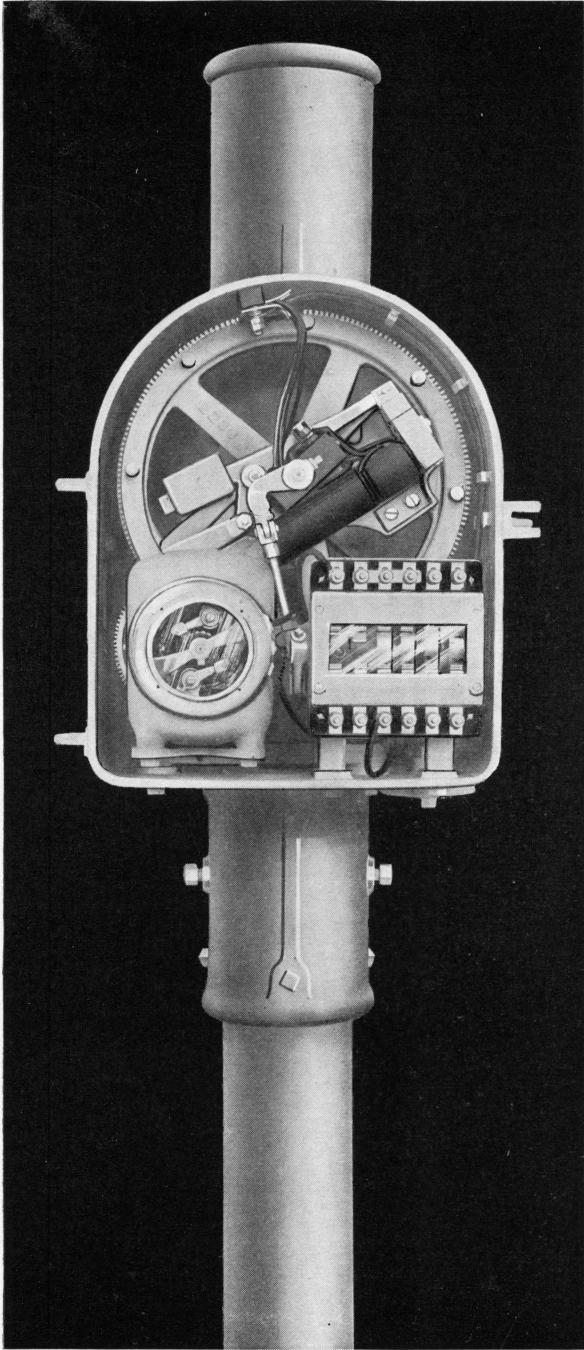
MODEL 5 THREE POSITION SIGNAL



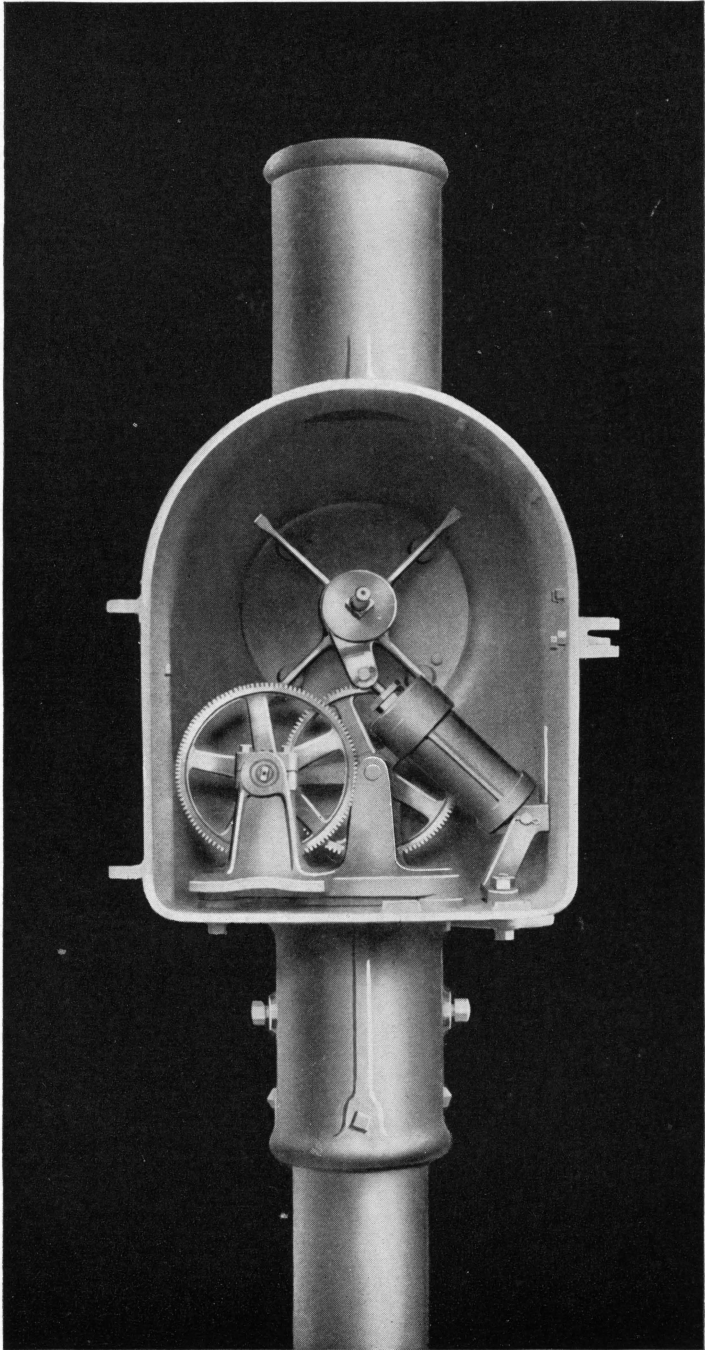
MODEL 5 THREE POSITION SIGNAL



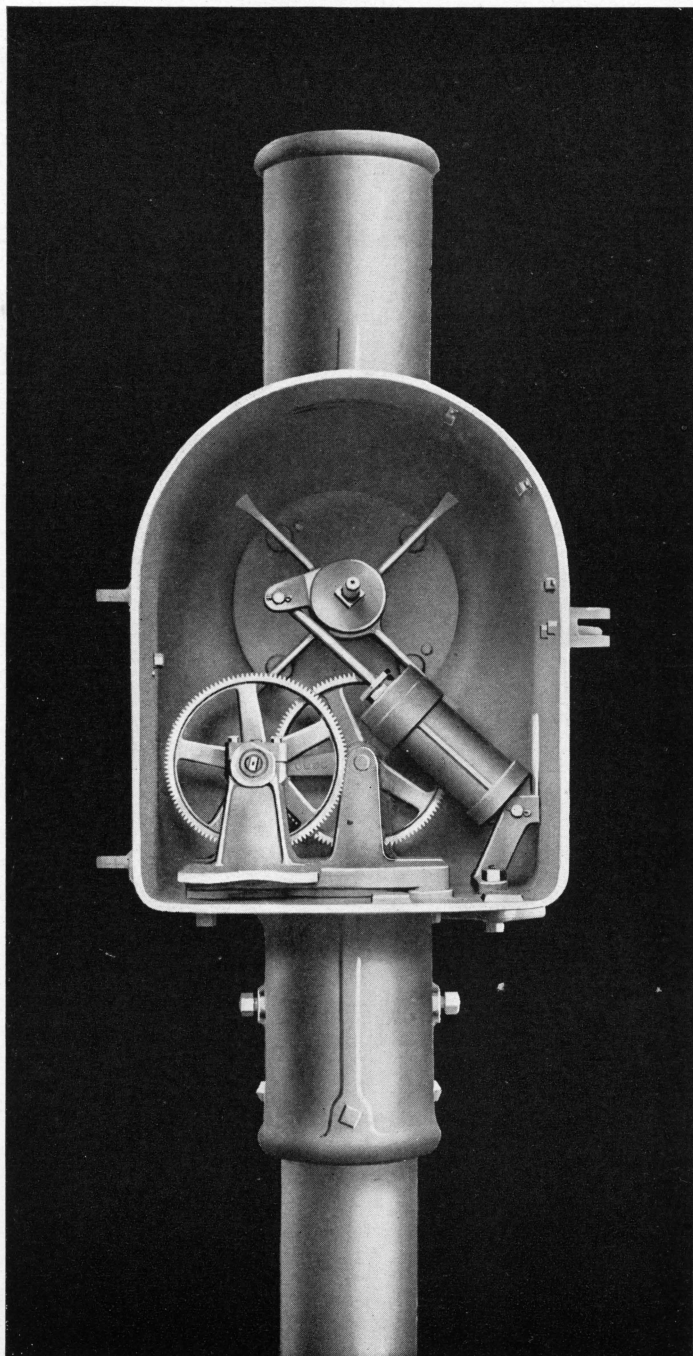
MODEL 5 THREE POSITION SIGNAL



MODEL 5 THREE POSITION SIGNAL, REAR VIEW



MODEL 5 THREE POSITION SIGNAL, SLOT RIG REMOVED



MODEL 5 THREE POSITION SIGNAL, SLOT RIG REMOVED

## MAINTENANCE OF MODEL 5 SIGNALS

**F**OR oiling bearings use *only the best grade of POLAR ICE MACHINE OIL.*

For replenishing the oil in the oil dash pot of the three-position signal, use *only the special non-freezing "NEUTRAL OIL" furnished by us for this purpose.*

Before oiling the dash pot and plunger, remove the plunger and thoroughly clean both pot and plunger, exercising care not to mar the surfaces.

The motor commutator should receive careful inspection, and should it become corroded it should be thoroughly cleaned with fine sand paper (never use emery), and a slight amount of oil applied with the tip of the finger or a rag.

When inspecting, care should be exercised to see that the commutator of the motor and circuit breaker contacts are clean; that all nuts are tight; that the dash pot is working properly; and that the slot levers and engaging rolls work freely.

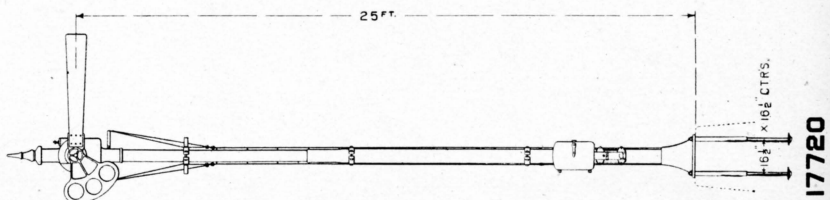
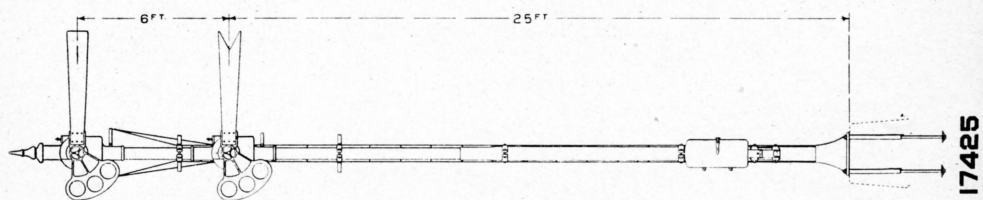
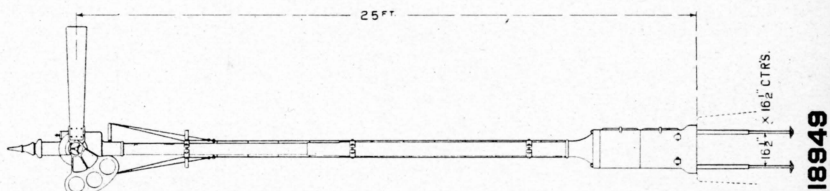
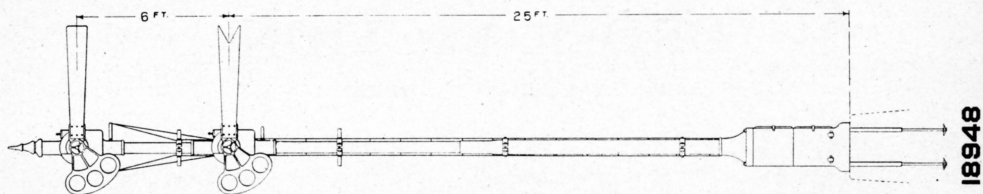
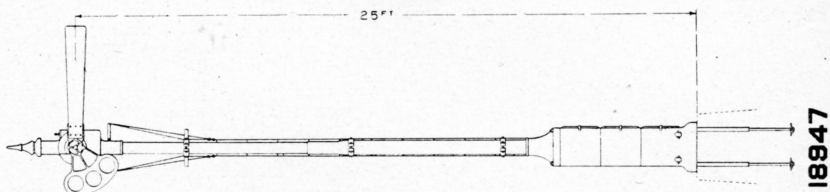
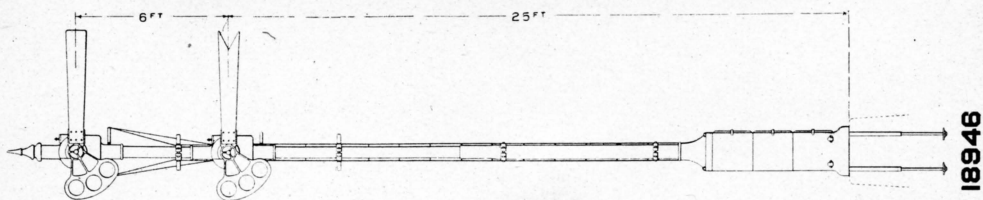
Oil holes are provided for all bearings, and the maintainer should be supplied with a can with a spout eight inches or more in length.

# **ORDER SECTION**

**ORDER BY NAME AND NUMBER**



### MODEL 5 TWO POSITION GROUND SIGNALS



## MODEL 5 TWO POSITION GROUND SIGNALS

Order No.	DESCRIPTION	List Price
17720	One Arm Ground Signal Complete as shown, with Single Relay Box, not including Relay, Lamp, or Roundels, . . . . .	\$332.00
17425	Two Arm Ground Signal Complete as shown, with Double Relay Box; not including Relay, Lamps, or Roundels, . . . . .	500.00
18949	One Arm Ground Signal Complete as shown, with Two Section Battery Case; not including Relay, Lamp, or Roundels, . . . . .	412.00
18948	Two Arm Ground Signal Complete as shown, with Two Section Battery Case; not including Relay, Lamps, or Roundels, . . . . .	580.00
18947	One Arm Ground Signal Complete as shown, with Three Section Battery Case; not including Relay, Lamp, or Roundels, . . . . .	452.00
18946	Two Arm Ground Signal Complete as shown, with Three Section Battery Case; not including Relay, Lamps, or Roundels, . . . . .	620.00
9500	Mechanism complete in Case, . . . . .	220.00
28446	Mechanism Pole and Ladder for Changing One Arm to Two Arm-Signal, . . . . .	244.00

NOTE:— Add \$15.00 to above prices for each 110 volt mechanism.

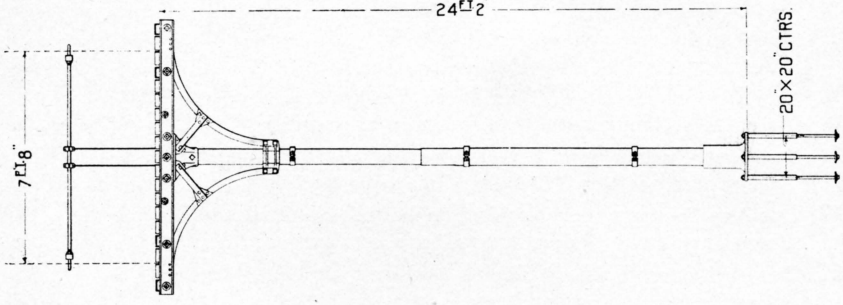
When ordering complete signals specify Spectacle and Lamp to be used.

Unless otherwise specified, Signals will be furnished 25 feet from base to center of first arm, and arms spaced 6 feet centers. Any departure from the above dimensions should be noted on order, and an additional charge will be made for same.

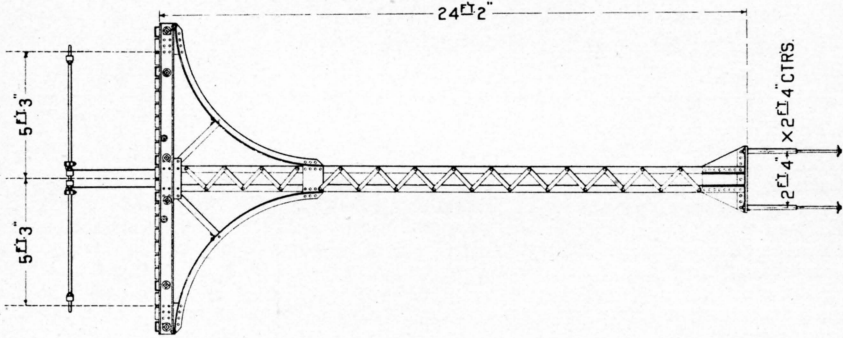
Battery cases are for local batteries, and the lower and intermediate sections will hold twelve cells of storage battery or eight cells of primary battery each. The upper section is wood-lined and provides ample room for four relays, with lightning arresters, terminals, etc.

Indication contacts and counters are not included in above prices. See prices listed on page 59.

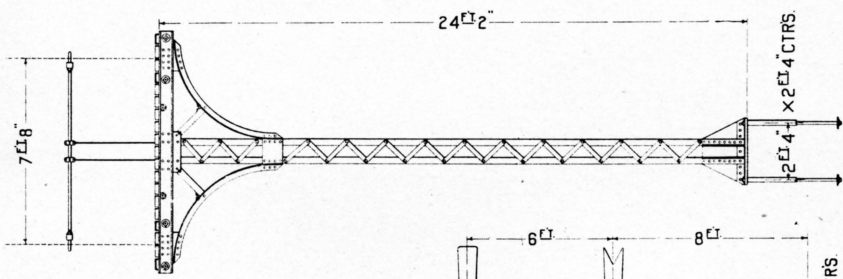
# MODEL 5 TWO AND THREE POSITION SIGNAL BRACKET POLES COMPLETE AND TWO POSITION BRIDGE OR BRACKET SIGNALS



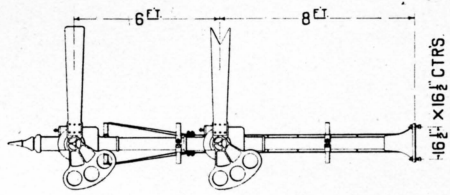
26618



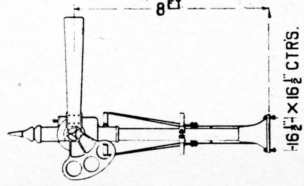
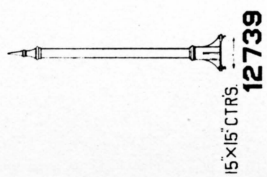
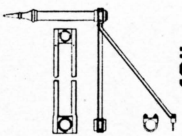
26617



26616



26615



26614

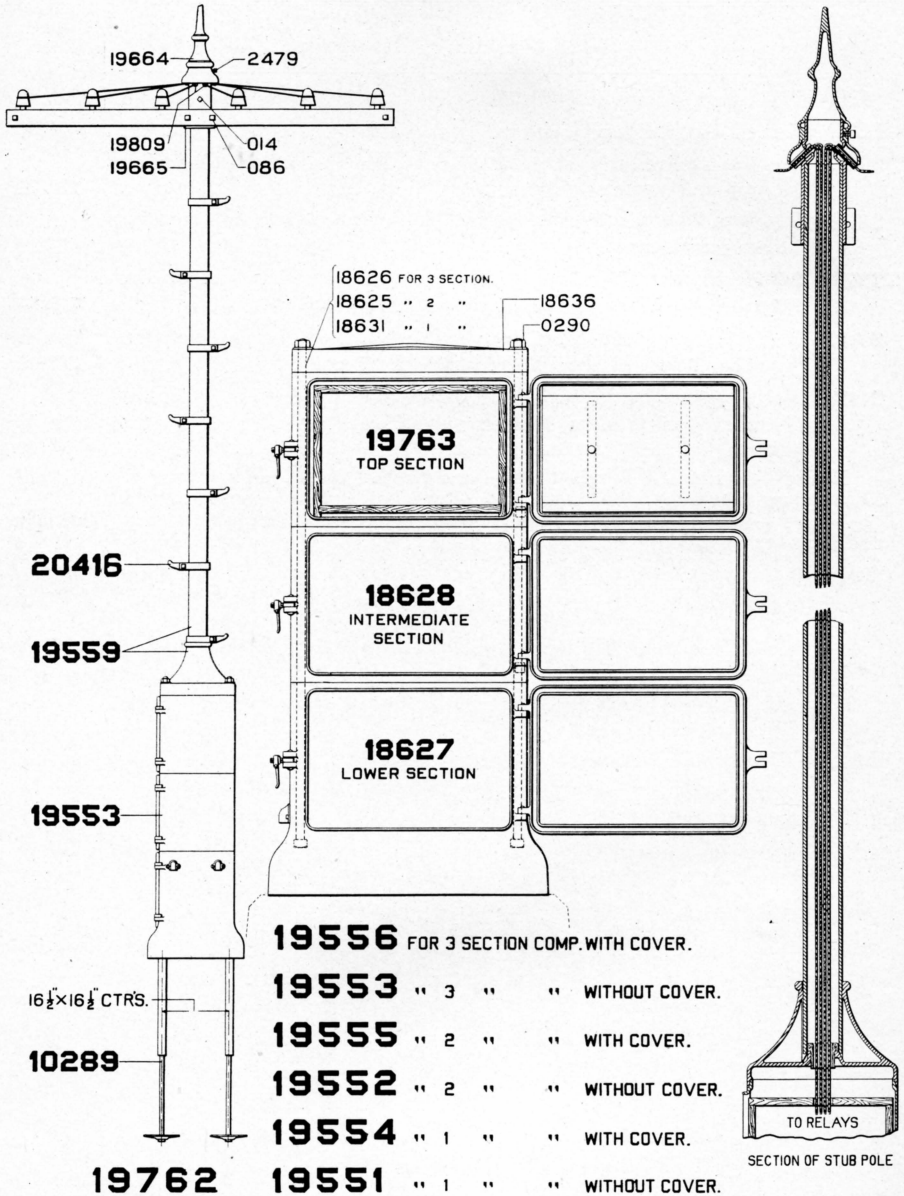
**MODEL 5 TWO AND THREE POSITION SIGNAL  
BRACKET POLES COMPLETE AND TWO  
POSITION BRIDGE OR BRACKET  
SIGNALS**

Order No.	DESCRIPTION	List Price
<b>4211</b>	Offset Bracket and Doll Complete, for 5 $\frac{9}{16}$ " O. D. Iron Ground Pole,	\$ 24.50
<b>12739</b>	Blank Doll Complete for use on Bracket Mast, . . . . .	20.00
<b>26614</b>	One Arm Bridge or Bracket Signal Complete as shown, not including Lamp or Roundels, . . . . .	268.00
<b>26615</b>	Two Arm Bridge or Bracket Signal Complete as shown; not including Lamps, or Roundels, . . . . .	436.00
<b>26616</b>	Lattice Bracket Mast Complete as shown (for two Signals), including Anchor Bolts, Ladder, Platform, and Hand Rail, . . . . .	320.00
<b>26617</b>	Lattice Bracket Mast Complete as shown (for three Signals), including Anchor Bolts, Ladder, Platform and Hand Rail, . . . . .	360.00
<b>26618</b>	Pipe Bracket Mast Complete as shown (for two Signals), including Anchor Bolts, Ladder, Platform, and Hand Rails, . . . . .	350.00

NOTE: — Bridge and Bracket Signals and Bracket Masts will be furnished to dimensions shown. Any departure from these dimensions should be noted on order.

NOTE: — When ordering Bridge or Bracket Signals Complete, specify Spectacle and Lamp to be used.

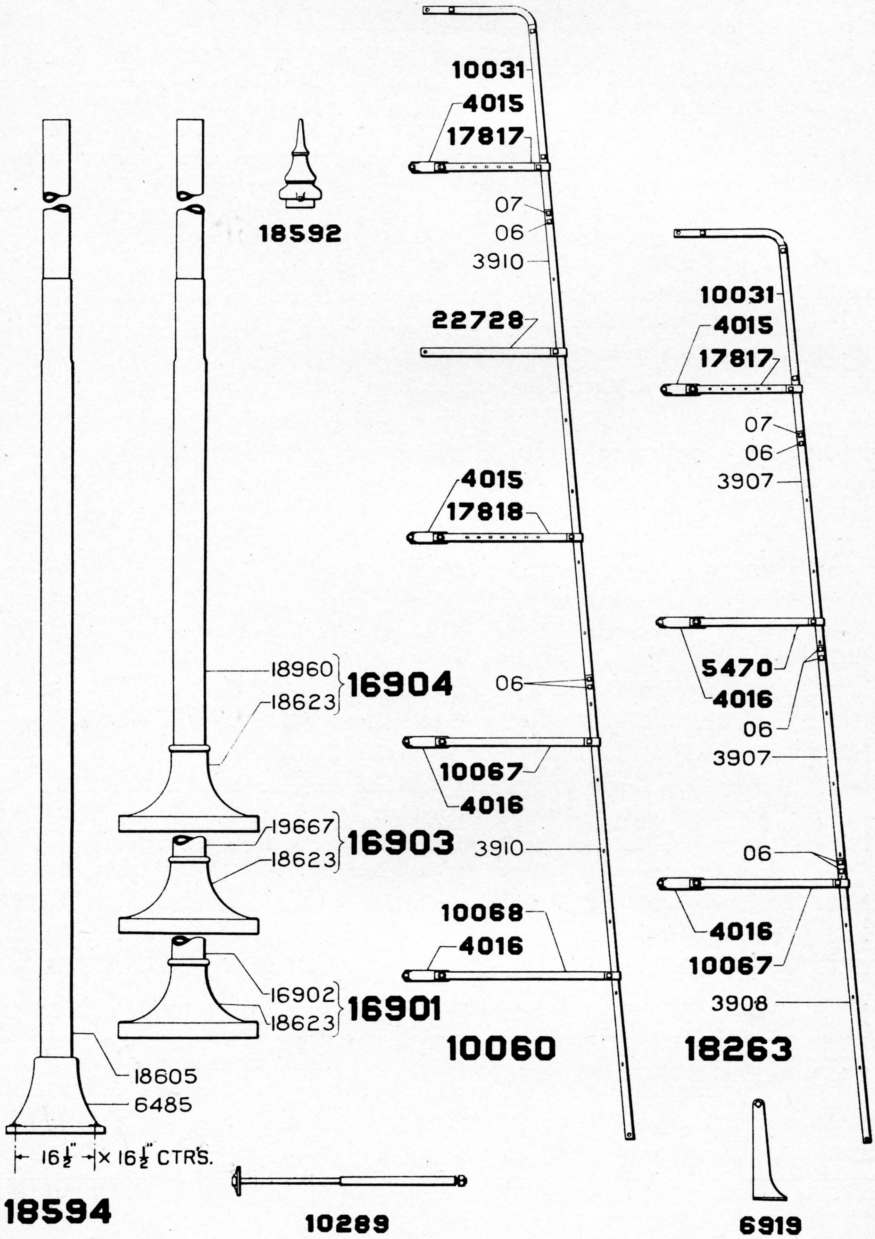
## MODEL 5 TWO AND THREE POSITION SIGNAL BATTERY AND RELAY CASES AND STUB POLE COMPLETE FOR CHARGING LINES



**MODEL 5 TWO AND THREE POSITION SIGNAL  
BATTERY AND RELAY CASES AND  
STUB POLE COMPLETE FOR  
CHARGING LINES**

Order No.	DESCRIPTION	List Price
19551	Battery Case, Lower Section Complete, with Bolts and Nuts, for Pole Socket or Cover, . . . . .	\$ 50.00
19552	Battery Case, Lower and Top Section Complete, with Bolts and Nuts, for Pole Socket or Cover, . . . . .	84.00
19553	Battery Case, Lower, Intermediate and Top Section Complete, with Bolts and Nuts for Pole Socket or Cover, . . . . .	110.00
19554	Battery Case, Lower Section Complete, with Cover, . . . . .	60.00
19555	Battery Case, Lower and Intermediate Section Complete, with Cover, . . . . .	94.00
19556	Battery Case, Lower, Intermediate, and Top Section Complete, with Cover, . . . . .	120.00
19762	Battery Case, Three Section, with Anchor Bolts, and Stub Pole Complete; Less Cross Arms and Line Insulators, for Charging Lines, . . . . .	174.00
014	Bolt and Nut, $\frac{1}{2}$ " x $6\frac{1}{2}$ ", for Cap to Pole, . . . . .	.07
086	Bolt and Nut, $\frac{3}{8}$ " x 12", for Cross Arms to Cap, . . . . .	.14
0290	Nut, 1" Hex., for Battery Case Bolts, . . . . .	.08
2479	Cap Screw, $\frac{1}{2}$ " 13 x 1" Sq. Hd., for Pinnacle, . . . . .	.05
10289	Foundation Bolt Complete, . . . . .	1.80
18625	Bolt and Nut, 1" x 43", for Two-Section Battery Case, . . . . .	.90
18626	Bolt and Nut, 1" x $62\frac{1}{4}$ ", for Three Section Battery Case, . . . . .	1.30
18627	Battery Case, Lower Section with Door and Hasp for use with Two or Three Section Battery Case Complete, . . . . .	44.00
18628	Battery Case, Intermediate Section, with Door and Hasp, for use with Three Section Battery Case Complete, . . . . .	30.00
18631	Bolt and Nut, 1" x $23\frac{3}{4}$ ", for Single Section Battery Case, . . . . .	.50
18636	Cover Only for Battery Case, . . . . .	10.00
19559	Pole Complete, with Socket and Bushing, for 19762, . . . . .	40.00
19664	Pinnacle for Stub Pole, . . . . .	2.50
19665	Cap supporting Cross Arms on 19762, . . . . .	5.00
19763	Battery or Relay Case, Top Section Wood Lined, with Door and Hasp for use with Two or Three Section Battery Case Complete, . . . . .	36.00
19809	Insulator, through Cap on Pole 19762, . . . . .	.10
20416	Step Complete for 19762, . . . . .	1.20

# POLES AND LADDERS FOR MODEL 5 TWO AND THREE POSITION SIGNALS

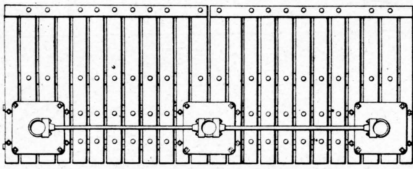


## POLES AND LADDERS FOR MODEL 5 TWO AND THREE POSITION SIGNALS

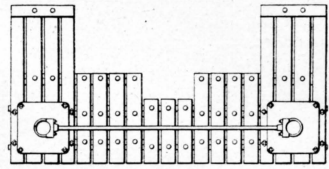
Order No.	DESCRIPTION	List Price
16901	Ground Pole for Single Section Battery Case 19551; 25 Feet from Base to Center of Arm, . . . . .	\$66.00
16903	Ground Pole for Two Section Battery Case 19552; 25 Feet from Base to Center of Arm, . . . . .	63.00
16904	Ground Pole for Three Section Battery Case 19558; 25 Feet from Base to Center of Arm, . . . . .	59.00
18594	Ground Pole; 25 Feet to Center of Arm, . . . . .	69.00
18263	Ladder and Platform Complete, for One Arm Ground Pole; 25 Feet from Base to Center of Arm, . . . . .	25.56
10060	Ladder and Platforms Complete, for Two Arm Ground Pole; 25 Feet Base to Center of First Arm, and 6 Feet Arm Centers, . . . . .	38.92
06	Bolt and Nut, $\frac{3}{8}$ " 16 x 1", for Ladder, . . . . .	.02
07	Bolt and Nut, $\frac{3}{8}$ " 16 x 1 $\frac{1}{4}$ ", for Ladder, . . . . .	.02
0175	Bolt and Nut, $\frac{3}{8}$ " 16 x 1 $\frac{1}{2}$ ", Anchor to Ladder, . . . . .	.03
3907	Straight Ladder Section, 6' 3" Long, . . . . .	2.20
3908	Straight Ladder Section, 8' 9" Long, . . . . .	3.00
3910	Straight Ladder Section, 13' 9" Long, . . . . .	4.90
4015	Ladder Clamp Complete, for 5 $\frac{9}{16}$ " O. D. Pole, . . . . .	.80
4016	Ladder Clamp Complete, for 6 $\frac{3}{8}$ " O. D. Pole, . . . . .	.90
5470	Brace Complete, 2' 9 $\frac{1}{4}$ " Center to Center, . . . . .	.42
6485	Base Only for 6" Ground Pole, . . . . .	18.00
6919	Anchor for Ladders, . . . . .	3.00
10031	Upper Hand Rail Complete, . . . . .	6.00
10067	Brace Complete, 3' 3" Center to Center, . . . . .	.48
10068	Brace Complete, 3' 9" Center to Center, . . . . .	.52
10289	Anchor Bolt Complete, 1" x 4' 0", . . . . .	1.80
16902	Pole Only, 5" and 6" x 21' 5 $\frac{1}{4}$ ", for 16901, . . . . .	42.00
17817	Platform Only, for One Arm Pole and Upper Arm of Two Arm Pole, . . . . .	4.40
17818	Platform Only, for Lower Arm of Two Arm Pole, . . . . .	4.80
18592	Pinnacle for 5" Pole, . . . . .	2.50
18605	Pole Only, 5" and 6", for 18594, . . . . .	48.00
18623	Socket Only for 6" Pole when used with Battery Case, . . . . .	20.00
18960	Pole Only, 5" and 6", for 16904, . . . . .	35.00
19667	Pole Only, 5" and 6", for 16903, . . . . .	39.00
22728	Lower Hand Rail Complete, . . . . .	.94
BELOW ARE PARTS REQUIRED FOR CHANGING LADDER FROM ONE ARM POLE TO LADDER FOR TWO ARM POLE.		
06	Bolt and Nut, $\frac{3}{8}$ " 16 x 1", for Ladder Section, . . . . .	.02
07	Bolt and Nut, $\frac{3}{8}$ " 16 x 1 $\frac{1}{4}$ ", for Ladder Section, . . . . .	.02
3907	Straight Ladder Section, 6' 3", . . . . .	2.20
4015	Ladder Clamp, for 5 $\frac{9}{16}$ " O. D. Pole, . . . . .	.80
10068	Ladder Brace, 3' 9" Center to Center, . . . . .	.52
17818	Platform Only, 2' 11 $\frac{3}{8}$ ", for Lower Arm, . . . . .	4.40
22728	Lower Hand Rail Complete, . . . . .	.94



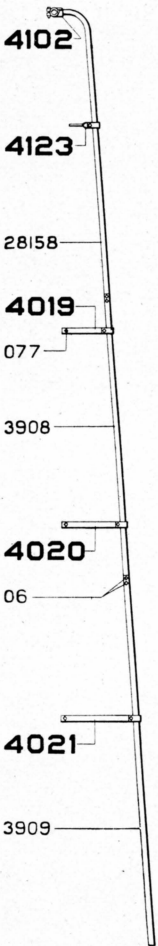
# MODEL 5 TWO OR THREE POSITION SIGNAL LADDERS AND PLATFORMS FOR BRACKET POLES



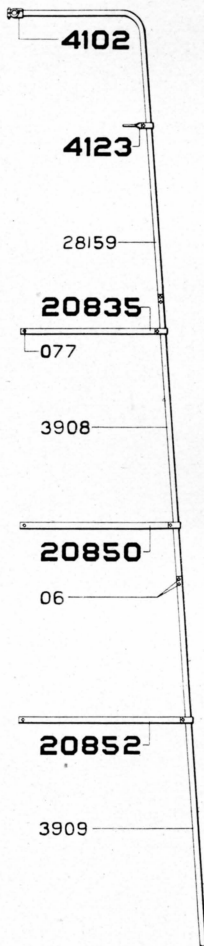
**20824**



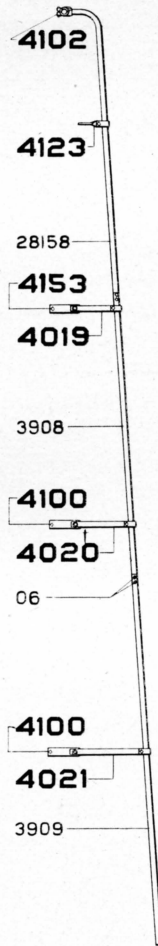
**20822  
28162**



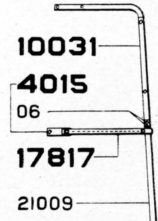
**28156**



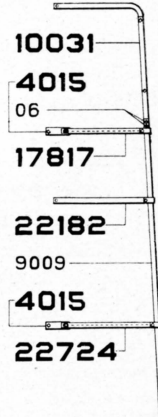
**28157**



**28163**



**21006**

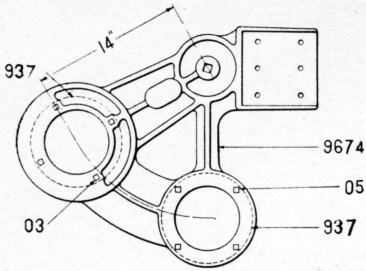


**28073**

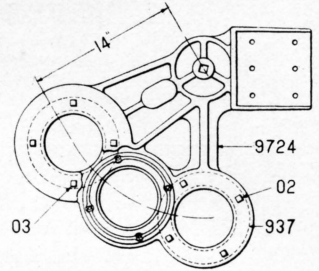
## MODEL 5 TWO OR THREE POSITION SIGNAL LADDERS AND PLATFORMS FOR BRACKET POLES

Order No.	DESCRIPTION	List Price
<b>21006</b>	Ladder Complete for One Arm Bridge or Bracket Pole, 8' 0" Base to Center of Arm, . . . . .	\$ 12.40
<b>28073</b>	Ladder Complete, for Two Arm Bridge or Bracket Pole, 8' 0" Base to Center of First Arm and 6' 0" Arm Centers, . . . . .	21.00
<b>28156</b>	Ladder Complete for Bracket Mast 26616, . . . . .	14.70
<b>28157</b>	Ladder Complete for Bracket Mast 26617, . . . . .	17.50
<b>28163</b>	Ladder Complete for Bracket Mast 26618, . . . . .	17.70
<b>20822</b>	Platform Complete for Bracket Mast 26616, . . . . .	35.00
<b>20824</b>	Platform Complete for Bracket Mast 26617, . . . . .	58.00
<b>28162</b>	Platform Complete for Bracket Mast 26618, . . . . .	35.00
<b>06</b>	Bolt and Nut, $\frac{3}{8}$ " 16 x 1", for Ladder Section, . . . . .	.02
<b>077</b>	Bolt and Nut, $\frac{1}{2}$ " 13 x $1\frac{1}{4}$ ", for fastening Brace to Mast, . . . . .	.04
<b>3908</b>	Straight Ladder Section, 8' 9" Long, . . . . .	3.00
<b>3909</b>	Straight Ladder Section, 11' 3" Long, . . . . .	4.00
<b>4015</b>	Ladder Clamp Complete for 5 $\frac{9}{16}$ " O. D. Iron Pole, . . . . .	.80
<b>4019</b>	Brace Complete, 1' 3 $\frac{3}{8}$ " Center to Center, . . . . .	.28
<b>4020</b>	Brace Complete, 1' 8 $\frac{3}{8}$ " Center to Center, . . . . .	.30
<b>4021</b>	Brace Complete, 2' 2 $\frac{1}{8}$ " Center to Center, . . . . .	.36
<b>4100</b>	Ladder Clamp Complete for 8 $\frac{5}{8}$ " O. D. Iron Pole, . . . . .	1.10
<b>4102</b>	Clamp Complete, holding Top of Ladder to Hand Rail, for Bracket Poles, . . . . .	.30
<b>4123</b>	Brace Complete, 9 $\frac{3}{8}$ " Center to Center, . . . . .	.22
<b>4153</b>	Ladder Clamp Complete for 7 $\frac{5}{8}$ " O. D. Iron Pole, . . . . .	1.00
<b>9009</b>	Straight Ladder Section, 9' 0" Long, . . . . .	3.30
<b>10031</b>	Upper Hand Rail Complete, . . . . .	6.00
<b>17817</b>	Platform Only, 2' 5 $\frac{3}{4}$ ", for Upper Arm of Two Arm Pole, . . . . .	4.40
<b>20835</b>	Brace Complete, 4' 2 $\frac{3}{8}$ " Center to Center, . . . . .	.56
<b>20850</b>	Brace Complete, 4' 7 $\frac{3}{8}$ " Center to Center, . . . . .	.60
<b>20852</b>	Brace Complete, 5' 1 $\frac{1}{2}$ " Center to Center, . . . . .	.66
<b>21009</b>	Bottom Section Ladder, 2' 11 $\frac{1}{2}$ " Long, . . . . .	1.20
<b>22182</b>	Lower Hand Rail Complete, 2' 10" Center to Center, . . . . .	.90
<b>22724</b>	Platform Only, 2' 9 $\frac{1}{4}$ ", for Lower Arm of Two Arm Pole, . . . . .	4.66
<b>28158</b>	Top Section Ladder for Two Doll Bracket Pole, . . . . .	3.56
<b>28159</b>	Top Section Ladder for Three Doll Bracket Pole, . . . . .	4.56

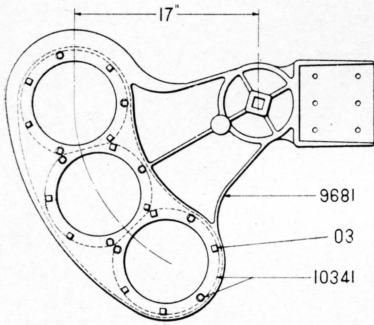
**MODEL 5 TWO POSITION SIGNAL SPECTACLES**



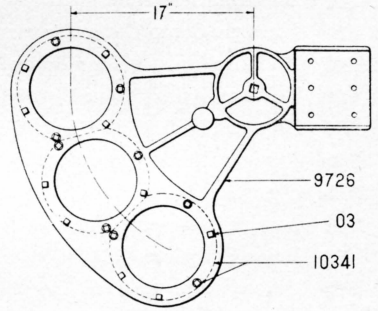
**9700-60°**



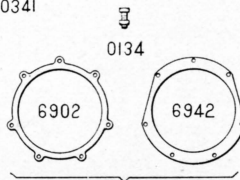
**9725-60°**



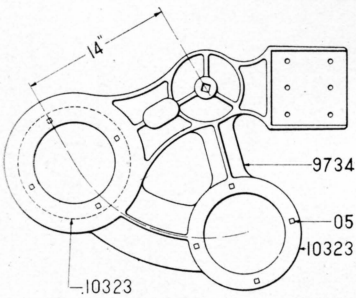
**9711-60°**



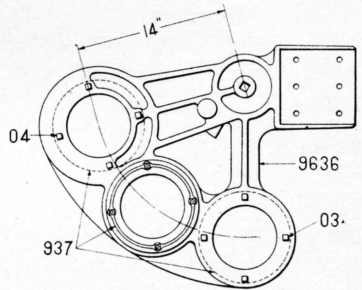
**9727-60°**



**10341**



**9735-75°**

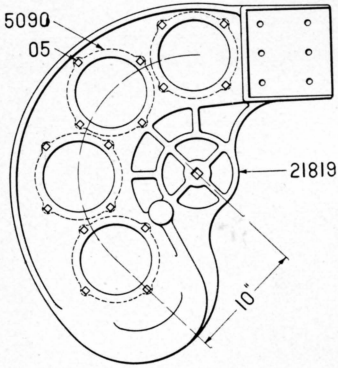


**9714-75°**

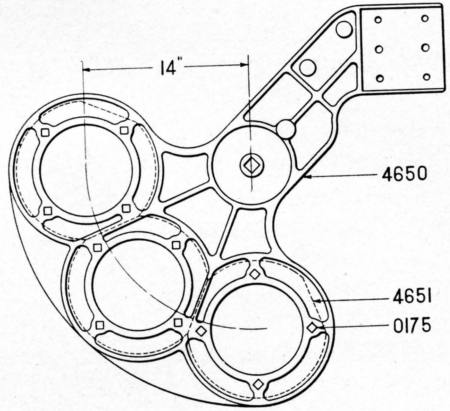
## MODEL 5 TWO POSITION SIGNAL SPECTACLES

Order No.	DESCRIPTION	List Price
<b>9700</b>	Spectacle Complete, Two Light, 60°, 14" Centers, takes 6½" Glass, .	\$ 5.40
<b>9711</b>	Spectacle Complete, Three Light, 60°, 17" Centers, takes 8⅜" Glass, .	6.20
<b>9714</b>	Spectacle Complete, Three Light, 75°, 14" Centers, takes 6½" Glass, .	5.40
<b>9725</b>	Spectacle Complete, Three Light, 60°, 14" Centers, takes 6½" Glass, .	6.40
<b>9727</b>	Spectacle Complete, Three Light, 60°, 17" Centers, takes 8⅜" Glass, .	6.00
<b>9735</b>	Spectacle Complete, Two Light, 75°, 14" Centers, takes 8⅜" Glass, .	6.00
<b>02</b>	Bolt and Nut, ¼" x 1", . . . . .	.02
<b>03</b>	Bolt and Nut, ¼" x 1½", . . . . .	.02
<b>04</b>	Bolt and Nut, ¼" x 1¾", . . . . .	.02
<b>05</b>	Bolt and Nut, ¼" x 1¼", . . . . .	.02
<b>0134</b>	Bolt and Nut, ¼" x ¾", . . . . .	.02
<b>937</b>	Bezel Ring for 9700, 9714, and 9725, . . . . .	.16
<b>6902</b>	Ring Only for Spectacles 9711 and 9727, . . . . .	.16
<b>6842</b>	Bezel Ring (Sheet Metal) for Spectacles 9711 and 9727, . . . . .	.30
<b>9636</b>	Spectacle Casting Only for 9714, . . . . .	4.80
<b>9674</b>	Spectacle Casting Only for 9700, . . . . .	4.80
<b>9681</b>	Spectacle Casting Only for 9711, . . . . .	4.20
<b>9724</b>	Spectacle Casting Only for 9725, . . . . .	4.20
<b>9726</b>	Spectacle Casting Only for 9727, . . . . .	4.00
<b>9734</b>	Spectacle Casting Only for 9735, . . . . .	4.80
<b>10323</b>	Bezel Ring for Spectacle 9735, . . . . .	.20
<b>10341</b>	Bezel Ring Complete for Spectacle 9711 and 9727, . . . . .	.60

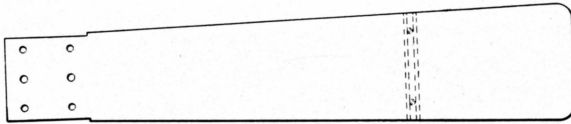
# MODEL 5 TWO POSITION SIGNAL SPECTACLES AND BLADES



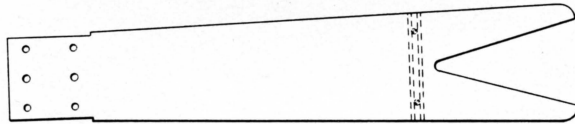
**22370-90°**



**4649-90°**



5946 - 4'-0"  
9797 - 4'-6"



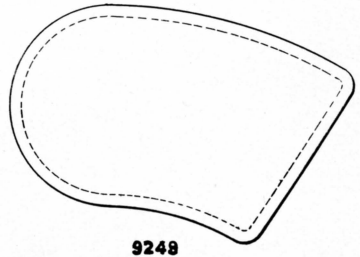
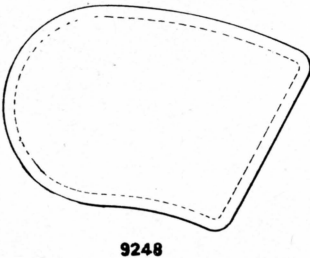
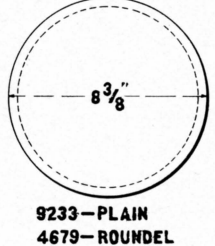
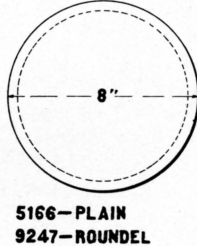
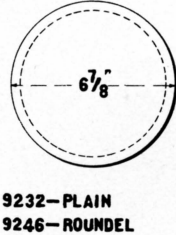
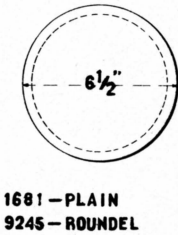
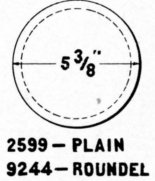
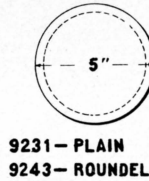
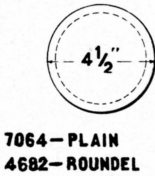
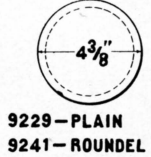
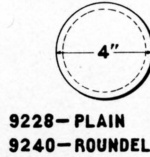
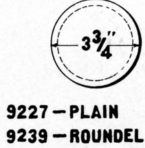
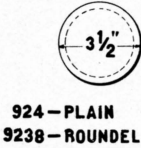
5947 - 4'-0"  
9798 - 4'-6"

## MODEL 5 TWO POSITION SIGNAL SPECTACLES AND BLADES

Order No.	DESCRIPTION	List Price
4649	Spectacle Complete, Three Light, 90°, 14" Centers, takes 8 $\frac{3}{8}$ " Glass, .	\$8.68
22370	Spectacle Complete, Universal, 90°, 10" Centers, takes 6 $\frac{1}{2}$ " Glass, . .	9.50
05	Bolt and Nut, $\frac{1}{4}$ " x 1 $\frac{1}{4}$ ", . . . . .	.02
0175	Bolt and Nut, $\frac{3}{8}$ " x 1 $\frac{1}{2}$ ", . . . . .	.03
1671	Bolt and Nut, $\frac{3}{8}$ " x 1 $\frac{3}{8}$ ", for Semaphore Blades, . . . . .	.05
4650	Spectacle Casting Only, for 4649, . . . . .	7.50
4651	Bezel Ring for Spectacle 4649, . . . . .	.30
5090	Bezel Ring for Spectacle 22370, . . . . .	.12
5946	4' 0" Ash Blade for Home Signal, . . . . .	1.76
5947	4' 0" Ash Blade for Distant Signal, . . . . .	1.76
9797	Ash Blade for Home Signal, 4' 6" long, . . . . .	1.76
9798	Ash Blade for Distant Signal, 4' 6" long, . . . . .	1.76
10318	Plate Washer for Blades, . . . . .	.12
21819	Universal Spectacle Casting Only, . . . . .	9.00

NOTE:—When ordering Semaphore Circles or Roundels, specify color.

# DOUBLE THICK PLAIN SEMAPHORE CIRCLES AND SOLID COLOR MOULDED SEMAPHORE ROUNDELS



## DOUBLE THICK PLAIN SEMAPHORE CIRCLES

Order No.	Diameter	Flashed Red	Pot Metal Green	Pot Metal Yellow	Pot Metal Blue	Pot Metal Purple	Clear
7066	2 $\frac{3}{8}$ "	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10	\$0.04
9226	2 $\frac{1}{2}$ "	.10	.10	.10	.10	.10	.04
1680	2 $\frac{7}{8}$ "	.12	.12	.12	.12	.12	.05
2600	3 "	.12	.12	.12	.12	.12	.05
924	3 $\frac{1}{2}$ "	.14	.14	.14	.14	.14	.06
9227	3 $\frac{3}{4}$ "	.14	.14	.14	.14	.14	.06
9228	4 "	.16	.16	.16	.16	.16	.07
9229	4 $\frac{3}{8}$ "	.17	.17	.17	.17	.17	.08
7064	4 $\frac{1}{2}$ "	.18	.18	.18	.18	.18	.08
9230	4 $\frac{3}{4}$ "	.20	.20	.20	.20	.20	.10
9231	5 "	.22	.22	.22	.22	.22	.10
2599	5 $\frac{3}{8}$ "	.25	.25	.25	.25	.25	.11
1681	6 $\frac{1}{2}$ "	.32	.32	.32	.32	.32	.12
9232	6 $\frac{7}{8}$ "	.36	.36	.36	.36	.36	.14
5166	8 "	.45	.45	.45	.45	.45	.20
9233	8 $\frac{3}{8}$ "	.50	.50	.50	.50	.50	.20

## SOLID COLOR MOULDED SEMAPHORE ROUNDELS

Order No.	Diameter	Red	Green	Yellow	Blue	Purple	Clear
9234	2 $\frac{3}{8}$ "	\$0.38	\$0.19	\$0.19	\$0.19	\$0.19	\$0.12
9235	2 $\frac{1}{2}$ "	.38	.19	.19	.19	.19	.12
9236	2 $\frac{7}{8}$ "	.48	.24	.24	.24	.24	.14
9237	3 "	.48	.24	.24	.24	.24	.14
9238	3 $\frac{1}{2}$ "	.58	.29	.29	.29	.29	.19
9239	3 $\frac{3}{4}$ "	.58	.34	.34	.34	.34	.24
9240	4 "	.58	.34	.34	.34	.34	.24
9241	4 $\frac{3}{8}$ "	.67	.38	.38	.38	.38	.26
4682	4 $\frac{1}{2}$ "	.67	.38	.38	.38	.38	.26
9242	4 $\frac{3}{4}$ "	.72	.48	.48	.48	.48	.31
9243	5 "	.72	.48	.48	.48	.48	.31
9244	5 $\frac{3}{8}$ "	.72	.48	.48	.48	.48	.34
9245	6 $\frac{1}{2}$ "	1.20	.67	.67	.67	.67	.48
9246	6 $\frac{7}{8}$ "	1.32	.72	.72	.72	.72	.53
9247	8 "	1.80	1.20	1.20	1.20	1.20	.60
4679	8 $\frac{3}{8}$ "	1.80	1.20	1.20	1.20	1.20	.60
9248		3.60	1.80	1.80	1.80	1.80	. .
9249		4.20	2.11	2.11	2.11	2.11	. .

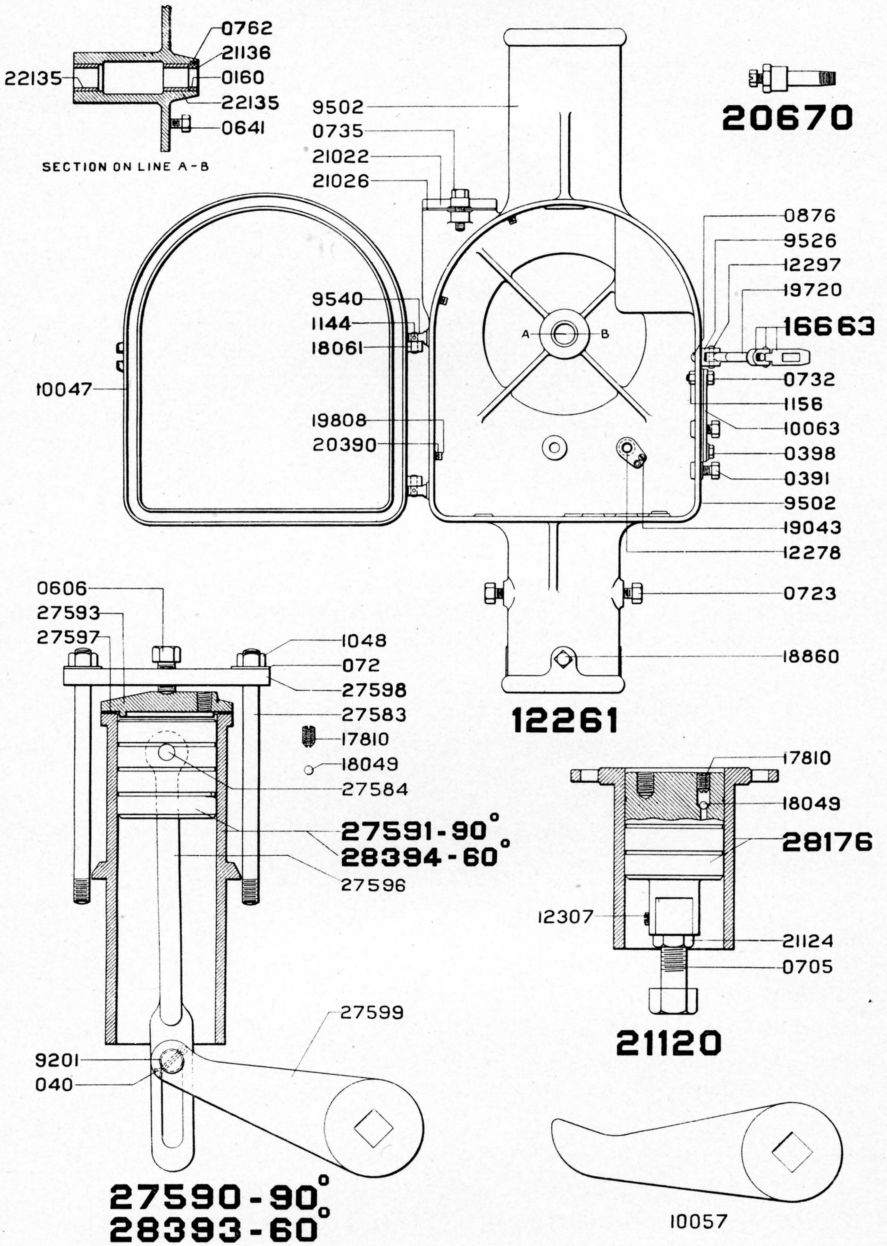


## MODEL 5 TWO POSITION SIGNAL MAIN SHAFTS AND STOP PLATES

LIST OF SPECTACLES WITH CORRESPONDING MAIN SHAFTS AND  
STOP PLATES

Spectacle	Takes Main Shaft	Shaft List Price	Takes Stop Plate	Stop Plate List Price
<b>4649</b> 3 Light 90°	. . . .	. . . .	. . . .	. . . .
<b>9700</b> 2 Light 60°	9536	\$5.00	20287	\$2.50
<b>9711</b> 3 Light 60°	19049	5.00	15930	2.50
<b>9712</b> 3 Light 75°	19722	6.00	9511	2.50
<b>9714</b> 3 Light 75°	20949	6.00	9511	2.50
<b>9725</b> 3 Light 60°	9536	5.00	20287	2.50
<b>22370</b> 3 Light 90°	9535	5.00	9512	2.50

# MODEL 5 TWO POSITION SIGNAL CASE AND DASH POTS



## MODEL 5 TWO POSITION SIGNAL CASE AND DASH POTS

Order No.	DESCRIPTION	List Price
12261	Case Complete, . . . . .	\$51.00
20670	Vent Complete for Dash Pot, . . . . .	1.00
21120	Buffer Dash Pot Complete with Piston, for 60° or 75° Signals, . . . . .	22.00
27590	Pull Back Dash Pot Complete with Fittings for 90° Signal, . . . . .	37.50
28393	Pull Back Dash Pot Complete with Fittings for 60° Signal, . . . . .	37.50
28394	Dash Pot Cylinder and Piston for 28393, . . . . .	23.00
27591	Dash Pot Cylinder and Piston Complete for 27590, . . . . .	23.00
28176	Dash Pot Cylinder and Piston Complete for 21120, . . . . .	21.50
040	Cotter Pin, $\frac{1}{8}$ " x 1" for Pin 9201, . . . . .	.008
072	Iron Washer, $\frac{1}{2}$ " for Stud 27583, . . . . .	.01
0160	Packing for Bearing for Main Shaft, . . . . .	.02
0391	Tap Bolt, $\frac{1}{2}$ " 13 x 1" Hex. Hd., Lamp Bracket to Case, . . . . .	.02
0398	Tap Bolt, $\frac{3}{8}$ " 16 x $\frac{3}{4}$ " Hex. Hd., for Oil Hole Cover, . . . . .	.02
0606	Cap Screw, $\frac{1}{2}$ " x 1" Hex. Hd., Yoke to Cap on Pull Back Dash Pot, . . . . .	.04
0641	Tap Bolt, $\frac{1}{2}$ " 13 x 1 $\frac{1}{4}$ " Hex. Hd., Stop Plate to Case, . . . . .	.04
0705	Tap Bolt, $\frac{3}{4}$ " x 3" Hex. Hd., for Dash Pot 21120, . . . . .	.06
0723	Tap Bolt, $\frac{5}{8}$ " 11 x $\frac{3}{4}$ " Hex. Hd., Ladder to Case, . . . . .	.03
0732	Tap Bolt, $\frac{3}{8}$ " 16 x 1 $\frac{1}{4}$ " Hex. Hd., Oil Hole Cover to Case, . . . . .	.02
0735	Tap Bolt, $\frac{1}{2}$ " 13 x 2" Hex. Hd., Cover 21022 to Case, . . . . .	.03
0762	Screw, No. 6 32 x $\frac{5}{16}$ " Flat Hd., Brass, for Ring 21136 to Case, . . . . .	.01
0876	Rivet, $\frac{5}{16}$ " x $\frac{7}{8}$ " Bracket 9526 to Case, . . . . .	.01
1048	Nut, $\frac{1}{2}$ " 13 Hex., Steel, for Stud 27583, . . . . .	.03
1144	Pin, $\frac{1}{8}$ " x 1 $\frac{1}{8}$ " for Hinge Pin, . . . . .	.04
1156	Nut, $\frac{3}{8}$ " 16 Hex., for Screw 0732, . . . . .	.02
9201	Pin, Crank 27599 to Rod 27596, . . . . .	.07
9502	Case Only for 12261, . . . . .	40.00
9526	Bracket for Hasp, . . . . .	.24
9540	Post for Door Hinge, . . . . .	.60
10047	Door for Signal Case, . . . . .	5.00
10057	Buffer Crank for Operating Dash Pot 21120, . . . . .	3.00
10063	Cover for Oil Hole on Signal Case, . . . . .	.30
12278	Bushing for Pinion, . . . . .	1.00
12297	Pin for Hasp Screw to Bracket 9526, . . . . .	.02
12307	Screw, $\frac{3}{8}$ " 16 x $\frac{1}{2}$ " Headless, for Dash Pot 21120, . . . . .	.05
16663	Hasp with Nut and Pin, . . . . .	.80
17810	Check Screw for Dash Pot 27590, . . . . .	.20
18049	Vent Ball for Dash Pot 27590, . . . . .	.01

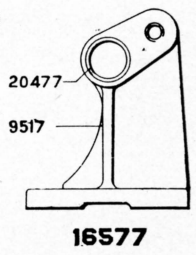
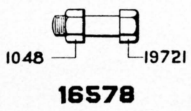
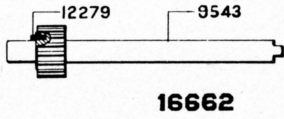
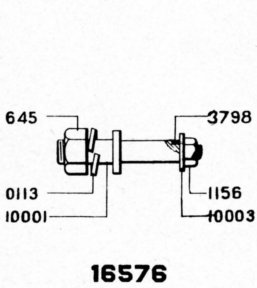
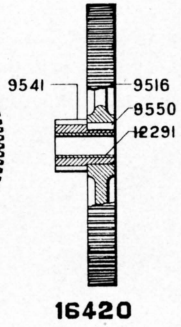
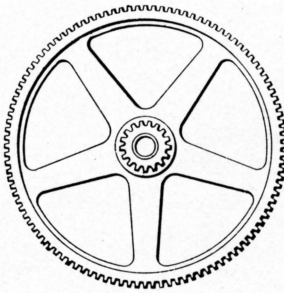
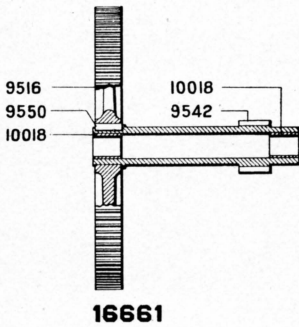
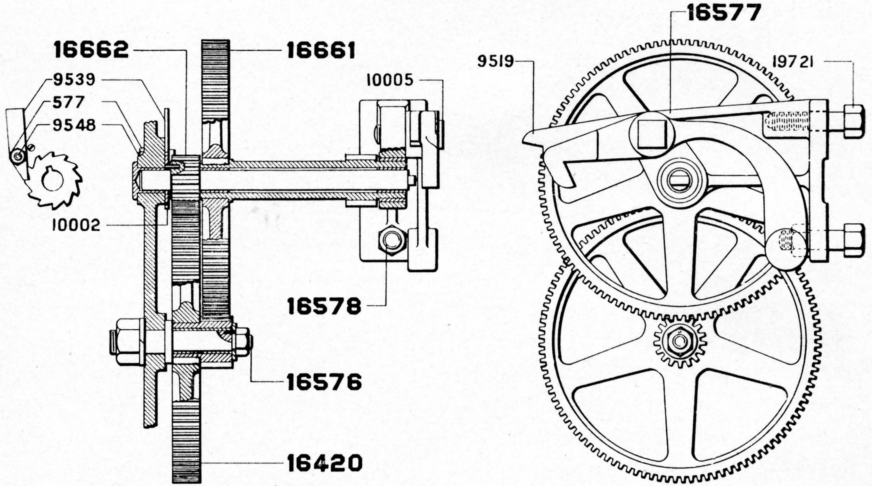
## MODEL 5 TWO POSITION SIGNAL CASE AND DASH POTS

Order No.	DESCRIPTION	List Price
18061	Pin for Hinge, . . . . .	\$ .10
18860	Set Screw, $\frac{5}{8}$ " 11 x $1\frac{1}{4}$ ", for Signal Case to Pole, . . . . .	.04
19043	Screw, supporting Stop for Ratchet Dog, . . . . .	.05
19720	Hasp Screw for Door Lock, . . . . .	.80
19808	Cleat for Wiring in Signal Case, . . . . .	.20
20390	Screw, No. 10 32 x $\frac{3}{8}$ " Rd. Hd., Brass, for Cleat 19808 to Signal Case,	.02
21022	Cover for Dash Pot, 21120, . . . . .	1.00
21026	Gasket for Dash Pot 21120, . . . . .	.20
21124	Nut, $\frac{3}{4}$ " for Bolt 0705, . . . . .	.08
21136	Ring for Retaining Packing for Main Shaft, . . . . .	.20
22135	Bushing for Main Shaft Bearing, . . . . .	1.10
27583	Stud, Cap to Case for Dash Pot 27590, . . . . .	.20
27584	Pin, $\frac{1}{2}$ " x $2\frac{3}{4}$ ", Operating Rod to Piston in Dash Pot 27590, . . . . .	.08
27593	Cap for Cylinder, for 27590, . . . . .	1.20
27596	Operating Rod for 27590, . . . . .	4.00
27597	Gasket for Dash Pot 27590, . . . . .	.20
27598	Yoke for Dash Pot 27590, . . . . .	1.30
27599	Crank for Dash Pot 27590, . . . . .	6.00
	Felt Strip for Door, . . . . .	.60

NOTE: — For Stop Plates see list of Spectacles, Main Shafts, etc., on page 51.

NOTE: — When ordering Lamp Brackets, give number or Spectacle and style of Lamp.

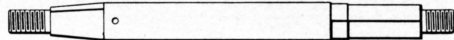
# MODEL 5 TWO POSITION SIGNAL BEARING AND INTERMEDIATE GEARS



## MODEL 5 TWO POSITION SIGNAL BEARING AND INTERMEDIATE GEARS

Order No.	DESCRIPTION	List Price
16576	Stud Complete for Intermediate Gear 16660, . . . . .	\$ 2.20
16577	Bearing Complete for Gearing, . . . . .	4.00
16420	Intermediate Gear Complete, first reduction, . . . . .	9.80
16661	Intermediate Gear Complete, second reduction, . . . . .	12.70
16662	Driving, Pinion Complete, . . . . .	5.04
0113	Lock Washer, $\frac{5}{8}$ " for Stud 10001, . . . . .	.02
577	Nut for Screw 9548, . . . . .	.02
645	Nut, Hex. $\frac{3}{8}$ " 11, for Stud 10001, . . . . .	.04
1048	Nut for Bolt 19721, . . . . .	.03
1156	Nut, Hex., $\frac{3}{8}$ " 16, for Stud 10001, . . . . .	.02
3798	Key for Washer 10003, . . . . .	.02
9516	Gear Only (Intermediate), . . . . .	6.00
9517	Bearing Only, . . . . .	3.20
9519	Locking Dog, . . . . .	3.00
9539	Dog for Ratchet, . . . . .	.20
9541	Pinion, Intermediate, for 16660 Comp., . . . . .	2.80
9542	Pinion, Main, for 16661 Comp., . . . . .	5.50
9543	Pinion, Driving, for 16662 Comp., . . . . .	5.00
9548	Screw, for Ratchet Dog, . . . . .	.10
9550	Key for Gear to Pinion, . . . . .	.04
10001	Stud Only for 16576, . . . . .	1.20
10002	Ratchet Wheel, $\frac{1}{8}$ " x $1\frac{3}{4}$ ", 12 teeth, . . . . .	1.00
10003	Washer for Intermediate Gear, . . . . .	.06
10005	Stud for Locking Dog 9519, . . . . .	.30
10018	Bushing for Main Pinion, . . . . .	.60
12279	Pin for Pinion 16662, . . . . .	.02
12291	Bushing for Pinion 9541, . . . . .	1.00
16578	Bolt and Nut, Bearing 16577 to Case, . . . . .	.15
19721	Cap Screw (Special), Bearing 16577 to Case, . . . . .	.12
20477	Bushing for Bearing 16577, . . . . .	.80

# MODEL 5 TWO POSITION SIGNAL SLOT RIG

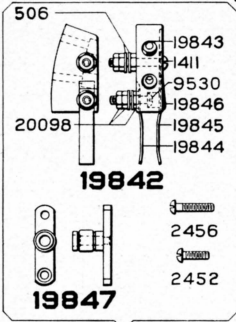
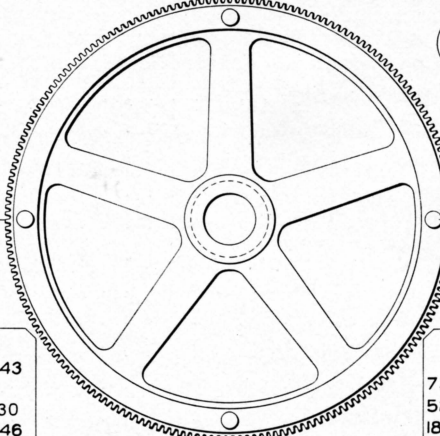


FOR MAIN SHAFT SEE LIST OF SPECTACLES, PAGE 51



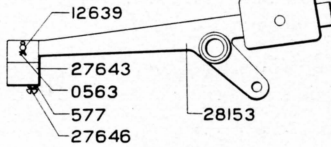
9513 FOR 60°  
9514 " 75°  
9515 " 90°

ROLLER 12296  
STUD 10006

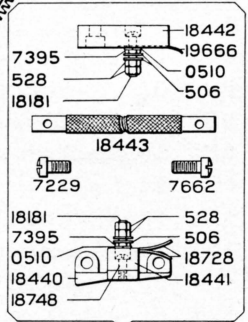


**19841**

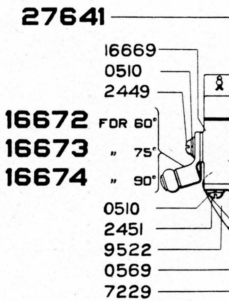
**12293** 60° 5 ROLLERS  
**12294** 75° 4 "  
**12295** 90° 3 "



**27641**



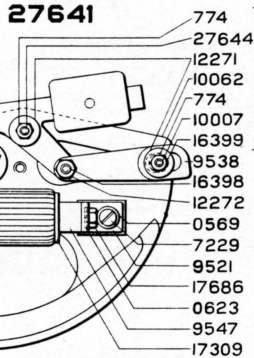
**18866**



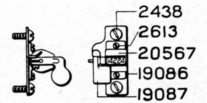
**28150** FOR 60°

**28151** FOR 75°

**28152** FOR 90°



**26593**



**20628**

## MODEL 5 TWO POSITION SIGNAL SLOT RIG

Order No.	DESCRIPTION	List Price
<b>12293</b>	Main Gear Complete for 60° Signals, . . . . .	\$16.50
<b>12294</b>	Main Gear Complete for 75° Signals, . . . . .	16.00
<b>12295</b>	Main Gear Complete for 90° Signals, . . . . .	15.50
<b>16672</b>	Bracket Complete, operating Circuit Breaker for 60° Signals, . . . . .	1.50
<b>16673</b>	Bracket Complete, operating Circuit Breaker for 75° Signals, . . . . .	1.50
<b>16674</b>	Bracket Complete, operating Circuit Breaker for 90° Signals, . . . . .	1.50
<b>18866</b>	Magnet Connection Complete, . . . . .	6.50
<b>19841</b>	Indication Contact Complete, . . . . .	9.00
<b>19842</b>	Contact Block Complete, Indication Contact, . . . . .	1.80
<b>20628</b>	Counter Complete, . . . . .	3.50
<b>26593</b>	Slot Carrier Complete with Studs, Nuts, Washers, and Roller, for Carrying Slot Mechanism, . . . . .	7.00
<b>27641</b>	Slot Lever Complete with Armature, . . . . .	13.00
<b>28150</b>	Slot Rig Complete for 60° Signal Machine. . . . .	48.00
<b>28151</b>	Slot Rig Complete for 75° Signal Machine, . . . . .	48.00
<b>28152</b>	Slot Rig Complete for 90° Signal Machine, . . . . .	48.00
<b>28153</b>	Slot Lever Complete without Armature 27643, Pin 12639, or Cotter 0563, . . . . .	8.50
<b>029</b>	Lock Washer, $\frac{3}{4}$ " , for Main Shaft, . . . . .	.02
<b>0510</b>	Lock Washer, $\frac{1}{4}$ " , for Screw 2449, etc., . . . . .	.02
<b>0563</b>	Cotter Pin, $\frac{1}{16}$ " x $\frac{1}{2}$ " , for Slot Lever, . . . . .	.008
<b>0569</b>	Lock Washer, $\frac{3}{8}$ " , for Screw 7229, . . . . .	.02
<b>0623</b>	Lock Washer, $\frac{5}{16}$ " , for Screw 17686, . . . . .	.02
<b>506</b>	Washer, $\frac{1}{4}$ " , for Binding Posts, . . . . .	.01
<b>528</b>	Nut, $\frac{1}{4}$ " 24 Hex., Brass, for Binding Posts on Connector 18866, . . . . .	.02
<b>577</b>	Nut for Screw 27646, . . . . .	.02
<b>646</b>	Nut, $\frac{3}{8}$ " 10 Hex., for Main Shaft, . . . . .	.05
<b>774</b>	Nut, $\frac{1}{4}$ " Hex., for Studs 10007 and 27644, . . . . .	.02
<b>1411</b>	Screw, $\frac{1}{4}$ " 24 x $1\frac{3}{4}$ " , for Binding Post on Indication Contact, . . . . .	.08
<b>2438</b>	Screw, No. 10 32 x $\frac{1}{2}$ " Rd. Hd., Brass, for Counter, . . . . .	.02
<b>2449</b>	Screw, $\frac{1}{4}$ " 24 x $\frac{1}{2}$ " , Circuit Breaker Bracket to Magnet Core, . . . . .	.04
<b>2451</b>	Screw, $\frac{1}{4}$ " 24 x $\frac{5}{8}$ " Rd. Hd., Steel, Bracket 9522 to Magnet Core, . . . . .	.02
<b>2456</b>	Screw, Block 19842 to Signal Case, . . . . .	.02
<b>2613</b>	Screw, No. 6 32 x $\frac{1}{4}$ " Rd. Hd., Brass, for Counter, . . . . .	.01
<b>7229</b>	Screw, $\frac{3}{8}$ " 16 x $\frac{3}{4}$ " Fil. Hd., Steel, Bracket 9522, etc., to Slot Carrier, . . . . .	.04
<b>7395</b>	Nut, Thin, $\frac{1}{4}$ " 24, for Binding Posts 18181, . . . . .	.03
<b>7662</b>	Screw, $\frac{3}{8}$ " x $\frac{7}{8}$ " Fil. Hd., for Block 18442 to Case, . . . . .	.05
<b>9518</b>	Collar for Main Shaft, . . . . .	1.20



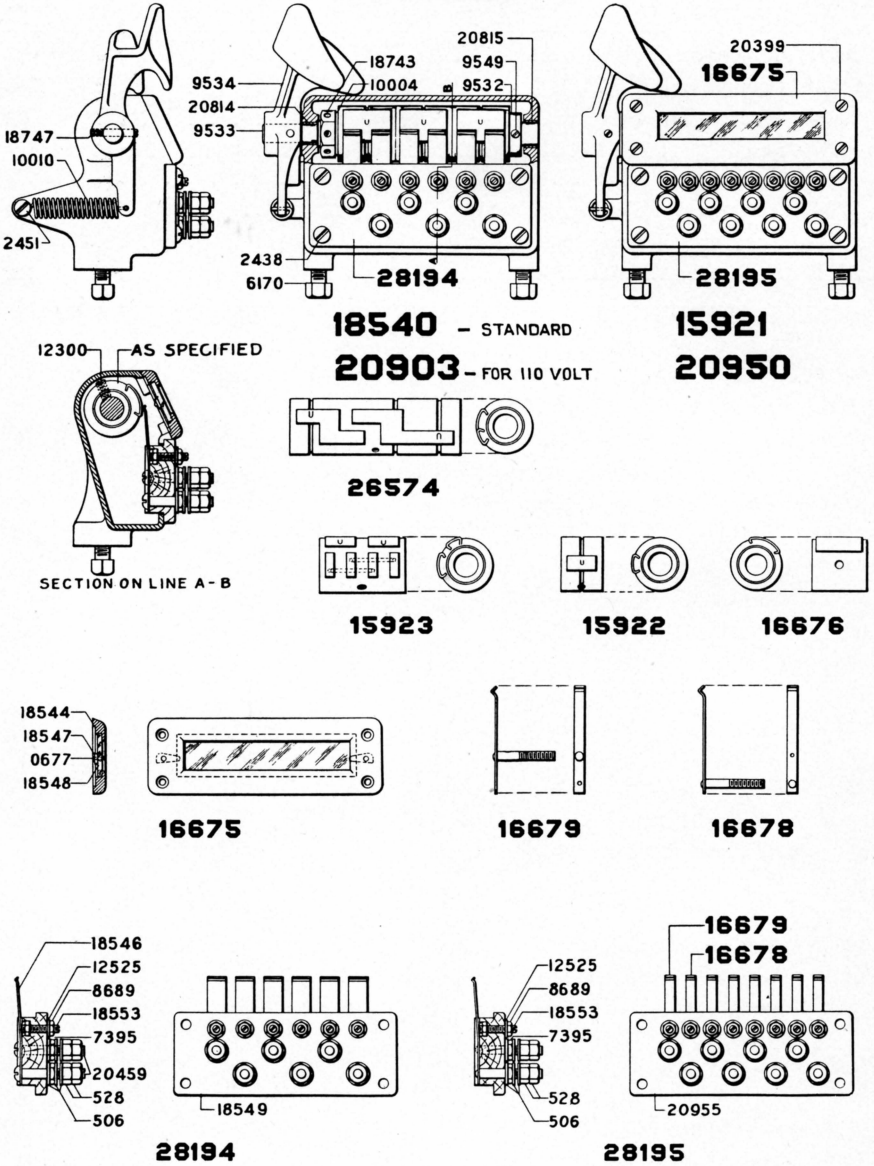
## MODEL 5 TWO POSITION SINGLE SLOT RIG

Order No.	DESCRIPTION	List Price
9521	Bracket, supporting Slot Magnet to Slot Carrier, . . . . .	\$ 1.00
9522	Bracket supporting Slot Magnet to Slot Carrier at Armature End, . .	1.50
9530	Screw, $\frac{1}{4}$ " 24 x $1\frac{1}{4}$ ", for Binding Post for Indication Contact, . . . . .	.07
9538	Dog for Slot, . . . . .	1.40
9547	Yoke for Slot Magnet, . . . . .	.80
10006	Stud for Main Gear, . . . . .	.20
10007	Stud for Slot Carrier, . . . . .	.30
10062	Slot Carrier, Only without Studs, . . . . .	5.00
12271	Washer, $\frac{5}{16}$ ", for Studs 10007 and 27644, . . . . .	.04
12272	Nut, $\frac{5}{16}$ " Hex., for Screw 16398, . . . . .	.04
12296	Roller for Main Gear, . . . . .	.50
12639	Pin, Armature to Slot Lever, . . . . .	.10
16398	Screw, Slot Dog to Slot Lever, . . . . .	.24
16399	Roller for Stud 10007, . . . . .	.40
16669	Core Complete for Slot Magnet, . . . . .	3.00
16670	Working Coil Complete for Slot Magnet; Specify Resistance or Voltage used for operating Signal (per pair), . . . . .	6.00
16671	Retaining Coil Complete for Slot Magnet; Specify Resistance or Voltage used for operating Signal (per pair), . . . . .	12.00
17309	Washer for Ends of Retaining Coils, . . . . .	.10
17686	Cap Screw, $\frac{5}{16}$ " 18 x $1\frac{3}{4}$ ", Bracket 9521 to Core, . . . . .	.04
18181	Screw, $\frac{1}{4}$ " 24 x $1\frac{1}{4}$ ", Binding Post for Connector 18866, . . . . .	.08
18440	Bracket supporting Block 18441 to Slot Carrier, . . . . .	1.00
18441	Insulation Block for Connector on Slot Carrier, . . . . .	.24
18442	Insulation Block for Connector to Signal Case, . . . . .	.40
18443	Connector, Phosphor Bronze Ribbon, . . . . .	.60
18728	Lower Re-enforcement for Connector, . . . . .	.20
18748	Screw, $\frac{1}{4}$ " 24 x $1\frac{1}{16}$ " Rd. Hd., Brass, for Block 18441 to Bracket 18440, . . . . .	.07
18777	Set Screw, Collar to Main Shaft, . . . . .	.12
19086	Base for Counter 20628, . . . . .	.60
19087	Counterweight Lever for Counter, . . . . .	.80
19666	Upper Re-enforcement for Connector, . . . . .	.20
19843	Contact Block Only, for Indication Contact, . . . . .	.50
19844	Contact Spring (Short) for Indication Contact, . . . . .	.24
19845	Contact Spring (Long) for Indication Contact, . . . . .	.30
19846	Re-enforcement for Spring 19845, . . . . .	.20
19847	Contact Stud Complete for Indication Contact, . . . . .	1.50
20098	Nut, $\frac{1}{4}$ " 24, Brass, for Binding Posts on Indication Contact, . . . . .	.02

## MODEL 5 TWO POSITION SIGNAL SLOT RIG

Order No.	DESCRIPTION	List Price
<b>20478</b>	Washer for Ends of Working Coils, . . . . .	\$0.10
<b>20567</b>	Counter Only, . . . . .	2.00
<b>20686</b>	Washer, Felt, between Coils on Slot Magnet, . . . . .	.06
<b>2452</b>	Screw, $\frac{1}{4}$ " 24 x $\frac{3}{4}$ " Rd. Hd., Mch. Contact Stud 19847 to Slot Magnet Core, . . . . .	.02
<b>27643</b>	Armature for Slot Lever 27641, . . . . .	4.00
<b>27644</b>	Stud for Slot Lever to Slot Carrier, . . . . .	.60
<b>27646</b>	Screw for Armature 27643, . . . . .	.12

## MODEL 5 TWO POSITION SIGNAL CIRCUIT BREAKER



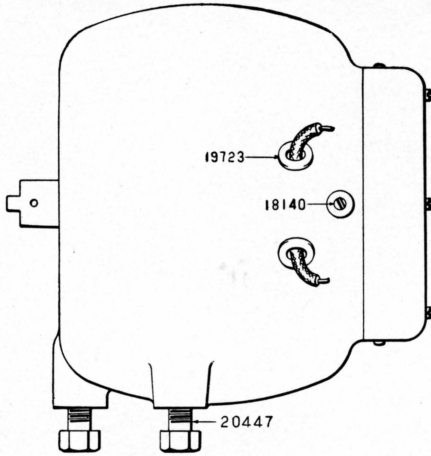
## MODEL 5 TWO POSITION SIGNAL CIRCUIT BREAKER

Order No.	DESCRIPTION	List Price
15921	Circuit Breaker Complete for use in Connection with Pole Changing Contacts, . . . . .	\$23.00
16675	Cover Complete for Circuit Breakers, . . . . .	.84
18540	Standard Circuit Breaker Complete for Three Circuits, . . . . .	20.00
20903	Circuit Breaker Complete for use with Motor Brake (110V Machines)	20.00
20950	Circuit Breaker Complete for Four Circuits, . . . . .	21.00
28194	Binding Post Block Complete for Circuit Breaker 18540 and 20903,	5.00
28195	Binding Post Block Complete for Circuit Breakers 15921, 20903, and 20950, . . . . .	6.00
0677	Escutcheon Pin No. 16, .065" x 1/2", Brass, for Clip No. 18547, . . . .	.01
506	Washer, 1/4", for Binding Posts, . . . . .	.01
528	Nut, 1/4", for Binding Posts, . . . . .	.02
2438	Screw, No. 10 32 x 1/2" Rd. Hd., for Block 18594, . . . . .	.02
2451	Screw, 1/4" 24 x 5/8", for Spring 10010, . . . . .	.02
6170	Cap Screw, 3/8" 16 x 1", Circuit Breaker to Case, . . . . .	.05
7395	Nut, 1/4", Brass, for Binding Posts, . . . . .	.03
8689	Jam Nut for Set Screw 18553, . . . . .	.03
9532	Collar for Shaft 9533, . . . . .	.24
9533	Shaft, . . . . .	.70
9534	Cam for operating Circuit Breaker, . . . . .	1.20
9549	Screw, Headless, for Collar 9532, . . . . .	.04
10004	Washer for Shaft, . . . . .	.06
10010	Spring for Cam, . . . . .	.20
12300	Screw, Commutator to Shaft, . . . . .	.03
12525	Washer for Nut 8689, . . . . .	.02
15922	Commutator Complete, One Contact, for Circuit Breaker 19521 and 20950, . . . . .	2.00
15923	Commutator Complete, Six Contacts, for Circuit Breaker 15921, . . . .	5.50
16676	Commutator Complete for Circuit Breaker 18540, . . . . .	2.30
16678	Contact Spring for Circuit Breakers 15921 and 20950, Lower Binding Posts, . . . . .	.36
16679	Contact Spring for Circuit Breaker 15921 and 20950, Upper Binding Posts, . . . . .	.36
18544	Cover Only, without Glass, . . . . .	.70
18546	Contact Spring for Circuit Breakers 18540 and 20903, . . . . .	.30
18547	Clip holding Glass to Cover, . . . . .	.01
18548	Glass for Cover, . . . . .	.10
18549	Insulation Block, . . . . .	1.00

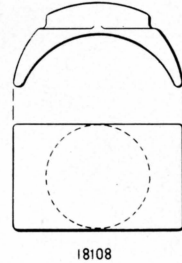
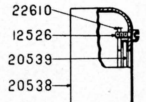
## MODEL 5 TWO POSITION SIGNAL CIRCUIT BREAKER

Order No.	DESCRIPTION	List Price
<b>18553</b>	Set Screw for Adjusting Contact Springs, . . . . .	\$0.05
<b>18743</b>	Nut, $\frac{5}{8}$ " 11, for Shaft, . . . . .	.24
<b>18747</b>	Set Screw, No. 10 32 x $1\frac{1}{4}$ ", for Cam, . . . . .	.04
<b>20399</b>	Screw, No. 10, 32 x $\frac{1}{2}$ " Fr. Head for Cover, . . . . .	.04
<b>20459</b>	Screw, $\frac{1}{4}$ " 24 x $1\frac{3}{8}$ " Rd. Hd., Brass, for Binding Posts, . . . . .	.08
<b>20814</b>	Bushing for Shaft, . . . . .	.20
<b>20815</b>	Bushing for Shaft, . . . . .	.24
<b>20955</b>	Insulation Block for Circuit Breakers 15921 and 20950, . . . . .	1.00
<b>26574</b>	Commutator Complete for Circuit Breaker 20903, . . . . .	7.50

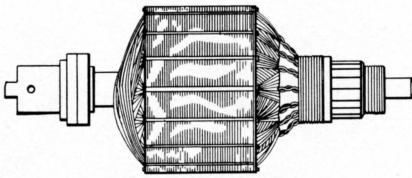
# MODEL 5 TWO POSITION SIGNAL MOTORS



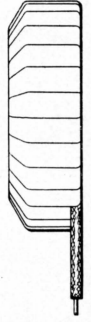
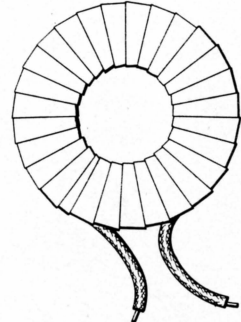
20520 FOR 10-100.  
 20920 " 15-150.  
 16665 " 110 VOLTS.



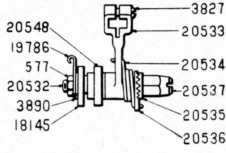
20542



20522 FOR 10-100 MOTOR.  
 20922 " 15-150 "  
 16666 " 110 VOLTS.

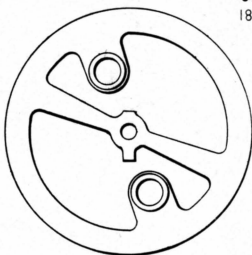


18127



16668

18141 FOR 10-100 MOTOR.  
 20514 " 15-150 "  
 16667 " 110 VOLTS.



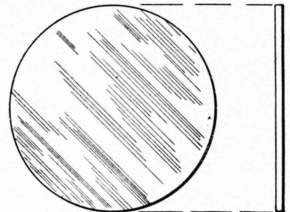
20531



18114



28177

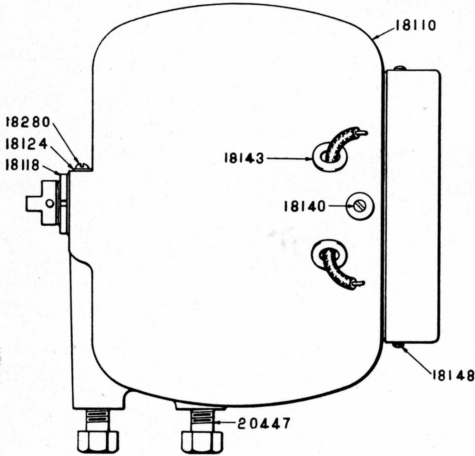


20539

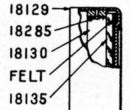
## MODEL 5 TWO POSITION SIGNAL MOTORS

Order No.	DESCRIPTION	List Price
16665	Ball Bearing Motor Complete, 110 Volt, . . . . .	\$75.00
20520	Ball Bearing Motor Complete, 10-100, . . . . .	60.00
20920	Ball Bearing Motor Complete, 15-150, . . . . .	60.00
577	Nut, No. 10-32 Hex., Brass, for Brush Holder, . . . . .	.02
3827	Screw, No. 8-32 x $\frac{1}{2}$ " Rd. Hd., Brass, for Brush Holder, . . . . .	.02
3890	Washer for Brush Holder, . . . . .	.01
7425	Pin for Brush Holder Stud, . . . . .	.02
12526	Screw, No. 4-36 x $\frac{1}{4}$ " Fil. Hd., Brass, for Hood, . . . . .	.02
16666	Armature Complete for 110 Volt Motor, . . . . .	40.00
16667	Field Coil for 110 Volt Motor, . . . . .	8.00
16668	Brush Holder Complete, . . . . .	2.50
18108	Pole Shoe, . . . . .	2.50
18117	Clutch Collar on Motor Shaft, . . . . .	.80
18114	Brush, Copper Gauze, . . . . .	.30
18127	Clutch, Motor to Gearing, . . . . .	.50
18140	Set Screw, $\frac{1}{4}$ " 24 x $\frac{5}{8}$ ", for holding Brush Holder Ring, . . . . .	.04
18141	Field Coil for 10-100 Motor, . . . . .	5.00
18145	Bushing for Insulating Brush Holder, . . . . .	.12
18281	Pin for 18117, . . . . .	.04
19723	Bushing for Insulating Leads, . . . . .	.12
19786	Terminal for Field Coils, . . . . .	.05
20447	Cap Screw, $\frac{3}{8}$ " 16 x $1\frac{5}{16}$ ", Steel, Motor to Case, . . . . .	.10
20514	Field Coil for 15-150 Motor, . . . . .	5.00
20522	Armature Complete for 10-100 Motor, . . . . .	30.00
20531	Brush Holder Ring, . . . . .	3.50
20532	Stud for Brush Holder, . . . . .	.50
20533	Arm for Holding Brush, . . . . .	1.00
20534	Spring for Brush Holder, . . . . .	.20
20535	Washer for Locking Spring Adjustment, . . . . .	.10
20536	Washer for Spring Adjustment, . . . . .	.20
20537	Nut for Spring Adjustment, . . . . .	.10
20538	Hood Only, . . . . .	2.00
20539	Glass for Hood, . . . . .	.20
20542	Hood Complete, . . . . .	2.50
20548	Bushing, Insulating Brush Holder, . . . . .	.20
20922	Armature Complete for 10-100 Motor, . . . . .	30.00
22610	Ring for holding Glass to Hood, . . . . .	.30
22632	Screw, $\frac{3}{8}$ " 16 x $1\frac{5}{8}$ " Fil. Hd., Steel, Pole Shoe to Case, . . . . .	.08
28177	Brush, Carbon, for 110 Volt Motor, . . . . .	.30

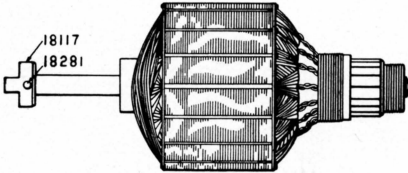
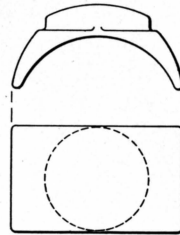
# MODEL 5 TWO POSITION SIGNAL MOTOR (OLD STYLE)



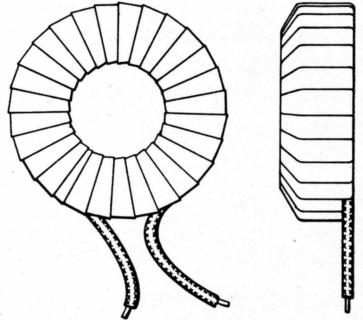
12288 — 10-100.  
18640 — 20-200.



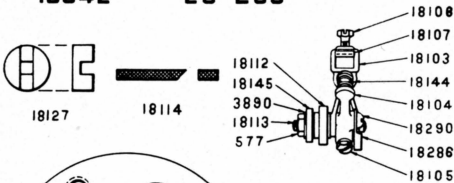
18284



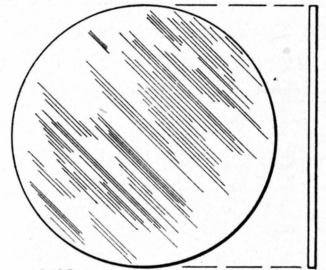
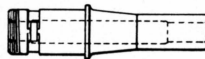
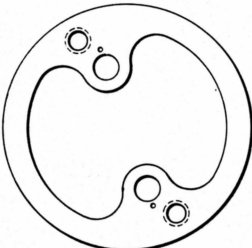
18100 FOR 10-100 MOTOR.  
18642 " 20-200 "



18141 FOR 10-100 MOTOR.  
18641 " 20-200 "



28407

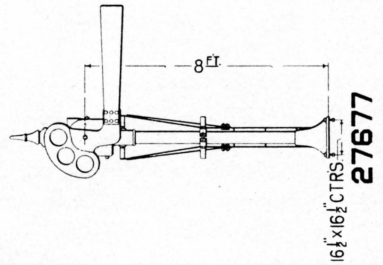
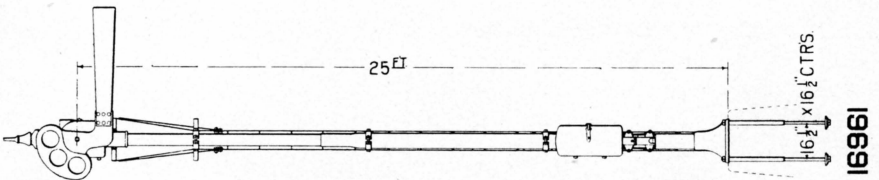
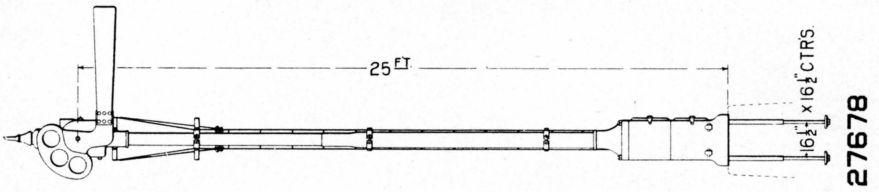
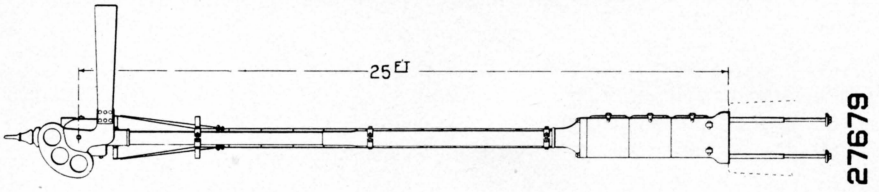




## MODEL 5 TWO POSITION SIGNAL MOTOR (OLD STYLE)

Order No.	DESCRIPTION	List Price
12266	Motor Complete, 10-100, . . . . .	\$60.00
18640	Motor Complete, 20-200, . . . . .	60.00
577	Nut, No. 10 32 Hex. Hd., for Brush Holder, . . . . .	.02
3890	Washer for Brush Holder, . . . . .	.01
5191	Screw, $\frac{3}{8}$ " 16 x $1\frac{3}{4}$ ", Pole Shoe to Case, . . . . .	.06
18100	Armature Complete for 10-100 Motor, . . . . .	30.00
18103	Brush Holder Only, . . . . .	1.00
18104	Spring Brace for Brush Holder, . . . . .	.80
18105	Screw, No. 8, 32 Hex. Hd., for 18104, . . . . .	.06
18106	Screw for Clamping Brush, . . . . .	.60
18107	Shield for Brush, . . . . .	.06
18108	Pole Shoe for Motor, . . . . .	2.50
18109	Ring for Brush Holder, . . . . .	2.50
18110	Motor Case Only, . . . . .	14.00
18112	Bushing for Insulating Brush Holder, . . . . .	.20
18113	Stud for Brush Holder, . . . . .	.10
18114	Brush, Copper Gauze, . . . . .	.30
18116	Oil Ring, . . . . .	.20
18117	Clutch, . . . . .	.80
18118	Nut for Bearing Sleeve, . . . . .	.40
18124	Cap for Oil Cup, . . . . .	.10
18126	Bearing Sleeve, . . . . .	5.00
18127	Clutch, Motor to Gearing, . . . . .	.50
18129	Hood Only, . . . . .	2.00
18130	Ring for Glass, . . . . .	.40
18135	Glass, . . . . .	.20
18140	Set Screw, $\frac{1}{4}$ " 24 x $\frac{3}{8}$ ", for Holding Brush Holder Ring, . . . . .	.04
18141	Field Coil for 10-100 Motor, . . . . .	5.00
18143	Bushing, Insulating Leads from Case, . . . . .	.16
18144	Spring for Brush Holder, . . . . .	.10
18145	Bushing, Insulating Brush Holder, . . . . .	.12
18148	Stud for Bayonet Lock, . . . . .	.06
18280	Screw, No. 8, 32 x $\frac{1}{4}$ " Rd. Hd., Iron for Oil Cup, . . . . .	.02
18281	Pin for Clutch, . . . . .	.04
18284	Hood Complete, . . . . .	3.00
18285	Escutcheon Pin, No. 14 x $\frac{1}{2}$ ", Ring to Hood, . . . . .	.01
18286	Terminal for Field Coil, . . . . .	.06
18290	Screw, No. 8, 32 x $\frac{3}{8}$ " Rd. Hd., Brass, Terminal to Brush Holder, . . . . .	.10
18641	Field Coil for 15-150 Motor, . . . . .	5.00
18642	Armature Complete for 15-150 Motor, . . . . .	30.00
20447	Cap Screw, $\frac{3}{8}$ " 16 x $1\frac{1}{8}$ " Hex. Hd., Iron, Motor to Case, . . . . .	.10
28407	Brush Holder Complete, . . . . .	2.70

# MODEL 5 THREE POSITION UPPER QUADRANT GROUND SIGNALS COMPLETE



## MODEL 5 THREE POSITION UPPER QUADRANT GROUND SIGNALS COMPLETE

Order No.	DESCRIPTION	List Price
<b>16961</b>	One Arm Ground Signal Complete as shown, with Double Relay Box, not including Relay, Lamp, or Roundels, . . . . .	\$450.00
<b>27677</b>	One Arm Bridge or Bracket Signal Complete as shown; not including Lamp or Roundels, . . . . .	386.00
<b>27678</b>	One Arm Ground Signal Complete as shown, with two section Battery Case; not including Relay, Lamp, or Roundels, . . . . .	530.00
<b>27679</b>	One Arm Ground Signal Complete as shown, with three section Battery and Relay Case; not including Relay, Lamp, or Roundels, . .	570.00
<b>16380</b>	Signal Mechanism Complete with Case, . . . . .	300.00
<b>28739</b>	Mechanism Pole and Ladder for changing one arm to two arm signal,	330.00

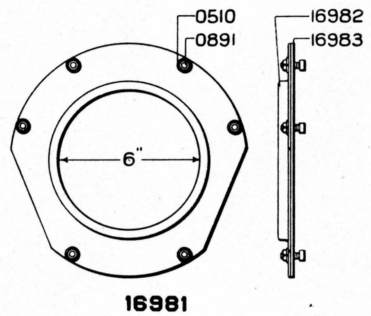
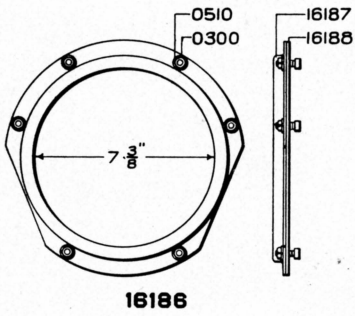
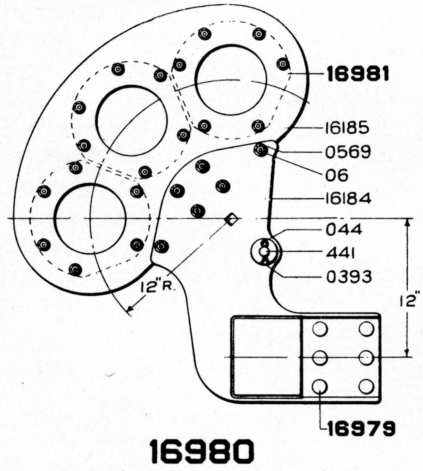
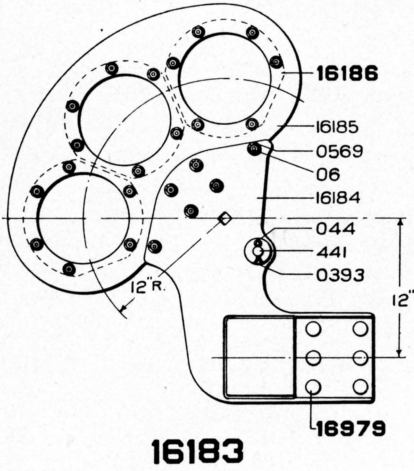
NOTE: — Add \$15 to above prices for each 110 Volt Signal.

NOTE: — When ordering Complete Signals, specify Spectacle and Lamp to be used.

Unless otherwise specified, Signals will be furnished 25 feet from base to center of spindle. Any departure from the above dimensions should be noted on order.

Counters are not included in above prices and if required will be furnished at price listed on page 67.

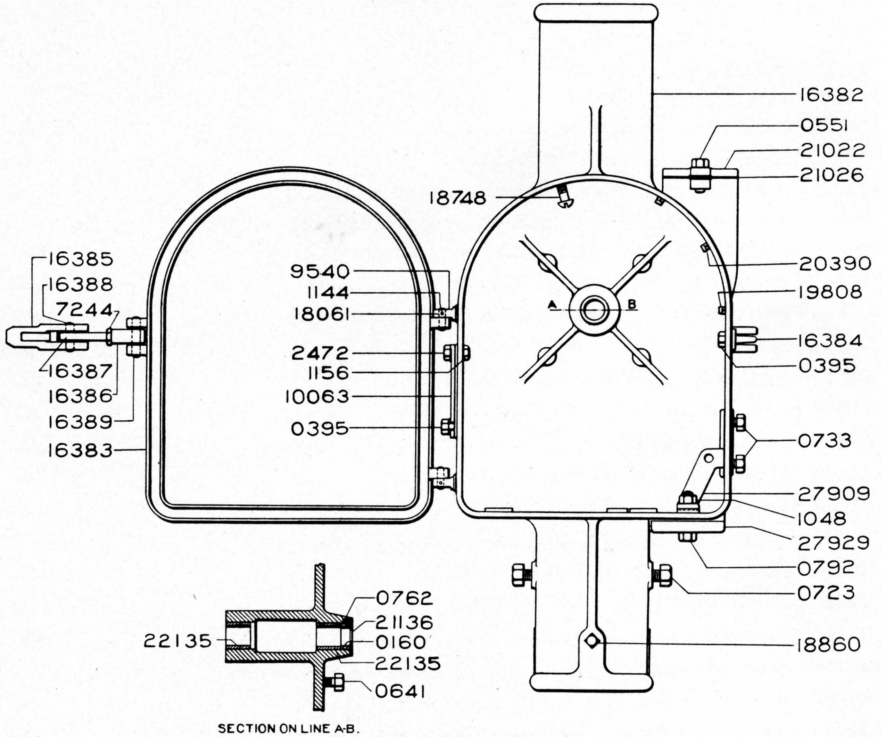
# MODEL 5 THREE POSITION UPPER QUADRANT SIGNAL SPECTACLES



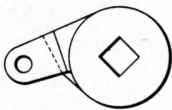
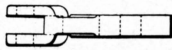
## MODEL 5 THREE POSITION UPPER QUADRANT SIGNAL SPECTACLES

Order No.	DESCRIPTION	List Price
16183	Spectacle Complete, Upward Moving Type, Three Light, 90° Throw, 12" Centers, takes 8 $\frac{3}{8}$ " Glass, . . . . .	\$13.00
16186	Bezel Ring Complete for 16183, . . . . .	1.20
16979	Bolt and Nut Complete, Blade to Spectacle, . . . . .	.07
16980	Spectacle Complete, Upward Moving Type, Three Light, 90° Throw, 12" Centers, takes 6 $\frac{1}{2}$ " Glass, . . . . .	13.00
16981	Bezel Ring Complete for 16980, . . . . .	1.20
06	Bolt and Nut, $\frac{3}{8}$ " 16 x 1", Blade Grip to Spectacle, . . . . .	.02
044	Cotter, $\frac{3}{16}$ " x 1 $\frac{1}{2}$ ", for Stud 441, . . . . .	.008
0510	Washer for Bolt 0350 and 0891, . . . . .	.02
0300	Bolt and Nut, $\frac{1}{4}$ " x $\frac{5}{8}$ " Sq. Hd., for 16186, . . . . .	.02
0393	Washer, $\frac{7}{8}$ " for Stud 441, . . . . .	.02
0569	Lock Washer, $\frac{3}{8}$ " for Bolt 06, . . . . .	.02
0891	Bolt and Nut, $\frac{1}{4}$ " 20 x $\frac{1}{2}$ " for 16981, . . . . .	.02
441	Stud, . . . . .	.12
16184	Blade Grip Only for 16183, . . . . .	4.00
16185	Spectacle Only for 16183 or 16980, . . . . .	4.50
16187	Bezel Ring Only for 16186, . . . . .	.60
16188	Retaining Ring for 16186, . . . . .	.30
16982	Bezel Ring Only for 16981, . . . . .	.60
16983	Retaining Ring for 16981, . . . . .	.30

# MODEL 5 THREE POSITION SIGNAL CASE AND DASH POT



## 16381



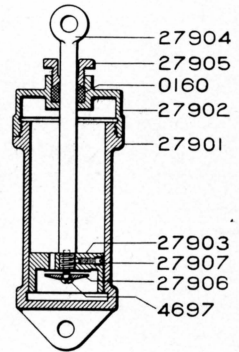
27908



23040



040



## 27900

## MODEL 5 THREE POSITION SIGNAL CASE AND DASH POT

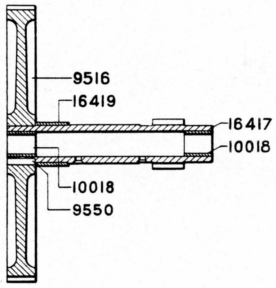
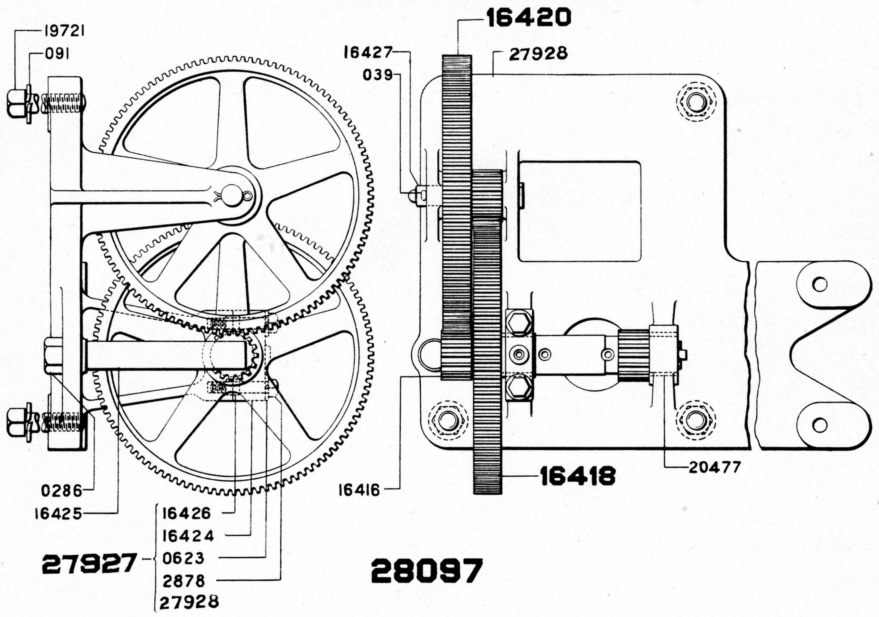
Order No.	DESCRIPTION	List Price
16381	Case Complete, . . . . .	\$58.00
27900	Oil Dash Pot Complete, . . . . .	30.00
040	Cotter, $\frac{1}{8}$ " x 1", for Pin 23040, . . . . .	.008
0160	Packing for Bearing and Dash Pot, . . . . .	.02
0395	Screw, $\frac{3}{8}$ " 16 x $\frac{3}{4}$ " for 10063 and 16384, . . . . .	.03
0551	Tap Bolt, $\frac{1}{2}$ " 13 x $1\frac{1}{2}$ " Cap 21022 to Cover, . . . . .	.04
0641	Tap Bolt, $\frac{1}{2}$ " 13 x $1\frac{1}{4}$ ", Stop to Case, . . . . .	.04
0723	Bolt, $\frac{3}{8}$ " 11 x $\frac{3}{4}$ " Hex. Hd., Ladder to Case, . . . . .	.03
0733	Bolt, $\frac{1}{2}$ " 13 x 1" Hex. Hd., for Lamp Bracket, . . . . .	.03
0762	Screw, No. 6, 32 x $\frac{5}{16}$ ", Ring 21136 to Case, . . . . .	.01
0792	Bolt, $\frac{1}{2}$ " 13 x $2\frac{1}{4}$ " Cap 27929 to Case, . . . . .	.04
1048	Nut for Bolt 0792, . . . . .	.03
1144	Pin for Hinge Pin 18061, . . . . .	.04
1156	Nut, $\frac{3}{8}$ " 16 Hex., for Screw 2472, . . . . .	.02
2472	Cap Screw, $\frac{3}{8}$ " 16 x $1\frac{1}{4}$ " Hex., for 10063 to Case, . . . . .	.05
4697	Screw, No. 10, 32 x $\frac{7}{8}$ " Rd. Hd. Mch., for Dash Pot, . . . . .	.02
7244	Nut for 16387, . . . . .	.10
9540	Post for Hinge, . . . . .	.60
10063	Cover for Hand Hole, . . . . .	.30
16382	Case Only, . . . . .	40.00
16383	Door for Case Comp. No. 16381, . . . . .	7.00
16384	Claw for Hasp, . . . . .	.70
16385	Tongue for Hasp, . . . . .	.36
16386	Eye for Hasp, . . . . .	.70
16387	Eye Rod for Hasp, . . . . .	.40
16388	Pin, $\frac{1}{2}$ " x $1\frac{11}{16}$ ", for 16385 and 16387, . . . . .	.14
16389	Pin, $\frac{1}{2}$ " x $2\frac{7}{16}$ ", Hasp to Door, . . . . .	.16
18061	Pin, $\frac{3}{8}$ " x $1\frac{1}{4}$ " for Hinge, . . . . .	.10
18748	Screw, $\frac{1}{4}$ " 24 x $\frac{11}{16}$ " Rd. Hd., Brass, Contact Block to Case, . . . . .	.07
18860	Screw, $\frac{5}{8}$ " 11 x $1\frac{1}{4}$ " Cup Pt., Case to Pole, . . . . .	.04
19808	Cleat for Wiring, . . . . .	.20
20390	Screw for 19808, . . . . .	.02
21022	Cap for Case, . . . . .	1.00
21026	Gasket for Cap 21022, . . . . .	.20
21136	Retaining Ring for outer end of Bearing, . . . . .	.20
22135	Bushing for Bearing, . . . . .	1.10
23040	Pin, $\frac{1}{2}$ " x $1\frac{7}{8}$ ", for Connecting up Dash Pot, . . . . .	.16

## MODEL 5 THREE POSITION SIGNAL CASE AND DASH POT

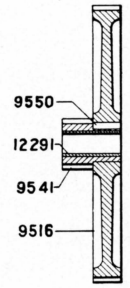
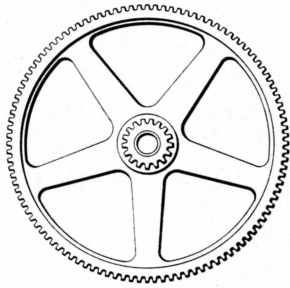
Order No.	DESCRIPTION	List Price
<b>27901</b>	Cylinder for Dash Pot, . . . . .	\$12.00
<b>27902</b>	Cap for Cylinder, . . . . .	6.00
<b>27903</b>	Piston for Dash Pot, . . . . .	6.00
<b>27904</b>	Piston Rod for Dash Pot, . . . . .	3.00
<b>27905</b>	Nut for Stuffing Box on Dash Pot, . . . . .	3.00
<b>27906</b>	Valve Disc for Dash Pot, . . . . .	.50
<b>27907</b>	Set Screw, No. 8, 32 x $1\frac{1}{16}$ " for Piston, . . . . .	.20
<b>27908</b>	Crank for operating Dash Pot, . . . . .	4.00
<b>27909</b>	Bracket, supporting Dash Pot, . . . . .	1.50
<b>27929</b>	Lower Cap for Case, . . . . .	1.20



# MODEL 5 THREE POSITION SIGNAL BEARING AND INTERMEDIATE GEARS



**16418**

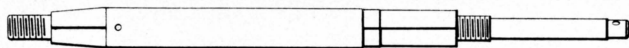


**16420**

## MODEL 5 THREE POSITION SIGNAL BEARING AND INTERMEDIATE GEARS

Order No.	DESCRIPTION	List Price
16418	Intermediate Gear Complete, Second Reduction, . . . . .	\$14.20
16420	Intermediate Gear Complete, First Reduction, . . . . .	9.80
27927	Bearing Complete, . . . . .	17.00
28097	Bearing Complete with Gears, . . . . .	49.00
039	Cotter Pin, $\frac{1}{8}$ " x $\frac{3}{4}$ ", for Pin 16427, . . . . .	.008
091	Lock Washer, $\frac{1}{2}$ ", for Screw 19721, . . . . .	.02
0286	Nut for Stud 16425, . . . . .	.02
0623	Lock Washer, $\frac{5}{16}$ ", for Screw 2878, . . . . .	.02
2878	Screw, $\frac{5}{16}$ " x $1\frac{1}{2}$ ", Hex Hd. Cap, for Bearing, . . . . .	.04
9516	Gear Only, Intermediate, . . . . .	6.00
9541	Pinion for Back Gear, . . . . .	2.80
9550	Key for Gears, . . . . .	.04
10018	Bushing for Pinion 16417, . . . . .	.60
12291	Bushing for Pinion 9541, . . . . .	1.00
16416	Driving Pinion for 16417, . . . . .	6.00
16417	Main Pinion, . . . . .	7.00
16419	Bushing for 16417, . . . . .	.50
16425	Retaining Stud for 16416, . . . . .	.80
16426	Dowel Bushing for Bearing, . . . . .	.10
16427	Pin for Gear 16420, . . . . .	.30
19721	Screw, Bearing to Case, . . . . .	.12
20477	Bushing for Front Bearing, . . . . .	.80

# MODEL 5 THREE POSITION SIGNAL SLOT RIG



16390



646



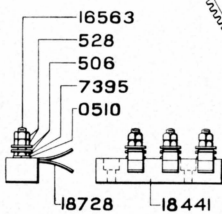
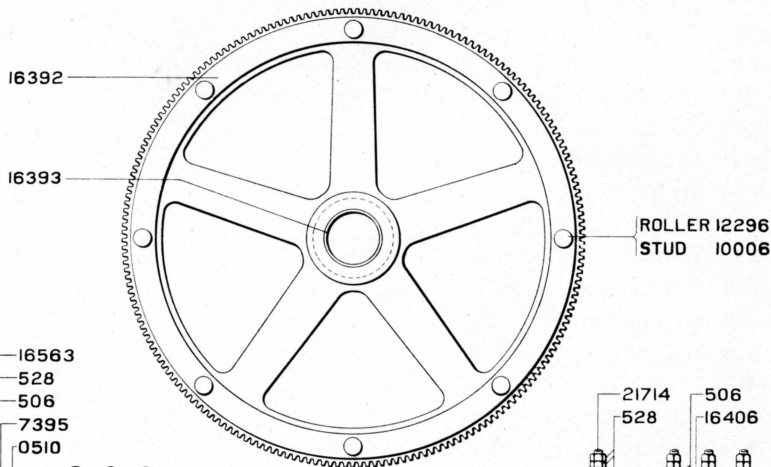
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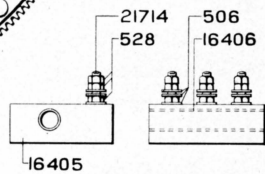
9518



18777

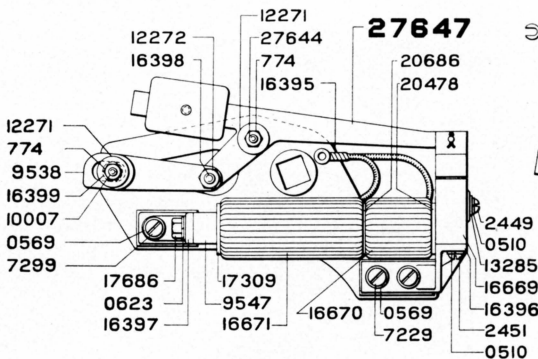


16407



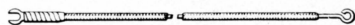
16404

16391



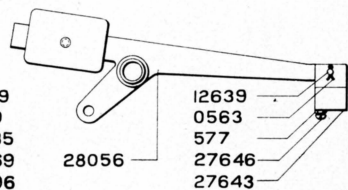
16394

27647



28148

28149



27647

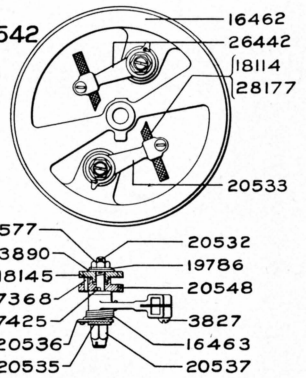
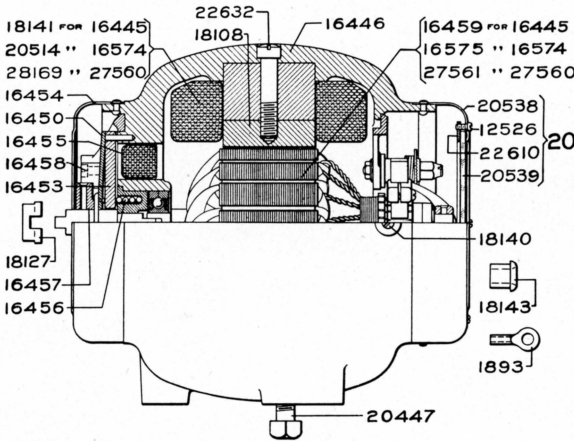
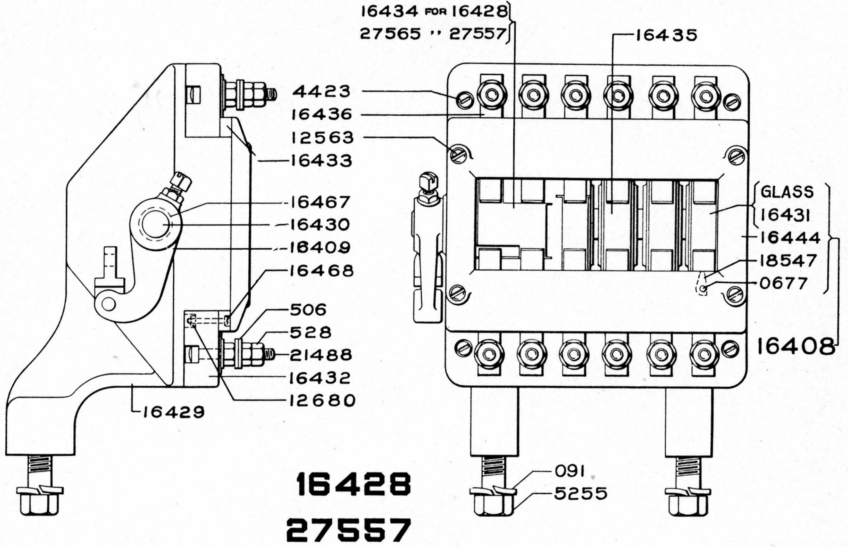
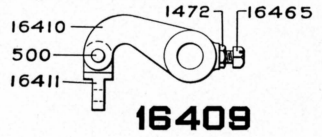
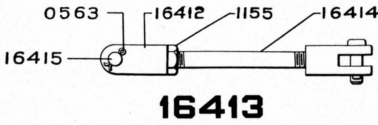
## MODEL 5 THREE POSITION SIGNAL SLOT RIG

Order No.	DESCRIPTION	List Price
16391	Main Gear Complete, . . . . .	\$19.00
16394	Slot Complete, . . . . .	50.00
16404	Terminal Block Complete, . . . . .	1.80
16407	Terminal Block Complete, . . . . .	2.10
27647	Slot Lever Complete with Armature, . . . . .	13.00
029	Lock Washer, $\frac{3}{4}$ " for Main Shaft, . . . . .	.02
0510	Lock Washer, $\frac{1}{4}$ ", . . . . .	.02
0563	Cotter Pin, $\frac{1}{16}$ " x $\frac{1}{2}$ " for Slot Lever, . . . . .	.008
0569	Lock Washer, $\frac{3}{8}$ ", . . . . .	.02
0623	Lock Washer, $\frac{5}{16}$ ", . . . . .	.02
506	Washer for Binding Posts, . . . . .	.01
528	Nut for Binding Posts, . . . . .	.02
577	Nut for Screw 27646, . . . . .	.02
646	Nut, $\frac{3}{4}$ ", for Main Shaft, . . . . .	.05
774	Nut for Studs 10007 and 27644, . . . . .	.02
2449	Screw, $\frac{1}{4}$ " 24 x $\frac{1}{2}$ ", for Strap 13285 to Core, . . . . .	.04
2451	Screw, $\frac{1}{4}$ " 24 x $\frac{5}{8}$ ", Bracket to Core, . . . . .	.02
7229	Screw, $\frac{3}{8}$ " 16 x $\frac{1}{4}$ ", Fil. Hd., Bracket to Disc, . . . . .	.04
7395	Nut (thin) for Binding Posts, . . . . .	.03
9518	Collar for Main Shaft, . . . . .	1.20
9538	Dog for Slot, . . . . .	1.40
9547	Yoke for Slot Magnets, . . . . .	.80
10006	Stud for Main Gear, . . . . .	.20
10007	Stud for Slot Dog, . . . . .	.30
12271	Washer for Stud 10007 and 27644, . . . . .	.04
12272	Nut for Screw 16398, . . . . .	.04
12296	Roller for Stud 10006 on Main Gear, . . . . .	.50
12639	Pin, Armature to Lever, . . . . .	.10
13285	Strap for Magnet Cores, . . . . .	.30
16390	Main Shaft, . . . . .	7.50
16393	Bushing for Main Gear, . . . . .	.70
16395	Slot Carrier Only, . . . . .	6.00
28170	Slot Carrier Complete with Studs, Nuts, Washers, and Roller, . . . . .	7.60
16396	Bracket supporting Core to Slot Carrier, . . . . .	2.00
16397	Bracket supporting Yoke to Slot Carrier, . . . . .	1.20
16398	Screw for Dog to Slot Lever, . . . . .	.24
16399	Roller for Stud 10007, . . . . .	.40
16405	Terminal Block for 16404, . . . . .	1.00

## MODEL 5 THREE POSITION SIGNAL SLOT RIG

Order No.	DESCRIPTION	List Price
<b>16406</b>	Insulation Tube for 16405, . . . . .	\$0.16
<b>16563</b>	Screw for Binding Posts for 16407, . . . . .	.10
<b>16669</b>	Core Complete, . . . . .	3.00
<b>16670</b>	Working Coil Complete for Slot Magnet; Specify Resistance or Voltage used for operating Signal, per pair, . . . . .	6.00
<b>16671</b>	Retaining Coil Complete for Slot Magnet; Specify Resistance or Voltage used for operating Signal, per pair, . . . . .	12.00
<b>17309</b>	Washer for Ends of Coils on Slot Magnet, . . . . .	.10
<b>17686</b>	Screw, $\frac{5}{16}$ " 18 x $1\frac{3}{8}$ " Hex. Hd., for Slot Magnet, . . . . .	.04
<b>18441</b>	Terminal Block for 16407, . . . . .	.24
<b>18728</b>	Re-enforcement for 16407, . . . . .	.20
<b>18777</b>	Screw for Collar 9518 to Main Shaft, . . . . .	.12
<b>20478</b>	Washer for Coils at Armature End, . . . . .	.10
<b>20686</b>	Washer between Coils, . . . . .	.06
<b>21714</b>	Screw for Binding Posts for 16404, . . . . .	.12
<b>27643</b>	Armature for Slot Lever 27647, . . . . .	4.00
<b>27644</b>	Stud for Slot Lever to Slot Carrier, . . . . .	.60
<b>27646</b>	Screw for Armature 27643, . . . . .	.12
<b>28056</b>	Slot Lever Complete without Armature 27643, Pin 12639 or Cotter 0563, . . . . .	8.50
<b>28148</b>	Connector (Front and Intermediate) for Slot to Contact Block 16407, . . . . .	.30
<b>28149</b>	Connector (Back) for Slot to Contact Block 16407, . . . . .	.30

# THREE POSITION UPPER QUADRANT MODEL 5 SIGNAL CIRCUIT BREAKER AND MOTOR



16445 - 10-100

16574 - 15-150

27560 - 110 V.

## THREE POSITION UPPER QUADRANT MODEL 5 SIGNAL CIRCUIT BREAKER

Order No.	DESCRIPTION	List Price
16428	Circuit Breaker Complete for Signal Machine 16380, . . . . .	\$32.00
27557	Circuit Breaker Complete for 110 Volt Signal Machine 16421, . . . . .	34.00
16408	Cover Complete, . . . . .	1.20
16409	Crank Complete, . . . . .	2.00
16413	Connecting Rod Complete, . . . . .	1.80
091	Washer, $\frac{1}{2}$ " Spring Lock, . . . . .	.02
0563	Cotter, $\frac{1}{16}$ " x $\frac{1}{2}$ ", for Connecting Rod 16413, . . . . .	.008
0677	Escutcheon Pin, .065" x $\frac{1}{2}$ ", for Clip, . . . . .	.01
500	Pin for Crank 16409, . . . . .	.04
506	Washer for Binding Posts, . . . . .	.01
528	Nut for Binding Posts, . . . . .	.02
1155	Nut for Connecting Rod 16413, . . . . .	.02
1472	Nut for Crank 16409, . . . . .	.02
4423	Screw, No. 10, 32 x $\frac{3}{4}$ " Rd. Hd., Brass, Block to Case, . . . . .	.02
5255	Screw, $\frac{1}{2}$ " x $1\frac{1}{4}$ " Hex. Hd. Cap, for Circuit Breaker Comp. to Signal Case, . . . . .	.07
12563	Screw, Cover to Case, . . . . .	.06
12680	Nut for Screw 16468, . . . . .	.02
16410	Crank Only for Crank Comp. 16409, . . . . .	1.00
16411	Link for Crank Comp. 16409, . . . . .	.60
16412	Jaw for Connecting Rod 16413, . . . . .	.60
16414	Rod Only for Connecting Rod 16413, . . . . .	.30
16415	Pin for Connecting Rod 16413, . . . . .	.12
16429	Case Only for Circuit Breaker, . . . . .	6.00
16430	Shaft for Circuit Breaker, . . . . .	1.00
16431	Glass for Cover, . . . . .	.12
16432	Block for Springs, . . . . .	.80
16433	Spacer for Springs, . . . . .	.40
16434	Contact Holder Complete, . . . . .	6.50
16435	Contact Holder Complete, . . . . .	3.00
16436	Contact Spring, . . . . .	.30
16444	Cover Only, . . . . .	1.00
16465	Set Screw, $\frac{1}{4}$ " 24 x $\frac{7}{8}$ " Sq. Hd. (V Pt.), for Crank 16409 to Shaft, . . . . .	.16
16467	Bushing for Bearing, . . . . .	.20
16468	Screw for Spacer 16433 to Block 16432, . . . . .	.06
18547	Clip for Glass, . . . . .	.01
21488	Screw for Binding Posts, . . . . .	.12
27565	Contact Holder Complete for Circuit Breaker 16428, . . . . .	8.50

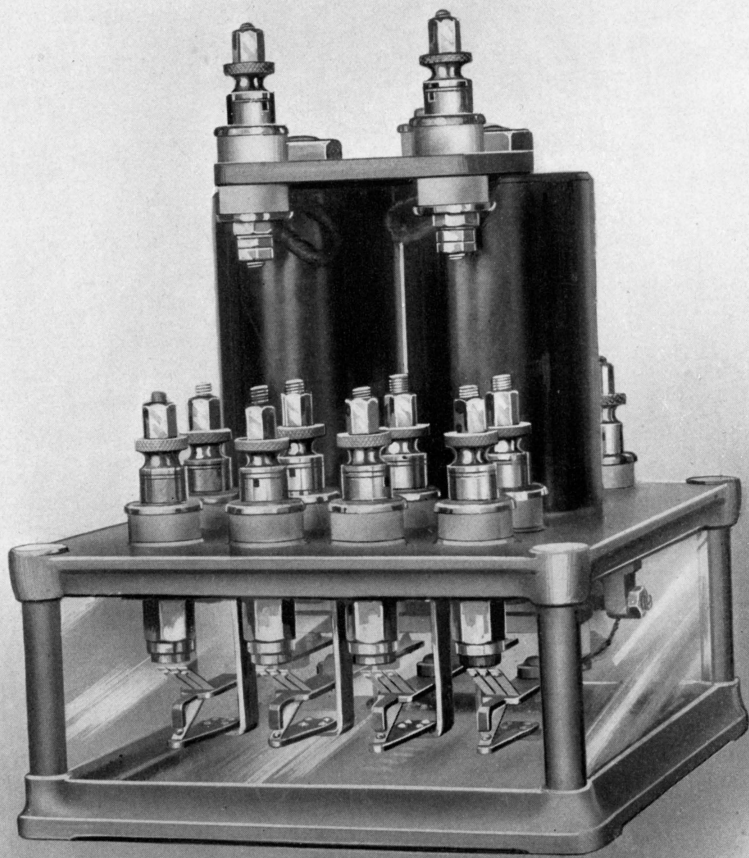
## MODEL 5 THREE POSITION SIGNAL MOTOR

Order No.	DESCRIPTION	List Price
16445	Motor Complete, 10-100, . . . . .	\$75.00
16574	Motor Complete, 15-150, . . . . .	75.00
27560	Motor Complete, 110 Volt, . . . . .	90.00
16461	Brush Holder Complete, . . . . .	9.00
20542	Hood Complete (Front), . . . . .	2.50
577	Nut for Brush Holder Stud 20532, . . . . .	.02
1893	Terminal for making Wire Connection to Brush Holder, . . . . .	.05
3827	Screw, No. 8 32 x $\frac{1}{2}$ " Rd. Hd., Brass, for Brush Holder, . . . . .	.02
3890	Washer for Stud 20532, . . . . .	.01
7368	Pin for Bushing on Brush Holder, . . . . .	.02
7425	Pin for Stud 20532, . . . . .	.02
12526	Screw for Ring to Hood, . . . . .	.02
16446	Case, . . . . .	20.00
16450	Brake Disc Complete, . . . . .	5.00
16453	Armature for Brake, . . . . .	3.50
16454	Hood (Back), . . . . .	2.00
16455	Coil for Brake (39 Ohms), . . . . .	3.00
16456	Spring for Brake, . . . . .	.12
16457	Bearing Bracket for 16450, . . . . .	3.50
16458	Screw for 16457 to Case, . . . . .	.08
16459	Armature Complete for 10-100 Motor, . . . . .	30.00
16462	Brush Holder Ring, . . . . .	3.50
16463	Spring for Brush Holder, . . . . .	.14
16575	Armature Complete for 15-150 Motor, . . . . .	30.00
18108	Pole Piece, . . . . .	2.50
18114	Brush, Copper Gauze, . . . . .	.30
18127	Clutch, Motor to Gearing, . . . . .	.50
18140	Screw for Brush Holder Ring, . . . . .	.04
18141	Field Coil for Motor 16445 and 27560; when ordering specify Motor to be used in, . . . . .	5.00
18143	Bushing for Leads, . . . . .	.16
18145	Bushing for Brush Holder, . . . . .	.12
19786	Terminal for Brush Holder, . . . . .	.05
20447	Screw for Motor to Signal Case, . . . . .	.10
20514	Field Coil for Motor 16574, 15-150, . . . . .	5.00
20532	Stud for Brush Holder, . . . . .	.50
20533	Brush Holder (Lower), . . . . .	1.00
20535	Lock Washer, for Brush Holder, . . . . .	.10



## MODEL 5 THREE POSITION SIGNAL MOTOR

Order No.	DESCRIPTION	List Price
<b>20536</b>	Adjusting Washer for Brush Holder, . . . . .	\$0.20
<b>20537</b>	Nut for Brush Holder. . . . .	.10
<b>20538</b>	Hood Only (Front), . . . . .	2.00
<b>20539</b>	Glass for Hood, . . . . .	.20
<b>20548</b>	Bushing for Brush Holder Ring, . . . . .	.20
<b>22610</b>	Bezel Ring for Hood, . . . . .	.30
<b>22632</b>	Screw for 18108 to Motor Case, . . . . .	.08
<b>26442</b>	Brush Holder (Upper), . . . . .	1.00
<b>27561</b>	Armature Complete for Motor 27560, 110 Volt, . . . . .	40.00
<b>28169</b>	Field Coil for Motor 27560, 110 Volt, . . . . .	8.00
<b>28177</b>	Brush, Carbon, for 110 Volt Motor, . . . . .	.30



MODEL 9 RELAY

## MODEL 9 RELAY

(Note: For 110V. Relays See G. R. S. Catalogue Section 1)

**O**UR MODEL 9 RELAY is regularly furnished with two, three, or four platinum to graphite front contacts and platinum to platinum back contacts.

The CONSTRUCTION of the relay is strong, substantial, and first-class in every respect, and the relay fully meets the specifications of the Railway Signal Association.

The COILS are large and form wound; after being taped they are subjected to a vacuum drying and impregnating process which deposits a layer of impregnating material around each wire in addition to the usual fabric insulation, this insulating material also forms a strong mechanical protection for the coils. The coils can be quickly removed and replaced without disturbing the adjustment of the relay.

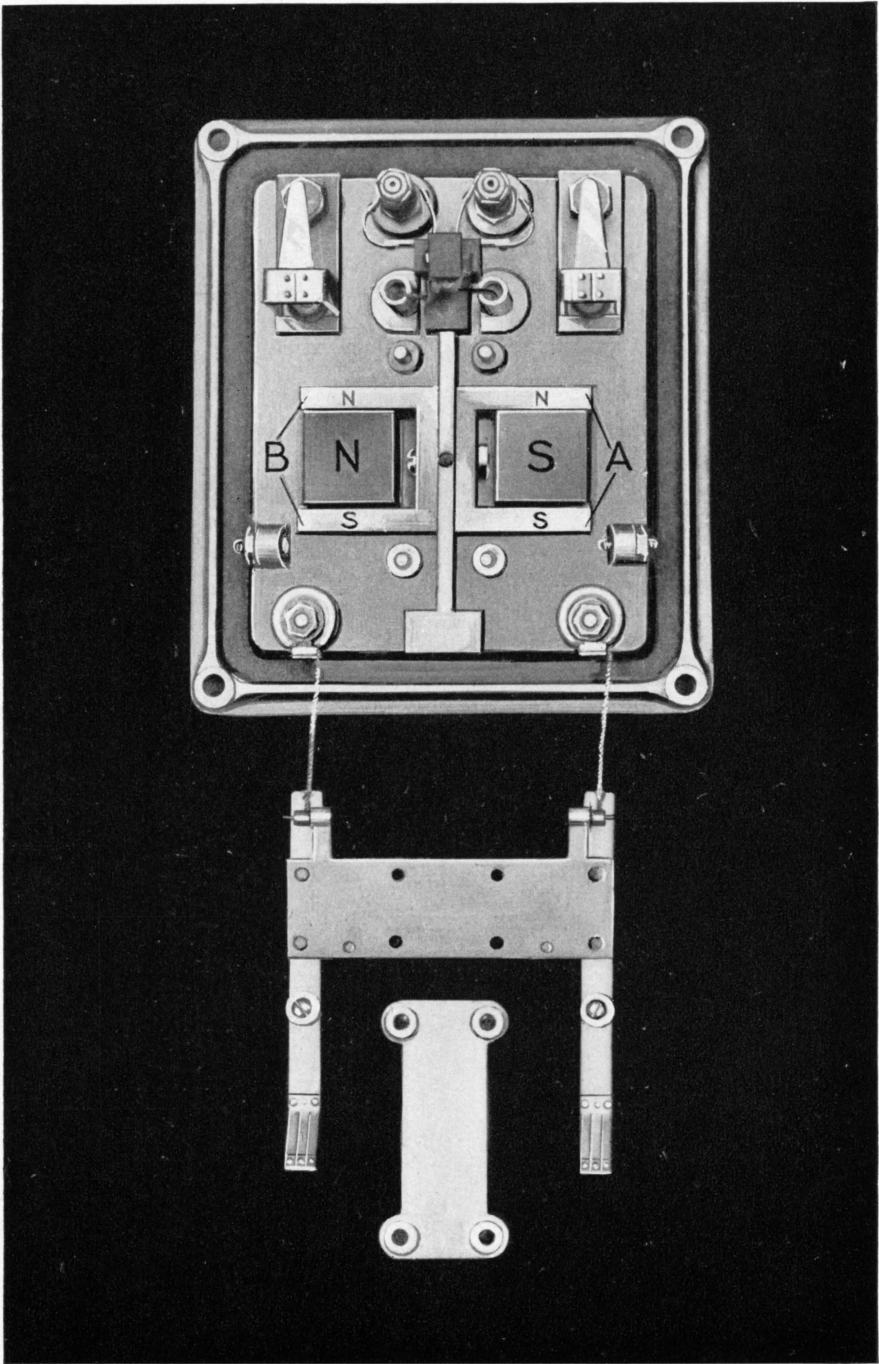
Hard rubber SHELLS and CAPS are fitted over the coils, further protecting them and adding to the finished appearance of the relay.

A strong CLEAR GLASS CASE allows ready inspection of the contacts. This case is protected by the four corner posts and the overhanging ledge of the base and top.

All iron parts are galvanized to prevent rusting, and all nuts are locked to prevent working loose.

The overall dimensions of the relay are  $6\frac{1}{8}$  inches wide,  $7\frac{1}{8}$  inches deep, and  $8\frac{1}{2}$  inches high.

Order No.	DESCRIPTION	List Price
13023	Two Point — Graphite Front and Platinum Back Contact, Model 9 Relay, . . . . .	\$31.00
13022	Three Point — Graphite Front and Platinum Back Contact, Model 9 Relay, . . . . .	35.00
13021	Four Point — Graphite Front and Platinum Back Contact, Model 9 Relay, . . . . .	39.00



MODEL 9 POLE CHANGING POLARIZED RELAY, BOTTOM VIEW

## MODEL 9 POLE CHANGING POLARIZED RELAY

**T**HIS relay is furnished with two neutral platinum to graphite and platinum to platinum back contacts in addition to the polar contacts.

The construction of the relay embodies newly patented features which are a marked improvement over older types in the following respects:

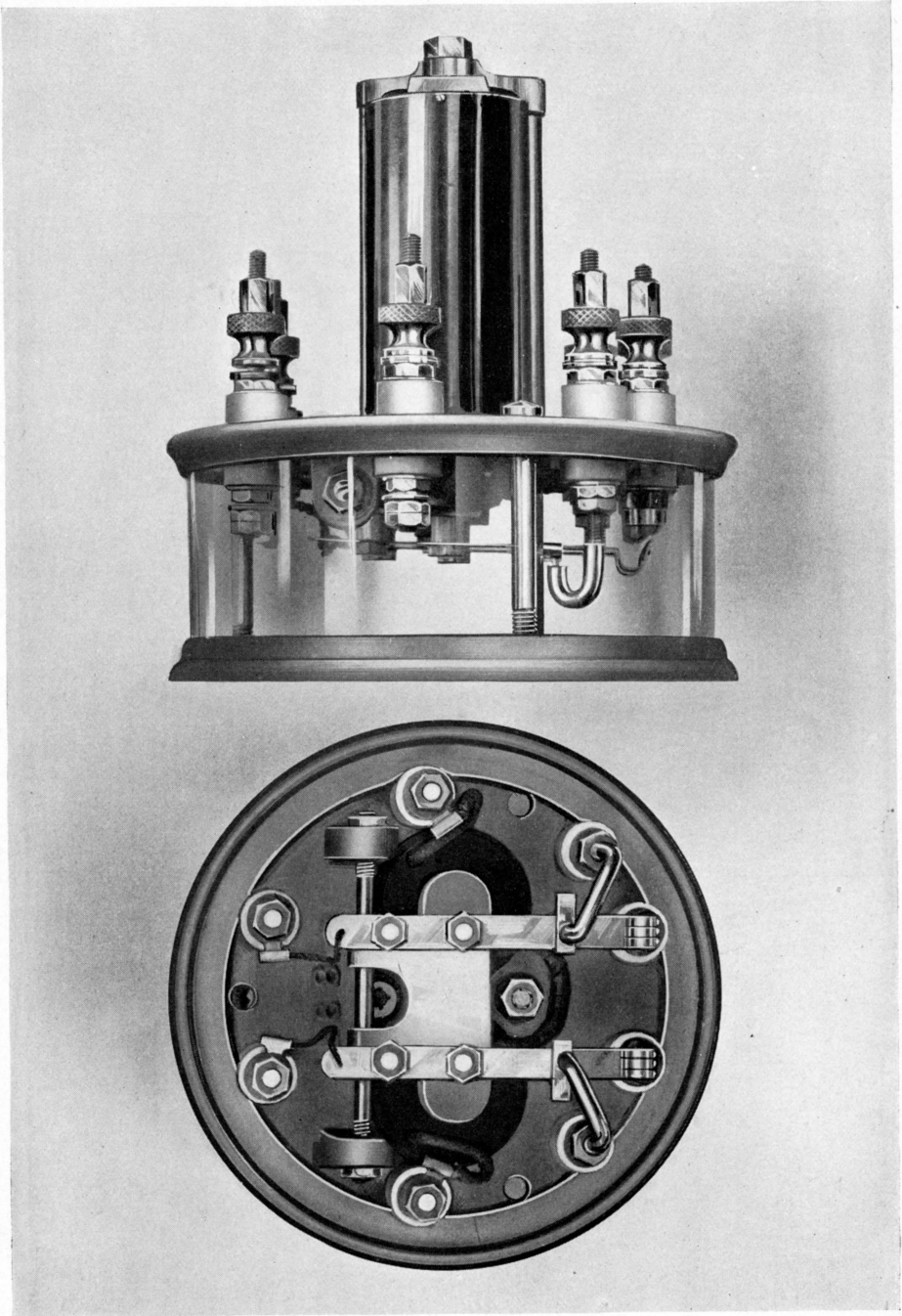
The magnetic circuit for the neutral armature is isolated from that of the pole-changing magnets, giving fully as strong a pull for the pole-changing contacts as we have for the neutral contacts. In all of the older types of construction the pull of the neutral armature was weakened by the addition of the polarized feature.

The cut on the opposite page shows a bottom view of the relay with the neutral armature and the lower support for the polar armature removed.

The permanent magnets "A" and "B" are fastened to a brass strip which is pivoted centrally between the pole pieces "N" and "S." This brass strip carries the polar contacts. The magnetic poles of the permanent magnets are so disposed that the two north poles come on one side of the pole pieces and the south poles on the opposite side. When the pole pieces of the magnets are so energized that the left-hand one is a north pole and the right-hand one is a south pole there is a turning movement imparted to the polar magnets moving the contacts to the right, this movement being assisted by all four poles of the permanent magnets. When the polarity of the magnets is reversed this action is likewise reversed.

The exterior appearance and dimensions of this relay are the same as our Model 9 Neutral Type Relay.

Prices for this relay upon request.



STYLE H RELAY

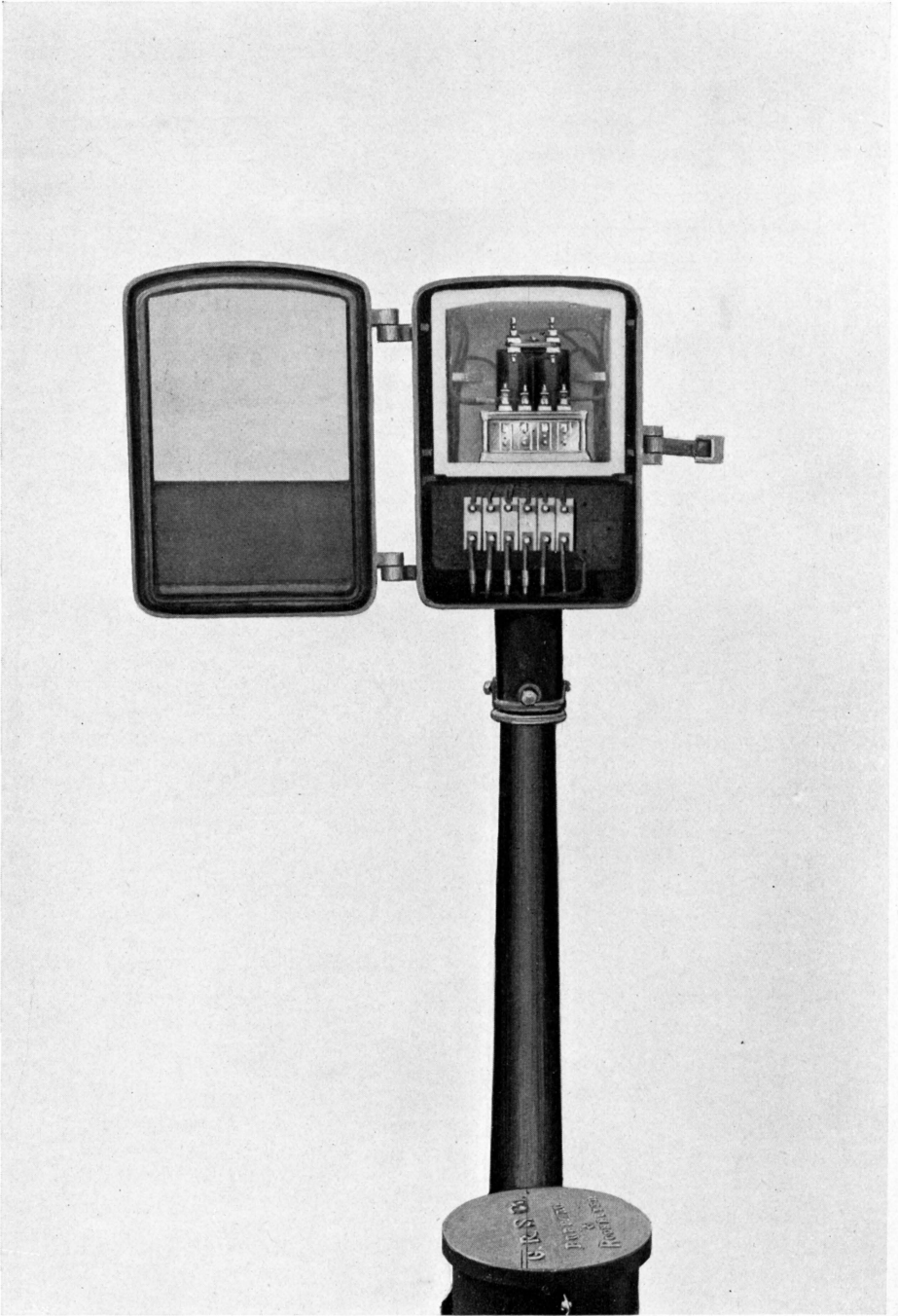
## STYLE "H" RELAY

**O**UR Style "H" Relay is a somewhat older type than our Model 9, but is largely and successfully used.

It is furnished in but one type, with two neutral contacts — platinum to graphite front and platinum to platinum back.

The insulation and the finish at all vital points are of the same high class as the Model 9. All other parts are finished to favorably compare with competing relays.

Prices upon request.



IRON RELAY BOX FOR ONE RELAY AND TERMINAL BOARD



## RELAY BOXES

**O**UR IRON, WOOD-LINED, RELAY BOXES are furnished in sizes to take one or two relays, with terminal and lightning arrester board; the boxes are weather and dust-tight, and provide for wiring and connecting in a neat and workmanlike manner.

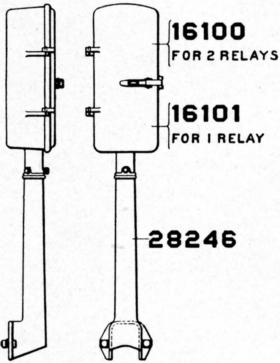
The INNER BOX is faced with felt and the door for it is backed by heavy springs.

The IRON BOX is fitted with a felt gasketed door fastened with a quick-acting spring toggle hasp, which brings the door snugly into place and takes an ordinary padlock.

A BRACKET and CLAMP BOLTS are furnished for attaching to 4-inch, 5-inch, or 6-inch poles, or cast-iron posts are furnished for attaching to battery chutes or for setting in the ground. The base used for setting in ground has a receptacle for trunking.

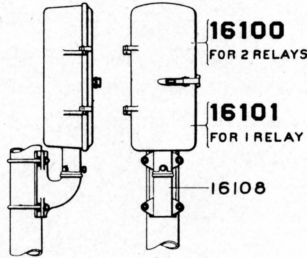
We also manufacture battery boxes, chutes, etc., of every description.

## RELAY BOXES



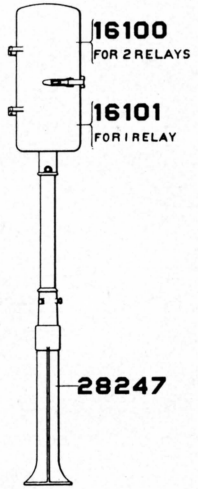
**28240** FOR 1 RELAY

**28241** FOR 2 RELAYS

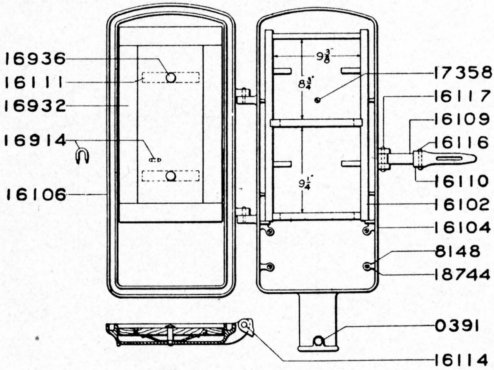


**28242** FOR 1 RELAY  
(U-BOLTS AS SPECIFIED)

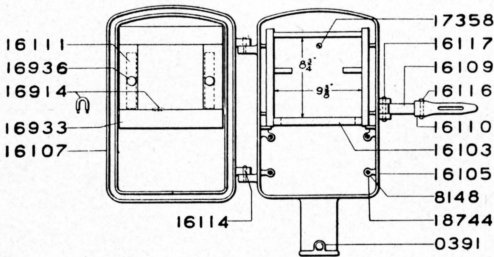
**28243** FOR 2 RELAYS  
(U-BOLTS AS SPECIFIED)



**28247**



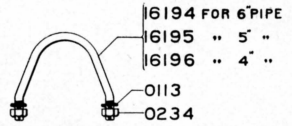
**16100** FOR 2 RELAYS



**16101** FOR 1 RELAY

**28244** FOR 1 RELAY

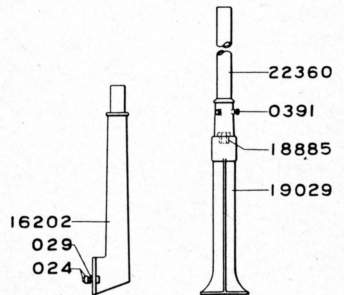
**28245** FOR 2 RELAYS



**16209** FOR 6" PIPE

**16210** " 5" "

**16211** " 4" "



**28246**

**28247**

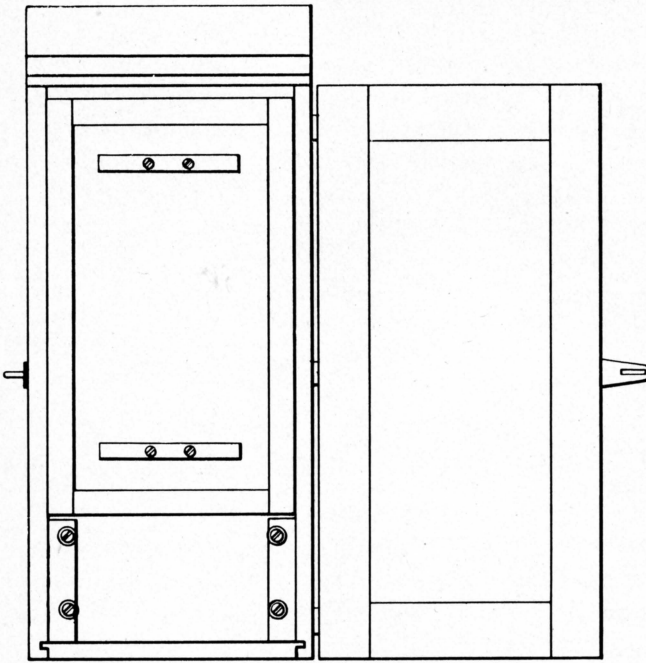
## RELAY BOXES

Order No.	DESCRIPTION	List Price
16101	Single Relay Box Complete, less Post, . . . . .	\$16.50
28465	16101 Less Inner Box and Door but with Wood Shelf, . . . . .	12.88
16100	Double Relay Box Complete, less Post, . . . . .	21.20
28466	16100 Less Inner Box and Door but with Wood Shelves, . . . . .	16.88
28240	Single Relay Box Complete, with Post for Battery Chute, . . . . .	21.18
28241	Double Relay Box Complete, with Post for Battery Chute. . . . .	25.88
28242	Single Relay Box Complete, for attaching to Signal Pole, . . . . .	20.80
28243	Double Relay Box Complete, for attaching to Signal Post, . . . . .	25.50
28244	Single Relay Box Complete, with Foundation, . . . . .	24.10
28245	Double Relay Box Complete, with Foundation, . . . . .	28.80
16209	U-Bolt Complete, for 6" Pipe, . . . . .	.40
16210	U-Bolt Complete, for 5" Pipe, . . . . .	.40
16211	U-Bolt Complete, for 4" Pipe, . . . . .	.40
28246	Post Complete, for Mounting Box on Battery Chute, . . . . .	4.68
28247	Post Complete, with Foundation, . . . . .	7.60
024	Bolt and Nut Complete, $\frac{3}{4}$ " x 2 $\frac{1}{4}$ ", Post to Battery Chute, . . . . .	.08
029	Washer $\frac{3}{4}$ " for Bolt 024, . . . . .	.02
0113	Lock Washer $\frac{3}{8}$ " for U-Bolt, . . . . .	.02
0234	Nut $\frac{3}{8}$ " for Clamp, . . . . .	.02
0391	Tap Bolt, $\frac{1}{2}$ " x 1", for Post 19029, . . . . .	.02
8148	Washer, $\frac{17}{16}$ " x $\frac{1}{2}$ " x $\frac{1}{16}$ " for Screw 18744, . . . . .	.01
16102	Wood Box Complete, for Iron Relay Box 16100, . . . . .	3.00
16103	Wood Box Complete, for Iron Relay Box 16101, . . . . .	2.20
16104	Case for Relay Box 16100, . . . . .	12.00
16105	Case for Relay Box 16101, . . . . .	9.00
16106	Door for Relay Box 16100, . . . . .	5.00
16107	Door for Relay Box 16101, . . . . .	3.50
16108	Bracket for Iron Relay Box to Signal Pole, . . . . .	3.50
16109	Link for Hasp on Iron Relay Box, . . . . .	.50
16110	Hasp Tongue, . . . . .	.30
16111	Spring for Frost Door for Iron Relay Box, . . . . .	.30
16114	Stud for Hinge, . . . . .	.20
16116	Pin for Hasp Tongue, . . . . .	.10
16117	Pin, Link to Case, . . . . .	.10
16194	Clamp, Bracket to 6" Pole, . . . . .	.36
16195	Clamp, Bracket to 5" Pole, . . . . .	.36
16196	Clamp, Bracket to 4" Pole, . . . . .	.36
16202	Post for Iron Relay Box to Battery Chute, . . . . .	4.48

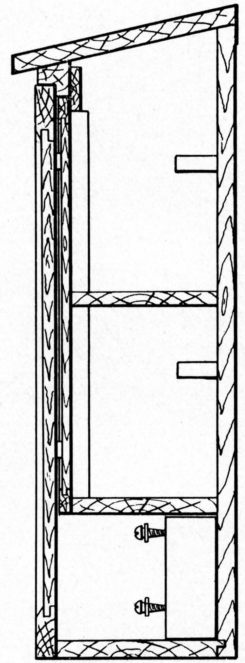
## RELAY BOXES

Order No.	DESCRIPTION	List Price
16914	Staple for Iron Relay Box, . . . . .	\$0.08
16932	Inner Door for Iron Relay Box 16100, . . . . .	1.00
16933	Inner Door for Iron Relay Box 16101, . . . . .	.80
16936	Stud for Inner Door, . . . . .	.20
17358	Screw $\frac{1}{4}$ " 24 x 1" Fill. Hd., Brass, for Iron Relay Box, . . . . .	.08
18744	Screw $\frac{1}{4}$ " 24 x $1\frac{3}{8}$ " for Terminal Board to Iron Relay Box, . . . . .	.08
18885	Bushing for Base 19029, . . . . .	.40
19029	Base for Post 17793 and 22360, . . . . .	5.20
22360	Post Supporting Iron Relay Box, . . . . .	2.00

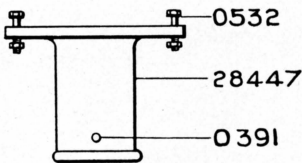
### WOOD RELAY BOXES



21361



21027



28448

## WOOD RELAY BOXES

**T**HE WOOD RELAY BOXES listed below are of the same general arrangement and internal dimensions as our wood-lined iron relay boxes, and are provided with spring-backed inner doors.

The socket listed is for use in mounting wood boxes on Posts Nos. 28246 and 28247, shown on page 96.

Order No.	DESCRIPTION	List Price
21027	Wood Relay Box for one Relay, . . . . .	
21361	Wood Relay Box for two Relays, . . . . .	
28447	Socket Complete, with Bolts, for Mounting Wood Boxes on Posts 28246 and 28247, listed on page 97, . . . . .	

## MODEL 1 LIGHTNING ARRESTER

**O**UR MODEL 1 LIGHTNING ARRESTER is a choke coil of high reactance and low ohmic resistance, with highly insulated turns mounted and sealed in a neat, strong, porcelain housing. The ends of the coil terminate at binding posts which pass through heavy brass discharge plates with serrated ends.

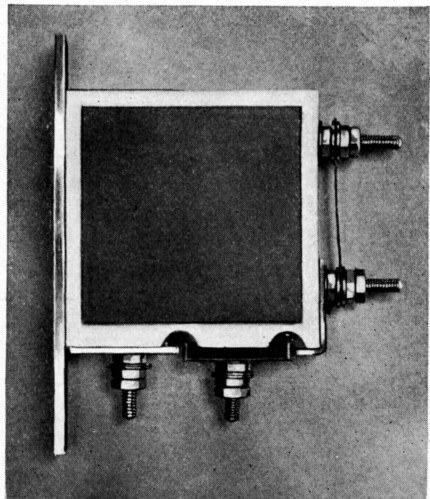
The GROUND PLATE is of carbon and is slotted, as is one of the discharge plates, so that the air gap is adjustable.

All BINDING POSTS are held against turning and are fitted with lock nuts.

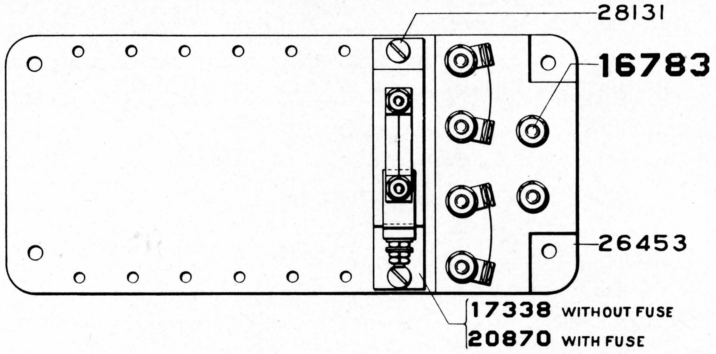
The arrester is furnished with or without fuse, is very compact, and when installed presents a neat and workmanlike appearance. See cut, page 94.

The dimensions of this arrester are 5 inches high, 4 inches deep, and 1 inch wide, assembling in box 1 inch ctrs.

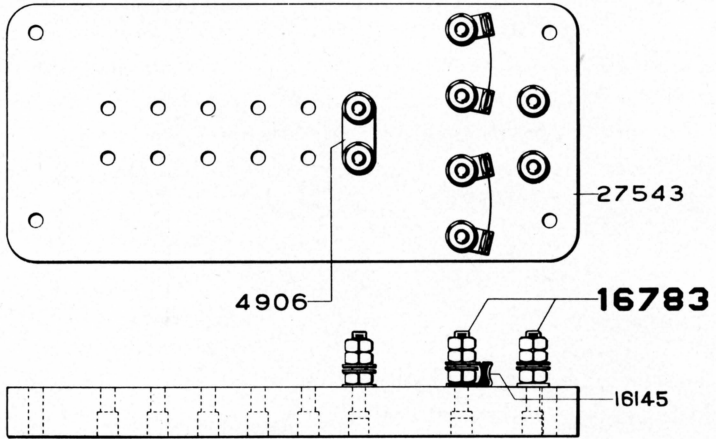
For PRICES see page 103.



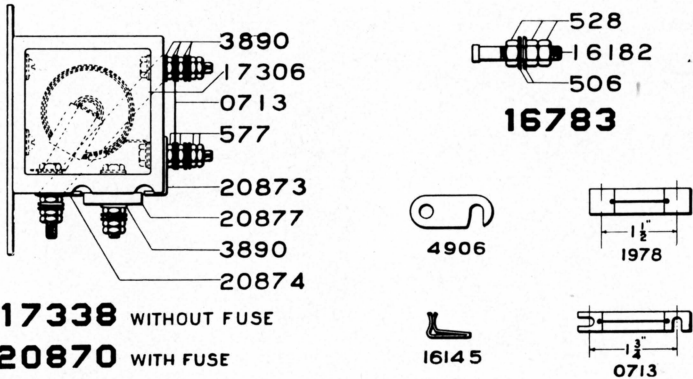
# LIGHTNING ARRESTERS, TERMINAL BOARDS AND FUSES FOR IRON AND WOOD RELAY BOXES



NUMBER OF BINDING POSTS, LIGHTNING ARRESTERS & FUSES AS SPECIFIED.



NUMBER OF BINDING POSTS, LINKS & FUSES AS SPECIFIED.

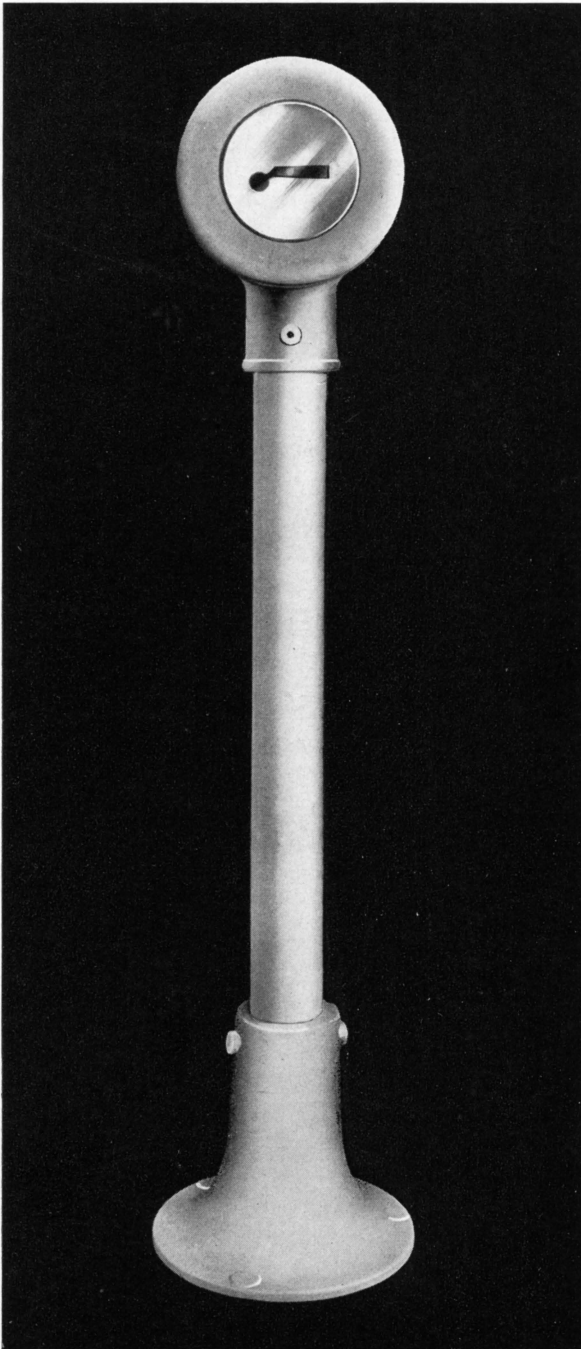


**17338** WITHOUT FUSE  
**20870** WITH FUSE

## LIGHTNING ARRESTERS, TERMINAL BOARDS AND FUSES FOR IRON AND WOOD RELAY BOXES

Order No.	DESCRIPTION	List Price
<b>28453</b>	Terminal Board 26453 with two Fuses as specified and two Binding Posts, . . . . .	
<b>28454</b>	Terminal Board 27543 with two Fuses as specified and two Binding Posts, . . . . .	
<b>17338</b>	Lightning Arrester Complete without Fuse, . . . . .	\$2.50
<b>20870</b>	Lightning Arrester Complete with Fuse, . . . . .	2.60
<b>0713</b>	Fuse, $\frac{1}{2}$ Amp., for Lightning Arresters, . . . . .	.05
<b>506</b>	Washer for Binding Post Complete 16182, . . . . .	.01
<b>528</b>	Nut for Binding Post Complete 16182, . . . . .	.02
<b>577</b>	Nut for Lightning Arrester, . . . . .	.02
<b>1978</b>	Fuse, 5 Amp., for Terminal Boards 26453 and 27543, . . . . .	.05
<b>3890</b>	Washer for Lightning Arresters, . . . . .	.01
<b>4906</b>	Link for Terminal Board 27543, . . . . .	.20
<b>16145</b>	Clip for Fuse on Terminal Boards 26453 and 27543, . . . . .	.10
<b>16182</b>	Screw for Binding Post Complete 16783, . . . . .	.12
<b>16783</b>	Binding Post Complete, . . . . .	.20
<b>17306</b>	Connector for Lightning Arresters, . . . . .	.10
<b>20873</b>	Instrument Plate for Lightning Arresters, . . . . .	.08
<b>20874</b>	Line Plate for Lightning Arresters, . . . . .	.06
<b>20877</b>	Ground Plate for Lightning Arresters, . . . . .	.24
<b>26453</b>	Terminal Board for Lightning Arresters and Fuses, . . . . .	2.00
<b>27543</b>	Terminal Board for Connecting Links and Fuses, . . . . .	1.00
<b>28131</b>	Screw, Fastening Lightning Arresters to Terminal Board 27543, . .	.01





MODEL 3 SWITCH INDICATOR

### MODEL 3 SWITCH INDICATOR

**O**UR MODEL 3 SWITCH INDICATOR is strong, substantial, and of neat appearance.

The MOVEMENT and CONTACTS are doubly protected from insects, moisture, dust, and frost by being housed in an inner case which is provided with a cover containing a clear glass, allowing inspection when the cover of the outer case has been removed.

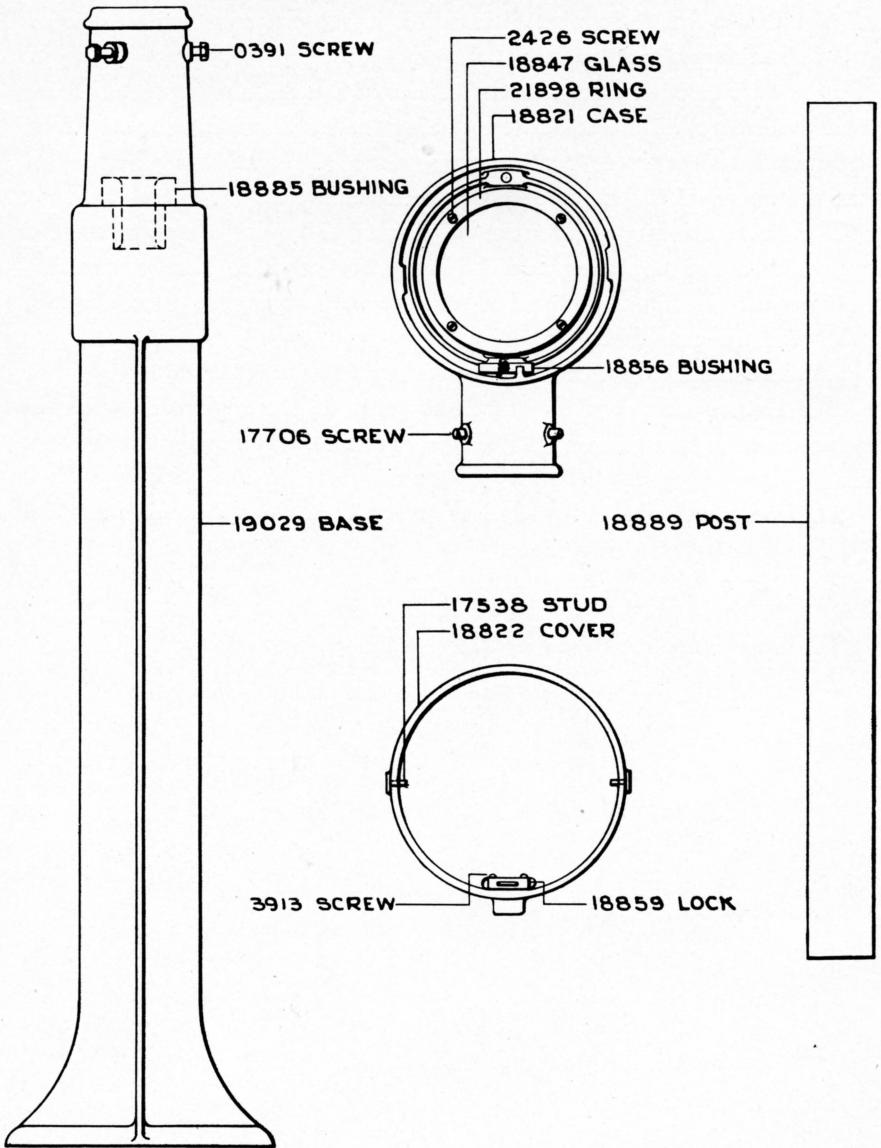
The COILS are large and form wound; after taping they are treated by a vacuum impregnating and drying process, which highly insulates the turns of wire from each other and forms a strong mechanical protection for the outside of the coils.

SILVER BACK CONTACTS are furnished for one circuit.

The FRONT CONTACT automatically cuts in the high resistance retaining coils as the instrument clears, materially reducing the energy consumed.

All iron parts are galvanized to prevent rusting, and all nuts are locked to prevent working loose.

### MODEL 3 SWITCH INDICATOR

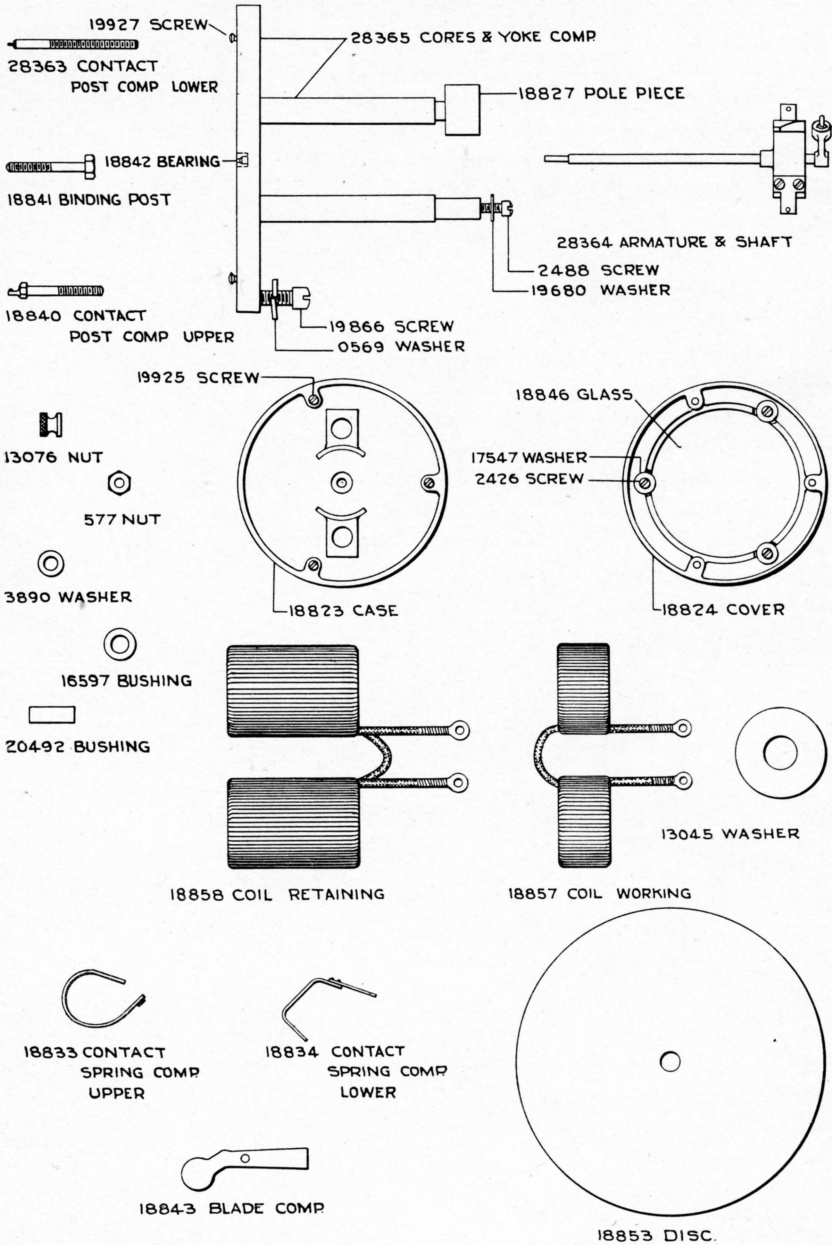


INDICATOR CASE AND FOUNDATION COMP 28367.

## MODEL 3 SWITCH INDICATOR

Order No.	DESCRIPTION	List Price
<b>18989</b>	Switch Indicator Complete with Post and Foundation 19029, to take Trunking, . . . . .	\$52.50
<b>18820</b>	Switch Indicator Complete less Post and Foundation 19029, . . . .	45.00
<b>28367</b>	Indicator Case, Post and Base Complete, . . . . .	22.50
<b>0391</b>	Set Screw, Base to Post, . . . . .	.02
<b>2426</b>	Screw for Ring holding Glass to Case, . . . . .	.01
<b>3913</b>	Screw, Lock to Cover, . . . . .	.01
<b>17538</b>	Stud for Cover, . . . . .	.04
<b>17706</b>	Set Screw, Case to Post, . . . . .	.06
<b>18821</b>	Case Only, Outer, . . . . .	7.00
<b>18822</b>	Cover for Case, . . . . .	6.00
<b>18847</b>	Glass for Case, . . . . .	.50
<b>18856</b>	Bushing, Wood, for incoming Wires, . . . . .	.30
<b>18859</b>	Lock with Key, . . . . .	1.00
<b>18885</b>	Bushing, Wood, in Base for incoming Wires, . . . . .	.40
<b>18889</b>	Post for Indicator, . . . . .	2.00
<b>19029</b>	Base, Supporting Indicator, . . . . .	5.20
<b>21898</b>	Ring, holding Glass to Case, . . . . .	.20

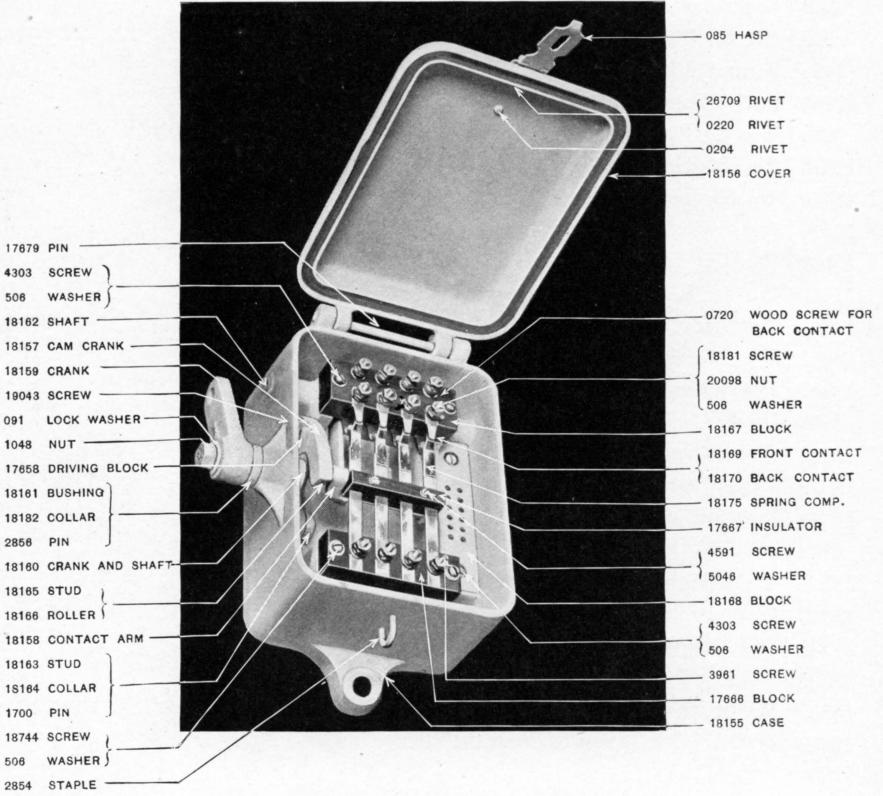
# MODEL 3 SWITCH INDICATOR



INDICATOR MOVEMENT ASSEMBLED COMPLETE 28366

## MODEL 3 SWITCH INDICATOR

Order No.	DESCRIPTION	List Price
<b>28366</b>	Switch Indicator Movement Complete, . . . . .	\$30.00
<b>0569</b>	Lock Washer, $\frac{1}{2}$ ", for Screw, Movement to Case, . . . . .	.02
<b>577</b>	Nut for Binding and Contact Posts, . . . . .	.02
<b>2426</b>	Screw holding Glass to Cover, . . . . .	.01
<b>2488</b>	Screw, Pole Piece to Core, . . . . .	.04
<b>3890</b>	Washer, flat, for Binding Posts, . . . . .	.01
<b>12513</b>	Pin, Blade to Shaft, . . . . .	.02
<b>13045</b>	Washer for Coils, . . . . .	.10
<b>13076</b>	Nut, Knurled, for Binding and Contact Posts, . . . . .	.06
<b>16597</b>	Bushing, Lavite, for Binding Posts, . . . . .	.06
<b>17547</b>	Washer, holding Glass to Inner Cover, . . . . .	.01
<b>18823</b>	Case Only, Inner, . . . . .	5.00
<b>18824</b>	Cover for Inner Case, . . . . .	1.20
<b>18827</b>	Pole Piece for Core, . . . . .	1.20
<b>18833</b>	Upper Contact Spring Complete, . . . . .	.70
<b>18834</b>	Lower Contact Spring Complete, . . . . .	.60
<b>18840</b>	Upper Contact Post Complete, . . . . .	1.20
<b>18841</b>	Post for Contact Springs, . . . . .	.16
<b>18842</b>	Bearing, . . . . .	.10
<b>18843</b>	Blade Complete, . . . . .	.80
<b>18846</b>	Glass for Cover of Inner Case, . . . . .	.20
<b>18853</b>	Disc, Back of Blade, . . . . .	.80
<b>18857</b>	Holding Coils (Specify Resistance), per pair, . . . . .	5.00
<b>18858</b>	Working Coils (Specify Resistance), per pair, . . . . .	10.00
<b>19680</b>	Washer, Pole Pieces to Cores, . . . . .	.01
<b>19866</b>	Screw, Yoke to Case, . . . . .	.06
<b>19925</b>	Screw, Inner Cover to Case, . . . . .	.01
<b>19927</b>	Screw, Disc to Magnet Yoke, . . . . .	.01
<b>20492</b>	Bushing, Oiled Linen, for Binding and Contact Posts, . . . . .	.10
<b>21447</b>	Felt Washer, between Mechanism and Case, . . . . .	.20
<b>22539</b>	Washer for Binding and Contact Posts, . . . . .	.02
<b>28363</b>	Lower Contact Post Complete, . . . . .	.70
<b>28364</b>	Armature Counterweight and Shaft Complete, . . . . .	6.50
<b>28365</b>	Cores and Yoke Complete, . . . . .	2.80



MODEL 2 SHUNT SWITCH BOX  
(No. 18154, FOUR CIRCUITS)

## MODEL 2 SHUNT SWITCH BOX

**O**UR MODEL 2 SHUNT SWITCH BOX is fitted with four front and back contacts arranged to shunt with not over  $\frac{3}{8}$ -inch movement of the switch points.

The box is 6 inches over all in height, and the crank regularly furnished is for a stroke of  $5\frac{1}{2}$  inches or less.

All parts of the movement are strong and simple and all bearings are brass bushed. Binding Posts are large, and ample provision has been made for wiring and connecting in a neat, workmanlike manner. Incoming wires come in from the under side of the box through a heavy insulation block.

The box is dust and weather tight, and by removing the crank and shifting it on the square portion of the shaft it can be used at either side of the switch.

A hasp and staple are provided for padlock.

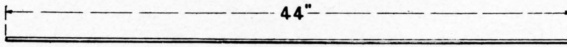
Order No.	DESCRIPTION	List Price
18154	Shunt Switch Box Complete, four circuits, . . . . .	\$28.00
892	Operating Rod Complete, . . . . .	3.30
010	Bolt with Nut $\frac{1}{2}$ " x $1\frac{1}{2}$ ", . . . . .	.04
040	Cotter Pin, . . . . .	.008
085	Hasp for Cover, . . . . .	.20
091	Lock Washer, $\frac{1}{2}$ ", for Nut 1048, . . . . .	.02
0204	Rivet, $\frac{3}{16}$ " x $\frac{1}{2}$ ", Rd. Hd. Iron, Hasp to Cover, . . . . .	.01
0220	Rivet, $\frac{3}{16}$ " x $\frac{5}{8}$ ", Rd. Hd. Iron, Hasp to Cover, . . . . .	.01
0720	Wood Screw, No. 4 x $\frac{5}{8}$ ", Flat Hd. Brass, Back Contact 18170 to Block 18167, . . . . .	.02
506	Washer, $\frac{1}{4}$ " for 4303, 18181 and 18744, . . . . .	.01
523	Nut, $\frac{7}{8}$ " Hex., . . . . .	.07
645	Nut, $\frac{5}{8}$ " Hex., . . . . .	.04
646	Nut, $\frac{3}{4}$ " Hex., . . . . .	.05
873	Screw Jaw, . . . . .	.33
874	Pin, . . . . .	.30
877	Rod, . . . . .	1.50
893	Foot, . . . . .	.80
1048	Nut, $\frac{1}{2}$ " Hex., 18159 to 18160, . . . . .	.03
1700	Pin, $\frac{1}{8}$ " x $1\frac{3}{8}$ ", 18164 to 18165, . . . . .	.04
2854	Staple, . . . . .	.08
2856	Pin, $\frac{3}{16}$ " x $1\frac{9}{16}$ ", 18182 to 18160, . . . . .	.04



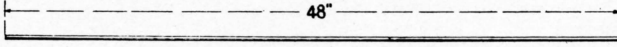
## MODEL 2 SHUNT SWITCH BOX

Order No.	DESCRIPTION	List Price
3961	Screw, $\frac{1}{4}$ " 24 x $1\frac{3}{4}$ " Rd. Hd. Brass, for Spring 18175, . . . . .	\$0.14
4303	Screw, $\frac{1}{4}$ " 24 x $1\frac{1}{2}$ " Rd. Hd. Brass, Block 18167 to Case, . . . . .	.04
4591	Screw, No. 10, 32 x $1\frac{1}{4}$ " Rd. Hd. Brass, Insulator 17667 to Contact Arm 18158, . . . . .	.03
5046	Washer, $\frac{3}{16}$ " for Screw 4591, . . . . .	.01
17658	Driving Block, . . . . .	.20
17666	Insulating Block for 18175, . . . . .	.50
17667	Insulator for Contact Arm, . . . . .	.24
17679	Pin, $\frac{3}{8}$ " x $6\frac{3}{8}$ ", Cover to Case, . . . . .	.08
18155	Case, . . . . .	8.00
18156	Cover, . . . . .	2.00
18157	Cam Crank, . . . . .	4.00
18158	Contact Arm, . . . . .	2.50
18159	Crank, outside, . . . . .	.50
18160	Crank, Operating, . . . . .	3.50
18161	Bushing, in Case for 18160, . . . . .	.50
18162	Shaft for 18158, . . . . .	.60
18163	Stud for 18157, . . . . .	.16
18164	Collar for 18163, . . . . .	.20
18165	Stud for 18166, . . . . .	.30
18166	Roller for 18158, . . . . .	.30
18167	Insulating Block for Front and Back Contacts, . . . . .	.60
18168	Block for Lead Wires, . . . . .	.44
18169	Front Contact Complete, . . . . .	.30
18170	Back Contact Complete, . . . . .	.50
18175	Contact Spring Complete, . . . . .	1.00
18181	Screw, $\frac{1}{4}$ " 24 x $1\frac{1}{4}$ " Rd. Hd. Brass, for Front Contacts, . . . . .	.08
18182	Collar for 18160, . . . . .	.30
18744	Screw, $\frac{1}{4}$ " 24 x $1\frac{3}{8}$ " Rd. Hd. Brass, 17666 to Case, . . . . .	.08
19043	Screw, No. 10, 32 x $\frac{1}{2}$ " Headless, Stop for 18160, . . . . .	.05
20098	Nut, $\frac{1}{4}$ " Hex. for 18181, . . . . .	.02
26709	Rivet, $\frac{3}{16}$ " x 1" Rd. Hd. Iron, Hasp to Cover, . . . . .	.01
	Felt, $\frac{1}{8}$ " x $\frac{7}{16}$ " x 4 Ft. long, for Cover, to make Case weatherproof, . .	.20

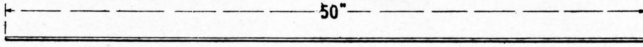
### BOND WIRES AND END POSTS



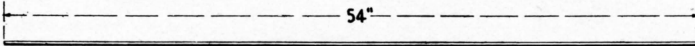
12350



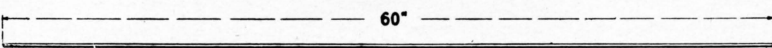
12351



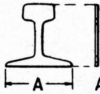
12352



12353



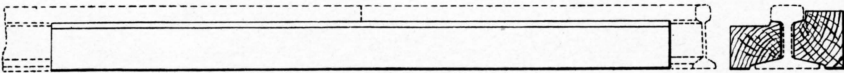
12354



- 12391 - 4 <sup>1</sup>/<sub>4</sub>"
- 12392 - 4 <sup>1</sup>/<sub>2</sub>"
- 12393 - 4 <sup>3</sup>/<sub>4</sub>"
- 12394 - 5"
- 12395 - 5 <sup>3</sup>/<sub>8</sub>"
- 12396 - 5 <sup>3</sup>/<sub>4</sub>"



10350



12349

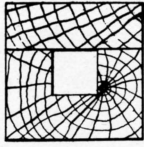
## BOND WIRES AND END POSTS

Order No.	DESCRIPTION	
<b>10350</b>	Channel Pin for No. 8 Bond Wire, . . . . .	Prices on Application.
<b>12350</b>	No. 8 Galvanized Bond Wire 44" long, . . . . .	
<b>12351</b>	No. 8 Galvanized Bond Wire 48" long, . . . . .	
<b>12352</b>	No. 8 Galvanized Bond Wire 50" long, . . . . .	
<b>12353</b>	No. 8 Galvanized Bond Wire 54" long, . . . . .	
<b>12354</b>	No. 8 Galvanized Bond Wire 60" long, . . . . .	
<b>12391</b>	Fibre End Post for rail 4 $\frac{1}{4}$ " high, . . . . .	
<b>12392</b>	Fibre End Post for rail 4 $\frac{1}{2}$ " high, . . . . .	
<b>12393</b>	Fibre End Post for rail 4 $\frac{3}{4}$ " high, . . . . .	
<b>12394</b>	Fibre End Post for rail 5" high, . . . . .	
<b>12395</b>	Fibre End Post for rail 5 $\frac{3}{8}$ " high, . . . . .	
<b>12396</b>	Fibre End Post for rail 5 $\frac{1}{4}$ " high, . . . . .	

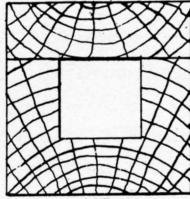
# TRUNKING AND STAKES



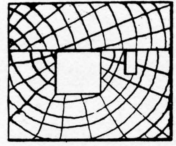
2747



898



897



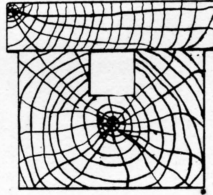
2059



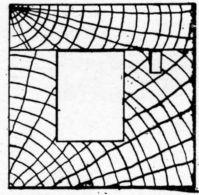
5524-3" X 4" X 4'-0"  
6034-4" X 4" X 3'-6"



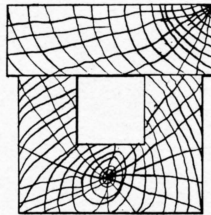
915-4" DIA. X 3'-0"



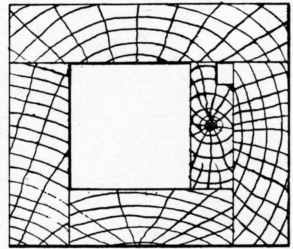
6033



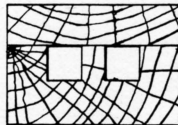
2058



5246



2057



5731

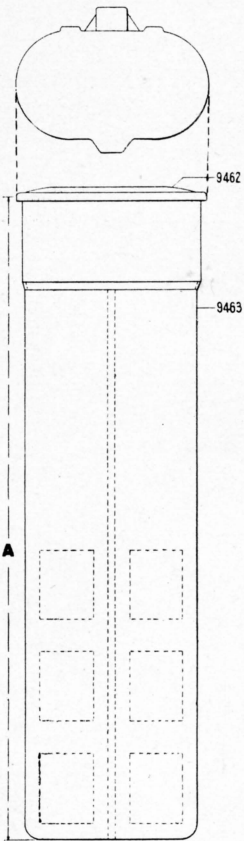


5730

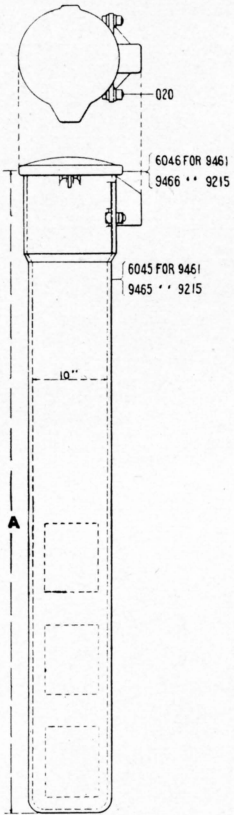
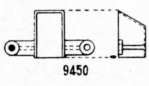
## TRUNKING AND STAKES

Order No.	DESCRIPTION	Prices upon Request.										
897	Trunking, 3" x 4", with lid 1 $\frac{1}{4}$ " x 4", grooves 1 $\frac{3}{4}$ " x 1 $\frac{3}{4}$ ", per foot, . . .		Prices upon Request.									
898	Trunking, 2" x 3", with lid 1" x 3", grooves 1" x 1", per foot, . . . .			Prices upon Request.								
915	Stake, 4" dia. 3' long, . . . . .				Prices upon Request.							
2057	Trunking, 4" x 6", with lid 1 $\frac{1}{4}$ " x 6", grooves 2 $\frac{3}{4}$ " x 2 $\frac{3}{8}$ " and $\frac{1}{2}$ " x $\frac{3}{8}$ " per foot, . . . . .					Prices upon Request.						
2058	Trunking, 3" x 4", with lid 1" x 4", grooves 1 $\frac{1}{2}$ " x 2" and $\frac{1}{4}$ " x $\frac{1}{2}$ " per ft.,						Prices upon Request.					
2059	Trunking, 2" x 3 $\frac{1}{2}$ ", with lid 1" x 3", grooves 1" x 1" and $\frac{1}{4}$ " x $\frac{1}{2}$ " per ft.,							Prices upon Request.				
2747	Trunking, for Wood poles 1 $\frac{3}{4}$ " x 3", grooves $\frac{3}{4}$ " x 1" per ft., . . . . .								Prices upon Request.			
5246	Trunking, 3" x 4", with lid 1 $\frac{1}{2}$ " x 4 $\frac{1}{2}$ ", grooves 1 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " per ft., . . .									Prices upon Request.		
5524	Stake, 3" x 4" x 4' long, . . . . .										Prices upon Request.	
5730	Trunking, 1 $\frac{3}{4}$ " x 5 $\frac{3}{4}$ ", with lid $\frac{7}{8}$ " x 5 $\frac{3}{4}$ ", with three grooves $\frac{3}{4}$ " x $\frac{7}{8}$ " per ft.											Prices upon Request.
5731	Trunking, 1 $\frac{3}{4}$ " x 3 $\frac{3}{4}$ ", with lid $\frac{7}{8}$ " x 3 $\frac{3}{4}$ ", with two grooves $\frac{3}{4}$ " x $\frac{3}{4}$ " per ft.,											
6033	Trunking, 3" x 4", with lid 1" x 4 $\frac{1}{2}$ ", grooves 1" x 1" per ft., . . . . .	Prices upon Request.										
6034	Stake, 4" x 4" x 3'6" long, . . . . .		Prices upon Request.									

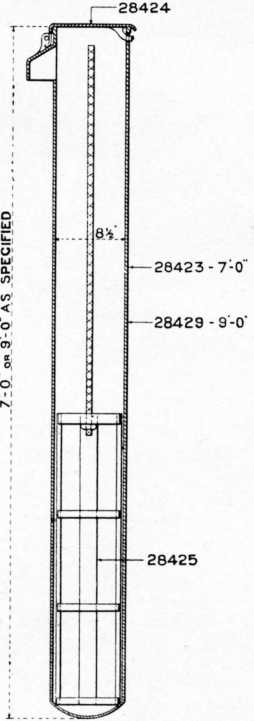
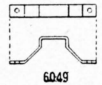
# BATTERY CHUTES



**9464** - 7'-0"



**9461** - 6'-0"  
**9215** - 7'-0"



- 28421** CHUTE AND ELEVATOR COMPLETE - 7'-0"
- 28422** CHUTE COMPLETE WITHOUT ELEVATOR - 7'-0"
- 28427** CHUTE AND ELEVATOR COMPLETE - 9'-0"
- 28428** CHUTE COMPLETE WITHOUT ELEVATOR - 9'-0"

## BATTERY CHUTES

**T**HE battery chutes shown on the opposite page are of two types. Chutes Nos. 9215, 9461, and 9464 have exceptionally heavy shells of a large diameter; are provided with high-grade elevators, and with frost boards; provision is made for bolting posts to the chutes to take relay boxes.

Chutes Nos. 28421 and 28427 are the same weight, dimensions, and finish as chutes furnished by competitors and fully meet the requirements where conditions are less exacting than those requiring the heavier and more expensive type of construction.

Order No.	DESCRIPTION	List Price
9461	6-Foot Cast Iron Battery Chute Complete with Elevator and Frost Board, to hold 2 or 3 cells, 6" x 8" Gravity Battery. When ordering specify whether for two or three cells, . . . . .	\$26.30
9215	7-Foot Cast Iron Battery Chute Complete with Elevator and Frost Board, to hold two or three cells, 6" x 8" Gravity Battery. When ordering specify whether for two or three cells, . . . . .	30.50
9464	7-Foot Double Battery Chute Complete with Elevators and Frost Board, to hold four or six cells of 6" x 8" Gravity Battery. When ordering specify whether for four or six cells, . . . . .	54.00
28421	7-Foot Battery Chute Complete, with Elevator, . . . . .	
28422	7-Foot Battery Chute Complete, without Elevator, . . . . .	
28427	9-Foot Battery Chute Complete, with Elevator, . . . . .	
28428	9-Foot Battery Chute Complete, without Elevator, . . . . .	
020	Bolt with Nut, $\frac{3}{4}$ " x 2", . . . . .	.08
071	Washer for $\frac{3}{8}$ " Bolt, . . . . .	.01
0238	Bolt with Nut, $\frac{3}{8}$ " x 3", . . . . .	.03
6045	Battery Chute, Casting Only, for 9461, . . . . .	
6046	Cover for 9461, . . . . .	
6047	Three-Cell Elevator for use with 9461, . . . . .	2.10
6048	Hanger for Battery Elevators, . . . . .	
6049	Strap for holding Trunking to 9461, . . . . .	
6050	Two-cell Elevator for use with 9461, . . . . .	1.82
9450	Cap for holding Trunking to 9215, . . . . .	
9462	Cover for Double Battery Chute 9464, . . . . .	
9463	Battery Chute, Casting Only, for 9464, . . . . .	
9465	Battery Chute, Casting Only, for 9215, . . . . .	
9466	Cover Only for 9215, . . . . .	
9469	Two-cell Elevator for use with 9215, . . . . .	
28423	Battery Chute, Casting Only, for 28421 and 28422, . . . . .	
28424	Cover for 28421, etc., . . . . .	
28425	Elevator for 28421 and 28427, . . . . .	
28429	Battery Chute, Casting Only, for 28427 and 28428, . . . . .	

The following memorandum of items will be of assistance in checking lists submitted for estimates:

SIGNALS; Specify height, spectacle, and lamp to be supplied.

BLANK DOLLS.

BRACKET POSTS.

LAMPS.

SLOTS.

BATTERY CHUTES.

BATTERY SHELTERS.

BATTERY, STORAGE.

BATTERY, PRIMARY.

RELAYS — Model                      Ohms                      Pts.

RELAY BOXES.

SHUNT SWITCH BOXES.

SHUNT SWITCH BOX CONNECTIONS.

SWITCH INDICATORS.

TOWER INDICATORS.

TOWER ANNUNCIATORS.

SWITCH LOCKS.

LEVER LOCKS.

CIRCUIT CONTROLLER ON LEVERS.

CIRCUIT CONTROLLER ON SIGNALS.

HAND RELEASES.

BELLS.

BELL KEYS.

PADLOCKS.

LIGHTNING ARRESTERS.

LIGHTNING ARRESTER BOXES.

LIGHTNING ARRESTER GROUND RODS.

INSULATED JOINTS, Track.

INSULATED JOINTS, Pipe.

INSULATED JOINTS, Switch Rods.

INSULATED JOINTS, Tie Plates.

CHANNEL PINS.

BOND WIRES,                      Inch.

TRUNKING.

STAKES.

WIRE, R. C. No.

WIRE, LINE No.

SUNDRIES



## INDEX TO ORDER NUMBERS

Order No.	Page	List Price	Order No.	Page	List Price	Order No.	Page	List Price
02	45	\$0.02	0732	53	\$0.02	2456	59	\$0.02
03	45	.02	0733	75	.03	2472	75	.05
04	45	.02	0735	53	.03	2488	109	.04
05	45	.02	0762	53	.01	2599	49	....
06	41	.02	0792	75	.04	2600	49	....
07	41	.02	0876	53	.01	2613	59	.01
010	111	.04	0891	73	.02	2747	117	....
020	119	.08	441	73	.12	2854	111	.08
024	97	.08	500	85	.04	2856	111	.04
039	79	.008	506	59	.01	2878	79	.04
040	53	.008	523	111	.07	3798	57	.02
044	73	.008	528	59	.02	3827	67	.02
071	119	.01	577	57	.02	3890	67	.01
072	53	.01	645	57	.04	3909	43	4.00
077	43	.04	646	59	.05	3913	107	.01
085	111	.20	774	59	.02	3961	112	.14
086	39	.14	873	111	.33	4015	41	.80
091	79	.02	874	111	.30	4016	41	.90
0104	39	.07	877	111	1.50	4019	43	.28
0113	57	.02	892	111	3.30	4020	43	.30
0134	45	.02	893	111	.80	4021	43	.36
0160	53	.02	897	117	....	4100	43	1.10
0175	41	.03	898	117	....	4102	43	.30
0204	111	.01	915	117	....	4123	43	.22
0220	111	.01	924	49	....	4153	43	1.00
0234	97	.02	937	45	.16	4211	37	24.50
0238	119	.03	1048	53	.03	4303	112	.14
0286	79	.02	1144	75	.04	4423	85	.02
0290	39	.08	1155	85	.02	4591	112	.03
0300	73	.02	1156	53	.02	4649	47	8.68
0391	53	.02	1411	59	.08	4650	47	7.50
0393	73	.02	1472	85	.02	4651	47	.30
0395	75	.03	1671	47	.05	4679	49	....
0398	53	.02	1680	49	....	4682	49	....
0510	59	.02	1681	49	....	4697	75	.02
0551	75	.04	1700	111	.04	4906	103	.20
0563	58	.008	1893	86	.05	5046	112	.01
0569	59	.02	1978	103	.05	5090	47	.12
0606	53	.04	2057	117	....	5166	49	....
0623	59	.02	2058	117	....	5191	69	.06
0641	53	.04	2059	117	....	5246	117	....
0677	63	.01	2426	107	.01	5255	85	.07
0705	53	.06	2438	59	.02	5470	41	.42
0713	103	.05	2449	59	.04	5524	117	....
0720	111	.02	2451	59	.02	5730	117	....
0723	53	.03	2452	61	.02	5731	117	....

## INDEX TO ORDER NUMBERS—CON.

Order No.	Page	List Price	Order No.	Page	List Price	Order No.	Page	List Price
5946	47	\$1.76	9244	49	....	9714	45	\$5.40
5947	47	1.76	9245	49	....	9724	45	4.20
6033	117	....	9246	49	....	9725	45	6.40
6034	117	....	9247	49	....	9726	45	4.00
6045	119	....	9248	49	....	9727	45	6.00
6046	119	....	9249	49	....	9734	45	4.80
6047	119	2.10	9450	119	....	9735	45	6.00
6048	119	....	9461	119	\$ 26.30	9797	47	1.76
6049	119	....	9462	119	....	9798	47	1.76
6050	119	....	9463	119	....	10001	57	1.20
6170	63	.05	9464	119	54.00	10002	57	1.00
6485	41	18.00	9465	119	....	10003	57	.06
6842	45	.30	9466	119	....	10004	63	.06
6902	45	.16	9469	119	....	10005	57	.30
6919	41	3.00	9500	35	220.00	10006	60	.20
7064	49	....	9502	53	40.00	10007	60	.30
7066	49	....	9511	51	2.50	10010	63	.20
7229	59	.04	9512	51	2.50	10018	57	.60
7244	75	.10	9516	57	6.00	10031	41	6.00
7368	86	.02	9517	57	3.20	10047	53	5.00
7395	59	.03	9518	59	1.20	10057	53	3.00
7425	67	.02	9519	57	3.00	10060	41	38.92
7662	59	.05	9521	60	1.00	10062	60	5.00
8148	97	.01	9522	60	1.50	10063	53	.30
8689	63	.03	9526	53	.24	10067	41	.48
9009	43	3.30	9530	60	.07	10068	41	.52
9201	53	.07	9532	63	.24	10289	39	1.80
9215	119	30.50	9533	63	.70	10318	47	.12
9226	49	....	9534	63	1.20	10323	45	.20
9227	49	....	9535	51	5.00	10341	45	.60
9228	49	....	9536	51	5.00	10350	115	....
9229	49	....	9538	60	1.40	12261	53	51.00
9230	49	....	9539	57	.20	12266	69	60.00
9231	49	....	9540	53	.60	12271	60	.04
9232	49	....	9541	57	2.80	12272	60	.04
9233	49	....	9542	57	5.50	12278	53	1.00
9234	49	....	9543	57	5.00	12279	57	.02
9235	49	....	9547	60	.80	12291	57	1.00
9236	49	....	9548	57	.10	12293	59	16.50
9237	49	....	9549	63	.04	12294	59	16.00
9238	49	....	9550	57	.04	12295	59	15.50
9239	49	....	9636	45	4.80	12296	60	.50
9240	49	....	9674	45	4.80	12297	53	.02
9241	49	....	9681	45	4.20	12300	63	.03
9242	49	....	9700	45	5.40	12307	53	.05
9243	49	....	9711	45	6.20	12350	115	....

## INDEX TO ORDER NUMBERS—CON.

Order No.	Page	List Price	Order No.	Page	List Price	Order No.	Page	List Price
12351	115	....	16185	73	\$4.50	16420	57	\$9.80
12352	115	....	16186	73	1.20	16425	79	.80
12353	115	....	16187	73	.60	16426	79	.10
12354	115	....	16188	73	.30	16427	79	.30
12391	115	....	16194	97	.36	16428	85	32.00
12392	115	....	16195	97	.36	16429	85	6.00
12393	115	....	16196	97	.36	16430	85	1.00
12394	115	....	16202	97	4.48	16431	85	.12
12395	115	....	16209	97	.40	16432	85	.80
12396	115	....	16210	97	.40	16433	85	.40
12513	109	\$0.02	16211	97	.40	16434	85	6.50
12525	63	.02	16380	71	300.00	16435	85	3.00
12526	67	.02	16381	75	58.00	16436	85	.30
12563	85	.06	16382	75	40.00	16444	85	1.00
12639	60	.10	16383	75	7.00	16445	86	75.00
12680	85	.02	16384	75	.70	16446	86	20.00
12739	37	20.00	16385	75	.36	16450	86	5.00
13021	89	39.00	16386	75	.70	16453	86	3.50
13022	89	35.00	16387	75	.40	16454	86	2.00
13023	89	31.00	16388	75	.14	16455	86	3.00
13045	109	.10	16389	75	.16	16456	86	.12
13076	109	.06	16390	81	7.50	16457	86	3.50
13285	81	.30	16391	81	19.00	16458	86	.08
15921	63	23.00	16393	81	.70	16459	86	30.00
15922	63	2.00	16394	81	50.00	16461	86	9.00
15923	63	5.50	16395	81	6.00	16462	86	3.50
15930	41	2.50	16396	81	2.00	16463	86	.14
16100	97	21.20	16397	81	1.20	16465	85	.16
16101	97	16.50	16398	60	.24	16467	85	.20
16102	97	3.00	16399	60	.40	16468	85	.06
16103	97	2.20	16404	81	1.80	16563	82	.10
16104	97	12.00	16405	81	1.00	16574	86	75.00
16105	97	9.00	16406	82	.16	16575	86	30.00
16106	97	5.00	16407	81	2.10	16576	57	2.20
16107	97	3.50	16408	85	1.20	16577	57	4.00
16108	97	3.50	16409	85	2.00	16578	57	.15
16109	97	.50	16410	85	1.00	16597	109	.06
16110	97	.30	16411	85	.60	16661	57	12.70
16111	97	.30	16412	85	.60	16662	57	5.04
16114	97	.20	16413	85	1.80	16663	53	.80
16116	97	.10	16414	85	.30	16665	67	75.00
16117	97	.10	16415	85	.12	16666	67	40.00
16145	103	.10	16416	79	6.00	16667	67	8.00
16182	103	.12	16417	79	7.00	16668	67	2.50
16183	73	13.00	16418	79	14.20	16669	60	3.00
16184	73	4.00	16419	79	.50	16670	60	6.00

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Order No.	Page	List Price	Order No.	Page	List Price	Order No.	Page	List Price
16671	60	\$12.00	18106	69	\$0.60	18284	69	\$3.00
16672	59	1.50	18107	69	.06	18285	69	.01
16673	59	1.50	18108	67	2.50	18286	69	.06
16674	59	1.50	18109	69	2.50	18290	69	.10
16675	63	.84	18110	69	14.00	18440	60	1.00
16676	63	2.30	18112	69	.20	18441	60	.24
16678	63	.36	18113	69	.10	18442	60	.40
16679	63	.36	18114	67	.30	18443	60	.60
16783	103	.20	18116	69	.20	18540	63	20.00
16901	41	66.00	18117	67	.80	18544	63	.70
16902	41	42.00	18118	69	.40	18546	63	.30
16903	41	63.00	18124	69	.10	18547	63	.01
16904	41	59.00	18126	69	5.00	18548	63	.10
16914	98	.08	18127	67	.50	18549	63	1.00
16932	98	1.00	18129	69	2.00	18553	64	.05
16933	98	.80	18130	69	.40	18592	41	2.50
16936	98	.20	18135	69	.20	18594	41	69.00
16961	71	450.00	18140	67	.04	18605	41	48.00
16979	73	.07	18141	67	5.00	18623	41	20.00
16980	73	13.00	18143	69	.16	18625	39	.90
16981	73	1.20	18144	69	.10	18626	39	1.30
16982	73	.60	18145	67	.12	18627	39	44.00
16983	73	.30	18148	69	.06	18628	39	30.00
17306	103	.10	18154	111	28.00	18631	39	.50
17309	60	.10	18155	112	8.00	18636	39	10.00
17338	103	2.50	18156	112	2.00	18640	69	60.00
17358	98	.08	18157	112	4.00	18641	69	5.00
17425	35	500.00	18158	112	2.50	18642	69	30.00
17538	107	.04	18159	112	.50	18728	60	.20
17547	109	.01	18160	112	3.50	18743	64	.24
17658	112	.20	18161	112	.50	18744	98	.04
17666	112	.50	18162	112	.60	18747	64	.04
17667	112	.24	18163	112	.16	18748	60	.07
17679	112	.08	18164	112	.20	18777	60	.12
17686	60	.04	18165	112	.30	18820	107	45.00
17706	107	.06	18166	112	.30	18821	107	7.00
17720	35	332.00	18167	112	.60	18822	107	6.00
17810	53	.20	18168	112	.44	18823	109	5.00
17817	41	4.40	18169	112	.30	18824	109	1.20
17818	41	4.80	18170	112	.50	18827	109	1.20
18049	53	.01	18175	112	1.00	18833	109	.70
18061	54	.10	18181	60	.08	18834	109	.60
18100	69	30.00	18182	112	.30	18840	109	1.20
18103	69	1.00	18263	41	25.56	18841	109	.16
18104	69	.80	18280	69	.02	18842	109	.10
18105	69	.06	18281	67	.04	18843	109	.80

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18846	109	\$ 0.20	19844	60	\$ 0.24	20920	67	\$60.00
18847	107	.50	19845	60	.30	20922	67	30.00
18853	109	.80	19846	60	.20	20949	51	6.00
18856	107	.30	19847	60	1.50	20950	63	21.00
18857	109	5.00	19866	109	.06	20955	64	1.00
18858	109	10.00	19925	109	.01	21006	43	12.40
18859	107	1.00	19927	109	.01	21009	43	1.20
18860	54	.04	20098	60	.02	21022	54	1.00
18866	59	6.50	20287	51	2.50	21026	54	.20
18885	98	.40	20390	54	.02	21027	101	....
18889	107	2.00	20399	64	.04	21120	53	22.00
18946	35	620.00	20416	39	1.20	21124	54	.08
18947	35	452.00	20447	67	.10	21136	54	.20
18948	35	580.00	20459	64	.08	21361	101	....
18949	35	412.00	20477	57	.80	21447	109	.20
18960	41	35.00	20478	61	.10	21488	85	.12
18989	107	52.50	20492	109	.10	21714	82	.12
19029	98	5.20	20514	67	5.00	21819	47	9.00
19043	54	.05	20520	67	60.00	21898	107	.20
19049	51	5.00	20531	67	3.50	22135	54	1.10
19086	60	.60	20532	67	.50	22182	43	.90
19087	60	.80	20533	67	1.00	22360	98	2.00
19551	39	50.00	20534	67	.20	22370	47	9.50
19552	39	84.00	20535	67	.10	22539	109	.02
19553	39	110.00	20536	67	.20	22610	67	.30
19554	39	60.00	20537	67	.10	22632	67	.08
19555	39	94.00	20538	67	2.00	22724	43	4.66
19556	39	120.00	20539	67	.20	22728	41	.94
19559	39	40.00	20542	67	2.50	23040	75	.16
19664	39	2.50	20548	67	.20	26442	87	1.00
19665	39	5.00	20567	61	2.00	26453	103	2.00
19666	60	.20	20628	59	3.50	26574	64	7.50
19667	41	39.00	20670	53	1.00	26593	59	7.00
19680	109	.01	20686	61	.06	26614	37	268.00
19720	54	.08	20814	64	.20	26615	37	436.00
19721	57	.12	20815	64	.24	26616	37	320.00
19722	51	6.00	20822	43	35.00	26617	37	360.00
19723	67	.12	20824	43	58.00	26618	37	350.00
19762	39	174.00	20835	43	.56	26709	112	.01
19763	39	36.00	20850	43	.60	27543	103	1.00
19786	67	.05	20852	43	.66	27557	85	34.00
19808	54	.20	20870	103	2.60	27560	86	90.00
19809	39	.10	20873	103	.08	27561	87	40.00
19841	59	9.00	20874	103	.06	27565	85	8.50
19842	59	1.80	20877	103	.24	27583	54	.20
19843	60	.50	20903	63	20.00	27584	54	.08

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27590	53	\$37.50	28056	82	\$8.50	28246	97	\$4.68
27591	53	23.00	28073	43	21.00	28247	97	7.60
27593	54	1.20	28097	79	49.00	28363	109	.70
27596	54	4.00	28131	103	.01	28364	109	6.50
27597	54	.20	28148	82	.30	28365	109	2.80
27598	54	1.30	28149	82	.30	28366	109	30.00
27599	54	6.00	28150	59	48.00	28367	107	22.50
27641	59	13.00	28151	59	48.00	28393	53	37.50
27643	61	4.00	28152	59	48.00	28394	53	23.00
27644	61	.60	28156	43	14.70	28407	69	2.70
27646	61	.12	28157	43	17.50	28421	119	....
27647	81	13.00	28158	43	3.56	28422	119	....
27677	71	386.00	28159	43	4.56	28423	119	....
27678	71	530.00	28162	43	35.00	28424	119	....
27679	71	570.00	28163	43	17.70	28425	119	....
27900	75	30.00	28169	87	8.00	28427	119	....
27901	76	12.00	28170	81	7.60	28428	119	....
27902	76	6.00	28176	53	21.50	28429	119	....
27903	76	6.00	28177	67	.30	28446	35	244.00
27904	76	3.00	28194	63	5.00	28447	101	....
27905	76	3.00	28195	63	6.00	28453	103	....
27906	76	.50	28240	97	21.18	28454	103	....
27907	76	.20	28241	97	25.88	28465	97	12.88
27908	76	4.00	28242	97	20.80	28466	97	16.88
27909	76	1.50	28243	97	25.50	28739	71	330.00
27927	79	17.00	28244	97	24.10			
27929	76	1.20	28245	97	28.80			

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38-LH, . . . . .	9734	2542, . . . . .	18157	18110X, . . . . .	18110
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1233, . . . . .	4651	16105X, . . . . .	16105	18822X, . . . . .	18822
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1880, . . . . .	6902	16110X, . . . . .	16110	19087X, . . . . .	19087
2127, . . . . .	9681	16184X, . . . . .	16184	19664X, . . . . .	19664
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2406, . . . . .	9534	16457X, . . . . .	16457	27929X, . . . . .	27929
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