

## SWITCHES—TYPE W

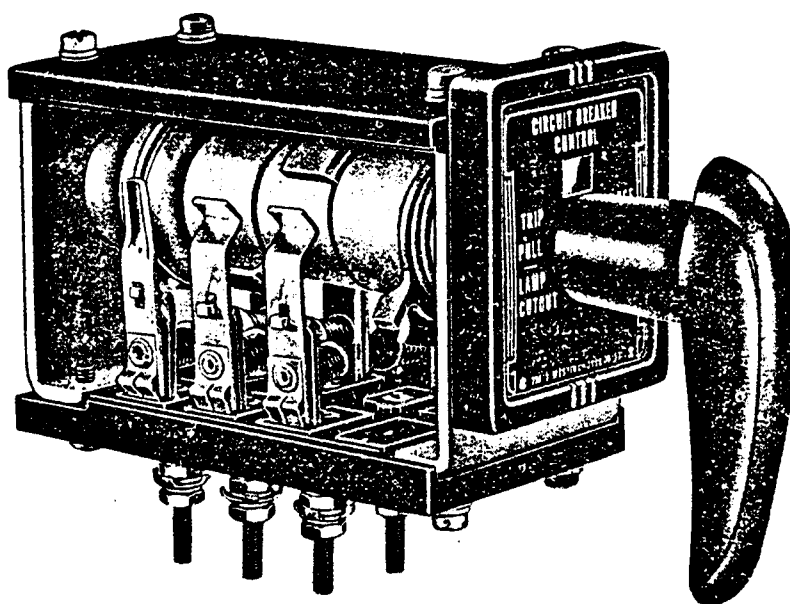


FIG. 1—SWITCH WITH SILVER CONTACTS AND MODERN HANDLE

### General

Type W switches are classified as instrument, control, and auxiliary switches and consist essentially of silver stationary contact fingers engaging silver moving contacts forming a rotor.

Instrument switches are of the "stay-put", non-spring return type. Control switches are of the momentary contact type and are spring return to the original or "off" position. Both are for panel mounting and equipped with handles for manual operation.

Auxiliary switches are of the non-spring return type and are not suitable for panel mounting. They are lever operated by the operating mechanism of switching devices, such as circuit breakers or disconnecting switches with which they are mounted. Their contact travel is thus determined by the travel of the main device mechanism.

### Instrument, Control and Auxiliary Switches

These switches are notable for their adaptability to various applications, their ruggedness, simplicity, accessibility, and reliable operation. They are insulated for 600-volt service and have a continuous conservative current carrying capacity of 10 amperes. The interrupting capacity depends upon voltage, current and inductance of the circuit controlled. The spring return control

switches have recommended interrupting ratings as follows:

### Recommended Interrupting Ratings

Alternating Current	
125 volt, 10 amperes	
250 volt, 7.5 amperes	
600 volt, 1.5 amperes	
Direct Current	
125 volt, 4 amperes	
250 volt, 2 amperes	
600 volt, 0.5 amperes	

For current in excess of the above ratings, control relays are recommended for use in conjunction with the control switches.

Circuits are generally connected from a stud on one side through contact on rotor to a stud on the other side and this constitutes a point or stage, as shown in Fig. 3. In the simplest form, a stage is a single pole, double break, single throw circuit. In other forms involving various sequences or connec-

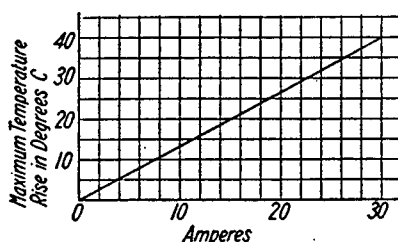


FIG. 2—CURVE SHOWING CAPACITIES OF TYPE W SWITCHES

## SWITCHES—TYPE W—Continued

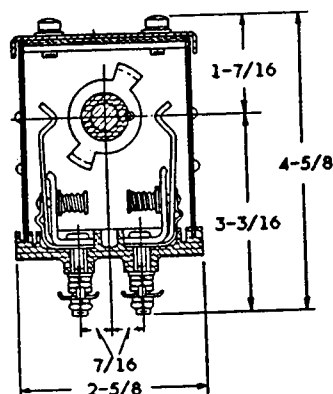


FIG. 3—CROSS SECTION THROUGH CONTACTS

Where space in the rear of a panel is very limited, the part on the rear of the panel can be hung downward from the bracket and operated by means of bevel gears. The contacts are protected by a metal enclosure, Fig. 9. The switch protected in this manner can also be used as a gas-proof switch against certain gases by filling the enclosure with oil.

## Construction

On the front of the panel, the switch presents a pleasing appearance with its sturdy, convenient black molded handle and artistic dial plate.

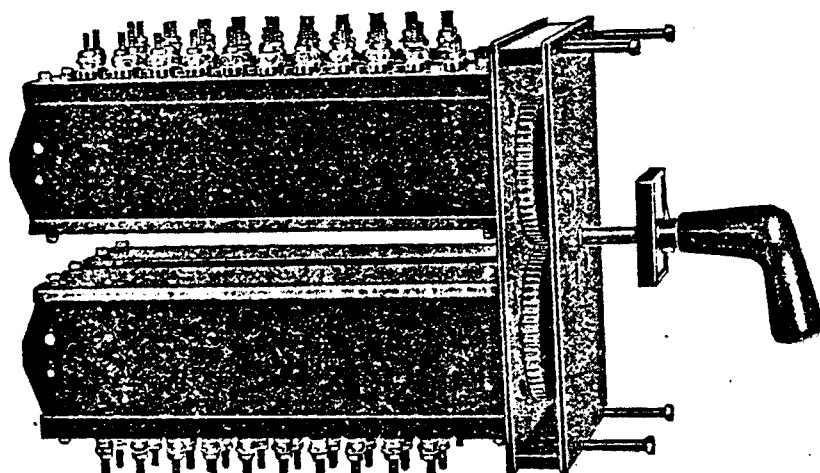


FIG. 4—FOUR 10-CIRCUIT GEARED UNITS

tions to the same circuit, the whole switch may serve as a single pole unit.

Standard single switches are made for 2, 3, 4, 5, 6, 8, and 10 point or stages in length. Modifications can be made for special switches to secure a maximum of 11 stages. For a greater number of stages, 2, 3, or 4 units are geared together to operate from one handle as shown in Fig. 4.

A single break, single pole, double throw feature on each stage is obtained by insertion of a single contact mounted on an inverted base as shown in Fig. 6. This base replaces the top cover.

To limit the operation of switches to certain operators or to interlock with other apparatus, both instrument and control switches can be provided with tumbler pin key-locks. These are mounted directly adjacent to the switch and can be arranged to lock the switch in certain positions and to prevent locking in other positions, Fig. 8.

From the rear, the black polished side and cadmium plated steel end plate make a neat looking switch.

An operating shaft, made from a cold rolled steel rod, rotates in bronze bearings, which are riveted in steel end plates. The steel end plates provide ample support for the base and the enameled steel top which is channel shaped to secure

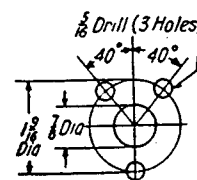


FIG. 5—DRILLING PLAN FOR TYPE W INSTRUMENT AND CONTROL SWITCHES

strength. This arrangement assures permanent alignment of the contacts.

Both the moving and stationary contacts are faced with a thick layer of silver to insure low contact drop throughout the life of the switch, even under adverse conditions of oxidation or other corrosion.

The moving contacts are separated by spacers of moisture-proof molded composition. They are keyed to an insulating Micarta tube, covering the steel operating shaft, by numbered key notches. Spacers and contacts are securely clamped to the shaft.

The stationary contacts are of the self-aligning type and are made of high conductivity copper alloy. Good contact pressure is obtained by use of compression springs which do not carry current. This contact construction operates with a self-aligning wiping action, insuring clean low resistance contact, with long life.

Multiple laminated copper shunts conduct the current from the contacts to the terminal studs. These studs are mounted on the base in such a manner that they positively will not turn or become loose.

The base is made from a high grade molded material which has both very high mechanical and dielectric strength and is ribbed to give ample creepage dis-

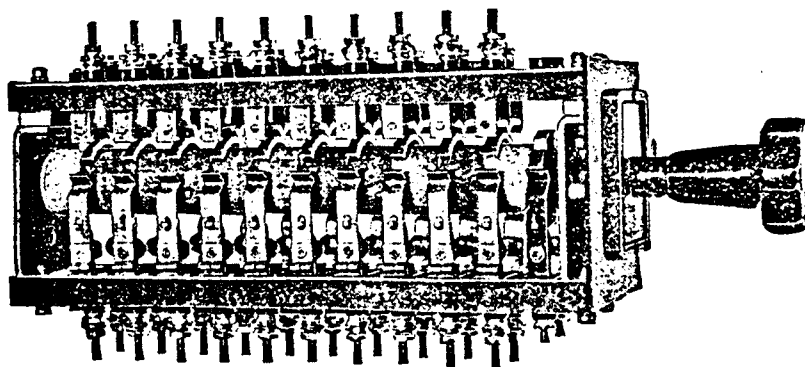


FIG. 6—TYPE W, 10-POLE, DOUBLE THROW SWITCH IN ONE UNIT

## SWITCHES—TYPE W—Continued

tance between studs. Each stud hole is numbered for identifying the connection from the wiring diagram.

Sheet Micarta side plates slide in grooves in the top and bottom of the switch, snapping snugly into the closed position. This arrangement provides immediate access for inspection of contacts.

To protect the entire switch on the rear of the panel, formed Micarta covers can be supplied. The side plates are then omitted. The studs, sides, and top are completely enclosed except for a small space underneath, next to the panel, for entrance of connecting wires. The covers are held in place by a single screw in the rear end plate of the switch.

The following are style numbers of the protective covers:

Points on Base	Style No.
2	1247412
3	1247413
4	1247414
5	1247415
6	1247416
8	1247417
10	1247418

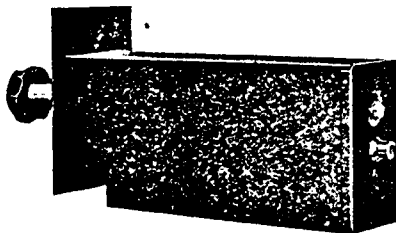


FIG. 7—TYPE W INSTRUMENT SWITCH WITH PROTECTIVE COVER IN PLACE

## Keys and Handles

Keys are generally described as a handle complete with operating shaft and nameplate, designed to be removable and for operation of one or more switches. Keys are used with all instrument switches, except ammeter, regulator, transfer, and temperature indicator switches. Synchronizing switches for synchronizing between machines require two keys, one for the running and one for the incoming machine. Each can be turned in only one direction.

Keys are constructed to be inserted only in the proper switch and can be withdrawn only when in the "OFF" position. This prevents the possibility

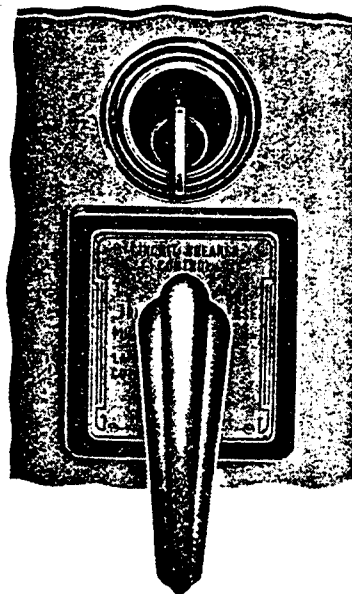


FIG. 8—TUMBLER PIN KEY-LOCK

of trouble when more than one circuit is to be connected to the same instrument through similar switches, provided only one key is used for all the similar switches.

Handles are available in oval, pistol grip, and round notched shapes, both modern and heavy duty design. Standard circuit breaker control switches are supplied with pistol grip handle; voltage, motor and speed control with oval han-

dles, and standard instrument switches with round notched handles. Round notched handle can also be supplied, if specified, for speed control switch. To replace a handle for any reason, it is only necessary to remove a small indicating pin or screw.

Special pistol grip and round notched handles are available as shown at bottom of panel, Fig. 13.

The minatrol type of handle can be adapted to the type W instrument switches in combination with the Minatrol face plates, Fig. 10. This arrangement, however, cannot be adapted to the spring return type W control switches.

All standard handles are of black molded composition. Colored handles, red, green, yellow, blue, gray, orange, and brown can be supplied on order at an increase in price with longer delivery.

## Dial Plates

All instrument and control switches are secured to the panel by three screws. The heads of the screws are countersunk in the dial plate, which also serves as the container for the red and green target indicators of the control switches. The former round plates have been superseded by rectangular plates, modern in design. Black nameplates with white letters are secured without screws, being inserted in the dial plate by setting in

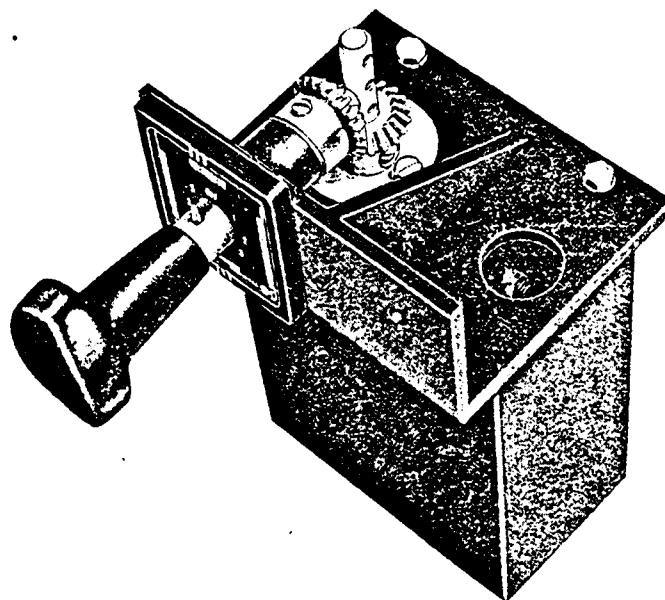


FIG. 9—OIL IMMERSSED TYPE W SWITCH

## SWITCHES—TYPE W—Continued

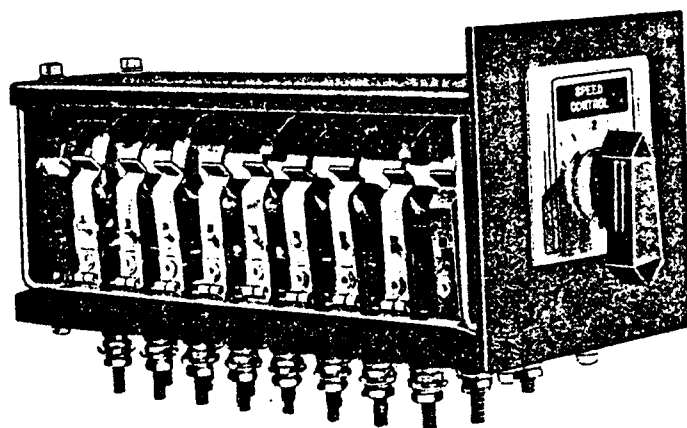
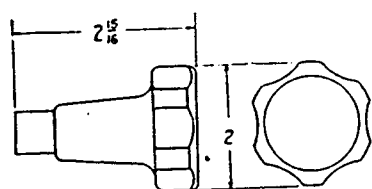
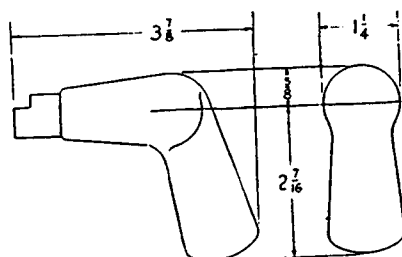


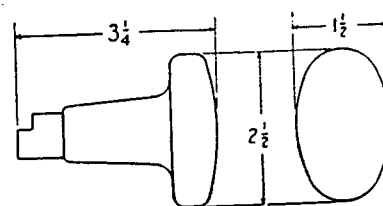
FIG. 10—TYPE W INSTRUMENT SWITCH WITH RECTANGULAR NAMEPLATE AND MINATROL HANDLE



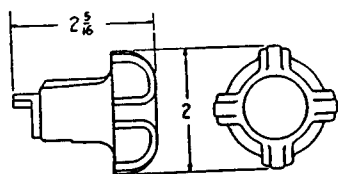
ROUND NOTCHED HEAVY DUTY



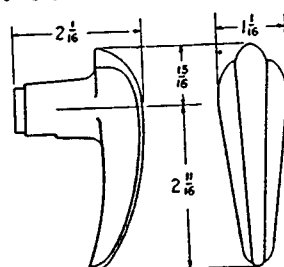
PISTOL GRIP HEAVY DUTY



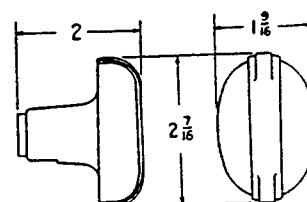
OVAL HEAVY DUTY



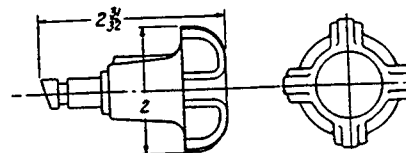
ROUND NOTCHED MODERN



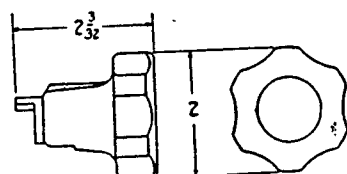
PISTOL GRIP MODERN



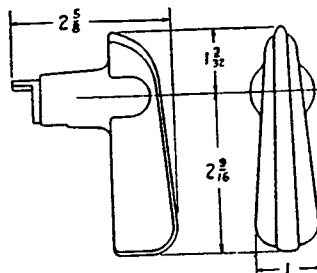
OVAL MODERN



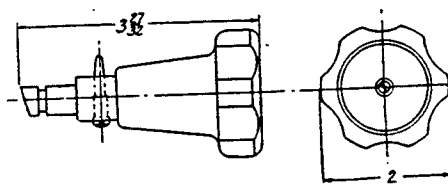
REMOVABLE KEY MODERN



ROUND NOTCHED MODERN-SPECIAL



PISTOL GRIP MODERN-SPECIAL



REMOVABLE KEY HEAVY DUTY

FIG. 11—VARIOUS DESIGNS OF HANDLES AND KEYS

## SWITCHES—TYPE W—Continued

top slot, then snapping into position by pressing in and down at the bottom. To remove, reverse the operation, i.e. press in at top and push upwards. Standard listed switches have nameplates with suitable titles and marking. Special nameplates with special titles and marking can be supplied on request, at slightly higher price.

## Switch Selections

**Instrument switches** should be selected for use with all classes of instruments, such as voltmeters, ammeters, wattmeters, frequency meters, power factor meters, temperature indicators, synchronizing and regulator transfer; for testing instruments, relays, meters, and for setting-up circuits for various combinations or sequences.

**Control switches** should be selected for control of all types of circuit breakers, feeder potential regulators, voltage control, speed control, starting and stopping, raising and lowering, various small motor control circuits and for all classes of apparatus which are electrically controlled.

**Auxiliary switches** should be selected for functions depending upon the operation of the apparatus controlled, such as indicating lamp circuits, bell alarm, interlocking and relays.

## Switch Operation

**Instrument switches** are made for partial or full 360° rotation, from two to ten radial positions. Hence, these switches serve best with round notched handles and these are regularly supplied. Oval and pistol grip handles can also be supplied, although the latter are not conveniently manipulated at 180°.

**Control switches** are made standard for three positions, being generally spring return from either side to the center. They can be made for a maximum of five positions, although the decrease in travel between positions reduces the interrupting capacity accordingly.

All circuit breaker control switches have a hole in the nameplate for a red and green target indicator to show the last manual operation of the switch. In the trip position, the signal lamp circuit can be opened by pulling the handle forward. The handles can be latched in this position, and when so latched, the "blackout" of the lamp indicates that the circuit controlled by the breaker is

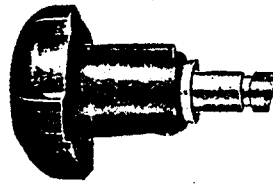


FIG. 12—OPERATING KEY AND HANDLE FOR TYPE W INSTRUMENT SWITCH

not in use. Voltage control, speed control, and motor control switches do not have the target indicator.

Bell alarm or auxiliary lamp circuits, used to indicate the automatic operation of apparatus, are controlled by the use of slip contact segments. These set up the circuit for the automatic indicator when the switch is operated in one direction and opens it when operated in the other direction. In each case the segment remains in the position to which it has been turned when the rotor and handle return to the center or neutral position. It is applicable to the three position spring return control switches only.

When more than two stages make contact in the neutral position only, a longer, heavier return spring is used. This sacrifices the first point or stage, studs 1 and 2, and allowance should be made for it when determining the number of stages for the circuits involved.

**Auxiliary switches**—(See Page 9).

## Instructions for Ordering

If switches listed by style number meet all conditions, even though some contacts are not used, order by style number. If special switches are required, indicate by exceptions to a standard switch, by a connection diagram or a full description, the connection desired in each position. Furnish wiring diagram if available (rear view).

Fig. 14 is a view of Form 21707 showing typical information required when special switches are involved. With this information, errors will be minimized and shipment expedited. This form is available on request.

All standard switches listed, have rectangular dial plates and are supplied with mounting screws for  $\frac{1}{8}$ -inch panel when heavy duty handles are used and for  $\frac{1}{8}$  or  $\frac{1}{4}$ -inch panel when modern handles are used. The switches having heavy duty handles can also be mounted on  $\frac{1}{4}$ , 1, 1½, and 2-inch thick panels by changing the length of the mounting screws. Switches having modern handles cannot be mounted on panels over  $\frac{1}{4}$ -inch thick. For panels over  $\frac{1}{4}$ -inch thick, these switches should be ordered similar to a style number except for panel thickness desired.

**Mounting screws** for different thicknesses of panels are as follows:

INSTRUMENT SWITCH			CONTROL SWITCH	
Thickness Panel, Inches	Length of Screw, Inches	Style No.*	Length of Screw, Inches	Style No.*
$\frac{1}{8}$	$1\frac{1}{4}$	555659	$\frac{1}{8}$	519480
$\frac{1}{4}$	$1\frac{1}{4}$	555658	$\frac{1}{4}$	519479
1	2	555657	$1\frac{1}{4}$	519478
$1\frac{1}{2}$	$2\frac{1}{4}$	555656	2	519477
2	3	1332469	$2\frac{1}{4}$	1332470

\* Style number includes three  $\frac{1}{4}$ -20 flat head steel machine screws as required per switch.

## Special Arrangements

Several special arrangements are available such as two or more units geared to a single handle shown in Fig. 4; a double base for double throw, Fig. 6; a locking arrangement, Fig. 8; and oil immersed switch, Fig. 9.

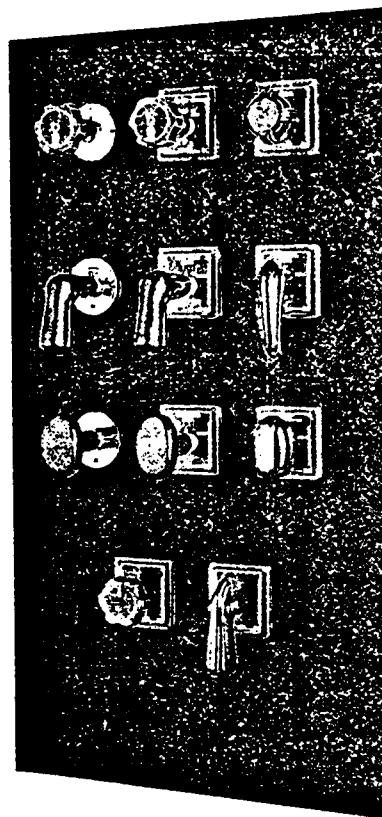


FIG. 13—TYPE W HANDLES AND DIAL PLATES

## SWITCHES—TYPE W—Continued

## TYPE W INSTRUMENT SWITCHES—TABLE I

## With Round Notched Handles

## Non-Spring Return

No. of Stages	Switch	Description	HEAVY DUTY		MODERN		Diagram Fig. No.	Dim. X Inches	Approx. Ship. Wt., Lb.
			Switch Style No. for $\frac{1}{4}$ " Mounting	Key Style No.	Switch Style No. for $\frac{1}{4}$ or $\frac{1}{2}$ " Mounting $\Delta$	Key Style No.			
3	Ammeter	Two Phase	1 040 744 $\emptyset$	.....	1 151 500 $\emptyset$	.....	1	5 $\frac{3}{32}$	2.5
3	Ammeter	Three Phase	1 040 745 $\emptyset$	.....	1 151 501 $\emptyset$	.....	1	5 $\frac{3}{32}$	2.5
5	Ammeter	Three Independent Circuits	1 151 877 $\emptyset$	.....	1 151 878 $\emptyset$	.....	1	6 $\frac{3}{32}$	3.25
1	Voltmeter	Single Phase A-C. One Pole D-C.	1 040 747†	1 105 144	1 040 747†	1 151 533	2A	4 $\frac{1}{32}$	2.
2	Voltmeter	Single Phase A-C. Two Pole D-C.	1 040 748†	1 105 145	1 040 748†	1 151 534	2B	4 $\frac{1}{32}$	2.
4	Voltmeter	Two Phase A-C. Two Pole D-C. Double Throw	1 040 749†	1 105 146	1 040 749†	1 151 535	2C,D,E	6 $\frac{3}{32}$	2.75
4	Voltmeter	Two Phase A-C. Two Pole D-C. Double Throw	1 254 746 $\emptyset$	.....	1 251 247 $\emptyset$	.....	2C,D,E	6 $\frac{3}{32}$	2.75
4	Voltmeter	Three Phase Three Wire A-C.	1 040 750†	1 105 148	1 040 750†	1 151 536	2F,G,H	6 $\frac{3}{32}$	2.75
4	Voltmeter	Three Phase Three Wire A-C.	.....	.....	1 173 014 $\emptyset$	.....	2F,G,H	6 $\frac{3}{32}$	2.75
4	Voltmeter	Three Phase Four Wire A-C.	1 040 762†	1 105 147	1 040 762†	1 151 544	2I,K	6 $\frac{3}{32}$	2.75
4	Voltmeter	Three Phase Four Wire A-C.	.....	.....	1 247 751 $\emptyset$	.....	2I,K	6 $\frac{3}{32}$	2.75
6	Voltmeter	Four Circuit Two Wire A-C. or D-C.	1 040 751 $\emptyset$	.....	1 151 503 $\emptyset$	.....	3	7 $\frac{25}{32}$	4.
8	Voltmeter	Six Circuit Two Wire A-C. or D-C.	1 040 752 $\emptyset$	.....	1 151 504 $\emptyset$	.....	3	9 $\frac{1}{32}$	4.75
2	Frequency Meter	Polyphase Two Element	1 040 753†	1 105 149	1 040 753†	1 151 537	2B	4 $\frac{1}{32}$	2.
6	Wattmeter		1 170 858†	1 105 150	1 170 858†	1 151 538	4	7 $\frac{25}{32}$	4.
6	Power Factor Meter		1 170 859†	1 105 151	1 170 859†	1 151 539	5	7 $\frac{25}{32}$	4.
3	Synchronizing	Three Pole, Machine to Bus	1 040 758†	1 105 152	1 040 758†	1 151 540	6	5 $\frac{3}{32}$	2.5
4	Synchronizing	Four Pole, Machine to Bus	1 040 759†	1 105 153	1 040 759†	1 151 541	6	6 $\frac{3}{32}$	2.75
2	Synchronizing	S.P.D.T. Between Machines Without Interlocks	1 040 760†	1 105 154R 1 105 155I	1 040 760†	1 151 542R 1 151 505I	7	4 $\frac{1}{32}$	2.
3	Synchronizing	S.P.D.T. Between Machines With Interlocks	1 040 761†	1 105 156R 1 105 157I	1 040 761†	1 151 543R 1 124 232I	7	5 $\frac{3}{32}$	2.5
6	Temperature Indicator*	5 Exploring Coils. One Switch per Indicator	.....	.....	1 176 899 $\emptyset$	.....	8	7 $\frac{25}{32}$	4.
6	Temperature Indicator*	5 Exploring Coils. Several Switches per Indicator	.....	.....	1 176 900†	1 176 901	8	7 $\frac{25}{32}$	4.
8	Temperature Indicator†	5 Exploring Coils. One Switch per Indicator	.....	.....	1 176 902 $\emptyset$	.....	9	9 $\frac{1}{32}$	4.75
9	Temperature Indicator†	5 Exploring Coils. Several Switches per Indicator	.....	.....	1 176 903†	1 176 904	10	11 $\frac{1}{32}$	5.5
7	Temperature Indicator*	6 Exploring Coils. One Switch per Indicator	1 040 765 $\emptyset$	.....	1 151 509 $\emptyset$	.....	11	9 $\frac{1}{32}$	4.75
9	Temperature Indicator*	6 Exploring Coils. Several Switches per Indicator	1 105 390†	1 105 159I	1 105 390†	1 173 297	12	11 $\frac{1}{32}$	5.5
10	Temperature Indicator†	6 Exploring Coils. One Switch per Indicator	1 040 764 $\emptyset$	.....	1 151 508 $\emptyset$	.....	13	11 $\frac{1}{32}$	5.5
6	Temperature Indicator	6 Thermo Couples	1 040 757 $\emptyset$	.....	1 151 506 $\emptyset$	.....	14	7 $\frac{25}{32}$	4.
6	General Purpose Transfer	Three Pole Double Throw	1 040 763 $\emptyset$	.....	1 151 507 $\emptyset$	.....	15	7 $\frac{25}{32}$	4.
7	Regulator Transfer	Typical Application Type JB-30 Regulators	1 040 766 $\emptyset$	.....	1 151 510 $\emptyset$	.....	16	9 $\frac{1}{32}$	4.75
6	Regulator Transfer	Typical Application Type SRA Regulators	1 173 288 $\emptyset$	.....	1 173 289 $\emptyset$	.....	17	7 $\frac{25}{32}$	4.

X Distance from rear of panel to rear end of switch

\* Approximate lead compensation

† Accurate lead compensation

 $\emptyset$  Switch has fixed handle

† Switch has no handle. Operate with key.

R Running key

I Incoming key

† Weight includes handles and keys

† Mounting screws for adapting heavy duty switches to panels of other thickness to be ordered from the following list. Style No. includes a set of 3 screws.

For  $\frac{1}{4}$ " panel set, Style No. 555 658For  $\frac{1}{2}$ " panel set, Style No. 555 657For  $\frac{3}{4}$ " panel set, Style No. 555 656

For 2" panel set, Style No. 1 332 469

\* Refers to Figure Number in Diagram Section 37-150

 $\Delta$  For panels of other thicknesses, use special switches priced according to formula in Price List 37-150.

SWITCHES—TYPE W—Continued  
 TYPE W CONTROL SWITCHES—TABLE II  
 With Pistol Grip or Oval Handles  
 Spring Return

No. of Stages	Application	CONTROL POSITIONS								HEAVY DUTY Switch Style No. for $\frac{1}{8}$ " Mounting †	Type of Handle	MODERN Switch Style No. for $\frac{1}{4}$ " or $\frac{1}{2}$ " Mounting Δ	Dia- gram Fig. No.	Dim. X Inches	Approx. Ship. Wt., Lb. §
		1 & 2	3 & 4	5 & 6	7 & 8	9 & 10	11 & 12	13 & 14	15 & 16						
3	Cir. Bkr. Control†	C	T	CTO	....	....	....	....	....	1 040 767	P	1 124 195	18	5 $\frac{1}{2}$ $\frac{1}{2}$	2.5
4	Cir. Bkr. Control†	C	T	CTO	SC	....	....	....	....	1 040 768	P	1 124 196	19	6 $\frac{1}{2}$ $\frac{1}{2}$	2.75
4	Cir. Bkr. Control†	....	C	T	OC	CTO	....	....	....	1 040 769	P	1 124 197	20	7 $\frac{1}{2}$ $\frac{1}{2}$	2.75
5	Cir. Bkr. Control†	....	C	T	OC	CTO	SC	....	....	1 040 770	P	1 124 198	21	7 $\frac{3}{4}$ $\frac{1}{2}$	3.25
6	Cir. Bkr. Control†	....	C	T	CTO	O	SC	SC	....	1 040 779	P	1 124 207	22	9 $\frac{3}{4}$ $\frac{1}{2}$	4.5
7	Cir. Bkr. Control†	....	C	T	CTO	OC	O	SC	SC	1 040 780	P	1 124 208	23	9 $\frac{3}{4}$ $\frac{1}{2}$	5.
5	Cir. Bkr. Control†	....	C	T	CTO	O	SC	....	....	.....	P	1 173 284	24	7 $\frac{3}{4}$ $\frac{1}{2}$	3.25
7	Cir. Bkr. Control†	....	C	T	CTO	O	SC	SC	....	.....	P	1 198 979	25	9 $\frac{3}{4}$ $\frac{1}{2}$	5.
4	Voltage Control— Motor Operated Rheo., or Induction Regulator	L	R	L	R	....	....	....	....	1 300 610	OV	1 300 615	26	6 $\frac{1}{2}$ $\frac{1}{2}$	3.25
4	Voltage Control— Motor Operated Rheo., or Induction Regulator	L	R	L	R	....	....	....	....	1 040 771	P	1 124 199	26	6 $\frac{1}{2}$ $\frac{1}{2}$	3.25
6	Voltage Control— Motor Operated Rheo., or Induction Regulator	L	R	L	R	L	R	....	....	1 300 611	OV	1 300 616	26	7 $\frac{25}{32}$	4.
6	Voltage Control— Motor Operated Rheo., or Induction Regulator	L	R	L	R	L	R	....	....	1 040 772	P	1 124 200	26	7 $\frac{25}{32}$	4.
6	Voltage Control— Motor Operated Rheo., or Induction Regulator with Con- tacts for Automatic Operation	L	R	L	R	AU	AU	....	....	1 300 612	OV	1 300 617	27	7 $\frac{3}{8}$ $\frac{1}{2}$	4.
6	Voltage Control— Motor Operated Rheo., or Induction Regulator with Con- tacts for Automatic Operation	L	R	L	R	AU	AU	....	....	1 040 773	P	1 124 201	27	7 $\frac{3}{8}$ $\frac{1}{2}$	4.
4	Motor Control— Arc Furnace Electrode, Normal Speed for Manual Operation	L	R	AU	....	M	....	....	....	1 087 451	P	.....	28	7 $\frac{1}{2}$ $\frac{1}{2}$	3.25
5	Motor Control— Arc Furnace Electrode High Speed for Manual Operation	L	R	M	AU	AU	....	....	....	1 123 995	P	1 123 996	28	7 $\frac{1}{2}$ $\frac{1}{2}$	4.
6	Motor Control	RU	S	RU	S	ST	ST	....	....	1 300 613	OV	1 300 618	29	7 $\frac{3}{8}$ $\frac{1}{2}$	4.
6	Motor Control	RU	S	RU	S	ST	ST	....	....	1 040 774	P	1 124 202	29	7 $\frac{3}{8}$ $\frac{1}{2}$	4.
4	Speed Control	L	R	L	R	....	....	....	....	1 300 614	OV	1 300 619	30	6 $\frac{1}{2}$ $\frac{1}{2}$	3.25
4	Speed Control	L	R	L	R	....	....	....	....	1 040 775	P	1 124 203	30	6 $\frac{1}{2}$ $\frac{1}{2}$	3.25
6	Motor Control— Breaker Elevating Device*	R	L	R	L	R	L	....	....	.....	OV	1 241 725	31	7 $\frac{25}{32}$	4.
9	Motor Control— Master Electrode	SEE Fig. 32								1 257 804	P	.....	32	11 $\frac{1}{2}$ $\frac{1}{2}$	6.

X Distance from rear of panel to rear end of switch  
 † Has target indicator  
 \* Non-Spring Return, (stay-put)  
 ‡ Mounting screws for adapting heavy duty switches to panels of other thickness to be ordered from following table. Style No. includes a set of 3 screws.  
 For  $\frac{1}{4}$ " panel set, Style No. 519 479  
 For  $\frac{1}{2}$ " panel set, Style No. 519 478  
 For  $1\frac{1}{4}$ " panel set, Style No. 519 477  
 For  $2\frac{1}{2}$ " panel set, Style No. 1 332 470  
 § Weight includes handles  
 Δ Refers to Figure Number in Diagram Section 37-150  
 For panels of other thicknesses, use special switches, priced according to formula in Price List 37-150  
 P Pistol Grip  
 OV Oval

## KEY TO CONTROL POSITIONS

C Contact closes in "Close" position  
 T Contact closes in "Trip" position  
 O Contact closes in "Off" position  
 CTO Contact open only when handle is pulled out  
 SC Contact closed when turned to "Close" position and remains closed until turned to "Trip" position.  
 It remains open until turned to "Close" position  
 OC Contact closes in "Off" and "Close" position  
 M Contact closes in "Manual" position  
 L Contact closes in "Lower" position  
 R Contact closes in "Raise" position  
 AU Contact closes in "Automatic" position  
 RU Contact closes in "Run" position  
 S Contact closes in "Start" position  
 ST Contact closes in "Stop" position

### SWITCHES—TYPE W—Continued

# SWITCH POSITION TABULATION

## WESTINGHOUSE FORM 21707-B

TYPICAL ORDERING DATA FOR SPECIAL SWITCHES

SWITCH S. O. \_\_\_\_\_ DATE \_\_\_\_\_  
PURCHASER JOHN DOE G. O. A2YZ ENG. \_\_\_\_\_

TYPE "W"-CONTROL-~~INSTRUMENT~~TEST-SWITCH

**SINGLE BASE**

○ 2	1 ○
○ 4	3 ○
○ 6	5 ○
○ 8	7 ○
○ 10	9 ○
○ 12	11 ○
○ 14	13 ○
○ 16	15 ○
○ 18	17 ○
○ 20	19 ○


**DOUBLE BASE**

○ 2	○ 2'	1 ○
○ 4	○ 4'	3 ○
○ 6	○ 6'	5 ○
○ 8	○ 8'	7 ○
○ 10	○ 10'	9 ○
○ 12	○ 12'	11 ○
○ 14	○ 14'	13 ○
○ 16	○ 16'	15 ○
○ 18	○ 18'	17 ○
○ 20	○ 20'	19 ○

[illegible]

NAMEPLATE (F.V.)  
SPECIFY ENGRAVING

## Breaker Control

trip  close

**REFERENCE:**

STANDARD STYLE NO.  
SWITCH POSITION  
TABULATION DRAWING  
NO. 2-A-9774 OR DWGS.  
1-D-2536 TO 1-D-2540  
INCLUSIVE.

CONTACTS: SPRING RETURN-~~SOX~~2PMX

HANDLE: FIXED-XXXXXXXXXX

WOODEN HEAVY DUTY (OLD TYPE)

PISTOL GRIP ~~XXXXXXXXXXXX~~

COLOR: BLACK-10820

FACEPLATE: RECTANGULAR-EDGING  
BLACK-NICKEL OR SILVER

MOUNTING: 1/2 IN. STEEL PANEL. ~~XXXXXXXXXXXX~~

MECH. TARGET: YES-~~NO~~

WIRING DIAGRAM: REF. DWG.

## REMARKS:

**NOTES:**

X - CONTACT CLOSED IN POSITION SHOWN.

A - CONTACT CLOSED WHEN SWITCH IS TURNED TO "CLOSE" POSITION & REMAINS CLOSED UNTIL SWITCH IS TURNED TO "TRIP" POSITION.

TEST:  
M-CONTACT "MAKES" BEFORE CONTACT B "BREAKS"

B=CONTACT "BREAKS" AFTER CONTACT M "MAKES"

\* WHEN MORE THAN TWO CIRCUITS ARE MADE IN THE OFF POSITION ON THE SPRING RETURN TYPE, A LONG SPRING IS USED AND CONTACTS 1-2 ARE NOT USED.

FROM \_\_\_\_\_ DEPT. WORKS OR D. O. \_\_\_\_\_ NAME \_\_\_\_\_

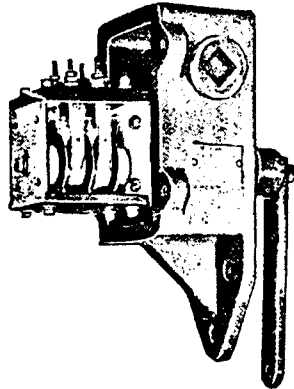
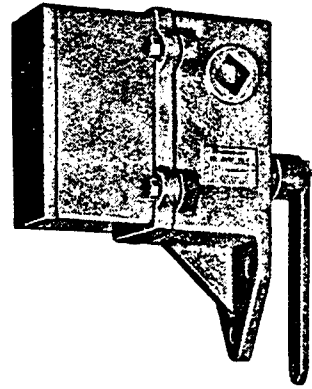
DEPT. WORKS OR D. O.

FIG. 14—SAMPLE OF FORM 21707 FOR USE IN ORDERING SPECIAL SWITCHES. (This form is available on request).



## SWITCHES—TYPE W—Continued

## WEATHER-PROOF AUXILIARY SWITCHES

FIG. 18—2-POLE AUXILIARY SWITCH.  
COVER REMOVEDFIG. 19—2-POLE AUXILIARY SWITCH.  
COVER IN PLACE

The type W weatherproof auxiliary switches are completely housed for outdoor applications. See Fig. 19. They are used with remotely controlled, gang-operated, disconnecting switches, or for any other application where it is desired to give a signal or alarm as to the action of some mechanical device.

They can also be used for relay and interlocking circuits.

These switches can be furnished in 2, 4, 6 or 10-pole types and are manufactured from standard indoor switch parts mounted on a cast brass base to which the cover is bolted.

The base contains 3 holes for  $\frac{3}{8}$ -inch mounting bolts. Holes tapped for conduit connection are provided on two sides and the top, two of which are fitted with pipe plugs. These holes are for

1-inch conduit on the 2 and 4-pole switches,  $1\frac{1}{4}$ -inch conduit on the 6-pole switch and  $1\frac{1}{2}$ -inch on the 10-pole switch.

A substantial cover, with a cast alloy flange, is provided to cover the switch. This cover contains an inner lining of insulating material. All joints are fitted with gaskets to assure weatherproof construction.

## STYLE NUMBERS

Description	Style No.
2-pole, 1-"a"—1-"b"*	599 938
4-pole, 2-"a"—2-"b"*	599 939
6-pole, 3-"a"—3-"b"*	599 940
10-pole, 5-"a"—5-"b"*	599 941

\* The letters "a" and "b" designate "make" and "break" as shown in the NEMA hand book on switching equipment.

## OUTLINE DIMENSIONS

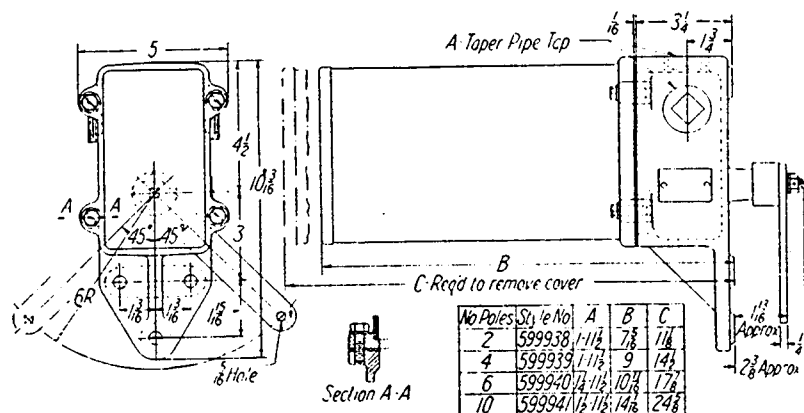


FIG. 20—WEATHER-PROOF AUXILIARY SWITCH

Dimensions are for reference only. For official dimensions, apply to nearest Westinghouse Sales office.

Order by Style Number



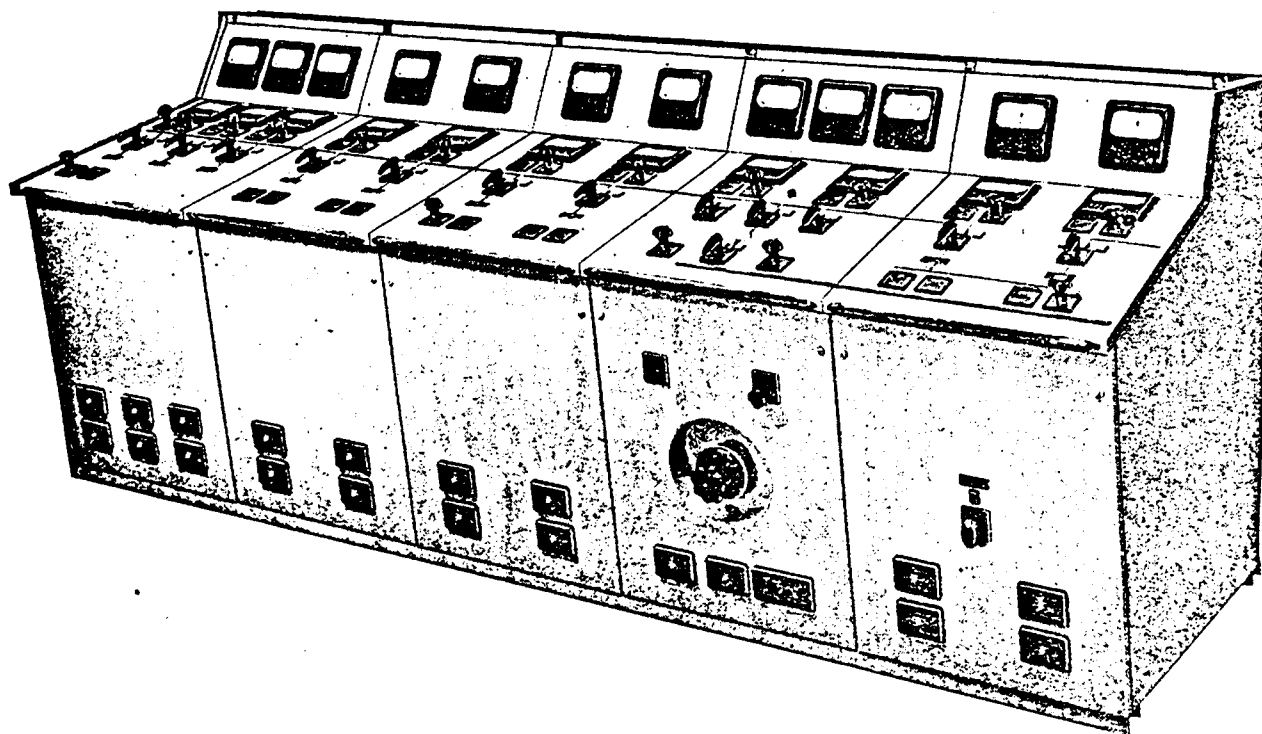


FIG. 21—INSTALLATION OF TYPE W INSTRUMENT AND CONTROL SWITCHES