

Part Catalogue No. 6191-22

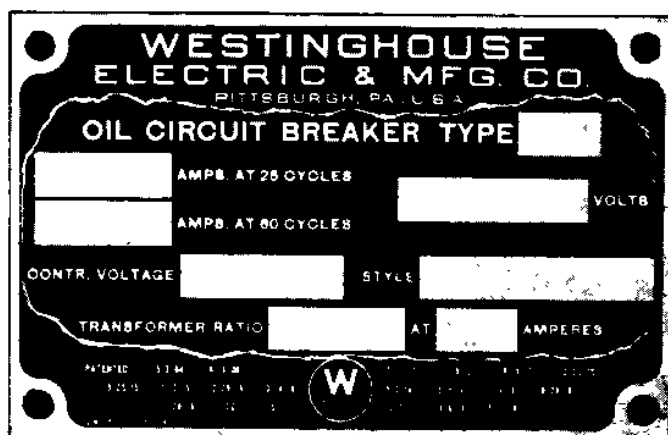
November, 1925

For prices refer to Catalogue 10-A or apply to nearest District Office

PARTS OF Westinghouse Type O-22 Oil Circuit-Breakers

600 to 2000 Amperes, 15000 to 25000 Volts
3000 and 4000 Amperes, 15000 Volts

Index to Parts	Page 2
Renewal Parts Data	Page 3
Index to Style Numbers	Pages 31-32



When ordering parts, give the information enclosed within the irregular lines on the nameplate.



WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
East Pittsburgh, Pa.
Printed in U. S. A.

INDEX TO PARTS

Parts For 600 to 2000 Ampere Breakers

	Page
Auxiliary Switch and Details.....	13
Electrical Operating Mechanism and Details.....	11
Moving and Stationary Contacts and Details.....	9
Muffler and Details.....	15
Operating Mechanism, Doors and Structure Details, for three pole units only.....	4
Operating Mechanism, Tanks and Details, for Single Pole units only.....	6
Oil Gauge and Details.....	8

Parts For 3000 and 4000 Ampere Breakers

Auxiliary Switch and Details.....	24
Covers, Doors and Details for three pole breakers.....	16
Electrical Operating Mechanism and Details.....	20
Moving and Stationary Contacts and Details.....	19
Muffler and Details.....	25
Oil Gauge and Details.....	18
Operating Mechanism, Tanks and Details for Single Pole Units Only.....	17
Tank Lifter and Details.....	26
Type A Knife Switch and Details.....	30

Parts Common to All Breakers

Control Panel and Details.....	28
Control Panel Mounting Details.....	29

RENEWAL PARTS DATAS
For
TYPE O-22 OIL CIRCUIT-BREAKERS
600 to 4000 Amperes, 15000-25000 Volts

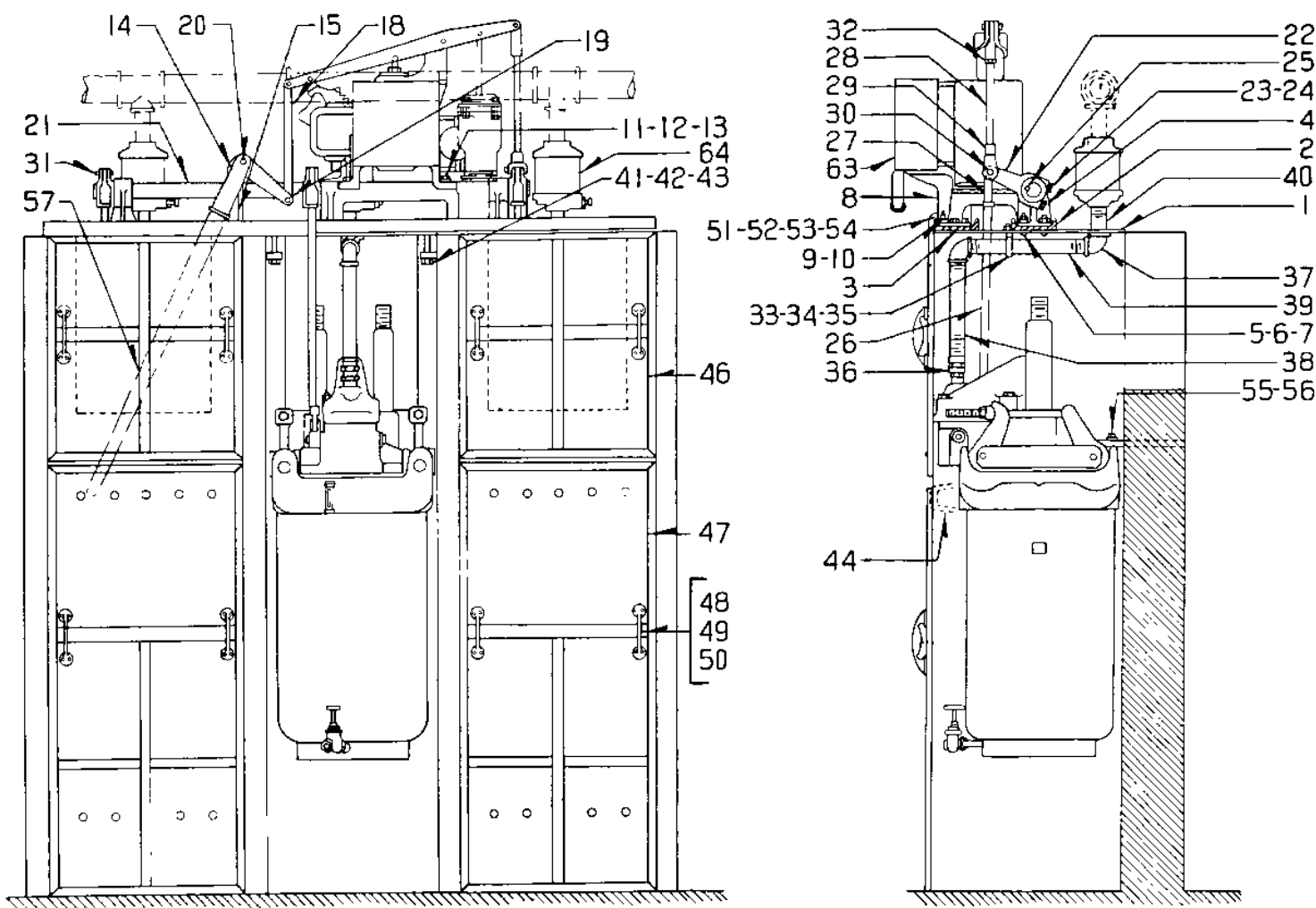
The following is a list of the essential renewal parts and the minimum quantity of each necessary to insure uninterrupted service.

Three Pole Breakers in use up to and including	2.	5.	15
Name of Part	No. Per Pole	No. Per Brkr.	—Recommended for Stock—
Breaker pole unit complete (when ordering give rating)	1	—	0 0 1
Condenser terminal	2	—	2 4 6
Arcing contact finger for stationary contact	4	—	12 24 36
Pressure spring for arcing contact finger, long, for 600 to 2000 amperes	4	—	4 8 12
Pressure spring for arcing contact finger, short, for 600 to 2000 amperes	4	—	4 8 12
Pressure spring for arcing contact finger, intermediate, for 3000 and 4000 amperes	4	—	4 8 12
Wood lifting rod with rod ends, for 600 to 2000 amperes	1	—	1 2 3
Wood lifting rod with rod ends, for 3000 and 4000 amperes	2	—	2 4 6
Brush unit without arcing tip	1	—	1 2 3
Arcing tip for brush unit	2	—	6 12 18
Oil tank without lining	1	—	0 1 2
Lining for oil tank	1	—	0 1 2
Closing coil, for 600 to 2000 amperes, (when ordering give data as per name plate marking)	—	1	1 1 2
Closing coil, for 3000 and 4000 amperes, (when ordering give data as per name plate marking)	—	3	3 3 6
Trip coil, for 600 to 2000 amperes (when ordering give data as per name plate marking)	—	1	1 1 2
Leather washer for moving closing core, for 600 to 2000 amperes	—	1	1 2 4
Metal expander for leather washer for moving closing core, for 600 to 2000 amperes	—	1	1 2 4
Leather washer for moving closing core, for 3000 and 4000 amperes	—	3	3 6 9
Metal expander for leather washer for moving closing core, for 3000 and 4000 amperes	—	3	3 6 9
Leather washer for dash pot plunger rod	—	1	1 2 4
Metal expander for leather washer for dash pot plunger rod	—	1	1 2 4
Valve for dash pot	—	1	1 2 4
Valve stem for dash pot	—	1	1 2 4
Valve spring for dash pot	—	1	1 2 4
Trigger with latch	—	1	0 1 2
Spring for trigger	—	1	0 1 2
Roller for latch	—	1	0 1 2
Control Panel	—	1	0 1 1
Contacts for Control relay	—	2	2 4 6
Relay operating coil	—	1	1 1 2
Relay release coil	—	1	1 1 2
Auxiliary switch complete for electric mechanism	—	1	1 1 2

OPERATING MECHANISM, DOORS AND STRUCTURE DETAILS

For Three-Pole Breakers Only

For 3 Pole, Single Throw, 600 to 2000 Amperes, 15000-25000 Volts



ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Breaker	Description
1	442774	1	Steel cover
2	442775	1	Channel iron base, rear
3	442776	1	Channel iron base, front
4	277454	3	Bearing for operating shaft
5	364784	12	Machine bolt, 1/2" -13 x 2" (standard hardware), for bearing, rear base and cover
6	383172	12	Lock washer, 1/2" (standard hardware), for bolt
7	364785	12	Iron washer, 1/2" (standard hardware), for bolt
8	405415	1	Bracket to mount electrical mechanism
9	465173	4	Machine bolt, 5/8" -11 x 2 1/4" (standard hardware), to mount bracket to base and cover
10	383239	4	Lock washer, 5/8" (standard hardware), for tap bolt
11	398233	3	Machine bolt, 5/8" -11 x 3 1/2" (standard hardware), to mount electrical mechanism on bracket
12	383239	3	Lock washer, 5/8" (standard hardware), for bolt
13	377348	3	Iron washer, 5/8" (standard hardware), for bolt
14	405425	1	Bell crank for hand closing lever
15	405426	1	Bearing bracket for bell crank
16*	465173	4	Machine bolt, 5/8" -11 x 2 1/4" (standard hardware), to mount bearing bracket
17*	383239	4	Lock washer, 5/8" (standard hardware), for bolt
18	405416	1	Link from bell crank to electrical mechanism
19	405427	1	Connection pin for bell crank and link

*Not illustrated

OPERATING MECHANISM, DOORS AND STRUCTURE DETAILS—Continued

For Three Pole Breakers Only—Continued

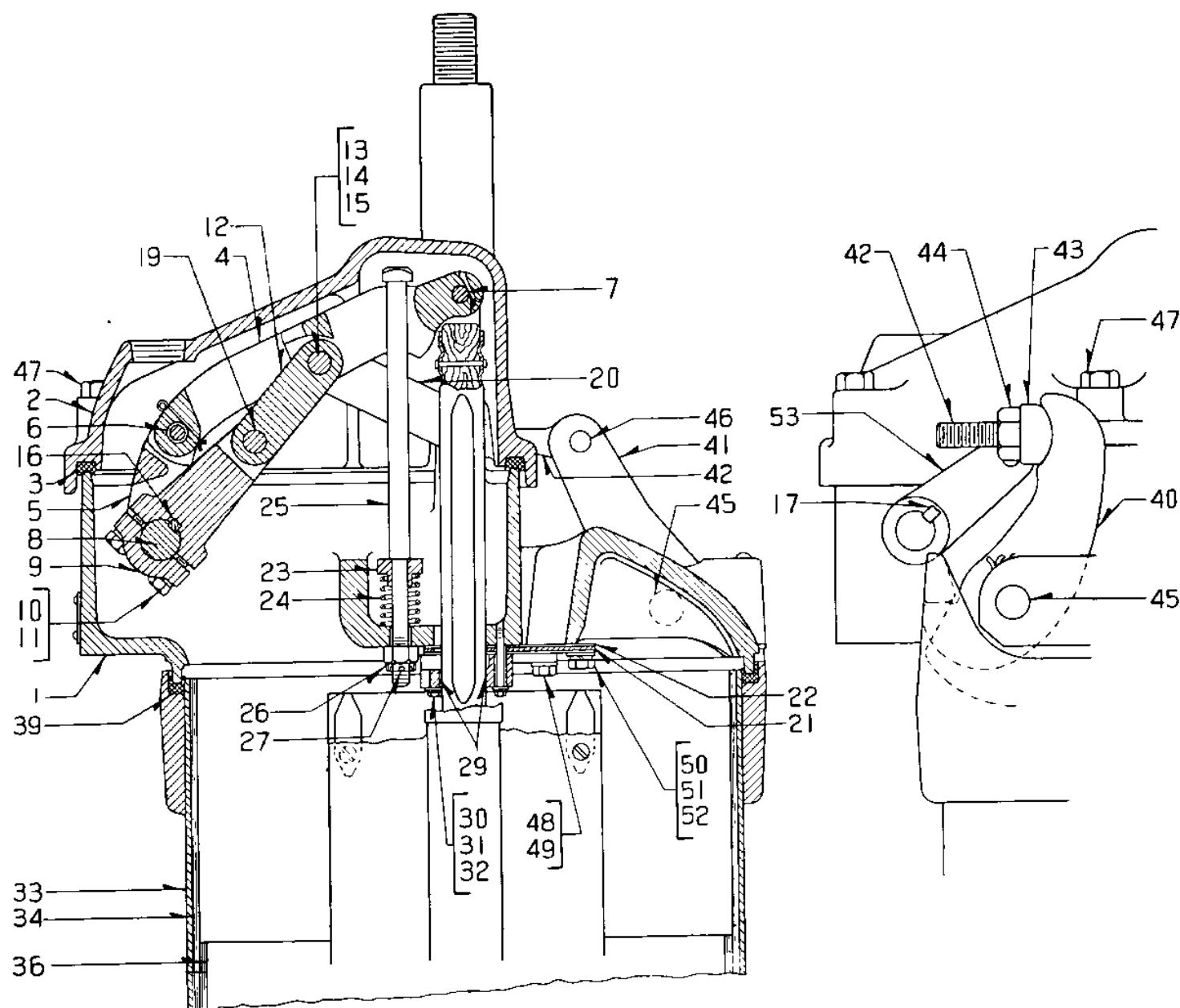
For 3 Pole, Single Throw, 600 to 2000 Amperes, 15000-25000 Volts

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Breaker	Description
20	405417	1	Bearing pin for bell crank and bearing bracket
21	405422	1	Operating shaft
22	405411	3	Lever on operating shaft for breaker pull rods
23	.....	12	Tap bolt, 1/2" -13 x 2 3/4" (standard hardware), to clamp lever to shaft
24	.....	12	Lock washer, 1/2" (standard hardware), for bolt
25	405423	3	Key for operating shaft and lever
26	405421	3	Pull rod from operating shaft lever to breaker unit closing lever
27	239919	3	Rod end for pull rod and operating shaft lever
28	405420	1	Operating rod from electrical mechanism to lever on operating shaft
29	283251	1	Rod end for operating rod and lever on operating shaft
30	405392	1	Connection pin for rod end on operating rod and lever on operating shaft
31	405391	2	Connection pin for rod end on pull rod and lever on operating shaft
32	405419	7	Pipe nut for operating rod end pull rod
33	405424	3	Pipe hanger for muffler pipe
34	397967	6	Machine bolt, 3/8" -16 x 1 1/4" (standard hardware), to mount pipe hanger
35	383169	6	Lock washer, 3/8" (standard hardware), for bolt
36	.....	3	Male and female union, 1 1/2" (standard hardware), to connect muffler pipe to mechanism base
37	.....	6	Elbow, 1 1/8" (standard hardware), for muffler base
38	.....	3	Wrought iron pipe, vertical 14 5/8" x 1 1/2" (standard hardware), from union to elbow
39	.....	3	Wrought iron pipe, horizontal 17 11/16" x 1 1/2" (standard hardware), from elbow to elbow
40	.....	3	Wrought iron pipe, 3 1/2" x 1 1/2" (standard hardware), from elbow to muffler
41	405390	12	Tap bolt, 3/4" -10 x 5 1/2" (standard hardware), to mount cover and angle base in cell
42	377315	12	Hexagon nut, 3/4" -10 (standard hardware), for bolt
43	398704	12	Lock washer, 3/4" (standard hardware), for bolt
44	405434	6	Wall insert with machine bolt for door hanger
45*	405437	6	Bracket for lower door hanger
46	405438	3	Upper door
47	424146	3	Lower Door
48	243201	12	Handle for door
49	.....	48	Countersunk head rivet, 3/16" x 5/8" (standard hardware), to fasten handle on door
50	3424	48	Washer for rivet
51	398131	6	Bracket for hanger hook on upper door
52	380266	6	Hanger hook
53	.....	12	Countersunk head copper rivet 3/8" x 1" (standard hardware), for bracket
54	.....	6	Round head stove bolt, 3/8" -18 x 2 1/2" (standard hardware), for bracket and hook
55	405389	12	Tap bolt, 1" -18 x 2 1/2" (standard hardware), to mount breaker unit in cell
56	405388	12	Lock washer 1" (standard hardware), for tap bolt
57	200874	†	Hand operating lever
58*	405433	3	Wall insert to mount breaker on rear wall
59*	405432	4	Wall insert to mount breaker on end and side wall
60*	405436	8	Wall insert to mount cover
61*	.....	15	Machine bolt, 3/4" x 6" (standard hardware), for wall inserts
62*	.....	15	Wrought iron washer, 3/4" (standard hardware), for machine bolt
63	424502	6	Control panel, for details see page 29
64	393556	3	Muffler, for details see page 15

*Not illustrated
†Usually one per station

OPERATING MECHANISM, TANKS AND DETAILS
For Single Pole Units Only
600 to 2000 Amperes, 15000-25000 Volts



ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Pole	Description
1	442737	1	Cast steel base
2	442738	1	Cast steel cover
3	.....	1	Square anchor flax packing, 40" of 5/8", for base and cover
4	442739	1	Main lever
5	442743	1	Rocker arm for main lever
6	442756	1	Connection pin for main lever and rocker arm
7	442755	1	Connection pin for main lever and lifting rod socket
8	442751	1	Operating shaft for pole unit
9	442742	1	Toggle lever from operating shaft to toggle link
10	387600	4	Tap bolt, 1/2" - 13 x 1 3/4" (standard hardware), for toggle lever
11	377346	4	Lock washer, 1/2" (standard hardware), for tap bolt
12	442745	1	Toggle link for toggle lever and main lever
13	442746	1	Connection pin for main lever and toggle link
14	442747	1	Retaining screw for connection pin
15	60959	1	Set screw for retaining screw
16	45607	1	Key for operating shaft and toggle lever
17	421643	1	Key for operating shaft and closing lever

OPERATING MECHANISM, TANKS AND DETAILS—Continued

For Single Pole Units Only—Continued

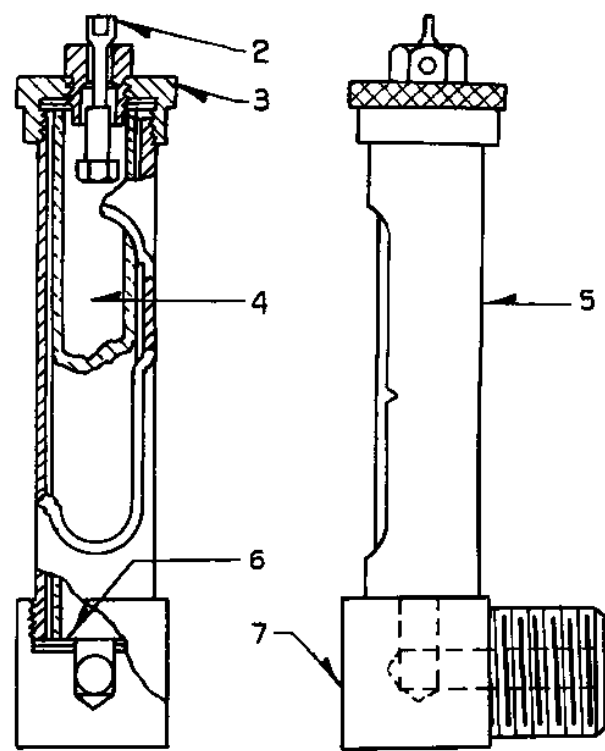
600 to 2000 Amperes, 15000-25000 Volts

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Pole	Description
18*	405450	1	Collar for operating shaft
19	442752	1	Connection pin for toggle lever and toggle link
20	442744	2	Link with shoulder pin used as guide for main lever
21	442740	1	Filling plate
22	442741	2	Gasket for filling plate
23	442748	1	Bumper for main lever
24	405521	1	Spring for bumper
25	442797	1	Rod for bumper and stop
26	320916	1	Crown nut for lower end of bumper rod
27	442750	1	Retaining pin for crown nut
28*	442754	2	Guide pin in base for tank
29	442762	1	Guide for lifting rod
30	.....	3	Tap bolt, $\frac{5}{16}$ " -18 x $2\frac{1}{4}$ " (standard hardware), to mount guide
31	3272	3	Washer for tap bolt
32	.....	3	Lock washer, $\frac{5}{16}$ " (standard hardware), for tap bolt
33	442778	1	Tank without lining, oil gauge or valve
34	438616	1	Micarta lining, long
35*	438626	1	Micarta lining, short
36	438625	1	Asbestos lining
37*	384961	1	Gate valve for tank
38*	424549	1	Oil gauge for tank (see page 8 for details)
39	.....	1	Square anchor flax packing, 67" x $\frac{5}{8}$ ", for tank
40	442763	2	Tank locking lever, front
41	442764	2	Tank locking lever, rear
42	442766	2	Eye bolt for tank lever adjustment
43	442765	2	Washer, for eye bolt
44	.....	2	Hexagon nut, 1" (standard hardware), for eye bolt
45	442767	4	Bearing pin for tank locking levers
46	63633	2	Connection pin for locking lever and eye bolt
47	.....	4	Tap bolt, $\frac{3}{4}$ " -10 x 5" (standard hardware), to fasten cover to base
48	.....	6	Tap bolt, $\frac{1}{2}$ " -13 x $1\frac{3}{4}$ " (standard hardware), to fasten condenser terminals to base
49	.....	6	Lock washer, $\frac{1}{2}$ " (standard hardware), for tap bolt
50	.....	4	Tap bolt, $\frac{1}{2}$ " -13 x $1\frac{1}{4}$ " (standard hardware), to fasten filler plate to base
51	.....	4	Lock washer, $\frac{1}{4}$ " (standard hardware), for tap bolt
52	3272	4	Washer, for tap bolt
53	442772	1	Closing lever (upward pull, left hand assembly)
54*	442773	1	Rod end for closing lever and pull rod
55*	442753	1	Connection pin for closing lever and rod end

*Not illustrated

OIL GAUGE AND DETAILS
For 600 to 2000 Amperes, 15000-25000 Volts



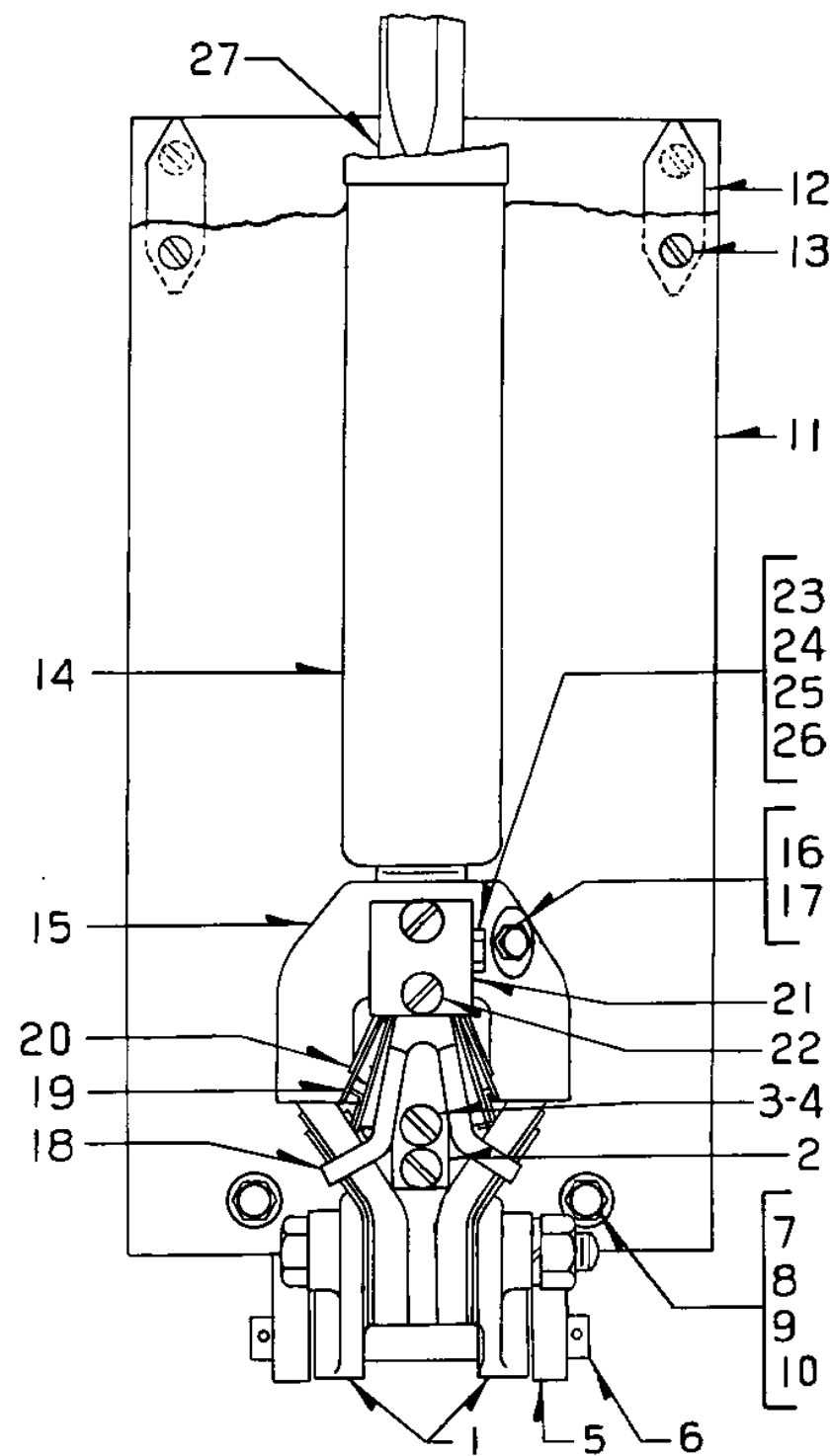
REFERENCE NO. 1

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Gauge	Description
1	424549	..	Oil gauge complete
2	442783	1	Valve and stem
3	250073	1	Cap
4	111973	1	Glass tube
5	152341	1	Outside tube
6	111980	2	Cork washer
7	113855	1	Elbow

MOVING AND STATIONARY CONTACT DETAILS

For 600 to 2000 Amperes, 15000-25000 Volts



ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Moving Contact Details

Ref. No.	Style No.	No. Per Pole Unit	Description
1	438639	1	Brush complete with arcing tips for 600 and 1200 amperes
1	438640	1	Brush complete with arcing tips for 1600 amperes
1	438641	1	Brush complete with arcing tips for 2000 amperes
2	422999	2	Arcing tip
3	.....	4	Fillister head iron machine screw, $\frac{5}{16}$ " -18 x $1\frac{1}{4}$ " (standard hardware), to mount arcing tip
4	.....	4	Lock washer, $\frac{5}{16}$ " (standard hardware), for screw
5	442758	2	Eye bolt for lifting rod foot and brush
6	442759	1	Connection pin for eye bolt and brush

MOVING AND STATIONARY CONTACT DETAILS—Continued
For 600 to 2000 Amperes, 15000-25000 Volts

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Moving Contact Details—Continued

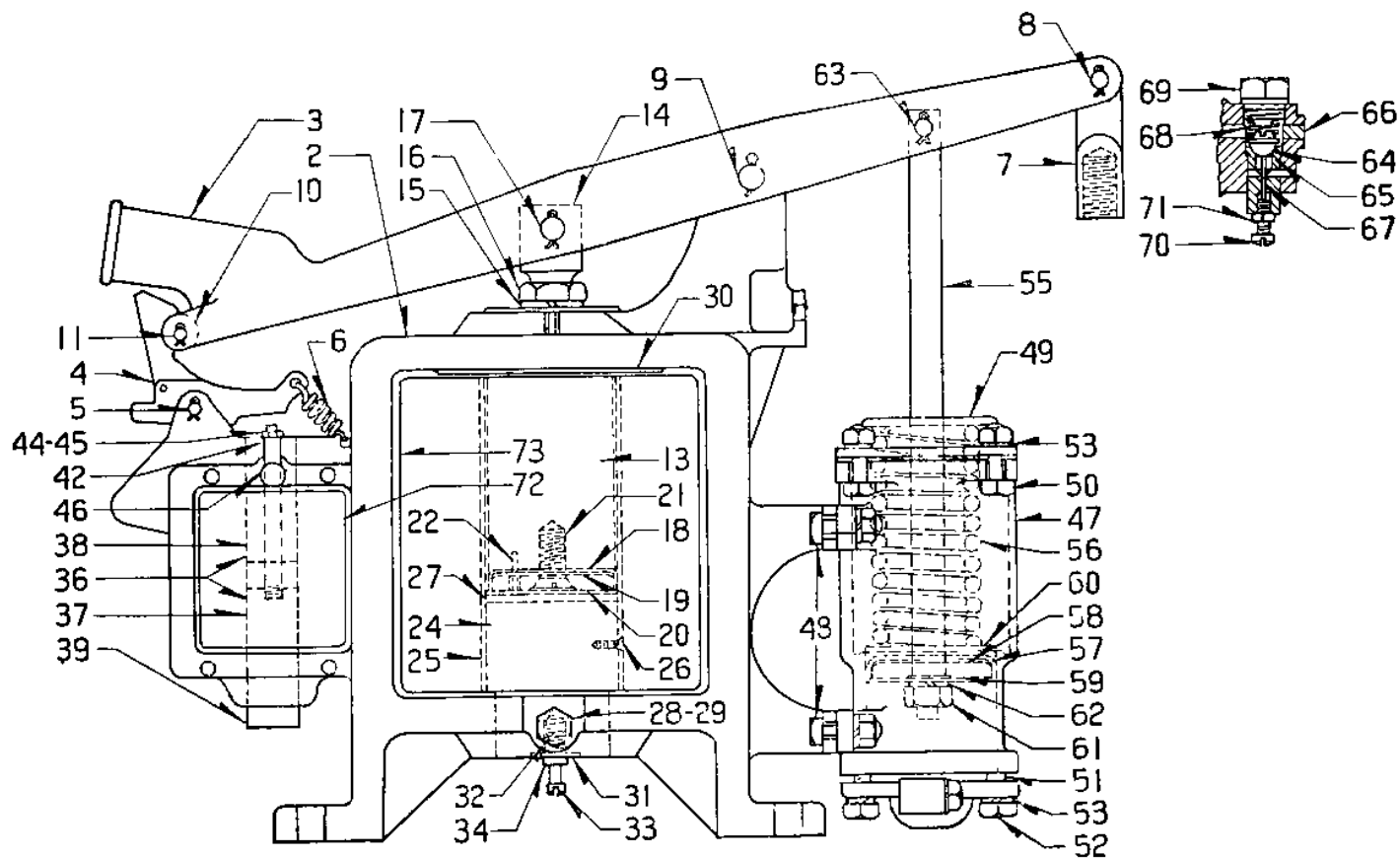
Ref. No.	Style No.	No. Per Pole Unit	Description
7	.....	2	Tap bolt, $\frac{3}{8}$ " -16 x $2\frac{1}{2}$ " (standard hardware), to clamp eye bolt in lifting rod foot for 15000 volts
7	.....	2	Tap bolt, $\frac{3}{8}$ " -16 x $2\frac{3}{4}$ " (standard hardware), to clamp barrier and eye bolt to lifting rod foot for 25000 volts
8	.....	2	Lock washer, $\frac{3}{8}$ " (standard hardware), for tap bolts
9	.....	2	Hexagon nut, $\frac{3}{8}$ " (standard hardware), for tap bolts
10	3428	2	Washer for tap bolts
11	442760	2	Micarta barrier for moving contact for 25000 volts
12	442761	2	Micarta block for barrier for 25000 volts
13	.....	4	Flat head iron machine screw, $\frac{5}{16}$ " -18 x $\frac{1}{8}$ " (standard hardware), for blocks and barriers for 25000 volts

Stationary Contact Details

14	438611	2	Condenser terminal for 600 amperes
14	438612	2	Condenser terminal for 1200 amperes
14	438613	2	Condenser terminal for 1600 amperes
14	438614	2	Condenser terminal for 2000 amperes
15	442768	2	Contact foot for condenser terminal for 600 and 1200 amperes
15	442770	2	Contact foot for condenser terminal for 1600 amperes
15	442771	2	Contact foot for condenser terminal for 2000 amperes
16	.....	2	Tap bolt, $\frac{5}{8}$ " -11 x $2\frac{1}{4}$ " (standard hardware), to clamp contact foot to terminal bushing for 600 and 1200 amperes
16	.....	2	Tap bolt, $\frac{5}{8}$ " -11 x $2\frac{1}{2}$ " (standard hardware), to clamp contact foot to terminal bushing for 1600 amperes
16	.....	2	Tap bolt, $\frac{5}{8}$ " -11 x 3" (standard hardware), to clamp contact foot to terminal bushing for 2000 amperes
17	.....	2	Lock washer, $\frac{5}{8}$ " (standard hardware), for tap bolt
18	420528	4	Contact finger with shunt
19	375336	4	Flat spring, long
20	375337	4	Flat spring, short
21	442769	2	Clamp plate for spring, contact finger and shunt
22	.....	4	Flat head iron machine screw, $\frac{5}{16}$ " -18 x $1\frac{1}{4}$ " (standard hardware), to fasten clamp plate to contact foot
23	.....	2	Tap bolt, $\frac{5}{16}$ " -18 x $2\frac{1}{4}$ " (standard hardware), to fasten spring, contact finger and shunt to contact foot
24	.....	2	Hexagon nut, $\frac{5}{16}$ " (standard hardware), for tap bolt
25	.....	2	Lock washer, $\frac{5}{16}$ " (standard hardware), for tap bolt
26	.....	2	Iron washer, $\frac{5}{16}$ " (standard hardware), for tap bolt
27	442757	1	Lifting rod complete

ELECTRICAL OPERATING MECHANISM AND DETAILS

For 600 to 2000 Ampere Breakers



REFERENCE NO. 1

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Mechanism	Description
1	405132	1	Electrical operating mechanism complete
2	405590	1	Mechanism frame
3	405589	1	Main lever
4	273087	1	Trigger complete
5	109229	1	Pin, to fasten trigger to overload trip
6	140362	1	Spring, for trigger
7	248949	1	Rod end, for main lever
8	87679	1	Pin, to fasten rod end to main lever
9	276860	1	Pin, to fasten main lever to mechanism frame
10	271427	1	Steel roller, for main lever
11	63603	1	Pin, to fasten steel roller in main lever
12*	405588	1	Operating core complete
13	225439	1	Moving core only
14	253488	1	Eye bolt, for moving core
15	85635	1	Lock washer, for eye bolt
16	255993	1	Nut, for eye bolt
17	63634	1	Pin, to fasten eye bolt to main lever
18	333085	1	Leather washer for closing moving core
19	189929	1	Expander for leather washer
20	271438	1	Follower for expander and leather washer
21	117211	1	Special flat head screw, to fasten leather, expander and follower to moving core
22	151006	1	Pin, to prevent leather, expander and follower from turning
23*	273334	1	Stationary core and brass sleeve complete
24	264230	1	Stationary core only
25	333083	1	Brass sleeve, for stationary core
26	.....	1	Flat head iron machine screw, No. 14-24 x 1/2" (standard hardware), to fasten brass sleeve to stationary core
27	.....	1	Flax packing, 1/16" square x 13" long, for stationary core
28	.....	2	Tap bolt, 3/4" x 3 1/2" (standard hardware), to fasten stationary core to mechanism frame

*Not illustrated

ELECTRICAL OPERATING MECHANISM AND DETAILS—Continued

For 600 to 2000 Ampere Breakers

Illustrated on Page 11

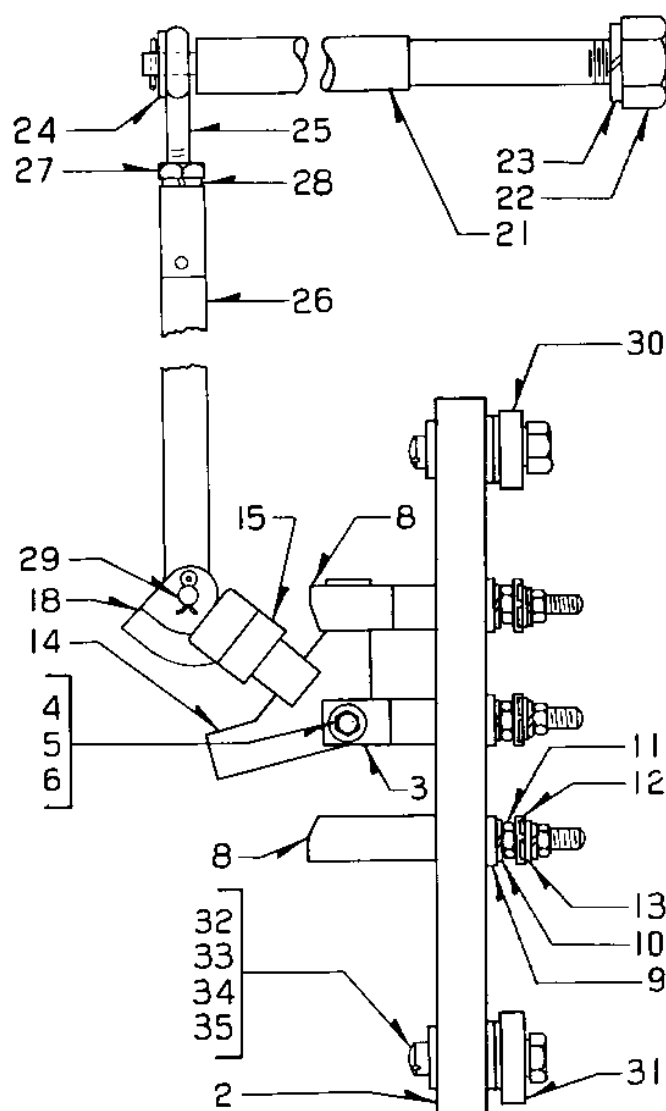
ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Mechanism	Description
29	.....	2	Lock washer, $\frac{3}{4}$ " (standard hardware), for tap bolt
30	333086	3	Gasket, used between coil and frame
31	185454	1	Brass bushing, for valve
32	184519	1	Brass ball, for valve
33	277826	1	Brass adjusting screw, for valve
34	.....	1	Hexagon iron machine screw nut, No. 20-18 (standard hardware), for adjusting screw
35*	198929	1	Spring, for valve
36	184889	1	Shunt trip core complete
37	333125	1	Moving core
38	333124	1	Stationary core
39	333123	1	Brass sleeve, for stationary core
40*	.....	2	Flat head iron machine screw, No. 10-32 x $\frac{3}{8}$ " (standard hardware), to fasten brass sleeve to stationary core
41*	385286	1	Moving core and stud
42	193688	1	Stud, for moving core or trip rod
43*	141901	1	Rivet for trip rod
44	40646	1	Washer, for trip rod
45	46870	1	Nut, for trip rod
46	.....	1	Tap bolt, $\frac{1}{2}$ " x $1\frac{3}{4}$ " (standard hardware), for overload trip
47	250114	1	Dash pot cylinder
48	.....	3	Tap bolt, $\frac{1}{2}$ " x $1\frac{3}{4}$ " (standard hardware), to fasten dash pot cylinder to mechanism frame
49	277560	1	Cover, for dash pot
50	.....	4	Tap bolt, $\frac{1}{2}$ " x $1\frac{3}{4}$ " (standard hardware), to fasten cover on dash pot
51	230342	1	Cylinder head, for dash pot
52	.....	4	Tap bolt, $\frac{1}{2}$ " x $1\frac{3}{4}$ " (standard hardware), to fasten cylinder head to cylinder
53	.....	12	Lock washer, $\frac{1}{2}$ " (standard hardware), for tap bolt
54*	122532	2	Gasket, used between cylinder head and cylinder
55	273372	1	Plunger rod, for dash pot
56	185303	1	Compression spring, for dash pot
57	112506	1	Leasher, for dash pot plunger rod
58	187120	1	Expander for leather
59	277547	1	Follower for expander and leather
60	272649	1	Washer, for plunger rod
61	.....	1	Hexagon nut, $\frac{3}{4}$ " (standard hardware), for plunger rod
62	.....	1	Lock washer, $\frac{3}{4}$ " (standard hardware), for plunger rod
63	117200	1	Pin, to fasten dash pot plunger rod to main lever
64	185236	1	Valve, for dash pot
65	214139	1	Bushing, for valve
66	275056	1	Brass plug, for valve
67	187761	1	Pin, for valve
68	198929	1	Spring, for valve
69	68776	1	Cap nut, for valve
70	.....	1	Fillister head iron machine screw, No. 10-32 x $\frac{1}{2}$ " (standard hardware), used as adjusting screw
71	40662	1	Nut, for adjusting screw
72	184037	1	Trip coil, 125 volts
72	187337	1	Trip coil, 250 volts
73	315872	1	Closing coil, 125 volts, 600 to 1200 amperes
73	276413	1	Closing coil, 250 volts, 600 to 1200 amperes
73	422330	1	Closing coil, 125 volts, 1600 and 2000 amperes
73	415261	1	Closing coil, 250 volts, 1600 and 2000 amperes

*Not illustrated

AUXILIARY SWITCH AND DETAILS

For 600 to 2000 Ampere Breakers



ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Switch	Description
1	445516	..	Switch complete (consisting of Ref. Nos. 2 to 20 inclusive)
2	453748	1	Slate base
3	68893	4	Hinge jaw
4	.....	4	Fillister head iron machine screw, No. 6-32 x 1/2" (standard hardware), to fasten hinge jaw to blade
5	58858	8	Cup washer for screw
6	46867	4	Nut, No. 6-32 (standard hardware), for screw
7*	424454	1	Short break jaw (upper left hand pole)
8	405488	7	Break jaw full length
9	7444	12	Wrought iron washer, 1/4" (standard hardware), for jaw stud
10	.....	24	Lock washer, 1/4" (standard hardware), for jaw stud
11	46868	24	Nut for jaw stud
12	163424	12	Crimp washer for jaw stud
13	3217	12	Brass washer for jaw stud
14	382302	4	Blade with block
15	405969	1	Cross bar
16*	.....	4	Tap bolt, 1/4" - 20 x 3/4" (standard hardware), to fasten cross bar to blade block
17*	7444	4	Wrought iron washer, 1/4" (standard hardware), for tap bolt
18	402871	1	Cross bar lever
19*	.....	2	Tap bolt, 1/4" - 20 x 1/8" (standard hardware), to fasten lever to cross bar
20*	7444	2	Wrought iron washer, 1/4" (standard hardware), for tap bolt

*Not illustrated

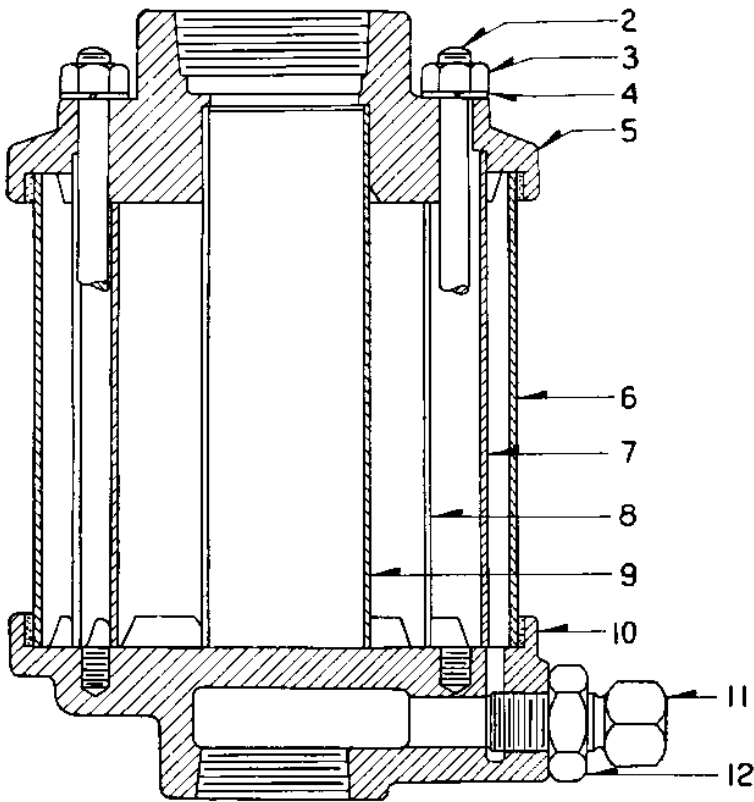
AUXILIARY SWITCH AND DETAILS—Continued
For 600 to 2000 Ampere Breakers

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Switch	Description
21	445520	1	Extension bar for electrical operating mechanism main lever
22	.....	1	Hexagon nut, 1/2"-13 (standard hardware), for extension bar
23	.....	1	Lock washer, 1/2" (standard hardware), for extension bar
24	.....	1	Wrought iron washer, 1/4" (standard hardware), for extension bar
25	453750	1	Eye bolt for extension bar and link
26	453749	1	Link with block to connect eye bolt to cross bar lever
27	.....	1	Hexagon nut, 1/4"-20 (standard hardware), for eye bolt
28	.....	1	Lock washer, 1/4" (standard hardware), for eye bolt
29	63593	1	Connecting pin for link and switch lever
30	445517	1	Upper mounting strap for base
31	445518	1	Lower mounting strap for base
32	.....	4	Fillister head iron machine screw, No. 14-24 x 1 3/8" (standard hardware), to mount base on mounting straps
33	3424	4	Lock washer, 1/4" (standard hardware), for screw
34	.....	4	Lock washer, 1/4" (standard hardware), for screw
35	.....	4	Hexagon iron machine screw nut, No. 14-24 (standard hardware), for screw
36*	.....	3	Fillister head iron machine screw, No. 14-24 x 3/4" (standard hardware), to fasten mounting strap to magnet frame
37*	.....	3	Lock washer, 1/4" (standard hardware), for screw
38*	.....	1	Fillister head iron machine screw, 3/8"-16 x 7/8" (standard hardware), to fasten upper mounting strap and spacer to magnet frame
39*	.....	1	Lock washer, 3/8" (standard hardware), for screw

*Not illustrated

MUFFLER AND DETAILS
For 600 to 2000 Ampere Breakers



REFERENCE NO. 1

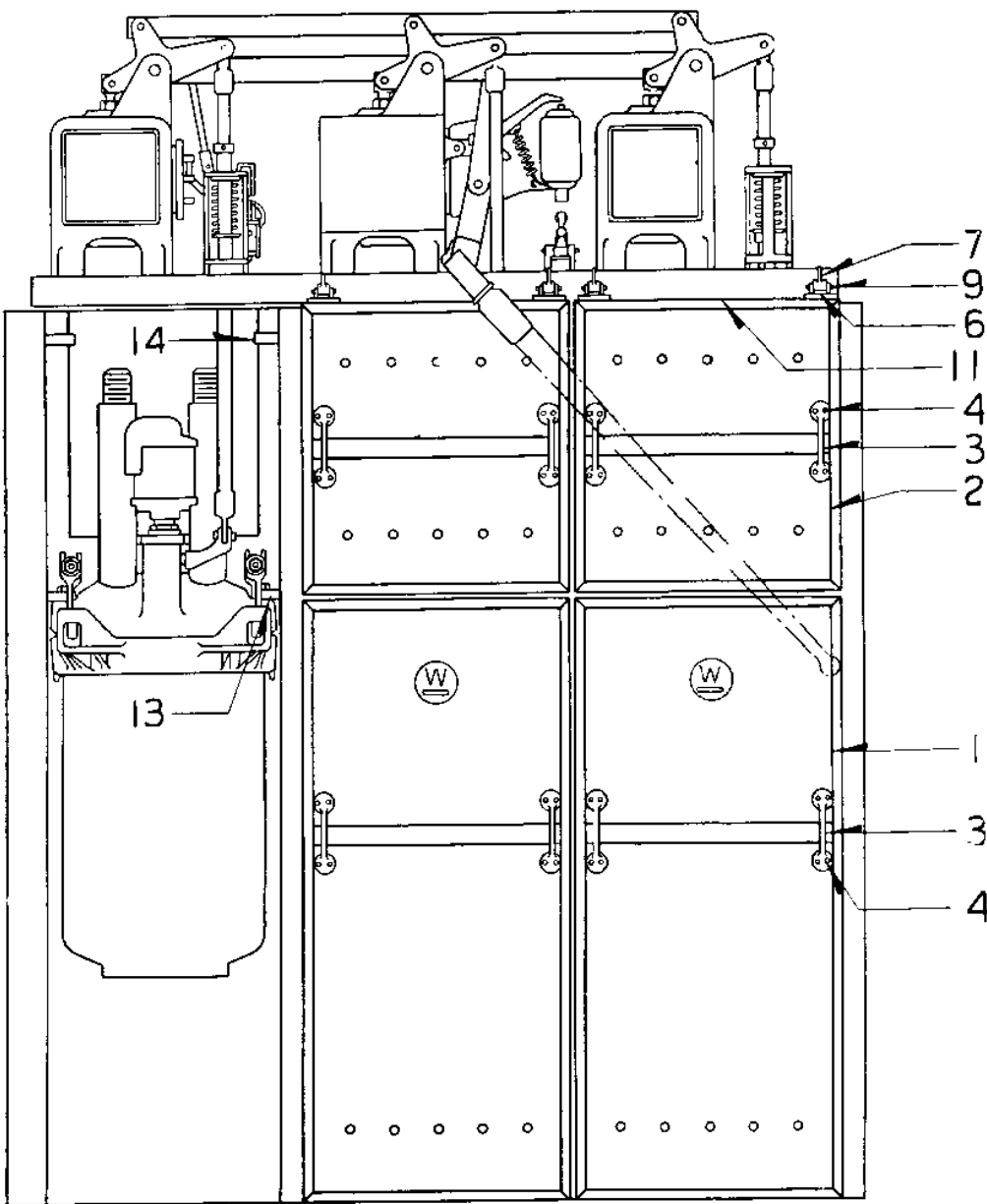
ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Muffer	Description
1	393556	1	Muffer complete
*	.....	2	Wrought iron elbow, 2" (standard hardware), to fit on top of muffer
*	.....	2	Close wrought iron nipple, 2" (standard hardware), for elbow
*	.....	1	Wrought iron nipple threaded on one end, 2" x 3" (standard hardware), for elbow.
2	398306	2	Stud bolt, to clamp muffer together
3	.....	2	Hexagon iron nut, 3/8"-16 (standard hardware), for stud bolt
4	.....	2	Lock washer, 3/8" (standard hardware), for stud bolt
5	398307	1	Cover for muffer
6	398305	1	Outside ring
7	398304	1	Short intermediate ring
8	398303	1	Long intermediate ring
9	398302	1	Inside ring
10	398308	1	Base, for muffer
11	.....	1	Set screw, 3/4" -10 x 1 1/2" (standard hardware), to fit in base
12	.....	1	Lock nut, 3/4" -10 (standard hardware), for set screw

*Not illustrated

COVERS, DOORS AND DETAILS

For 3000 and 4000 Ampere, Three Pole Breakers



ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

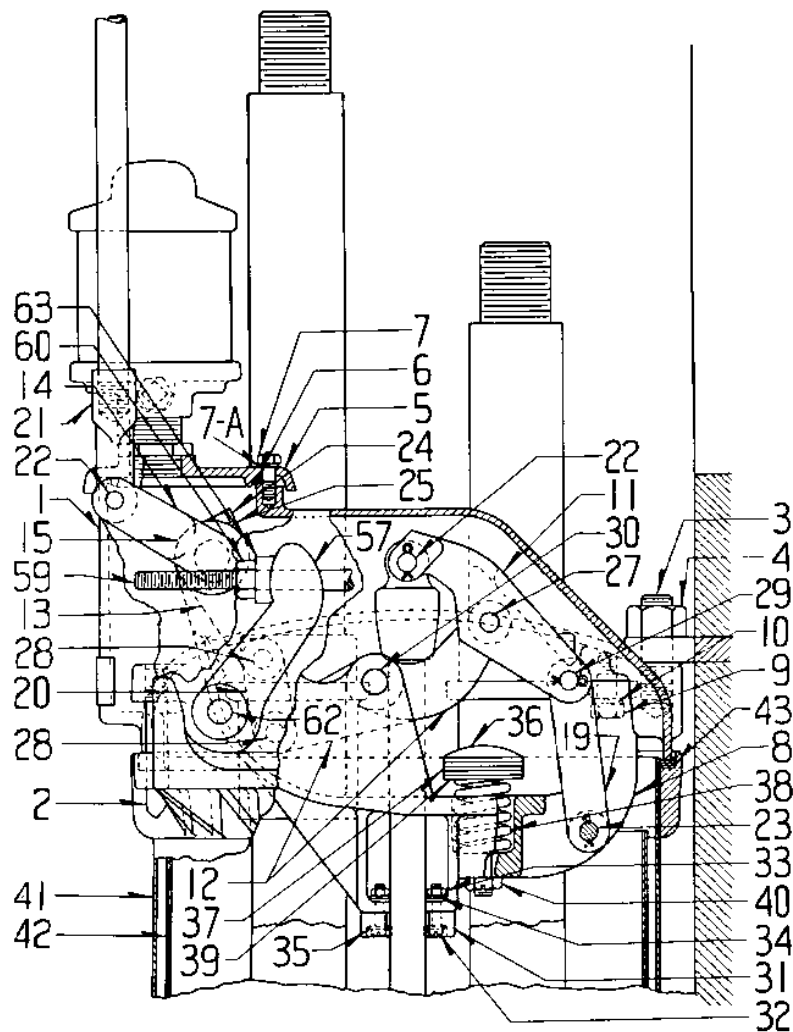
Ref. No.	Style No.	No. Per Breaker	Description
1	424146	3	Lower door complete
2	405476	3	Upper door complete
3	243201	12	Handles, for doors
4	.....	48	Rivet, $\frac{3}{16}$ " x $\frac{5}{8}$ " (standard hardware), to fasten handles to doors
5*	3424	48	Washer, for rivets
6	398131	6	Hook bracket, for upper door
7	380266	6	Hook, for upper door
8*	.....	12	Rivet, $\frac{3}{8}$ " x 1" (standard hardware), to fasten brackets to doors
9	.....	6	Round head stove bolt, $\frac{5}{16}$ " x $1\frac{1}{2}$ " (standard hardware), to fasten hooks to brackets
10*	405437	6	Door hanger, for lower door
11	405478	1	Top cover
12*	405433	3	Wall insert, 10" long used as guide plate for rear wall
13	405432	4	Wall insert, 10" long, for middle wall
14	405436	4	Wall insert 8 $\frac{1}{2}$ " long, for middle wall and top cover
15*	405140	4	Wall insert and machine bolt for lower door hanger
16*	.....	17	Machine bolt, $\frac{3}{4}$ " x 6" (standard hardware), for wall inserts
17*	.....	17	Washer, $\frac{3}{4}$ " (standard hardware), for bolt
18*	.....	12	Top bolt $\frac{3}{8}$ " x $\frac{5}{8}$ " (standard hardware), for lower door hanger

*Not illustrated

OPERATING MECHANISM, TANKS AND DETAILS

For Single Pole Units Only

For 3000 and 4000 Ampere Breakers



ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Unit	Description
1	405439	1	Mechanism base
2	405440	2	Guide pin, for base and tank
3	405441	4	Mounting stud, for base and wall insert
4	.....	4	Hexagon nut, 1" (standard hardware), for mounting stud
5	405462	1	Mechanism cover
6	.....	3	Gasket, 3/8" square x 17" long, of flax packing
7	.....	3	Tap bolt, 1/2" x 1 1/2" (standard hardware), to fasten cover to base
7A	.....	3	Lock washer 1/4" (standard hardware), for tap bolt
8	405443	1	Mechanism support
9	.....	2	Tap bolt 3/4 x 2" (standard hardware), to fasten mechanism support to base
10	.....	2	Lock washer, 3/4", for tap bolt
11	405444	1	Main lever
12	405445	1	Fulcrum lever
13	405446	1	Toggle lever
14	405448	1	Lifting lever
15	405450	1	Collar for lifting lever
16*	.....	1	Tap bolt, 1/4" x 3" (standard hardware), to fasten collar to lifting lever
17*	.....	1	Lock washer, 1/4" (standard hardware), for tap bolt
18*	.....	1	Hexagon nut, 1/4" (standard hardware), for tap bolt
19	405447	1	Main link
20	405449	1	Toggle link
21	405455	1	Rod end, for lifting lever

*Not illustrated

OPERATING MECHANISM, TANKS AND DETAILS—Continued

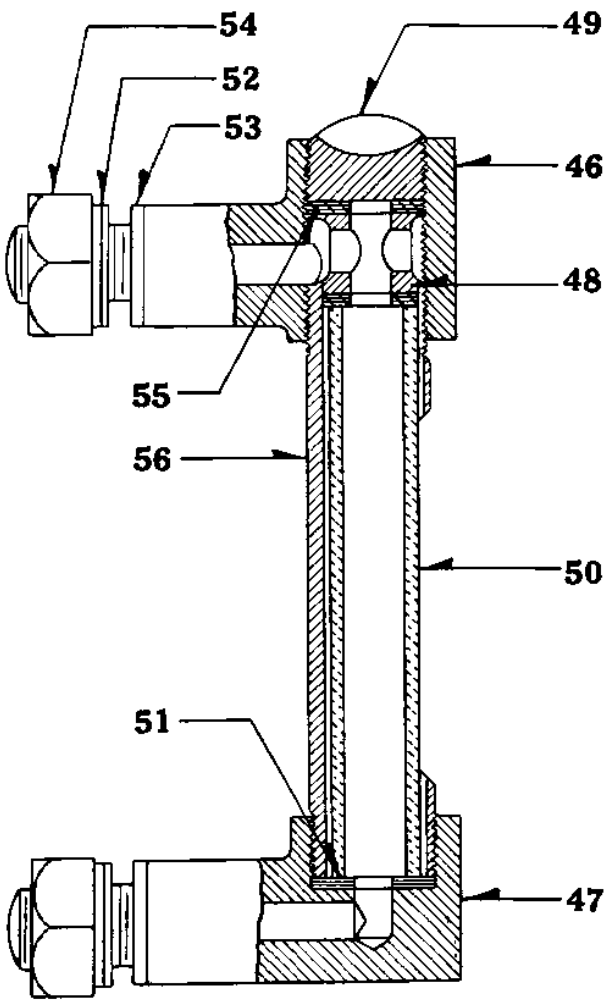
For Single Pole Units Only—Continued

For 3000 and 4000 Ampere Breakers

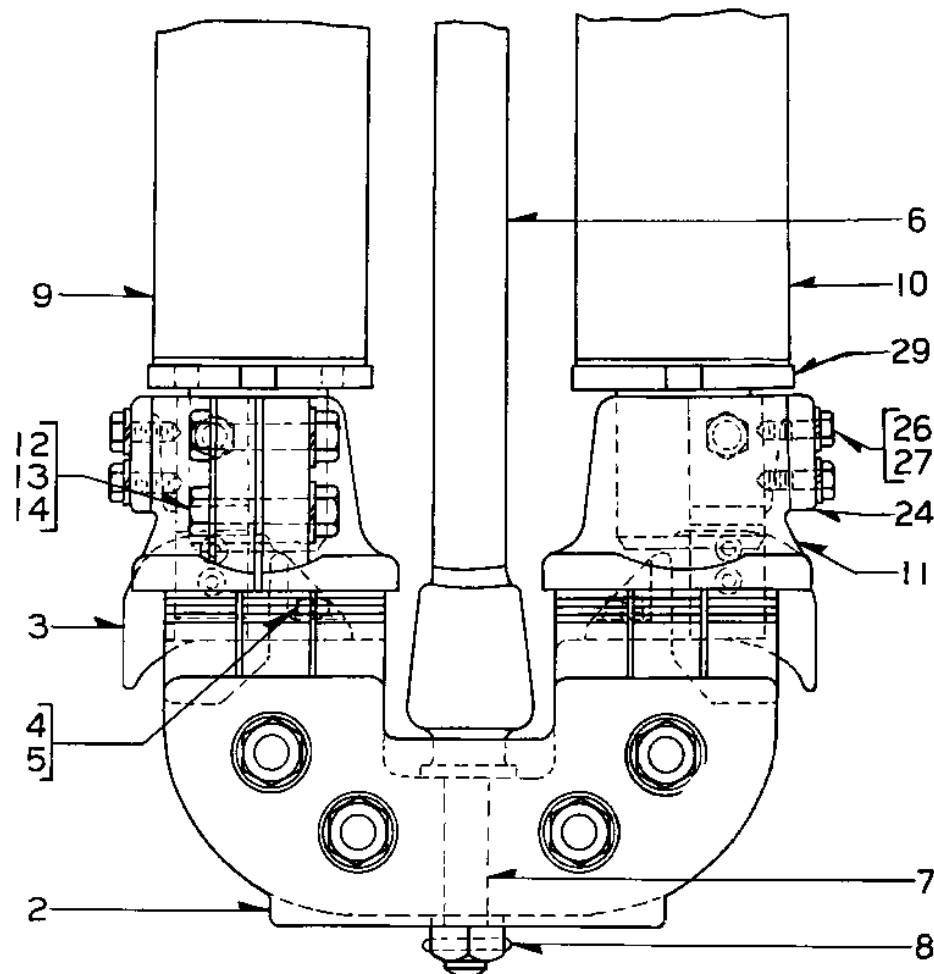
ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Unit	Description
22	63632	2	Pin, to fasten rod end to main and lifting levers
23	88353	1	Pin, to fasten main link to mechanism support
24	.....	2	Tap bolt, 1/2" x 1 3/4" (standard hardware), for toggle lever
25	.....	2	Lock washer, 1/2" (standard hardware), for tap bolt
26*	405451	1	Key, for lifting lever
27	87676	1	Pin, to fasten fulcrum lever to main lever
28	405457	2	Pin, to fasten toggle link to fulcrum lever and toggle link to toggle lever
29	405458	1	Pin, to fasten main link to main lever
30	405459	1	Pin, to fasten fulcrum lever to mechanism support
31	405461	1	Guide block, for moving contact rod
32	.....	4	Fillister head iron machine screw, No. 24-16 x 1 3/4" (standard hardware), to fasten guide block to base
33	.....	4	Hexagon iron machine screw nut, No. 24-16 (standard hardware), for machine screw
34	.....	4	Lock washer, 1/4" (standard hardware), for machine screw
35	3415	4	Washer, for machine screw
36	405452	1	Bumper and stud
37	405453	1	Leather washer, for bumper
38	405454	1	Spring, for bumper
39	430040	2	Washer, for bumper
40	405489	1	Nut, for bumper stud
41	405466	1	Oil tank only
42	432858	1	Lining for oil tank
43	.....	1	Gasket 5/8" square x 67" long, of flax packing
44*	384961	1	Gate valve for oil tank
Oil Gauge and Details			
45	405469	1	Oil gauge complete, for oil tank
46	405470	1	Upper support for oil gauge
47	405471	1	Lower support for oil gauge
48	405472	1	Brass retainer for upper support
49	405473	1	Brass cap for upper support
50	111973	1	Glass tube for oil gauge
51	442794	2	Washer used between glass tube, support and retainer
52	141601	2	Washer used between tank and support
53	442795	4	Washer used between tank and support
54	.....	2	Lock nut, 1/2" (standard hardware), for support
55	442796	2	Washer, used between retainer and cap
56	405474	1	Brass tube protector, for glass tube
57	442779	2	Front locking lever for oil tank
58*	442780	2	Rear locking lever for oil tank
59	442781	2	Adjusting rod for oil tank locking levers
60	.....	2	Hexagon nut, 3/4" (standard hardware), for support rod
61*	63632	2	Pin, for adjusting rod and locking lever
62	405442	4	Shaft for locking levers
63	384967	2	Washer for locking levers

*Not illustrated.



MOVING AND STATIONARY CONTACTS AND DETAILS
For 3000 and 4000 Ampere Breakers



ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

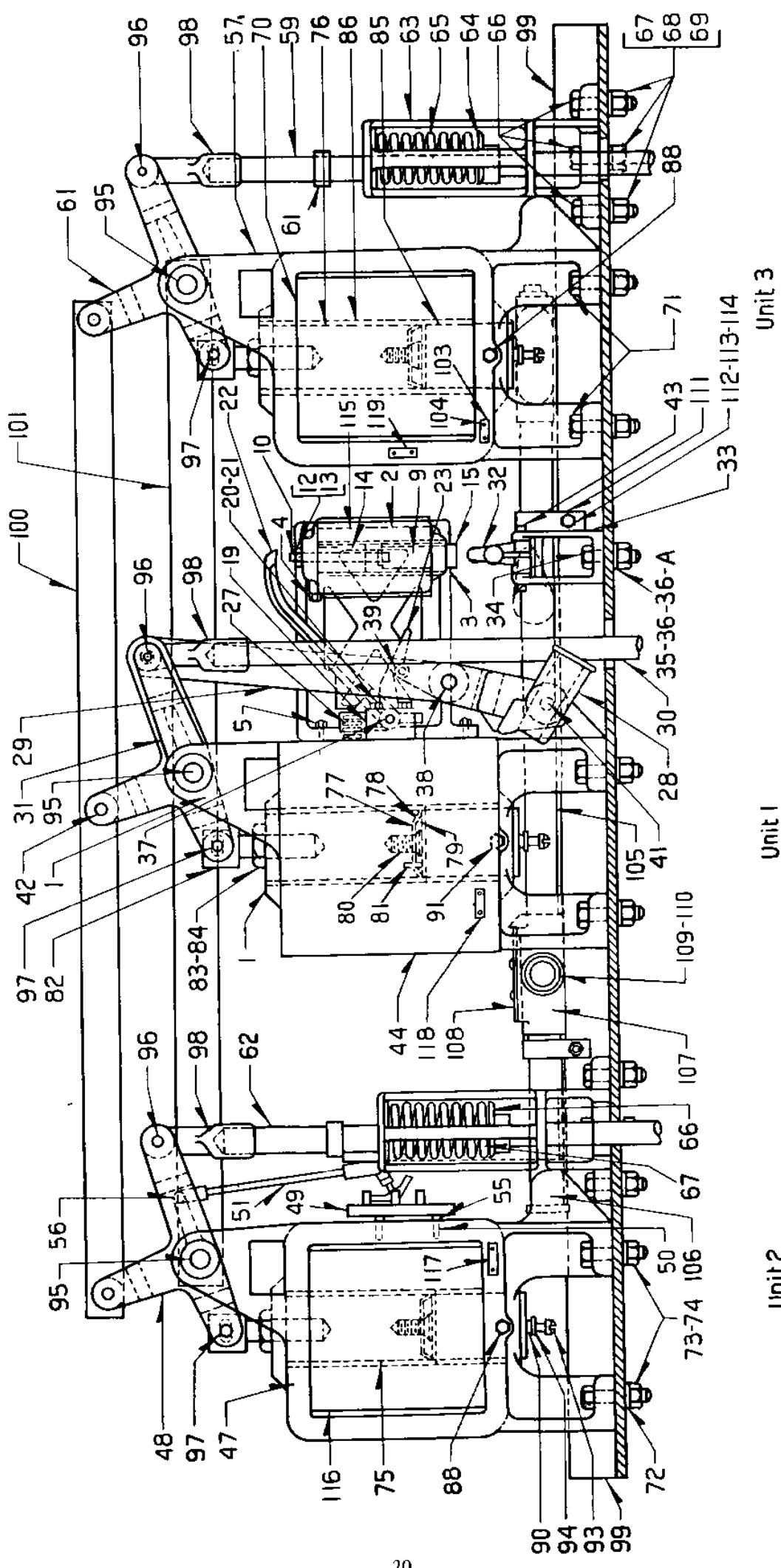
Ref. No.	Style No.	No. Per Pole Unit	Description
1*	405490	1	Moving contact complete (consists of Ref. No. 2 to 8 inclusive)
2	405492	1	Brush unit assembly complete
3	405494	2	Arcing tip, for brush
4	.....	4	Tap bolt, $\frac{3}{8}$ " x $1\frac{1}{4}$ " (standard hardware), to fasten arcing tip to brush
5	.....	4	Lock washer, $\frac{3}{8}$ " (standard hardware), for tap bolt
6	405499	2	Lifting rod complete
7	405501	2	Stud, for lifting rod
8	405491	2	Pin, to prevent nut from turning on stud

Stationary Contacts and Details

9	405481	2	Condenser terminal complete, long
10	405482	2	Condenser terminal complete, short
11	405486	4	Contact foot
12	.....	8	Tap bolt, $\frac{5}{8}$ " x 3" (standard hardware), to fasten contact foot to rod
13	.....	8	Hexagon nut, $\frac{5}{8}$ " (standard hardware), for tap bolt
14	.....	8	Lock washer, $\frac{5}{8}$ " (standard hardware), for tap bolt
15*	405493	4	Shunt and contact tip complete
16*	405498	4	Flat spring, long
17*	405497	4	Flat spring, intermediate
18*	405496	4	Flat spring, short
19*	.....	2	Tap bolt, $\frac{1}{2}$ " x $2\frac{1}{2}$ " (standard hardware), to fasten shunt to bracket
20*	.....	2	Hexagon nut, $\frac{1}{2}$ " (standard hardware), for tap bolt
21*	.....	2	Lock washer, $\frac{1}{2}$ " (standard hardware), for tap bolt
22*	.....	16	Tap bolt, $\frac{1}{2}$ " x $1\frac{3}{4}$ " (standard hardware), to fasten terminal clamp to base
23*	.....	16	Lock washer, $\frac{1}{2}$ " (standard hardware), for tap bolt
24	405495	2	Bracket, to mount shunt and contact tip
25*	405485	4	Gasket, used between porcelain bushing and clamp
26	.....	8	Tap bolt, $\frac{3}{8}$ " x $1\frac{1}{4}$ " (standard hardware), to fasten contact foot to bracket
27	.....	8	Lock washer, $\frac{3}{8}$ " (standard hardware), for tap bolt
28*	22571	4	Contact nut, for terminal rod
29	442793	4	Spanner nut for bottom of condenser terminal

*Not illustrated

ELECTRICAL OPERATING MECHANISM AND DETAILS



ELECTRICAL OPERATING MECHANISM AND DETAILS—Continued

For 3000 and 4000 Ampere Breakers

Parts Illustrated on Page 20

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Parts for Unit No. 1 Only

Ref. No.	Style No.	No. Per Mechanism	Description
1	405616	1	Mechanism frame
2	405619	1	Shunt trip frame
3	405600	1	Shunt trip frame bracket
4	.....	2	Tap bolt, 1/2" x 1 1/4" (standard hardware), to fasten shunt trip frame to bracket
5	.....	3	Tap bolt, 1/2" x 1 3/4" (standard hardware), to fasten shunt trip bracket to mechanism frame
6*	.....	5	Lock washer, 1/2" (standard hardware), for tap bolts
7*	405606	1	Moving and stationary cores complete
8*	405607	1	Moving core with stud
9	333125	1	Moving core only
10	405608	1	Stud, for moving core
11*	141901	1	Rivet, to fasten moving core to stud
12	40646	1	Washer, for stud
13	46870	1	Nut, for stud
14	333124	1	Stationary core
14A*	432367	3	Spacer, used between coil and frame
14B*	432368	3	Spacer, used between coil and frame
15	333123	1	Brass sleeve, for stationary core
16*	.....	2	Flat head iron machine screw, No. 10-32 x 3/8" (standard hardware), to fasten brass sleeve to stationary core
17*	.....	1	Tap bolt, 1/2" x 1 3/4" (standard hardware), to fasten stationary core to frame
18*	.....	1	Lock washer, 1/2" (standard hardware), for tap bolt
19	405603	2	Trip lever bearing
20	.....	4	Tap bolt, 1/2" x 2 1/2" (standard hardware), to fasten trip lever bearing to mechanism frame
21	.....	4	Lock washer, 1/2" (standard hardware), for tap bolt
22	405602	1	Trip lever
23	405605	1	Latch complete
24*	.....	1	Tap bolt, 3/8" -16 x 1 1/2" (standard hardware), used as adjusting screw
25*	.....	1	Lock washer, 3/8" (standard hardware), for tap bolt
26*	.....	1	Lock nut, 3/8" (standard hardware), for tap bolt
27	405604	1	Spring, for latch
28	405601	1	Hand closing lever socket
29	405592	1	Link for hand closing lever and main lever
30	405597	1	Lifting rod
31	405613	1	Main lever
32	405612	1	Hand trip lever
33	405611	1	Bracket, for hand trip lever
34	.....	2	Tap bolt, 3/4" x 2" (standard hardware), to fasten hand trip lever bracket to support
35	.....	2	Lock washer, 3/4" (standard hardware), for tap bolt
36	.....	2	Hexagon iron nut, 3/4" (standard hardware), for tap bolt
36A*	3300	2	Washer for tap bolt
37	405122	1	Pin, to fasten trip lever in bearing
38	272421	1	Pin, to fasten hand closing lever to link
39	271427	1	Roller, for latch
40*	63603	1	Pin, to fasten roller to latch
41	168903	1	Pin, for hand closing lever
42	277562	1	Pin, to fasten main link to main lever
43	63610	1	Pin, for hand trip lever
44	442798	1	Control panel, for details see page 28
44	442799	1	Control panel complete (for details see page 28)
45*	.....	1	Name plate No. 2416
46	.....	4	Escutcheon pin, No. 12 x 3/8" (standard hardware), for name plate

Parts for Unit No. 2 Only

47	405618	1	Mechanism frame
48	405615	1	Main lever
49	432363	1	Auxiliary switch complete. For details see page 24
50	.....	4	Tap bolt, 1/2" x 1 1/2" (standard hardware), to fasten switch to mechanism frame

*Not illustrated

ELECTRICAL OPERATING MECHANISM AND DETAILS—Continued**For 3000 and 4000 Ampere Breakers**

Parts Illustrated on Page 20

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION**Parts for Unit No. 2 Only—Continued**

Ref. No.	Style No.	No. Per Mechanism	Description
51	432364	1	Link to connect switch and main lever
52*	432365	1	Link and block
53*	442786	1	Eye bolt for link
54*	.....	1	Lock nut, $\frac{1}{4}$ " (standard hardware), for link and eye bolt
55	405128	4	Spacer, used between switch base and mechanism frame
56	88903	1	Pin, to fasten link to main lever

Parts for Unit No. 3 Only

57	405617	1	Mechanism frame
58	405614	1	Main lever

Parts Common to Units No. 2 and No. 3 Only

59	405596	1	Lifting rod
60*	405599	1	Lifting rod and collar
61	405595	2	Collar for lifting rod
62	405598	1	Pin, to fasten collar to lifting rod
63	405123	1	Spring housing, for dash pot
64	405124	1	Washer, used with spring
65	405125	1	Spring, for dash pot
66	.....	3	Tap bolt, $\frac{3}{8}$ " x $2\frac{3}{4}$ " (standard hardware), to fasten spring housing to cast iron support
67	.....	3	Lock washer, $\frac{3}{4}$ " (standard hardware), for tap bolt
68	.....	3	Hexagon iron nut, $\frac{3}{4}$ " (standard hardware), for tap bolt
69	3300	3	Washer for tap bolt

Parts Common to All Units

70	432366	3	Spacer, used between coil and frame
71	.....	4	Tap bolt, $\frac{3}{4}$ " x $2\frac{3}{4}$ " (standard hardware), to fasten frame to base
72	.....	4	Lock washer, $\frac{3}{4}$ " (standard hardware), for tap bolt
73	.....	4	Hexagon iron nut, $\frac{3}{4}$ " (standard hardware), for tap bolt
74	3300	4	Washer for tap bolt
75	405588	1	Moving core complete
76	225439	1	Moving core only
77	333085	1	Leather washer for closing moving coil
78	189929	1	Expander for leather washer
79	271438	1	Follower for expander and leather washer
80	117211	1	Special flat head screw, to fasten leather, expander and follower to moving core
81	151006	1	Pin, to prevent leather, expander and follower from turning
82	253488	1	Eye bolt for moving core
83	85635	1	Lock washer, for eye bolt
84	255993	1	Hexagon nut, for eye bolt
85	264230	1	Stationary core
85A*	380236	1	Flax packing for stationary core
86	333083	1	Brass sleeve, for stationary core
87*	.....	1	Flat head iron machine screw, No. 14-24 x $\frac{1}{2}$ " (standard hardware), to fasten brass sleeve to stationary core
88	.....	2	Tap bolt, $\frac{3}{4}$ " x 3" (standard hardware), to fasten stationary core to mechanism frame
89*	.....	2	Lock washer, $\frac{3}{4}$ " (standard hardware), for tap bolt
90	185454	1	Brass plug, for valve
91	184519	1	Brass ball, for valve
92*	198929	1	Spring, for valve
93	277826	1	Adjusting screw, for valve
94	.....	1	Hexagon nut, No. 20-18 (standard hardware), for adjusting screw
95	405609	1	Bearing pin, for main lever
96	299008	1	Pin, to fasten lifting rod to main lever

*Not illustrated

ELECTRICAL OPERATING MECHANISM AND DETAILS—Continued**For 3000 and 4000 Ampere Breakers**

Parts Illustrated on Page 20

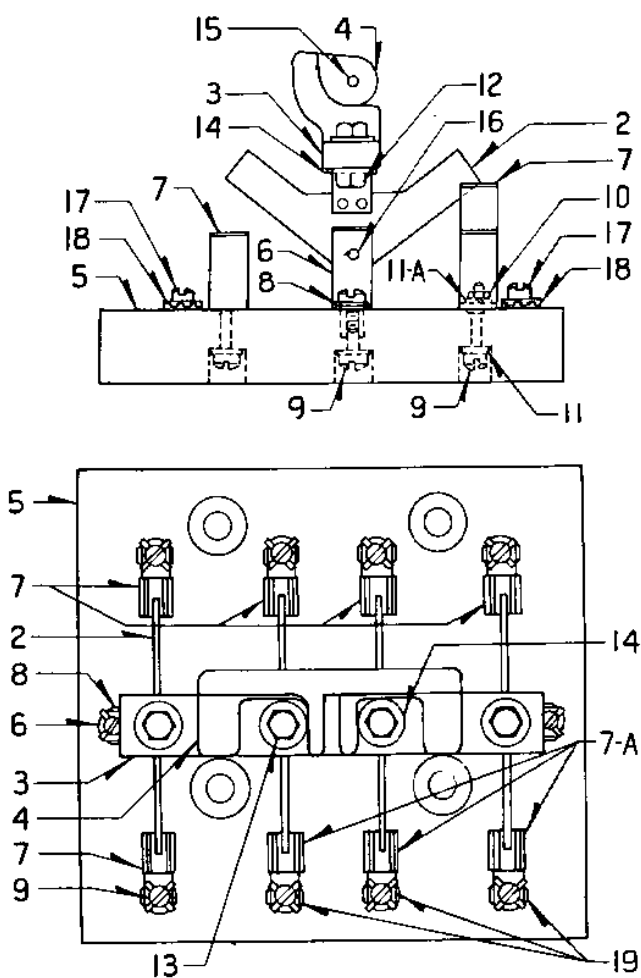
ORDER PARTS BY STYLE NUMBER AND DESCRIPTION**Parts Common to All Units—Continued**

Ref. No.	Style No.	No. Per Mechanism	Description
97	87676	2	Pin, to fasten eye bolt to main lever
98	405455	1	Rod end, for lifting lever
99	405130	1	Channel iron, for mechanism base
100	405593	1	Main link
101	405594	1	Guide link
102*	200874	1	Handle lever
103	199654	1	Wire cleat for 4 wires
104	.....	8	Fillister head machine screw, No. 8-32 x $\frac{3}{4}$ " (standard hardware), for wire cleats
105	.....	1	Standard conduit pipe, $1\frac{1}{4}$ " x 30" long
106	.....	1	Standard conduit pipe, $1\frac{1}{4}$ " x $12\frac{1}{2}$ " long
107	.....	3	Condulet box, C. H. catalogue No. T-444
108	.....	3	Condulet cover, C. H. catalogue No. 400-F
109	.....	3	Conduit bushing, $1\frac{1}{4}$ "
110	.....	2	Close wrought iron nipple, $1\frac{1}{4}$ "
111	405131	2	Conduit support
112	.....	2	Fillister head iron machine screw, No. 14-24 x 1" (standard hardware), to fasten support to base
113	.....	2	Iron machine screw nut, No. 14-24 (standard hardware), for machine screw
114	.....	2	Lock washer, $\frac{1}{4}$ " (standard hardware), for machine screw
115	247190	1	Trip coil, 125 volts
115	247191	1	Trip coil, 250 volts
116	434737	1	Closing coil 125 volts
116	422326	1	Closing coil 250 volts
117	199657	1	Wire cleat for 7 wires
118	199656	1	Wire cleat for 6 wires
119	199652	1	Wire cleat for 2 wires
120	.....	2	C. I. Pipe pin, $1\frac{1}{4}$ " (standard hardware), for dead end of conduit box Ref. No. 107

*Not illustrated

AUXILIARY SWITCH AND DETAILS

For Use With Electrical Operating Mechanism Unit No. 2

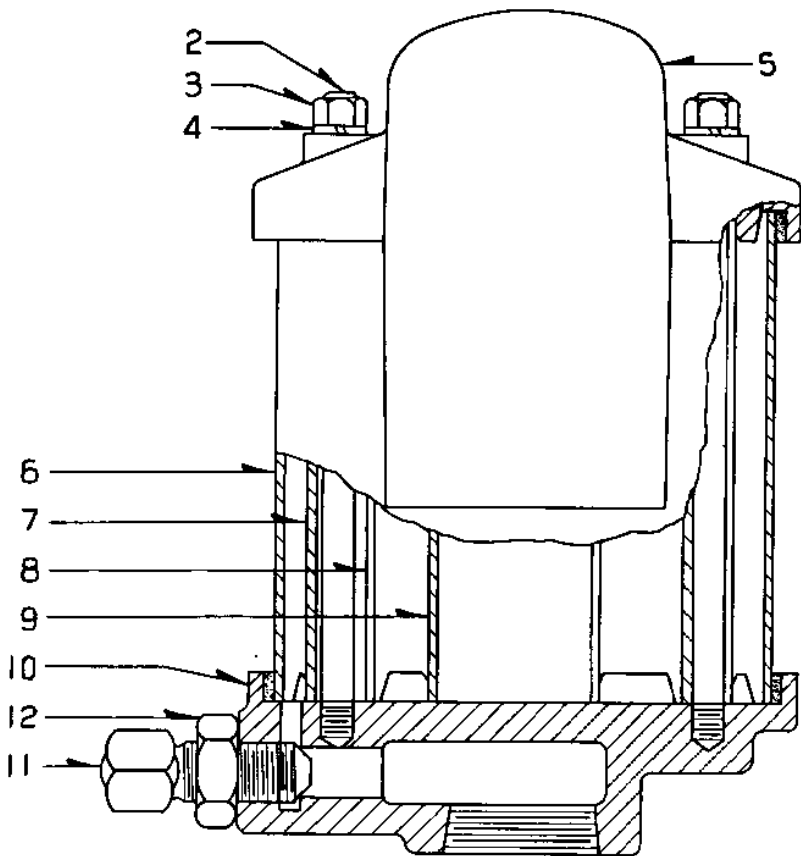


ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Switch	Description
1	432363	..	Auxiliary switch complete
2	432362	4	Switch blade and block
3	405569	1	Cross bar
4	402871	1	Switch lever
5	405121	1	Slate base
6	263124	4	Hinge jaw
7	432361	5	Break jaw
7-A	236034	3	Break jaw
8	263125	4	Connector
9	.....	12	Fillister head iron machine screw, No. 10-32 x 7/8" (standard hardware), to fasten hinge jaw and break jaws to base
10	.....	12	Iron machine screw nut, No. 10-32 (standard hardware), for machine screw
11	3410	12	Washer for machine screw
11-A	.....	12	Lock washer, ".190 (standard hardware), for machine screw
12	.....	2	Tap bolt, 1/4" x 3/8" (standard hardware), to fasten lever to cross bar
13	.....	4	Tap bolt, 1/4" x 3/4" (standard hardware), to fasten switch blade to cross bar
14	7444	6	Washer for tap bolts
15	88901	1	Pin to fasten lever to link
16	.....	4	Round head copper rivet, 1/8" x 5/16" (standard hardware), to fasten switch blade in hinge jaw
17	.....	12	Fillister head iron machine screw, No. 10-32 x 1/2" (standard hardware), used as contact screws
18	148425	12	Crimp washer for contact screw
19	236036	3	Terminal block for break jaw

MUFFLER AND DETAILS

For 3000 and 4000 Amperes

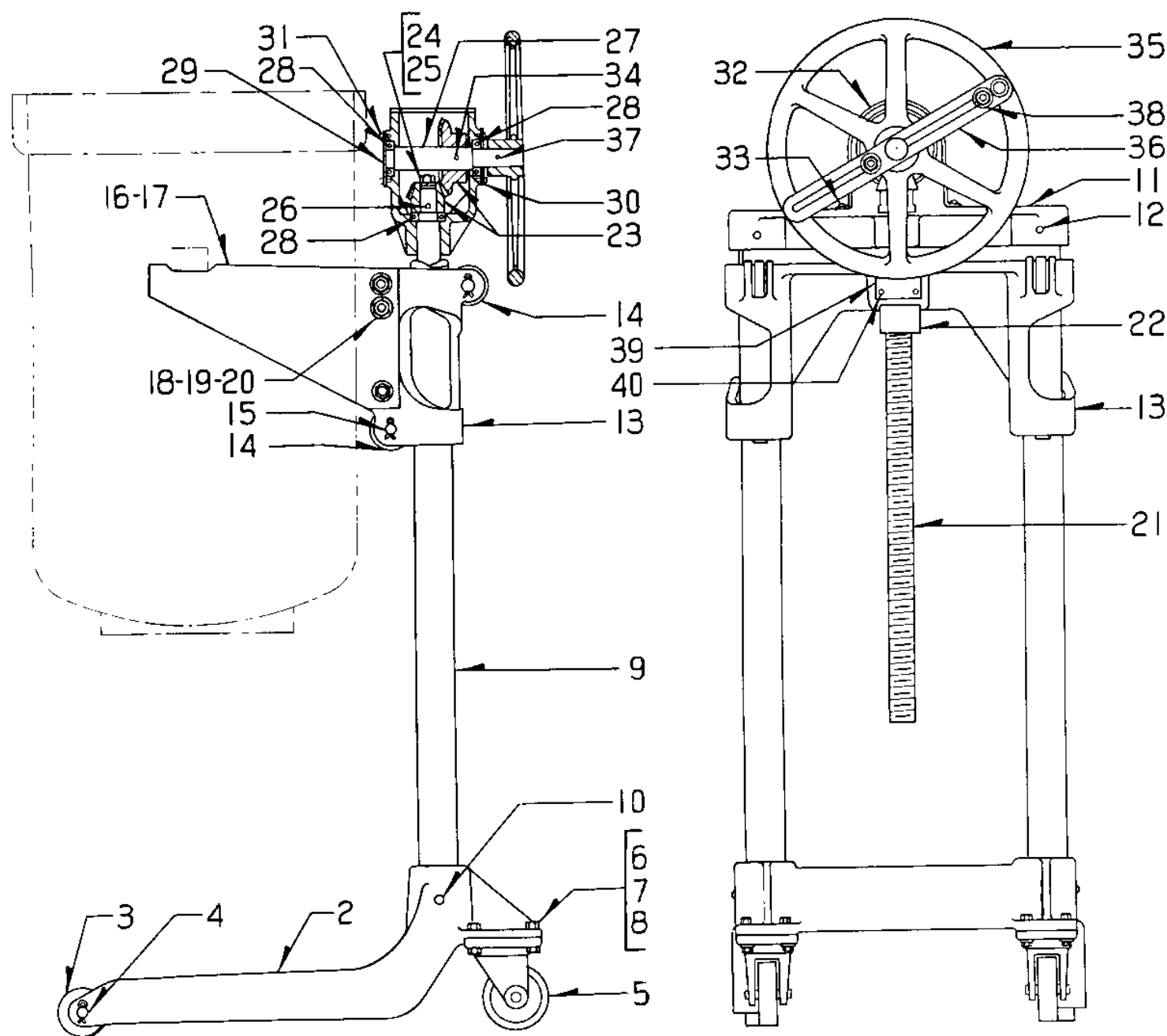


ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Muffer	Description
1	405479	1	Muffer complete
2	398306	2	Stud bolt, to clamp muffer together
3	.....	2	Hexagon iron nut, $\frac{3}{8}$ "-16 (standard hardware), for stud bolt
4	.....	2	Lock washer, $\frac{3}{8}$ " (standard hardware), for stud bolt
5	405480	1	Cover for muffer
6	398305	1	Outside ring
7	398304	1	Short intermediate ring
8	398303	1	Long intermediate ring
9	398302	1	Inside ring
10	398308	1	Base, for muffer
11	.....	1	Set screw, $\frac{3}{4}$ "-10 x $1\frac{1}{2}$ " (standard hardware), to fit in base
12	.....	1	Lock nut, $\frac{3}{4}$ "-10 (standard hardware), for set screw
13*	.....	1	Wrought iron nipple, $1\frac{1}{2}$ " x $2\frac{1}{2}$ " long, to connect muffer to mechanism cover
14*	.....	1	Malleable iron pipe nut, $1\frac{1}{2}$ " for nipple

*Not illustrated

TANK LIFTER AND DETAILS
For 3000 to 4000 Ampere Breakers



REFERENCE NO. 1

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

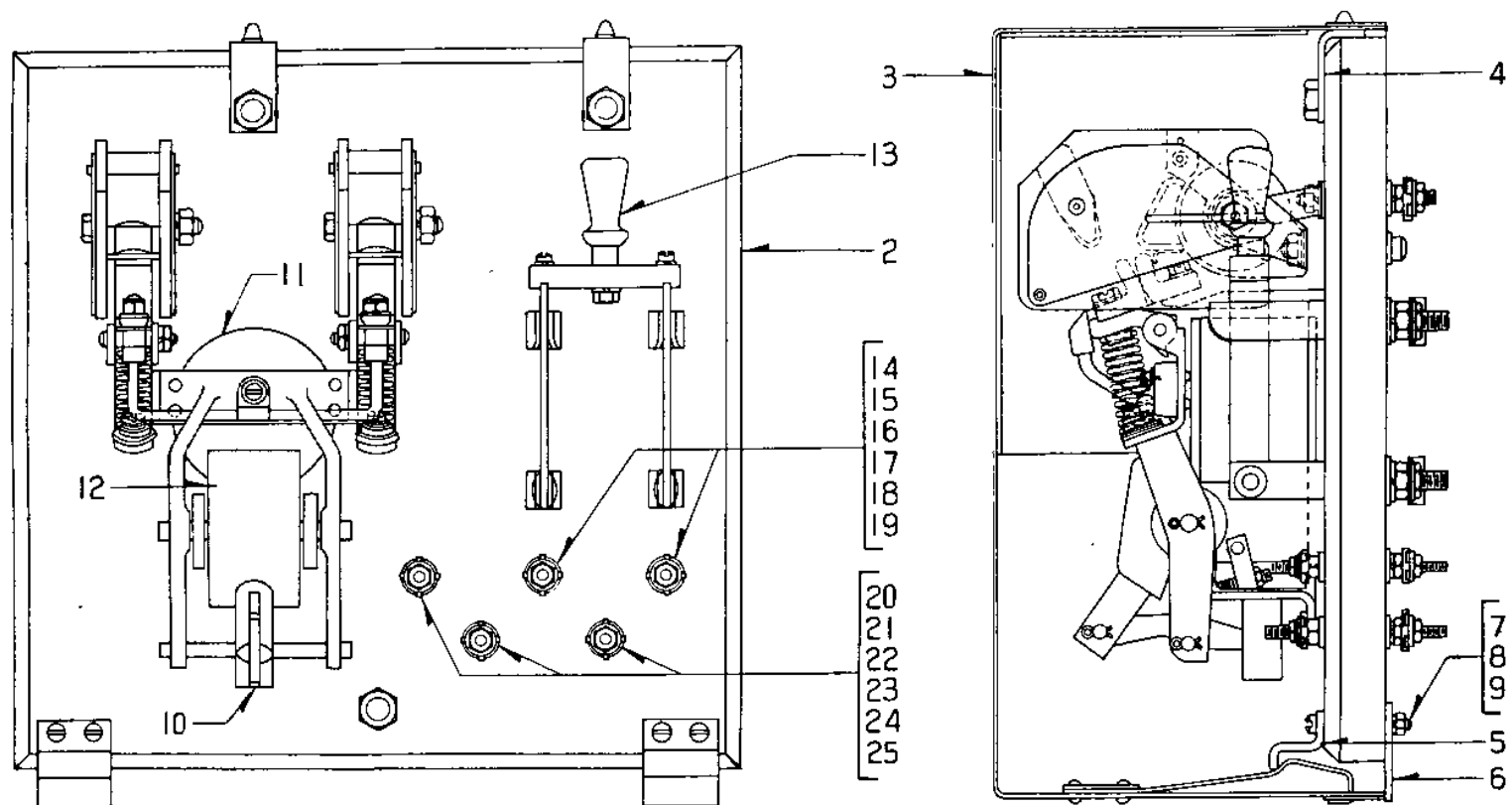
Ref. No.	Style No.	No. per Lifter	Description
1	445481	1	Tank lifter complete
2	432369	1	Base
3	385010	2	Roller for rear base
4	432380	2	Bearing pin for roller
5	385001	2	Castors for front base
6	385358	8	Tap bolt, $\frac{3}{8}$ " -16 x $1\frac{1}{2}$ " (standard hardware), to fasten castors to base
7	389521	8	Hexagon nut, $\frac{3}{8}$ " -16 (standard hardware), for tap bolt
8	383169	8	Lock washer, $\frac{3}{8}$ " (standard hardware), for tap bolt
9	432371	2	Support for gear housing and lifting bracket
10	.....	2	Round head iron rivet, $\frac{1}{4}$ " x $4\frac{1}{2}$ " (standard hardware), for support and base
11	432378	1	Gear housing

TANK LIFTER AND DETAILS—Continued

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Lifter	Description
12	.....	2	Cold rolled steel rivet, 1/4" x 4 1/2" (standard hardware), for support and gear housing
13	432379	1	Lifting bracket
14	432372	4	Roller for lifting bracket
15	88353	4	Bearing pin for roller
16	432376	1	Lifting arm (left hand)
17	432377	1	Lifting arm (right hand)
18	377439	6	Tap bolt, 5/8" -11 x 2 1/4" (standard hardware), to fasten lifting arm to bracket
19	379917	6	Hexagon nut, 5/8" -11 (standard hardware), for tap bolt
20	383239	6	Lock washer, 5/8" (standard hardware), for tap bolt
21	432370	1	Lifting screw
22	432374	1	Nut for lifting screw and bracket
23	453738	1	Bevel gear
24	432373	1	Washer for top of lifting screw
25	379917	1	Hexagon nut, 5/8" -11 (standard hardware), for top of lifting screw
26	.....	1	Taper pin, No. 7 x 2 1/4" (standard hardware), for pinion gear and lifting screw
27	453731	1	Shaft for hand wheel
28	453686	3	Ball bearing for hand wheel shaft and lifting screw (Catalogue No. K-111 Boston Gear Works)
29	453732	1	Retaining plate for ball bearing on hand wheel shaft, rear
30	453733	1	Retaining plate for ball bearing on hand wheel shaft, front
31	.....	8	Fillister head iron machine screw, No. 14-24 x 3/4" (standard hardware), to fasten retaining plate to gear housing
32	385009	1	Cover for gear
33	.....	4	Fillister head iron machine screw, No. 14-24 x 5/8" (standard hardware), to fasten cover to gear housing
34	.....	1	Taper pin, No. 7 x 3 1/4" (standard hardware), for driving gear and hand wheel shaft
35	453697	1	Hand wheel
36	453698	1	Crank and handle
37	.....	1	Taper pin, No. 7 x 2 3/4" (standard hardware), for hand wheel shaft
38	.....	2	Machine bolt, 5/8" -11 x 2" (standard hardware), to fasten handle to hand wheel
39	.....	1	Name plate No. 3040
40	.....	4	Escutcheon pin, No. 12 x 3/8" (standard hardware), for name plate

CONTROL PANEL AND DETAILS



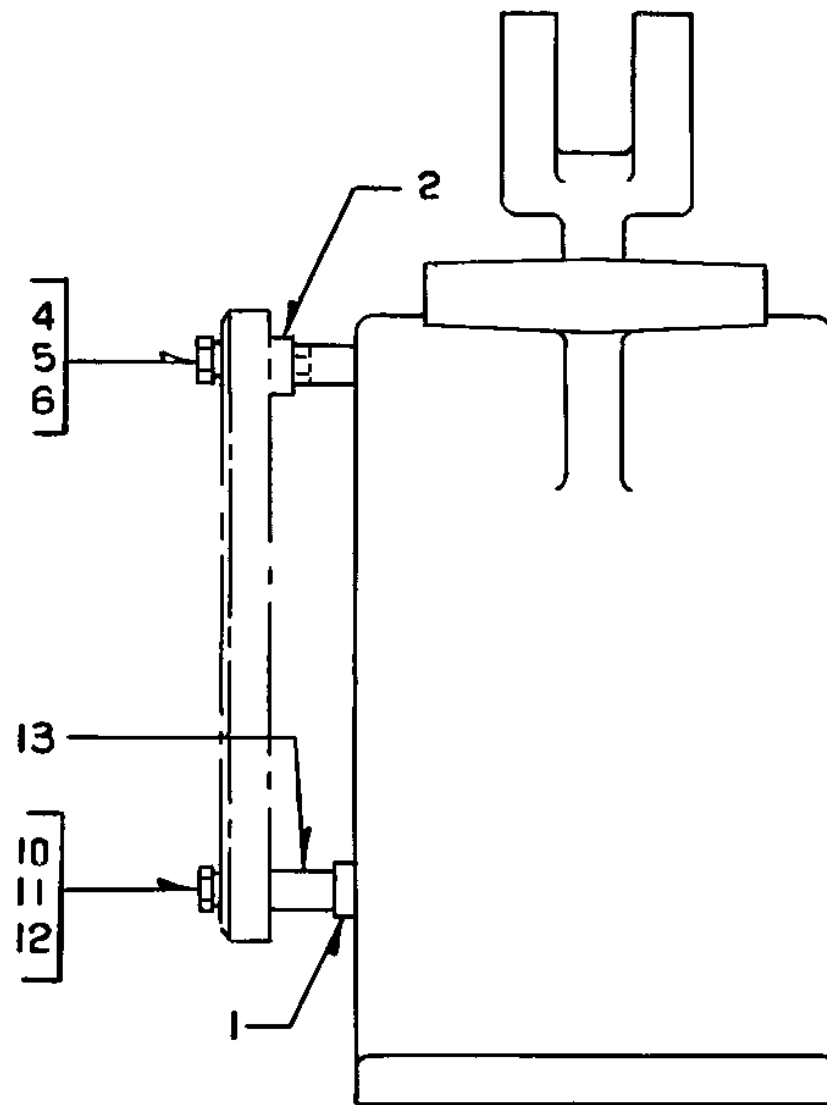
REFERENCE No. 1

ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Panel	Description
1	442798	..	Control panel complete, 125 volts
1	442799	..	Control panel complete, 250 volts
2	442791	1	Slate panel
3	442790	1	Cover, for slate panel
4	415816	2	Support, for cover
5	415817	2	Latch, for cover
6	415818	2	Stop, for cover
7	.....	4	Fillister head iron machine screw, No. 10-32 x 1 3/4" (standard hardware), to fasten latch and stop to panel
8	.....	4	Lock washer, ".190 (standard hardware), for machine screw
9	.....	4	Hexagon iron nut, No. 10-32 (standard hardware), for machine screw
10	415601	1	Type S-1, two pole control relay without coils. For details see Part Catalogue No. 6221-1.
10	415602	1	Type S-1, two pole, control relay with 125 volt coil. For details see Part Catalogue No. 6221-1
10	415603	1	Type S-1, two pole, control relay with 250 volt coil. For details see Part Catalogue No. 6221-1
11	285640	1	Operating coil, 125 volts
11	285641	1	Operating coil, 250 volts
12	375628	1	Releasing coil, 125 volts
12	375629	1	Releasing coil, 250 volts
13	398301	1	Type A Knife switch. For details see page 30
14	361711	2	Terminal stud, large
15	163424	4	Crimp washer, for terminal stud
16	3424	4	Steel washer, for terminal stud
17	3217	4	Brass washer, for terminal stud
18	.....	4	Lock washer, 1/4" (standard hardware), for terminal stud
19	46868	8	Nut, for terminal stud
20	361706	3	Terminal stud, small
21	148425	6	Crimp washer, for terminal stud
22	3422	6	Steel washer, for terminal stud
23	7453	6	Brass washer, for terminal stud
24	.....	6	Lock washer, 3/4" (standard hardware), for terminal stud
25	40662	12	Nut, for terminal stud

CONTROL PANEL AND DETAILS—Continued

Mounting Details

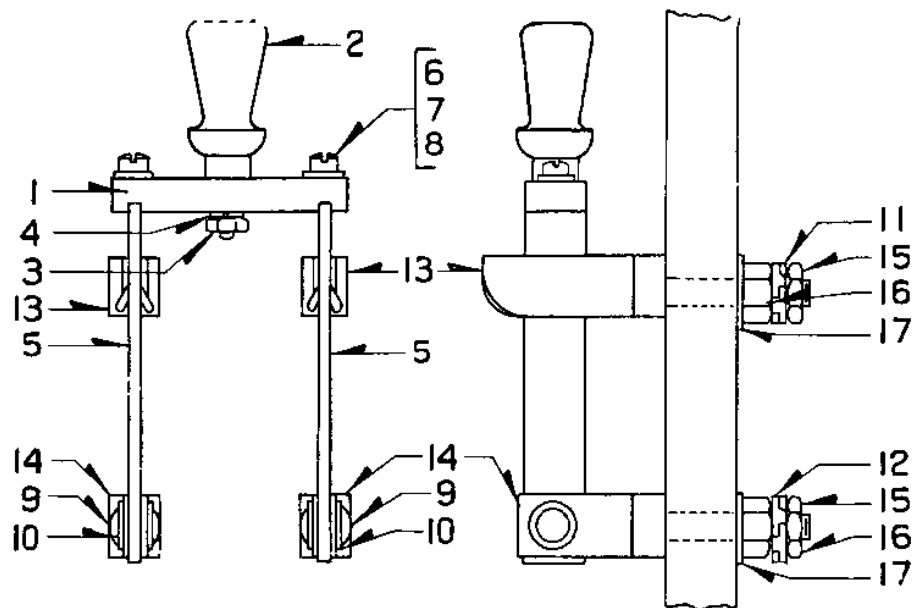


ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. per Panel	Description
1	432381	1	Lower mounting strap
2	432382	1	Upper mounting strap
3*	.....	2	Flat head iron machine screw, $\frac{3}{8}$ " x $2\frac{1}{4}$ " (standard hardware), to fasten upper mounting strap to magnet frame
4	.....	2	Tap bolt, $\frac{3}{8}$ " x 2" (standard hardware), to fasten control panel to upper mounting strap
5	.....	2	Hexagon iron nut, $\frac{3}{8}$ " (standard hardware), for tap bolt
6	.....	2	Lock washer, $\frac{3}{8}$ " (standard hardware), for tap bolt
7	3428	4	Iron washer for tap bolt
8*	.....	1	Tap bolt, $\frac{3}{8}$ " x $1\frac{1}{8}$ " (standard hardware), to fasten lower mounting strap to magnet frame
9*	.....	1	Lock washer, $\frac{3}{8}$ " (standard hardware), for tap bolt
10	.....	1	Tap bolt, $\frac{3}{8}$ " x $2\frac{3}{4}$ " (standard hardware), to fasten control panel to lower mounting strap
11	.....	1	Lock washer, $\frac{3}{8}$ " (standard hardware), for tap bolt
12	3428	1	Iron washer for tap bolt
13	394498	3	Spacer between control panel and magnet frame

*Not illustrated

TYPE A KNIFE SWITCH, STYLE NO. 398301 AND DETAILS



ORDER PARTS BY STYLE NUMBER AND DESCRIPTION

Ref. No.	Style No.	No. Per Switch	Description
..	398301	..	Type A knife switch, 2-pole, single-throw, 100 amperes, 250 volts, direct current
1	385050	1	Cross bar
2	293081	1	Handle complete
3	40662	1	Hexagon iron nut, to fasten handle to cross bar
4	4000	1	Lock washer, used under hexagon iron nut
5	189777	2	Switch blade
6	.....	2	Fillister head iron machine screw, No. 10-32 x $\frac{3}{4}$ " (standard hardware) to fasten switch blade to cross bar
7	40662	2	Hexagon iron nut, for machine screw
8	3410	2	Washer, to fit between hexagon iron nut and cross bar
9	.....	2	Copper rivet, $\frac{1}{8}$ " x $\frac{1}{2}$ " (standard hardware), used as a hinge pin for switch blade
10	230883	4	Washer, for rivet
11	23216	4	Terminal clip, for break jaw
12	194512	8	Terminal clip, for hinge jaw
13	189769	2	Break jaw complete
14	189768	2	Hinge jaw complete
15	369094	4	Contact nut, for hinge and break jaws
16	15309	4	Hexagon brass nut, to fasten hinge and break jaws to base
17	3272	4	Iron washer, used under hexagon brass nut
18*	.....	4	Lock washer $\frac{5}{16}$ " (standard hardware) between iron washer and brass nut

*Not illustrated

INDEX TO STYLE NUMBERS

Style No.	Page	Style No.	Page	Style No.	Page
3217	13-28	193688	12	377348	4
3272	7-30	194512	30	377439	27
3300	21-22	198929	12-22	379917	27
3410	24-30	199652	23	380236	22
3415	18	199654	23	380266	5-16
3422	28	199656	23	382302	13
3424	5-14-16-28	199657	23	383169	5-26
3428	10-29	200874	5-23	383172	4
4000	30	214139	12	383239	4-27
7444	13-24	225439	11 22	384961	7-18
7453	28	230342	12	384967	18
15309	30	230883	30	385001	26
22571	19	236034	24	385009	27
23216	30	236036	24	385010	26
40646	12-21	239919	5	385050	30
40662	12-28-30	243201	5-16	385286	12
45607	6	247190	23	385358	26
46867	13	247191	23	387600	6
46868	13-28	248949	11	389521	26
46870	12-21	250073	8	393556	5-15
58858	13	250114	12	394498	29
60959	6	253488	11-22	397967	5
63593	14	255993	11-22	398131	5-16
63603	11-21	263124	24	398233	4
63610	21	263125	24	398301	28-30
63632	18	264230	11-22	398302	15-25
63633	7	271427	11-21	398303	15-25
63634	11	271438	11-22	398304	15-25
68776	12	272421	21	398305	15-25
68893	13	272649	12	398306	15-25
85635	11-22	273087	11	398307	15
87676	18-23	273334	11	398308	15-25
87679	11	273372	12	398704	5
88353	18-27	275056	12	402871	13-24
88901	24	276413	12	405121	24
88903	22	276860	11	405122	21
109229	11	277454	4	405123	22
111973	8-18	277547	12	405124	22
111980	8	277560	12	405125	22
112506	12	277562	21	405128	22
113855	8	277825	12-22	405130	23
117200	12	283251	5	405131	23
117211	11-22	285640	28	405132	11
122532	12	285641	28	405140	16
140362	11	293081	30	405388	5
141601	18	299008	22	405389	5
141901	12-21	315872	12	405390	5
148425	24-28	320916	7	405391	5
151006	11-22	333083	11-22	405392	5
152341	8	333085	11-22	405411	5
163424	13-28	333086	12-21	405415	4
168903	21	333123	12	405416	4
184037	12	333124	12-21	405417	5
184519	12-22	333125	12-21	405419	5
184889	12	361706	28	405420	5
185236	12	361711	28	405421	5
185303	12	364784	4	405422	5
185454	12-22	364785	4	405423	5
187120	12	369094	30	405424	5
187337	12	375336	10	405425	4
187761	12	375337	10	405426	4
189768	30	375628	28	405427	4
189769	30	375629	28	405432	5-16
189777	30	377315	5	405433	5-16
189929	11-22	377346	6	405434	5

INDEX TO STYLE NUMBERS—Continued

Style No.	Page	Style No.	Page	Style No.	Page
405436.....	5-16	405602.....	21	442737.....	6
405437.....	5-16	405603.....	21	442738.....	6
405438.....	5	405604.....	21	442739.....	6
405439.....	17	405605.....	21	442740.....	7
405440.....	17	405606.....	21	442741.....	7
405441.....	17	405607.....	21	442742.....	6
405442.....	18	405608.....	21	442743.....	6
405443.....	17	405609.....	22	442744.....	7
405444.....	17	405611.....	21	442745.....	6
405445.....	17	405612.....	21	442746.....	6
405446.....	17	405613.....	21	442747.....	6
405447.....	17	405614.....	22	442748.....	7
405448.....	17	405615.....	21	442750.....	7
405449.....	17	405616.....	21	442751.....	6
405450.....	7-17	405617.....	22	442752.....	7
405451.....	18	405618.....	21	442753.....	7
405452.....	18	405619.....	21	442754.....	7
405453.....	18	405969.....	13	442755.....	6
405454.....	18	415261.....	12	442756.....	6
405455.....	17-23	415601.....	28	442757.....	10
405457.....	18	415602.....	28	442758.....	9
405458.....	18	415603.....	28	442759.....	9
405459.....	18	415816.....	28	442760.....	10
405461.....	18	415817.....	28	442761.....	10
405462.....	17	415818.....	28	442762.....	7
405466.....	18	420528.....	10	442763.....	7
405469.....	18	421643.....	6	442764.....	7
405470.....	18	422326.....	23	442765.....	7
405471.....	18	422330.....	12	442766.....	7
405472.....	18	422999.....	9	442767.....	7
405473.....	18	424146.....	5-16	442768.....	10
405474.....	18	424454.....	13	442769.....	10
405476.....	16	424502.....	5	442770.....	10
405478.....	16	424549.....	7-8	442771.....	10
405479.....	25	430040.....	18	442772.....	7
405480.....	25	432361.....	24	442773.....	7
405481.....	19	432362.....	24	442774.....	4
405482.....	19	432363.....	21-24	442775.....	4
405485.....	19	432364.....	22	442776.....	4
405486.....	19	432365.....	22	442778.....	7
405488.....	13	432366.....	22	442779.....	18
405489.....	18	432367.....	21	442780.....	18
405490.....	19	432368.....	21	442781.....	18
405491.....	19	432369.....	26	442783.....	8
405492.....	19	432370.....	27	442786.....	22
405493.....	19	432371.....	26	442790.....	28
405494.....	19	432372.....	27	442791.....	28
405495.....	19	432373.....	27	442793.....	19
405496.....	19	432374.....	27	442794.....	18
405497.....	19	432376.....	27	442795.....	18
405498.....	19	432377.....	27	442796.....	18
405499.....	19	432378.....	26	442797.....	7
405501.....	19	432379.....	27	442798.....	21-28
405521.....	7	432380.....	26	442799.....	21-28
405569.....	24	432381.....	29	445481.....	26
405588.....	11-22	432382.....	29	445516.....	13
405589.....	11	432858.....	18	445517.....	14
405590.....	11	434737.....	23	445518.....	14
405592.....	21	438611.....	10	445520.....	14
405593.....	23	438612.....	10	453686.....	27
405594.....	23	438613.....	10	453697.....	27
405595.....	22	438614.....	10	453698.....	27
405596.....	22	438616.....	7	453731.....	27
405597.....	21	438625.....	7	453732.....	27
405598.....	22	438626.....	7	453733.....	27
405599.....	22	438639.....	9	453738.....	27
405600.....	21	438640.....	9	453748.....	13
405601.....	21	438641.....	9	453749.....	14
				453750.....	14
				465173.....	4