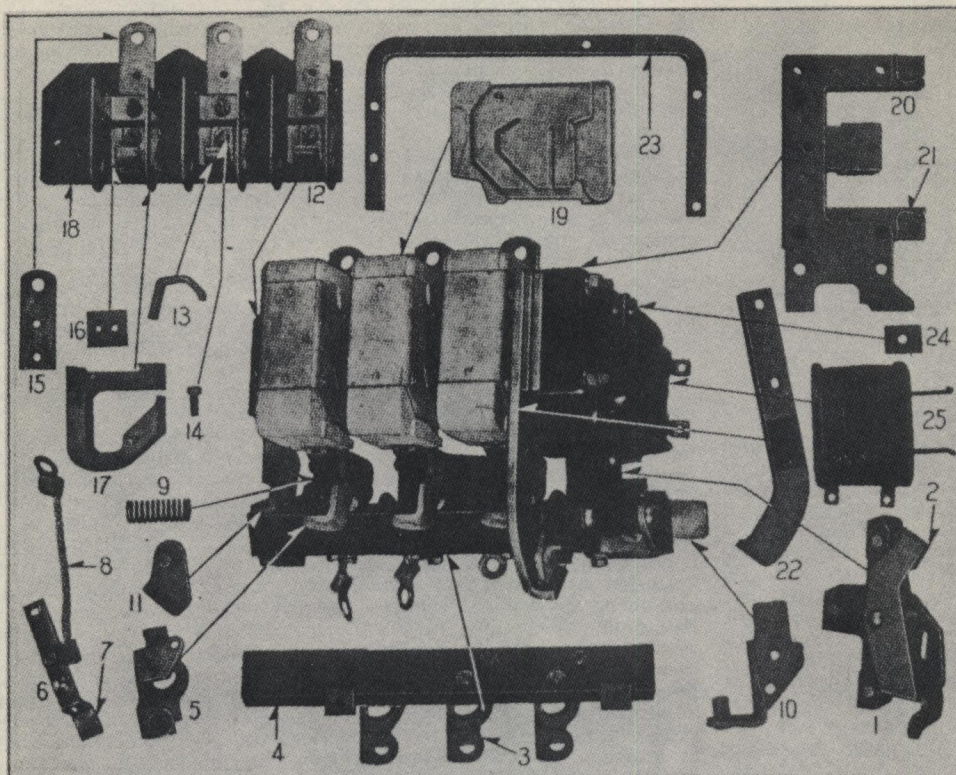




TYPE Dn CONTACTORS
Size 3, Frame No. 330 (3 Pole)—Size 4, Frame No. 430 (3 Pole)



Frame Size		330-P	430-P	No. Per Contactor	Contactors in Use	
Ampere Rating		100	150		1	5
Style Number of Contactor		1 039 891	1 039 892		Recommended for Stock	
Ref. No.	Description of Part	Style Number of Part				
1	Armature Iron with Mounting Bracket	884 580	884 581	1	0	0
2	Non-Magnetic Shim	884 574	884 574	1	0	1
3	Cross Bar with Moving Contact Bracket	1 039 878	1 039 878	1	0	0
4	Cross Bar	1 039 860	1 039 860	1	0	1
5	Moving Contact Bracket	884 594	884 594	3	0	0
6	Moving Contact with Shunt	884 567	884 568	3	0	1
7	Moving Contact	884 595	884 595	3	2	4
8	Shunt	884 613	884 614	3	2	4
9	Contact Spring	884 590	884 591	3	0	1
10	Bearing Bracket—Magnet End	884 575	884 575	1	0	0
11	Bearing Bracket—Left Hand End	884 576	884 576	1	0	0
12	Stationary Contact Base Complete	1 039 877	1 039 877	1	0	0
13	Stationary Contact	884 596	884 596	3	2	4
14	Stationary Contact Screw	186 529	186 529	3	2	4
15	Stationary Contact Connector	884 597	884 597	3	0	0
16	Stationary Contact Spacer	884 598	884 598	3	0	0
17	Blowout Coil	884 583	884 583	3	0	1
18	Base	1 039 859	1 039 859	1	0	0
19	Arc Quencher	884 589	884 589	3	1	2
†	Stationary Contact Stud	178 553	178 553	3	0	1
†	Shunt Stud	361 718	361 718	3	0	1
20	Stationary Core	884 560	884 562	1	0	0
21	Shading Coil	884 558	884 559	2	0	1
22	Stop	1 041 907	1 041 907	1	0	0
23	Frame	1 039 874	1 039 874	1	0	0
24	Coil Retaining Washer	882 191	882 191	2	0	0
25	Operating Coil	†	†	1	1	1

† Not illustrated.

‡ When ordering, specify identification number shown on Coil. See Table for Style Number of commonly used Coils. Parts indented are included in the part under which they are indented.

This list of Renewal Parts is given only as a guide. When continuous operation is a primary consideration, additional insurance against shutdowns is desirable. Under such conditions more renewal parts should be carried, the amount depending upon the severity of the service and the time required to secure renewals.

ORDERING INSTRUCTIONS

Name the part and give its style number. Give the complete nameplate reading. State whether shipment is desired by express, freight or parcel post. Send all orders or correspondence to nearest Sales Office of the Company. Small orders should be combined so as to amount to a value of at least \$1.00 net. Where the total of the sale is less than this, the material will be invoiced at \$1.00.

Westinghouse Electric & Manufacturing Company

TYPE Dn CONTACTORS

Size 3, Frame No. 330 (3 Pole)—Size 4, Frame No. 430 (3 Pole)

Instructions

Description—Type Dn Contactors are alternating current contactors which can be supplied either with or without De-ion arc quenchers. The contactors are designed for mounting on steel plate or insulating panels up to 2 inches thick.

When a contactor is mounted on a steel plate, insulation of the shunts is provided by an insulating plate interposed between the contactor and steel plate.

Ratings—The 8 hour open ratings are 100 amperes for the Size 3 Dn Contactor and 150 amperes for the Size 4 Dn Contactor. Insulation is for a maximum of 600 volts.

Unit Assembly—Type Dn Contactors are of unit assembly, with the cross-bar pivoted in bearings integral with the frame, which supports the magnet and stationary contacts. This insures accurate and permanent alignment of parts before leaving the factory.

Interchangeability of parts among Sizes 3 Dn and 4 Dn Contactors is an advantageous feature enabling the user to carry a smaller stock of renewal parts.

Mounting of the contactor to a vertical panel is accomplished by means of three bolts inserted from the front of the frame. These may be held by nuts at the back of the panel or may be threaded into tapped spacers previously secured to the panel. The latter arrangement permits of removing the contactor from the panel for servicing or other attention without necessitating the operator's going to the rear of the panel.

Magnet—The magnet consists of an E-shaped stator and a T-shaped armature. In addition to other advantages, the T-shaped armature is of sufficiently low inertia to accelerate rapidly on opening, affording a quick break of the contacts and consequently less arcing. Movement of the armature is almost vertical, rendering less likely the chance of accidental closing due to shock or impact.

Operating Coil—The coil is designed for continuous duty at 100% of its rating. It will operate the contactor satisfactorily at from 85% to 110% of its rated voltage.

TABLE OF OPERATING COILS

Volts	Cycles	DN 330-P		DN 430-P	
		Style No.	Style No.	Style No.	Style No.
110	60	897 905	1 014 611		
208	60	944 740	1 040 139		
220	60	874 111	1 040 140		
440	60	919 996	966 752		
550	60	943 156	966 746		
110	50	966 738	1 040 141		
220	50	966 739	1 040 142		
440	50	966 740	1 040 143		
550	50	966 741	1 040 144		
110	25	874 111	1 040 140		
220	25	919 996	966 752		
440	25	966 742	1 040 145		
550	25	895 655	1 040 159		

Contacts—The contact tips are of heavy copper, designed for easy removal and replacement. Movement of the tips on opening and closing produces a slight wiping action which insures a

clean contact surface but which is not sufficient to produce undue wear. A "hammer blow" dealt the contacts at the moment of opening increases the speed of separation, thereby decreasing the arcing.

Following the moment at which the contacts meet, the armature and cross-bar have an unusually long overtravel before the magnet seals. This insures that ample contact pressures exist, even when the contacts are worn so far as to require replacement.

The contact springs are unusually long, insuring almost constant pressure as the contacts wear.

The current-carrying contact shunts of flexible copper cable give complete freedom to the cross-bar and have ample capacity to carry the maximum current for which the contactors are rated. The shunts are suspended about the center of rotation of the crossbar, minimizing their flexure and increasing their life to such an extent that their renewal is practically never required.

De-ion Arc Quenchers—The De-ion arc quenchers are of exclusive design functioning to confine, divide and extinguish the arc almost instantaneously, greatly prolonging the contact life. Confinement of the arc is a feature which admits of close spacing of the contactor poles, while at the same time the superior performance of the De-ion principle enables the contactor to maintain a high interrupting capacity.

The arc quenchers are easily removed for inspection of the contacts.

Connections—The contactors may be connected from the front or from the back. See the Renewal Parts List for studs for back-connecting.

Provision for Interlock—Provision is made in two places, on the cross-bar of the contactor for mounting moving contact assemblies of Type L-41 Electrical Interlocks. The stationary members of the interlocks are to be secured to the panel on which the contactor is mounted. For more complete information concerning the Type L-41 Electrical Interlock refer to Instruction Leaflet 2406.

Maintenance

The contactor should be inspected frequently to see that no impairment of electrical or mechanical functioning occurs in service. Accumulations of dust may be removed with a dry cloth or a compressed air jet. Except only when cleaning the magnet sealing surfaces avoid oily cloths, as an oil film quickly attracts dust.

Bearings—Bearing pins are of wear-resistant nitrided alloy steel. They should not be lubricated as oil collects dust, hindering free operation of the contactor.

Magnet—Before shipment, the magnet sealing surfaces are covered with grease to prevent rusting. This should be removed before the contactor is placed in service. The surfaces should be cleaned occasionally with a cloth moistened with a light oil to remove deposits of dirt and prevent rusting.

The magnet armature and the bracket supporting it may be easily removed as a unit by removing the two screws securing the bracket to the cross-bar.

Contacts—The contact tips should not be lubricated, as the slight wear of dry contacts produces a self-cleaning action. Should excessive roughening or burning occur the tips may be dressed with a fine file. Do not use emery cloth, as abrasive granules left imbedded in the contact surfaces may raise the contact resistance and produce a tendency of the contacts to weld.

Chiefly for reasons of mechanical strength it is advisable to replace the contact tips before they have become worn to one-third their original thickness.

Correct contact pressures should be maintained as follows:

Contact Size No.	Initial Pressure	Final Pressure
3	2.8 pounds	6 pounds
4	4 pounds	9 pounds

The contact gap, measured at the heels of the contacts in their fully-open position, is $\frac{5}{8}$ inch for both the Size 3 Dn and Size 4 Dn contactors.

Operating Coil—To remove the coil, first remove the armature by taking out the two bolts securing its supporting bracket to the cross-bar. Then loosen the bolt which holds the coil to the magnet and separate the rectangular washers until it is possible to lower the coil entirely free of the magnet.

De-ion Arc Quenchers—To remove a De-ion arc quencher, grasp it at its lower end and swing it upward (it will pivot about point P, see Fig. 2), striking its lower corner upward with the palm of the hand to overcome any initial resistance to movement. The arc quencher is then free to be lifted entirely clear of the contactor.

To restore the De-ion arc quencher to its location on the contactor, slide it into the position indicated in Fig. 2, and by striking the upper corner in a direction indicated by the arrow force the arc quencher into the final location shown by the dotted lines.

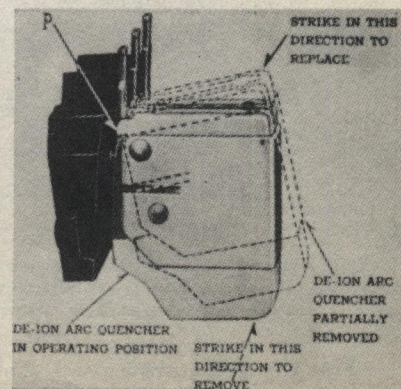
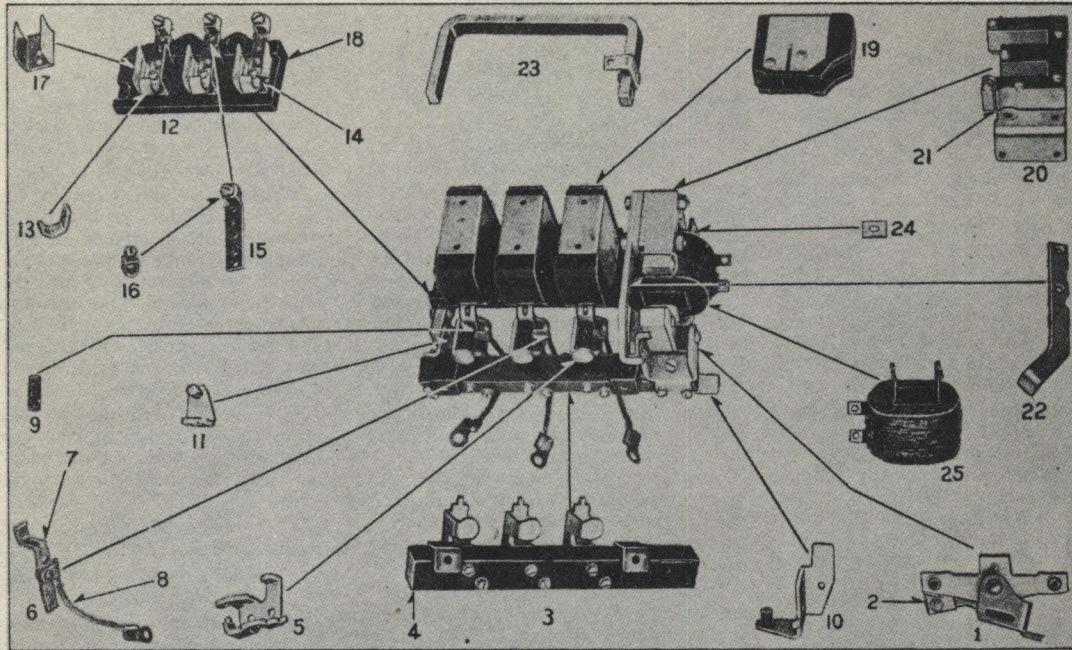


FIG. 2—DETAIL OF ARC QUENCHER AND ITS SUPPORTING BRACKET, SHOWING EASE OF REMOVAL AND REPLACEMENT.

TYPE Dn CONTACTOR—SIZE 2, Frame Numbers 220, 230, 230-P, 240



Frame Size		220	230	230-P	240	No. Per Contactor	Contactors in Use	
Style Number of Contactor		972 863	972 866	1 039 961	972 869		1	5
Ref. No.	Description of Part	Style Number of Part					Recommended for Stock	
		220	230	230-P	240		1	5
1	Armature Iron With Mounting Bracket	972 858	972 858	972 858	972 859	1	0	0
2	Non-Magnetic Shim	972 734	972 734	972 734	972 734	1	0	1
3	Cross Bar With Moving Contact Bracket	972 779	972 855	1 039 958	972 856	1	0	0
4	Cross Bar	972 747	972 748	1 039 862	972 749	1	0	1
5	Moving Contact Bracket	972 738 (2)	972 738 (3)	972 738 (3)	972 738 (4)	()	0	0
6	Moving Contact With Shunt	972 778 (2)	972 778 (3)	972 778 (3)	972 778 (4)	()	0	1
7	Moving Contact	972 739 (2)	972 739 (3)	972 739 (3)	972 739 (4)	()	0	4
8	Shunt	972 773 (2)	972 773 (3)	972 773 (3)	972 773 (4)	()	2	4
9	Contact Spring	972 774 (2)	972 774 (3)	972 774 (3)	972 774 (4)	()	2	1
10	Bearing Bracket—Magnet End	972 735	972 735	972 735	972 735	1	0	0
11	Bearing Bracket—Left Hand End	972 736	972 736	972 736	972 736	1	0	0
12 ^o	Stationary Contact Base Complete	972 860	972 861	1 039 957	972 862	1	0	0
12x	Stationary Contact Base Complete	972 775	972 776	...	972 777	1	0	0
13	Stationary Contact	972 740 (2)	972 740 (3)	972 740 (3)	972 740 (4)	()	0	4
14	Stationary Con. Screw, 190'-32 x 3/8" Fil. Hd. I. M. Sc.	Std. Hdw. (3)	Std. Hdw. (3)	Std. Hdw. (3)	Std. Hdw. (4)	()	2	4
15	Stationary Contact Connector	972 743 (2)	972 743 (3)	1 039 956 (3)	972 743 (4)	()	2	0
15	Connection Lug—Solderless	974 131 (2)	974 131 (3)	...	974 131 (4)	()	0	1
15x	Stationary Contact Spacer	972 742 (2)	972 742 (3)	...	972 742 (4)	()	0	0
17 ^o	Arc Quencher Support	972 766 (2)	972 766 (3)	972 766 (3)	972 766 (4)	()	0	0
18	Base	972 746	972 744	1 039 861	972 745	1	0	0
19	Arc Quencher	972 771 (2)	972 771 (3)	972 771 (3)	972 771 (4)	()	0	2
19†	Shunt Stud	559 187 (2)	559 187 (3)	559 187 (3)	559 187 (4)	()	1	0
20	Stationary Core	972 658	972 658	972 658	972 660	1	0	0
21	Shading Coil	972 654	972 654	972 654	972 657	2	0	1
22	Stop	972 687	972 687	1 041 906	972 687	1	0	0
23	Frame	972 683	997 939	1 039 920	972 685	1	0	0
24	Coil Retaining Washer	972 754	972 754	972 754	972 754	2	0	0
25	Operating Coil	†	†	†	†	1	0	0

† Not illustrated. ° Used Only on Contactor With Arc Quencher. x Used Only on Contactor Without Arc Quencher.
() Figures in Parentheses indicate the number per Contactor. † When ordering, specify identification number stamped on coil.
See table for style number of commonly used coils. Parts indented are included in the part under which they are indented.

This list of Renewal Parts is given only as a guide. When continuous operation is a primary consideration, additional insurance against shutdowns is desirable. Under such conditions more renewal parts should be carried, the amount depending upon the severity of the service and the time required to secure renewals.

ORDERING INSTRUCTIONS

Name the part and give its style number. Give the complete nameplate reading. State whether shipment is desired by express, freight or parcel post. Send all orders or correspondence to nearest Sales Office of the Company. Small orders should be combined so as to amount to a value of at least \$1.00 net. Where the total of the sale is less than this, the material will be invoiced at \$1.00.

Westinghouse Electric & Manufacturing Company

TYPE Dn CONTACTORS

Size 2—Frame Nos. 220 (2 poles), 230 and 230-P (3 poles), 240 (4 poles)

Instructions

Description—Type Dn Contactors are alternating current contactors which can be supplied either with or without De-ion arc quenchers. The contactors are designed for mounting on steel plate or insulating panels up to 2 inches thick.

When a contactor is mounted on a steel plate, insulation of the shunts is provided by an insulating plate interposed between the contactor and steel plate.

Ratings—The 8 hour open rating of the size 2 Dn contactors is 50 amperes. Insulation is for a maximum of 600 volts.

Unit Assembly—Type Dn Contactors are of unit assembly, with the cross-bar pivoted in bearings integral with the frame which supports the magnet and stationary contacts. This insures accurate and permanent alignment of parts before leaving the factory.

Mounting of the contactor to a vertical panel is accomplished by means of three bolts inserted from the front of the frame. These may be held by nuts at the back of the panel or may be threaded into tapped spacers previously secured to the panel. The latter arrangement permits of removing the contactor from the panel for servicing or other attention without necessitating the operator's going to the rear of the panel.

Magnet—The magnet consists of an E-shaped stator and a T-shaped armature. In addition to other advantages, the T-shaped armature is of sufficiently low inertia to accelerate rapidly on opening, affording a quick break of the contacts and consequently less arcing. Movement of the armature is almost vertical, rendering less likely the chance of accidental closing due to shock or impact.

Operating Coil—The coil is designed for continuous duty at 100% of its rating. It will operate the contactor satisfactorily at from 85% to 110% of its rated voltage.

TABLE OF OPERATING COILS

Volts	Cycles	Dn-220 Dn-230 Dn-230-P	Dn-240
		Style No.	Style No.
110	60	974 133	1 014 618
220	60	974 135	1 014 620
440	60	974 136	1 014 621
550	60	974 138	1 014 623
110	50	974 140	1 014 625
220	50	974 141	1 014 626
440	50	974 142	1 014 627
550	50	974 143	1 014 628
110	25	974 135	1 014 620
220	25	974 136	1 014 621
440	25	974 144	1 014 629
550	25	974 145	1 014 630

Contacts—The contact tips are of heavy copper, designed for easy removal and replacement. Movement of the tips on opening and closing produces a slight wiping action which insures a clean contact surface but which is not sufficient to produce undue wear. A

"hammer blow" dealt the contacts at the moment of opening increases the speed of separation, thereby decreasing the arcing.

Following the movement at which the contacts meet, the armature and cross-bar have an unusually long overtravel before the magnet seals. This insures that ample contact pressures exist, even when the contacts are worn so far as to require replacement.

The contact springs are unusually long, insuring almost constant pressures as the contacts wear.

The current-carrying contact shunts of flexible copper cable give complete freedom to the cross-bar and have ample capacity to carry the maximum current for which the contactors are rated. The shunts are suspended about the center of rotation of the crossbar, minimizing their flexure and increasing their life to such an extent that their renewal is practically never required.

De-ion Arc Quenchers—The De-ion arc quenchers are of exclusive design functioning to confine, divide and extinguish the arc almost instantaneously, greatly prolonging the contact life. Confinement of the arc is a feature which admits of close spacing of the contactor poles, while at the same time the superior performance of the De-ion principle enables the contactor to maintain a high interrupting capacity.

The arc quenchers are easily removed for inspection of the contacts.

Connections—The contactors may be connected from the front or from the back. See the Renewal Parts List for studs for back-connecting.

Provision for Interlock—Provision is made in two places, on the cross-bar of the contactor for mounting moving contact assemblies of Type L-41 Electrical Interlocks. The stationary members of the interlocks are to be secured to the panel on which the contactor is mounted. For more complete information concerning the Type L-41 Electrical Interlock refer to Instruction Leaflet 2406.

Maintenance

The contactor should be inspected frequently to see that no impairment of electrical or mechanical functioning occurs in service. Accumulations of dust may be removed with a dry cloth or a compressed air jet. Except only when cleaning the magnet sealing surfaces avoid oily cloths, as an oil film quickly attracts dust.

Bearings—Bearing pins are of wear-resistant nitrided alloy steel. They should not be lubricated as oil collects dust, hindering free operation of the contactor.

Magnet—Before shipment, the magnet sealing surfaces are covered with grease to prevent rusting. This should be removed before the contactor is placed in service. The surfaces should be cleaned occasionally with a cloth

moistened with a light oil to remove deposits of dirt and prevent rusting.

The magnet armature and the bracket supporting it may be easily removed as a unit by removing the two screws securing the bracket to the cross-bar.

Contacts—The contact tips should not be lubricated, as the slight wear of dry contacts produces a self-cleaning action. Should excessive roughening or burning occur the tips may be dressed with a fine file. Do not use emery cloth, as abrasive granules left imbedded in the contact surfaces may raise the contact resistance and produce a tendency of the contacts to weld.

Chiefly for reasons of mechanical strength it is advisable to replace the contact tips before they have become worn to one-third their original thickness.

Correct contact pressures should be maintained as follows:

Initial pressure—1 lb. 2 oz.

Final pressure—2 lb. 14 oz.

The contact gap, measured at the heels of the contacts in their fully-open position, is $\frac{1}{16}$ inch.

Operating Coil—To remove the coil, first remove the armature by taking out the two bolts securing its supporting bracket to the cross-bar. Then loosen the bolt which holds the coil to the magnet and separate the rectangular washers until it is possible to lower the coil entirely free of the magnet.

De-ion Arc Quenchers—To remove a De-ion arc quencher, grasp it at its lower end and swing it upward (it will pivot about point P, see Fig. 1), striking its lower corner upward with the palm of the hand to overcome any initial resistance to movement. The arc quencher is then free to be lifted entirely clear of the contactor.

To restore the De-ion arc quencher to its location on the contactor, slide it into the position indicated by the dashed lines in Fig. 1, and by striking the upper corner in a direction indicated by the arrow force the arc quencher into its final location

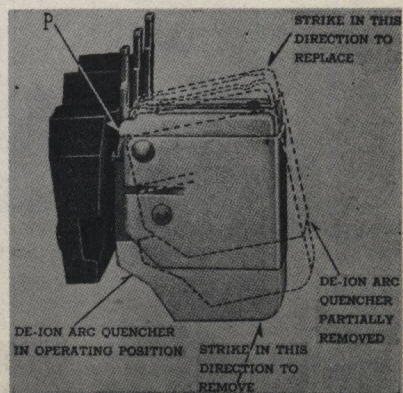


FIG. 1 — DETAIL OF ARC QUENCHER AND ITS SUPPORTING BRACKET, SHOWING EASE OF REMOVAL AND REPLACEMENT.