ROTORS AND ASSOCIATED BANKS OF 200 AND 206 TYPE SELECTORS AND 25 POINT ROTARY SWITCHES CLEANING AND TREATMENT

1. GENERAL

1.01 This section covers the procedures for cleaning and treatment of rotors and associated banks of 200 and 206 type selectors and of 25 point rotary switches.

1.02 Ordinarily rotors and bank contacts treated with sleeving as outlined herein should not require treatment more frequently than at yearly intervals. This interval may be extended if experience indicates that the local conditions are such as to insure that the parts are satisfactory during the extended interval.

2. TOOLS AND MATERIALS

Code No.	Description
Tools	
46	Wrench - 3/8" Hex. Socket
245	Wrench - 3-1/8" and 7/16" Hex. Open Double End Flat
425A (2 required)	Selector Holder
468A	Bench Fixture
469A (4 required)	Hand Grip
470A	Bank Contact Cleaner
KS-7507	Vacuum Cleaner
-	Screw-driver, Regular, 4" per A.T.&T.Co. Dwg. 46-X-34
-	Screw-driver, Cabinet, 3-1/2" per A.T.&T.Co. Dwg. 46-X-40
-	Toothpicks, Hardwood, Flat at One End and Pointed at Other
Materials	
29	Sleeving (Aloxite) (For Banks)
30	Sleeving (Oiled) (For Banks)
32	Sleeving (Aloxite) (For Rotors)
33	Sleeving (Oiled) (For Rotors)
-	Strip of Fibre (See 3.08)

3. PROCEDURES FOR CLEANING AND TREATMENT OF BANKS AND ROTORS

Preparation of No. 470A Bank Contact Cleaner

3.01 To resleeve the No. 470A bank contact cleaner, withdraw the removable blade from the notch in the handle by pulling it up and out of the notch and swing the free end out away from the handle as shown in Fig. 1. Hold the handle of the cleaner with one hand and with the other hand grasp the sleeving at the end of the fixed blade near the handle. Lift the sleeving away from the inner rim of the blade to disengage it from the serrations and pull the sleeving off the fixed blade. Repeat this procedure on the removable blade while firmly holding the notched end of the blade.

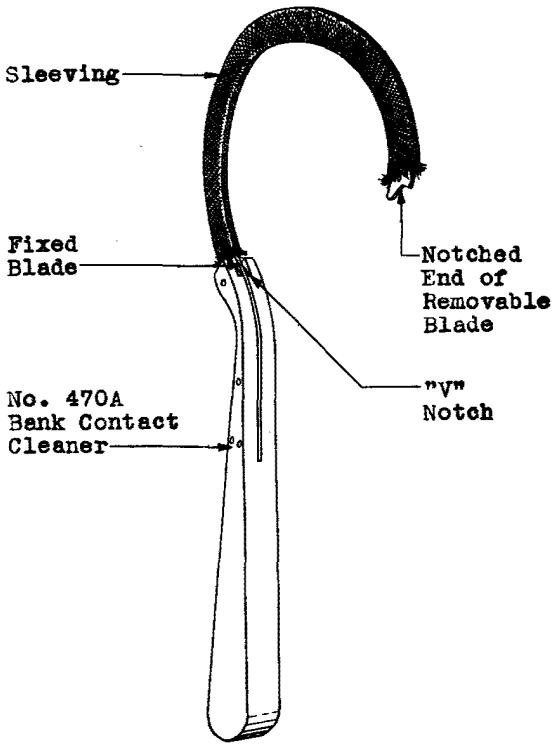

Fig. 1 - Removing Sleeving From No. 470A Bank Contact Cleaner

3.02 Cut off a portion of clean sleeving approximately 6-1/4" long. Hold the handle in one hand and push the clean sleeving over the fixed blade and down against the handle until a slight bunching occurs. Then pull the free end of the sleeving until it is stretched tightly over the blade and forced into the serrations as shown in Fig. 2. Force the unnotched end of the removable blade into the free end of the sleeving until the removable blade comes in contact with the end of the fixed blade. Under this condition the sleeving will reach the "V" notch at the end of the blade. Force the sleeving into the serrations. Fold the removable blade back against the fixed blade and insert the blade over the notch in the handle as shown in Fig. 3.

Caution: The sleeving must be very tight at the fold of the blades in order to hold the removable blade rigidly in position.

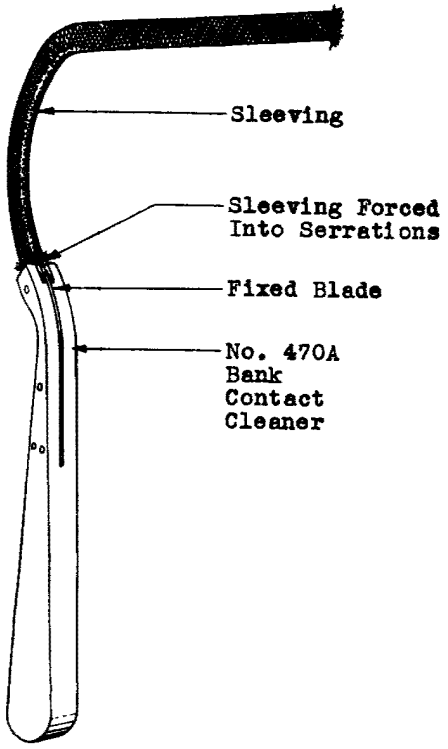

Fig. 2 - New Sleeving Over Fixed Blade

Threading the No. 469A Hand Grip

3.03 Rotor Assemblies Having Six Brushes To thread the No. 469A hand grip for use on a rotor assembly having six brushes cut off a portion of clean sleeving approximately seven feet long and without twisting

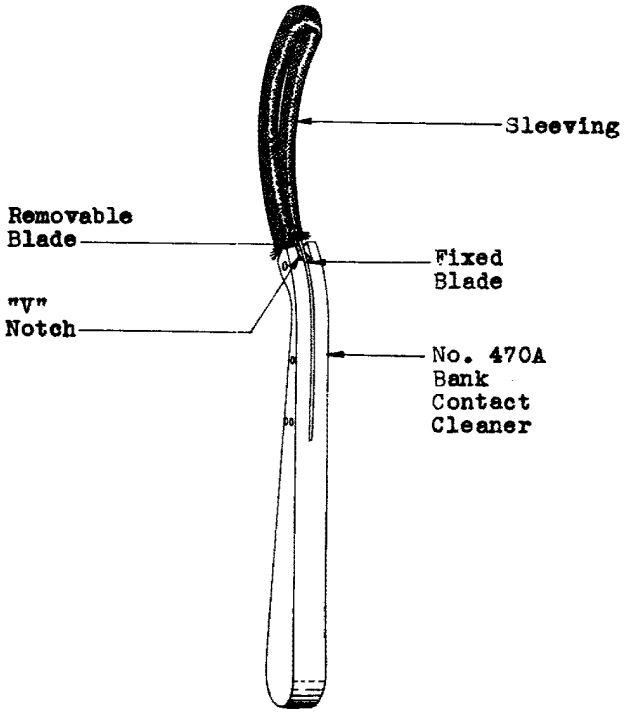

Fig. 3 - Removable Blade of No. 470A Bank Contact Cleaner Inserted in "V" Notch

it fasten the two ends to the two outside holding pins on one of the tools as follows. Hold the grip and the sleeving as shown in Fig. 4. Exercise care to keep the sleeving clean. Slide the sleeving under the spring clip until it assumes the position shown in Fig. 5. Loop it over the loose end and around the first holding pin. Proceed as outlined above to thread the other end of the sleeving around the other outside holding pin. Using three adjacent holding pins on the other No. 469A hand grip, thread the sleeving between the two hand grips, thus giving the effect of six parallel strings as shown in Fig. 6. Equalize the lengths of these strings to eliminate the slack in any one string.

3.04 Rotor Assemblies Having Two or Four Brushes To thread the No. 469A hand grips, cut off lengths of sleeving approximately 58 inches long for rotor assemblies having four brushes or 32 inches for rotor assemblies having two brushes and load the grips as shown in Fig. 6.

3.05 Rotor Assemblies Having Odd Number of Brushes To thread the No. 469A hand grips, cut off lengths of sleeving approximately 72 inches long for rotor assemblies having five brushes or 45 inches for

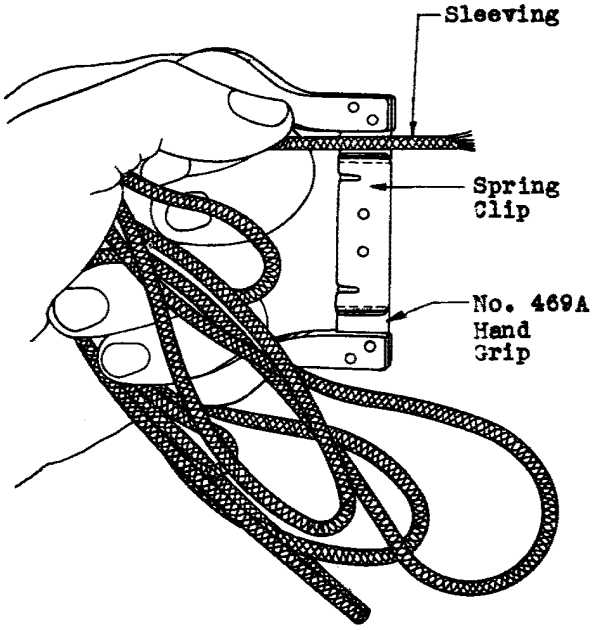

Fig. 4 - Holding Sleeving and No. 469A Hand Grip Preparatory To Inserting Sleeving In Slot of Spring Clip

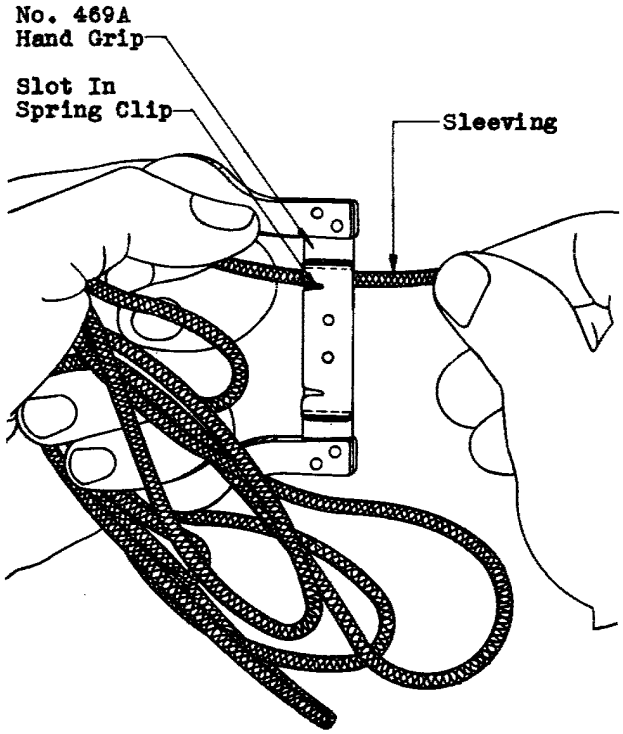

Fig. 5 - Inserting Sleeving In Slot In Spring Clip of No. 469A Hand Grip

rotor assemblies having three brushes and load the grips as shown in Fig. 7.

Caution: The sleeving must not be twisted when threading the No. 469A hand grips as twisted sleeving will interfere with the cleaning of the rotor assembly.

Preparation and Grouping of Selectors and Switches

3.06 The procedures outlined in 3.07 to 3.10 are based on a general cleaning and treatment of selectors. Occasionally it is necessary to clean only one or two rows of bank contacts. To do this, it will not be necessary to remove the rotor assembly from the selector or switch except when cleaning the three rows of bank contacts nearest the switch interrupter contacts of heavy duty rotary switches. In case of selectors equipped with detachable feeder brushes, remove these brushes as outlined in 3.09.

3.07 Before cleaning the banks or rotors divide the selectors or switches to be cleaned into groups of five starting at the top of the bay or frame. Make busy the associated circuits in the approved manner. Identify each bank, frame and rotor with a pencil mark in order to facilitate reassembling of the rotors with the bank and selector from which they are removed. This will not be necessary when occasional cleaning is done as the rotor assembly is not removed from the frame.

3.08 Preparation for Supporting Selector or Switch Frame Before cleaning a selector, it is advisable to provide a support for the selector frame. In general, this is accomplished by mounting two No. 425A selector holders on the mounting strap directly beneath the selectors to be cleaned as shown in Fig. 8 and placing a strip of fibre on the support to form a table. Where the mounting strap is so thin as not to afford a satisfactory clamping of the support, insert a wedge between the support and the frame. In those cases where apparatus other than selectors is mounted directly beneath the selectors and the support cannot be used, use the apparatus directly beneath the selector as the support for the fibre.

3.09 Removal of Frames from Banks - Selectors Remove the detachable feeder brushes, if provided, from the frame as follows. Remove the detachable feeder brush clamping nut with the No. 245 wrench and remove the washers and feeder brushes. Take care in doing this not to disturb any of the brush adjustments. Remove the frames from the alternate selector banks and then remove the rotor assembly from all frames as outlined in the Division 026 section covering piece part data and replacement procedures for the apparatus involved.

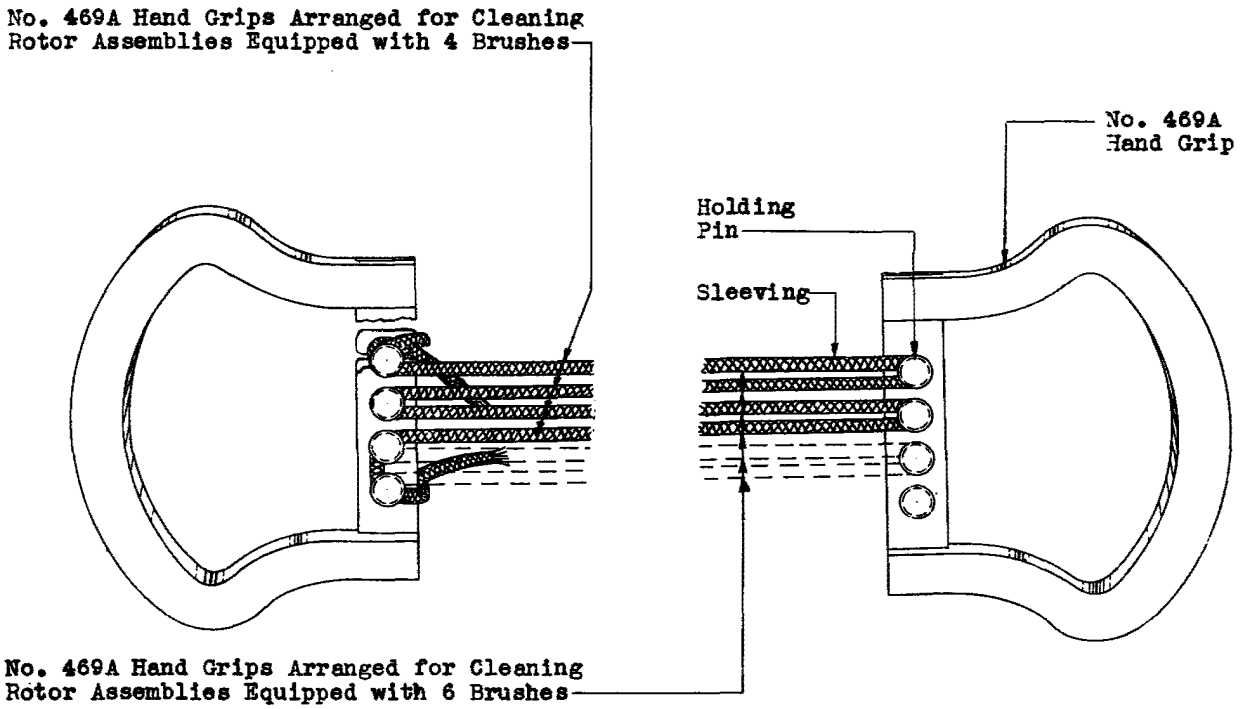

Fig. 6 - No. 469A Hand Grips Arranged For Cleaning Rotor Assemblies Having 4 or 6 Brushes

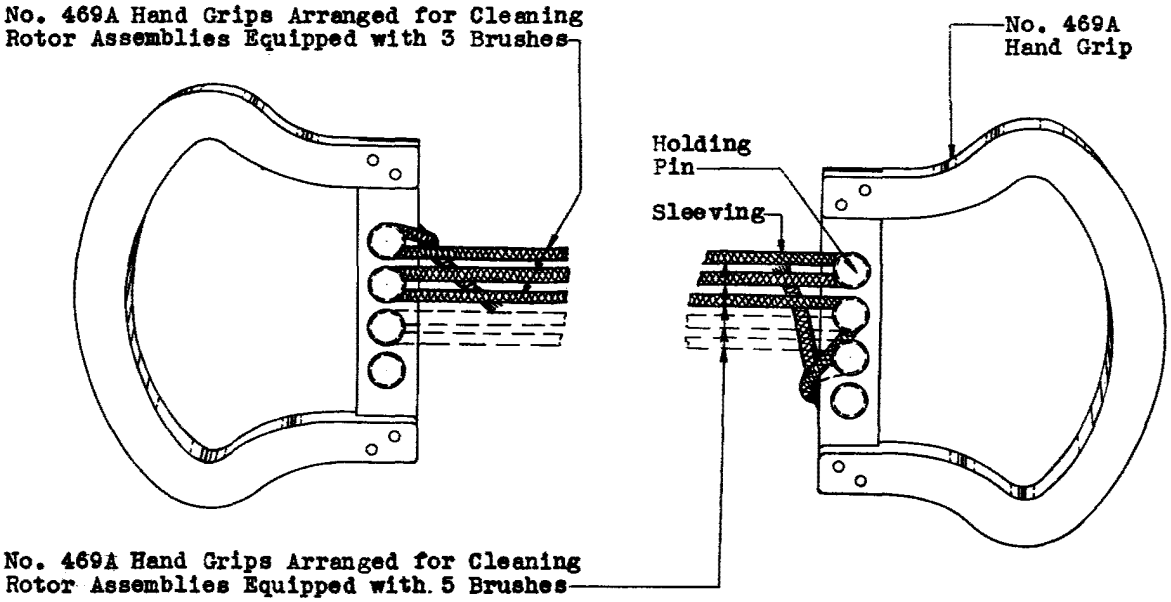

Fig. 7 - No. 469A Hand Grips Arranged For Cleaning Rotor Assemblies Having 3 or 5 Brushes

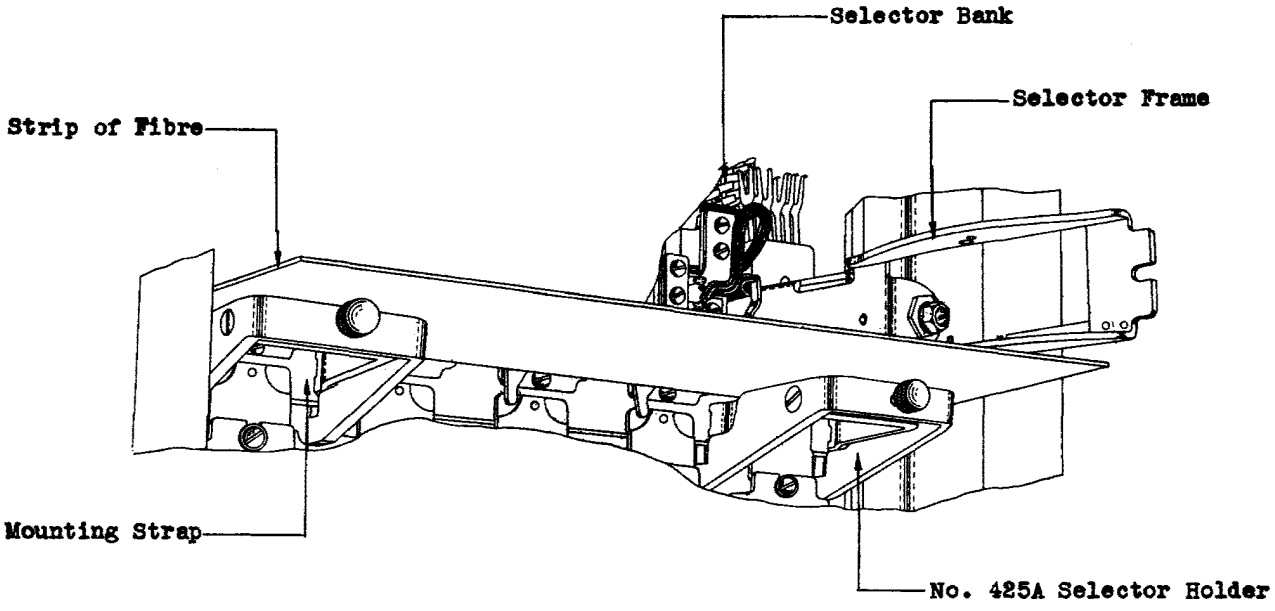

Fig. 8 - Method of Supporting Selector Frames

3.10 Removal of Frames from Banks - 25 Point Rotary Switches Remove the frame mounting screws from alternate switches with the 4" regular screw-driver and remove the frames from the banks. On switches where the rotor assembly is mounted on a hollow shaft, remove the indicator set screws with the 3-1/2" cabinet screw-driver and remove the bearing pin assembly and remove the rotor assembly. On switches where the rotor assembly is mounted on a solid shaft, remove the pivot screws with the No. 46 wrench. The nut on the side of the frame further from the ratchet wheel on this switch has a left hand thread. Slide the rotor assembly shaft through the bearing hole in the frame until the shaft at the ratchet wheel end clears its bearing hole in the frame. Then guide the ratchet wheel toward the rear of the frame and remove the rotor assembly.

3.11 Mounting No. 468A Bench Fixture The following procedures are based on the assumption that the No. 468A bench fixture is securely mounted. As a means of facilitating the cleaning, the bench fixture may be mounted on a board which in turn may be securely fastened to a rolling ladder by "C" clamps or may be located at some other convenient point.

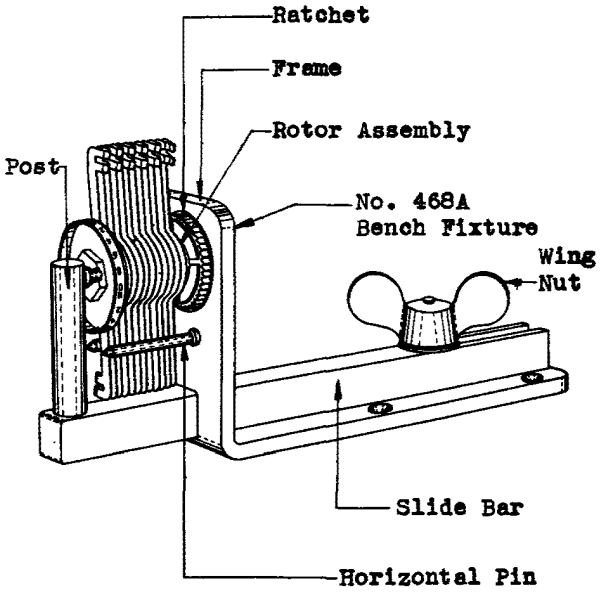

Fig. 9 - Mounting Hollow Shaft Rotor Assembly of Selectors and Switches

Mounting of Rotors in Cleaning Fixture

3.12 Move the slide bar of the No. 468A bench fixture to its open position. Mount the rotor as follows:

On all switches except 25 point rotary switches equipped with a solid shaft rotor assembly, mount the rotor in the support so that the ratchet is against the frame and one set of brushes is between the two horizontal pins. Move the slide bar until the pin in the post engages the hole in the rotor shaft. With the post engaging the shaft as shown in Fig. 9, tighten the wing nut securely.

On the 25 point rotary switches equipped with a solid shaft rotor assembly, mount the rotor as outlined for the other switches but provide a bearing surface for the post of the fixture by mounting the pivot screws over the shaft and pin in the post as shown in Fig. 10.

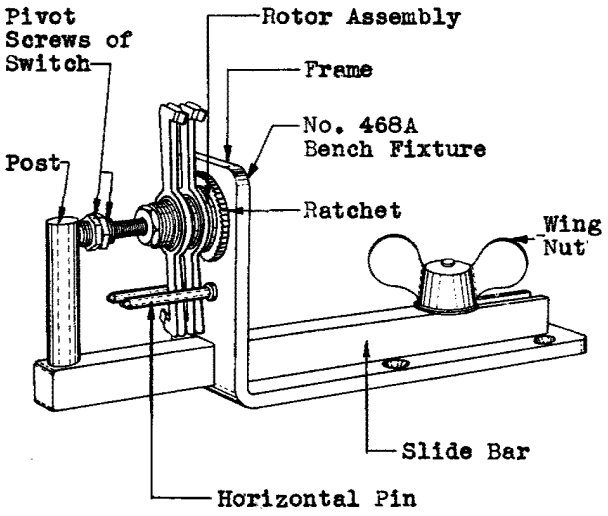

Fig. 10 - Mounting Solid Shaft Rotor Assembly of Switches

Cleaning and Treatment of Brass and Bronze Bank Contacts

3.13 Initially clean and treat brass or bronze bank contacts with the No. 29 Aloxite sleeving as outlined in 3.14 to 3.17 incl. followed by an oil treatment with No. 30 sleeving as outlined in 3.18 to 3.21 incl. Subsequently treat the bank with the oiled sleeving as outlined in 3.18 to 3.21 incl.

3.14 Abrasive Cleaning Insert the free end of the No. 470A bank contact cleaner equipped with No. 29 aloxite sleeving between the rows of bank contacts from the top of the bank and force the cleaner downward in a rotary motion using the spacers between the bank contact rows as an approximate guide for the travel of the outer edge of the cleaner. Make sure that half of the bank contacts are covered but do not force the cleaner in so far that there is danger of snagging the ends of the sleeving on the bank frame or bank contacts.

3.15 Take five double strokes between each pair of bank contact rows and against the outer surfaces of the outer rows progressing from right to left. In cleaning the outer rows it is advisable to apply a moderate pressure with the fingers, since there is no other backing for the cleaner.

3.16 Invert the cleaner and repeat the same process for bank contacts on the lower half of the bank. After these contacts have been cleaned, turn the removable blade to the other side of the fixed blade so as to present a clean surface.

3.17 Repeat the cleaning of the bank contacts but progressing from left to right in order to more evenly distribute the effect of the aloxite particles. One piece of sleeving should ordinarily clean a bank having six rows of bank contacts without becoming excessively worn or dirty.

3.18 Oil Treatment Insert the free end of the No. 470A bank contact cleaner equipped with No. 30 oiled sleeving between the rows of bank contacts from the top of the bank and force the cleaner downward in a rotary motion using the spacers between the bank contact row as an approximate guide for the travel of the outer edge of the cleaner. Make sure that half of the bank contacts are covered but do not force the cleaner in so far that there is danger of snagging the ends of the sleeving on the bank frame or bank contacts.

3.19 Take five double strokes between each pair of bank contact rows and against the outer surfaces of the outer rows progressing from right to left. In treating the outer rows it is advisable to apply a moderate pressure with the fingers, since there is no other backing for the cleaner.

3.20 Invert the cleaner and repeat the same process for bank contacts on the lower half of the bank. After these contacts have been treated turn the removable blade to the other side of the fixed blade so as to present a clean surface.

3.21 Repeat the treatment of the bank contacts but progressing from left to right in order to more evenly distribute the oil. One piece of sleeving should ordinarily treat a bank having six rows of bank contacts without becoming excessively wor or dirty.

3.22 Occasional Treatment When occasional treatment of bank contacts is required, rotate the rotor brushes by hand until the brushes in contact with the bank contacts are slightly below the center bank contacts. Treat the contacts in the upper portion of the bank with the No. 470A bank contact cleaner as outlined in 3.18 to 3.21 incl. Rotate the brushes until they contact with the bank contacts slightly above the center of the bank and then treat the contacts in the lower half as outlined above.

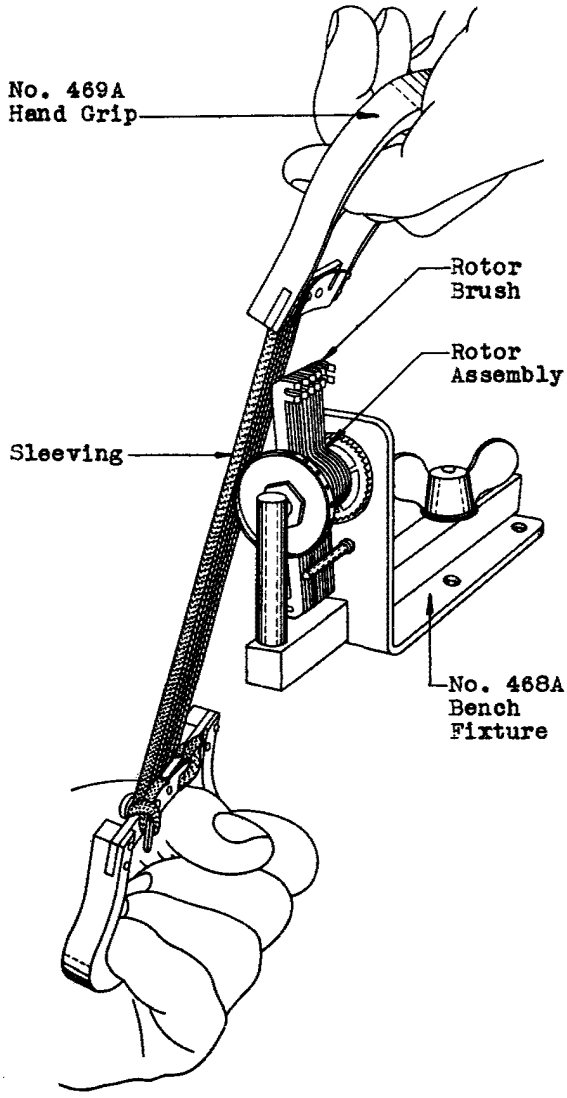

Fig. 11 - Method of Inserting Sleeving Between Brushes of Rotor Assembly

Treatment of 25 Point Rotary Switch Silver-Plated Bank Contacts

3.23 Treat the banks with the No. 30 oiled sleeving as outlined in 3.18 to 3.21 incl. In no case shall No. 29 aloxite sleeving be used for cleaning banks equipped with silver-plated bank contacts. Where more than one bank is to be cleaned, proceed along the shelf from right to left.

Note: When exposed to atmospheric conditions, silver-plated bank contacts may show signs of tarnish or discoloration. This is not detrimental to the contact and no attempt should be made to remove it.

Cleaning and Treatment of Rotors

3.24 Rotors Clean the rotors with the No. 32 aloxite sleeving as outlined in 3.25 to 3.29 incl. followed by an oil treatment with No. 33 sleeving as outlined in 3.30 to 3.33 incl.

3.25 Abrasive Cleaning Take the No. 469A hand grip loaded with No. 32 aloxite sleeving holding the right hand grip above and to one side of the one in the left hand so that the strings are at an angle of approximately 15° to the vertically mounted brushes as shown in Fig. 11. After entering each string into its proper brush, pass it through the brush tips with a slight downward pressure and a pull to the right. Clean the contact surfaces by forcing the grips alternately up and down.

3.26 In cleaning, hold the grip which is being pushed so that the strings cover as much of the hub on that side as possible. At the same time have the trailing end slack as shown in Fig. 12. A downward movement of the right hand followed by a downward movement of the left hand is to be considered one stroke. Each movement shall be as long as the sleeving conveniently permits.

3.27 After one side of the rotor has been cleaned with two such strokes, remove the rotor assembly from the No. 468A bench fixture and remount it with the brushes end for end and clean the other half of the rotor in a similar manner. In removing the sleeving from the rotor, lift the grip in the left hand up and over the rotor brushes so as to pull the sleeving out from between the brush tips.

3.28 After a group of 5 rotors has received two cleaning strokes, repeat the process, using three strokes, thus each rotor receives a total of 5 cleaning strokes with sleeving. In general, one loading of sleeving will clean five rotors without becoming excessively worn or dirty.

3.29 After the group of rotors has been cleaned with the No. 32 aloxite sleeving remove the excess material, mainly lint, by subjecting the rotor to a suction hose using the KS-7507 vacuum cleaner or equivalent.

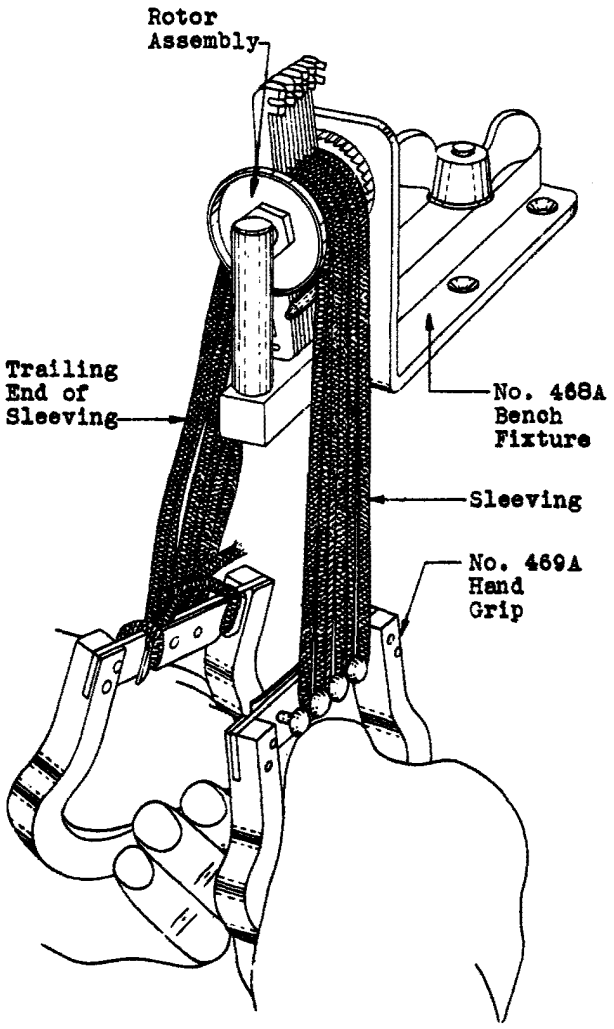

Fig. 12 - Method of Cleaning Rotor Assembly

3.30 Oil Treatment After the rotor has received the suction hose cleaning, take the No. 469A hand grips loaded with No. 33 oiled sleeving holding the right hand grip above and to one side of the one in the left hand so that the strings are at an angle of approximately 15° to the vertically mounted brushes as shown in Fig. 11. After entering each string into its proper brush, pass it through the brush tips with a slight downward pressure and a pull to the right. Treat the contact surfaces by forcing the grips alternately up and down.

3.31 In treating, hold the grip which is being pushed so that the strings cover as much of the hub on that side as possible. At the same time have the trailing end slack as shown in Fig. 12. A downward movement of the right hand followed by a downward movement of the left hand is to be considered one stroke. Each movement shall be as long as the sleeving conveniently permits.

3.32 After one side of the rotor has been treated with two such strokes, remove the rotor assembly from the No. 468A bench fixture and remount it with the brushes end for end and treat the other half of the rotor in a similar manner. In removing the sleeving from the rotor, lift the grip in the left hand up and over the rotor brushes so as to pull the sleeving out from between the brush tips.

3.33 After a group of 5 rotors has received two treating strokes, repeat the process, using three strokes, thus each rotor receives a total of 5 treating strokes with sleeving. In general, one loading of sleeving will treat five rotors without becoming excessively dirty.

Assembly and Check of Selector or Switch

3.34 At this time, straighten any feeder brush springs that are kinked or seem to be out of line with respect to the other feeder brushes. Remount the parts. To do this, insert the assembly from the rear of the frame guiding the end of the shaft furthest from the ratchet wheel into its bearing hole. Hold the ratchet pawl and retaining pawl so that they will not interfere with the remounting of the other end of the shaft. Insert this end in place and then remount and securely tighten the pivot screws. Remount the frame on the bank. If the detachable feeder brushes are furnished, remount the brushes and insert and securely tighten the clamping nut. In all other cases insert and tighten the mounting screws securely. Remove the fibre strip and No. 425A selector holders. Check that the selector meets the requirements specified in the Division 026 section covering the apparatus involved. Make the necessary tests to ascertain that the circuit is in satisfactory operating condition.

3.35 Operation of Selector or Switch Operate the selector or switch electrically until the rotor makes about twenty-five revolutions before restoring the equipment to service. When the selector or rotary switch is wired so that it can not be rotated under self interruptions, rotate it under control of the relay wired to its interrupter contacts. After making this test if there is any indication of lint on the feeder brush contacts, remove it with a clean toothpick.