Oct. 19, 1965 F. W. KUSSY ETAL 3,213,255

STATIONARY CONTACT COMBINATION INCLUDING RESILIENT RETAINING MEANS

Filed March 25, 1964

FIG. 1.

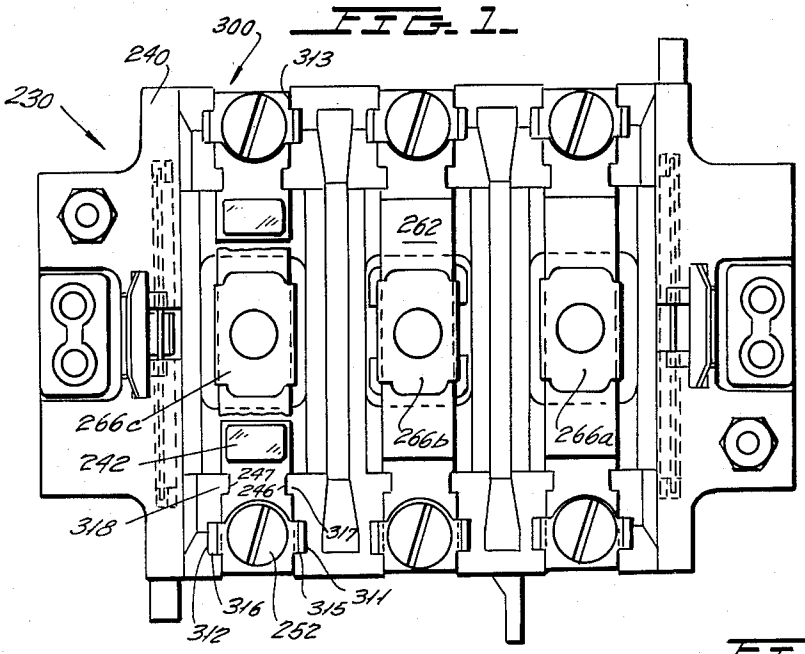


FIG. 2.

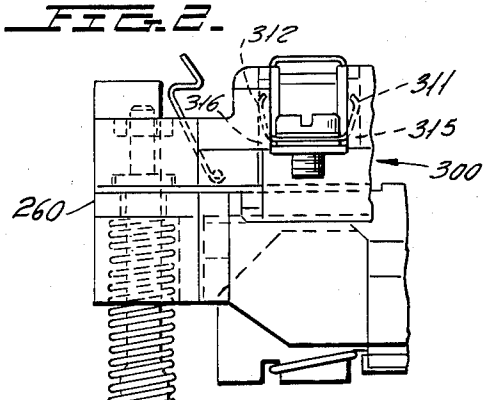


FIG. 3.

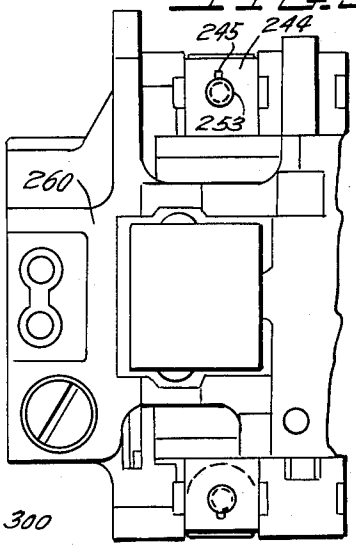


FIG. 5.

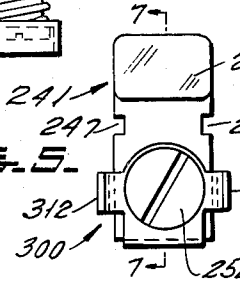


FIG. 4.

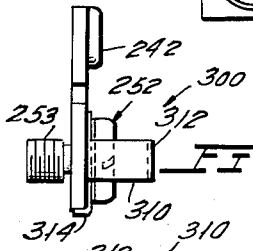


FIG. 6.

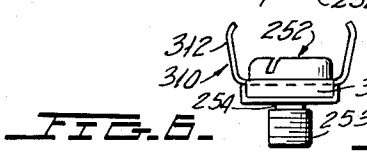
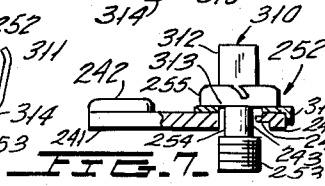


FIG. 7.



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STATIONARY CONTACT COMBINATION INCLUDING RESILIENT RETAINING MEANS

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5 Claims. (Cl. 200—166)

Our invention relates to a stationary contact combination and more particularly is directed to a novel arrangement whereby the stationary contact combination is frictionally held in place by a contact arm retainer and so designed and constructed so as to be easily removable and replaceable when necessary.

Our invention relates to an improvement in the stationary contact combination such as that shown in copending U.S. application Serial No. 189,915 filed April 24, 1962, in the names of John B. Cataldo et al., entitled "Electrical Device" and assigned to the assignee of the instant invention, and is particularly adaptable for use in connection with a contactor.

In the construction of a contactor, of the type disclosed in the aforementioned copending application, there is a contact assembly comprised of a plate carrying the stationary contacts and a carrier having the bridging movable contacts. When the contact assembly is removed from the contactor, it is desirable to have the stationary contacts remain in place. The fastening means of the stationary contact combination is utilized to perform a dual function, namely to mechanically secure the plate of the contact assembly to the base of the contactor, as well as to provide the pressure for the electrical contact between the stationary contacts of the plate and the terminals on the base of the contactor.

When it is desired to gain access to the interior of the contactor, as for example, to observe the coil and magnetic structure, it is necessary to loosen all of the fastening means associated with the stationary contacts, thereby removing the mechanical and electrical connection between the contact assembly and the remaining contactor. However, in such cases, it is desirable to have the stationary contacts remain in place on the plate and not fall out or be dislodged from the plate.

To this end, we have provided a novel contact arm retainer made of a spring-like material in which protruding arms thereof are in registry in grooves of the plate to thereby frictionally hold the stationary contacts in position. Thus, even though the fastening means for the stationary contacts have been loosened, the entire stationary contact combination comprised of a stationary contact arm, a contact arm retainer, and the fastening means, will remain in place with respect to the plate due to the spring force of the protruding arms of the contact arm retainer against the plate. However, the stationary contact combination can, nevertheless, be readily removable and replaceable with respect to the plate by first moving the two protruding arms toward each other. This will remove the spring force to permit the fastening means and contact arm retainer to be lifted out which permits removal of the stationary contact arm.

Accordingly, a primary object of our invention is to provide a means whereby the stationary contacts and their retaining means or mounting screws can be kept in position while the plate is removed from the contactor and still be constructed so that the stationary contact can be readily removable and replaceable.

The object of our invention will be more readily apparent when taken in connection with the following drawings, in which:

FIGURE 1 is a top view of the contact carrier assembly illustrating our novel stationary contact combinations in place. In FIGURE 1, the bridging contact of the left pole has been removed.

FIGURE 2 is a partial end view of the contact carrier assembly of FIGURE 1 and illustrates an end view of our novel stationary contact combination.

FIGURE 3 is a partial bottom view of the contact carrier assembly of FIGURES 1 and 2.

FIGURE 4 is a side view of our novel stationary contact combination.

FIGURE 5 is a top view of our novel stationary contact combination of FIGURE 4.

FIGURE 6 is an end view of our novel stationary contact combination of FIGURES 4 and 5.

FIGURE 7 is a cross-sectional view taken in direction of the arrows 7—7 of FIGURE 5 showing our novel stationary contact combination.

Referring first to FIGURES 4, 5, 6 and 7, it is seen that our novel stationary contact combination **300** is comprised of a stationary contact arm **241**, a fastening means or mounting screw **252**, and a contact arm retainer **310**. The contact arm retainer **310** is comprised of a spring-like material having two protruding arms **311** and **312** with an opening **313** and may have an extending ledge **314**. The stationary contact arm **241** is comprised of contact **242**, an opening **243** in the extension portion **244**. The fastening means or mounting screw **252** is comprised of a threaded portion **253** and a reduced size shaft **254** extending between the threaded portion **253** and the head **255** of the screw **252**. The stationary contact combination **300** is put together by passing the threaded portion **253** of the screw **252** through the opening **313** of the contact arm retainer **310** and the opening **243** of the stationary contact arm **241**. The opening **313** of the contact arm retainer **310** can be comprised of locking teeth extending to the shaft of the reduced size shaft **254** so that the retainer **310** is captured on the fastening means **252** and can function as a lockwasher. Thereafter, if desired, the stationary contact arm **241** can be peened over at **245** so that a portion of the metal extends above the threaded portions **253** to thereby capture the fastening means **252** to the stationary contact arm **241**.

In FIGURES 1, 2 and 3, we have shown, respectively, a top, side and bottom view of a contact carrier assembly to be used in connection with a contactor. The contact carrier assembly **230** of FIGURES 1, 2 and 3 shows the manner in which the stationary contact combination **300** of FIGURES 4, 5, 6 and 7 can be used in connection with a contactor. In particular, the contact carrier assembly **300** is comprised of two main components, namely the plate **240** and the carrier **260**. The carrier **260** contains the bridging contacts **262** and their retainer means **266**. The plate **240** has a plurality of channels **313** into which the stationary contact combination **300** are positioned. Thus, as seen in FIGURE 1, there are two stationary contact combinations **300** for each pole of the unit. The channels **313** of the plate **240** are provided with recesses **315** and **316** to receive the protruding ears **311, 312**. The channels **313** are also provided with protrusions **317** and **318** which register with the recesses **246** and **247** of the stationary contact arms **241** to thereby properly position the stationary contact combination **300** within the channels **313** with respect to the bridging contacts **262**.

It is noted that the stationary contact combination **300** is placed into the channels **313** of the plate **240** by moving the protruding ears **311, 312** toward each other, positioning the stationary contact combination **300** in place and then allowing the spring force of the protruding ears **311, 312** to exert a force against the recesses **315, 316** of

the channel to thereby hold the stationary contact combination in place. It is noted that fastening means 252 are utilized to mechanically secure the plate 230 to the base of a contactor (not shown) as well as provide the means for electrically connecting the stationary contact 242 to terminals of the contactor (not shown). When it is desired to remove the contact carrier assembly 230 from the contactor, all of the fastening means 252 are loosened so that the entire contact assembly 230 can be removed. However, because of our novel contact arm retainer 310, the stationary contact combination 300 is retained on the plate 240. It is noted that in the illustration of FIGURE 1, the bridging contact 262 has been removed from the extreme left pole and, even with the bridging contact removed, the stationary contact combination is held in position as a result of the spring force exerted by the contact arm retainers.

It is also further noted that the stationary contact assembly 300 can easily and readily be removed from the plate 240 by first moving the protruding ears 311, 312 toward each other so that the fastening means 252 and the contact arm retainer 310 can be easily removed and replaced. If the stationary contact arm 241 is peened to the fastening means 252 then the stationary contact combination 300 is lifted out as a single unit. However, if the stationary contact arm 241 is not peened to the fastening means 252, then the stationary contact combination 300 is removed in two steps. That is, the contact arm retainer 310 is first lifted out and in so doing the fastening means 252 is automatically removed and then the stationary contact arm 241 can be lifted out.

We have shown a preferred embodiment of our invention in connection with FIGURES 1 through 7. It will be apparent that many variations can be encompassed within the spirit of our invention. Accordingly, we wish to be bound by the following claims taken in consideration with the foregoing specification and the attached drawings.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. A device of the class described including a contact assembly comprised of a plate and a carrier; said carrier containing a plurality of bridging contacts and said plate containing a pair of stationary contact combinations corresponding to each of said bridging contacts; said plate

having channels to receive said stationary contact combinations; each of said stationary contact combinations being comprised of a stationary contact arm, a contact arm retainer, and a fastening means; said contact arm retainer being made of a spring material and containing protruding arms; said plate channels each having a set of grooves to receive said protruding arms of said contact arm retainer whereby said stationary contact arm and said fastening means are retained on said plate by the spring force of said protruding arms.

2. The device of claim 1 wherein each of said stationary contact arms has means to retain it to said fastening means to thereby capture said contact arm retainer between said stationary contact arm and said fastening means.

3. The device of claim 1 wherein said protruding arms of said contact arm retainer are operatively positioned to permit said stationary contact combination to be removed from said plate when said protruding arms are moved toward each other against spring force and lifted out.

4. The device of claim 3 wherein said plate channels each have a set of protrusions to register with recesses in said stationary contact arm.

5. A device of the class described including a plate containing a pair of stationary contact combinations; said plate having channels to receive said stationary contact combinations, each of said stationary contact combinations being comprised of a stationary contact arm, a contact arm retainer, and a fastening means; said contact arm retainer being made of a spring material and containing two protruding arms; said plate channels each having a set of protrusions to register with recesses in said stationary contact arm; said contact arm retainer positioned between said stationary contact arm and said fastening means; said fastening means capable of mechanically securing said plate and electrically securing said contact arm to a second member; said plate channels each having a pair of grooves to receive said protruding arms of said contact arm retainer whereby said stationary contact arm and said fastening means are retained on said plate only by the spring force of said protruding arms.

No references cited.

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