

Dec. 25, 1945.

R. RIVERS

2,391,479

SPRING CONNECTOR FOR SELECTORS

Filed Aug. 14, 1943

FIG.1.

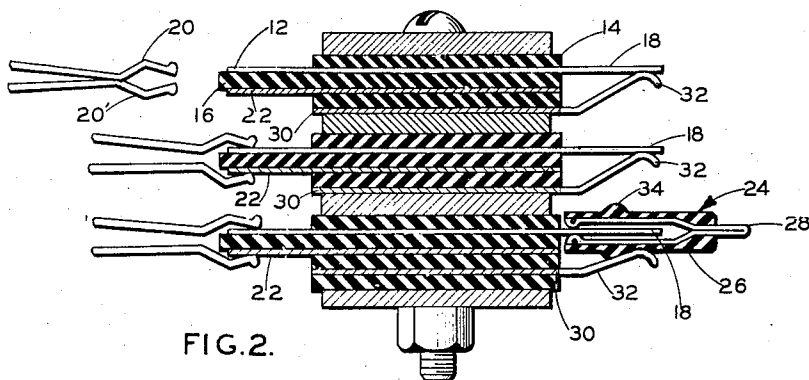
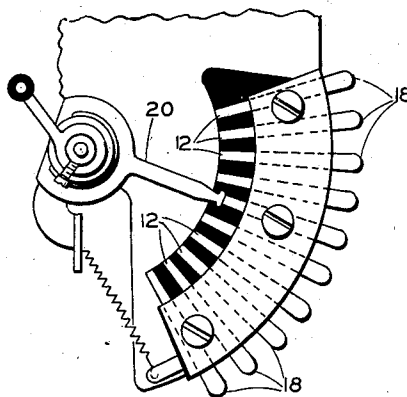


FIG.2.

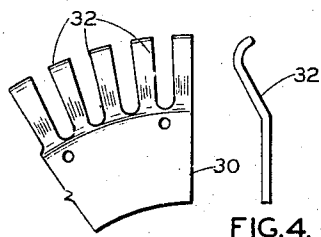


FIG.3.

FIG.4.

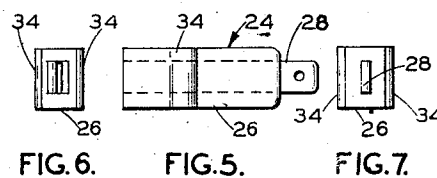


FIG.6.

FIG.5.

FIG.7.

INVENTOR.

ROBERT RIVERS

BY *William D. Hall*
Attorney

UNITED STATES PATENT OFFICE

2,391,479

SPRING CONNECTOR FOR SELECTORS

Robert Rivers, Belmar, N. J.

Application August 14, 1943, Serial No. 498,715

4 Claims. (Cl. 177-353)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to selectors or stepping relays, and more particularly to a selector arranged for ready change of the code combination of digits for which the selector is set.

The object of this invention is to provide a spring connector arrangement which makes it possible to readily change the connections to the banks of contacts of the selector without necessitating soldering. This is to facilitate setting up the selector in accordance with a desired code. A further object is to automatically ground or otherwise connect together all of the contacts other than that selected for a code number. Still another object is to provide resilient means for interlocking with and holding the spring connector in proper position.

To accomplish the foregoing and other objects which will hereinafter appear, my invention resides in the selector elements and their relation one to the other, as hereinafter are more particularly described in the specification, and sought to be defined in the claims. The specification is accompanied by a drawing in which

Figure 1 is a plan view of the main part of a selector;

Figure 2 is a section drawn to enlarged scale through a selector having three superposed banks of contacts;

Figure 3 illustrates a small section of a shorting plate forming a part of the invention;

Figure 4 is an edge view of the same;

Figure 5 is a plan view of a spring connector; and

Figures 6 and 7 are opposite end views of the same.

Referring to the drawing, and more particularly to Figures 1 and 2, the selector in normal form comprises a series of spaced contacts 12, which are clamped between insulation plates 14 and 16 (Figure 2). These contacts are projected to form extensions 18, which were heretofore used as soldering lugs. The contacts 12 are slidably engaged by a suitable springy contact arm 20. To facilitate external electrical connection to the movable contact arm 20, an additional continuous metal plate or slider plate 22 may be provided beneath insulation plate 16, and the arm 20 may be made double, the lower portion 20' being adapted to slide on plate 22. A number of banks of contacts may be provided, there being three such banks in the present case, corresponding to code numbers hav-

ing three digits. (The contact arms 20 and 20' are shown separated from the uppermost bank, but are shown in engagement with the two lower banks.)

A connection may be made to one of the contacts in each of the banks in accordance with a desired code number, and all of the other contacts are connected together and either grounded or connected in common in some suitable way in the circuit for which the selector is used. For some purposes it is frequently necessary to change the code being used, and to set up the selector in accordance with a desired new code.

In accordance with the present invention, the three conductors leading to the three banks are each provided at its end with a spring connector such as that shown at 24. This consists of a hollow insulation housing or sheath 26 open at one end and carrying inside a generally U-shaped metal clip 28, preferably made of phosphor bronze. The clip is so dimensioned as to be received slidably and with a snug fit around one of the extensions or soldering lugs 18.

The banks of contacts in the selector are modified by the provision of a bottom plate or shorting plate 30 having spring fingers 32. These fingers underlie the soldering lugs and normally bear upwardly against the same, as is shown at the right-hand part of the upper two banks. When the connector 24 is applied to one of the soldering lugs, it bends the corresponding spring finger 32 downwardly, as is shown at the right of the bottom bank. With this arrangement, all of the contacts of the bank are normally connected together by spring fingers 32 and shorting plate 30 except the selected contact. That is disconnected from the others by the insulation sheath 26 of the spring connector, and is instead connected to the lead (not shown) carrying the connector.

The insulation sheath 26 is preferably provided with protuberances or detent projections 34 at the top and bottom. These are received within the end of spring finger 32, thereby holding the connector firmly in position despite vibration or other treatment tending to shake the connector from the soldering lug.

It is believed that the construction and method of use, as well as the advantages of the invention, will be apparent from the foregoing description. The invention does many things at once. It provides a readily changeable connection to a selected contact. It connects all of the other contacts together. It disconnects the selected contact from all other contacts. It interlocks the connector

and the selected contact against accidental separation.

It will be understood that it is not essential to use a slider plate for external connection to the contact arm, and instead a flexible connection may be made directly to a single spring arm. It will also be understood that even when a slider plate is used, it is not necessary to arrange the plates in the sequence shown, and instead the shorting plate may be disposed on one side of the contacts, while the slider plate is disposed on the other, or the shorting plate may be made the intermediate plate and the slider plate may be made the bottom plate.

It will be apparent that while I have shown and described my invention in a preferred form, many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention, as sought to be defined in the following claims.

I claim:

1. A selector comprising a bank of contacts for engagement by a movable contact arm, extensions on said contacts for electrical connection thereto, a shorting plate insulated from said bank of contacts, a portion of said shorting plate being slotted to provide a series of spring fingers so bent that each normally engages a mating contact extension and insulation means adapted to separate the adjacent spring finger of the shorting plate from a mating contact extension, while all of the other contact extensions remain mutually interconnected by the other spring fingers and shorting plate.

2. A selector comprising a bank of contacts for engagement by a movable contact arm, extensions on said contacts for electrical connection thereto, a shorting plate insulated from said bank of contacts, a portion of said shorting plate being slotted to provide a series of spring fingers so bent that each normally engages a mating contact extension, and a connector adapted to be detachably received over one of the aforesaid contact extensions, said connector including a metal part for electrical contact, said metal part being sheathed in insulation and the insulation being adapted to insulatedly separate the adjacent spring finger of the shorting plate from the mating contact extension on which the connector is placed, while all of the other contact ex-

tensions remain mutually interconnected by the other spring fingers and shorting plate.

3. A selector comprising a bank of contacts for engagement by a movable contact arm, extensions on said contacts for electrical connection thereto, a shorting plate insulated from said bank of contacts, a portion of said shorting plate being slotted to provide a series of spring fingers so bent that each normally engages a mating contact extension, and a connector adapted to be detachably received over one of the aforesaid contact extensions, said connector including a metal part for electrical contact, said metal part being sheathed in insulation and the insulation being adapted to insulatedly separate the adjacent spring finger of the shorting plate from the mating contact extension on which the connector is placed, while all of the other contact extensions remain mutually interconnected by the other spring fingers and shorting plate, each of said connectors also having a detent projection adapted to interengage with the cooperating spring finger in order to hold the connector securely on the contact extension.

4. A selector comprising a bank of contacts for engagement by a movable contact arm, extensions on said contacts for electrical connection thereto, a shorting plate insulated from said bank of contacts, a portion of said shorting plate being slotted to provide a series of spring fingers so bent that each normally engages a mating contact extension, a slider plate insulated from said bank of contacts and shorting plate, said slider plate having a portion adapted for engagement by the contact arm for external connection thereto, and a connector adapted to be detachably received over one of the aforesaid contact extensions, said connector including metal spring fingers sheathed in insulation and adapted to insulatedly separate the adjacent spring finger of the shorting plate from the mating contact extension on which the connector is placed, while all of the other contact extensions remain mutually interconnected by the other spring fingers and shorting plate, said connector also having a detent projection adapted to interengage with the cooperating spring finger in order to hold the connector securely on the contact extension.

ROBERT RIVERS.