

Oct. 5, 1943.

S. BRAND ET AL

2,330,948

PLUGBOARD

Filed April 10, 1942

2 Sheets-Sheet 1

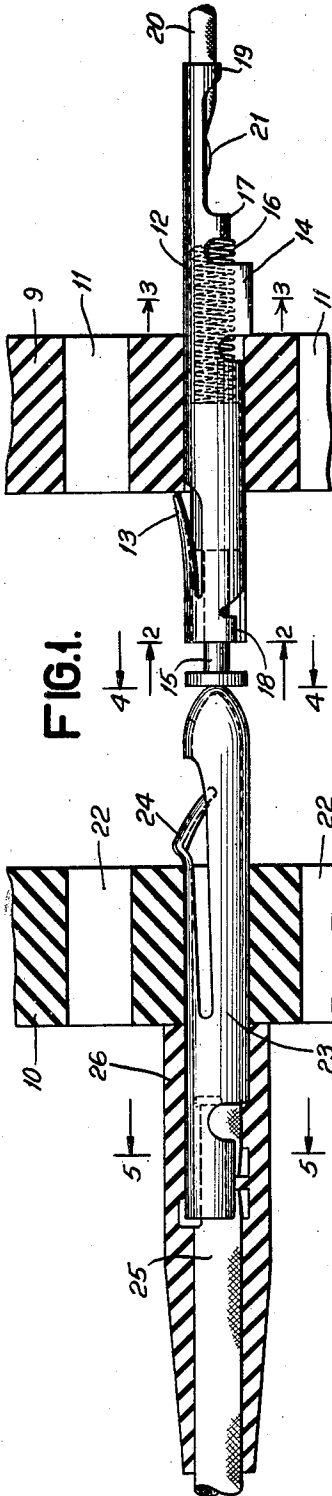


FIG. 3.

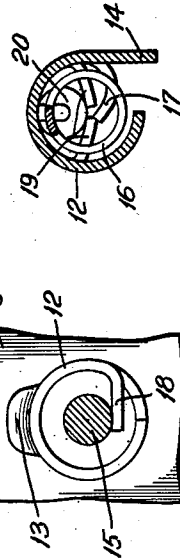


FIG. 4.

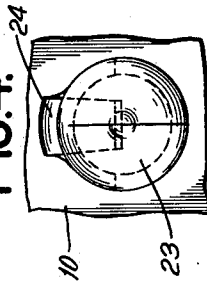


FIG. 6.

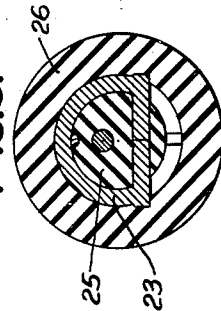


FIG. 8.

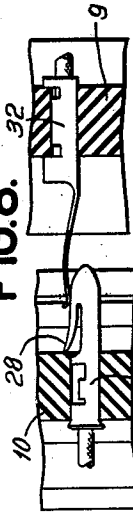
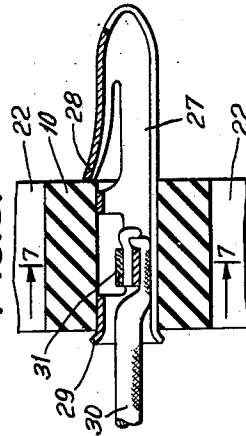


FIG. 7.



FIG. 9.



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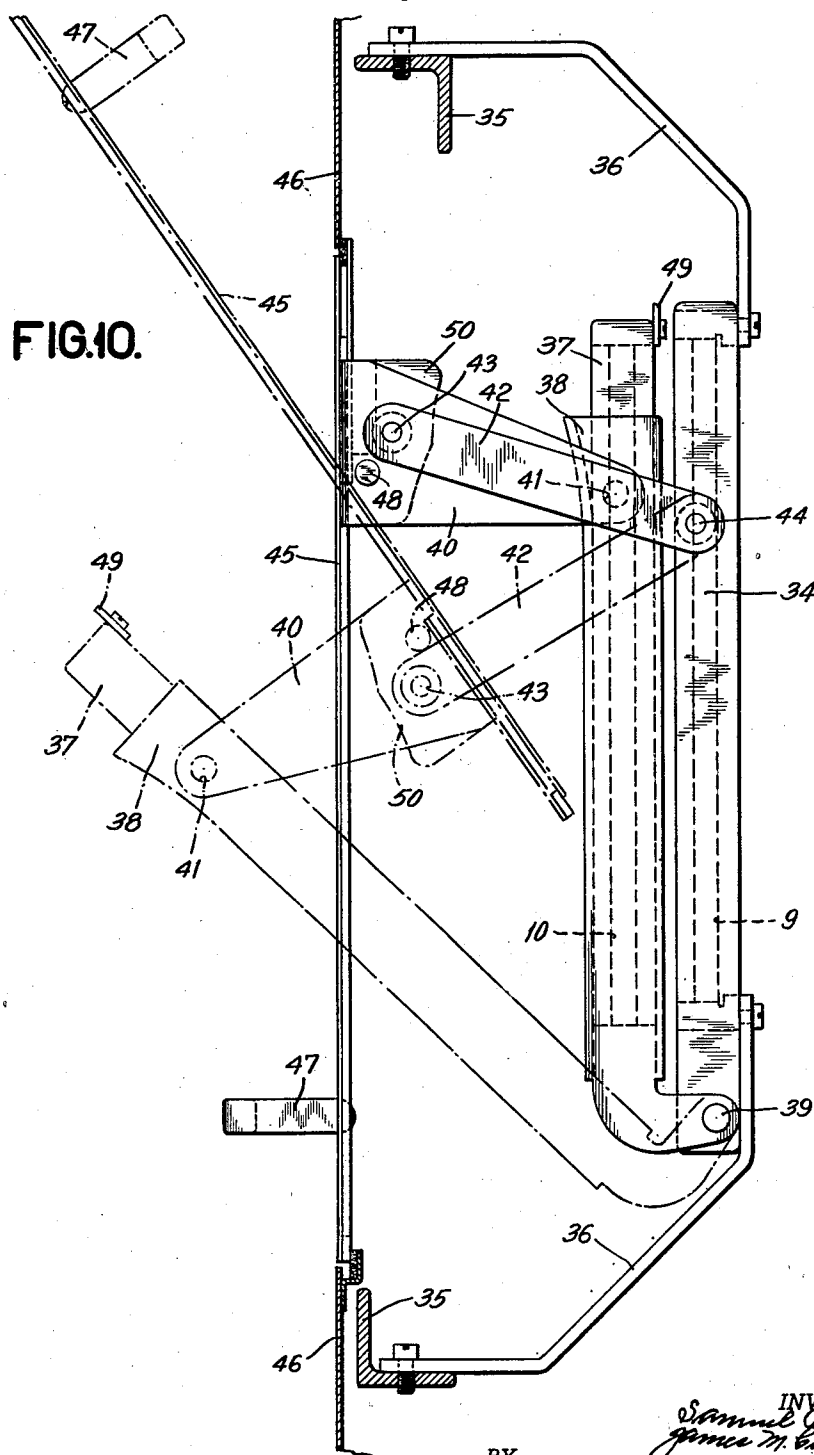
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2 Sheets-Sheet 2



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2,330,948

PLUGBOARD

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3 Claims. (Cl. 173—328)

This invention relates to contactors for use in the plugboard or circuit connecting panel of electric accounting machines.

The principal object of the invention is to provide an improved and simplified contactor arrangement to the end that initial assembly of a plugboard is greatly facilitated.

A further object is to provide a contactor that may readily be removed from the plugboard without the use of special tools.

A still further object is to provide a contactor which will readily cooperate with other contactors already provided in existing machines.

Another object is to provide an improved mechanism for receiving the connecting panel and moving it to and from connecting position.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a view of an enlarged scale of a pair of contactors, one being in a fixed plugboard and the other in a removable plugboard.

Figs. 2, 3, 4 and 5 are sections taken along correspondingly numbered lines of Fig. 1.

Fig. 6 is a section through another form of contactor.

Fig. 7 is a section on lines 7—7 of Fig. 6.

Fig. 8 is a view showing the improved contactor for the movable plugboard in cooperative relationship with an existing type of contactor in a fixed plugboard.

Fig. 9 is a similar view showing the improved contactor in the fixed plugboard in cooperative relationship with an existing contactor in the movable plugboard.

Fig. 10 is a sectional view showing the mechanism for receiving and moving the connecting panel into operative position.

The particular type of plugboard for electric accounting machines to which the present invention applies is that shown in the patent to C. D. Lake, No. 2,111,118 granted March 15, 1938, in which there is provided a fixed plugboard containing rows and columns of spring contactors and an insertible plugboard in which there are corresponding rows and columns of companion contactors fixedly secured to this board. This latter board is arranged to be swung into engagement with the first board so that electric contact is effected between oppositely located contactors on the two doors.

Referring to Fig. 1, 9 represents the fixed plugboard panel similarly identified in the patent and 10 represents the movable plugboard panel also so identified in the patent. In the panel 9, there are provided rows and columns of circular holes 11 into which the contactor sleeve 12 is inserted. This sleeve is formed with a resilient tongue 13 which folds inwardly as the sleeve is inserted and snaps up into the position as shown in Fig. 1 when the sleeve is fully inserted, thereby preventing retrograde movement of the sleeve. There is also an extension 14 extending beyond the perimeter of the sleeve to act as a limit stop so that, when the sleeve is fully inserted, it is locked in position between tongue 13 and extension 14. Within the sleeve is a plunger 15 and a spring 16, and a bent-over ear 17 of the sleeve serves to confine the right end of the spring while its left end urges the plunger 15 toward the left. At the left end there is a second bent-over ear 18 which confines the plunger at that point. At the extreme right end of the sleeve is a further portion 19 which may be pressed around a terminal of a contact wire 20, the strands of which may also be suitably soldered to the sleeve as indicated at 21.

In constructing the plugboard, it is simply required that a panel 9 be provided with rows and columns of circular holes 11 drilled therethrough, and in the necessary positions sleeves 12 with their spring-pressed plungers are inserted. For purposes of effecting a different arrangement of the sleeves or replacement of parts, it is only necessary to manually depress the tongue 13 and then slide the sleeve out of the opening toward the right, which is an obviously simple operation requiring no tools therefor.

The removable panel 10 is also provided with rows and columns of circular openings 22 into which removable jacks are insertible in desired positions to make contact with the heads of plungers 15 in the panel 9. Each jack comprises a sleeve 23 formed from a single blank with a detenting spring portion 24 so formed that, as the sleeve 23 is inserted into the opening 22 from the left side of panel 10, the edge of the hole will engage and depress the spring portion 24 which upon full insertion of the sleeve will snap into the position shown in Fig. 1 where it serves to hold the sleeve in position. To the left end of the sleeve 23 there is secured the usual plug wire 25 surrounded by a molded rubber casing 26. This wire 25 is suitably insulated and has at its opposite end a second identical sleeve 23 which is inserted in another opening 22 of the panel 10,

so that an electrical circuit can be completed from the plunger 15 in one position on the panel 9, through the contacting sleeve 23 and the wire 25 to the second sleeve 23, and thence back through a plunger 15 in another hole 11 of panel 9 to complete a circuit between any two plungers 15 and their connected wires 20. To remove the sleeve 23, it is merely necessary to grasp the wire 25 or its casing 26 and with a slight pull the spring portion 24 will fold under and permit removal of the sleeve.

In Fig. 6 is shown a form of jack insertible in the panel 10 which is used where connections are not frequently changed. This jack comprises a sleeve 27 insertible in any of the holes 22 of the panel 10 and has a spring tongue 28 similar to the tongue 13 of sleeve 12 which, when the sleeve 27 is inserted, will snap into the position shown in Fig. 6. The left end of the sleeve 27 is flared as indicated at 29 to serve as a limit stop, and the portion of the sleeve within the panel is configured to receive and secure the end of a wire 30 as indicated at 31 in Fig. 7. This sleeve 27 is removable also by manually depressing the tongue 28 and thereafter sliding the sleeve toward the left.

Figs. 8 and 9 show the manner in which the improved contactors of Figs. 1 and 6 cooperate with contactors as presently used in commercial electric accounting machines. In Fig. 8 the sleeve 27 in the movable plugboard 10 is shown in contacting relationship with the usual spring contactor 32 in the fixed panel in the machine. This contactor 32 corresponds to the contactor designated 2 in the Lake Patent No. 2,111,118, and it is seen by comparison with Fig. 1 that this contactor 27 cooperates equally well with the improved contactor where it makes contact at its right end with the plunger 15 and in Fig. 8 where it is shown as making sliding contact along its side with the spring contactor 32. In Fig. 9 is shown the reverse condition where the movable panel 10 is provided with the usual locked contactor which is designated 33 and which corresponds to the contactor designated 5 in the Lake patent. As seen in Fig. 9, the contactor 33 engages the plunger 15 of sleeve 12 in the same manner that the latter is engaged by the tip of sleeve 23 in Fig. 1.

From the above it is thus seen that there is provided an improved pair of contactors which might be generally designated as the fixed contactor and the movable contactor, which may be employed in electric accounting machines in place of the corresponding contactors as presently employed. The construction of the contactors is such that, where an existing machine is already provided with the older form of fixed contactors, they need not be changed as the improved movable contactor will cooperate therewith. Also, where a recent machine is provided with improved fixed contactors, it is not necessary to obsolete older movable panels and these may continue to be employed as indicated in Fig. 9.

Fig. 10 illustrates the manner in which the plugboards 9 and 10 are brought into operative relationship. The fixed panel 9 is supported in a frame 34 attached to the frame of the machine 35 as by brackets 36. The movable panel 10 is supported in a frame 37 which is slidable into a holder 38 whose lower end is pivoted on frame 34 at 39.

Holder 38 has an arm 40 pivoted thereto at 41 and arm 40 in turn has a link 42 pivoted thereto at 43, the opposite end of the link being pivoted

at 44 to the fixed frame 34. Integral with arm 40 is a cover plate 45 which, when the arm 40 is in its full line position, lies in the plane of the machine casing 46 and serves as a cover for the plugboards, guarding them against dust and accidental disturbance of the plug connections.

When it is desired to remove the frame 37, the operator grasps handle 47 on cover 45 and rocks the cover and arm 40 clockwise about pivot 43 to the dotted line position shown in Fig. 10. At the same time pivot 43 swings downwardly in an arc about pivot 44 and holder 38 is rocked counterclockwise about its pivot 39. A pin 48 in arm 40 serves as a limit stop by engagement with an edge of link 42.

With the parts thus brought to the dotted line positions, frame 37 may readily be slid out of holder 38 and replaced. To return the parts, handle 47 is grasped and cover 45 rocked back to position where it will be observed that arm 40 and link 42 form a toggle with pivot 41 lying above a line extending between the center of pivots 43 and 44, and such relationship of the parts serves to hold them in position.

To frame 37 is attached a plate 49 and in the path of this plate is a cam member 50 secured to cover 45. The purpose of member 50 is to insure that the frame 37 is fully seated in holder 38 before contact is made with the fixed plugboard. It will be noted that as the holder 38 is rocked, member 50 swings over the top of frame 37 and, if the frame is not fully seated, the leading edge of member 50 will strike plate 49 and prevent further movement of the parts. If frame 37 is only slightly extended, member 50 will cam it down as it passes over plate 49, thus insuring proper seating.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. An interconnecting plugboard for accounting machines comprising a fixed set of contacts and supporting means therefor, a movable set of contacts engageable with the fixed set, a pivoted supporting frame therefor, a cover plate pivotally connected to said frame and extending parallel thereto when the contacts are engaged, a restraining link extending between the cover plate and said first named supporting means to hold the cover plate and frame in contacting position, rotation of said cover plate under restraint of said link causing the cover to rock the frame out of contacting position and the cover to swing to the opposite side of the frame.

2. In an apparatus of the class described, a fixed plugboard panel, a movable plugboard panel pivoted at its base to rock from a position parallel to the first panel to a position at an angle thereto, a cover plate parallel to the panels when they are in their relative parallel positions, an arm extending between the plate and the movable panel, a link extending between the plate and the fixed panel, said arm and link forming a toggle holding the panels in parallel relationship, said cover plate upon manual movement out of its parallel position being constrained by the link and arm to rock the movable panel to its angu-

lar position and to rock itself in an arc over the free end of said panel to a position between the two panels.

3. In an apparatus of the class described, a fixed plugboard panel, a movable plugboard holder, a plugboard panel insertible in said holder, said holder being pivoted at its base to rock from a position parallel to the first panel to a position

at an angle thereto, and a cam member guided to automatically pass over the free end of the holder as the holder is moved from either position to the other to engage and fully seat the panel in the holder during said movement of the holder.

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