

March 15, 1938.

C. D. LAKE

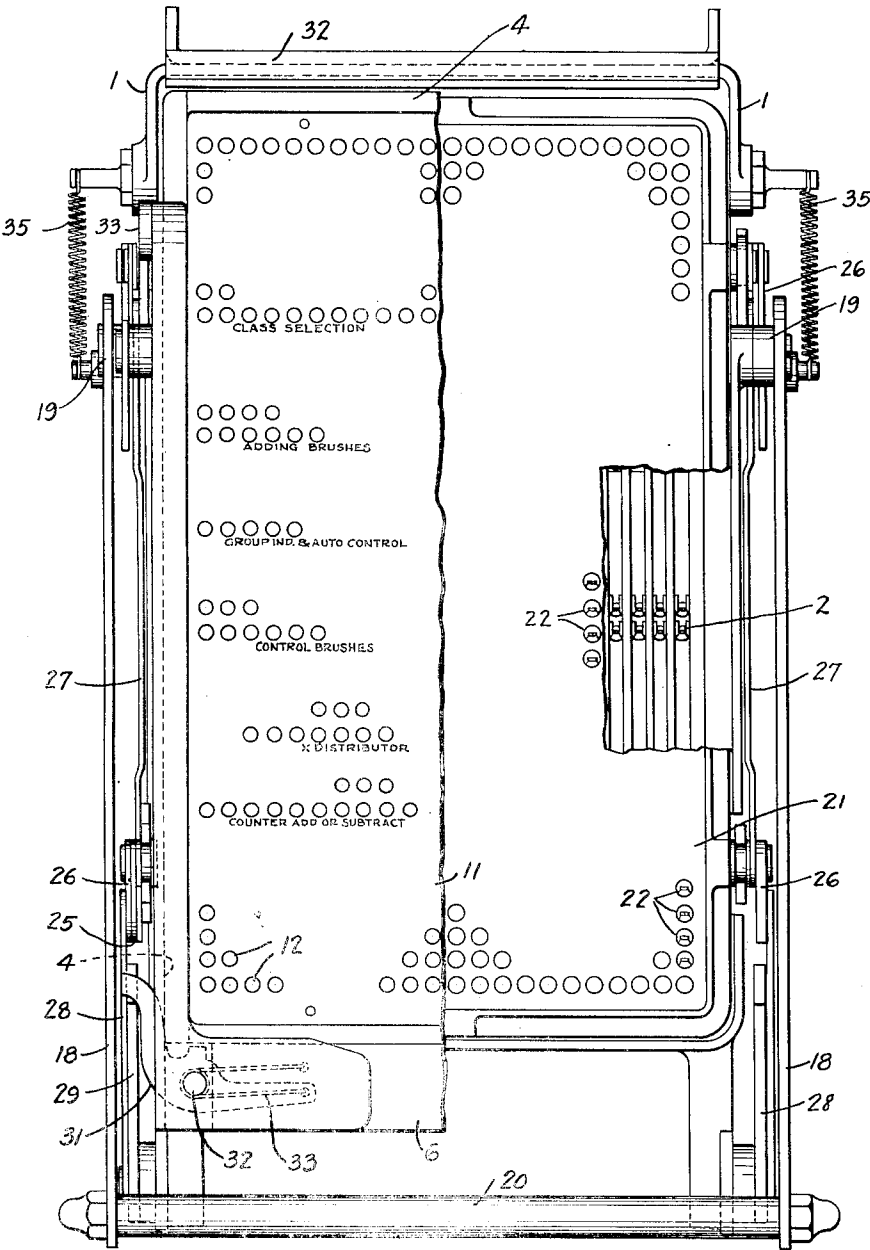
2,111,118

PLUGBOARD

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2 Sheets-Sheet 1

FIG. 1



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FIG. 2

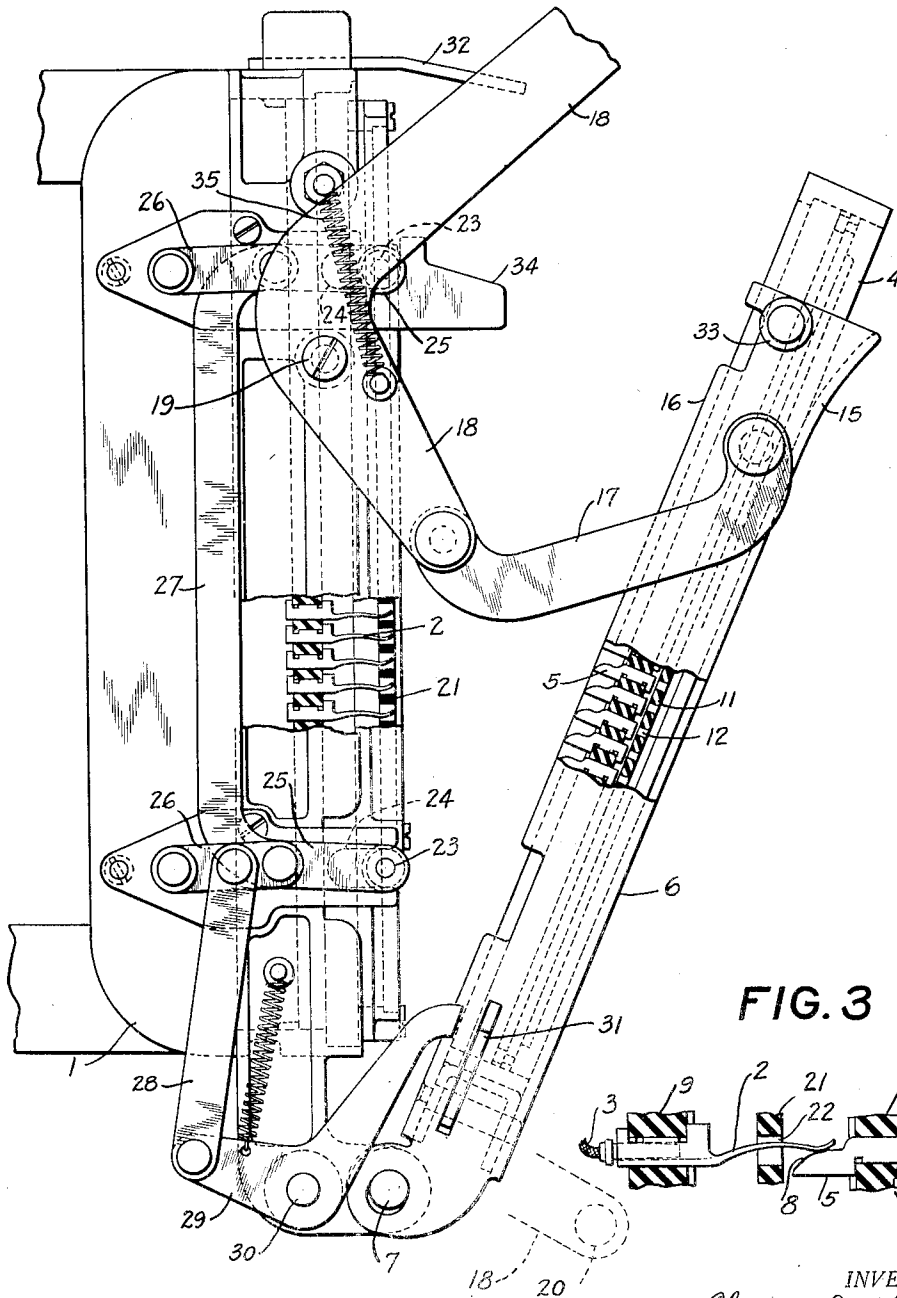
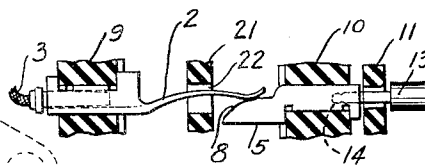


FIG. 3



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PLUGBOARD

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6 Claims. (Cl. 173-328)

This invention relates to electric plugboards for perforated record controlled accounting machines, such as the Hollerith type of tabulating machine.

5 In these machines, separate columns of data on record cards are analyzed by separate sensing brushes which are electrically connected to control magnets to effect the proper operation of accumulating and printing as well as other operations of the machines. The electric sensing brushes of the various columns are connected to the desired columns of printing type and different orders in the accumulating devices or to the other control elements of the machine. The means interconnecting the brushes and these other parts of the machine include wire connected jacks which may be plug connected between any of the brushes and any of the columns or orders of printing and accumulating devices or other control devices.

10 It has been common to effect a complete plugging of the machine for each type of report which is to be made from the record cards which are to be run through the machine. Very often, certain standard reports are to be made from stacks of cards punched in accordance with some common form and in order to save the time of replugging the entire machine whenever these common forms are to be printed, set-up plug boards may be maintained in plugged or connected condition for these common reports and inserted as a complete unit in the machine whenever it is desired to use them. Whenever it is desired to make slight changes in the forms or to omit portions of the reports, the appropriate plug connections may be changed or removed.

15 United States Patent 1,933,335 to Peirce shows a type of removable plugboard adapted for use in these machines. Application Serial No. 687,268 to Albert W. Mills, filed August 29, 1933, which became Patent 2,056,361, October 6, 1936, for a plugboard for tabulating machines shows a further improvement upon this type of plugboard.

20 One of the objects of the present invention is to provide means for protecting the delicate contact terminals in the plugboard under certain conditions.

25 Another object is to provide a protecting device of this nature which will automatically assume operative position when the removable portion of the plugboard is taken from the machine or is being inserted into position in the machine.

30 Another object is to provide means to insure the proper adjustment of the parts relative to

each other when the removable portion of the plugboard is inserted in the machine.

A further object is to provide an improved clamping means for locking the removable portion of the board in operative position in the board.

Referring to the drawings in which I have shown what I now consider to be the preferred form of my invention:

Fig. 1 is a front elevation of the plugboard. 10

Fig. 2 is a side elevation showing the parts in open position.

Fig. 3 is a detail of the contacts showing the manner of cooperation when the plugboard is in closed position. 15

Referring to the drawings, a portion 1 of the plugboard is adapted to be permanently fixed to a machine such as a tabulating machine. This fixed portion is provided with a plurality of contact members 2, some of which are adapted to be connected by wires 3 to the sensing brushes of the machine while others are connected to printing, accumulating and various control parts. The removable portion 4 of the plugboard is provided with cooperating contact members 5 and is slidably mounted in a hinged frame 6 pivoted at 7 to the fixed portion of the board. When the hinged portion is moved into close position, the contacts 2 and 5 cooperate with each other as in Fig. 3, the contact 2 cooperating first with the bevel portion 8 and being pressed upwardly to the position shown in Fig. 3 thus effecting a wiping and pressing contact so as to insure a clean electrical contact. The terminal contacts 2 are mounted in an insulating block 9 carried by the fixed portion 1 of the board and the contacts 5 are mounted in a similar insulating block 10 carried by the sliding portion 4. An insulating plate 11 may be employed to cover the rear terminals of the contacts 5 so as to minimize the possibility of shortcircuiting the contacts. Plate 11 is provided with holes 12 adjacent to the rear of each of the contacts 5 so that the plugging jacks 13 may be plugged into the sockets 14 in the contacts 5. In this manner, any of the contacts 5 may be connected to any other of such contacts so that when the contacts 5 are in cooperation with contacts 2, current coming through any one of the sensing brushes may be run through any one of the operating magnets to control the desired accumulating order or printing column or other controlled device. The portion 4 containing contacts 5 and plugging connections 13 may be inserted in the hinged frame 55

6 from the top and held in position by projections or flanges 15, 16.

The frame 6 is connected by links 17 to arms 18 pivoted at 19 to the fixed portion 1 of the plugboard. The arms 18 are interconnected at their outer ends by a bar 20. By raising the arms 18 to the position of Fig. 2, the frame 6 is moved to open position for the removal or insertion of slide portion 4 and by rocking arms 18 to lowered dotted position (see also Fig. 1) the frame 6 with the slide plugboard 4 will be moved into operative position where the contacts 2 will cooperate with the corresponding contacts 5 to complete the connection between the sensing brushes and other parts of the machine.

It is important when the plugboard is in open position, or when there is no slide portion 4 in frame 6, that the free ends of contacts 2 shall not be so exposed that they may be accidentally struck or bent or otherwise damaged so as to interfere with the proper functioning of the parts. A slight bending of the contacts might without being noticed impair the proper contacting and thus impair the operation of the machine.

In order to protect these contacts from injury, I have provided a protecting plate 21 having holes 22 for the ends of the contacts 2 to reach through as in Fig. 3 to cooperate with contacts 5 when the parts are in closed position. When the frame 6 is moved to open position as in Fig. 2, the protecting plate 21 is adapted to assume position of Fig. 2 so that none of the contacts 2 will project beyond the outer surface of the plate. The plate 21 is carried by pins 23 movable in slots 24 in the fixed portion 1 and is provided with toggle links 25, 26 on opposite sides which are interconnected by links 27.

A link 28 on each side of the board is connected between the toggles and bell crank arms 29 will operate the toggles when the arms 29 are rocked counterclockwise about their pivots 30 in Fig. 2. This will move the protecting plate 21 to the left in Fig. 2, away from the ends of contacts 2 as in Fig. 3. The movable frame 6 is provided with arms 31 pivoted at 32 and provided with springs 33 to normally rock the arm 31 out of cooperative relation with the arm 29. When the slide portion 4 is lowered into position in the frame 6 it will engage the arms 31 as shown in Fig. 1 and rock them outwardly into alignment with the upper ends of the arms 29. Now when the frame 6 is rocked into closed position, the arms 31 will engage arms 29 and rock the latter counterclockwise in Fig. 2 and move the protecting plate 21 inwardly so as to free the outer ends of contacts 2 so that they may cooperate with contacts 5.

Thus, whenever the frame is moved to open position, the plate 21 will move outwardly to protect the ends of the contacts 2 and when the frame 6 is closed with a plug slide portion 4 in position, the protecting plate 21 will be moved away from the ends of the contacts 2. On the other hand, if the frame 6 is closed without a plug slide 4 in position the arms 31 will not engage the arms 29 and the plate 21 will remain in its operative or protecting position. The ends of the contacts 2 are in this way protected from damage which might otherwise be inflicted through the openwork of the hinged frame 6.

In order that the slide portion 4 may be fully inserted in the frame 6 when the parts are closed, a projection 32 may be attached to the upper portion of the fixed member 1 to engage the slide portion 4 and prevent the closing of the parts

unless the slide portion 4 is fully inserted to the bottom of the frame member 6.

To further insure accurate setting of the parts and at the same time increase the pressure between contacts 2 and 5, rollers 33 may be provided on frame 6 to cooperate with cams 34 on the fixed portion 1 so as to lift the frame slightly when it is closed. Sufficient play is provided in bearings 7 to permit this slight movement of the frame.

Springs 35 may be provided to hold arms 18 in the position of Fig. 2 when the board is open, and by passing to the other side of pivot 19 when the board is closed, hold the parts in such position also.

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 protecting member normally placed in position to protect said contacts, a positionable frame pivotally associated with the said supporting means, a member slidably mounted in the said frame and carrying a second set of contacts which are adapted to cooperate with the fixed set of contacts, and means associated with said frame and adapted to be rendered operative when the last mentioned member is in position in the frame for displacing said protective member from the fixed set of contacts when the frame is moved into cooperative relation with said fixed set of contacts to effect cooperation between the fixed set and said second set of contacts.

2. An interconnecting plugboard for accounting machines comprising a fixed set of contacts and supporting means therefor, a protecting plate normally in position to protect said contacts, a frame pivotally secured to said supporting means and movably associated with said set of contacts, a removable member associated with said frame having a second set of contacts adapted to cooperate with the fixed contacts, means for moving said protecting plate to inoperative position to permit cooperation between said first and second sets of contacts, and means operated by said removable member when in position in said frame for rendering said moving means operative.

3. An interconnecting plugboard for accounting machines comprising a fixed set of contacts, a protecting plate for said contacts, a frame hingedly associated with said set of contacts, linkage between said protecting plate and said frame, a removable member adapted to be inserted in said frame having a second set of contacts adapted to cooperate with the first set of contacts, and means operated by said member when in position in said frame to render said linkage operative to move the protecting plate to inoperative position when the frame is moved into cooperative relation with said first set of contacts to effect cooperation between the first and second sets of contacts.

4. An interconnecting plugboard for accounting machines comprising a fixed set of contacts

and supporting means therefor, a plate normally in position to protect said contacts, a frame pivotally secured to said supporting means movable into cooperative relation with said contacts, a member slidable into said frame and provided with a second set of contacts adapted to cooperate with said first set of contacts, and means controlled by said member when inserted in said frame for moving said protecting plate to inoperative position to permit cooperation between the two sets of contacts when the frame is moved into cooperative relation with said first set of contacts.

5. A plugboard for an accounting machine comprising a fixed member having contact terminals and a movable member pivotally secured to said fixed member having cooperating contacts, a movable protecting plate associated with the contact terminals of the fixed member and positionable longitudinally with respect to said

terminals, and means cooperating with the said movable member for controlling the positioning of said protecting plate.

6. An interconnecting plugboard for accounting machines comprising a fixed member and a movable member, supporting means for the fixed member and said movable member pivotally secured thereto, the fixed member being provided with contact terminals and the movable member being provided with terminals adapted to cooperate with the terminals of the fixed member, a movable protecting member associated with and adapted to protect the contact terminals of the fixed member and positionable longitudinally with respect to said terminals, and means operated by the movable member for positioning the protecting member to an intermediate and inoperative position to permit interconnection between the contact terminals.

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