

March 24, 1959

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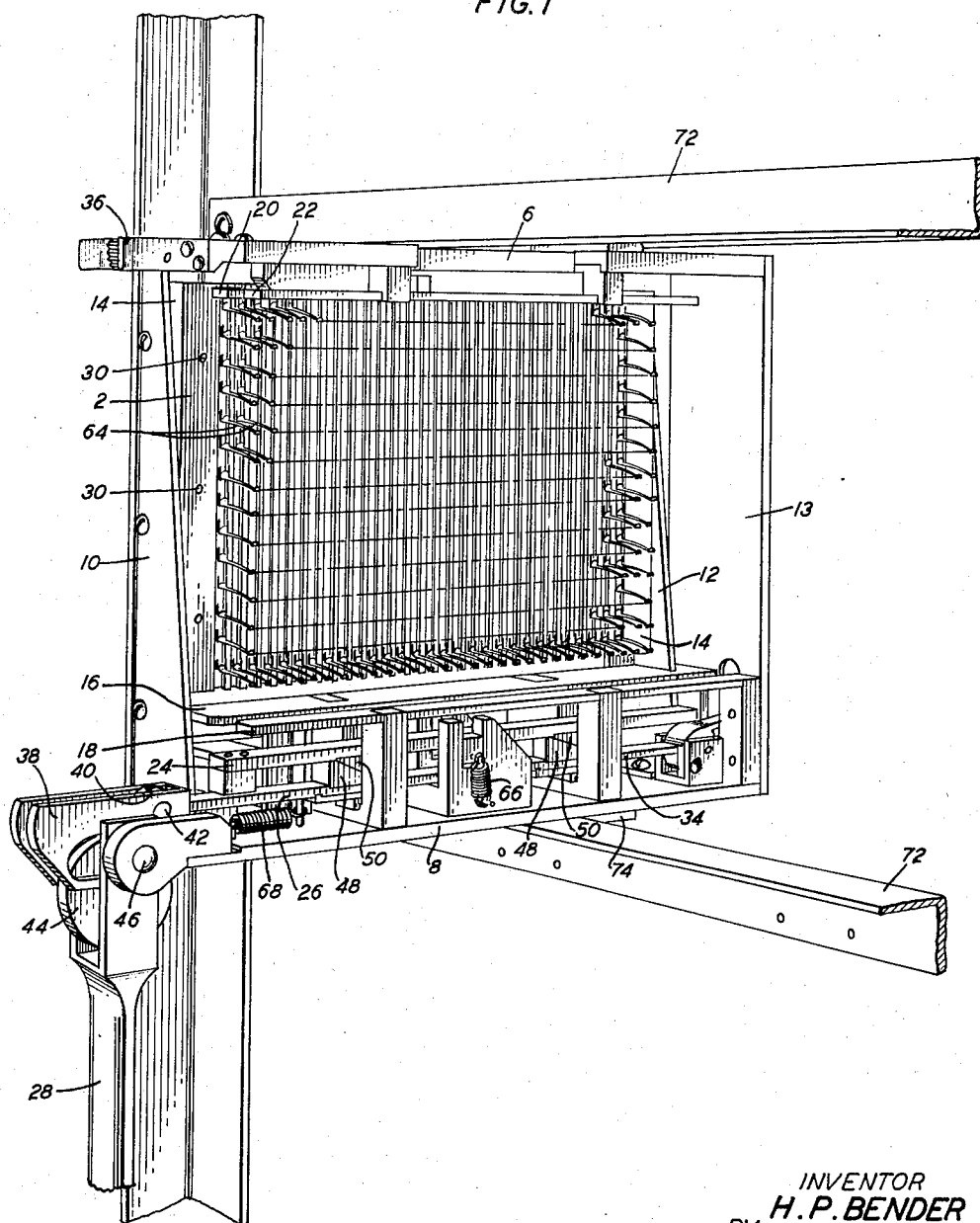
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PLUGBOARD WITH SLIDABLE PANEL

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4 Sheets-Sheet 1

FIG. 1



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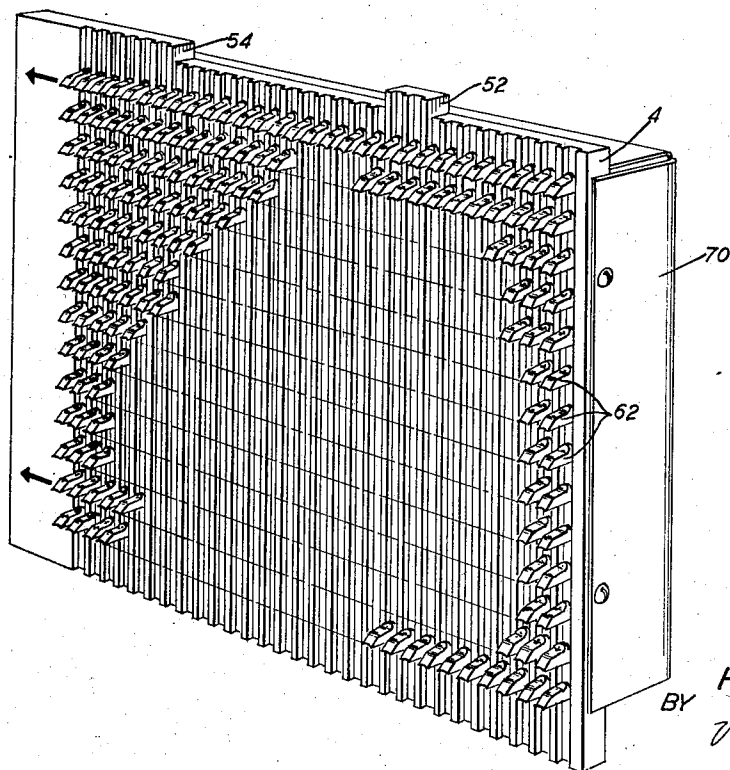
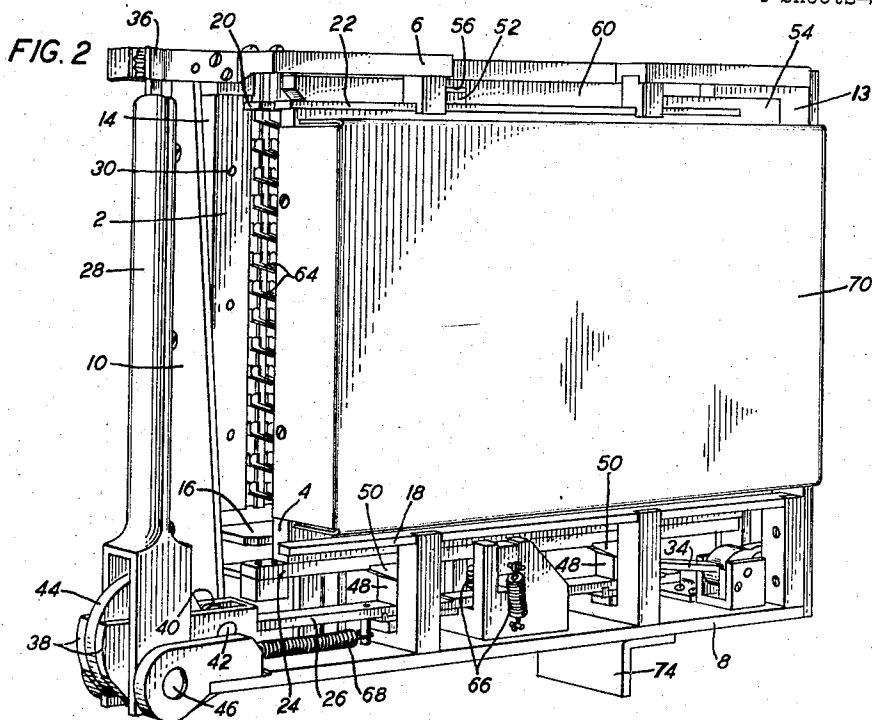
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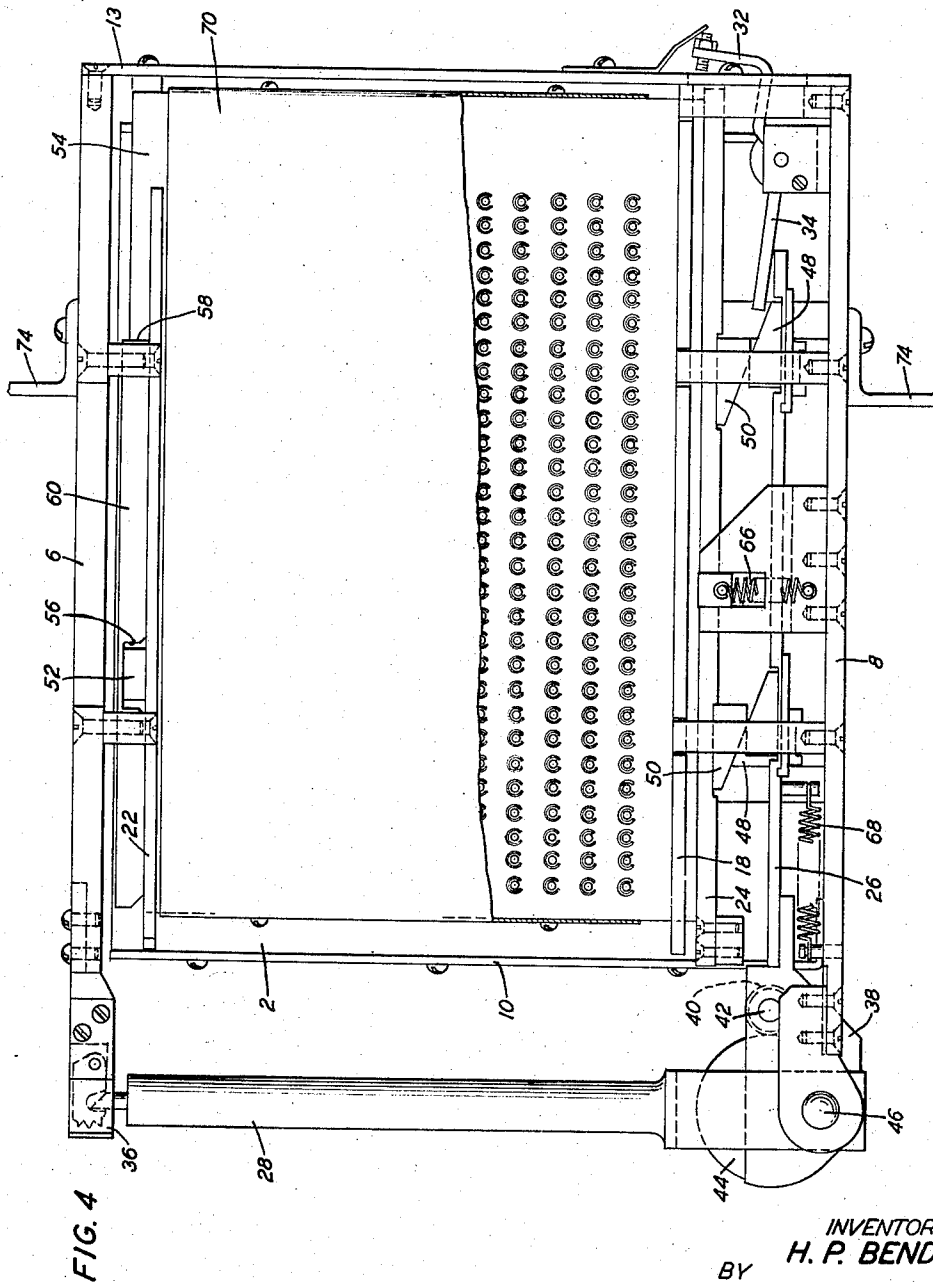
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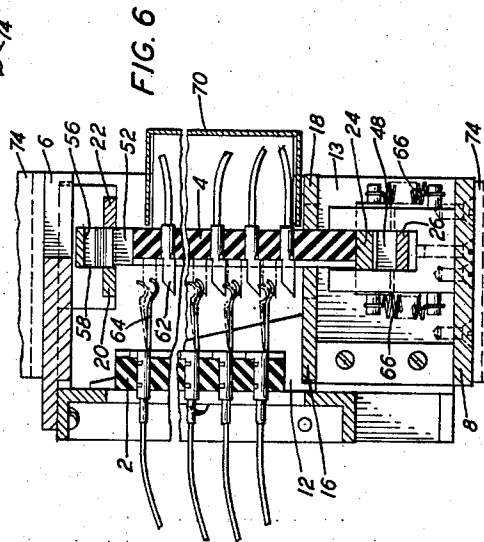
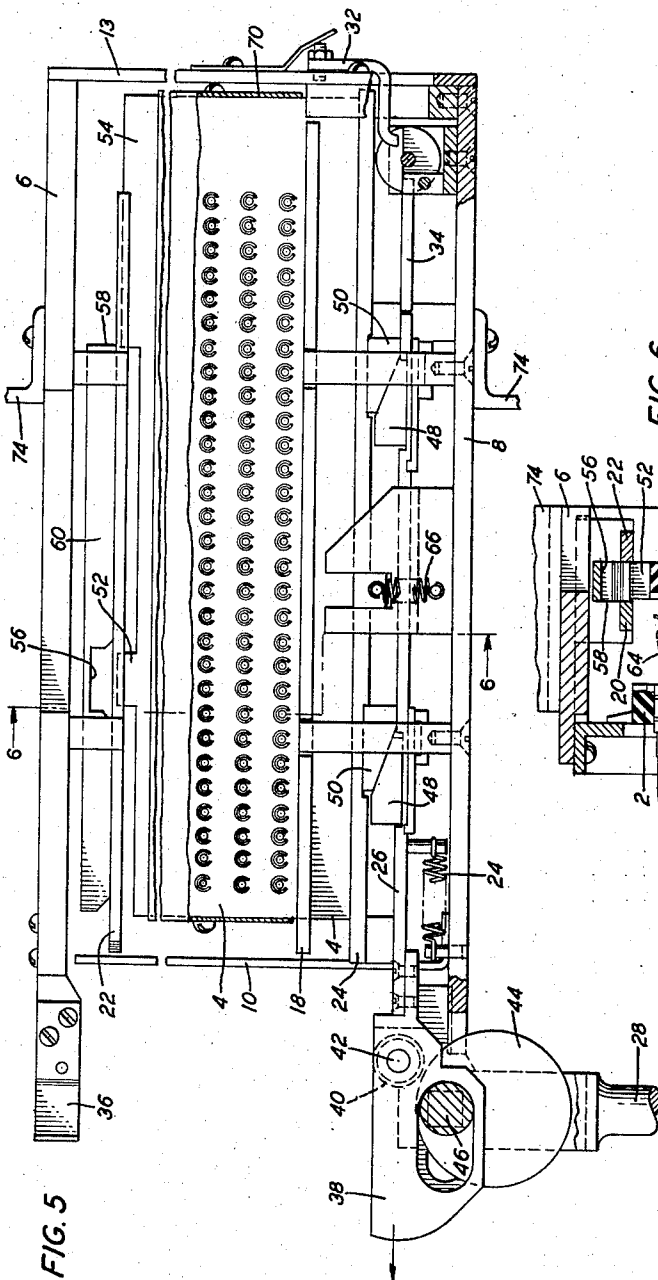
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4 Sheets-Sheet 4



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2,879,493

PLUGBOARD WITH SLIDABLE PANEL

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5 Claims. (Cl. 339—18)

This invention relates to plugboards, and particularly to plugboards comprising a fixed terminal panel and a detachable, removable control panel which may be patched in accordance with a predetermined pattern.

Plugboards comprising detachable panels are known in the art. In these plugboards the detachable control panel is mounted in a hinged supporting frame or carrier which is pivoted to the stationary or fixed portion of the board. The contacts of the control panel are swung and lifted into position to engage the corresponding contacts of the fixed panel.

The hinged panel type of plugboard has proved to be quite satisfactory for application in automatic accounting and tabulating machines. However, it requires greater space for installation and operation than can be made available for the switching of telephone lines in traffic control centers.

It is a principal object of this invention to provide a plugboard which requires far less space for installation and operation than the hinged panel type.

Another object of the invention is to provide a plugboard mechanism which will cause the contact pressure between all the cooperating contact members to be distributed evenly.

In accordance with the features of this invention the detachable control panel is inserted in a frame support between upper and lower guide rails to face the fixed panel with its contacts directly below the corresponding contacts on the fixed panel. It rests on an upper platform to which vertical motion is imparted by the application of the principle of inclined planes. This is accomplished by means of a lower platform to which horizontal motion may be imparted, and a number of pairs of matched wedges or quins disposed between the two platforms. When horizontal motion is imparted to the lower platform the wedges affixed thereto slidably engage the wedges affixed to the upper platform to impart vertical motion thereto. The contacts on the control panel are thereby moved vertically to slidably engage the cooperating contacts on the fixed panel.

These and other features of the invention will be more clearly understood from the following detailed description and the accompanying drawings in which:

Fig. 1 is a view in perspective of an illustrative embodiment of the invention showing the supporting frame and the fixed panel;

Fig. 2 is a view in perspective of the embodiment shown in Fig. 1 with the control panel disposed in the supporting frame and the corresponding fixed and control panel contacts engaged;

Fig. 3 is a view in perspective of the control panel showing some of its contacts;

Fig. 4 is a view in side elevation with the cover of the control panel partially broken away;

Fig. 5 is a view in side elevation showing the control panel prior to the application of vertical motion thereto; and

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Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5 showing the corresponding contacts prior to their engagement.

Referring now to the accompanying drawings, fixed panel 2 and detachable control panel 4 are supported in a structure, preferably of steel, which comprises top and base plates 6 and 8 respectively, bracing members 10 and 12, end plate 13, mounting frame 14, lower guide rails 16 and 18, upper guide rails 20 and 22, upper platform 24, lower platform 26 and operating arm 28.

Panel 2 is secured to frame 14 by means of screws or bolts 30. With arm 28 down in released position, as shown in Figs. 1 and 5, panel 4 is disposed on platform 24 between guide rails 16, 18, and 20, 22 and manually actuated toward bracing member 12. When panel 4 is properly positioned with respect to panel 2 it will actuate arm 32 and thereby trigger safety latch 34 as shown in Fig. 4. With safety latch 34 displaced from its locking position, arm 28 may be moved upward until it engages latch 36. Unless panel 4 is properly disposed in the mounting frame, safety latch 34 will not be triggered and arm 28 cannot be moved upward. This safety feature provides assurance that the contacts on the control panel will always properly engage the corresponding contacts on the fixed panel.

As shown in Fig. 5, lower platform 26 is attached to yoke 38 within which are disposed roller 40 on pin 42 and cam 44 affixed to arm 28 by shaft 46. To lower platform 26 are affixed wedges 48, and to upper platform 24 are affixed wedges 50. When arm 28 is moved upward cam 44 frictionally engages roller 40 to impart horizontal motion to yoke 38 and platform 26. When platform 26 is actuated, wedges 48 slidably engage wedges 50 to impart vertical motion to platform 24 and control panel 4 supported thereon. Extended portions 52 and 54 of panel 4 engage undercut portion 56 and edge 58 respectively of guide bar 60 to lock panel 4 in contact position, and contacts 62 on control panel 4 slidably engage cooperating contacts 64 on fixed panel 2. When arm 28 has completed its circular movement of 180 degrees and is secured by latch 36, the contact pressure between all cooperating contact members will be evenly distributed. The relative positions of the corresponding contacts prior to engagement (solid lines) and after engagement (dotted lines) are shown in Fig. 6.

Springs 66 are attached to upper platform 24 to oppose the vertical movement of the platform and to restore it to its original position when arm 28 is lowered to its released position. Spring 68 opposes the horizontal motion of platform 26 and thereby helps to restore it to its original position when arm 28 is lowered.

Cover 70 is applied to the outer side of panel 4 after the patch pattern has been completed. The plugboard, when mounted on a conventional telephone central office frame 72 by means of brackets 74, occupies a relatively small area. A number of boards may be conveniently mounted in juxtaposition on the same frame.

It is to be understood that the above-described arrangements are illustrative of the application of the principles of the invention. Other arrangements may be devised by those skilled in the art without departing from the spirit and scope of the invention.

What is claimed is:

1. In a plugboard comprising a supporting frame, a terminal panel secured to said frame and a removable control panel insertible in said frame to assume a substantially vertical and parallel position with respect to said terminal panel whereby its contacts are directly below corresponding contacts on said terminal panel, means for imparting vertical motion to said control panel to cause said corresponding contacts to be brought into engage-

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ment, said means including a first platform engaging the bottom surface of said control panel, a second platform separated from said first platform by a pair of upper and lower wedges, said upper wedges being attached to said first platform, and means for imparting horizontal motion to said second platform to cause said lower wedge to slidably engage said upper wedge and thereby impart vertical motion to said first platform.

2. In a plugboard comprising a supporting frame, a terminal panel affixed to said frame, an operating arm pivotally secured to said frame, and a removable control panel insertible in said frame to assume a substantially vertical and parallel position with respect to said terminal panel whereby its contacts are directly below corresponding contacts on said terminal panel, means for imparting vertical motion to said control panel to cause said corresponding contacts to be brought into engagement, said means including a first platform engaging the bottom surface of said control panel, a second platform separated from said first platform by a pair of upper and lower wedges, said upper wedge being attached to said first platform, and cam means controlled by said operating arm for imparting horizontal motion to said second platform to cause said lower wedge to slidably engage the corresponding upper wedge and thereby impart vertical motion to said first platform.

3. A plugboard in accordance with claim 2 wherein a latch member associated with said frame prevents the movement of said second platform and thereby renders said cam means ineffective until said control panel assumes said vertical and parallel position.

4. A plugboard comprising a supporting frame having upper and lower guide rails, a terminal panel affixed to said frame, an operating arm pivotally secured to said frame, a removable control panel insertible in said frame in such manner as to be guided by said upper and lower guide rails to assume a substantially vertical and parallel position with respect to said terminal panel whereby its contacts are directly below corresponding contacts on said terminal panel, means for imparting vertical motion to said control panel to cause said corresponding contacts to be brought into engagement, said means including a first platform engaging the bottom surface of said control

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panel, a second platform separated from said first platform by a pair of upper and lower wedges, said upper wedge being attached to said first platform, and cam means controlled by said operating arm for imparting horizontal motion to said second platform to cause said lower wedge to slidably engage said upper wedge and thereby impart vertical motion to said first platform, and a latch member associated with said frame, said latch member being in a normal locking position to prevent the movement of said second platform and thereby render said cam means ineffective until displaced from said locking position by said control panel on assuming said vertical and parallel position.

5. In a plugboard comprising a supporting frame, a terminal panel affixed to said frame, and a removable control panel insertible in said frame to assume a substantially parallel position with respect to said terminal panel whereby its contacts are disposed in overlapping spaced relationship with corresponding contacts on said terminal panel, a first platform engaging said control panel, a second platform separated from said first platform by a pair of wedges, one of said wedges being affixed to said first platform, the other of said wedges being affixed to said second platform, means for imparting motion to said second platform to cause the wedge affixed thereto to slidably engage the wedge affixed to said first platform to impart motion to said first platform and to said control panel in a direction normal to the direction of movement of said second platform and thereby cause said corresponding contacts to be brought into engagement.

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