

April 14, 1964

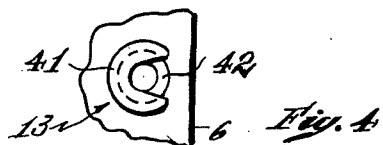
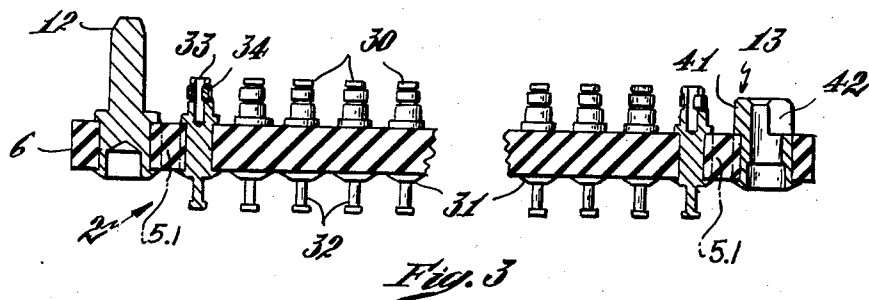
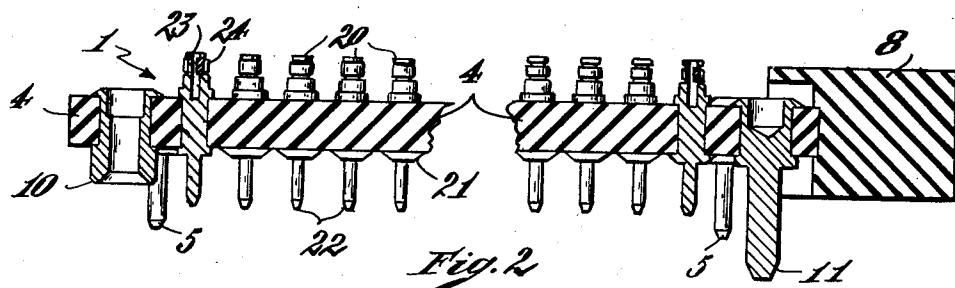
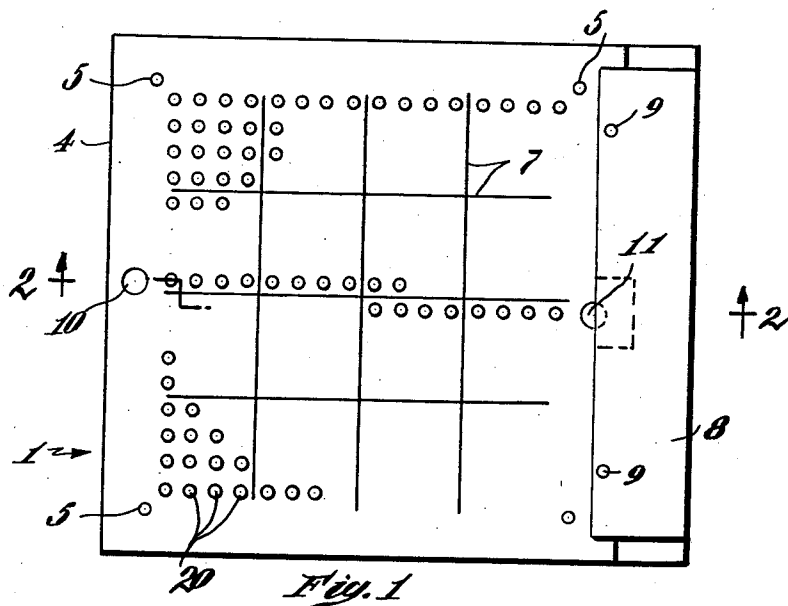
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3,129,044

PATCH PANEL PRESS

Filed March 7, 1961

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

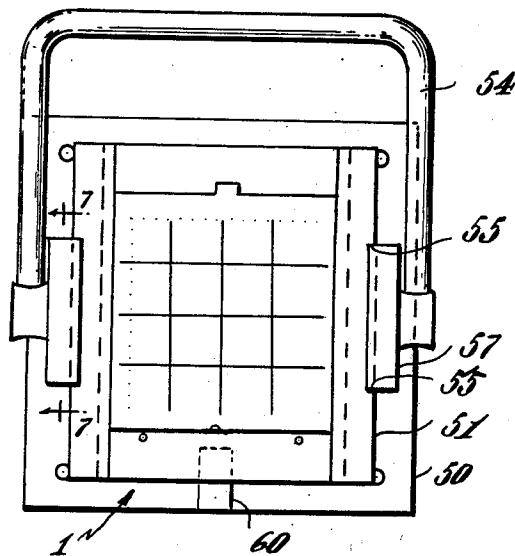


Fig. 5

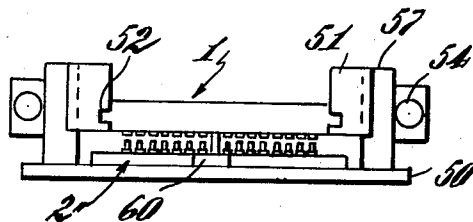


Fig. 6

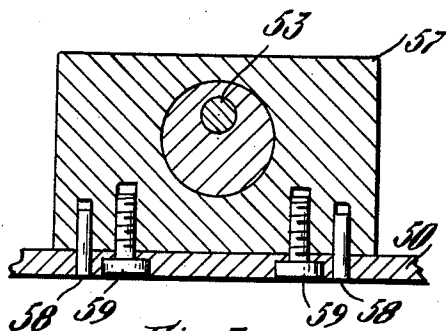


Fig. 7

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3,129,044

PATCH PANEL PRESS

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4 Claims. (Cl. 339-18)

The field of this invention is that of connectors for electric circuit components and more particularly of so-called patch panels such as are typically associated with electronic computing or control apparatus.

The preparation of electronic computer or control apparatus prior to performing a particular problem or program is likely to involve the setting up or rearrangement of numerous, often several hundreds of connections and since these highly elaborate and expensive machines are expected to perform a great variety of functions in the scientific, business, and accounting fields, it has become customary to provide them with devices permitting quick changes from one set-up to another. In most instances such devices involve multiple connection terminal boards and corresponding prewired patch panels whereby one entire set or subset of connections may be exchanged for another set in a single operation requiring merely the simple association with each other of different sets of such panels.

These patch panel assemblies typically have a plurality of pins located on a patch panel board so as to engage corresponding jacks in a fixed terminal board. Thus a patch board can be prepared for each type of problem which the machine is to handle by making connections between appropriate pins. These connections are then carried over to the corresponding jacks and their associated components of the machine when the patch panel is brought into engagement with the fixed terminal board. It is of course also possible to have the jacks on the patch panel and the pins on the fixed terminal board but, as the pins are more easily damaged than the jacks, the pins are preferably associated with the more easily replaced and repaired patch panels.

Objects of the present invention are to provide a patch panel assembly which will yield a very precise alignment of the contact regions before any engagement between pins and jacks is made, which enables such alignment to be quickly and conveniently perfected, which produces even engagement without a warping of either the patch panel or the fixed terminal board, wherein delicate contact components are protected against injury, which lends itself to a very convenient method of engagement, which is compact and rugged, and which is of simple and inexpensive manufacture and operation.

A further object is to provide a patch panel including contact pins which is not easily damaged in use or by ordinary handling in general and particularly not by being placed on a flat surface.

The substance of the invention can be briefly summarized as to characteristic aspects thereof as follows.

In one principal aspect, the present invention contemplates a generally rectangular patch panel having at each corner a riding pin which projects beyond the contact pins so as to prevent injury thereto and which is independent of

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any aligning means so that any injury to the riding pins will not affect the alignment.

In another important aspect the invention contemplates aligning means including a pin near the front edge of the patch panel and a bushing near the corresponding edge of the usually fixed terminal board, the front portion of the bushing being flush with that part of the terminal board lying immediately in front of the bushing and the remaining portions of the bushing projecting above the surface of the fixed terminal board so as to conveniently limit the lateral travel of the patch panel relative to the terminal board.

In a preferred embodiment a press device is provided for engaging the patch panel and the fixed terminal board which press device includes a front loading frame for holding the patch panel and a handle operated eccentric.

These and other objects, aspects, and advantages of the invention will be apparent from the following more particular description of a preferred practical embodiment thereof illustrating its novel characteristics.

The description refers to drawings in which

FIG. 1 is a plan view of a patch panel according to the invention;

FIG. 2 is a section on line 2-2 of FIG. 1;

FIG. 3 is a section through a fixed contact board corresponding to the patch panel of FIG. 1;

FIG. 4 is an enlarged plan view of an aligning bushing;

FIG. 5 is a plan view of a patch panel press device;

FIG. 6 is a front view of a patch panel press according to the invention; and

FIG. 7 is a section on lines 7-7 of FIG. 5.

In FIGS. 1 and 2 of the drawings, 1 indicates the movable patch panel assembly the body of which carries a multiplicity of terminals 20 inserted into an insulating board 4 in a 16 x 16 array and suitably secured such as by staking indicated at 21. Lines 7 are applied to the board 4 for example by silk screening so as to facilitate the location of any particular terminal 20 within the array. A terminal board 2 is of generally speaking similar construction, as shown in FIG. 3, and assumed to be fixed as will be described below. Each terminal 20 includes a pin portion 22 for engaging a corresponding jack 30 on the fixed contact board 2. Each corner of the patch panel 1 carries a riding pin 5 which projects further beneath the board 4 than the pin portions 22 of the terminals 20. Attached to the front edge of the patch panel 1 is a handle 8 secured by roll pins 9. The forward edge of the panel also carries at approximately its midpoint an aligning pin 11 while the opposing or rearward edge carries at its midpoint an aligning bushing 10. The relation of the fixed contact board 2 and the movable patch panel 1 is indicated by FIGS. 2 and 3. The fixed contact board 2 has an insulating board 6 the body of which carries a multiplicity of jacks 30 for engaging the pins 22 of the patch panel 1. The jacks 30 are inserted through the insulating board 6 and secured thereto such as by staking 31. The lower ends of these jacks 30 terminate in terminal portions 32 adapted for more or less permanent connection to the machine. Preferably the upper ends of each jack 30 include bores 33 whose periphery is longitudinally split and encompassed by a spring 34 so as to provide a resilient grip on the pins 22. In the preferred embodiment illustrated the terminals 20 of the patch panel 1 (FIG. 2) include at their upper

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end a jack structure similar to that of the jacks of FIG. 3 so that connections between terminals 20 can be conveniently made with pin-tipped leads. This structure, as shown in FIGS. 2 and 3, comprises bores 23 whose peripheries are longitudinally split and encompassed by springs 24.

The rear of the fixed contact board 2 carries an aligning pin 12 which corresponds with the bushing 10 while the forward edge carries a bushing 13 corresponding to the pin 11. The rearward portion 41 of the bushing 13 projects above the surface of the insulating panel 6 so as to provide a stop for the patch panel 1 as it is brought into engagement with the fixed contact board 2. The front portion 42 of the bushing 13 is cut off flush with the surface of the insulating panel 6 to facilitate the engagement. FIG. 4 shows a preferable shape for the bushing 13 providing for ease of engagement with pin 11. The board 2 has also four apertures indicated at 5.1, for receiving the riding pins 5 of panel 1.

With this configuration of parts, it is possible to align the corresponding terminals preparatory to engagement, by merely moving the patch panel 1 along the fixed contact board 2 until the aligning pin 11 on the patch panel engages the projecting portion 41 of the bushing 13. When the alignment is approximately correct, the riding pins 5 are free to pass through the corresponding apertures 5.1 in the fixed contact board 2. As the patch panel 1 approaches engagement with the fixed contact board 2, the pin 11 and the bushing 10 to perfect the alignment by coming into a precisely defined engagement with the bushing 13 and the pin 12 respectively.

FIGS. 5, 6 and 7 depict a press for bringing the patch panel 1 into engagement with the fixed contact board 2. This press provides a front loading frame 51 including a slot 52 for receiving the patch panel 1 (FIG. 6). An eccentric 53 is driven by a handle 54 and operates on the frame 51 to effect the engagement. The handle 54 is journaled in pillow blocks 57 which also serve as guides for the frame 51, shoulders 55 on the frame 51 bearing against the sides of the blocks 57. The blocks 57 are secured to a base 50 by aligning pins 58 and screws 59. Normally, the fixed contact board 2 will also be attached to this base 50 and the whole unit will be incorporated into the electrical apparatus which it is intended to serve, such as a computing machine. Preferably a plate 60 of the same thickness as the insulating board is attached to the base 50 adjacent the fixed contact board 2 so as to provide a bearing surface of greater length for the aligning pin 11 as it approaches the bushing 13.

To connect a new patch panel into the circuit the handle 54 is pivoted to the rear lifting the frame 51 carrying the old patch panel which is then removed. The new patch panel is inserted in the slot 42 until the pin 11 engages the projecting portion 41 of the bushing 13. Pivoting the handle 54 forward will then drive the patch panel 1 into a precisely aligned engagement with the fixed contact board 2.

It will now be evident that connectors according to the invention offer the following advantages and appreciably improved results among others appearing from the above exposition of the objects and the nature of the invention, and from the description of a practical embodiment.

One result and important advantage of the above described arrangement is that if the riding pins 5 become somewhat bent or deformed in performing their function of protecting the terminal pins 22, this distortion will not affect the final alignment which is accomplished independently. Thus the apertures 5.1 for receiving the pins 5 may have relatively gross clearance as compared with that of the aligning pin and bushing which effect the final alignment before the pins 22 and jacks 30 engage.

The riding pins 5 are of great utility in preventing injury to the pins 22 when the patch panel 1 is handled or stored. More particularly the riding pins 5 will pre-

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vent contact between the pins 22 and any flat surface upon which the patch panel is placed. Normally, the patch panel would rest on the aligning pin 11 and the two riding pins 5 at the opposite edge of the board. If, however, the patch panel is tilted, a riding pin 5 at the same edge as the aligning pin 11 will come into contact with the surface, still preventing contact between the surface and the pins 22. It will be evident that for many purposes two riding pins near the panel side opposite to the side with the aligning pin will serve to protect the contacts.

The press construction described with reference to FIGS. 5 to 7 cooperates with the placing, aligning and contacting components according to FIGS. 1 to 4 to provide as particularly advantageous results the extremely easy handling even by unskilled operators and an optimally rugged and uncomplicated construction securing the maximal reliability which is of primary importance with apparatus of this type.

It should be understood that this disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

We claim:

1. A patch panel comprising:

a board carrying a plurality of terminal means extending therefrom;

an aligning pin extending near an edge portion of said board beyond said terminal means;

an aligning bushing near an edge portion opposite to said aligning pin; and

two riding pins extending on either side of said bushing beyond said terminal means but being shorter than said aligning pin;

whereby said aligning and riding pins protect the terminal means from contact with a surface on which the board may rest with these pins, and whereby the aligning pin and bushing can be brought into initial engagement with a corresponding aligning bushing and pin, respectively, without interference by the riding pins.

2. A patch panel assembly comprising:

a patch panel of essentially rectangular contour including a plurality of contact pins, riding pins projecting near corners of said panel beyond said contact pins, and an aligning pin; and

a fixed terminal board including a plurality of jacks corresponding to said contact pins and an aligning bushing, said aligning bushing having a front portion which is flush with the surface of said fixed terminal board and the remaining portions of which project above the surface of said terminal board.

3. A patch panel assembly for use in a patch panel press comprising:

a patch panel of generally rectangular contour including a first plurality of contact means extending from said panel,

an aligning pin and an aligning bushing near opposite sides of said panel respectively, and

a riding pin near each corner of the side of said bushing and projecting beyond said contact means for protecting them together with the aligning pin during handling of the patch panel; and a terminal board including

a second plurality of contact means corresponding to said first contact means,

an aligning bushing and an aligning pin corresponding to and complementing said aligning pin and aligning bushing of said patch panel, and

apertures for receiving said riding pins, the clearing between said riding pins and said apertures being greater than between complementary aligning pins and bushings.

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4. A patch panel press assembly comprising:
a fixed contact board;

a patch panel; and

a press mounted above said fixed contact board and including a front loading frame for holding the patch panel and a handle operated eccentric for bringing a patch panel held by said frame into engagement with said fixed contact board;

said patch panel including an aligning pin attached to the trailing edge of the patch panel as it is inserted into the press; and

said fixed contact board including a bushing in the front edge of said board, the front portion of said bushing being flush with the surface of the fixed contact

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board lying immediately in front of said bushing and the remaining portion of said bushing projecting above the surface of said board.

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