

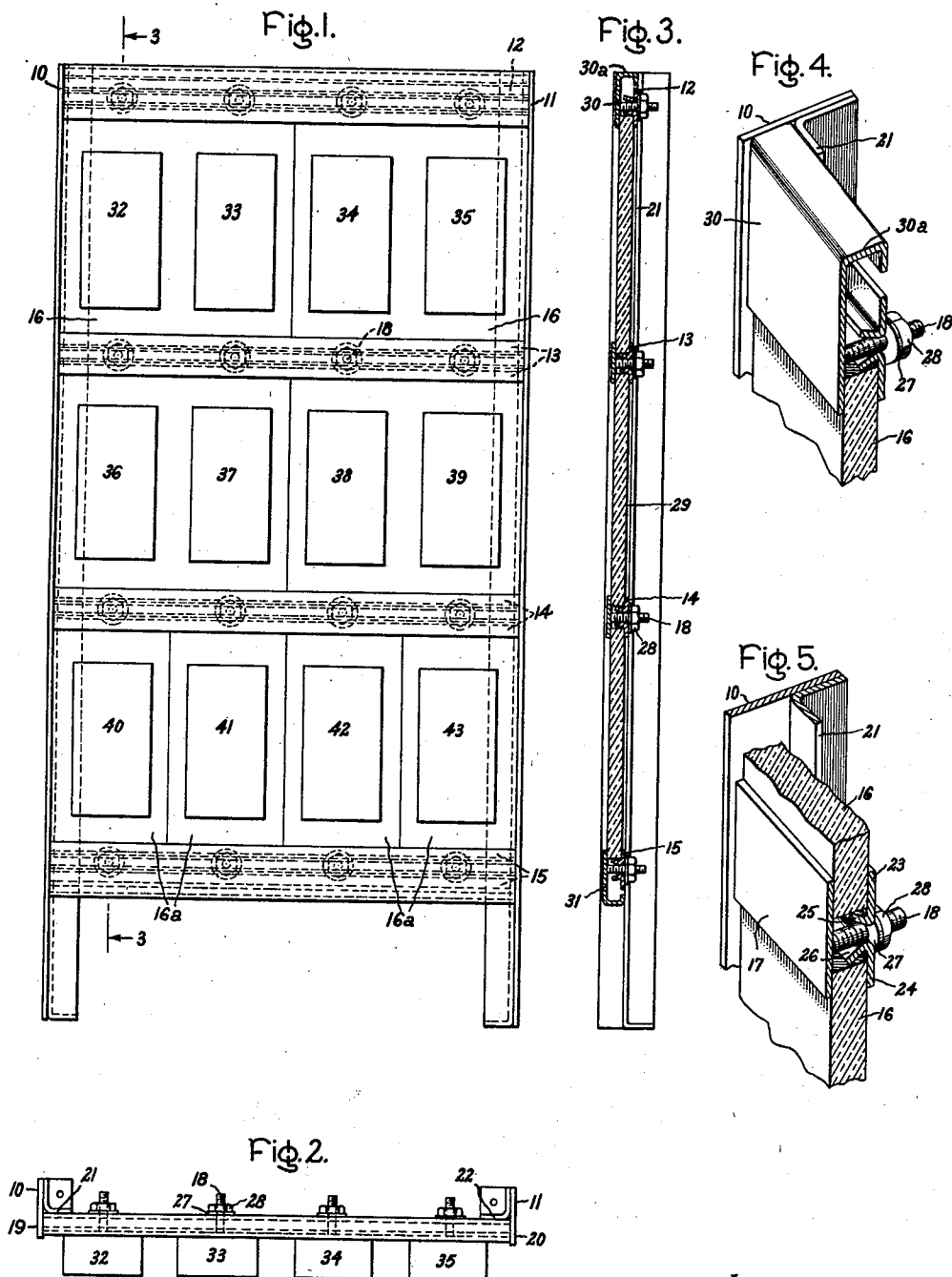
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PANEL

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My invention relates to panels for supporting electric control devices, particularly to panels for supporting the contactors and control devices for electric motors, and has for its object a simple and inexpensive panel construction.

Heretofore, panels for electric control devices have ordinarily been made from a large slab of electrically insulating material, such as slate or molded compound, of sufficient size for the mounting of all of the control devices on it. This slab is then supported in an upright position by suitable brackets or supporting framework secured to it. One disadvantage of such panels is the relatively high cost of large single piece slabs of insulating material as compared with a plurality of small slabs having collectively the same surface area. This higher cost of large slabs is particularly true of slate.

It is an object of my invention to provide an attractive and inexpensive framework for supporting a plurality of small slabs in juxtaposition to each other so as to give a desired surface area for the mounting of the electric devices.

In carrying out my invention in one form I provide a metal framework of upright and horizontally extending angle bars and providing enlarged recesses for the insertion of slabs of insulating material, together with cross plates at the junctions of the slabs for securing the slabs in place.

For a more complete understanding of my invention, reference should be had to the accompanying drawing in which Fig. 1 is a front elevation view of a motor controlled panel embodying my invention; Fig. 2 is a plan view of the panel shown in Fig. 1; Fig. 3 is a sectional view taken along the line 3—3 of Fig. 1; Figs. 4 and 5 are enlarged fragmentary views showing details of construction.

Referring to the drawing, in one form of my invention I provide two upright T angle end bars 10 and 11 which are secured together in parallel spaced relation by means of a plurality of pairs 12, 13, 14 and 15 of substantially horizontal angle irons having their ends secured respectively to the upright side angle irons 10 and 11. Thus a top pair of bars 12 is provided together with a bottom pair 15 and two intermediate pairs 13 and 14. Slabs 16 of electrically insulating material, such as slate, are fitted into the framework thus formed by the upright and horizontal angle bars in somewhat the manner of a picture in a picture frame. These slabs are secured in place by substantially horizontal metal plates 17 overlapping the edges of the slabs at the junctions of the

slabs, which plates are held in place by bolts 18 attached to them and extending between the angle bars of each pair.

Thus it will be observed from the drawing that the upright angle bars 10 and 11 are arranged with their flanges or sides 19 and 20 (Fig. 2) forming the sides of the panel framework, while their flanges 21 and 22 are at the back of the framework and form back supports. Actually, as shown in Fig. 2, for increased strength the angle bars 10 and 11 are formed as relatively wide upright plates to the inner sides of which angle bars are secured in lengthwise relation therewith and having the back flanges 21 and 22 extending toward each other.

Also, as shown clearly in Fig. 5 of the drawing, the horizontal angle bars of each pair of cross bars are arranged with rearward flanges 23 and 24 extending respectively upward and downward in the same plane to form back flanges for the framework against which the slabs 16 rest. These pairs of horizontal angle bars have their other flanges or sides 25 and 26 adjacent each other and extending toward the front of the framework, so that the flange 25 forms a bottom support for the slabs 16 just above and the flange 26 forms a stop for the top of the slab 16 just below. This is also shown clearly in Fig. 3. Moreover, the bars of each horizontal pair are spaced apart just far enough to allow the bolts 18 to be inserted freely between them. A washer 27 is put on the bolt and the nut 28 screwed tightly against the washer, whereby the horizontal front plate 17 is drawn tightly against the front sides of the slabs 16. In this way the top and bottom edges of the slabs are clamped between the horizontal bar 17 and a back flange 23 or 24 of an angle bar. Preferably, as shown, the bolts 18 are secured at spaced intervals to the rearward side of the plate 17, as by welding, so that the front exposed surface of the plate is unbroken.

As shown in Fig. 3, the horizontal pairs of angle bars have their rearward flanges 23 and 24 in overlapping relation against the rearward flanges 21 and 22 of the upright end bars on the front sides of the flanges 21 and 22 and, consequently, the outer upright side edges of the slabs are spaced from these back flanges 21 and 22 as indicated by the reference numeral 29. Thus the slabs are entirely self-supporting between the cross bars in a direction transverse to the thicknesses of the slabs. Preferably, the horizontal pairs of bars are secured to the upright bars by welding.

As shown in Figs. 3 and 4, a special horizontal

plate 30 is provided at the top of the framework. This plate has a flange 30a extending rearwardly and engaging the rearward flanges 21 and 22 of each upright bar. The flange 30a suitably spaces the top edge of the plate 30 so that the lower edge can be clamped against the slab 16 and forms a top edge of the panel. A similar construction is provided for the bottom plate 31 as shown in Fig. 3.

Another feature of the pairs of bars is that the included angle between the flanges is somewhat less than 90 degrees. Thus the angle between the flanges 23 and 25, as shown in Fig. 5, is approximately 60 degrees. This acute angle assures that the lower edge of the slab 16 bears tightly against the back flange 23 or 24 of the angle bar without the necessity of rounding off the corner of the slab. It will be understood that a 90 degree angle bar does not have a sharp angle at the junction of the sides, but this angle is filled in or rounded out somewhat. Consequently, if 90 degree angle bars were used, it would be necessary to round off the edge of the slab fitting in the angle iron to assure that the slab bears tightly against the back flange in each case.

With this metal framework a plurality of relatively small rectangular slabs 16 of insulating material can be used to build up a panel of a desired size. The slabs must each, of course, have an upright dimension substantially equal to the distance between the forwardly pointing flanges 25 and 26 of its upper and lower horizontal angle bars. The horizontal dimension, however, of each slab may be much less than the entire width of the panel. As shown, two top slabs 16 forming a set horizontally adjacent each other are provided between the pairs of horizontal bars 11 and 13, and also a set of two horizontally adjacent slabs are provided between the pairs 13 and 14. Between the pairs 14 and 15, however, a set of four bottom slabs 16a horizontally adjacent each other are provided. Of course, the size of the slabs will be determined by the size and character of the electrical devices mounted on them.

As shown, the horizontally adjacent slabs of each set have their adjacent upright or side edges in abutting engagement with each other, while the two outer upright side edges of each set are in substantial engagement with the bases of the end bars 10 and 11, i. e., the sides 19 and 20. In other words, in the lower set, for example, the four slabs have their edges which are adjacent each other in engagement with each other, while the left and right-hand outer upright edges are in substantial engagement with the sides 19 and 20. In this manner and together with the clamping plates 17, 30 and 31, a compact, closely fitting structure is formed closely simulating in appearance a plane surface panel provided with a single large slab of insulating material. It will be observed that the front of the panel, as seen in the drawing, presents a nearly smooth plane surface, the only parts projecting in front of the surfaces of the slabs being the relatively thin clamping plates 17, 30 and 31 and the slightly projecting edges of the end bars 10 and 11.

The electrical devices mounted on the panel have been indicated diagrammatically by rectangles. For example, as shown the two slabs in the upper section of the panel support four contactors 32 to 35 inclusive, two on each slab. The middle section has relays 36 to 39 inclusive mounted on it, two on each slab, while the lower section has four resistance controlling contactors 40 to 43 mounted on it, one contactor being

mounted on each of the four insulating slabs. Moreover, the size of the slabs is determined by the replacement requirements of the devices. Thus with each of the contactors 40 to 43 mounted on a separate slab, each contactor may be removed easily with its supporting slab and a new contactor and slab put in its place. It will be observed that this removal for replacement is very readily done by simply removing the adjacent clamping plates 17.

It will be understood that suitable means (not shown) will be provided for holding the assembled panel in its upright position, this supporting means being secured to the upright side angle bars.

While I have shown a particular embodiment of my invention, it will be understood, of course, that I do not wish to be limited thereto, since many modifications may be made and I, therefore, contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A panel for supporting electric apparatus comprising two parallel upright end T bars arranged with their bases on their outer sides and with their central flanges extending toward each other, at least three pairs of angle bars, top, bottom and intermediate, extending substantially horizontally between said upright bars and having their ends secured to said central flanges of said upright bars in front overlapping relation therewith, said pairs of horizontal bars being spaced vertically apart and the bars of each pair being close together with the top bar of each pair having a back flange extending upward and a bottom flange extending forward and the bottom bar of each pair having a back flange extending downward and a top flange extending forward, rectangular slabs of electrically insulating material extending between said pairs of horizontal bars so that each slab rests against the back flanges of adjacent top and bottom bars of the pairs and is supported on the forwardly projecting flange of said adjacent bottom bar, there being top and bottom slabs and at least two slabs having bottom and top edges adjacent each other and supported by said intermediate pair of horizontal bars, an intermediate clamping plate overlapping said adjacent edges, bolts secured to said plate extending between said intermediate pair of horizontal bars for clamping said two slabs against said back flanges, a top clamping plate extending between the tops of said upright bars and having its lower edge overlapping the upper edge of the said top slab, projections on the upper side of said plate engaging at each end the central flanges on said upright bars, and clamping bolts secured to said top plate extending between said top pair of horizontal bars for clamping the lower edge of said plate against the upper side of said top slab and said projections against said central flanges on said upright bars.

2. A panel for supporting electric apparatus comprising two parallel upright end T bars arranged with their bases on their outer sides and with their central flanges extending toward each other, at least three pairs of angle bars, top, bottom and intermediate, extending substantially horizontally between said upright bars and having their ends secured to said central flanges of said upright bars in front overlapping relation therewith, said pairs of horizontal bars being spaced vertically apart and the bars of each pair being

close together with the top bar of each pair having a back flange extending upward and a bottom flange extending forward and the bottom bar of each pair having a back flange extending downward and a top flange extending forward, rectangular slabs of electrically insulating material extending between said pairs of bars so that each slab rests against the back flanges of adjacent top and bottom bars of the pairs and is supported on the forwardly projecting flange of said adjacent bottom bar, there being a set of top slabs horizontally adjacent each other and a set of bottom slabs horizontally adjacent each other and at least two sets of said horizontally adjacent slabs having bottom and top edges adjacent each other and supported by said intermediate pair of horizontal bars, an intermediate clamping plate overlapping said adjacent edges, bolts secured to said plate extending between said intermediate pair of horizontal bars for clamping said two sets of slabs against said back flanges, a top clamping plate extending between said end bars and having its lower edge overlapping the upper edge of the said top set of slabs, the upper side of said plate being bent over rearwardly so as to form a top edge of the panel and engage at each end the central flanges on said end bars, clamping bolts secured to said top plate extending between said top pair of horizontal bars for clamping the lower edge of said plate against the upper sides of said top set of slabs and the upper edge of said plate against said central flanges on said end bars, a bottom clamping plate similar in construction to said top plate for securing the lower edges of said bottom set of slabs, and bolts secured to said bottom plate passing between the bars of said bottom pair of horizontal bars, the adjacent upright edges of said slabs in a set being in engagement with each other and the outer upright edges of said sets of slabs being in substantial engagement with the bases of said end bars.

3. An electric panel comprising two upright bars provided with upright side and back flanges, a plurality of pairs of supporting cross angle bars having their ends secured to said upright bars, said pairs of cross bars being spaced apart with the bars of each pair close together, the top bar of each pair having a bottom flange extending forward and a back flange extending upward and positioned at each end against said back flanges on said upright bars and the bottom bar of each pair having a top flange extending forward and a back flange extending downward and positioned at each end against said back flanges on said upright bars, a set of rectangular slabs made of electrically insulating material between said bottom and top forwardly extending flanges of adjacent pairs of said cross bars, clamping plates engaging respectively the top and bottom edges of said slabs so as to hold said slabs against said downwardly and upwardly extending back flanges of said pairs, securing means for said clamping plates extending between the bars of each pair, said slabs having upright outer side edges adjacent said upright back flanges spaced from said upright back flanges by said cross bar back flanges so that said slabs are self-supporting between said pairs of supporting cross bars, and one or more electric devices mounted on said slabs, the adjacent inner upright edges of said slabs being in engagement with each other and the outer upright edges of said set of slabs being in substantial engagement with the side flanges of said upright bars thereby to form with said clamping plates a substantially smooth unbroken panel surface and each of said slabs together with the electric device mounted on it being removable for repair or replacement by removing said clamping plates.

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