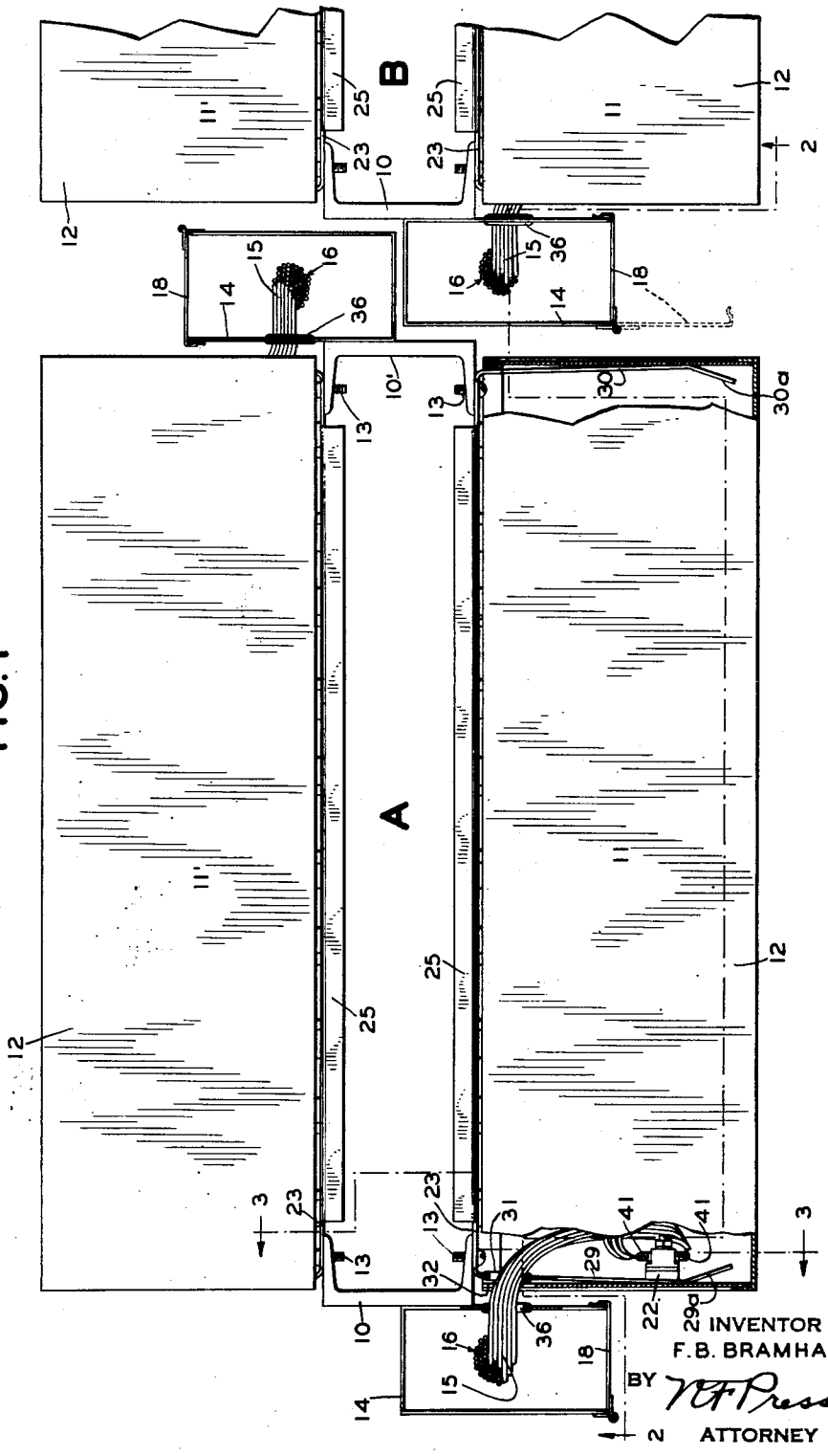
Oct. 22, 1940. F. B. BRAMHALL 2,219,250

ELECTRICAL APPARATUS PANEL STRUCTURE

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FIG. 1



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FIG. 2

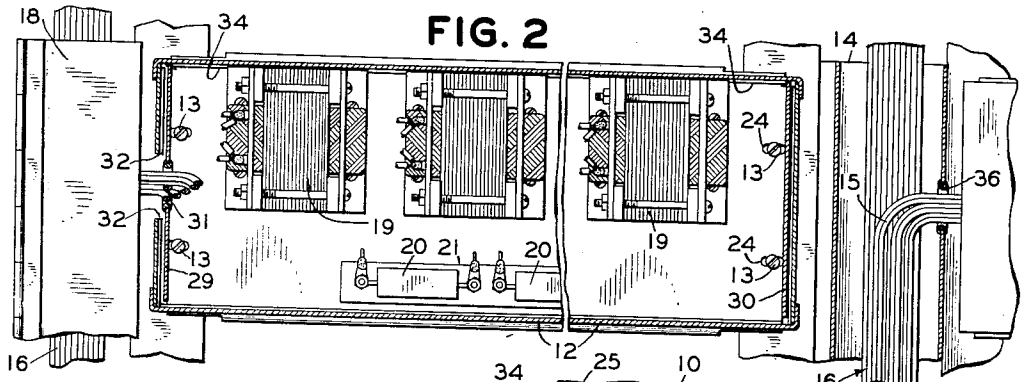


FIG. 3

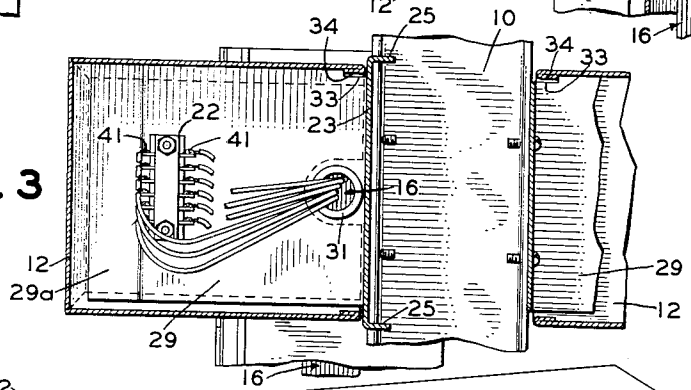
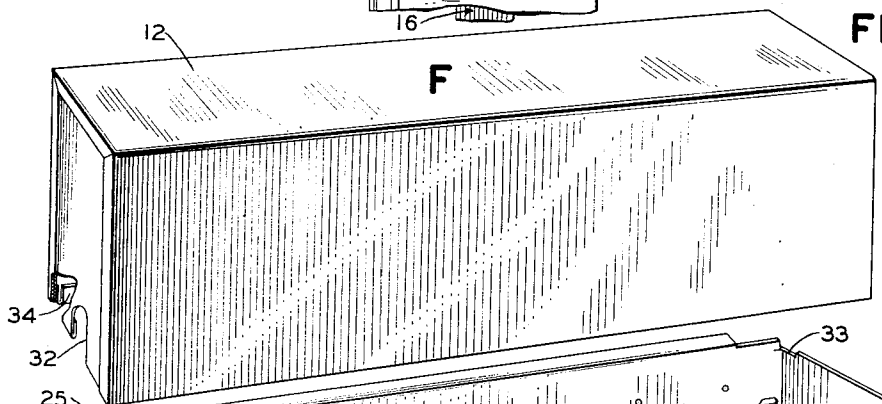


FIG. 5



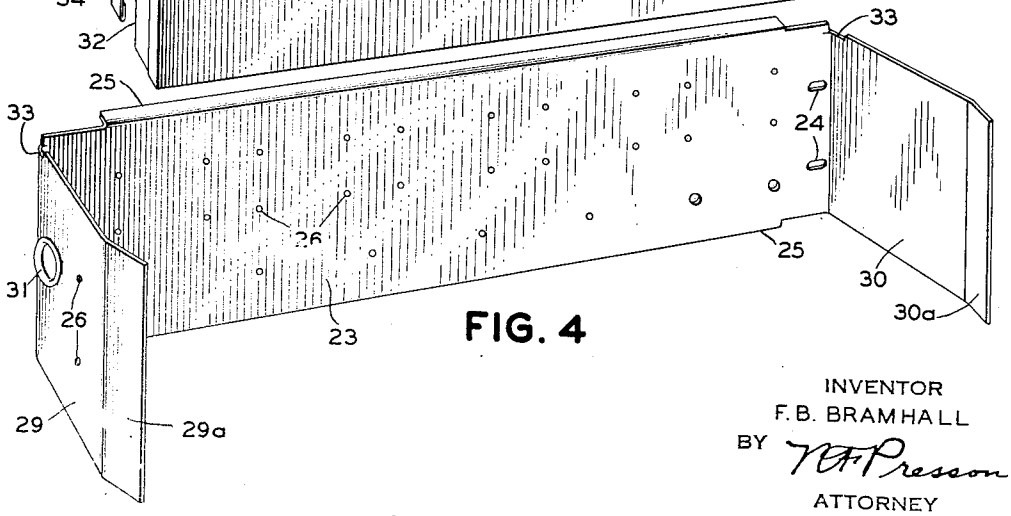


FIG. 4

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UNITED STATES PATENT OFFICE

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ELECTRICAL APPARATUS PANEL STRUCTURE

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Application December 10, 1937, Serial No. 179,214

6 Claims. (Cl. 175—307)

This invention relates to an electrical apparatus panel structure, and more particularly to a novel and improved panel and associated structure for mounting telegraph apparatus and the like.

The growing amount of telegraph apparatus which must be installed in large central offices makes the problem of space requirements an important one, and usually this problem necessitates the mounting of equipment on vertical racks or frames constructed of channel iron uprights arranged in bays and having suitable supporting means at the base and top of the racks. The apparatus elements, e. g., tuning devices, amplifiers, etc., are assembled in associated groups on moderate sized panels which are then mounted one above the other on the vertical racks; preferably, and in accordance with the invention, the apparatus panels and the apparatus carried thereby are mounted on both sides of the vertical racks, with vertical wiring ducts between adjoining bays of vertical racks. In addition to the requirement of adequate strength to support the attached equipment, provision must also be made for suitable cover means to exclude dust and dirt from the apparatus and to protect it from mechanical injury.

One of the objects of the present invention is to provide a suitable apparatus panel, and cover therefor, which will enable the apparatus to be suitably mounted on both sides of vertical supporting racks.

Another object is a suitable one-piece apparatus panel in which there are no detachable parts to become loosened or lost.

A further object of the invention is to provide panel apparatus of the character described having suitable terminal block mounting structure.

Other objects are the provision of improved means to positively lock the cover in position on the apparatus panel, and to enable the removal and replacement of the cover with minimum possibility of establishing contact with live electrical circuits.

An additional object is to provide suitable apparatus of the character described, which may be made by quantity production methods, and which may be assembled with a minimum of manual labor, and therefore may be furnished and installed at a lower cost.

The invention further resides in the features of combination, construction and arrangement hereinafter described and claimed.

For an understanding of the invention, and for illustration of one of the various forms it may take, reference is had to the accompanying drawings, in which:

Figure 1 is a plan view of adjoining bays of a vertical rack having mounted thereon apparatus panels in accordance with the invention, showing the panel covers in place;

Figure 2 is a view, in elevation, showing the interior of one of the apparatus panels and apparatus mounted thereon, taken along the line 2—2 of Fig. 1;

Figure 3 is a transverse section, taken along the line 3—3 of Fig. 1, showing certain details of the apparatus panels;

Figure 4 is a perspective view of the apparatus panel with the cover removed; and

Figure 5 is a perspective view of the cover removed from the apparatus panel.

Referring now to Fig. 1 of the drawings, there is shown a plan view of an apparatus supporting framework comprising a vertical rack having uprights 10, 10', arranged in bays A, B, these uprights extending vertically from the floor towards the ceiling of the central office or other room in which telegraph apparatus and the like may be located. The bases of the uprights usually are secured, by means of a channel iron or angle iron base, to the floor of the office, and the upper ends of the uprights may extend to the ceiling and be secured thereto, in a manner well known in the art, or they may be secured, in known manner, to laterally extending framework sections so that the rack is self-supporting. Any other suitable method of supporting the uprights 10 and 10' may, of course, be employed.

As shown in the figure, each of the bays A, B comprises a number of oppositely disposed apparatus panels 11, 11', each of which has a removable cover 12 that encloses and protects the apparatus carried by the panels. The panels on each side of the rack are mounted one above the other by any suitable means, such as screws 13 which thread into the channel uprights 10, 10'. It will be understood that a number of these apparatus panels are thus mounted one above the other in each bay, although to simplify the drawings, only two opposed panels per bay are shown in the figure. Intermediate the channel irons 10 and 10' of adjoining bays are vertical wiring ducts or conduits 14, each of which carries the conductors 15 for one vertical row of the apparatus panels. The conductors within each conduit may be grouped into a cable 16, as shown in Fig. 2, or may lie loosely in the conduit, as desired. Each of the conduits 14 has doors 18 opposite the associated apparatus panels, the doors

opening outwardly, as indicated in dotted outline in the lower right hand portion of Fig. 1, to facilitate installation and inspection of the conductors.

Fig. 2 shows how the apparatus may be mounted on the apparatus panel, which apparatus may comprise tuning devices 19, condensers 20 and relays, amplifiers and other devices employed in telegraph systems and the like. A terminal block 21, Fig. 2, and a terminal block 22, Fig. 3, also are mounted on the apparatus panel in a manner to permit ready accessibility with a minimum consumption of space.

Fig. 4 shows one of the apparatus panels removed from the vertical rack, the panel being viewed from the front thereof. The panel cover, Fig. 5, is shown with the front or outer portion F upwardly, more clearly to disclose certain details of construction of the cover. As will be evident from Fig. 4, each apparatus panel or mounting plate 23 may be stamped from sheet metal having a thickness, for example, of the order of one-sixteenth of an inch, the panel having two slots 24 at each end thereof for receiving the mounting screws 13 shown in Figs. 1 and 2. The panel is provided with beaded or rolled portions 25 at its upper and lower edges to provide greater strength and rigidity to the plate. The panel is drilled and tapped, as at 26, to receive machine screws and studs for mounting the apparatus on the panel.

Secured to, and preferably integral with the panel 23, are two extending end portions 29, 30 of spring metal adapted to bear against the inner surfaces of the ends of the cover 12 and firmly hold the cover in position in slidable frictional gripping engagement therewith, as may be seen from Fig. 1. The members 29 and 30 each is slightly less in width than the inside height of the cover to enable removal of the cover, but is sufficiently wide to insure a close fit between the members and the cover thereby to obviate the possibility of establishing accidental contact with the apparatus or live electrical circuits associated therewith. The ends 29 and 30 of the panel are provided with inwardly projecting portions 29*a* and 30*a* to facilitate replacement of the cover.

The end portions 29 and 30 of the panel have notches 33 into which the beaded reenforcing edge 34 of the top of the cover 12, Fig. 5, drops when the cover is on, thus preventing the cover from being displaced or removed until the cover is raised a slight distance vertically to enable the beaded edge 34 to clear the slots 33. It will be noted that no screws or detachable parts are required to hold the cover locked in position.

An aperture for the passage of the incoming conductors 15 is provided in the end portion 29, an eyelet or grommet 31 being used to prevent abrasion of the insulation on the conductors where they pass through the aperture. The cover 12 has a cutaway or apertured portion 32 to provide clearance for the grommet and conductors when the cover is in place. The conduit 14 also has an apertured portion with a grommet 36, Fig. 1, adjacent to each apparatus panel for the passage of the conductors 15, the foregoing apertured portions being in alignment with each other.

It will be seen from Fig. 1 that all incoming connections are made at an end of each panel, and thus no connectors or conductors are required on either the front or rear of the panel, and therefore the panels may be placed directly opposite each other in the same bay. By means of this arrangement the number of panels which may be mounted on the vertical framework is approximately twice the number possible with panels of the type heretofore employed in which the connections are brought out from the rear of the panel. Fig. 3 shows the terminal block 22 having terminal lugs 41, to the outer ends of which the incoming conductors are soldered, this providing for quick and easy disconnection of any of the conductors in case of circuit trouble. The conductors from the apparatus on the panel are connected to the other ends of the terminal lugs 41, and thus the apparatus may be connected up and tested prior to the installation of the panel on the vertical frame, so that only a minimum amount of soldering is required when the panel is in position.

Various other modifications and forms will readily occur to those skilled in the art without the exercise of inventive skill, and the invention therefore is not restricted except as indicated by the scope of the appended claims.

I claim:

1. In combination, an apparatus panel for mounting electrical apparatus, said panel being adapted to be secured to a supporting frame, the panel comprising a plate body portion for mounting the apparatus and having means to enable the panel to be secured to the supporting frame, said plate body having portions extending outwardly from the ends thereof and substantially at right angles to the plate, a readily detachable cover for the apparatus panel enclosing the apparatus mounted on the panel, said cover having the ends thereof adapted to engage said outwardly extending end portions of the plate in slidable frictional gripping engagement therewith, and means for locking the cover in position on the apparatus panel comprising complementary portions on the extending end portions and the cover which engage in such manner that the cover must be raised relative to the apparatus panel to release the complementary locking portions from each other before the cover can be removed.

2. In combination, an apparatus panel for mounting electrical apparatus, said panel being adapted to be secured to a supporting frame, the panel comprising a rectangular plate having means to enable the panel to be secured to the supporting framework, said rectangular plate having portions extending outwardly from the ends thereof and substantially at right angles to the plate, a readily detachable cover for the apparatus panel enclosing the apparatus mounted on the panel, said cover having the ends thereof adapted to engage said outwardly extending end portions of the plate in slidable frictional gripping engagement therewith, and means for locking the cover in position on the apparatus panel comprising complementary portions on the extending end portions and the cover which engage in such manner that the cover must be raised vertically relative to the apparatus panel to release the complementary locking portions from each other before the cover can be removed.

3. In combination, an apparatus panel for mounting electrical apparatus, said panel being adapted to be secured to a supporting frame, the panel comprising a rectangular plate having means to enable the panel to be secured to the supporting framework, said rectangular plate having portions extending outwardly from the ends thereof and substantially at right angles to the plate, a cover for the apparatus panel, said cover having the ends thereof adapted to engage said outwardly extending end portions of the

plate in slidable frictional gripping engagement therewith, and means for locking the cover in position on the apparatus panel comprising complementary portions on the extending end portions and the cover which engage in such manner that the cover must be raised vertically relative to the apparatus panel to release the complementary locking portions from each other before the cover can be removed, said extending end portions being of such width relative to the inside height of the cover as to obviate the possibility of establishing accidental contact of the cover with the electrical apparatus on the panel, the width of said end portions being sufficiently less than the inside height of the cover to enable the cover to be raised to release the complementary locking portions and permit removal of the cover.

4. In combination, an apparatus panel for mounting electrical apparatus, said panel being adapted to be secured to a supporting frame, the panel comprising a rectangular plate having means to enable the panel to be secured to the supporting framework, said rectangular plate having portions extending outwardly from the ends thereof and substantially at right angles to the plate, a cover for the apparatus panel, said cover having the ends thereof adapted to engage said outwardly extending end portions of the plate in slidable frictional gripping engagement therewith, and means for locking the cover in position on the apparatus panel comprising complementary portions on the extending end portions and the cover which engage in such manner that the cover must be raised vertically relative to the apparatus panel to release the complementary locking portions from each other before the cover can be removed, one of said extending end portions and one end of the cover having aligned apertured portions for receiving conductors, and a terminal block for said conductors secured to the inner side of said one of the extending end portions.

5. A one-piece apparatus panel of the character described, comprising a rectangular metal plate, said plate having a body portion for supporting electrical apparatus, and end portions bent outwardly substantially at right angles to the body portion, said end portions being adapted to support a cover for the apparatus and at least one of the end portions having means integral therewith for engaging and positively locking the cover in position on the panel in such manner that the cover must be raised vertically relative to the apparatus panel to release the locking means before the cover can be removed.

6. A one-piece apparatus panel of the character described adapted to be mounted on a supporting frame, said panel comprising a rectangular plate formed from sheet metal, said plate having a flat body portion for supporting electrical apparatus and flat end portions bent outwardly substantially at right angles to the body portion, said body portion and said end portions being disposed in vertical planes when the apparatus panel is mounted on its supporting frame, said end portions being adapted to spring outwardly to engage and support a cover for the apparatus and each having a portion thereof formed to provide means for engaging and positively locking the cover in position on the panel in such manner that the cover must be raised vertically relative to the apparatus panel to release the locking means before the cover can be removed.

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