Sept. 13, 1938. G. M. REED 2,130,250

ELECTRIC SWITCH GEAR

Filed Aug. 1, 1936

Fig. 1.

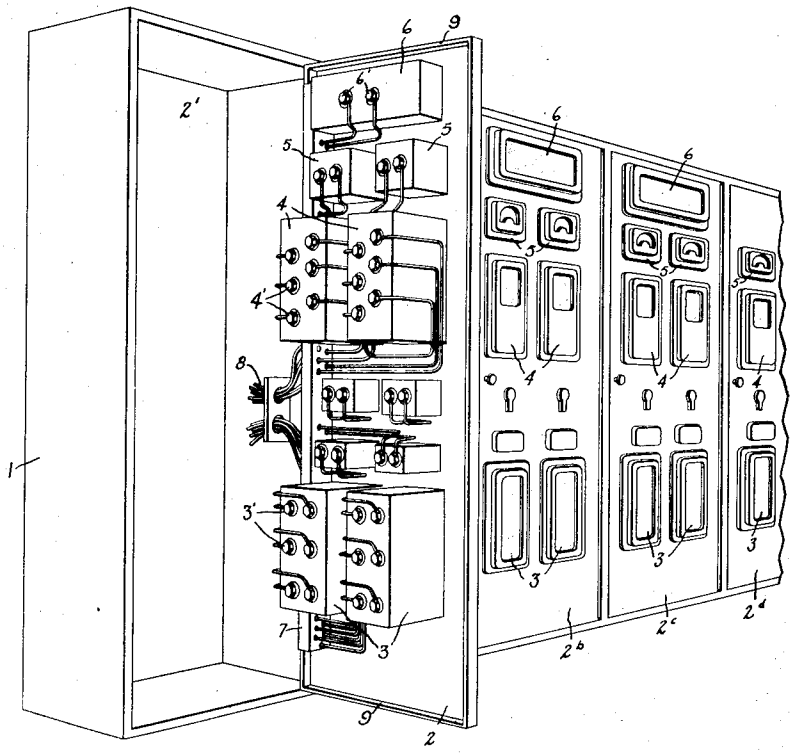
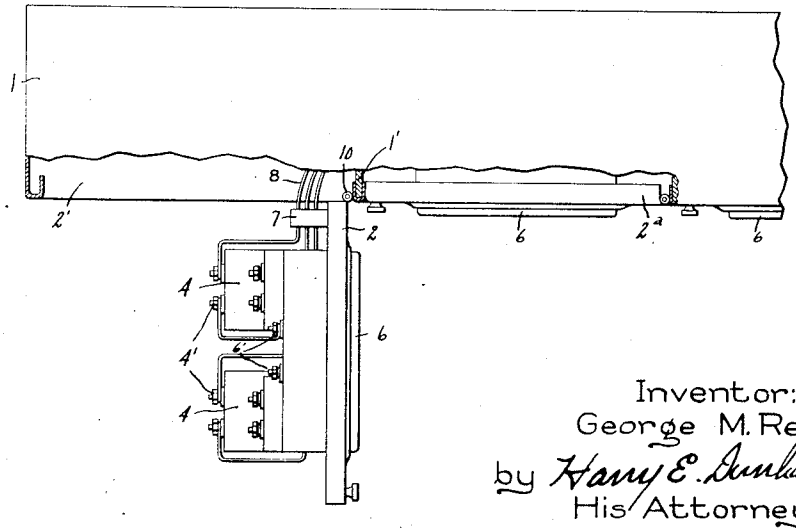


Fig. 2.



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Patented Sept. 13, 1938 2,130,250

UNITED STATES PATENT OFFICE

2,130,250

ELECTRIC SWITCH GEAR

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Application August 1, 1936, Serial No. 93,845

2 Claims. (Cl. 175—298)

My invention relates to electric switchgear, more particularly to switchboards of the hinged panel type on which are mounted switch control means, recording and indicating instruments and meters, relays, etc.

The usual arrangement in switchboards of the above type comprises a plurality of vertically mounted and alined sections or panels on one side of which are mounted for inspection and observation the instruments, meters, etc. The other or rear side of the board generally accommodates the wiring and other devices, such as fuses, resistors, terminal blocks, etc., the rear side being either open or enclosed, as in metal enclosed switchgear, by a sheet metal housing. The hinged panels, which swing outwardly from the face of the switchboard, permit access to the rear of the board and must necessarily be of appreciable width or appreciably spaced in order to prevent damage by collision between the protruding instruments or meters on an open and closed panel, respectively. This type of switchboard, therefore, has a comparatively poor space factor with respect to the instruments and meters. Where available space for the switchboard is limited or restricted, as in certain industrial and other installations, this design factor is clearly a disadvantage.

A principal object of my invention is the provision of an improved switchboard of the hinged panel type which is compact with respect to the necessary instrument space, readily accessible, efficiently protected and neat in appearance.

My invention will be more fully set forth in the following description referreing to the accompanying drawing, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

Referring to the drawing, Fig. 1 is an elevational view in perspective of a hinged panel type switchboard embodying the present invention, and Fig. 2 is a plan view, partly in section, of part of the switchboard shown by Fig. 1.

The electric switchboard shown by Fig. 1 is, in the present instance, of the metal enclosed type and comprises a stationary supporting frame and sheet metal housing 1 on which are vertically hinged a plurality of sheet metal panels 2, 2a, 2b, 2c, etc., the panels having the dual function of enclosing individual compartments, such as 2', formed in the housing 1 and supporting the various electric devices usually found on a switchboard. As shown, all of the panel sections are hinged and when closed are in plane alinement to form the switchboard, although it should be understood that some of the panel sections, if desired, may be fixed.

For the purpose of simplifying the disclosure, the electric apparatus, such as switches, etc., usually mounted within the compartment 2' and associated with the devices on the switchboard, are omitted from the drawing since this apparatus forms no part of the present invention. The devices mounted on the panel 2, for example, may comprise the usual relays 3; watthour meters 4, indicating and recording instruments 5 and 6, terminal blocks 7, etc. and the usual circuit wiring associated therewith and flexibly led, as at 8, to the stationary apparatus in a compartment 2'. The sheet metal panel 2 is provided with inwardly turned flanges as at 9 and is suitably hinged at 10 (Fig. 2) with respect to the supporting frame 1' of the housing 1 so that the panel swings outwardly as illustrated.

In previous installations it has been customary to mount the comparatively bulky instruments and meters, 3, 4, 5, 6, respectively, on or at the outer face of the panel 2, the instruments and meters projecting appreciably beyond the face of the panel and the terminals for these devices being on or closely spaced with respect to the rear of the panel.

Referring more particularly to Fig. 2, it will be apparent that were the instruments 6 on panels 2 and 2a mounted in this manner they would either be in direct contact or even prevent opening of the panel 2 to the position shown. Such an arrangement would obviously be unsuitable since serious damage to the instruments could readily occur in case of sudden opening of the panel. Accordingly, in such installations the panels 2, 2a, etc. are spaced or widened to such an extent that no interference between the instruments can occur, such spacing, as above pointed out, resulting in a poor space factor in so far as the instruments and meters themselves are concerned.

For the purpose of greatly improving this space factor and for greatly improving the appearance and utility of the board, the instruments 3, 4, 5, 6, etc. are inserted within openings of corresponding size in the sheet metal panels so that the faces of the instruments and meters are substantially flush, in a practical sense, with the face of the board as illustrated more clearly in Fig. 2. The instruments and meters are suitably secured to the panel in this flush mounted position and the associated terminals 3', 4', etc. which are mounted at the rear side of the panel are suit-

ably connected to the circuit wiring leading to a terminal block as at 7.

As clearly illustrated by Fig. 2, the spacing between the panels 2 and 2a may be reduced, if desired, to the actual hinge support and the panels themselves may be designed for the actual instrument and meter space required. In addition to the advantages secured by such a compact arrangement, the instruments and meters being now substantially behind the switchboard or enclosed by a metallic housing are more effectively protected from damage due to exterior mechanical causes and present a uniformly neat and systematic appearance. In addition to the advantages above pointed out, the flush mounted arrangement of the instruments and meters on the panels results in a more clear aisle space where boards are mounted in parallel rows facing each other.

It shall be understood that the present invention is not limited to an enclosed arrangement, the hinged type panelboard in such cases having the rear side comparatively open or suitably spaced from a wall.

It should be further understood that my invention is not limited to specific details of construction and arrangement thereof herein illustrated, and that changes and modifications may occur to one skilled in the art without departing from the spirit of my invention.

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

1. An electric switchboard of the hinged panel type comprising a fixed supporting structure, a plurality of vertically positioned panel sections mounted on said structure and normally in generally plane alinement to form a switchboard, said panels having electrical devices including instruments and meters mounted in apertures in said panels, said instruments and meters having the faces thereof visible on one side of said switchboard and the terminals and circuit wiring therefor being at the opposite or rear side thereof, the faces of said instruments and meters approximating a flush mounted relationship with respect to the front of said switchboard, and means for hinging said panel sections for individual rotation away from the rear side of said switchboard, said individual panel sections corresponding in width to the necessary instrument and meter space and being closely spaced by reason of said flush-mounted relationship for minimum switchboard width with reference to the adjacent panel sections so that there is no appreciable interference between said meters and instruments when any one of said panel sections is opened.

2. An electric switchboard of the hinged panel type comprising a sheet metal switch housing having individual compartments formed therein, a plurality of vertically positioned panel sections individually hinged on said housing for pivotal movement in the same direction for closing said compartments respectively, said panels having electrical devices including instruments and meters extending through and mounted therein, the faces of said instruments and meters being visible on the front side of said panels and the terminals and circuit wiring therefor being at the opposite or rear side and normally in said compartments, said instruments and meters being carried mainly at the rear side of said panels so that the front of said panels approximates a flush mounted relationship between the instruments and panels, the distance between the hinged mounting of each panel section and the nearest devices on the adjacent panel section being reduced to a minimum whereby interference is substantially eliminated between said devices on adjacent panel sections when a panel section is open.

GEORGE M. REED.