

March 29, 1960

N. E. SWANSON

2,930,939

PANEL

Filed Aug. 30, 1954

FIG. 1.

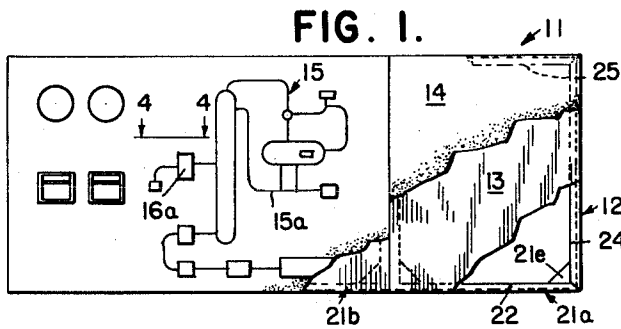


FIG. 3.

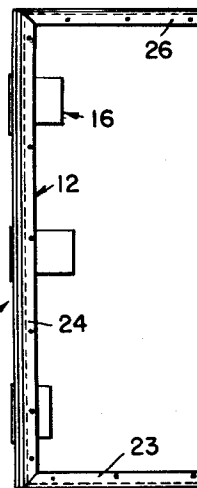


FIG. 2.

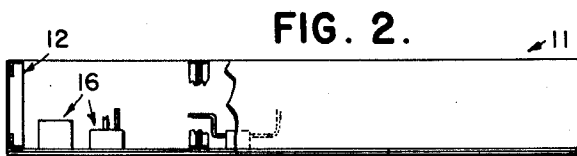


FIG. 4.

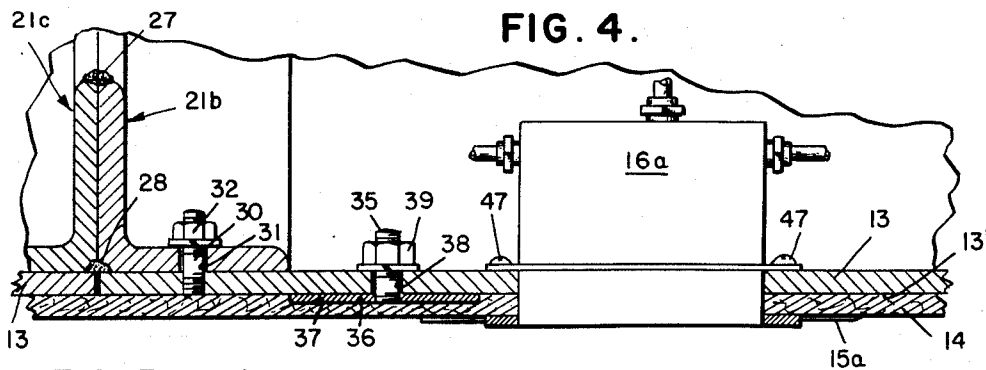


FIG. 5.

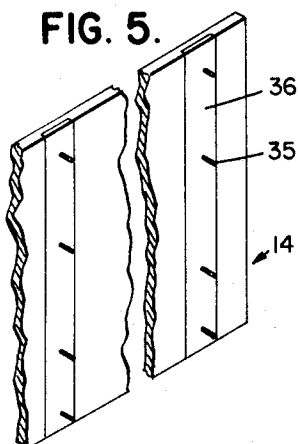


FIG. 6.

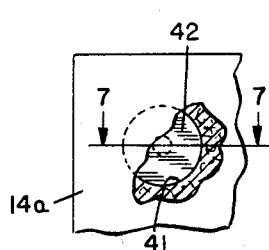
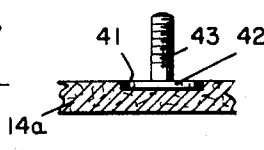


FIG. 7.



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PANEL

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Application August 30, 1954, Serial No. 453,112

3 Claims. (Cl. 317-99)

This invention relates to graphic control panels.

A graphic control panel is a panel structure wherein a schematic diagram of an industrial process, electrical system or the like is delineated on the front of a panel and various instruments and controls are mounted on the panel structure in their appropriate positions in the diagram whereby an operator can immediately see with which phase of a process or circuit each control or instrument is associated.

Conventional graphic panels have consisted of steel plates flanged at their edges and bolted together to achieve the desired size. Such panels are not self-supporting and hence are attached to a ceiling or wall of the control room to provide the necessary support therefor. The face of the panel is usually painted to delineate the flow diagram or electric circuit although in some cases metal strips are attached to the panel for this purpose.

Some use also has been made of panels consisting of plywood bolted to a frame with a thin facing sheet of a so-called "plastic," such as formica, over the plywood. With this type of panel the flow diagram is usually inlaid in the facing sheet prior to cementing the sheet to the plywood.

Such panels as those described above, and as far as I know, all panels heretofore used have one or more serious disadvantages as follows: they are not self-supporting; painted panels require frequent repainting at considerable cost; the diagrammatic material cannot be readily changed; the panel structure is inflexible in that it cannot be readily removed for major alternations as required where process changes are made and the panels cannot be disassembled sectionally to effect partial changes.

An object of the present invention is to provide a panel or control center construction embodying a graphic panel of novel and improved design which does not have the above-noted disadvantages of prior types of control panels.

A particular object of the invention is to provide an improved and novel control center construction embodying panel means in which the entire structure is self-supporting and can be placed anywhere space is available.

A further object of the invention is to provide a control center of the graphic panel type which is flexible in that the instruments, controls and the like mounted thereon can be readily changed and various portions of panel structure removed and replaced including the flow diagram or circuit schematic means thereon.

Another object is to provide a novel construction embodying a framework, a plate means detachably secured to the framework and facing means covering the plate means and detachably secured thereto.

Still another object is to provide a novel means for attaching non-metallic sheets to metal plates or other objects.

These and other objects will be apparent from the drawing and the following description thereof.

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Referring to the drawing:

Fig. 1 is a front elevational view, partly broken away, of a graphic panel control center structure embodying the invention;

Fig. 2 is a plan view, partially broken away, of the structure of Fig. 1;

Fig. 3 is an end elevational view of the structure of Fig. 1 on a larger scale;

Fig. 4 is an enlarged fragmentary sectional view on line 4-4 of Fig. 1;

Fig. 5 is a fragmentary perspective view of the rear side of a facing sheet;

Fig. 6 is a fragmentary front elevational view, partly broken away, of a portion of a facing sheet showing an alternate form of attachment means; and

Fig. 7 is a sectional view on line 7-7 of Fig. 6.

More particularly describing the invention, I show a control center structure in Fig. 1, generally indicated by 11. This includes a frame 12, a plurality of plates 13 secured to the frame, and facing sheets 14. On the front side of the facing sheets is delineated schematically or diagrammatically a particular industrial process, electrical system or the like, indicated by 15. The control structure also includes a plurality of functional elements, some of which may be instruments and other control devices, such as switches, valves or the like. These are generally indicated by 16.

The frame 12 is preferably fabricated in sections, such as those indicated by 21a, 21b, and 21c in sufficient number as may be required for any particular control center. Each section is of open, rectangular construction and may be fabricated of steel members of angle cross section. By way of example, the section 21a is formed of two lower main members 22, two lower cross members 23, four upright members 24, two upper main members 25, and two upper cross members 26. These may be welded or otherwise secured together and triangular bracing plates 21c provided at some of the corners as shown.

The individual sections 21a, 21b, and 21c are welded together at the areas 27, 28 as best shown in Fig. 4.

To the front of the frame I attach a plurality of steel plates 13, which, for convenience, may be of any desired width but are preferably of sufficient width to overlie at least two of the upright members of the frame. Stud 30 mounted in the plates and extending through holes 31 in the frame are used for attaching the plates to the frame, nuts 32 being used to secure the studs.

The plates 13 should be of sufficient thickness to support a required number of the functional elements 16 thereon and they should present a flat, forward surface 13' against which an outer facing sheet may be mounted.

For the facing sheet I prefer to use a so-called "plastic" material, such as formica which is a well-known product. One or more facing sheets 14 is used depending upon the area to be covered, and these are detachably secured to the steel plates 13 by means of stud means 35. In the form of the invention shown in Fig. 5 the stud means comprises a plurality of metal strips 36 mounted in grooves 37 in the rear surface of the facing sheet 14. The strips 36 are cemented in place by a suitable type of cement capable of joining metal and plastic. The strips 36 carry a plurality of rearwardly projecting threaded studs 35 and the plates 13 are provided with apertures 38 to accommodate these. Nuts 39 serve to detachably secure the facing sheets 14 to the front surface of the plates 13.

In Figs. 6 and 7 I show an alternate type of securing means. Referring to these figures, numeral 14a indicates a facing sheet, and this is provided with a plurality of circular recesses 41 on its rear surface to receive the

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flat heads 42 of studs having threaded shanks 43. The heads 42 are cemented in the recesses of the sheet.

For the purpose of delineating the required flow diagram or the like on the front of the facing sheets, I provide strip and sheet delineation material which is the same as or compatible with the facing sheets and this is cemented to the facing sheet preferably with a cement which will permit the removal of the delineating material by application of solvent. A delineation strip is indicated by 15a in Fig. 4. The functional elements 16 are secured directly to the plates 13 and by way of example, the functional element 16A is shown in Fig. 4 mounted on the steel plate 13 by means of screws 47. Openings are provided in the steel plate and the facing sheet to accommodate the portion of the functional element which it is desired to have visible or accessible from the front side of the panel structure and in Fig. 4 the functional element 16A is shown projecting through the openings in the plate and facing sheet, respectively.

It will be apparent that the above-described structure provides a highly flexible, self-supporting control center of the graphic panel type. The construction is such that initial assembly is relatively easy, and subsequent major or minor changes can be effected in any part.

Although I have illustrated and described a preferred form of my invention, I contemplate that various changes and modifications can be made therein without departing from the invention, the scope of which is indicated by the following claims.

I claim:

1. In a graphic control center, a self-supporting frame adapted to rest on a floor, a plate removably secured to said frame and having openings therein, a plurality of functional devices removably mounted on the rear of said plate and extending forwardly through said openings, a facing sheet having openings of a size and shape to accommodate the devices and removably secured to the front face of the plate by means of a support member

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recessed into the rear face of the sheet and a stud carried by said support member and extending through said plate, said facing sheet carrying delineations thereon to graphically represent the process or system to which the functional elements relate, said delineations being directed toward and from the openings in the sheet to include the elements in the graphic representation.

2. In the graphic control center of claim 1, the sheet having a recess in the rear face thereof extending from one edge to an opposite edge, said support member comprising an elongated strip mounted in the recess and having its outer face flush with the rear face of the strip and studs projecting from the strip into openings in the plate.

3. In a graphic panel structure, a frame, a rigid panel on the frame having a facing sheet of plastic material attached thereto and means removably mounting strips of material having the same co-efficient of expansion as said facing sheet to delineate a graphic representation of a process or system, said means comprising a cement of the type which is dissolvable by a solvent, the material of the sheet being inert to such solvent.

References Cited in the file of this patent

UNITED STATES PATENTS

25	1,659,309	Auld	Feb. 14, 1928
	1,963,722	Smith	June 19, 1934
	1,968,039	Hornberger	July 31, 1934
	2,010,338	White	Aug. 6, 1935
30	2,315,420	Harrington	Mar. 30, 1943
	2,325,095	Auth	July 27, 1943
	2,374,800	Bohlke	May 1, 1945
	2,394,062	Houck	Feb. 5, 1946
	2,508,030	Karns	May 16, 1950
35	2,592,552	Florez	Apr. 15, 1952
	2,722,888	Page	Nov. 8, 1955
	2,787,773	Potter	Apr. 2, 1957
	2,804,607	Nalle	Aug. 27, 1957