May 6, 1952 E. A. NEUGASS 2,595,973

INSTRUMENT PANEL

Filed Feb. 16, 1950 2 SHEETS--SHEET 1

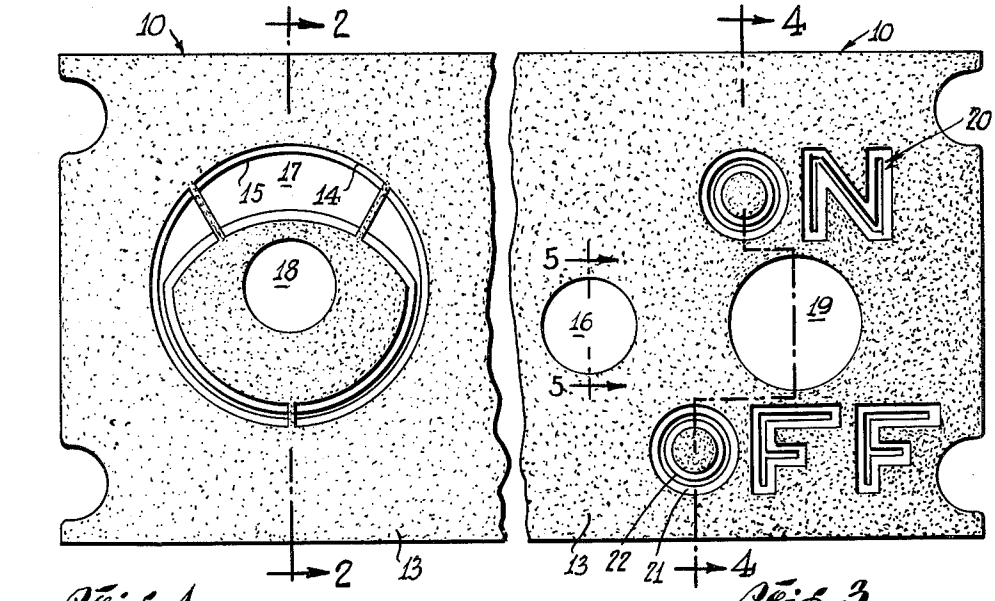

Fig. 1.

Fig. 3.

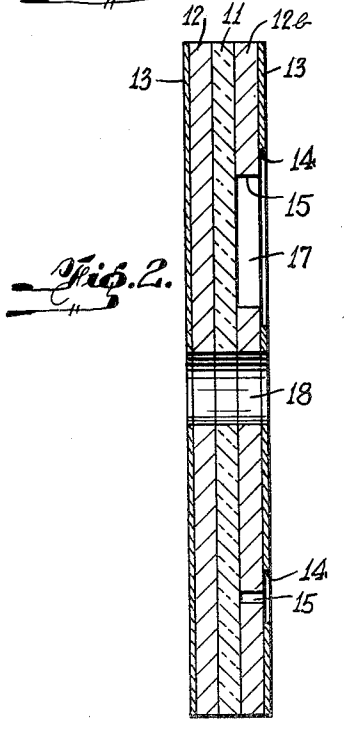

Fig. 2.

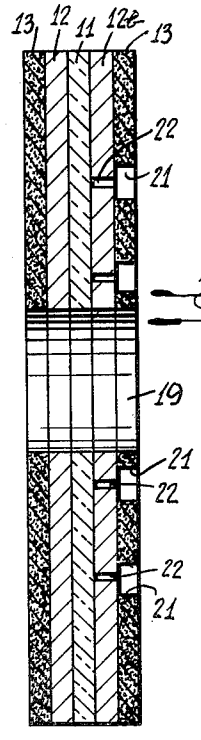

Fig. 4.

INVENTOR.
EDWIN A. NEUGASS.

BY Edwin E. Dawson

ATTORNEY.

May 6, 1952 E. A. NEUGASS 2,595,973

INSTRUMENT PANEL

Filed Feb. 16, 1950 2 SHEETS--SHEET 2

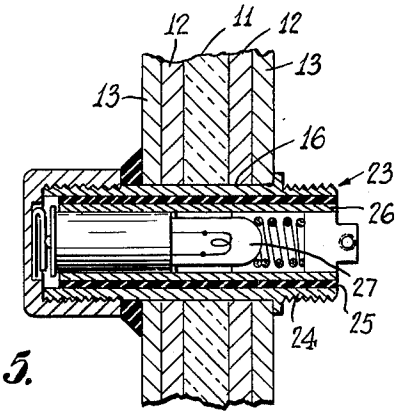

Fig. 5.

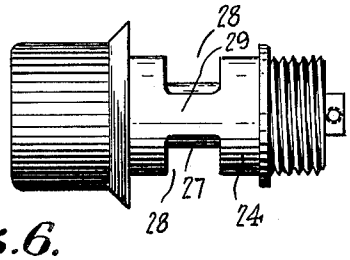

Fig. 6.

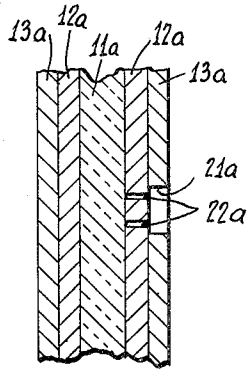

Fig. 7.

INVENTOR.
EDWIN A. NEUGASS.
BY Maxwell E. Spann
ATTORNEY.

Patented May 6, 1952 2,595,973

UNITED STATES PATENT OFFICE

2,595,973

INSTRUMENT PANEL

Edwin A. Neugass, Portchester, N. Y.

Application February 16, 1950, Serial No. 144,457

3 Claims. (Cl. 41—22)

1

This invention relates to improvements in instrument bearing panels, and more specifically, the present invention pertains to instrument bearing panels the illumination thereof, particularly for aircraft instruments.

It is an object of this invention to provide an instrument panel wherein the engraved characters are sharply defined when illuminated by either natural light or by a source of artificial light carried by the panel.

It is another object of the present invention to provide a laminated panel built up of transparent or translucent and opaque laminations producing sharp contrast between the opaque and transparent surfaces.

A further object of this invention is to provide a laminated instrument panel in which the engraved characters thereon are sharply defined in natural light by the contrast between a dark opaque outer surface and an underlying relatively bright or lightly colored opaque underlying surface, and in which sharp definition is obtained by the emission of artificial light through relatively fine or thin openings formed in the underlying surface, when the panel is illumined by artificial light.

Still another object of the invention is to provide a laminated instrument panel which has a high resistance to abrasion and is provided with engraved characters of enduring and permanent character.

Various further and more specific objects, features and advantages will clearly appear from the detailed description given below taken in connection with the accompanying drawings which form a part of this specification and are merely illustrative of possible preferred embodiments of my invention.

In the drawings:

Figure 1, is a front elevation of a portion of a panel constructed according to an embodiment of the invention,

Figure 2, is an enlarged vertical sectional view taken on the line 2—2 of Figure 1,

Figure 3, is a front elevation of another portion of a panel constructed according to this invention,

Figure 4, is an enlarged vertical sectional view taken on the line 4—4 of Figure 3,

Figure 5, is an enlarged vertical sectional view taken on the line 5—5 of Figure 3,

Figure 6, is an enlarged top detail view of a lamp and its housing employed in this invention and shown in section in Figure 5, and

Figure 7, is a fragmentary enlarged vertical section similar to the view of Figure 4 of a modification of the panel constructed according to this invention.

2

Referring to the drawings, and initially to Figures 1 through 4 thereof, the numeral 10 designates generally a laminated panel constructed according to an embodiment of this invention. The center core or layer 11 is light transmitting, and is preferably formed of a plastic material of the class of acrylic resins or materials, and their polymers and copolymers, methyl methacrylate being preferred, although other light transmitting material, such as quartz, may be employed. The adjacent layers or laminae, 12, 12b next to core 11 are opaque and preferably white in color having a high contrast value, and may be formed of the class of polyvinyl or vinyl or materials, their polymers or copolymers. Finally, the outermost layers or laminae are formed of opaque polyvinyl or vinyl resins or materials, their polymers or copolymers, or of any other opaque abrasion resisting material, having a low light reflecting surface. The outermost layers are designated by the reference characters 13, and have a dark color, to thereby provide a sharp color contrast relative to the underlying opaque layers 12, 12b.

Portions of the top outer layer 13, are cut away as indicated at 14 to thereby expose the underlying portion of the color contrasting underlying layers 12, 12b. Relatively narrow openings 15 are formed in the underlying next adjacent layer 12b, and communicating with the openings 14 formed within the outer layer. Light transmitted through the central core or layer 11 from suitable light emitting sources disposed in the opening 16 will illuminate the area 17 defined by the opening 15 formed in the layer 12b. A dial, scale, or other suitable parts to be illuminated, may be superimposed over the area 17 to be thereby illuminated. The internal walls of the opening 16 are kept clear, to permit the light to be transmitted through the core or central layer 11, whereas, other holes or openings such as at 18 and 19, and provided to receive the body of instrument, are coated with an opaque paint or lacquer to prevent the light from being transmitted through these latter instrument receiving openings.

As seen in Figures 3 and 4, indicia generally referred to by the numeral 20 may be engraved upon the face of the panel by cutting relatively wide openings through the outer layer 13, and relatively thin communicating openings 22 through the next adjacent underlying layers 12, 12b. Under natural illumination, the exposed

portions of the layers **12**, **12***b*, and having a sharp color contrast with respect to the surface of the layer **13**, will provide visible and indestructible indicia on the face of the panel. When the panel is illuminated by an artificial light source, disposed in the opening **16**, the light will be transmitted through the central core **11** and through the thin openings **22**. This will provide thin lines of high light intensity resulting in maximum visibility, without interference with night vision. The layer **12***b* may be made phosphorescent so that if the lighting system fails to function, the markings will still emit a glow.

In the fragmentary sectional view shown in Figure 7, I have illustrated a modification of the invention, in which a relatively thick opening **21***a* is formed through the outer layer **13***a*, and a pair of relatively thin parallel openings, communicating with the opening **21***a* are formed through the underlying next adjacent opaque layer **12***a*. In this modification the indicia, when artificially illuminated, will be defined by pairs of parallel thin lines of high intensity.

In Figures 5 and 6, I have illustrated a suitable light emitting means for installation in the opening **16**. Such panel lights are conventional, and it is therefore deemed unnecessary to describe the part in detail except to state that sleeve **26**, insulation **25**, and sleeve **24** are cut out as indicated at **28**, leaving a pair of ridges **29**. Light will then penetrate from the bulb **27** through the cut-outs **28** into the adjacent central layer or core **11**.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. An instrument panel comprising a sheet of clear light transmitting material, a layer of light colored opaque material superimposed on each of the opposite sides of said sheet, an outer layer of dark opaque material superimposed on one of said layers of light colored opaque material, said outer layer of opaque material having an opening formed therein to expose said one layer of light colored opaque material and the latter having an opening therethrough of lesser size than said opening in said outer opaque layer and registering with the latter opening and shaped similarly thereto to expose said sheet of clear material, said openings in said outer dark colored opaque layer and in said one light colored opaque layer being formed so that the exposed area of said light colored opaque layer is substantially greater than the exposed area of said sheet of clear material, and means for admitting light to said clear light transmitting sheet whereby light is reflected from the other of said light colored opaque layers through said openings in said one light colored and dark colored opaque layers.

2. An instrument panel according to claim 1; wherein said openings are formed with substantially parallel walls extending normal to the outer surface of said outer opaque layer.

3. An instrument panel comprising a sheet of clear light transmitting material, a layer of white opaque material superimposed on each of the opposite sides of said sheet, an outer layer of black opaque material superimposed on one of said layers of white opaque material, said black outer layer having an opening formed therethrough to expose said one white layer and the latter having a relatively small opening formed therethrough, said opening through said one white layer being registered with said opening through said black layer and having a similar configuration to expose said sheet of clear material, the linear dimensions of said opening through said one white layer being substantially smaller than the difference between the corresponding linear dimensions of said openings in said black outer layer and said one white layer, and means for admitting light to said clear light transmitting sheet whereby light is reflected from the other of said white layers through said registered openings.

EDWIN A. NEUGASS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
503,489	Nicolai	Aug. 15, 1893
2,128,246	Hardesty	Aug. 30, 1935
2,518,726	Shlenker	Aug. 15, 1950