

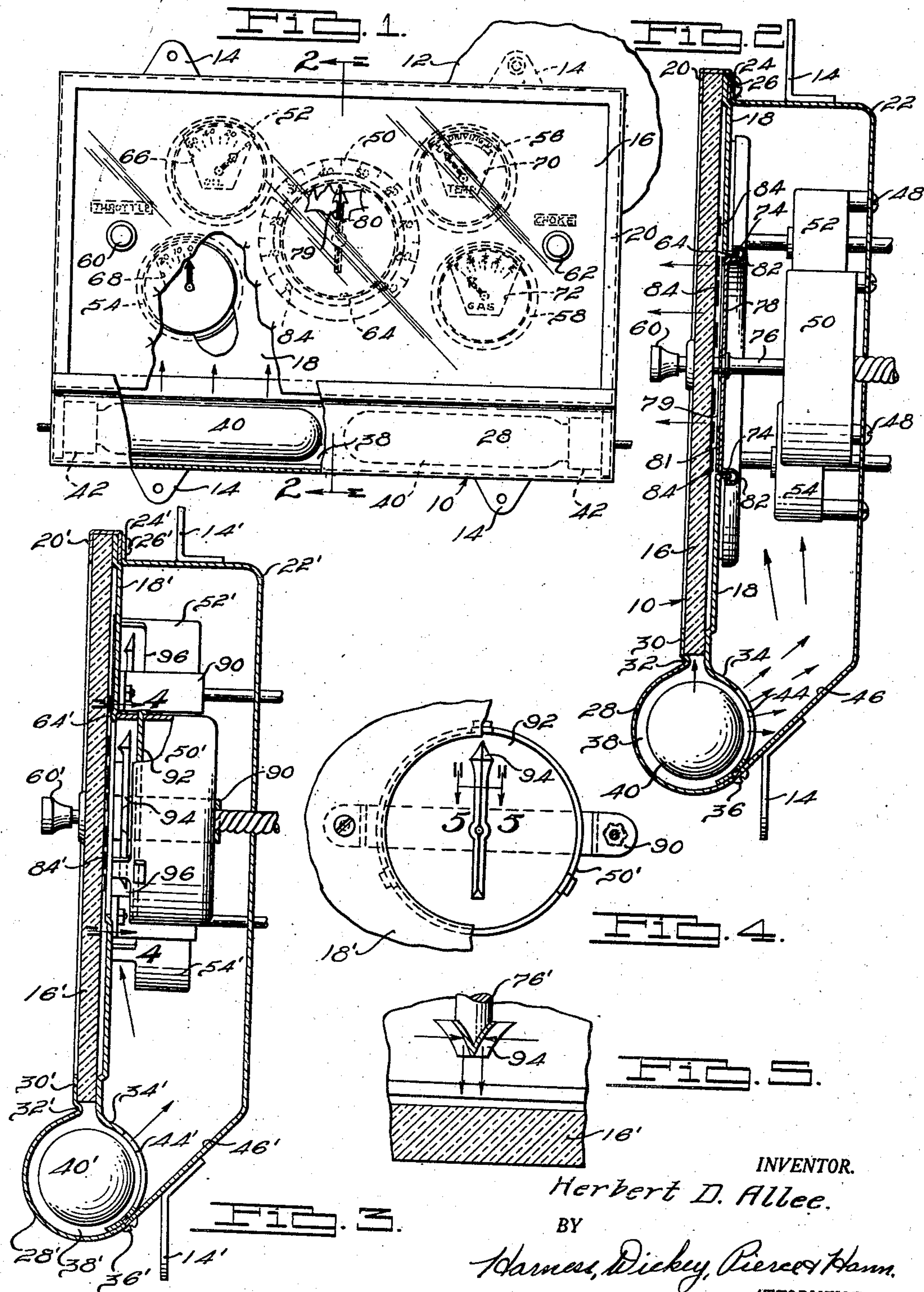
Nov. 26, 1935.

H. D. ALLEE

2,022,175

INSTRUMENT PANEL

Filed Feb. 11, 1935



INVENTOR.

Herbert D. Allee.

BY

Harnes, Dickey, Pierce & Hann.
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,022,175

INSTRUMENT PANEL

Herbert D. Allee, South Bend, Ind.

Application February 11, 1935, Serial No. 5,900

7 Claims. (Cl. 116—129)

This invention relates to instrument panels particularly of the type adaptable for use in connection with automobiles, the principal object being the provision of an instrument panel which when illuminated at night will disclose only the indicia of the various instruments contained therein together with the pointers for such instruments, the remainder of the face of the instrument panel remaining blank under illumination and the illumination of the indicia and pointers themselves being of a soft and non-glaring character.

Objects of the invention include the provision of an instrument panel in which a transparent face plate is provided for supporting the dial indicia of the various instruments cooperating therewith, and in which the indicia are illuminated without otherwise illuminating the face plate; the provision of an instrument panel having a glass face upon which the indicia for the cooperating instruments are adhered, together with means for projecting light through an edge of the glass whereby the indicia only will be illuminated and the remainder of the glass will appear blank and black in darkness; the provision of an instrument panel including a glass face on the rear surface of which the indicia for one or more instruments are adhered, together with a suitable decorative backing member for the glass face so associated therewith as to prevent its illumination by light projected through an edge of the glass face; the provision of an instruments panel of the type described in which the indicia for an instrument are adhered to the rear surface of the glass face and an opaque decorative backing member is provided for the glass face, the backing member being provided with openings therein and the instrument being provided with a plate movable thereby and overlying the opening to prevent the projection of light therethrough, the plate being provided with a transparent or translucent pointer adapted to be illuminated by the presence of light in back of it whereby the relative position of the pointer with respect to the indicia may be observed; the provision of a construction as above described with the exception that instead of having a plate movable with the instrument and the plate having a transparent pointer associated therewith for illumination from the rear, the instrument is provided with a pointer only, without a plate, adapted for illumination from a direction corresponding with the plane of the plate; and the provision of an instrument panel including a glass face, the rear surface of which is provided with suitable indicia adhered thereto, a suitable ornamental backing plate of opaque material having openings therein through which the pointers of the instruments may be observed, and a housing for

the instruments together with means for illuminating the indicia by projecting light into the glass face from an edge thereof, and illuminating the pointers of the instruments from the rear of the backing plate.

The above being among the objects of the present invention, the same consists in certain novel features of construction and combinations of parts to be hereinafter described with reference to the accompanying drawing, and then claimed, having the above and other objects in view.

In the accompanying drawing which illustrates suitable embodiments of the present invention and in which like numerals refer to like parts throughout the several different views,

Fig. 1 is a partially broken face view of an instrument panel, showing a fragment of an instrument board associated therewith.

Fig. 2 is an enlarged vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2, but illustrating a slightly modified form of construction in which a different form of pointer arrangement and illumination therefor is provided.

Fig. 4 is a fragmentary, partially broken, face view of one of the instruments and its cooperating pointer, taken on the line 4—4 of Fig. 3.

Fig. 5 is an enlarged fragmentary sectional view taken on the line 5—5 of Fig. 4.

It is commonly recognized by the motoring public that when driving an automobile at night any illumination within the body of the automobile apparent to the driver detracts from the vision of the driver and accordingly is not only not desirable but may actually be dangerous. It is equally well recognized that it is desirable that the driver be able to inspect from time to time the various instruments with which the automobile is equipped to ascertain not only the speed at which the automobile is travelling but that various parts thereof are continuing to operate in a normal manner, and that the supply of fuel and oil is sufficient for the particular requirements at the moment. The problem of illumination of instrument panels has always been important in that such instrument panels are usually the chief source of illumination within an automobile during normal driving conditions at night, and the problem of illuminating the instrument panel sufficiently to enable the driver to readily inspect the various instruments contained within the panel and yet prevent any glare that detracts from the driver's vision has been difficult of achievement. The present invention provides a construction by means of which the various instruments included in the panel may be quickly and clearly read by the operator and yet the illumination of the instruments from the

driver's standpoint will be such that his vision will be unimpaired thereby.

Referring to the drawing, an instrument panel is indicated generally at 10, it being shown for the purpose of illustration only as being of rectangular shape. It will be understood that in accordance with conventional practice such instrument panels are mounted in an opening in an instrument board such as 12, a fragment of which is indicated in Fig. 1, with its front face arranged in approximately flush relation with respect to the front face of the instrument board, the instrument panel being relatively closely received in the opening in the instrument board and being provided with lugs such as 14 overlying the concealed face of the instrument board and through which screws (not shown) are projected for the purpose of securing the instrument panel and board together in assembled relationship.

The instrument panel itself comprises a glass face plate or pane 16, preferably of appreciable thickness on the order of plate glass. Positioned against the rear face of the plate 16, as viewed from the face of the instrument panel, is a backing plate 18. This backing plate may be perfectly flat if desired and lie directly against the face plate 16, except possibly having the margins thereof around the openings for the instruments to be later referred to flanged inwardly where desired, but for the purpose of illustration only in order to bring out certain features of the invention it is shown in the drawing as being slightly inwardly offset from the back face of the face plate 16 except around its periphery, so that the main body portion thereof is rearwardly spaced from the rear face of the face plate 16. A channel shaped frame member 20 extends around the top and sides of the face plate 16 and also embraces the corresponding margins of the backing plate 18 therein for the purpose of securing it in assembled relation with respect to the plate 16.

A housing indicated generally at 22 is provided on the rear face of the face plate 16, its forward face over the length corresponding to the frame 20 being outwardly flanged as at 24 and being suitably secured to the rear face of the frame 20 as by screws 26. The lower edge of the housing 22 is projected downwardly at an angle beyond the lower edge of the face plate 16 and is formed into a partially cylindrical portion 28, the axis of which portion is vertically aligned with the center of the plate 16. The margin of the portion 28 is brought upwardly as at 30 into contact with the forward lower margin of the face plate 16 so as to effect a continuation of the frame 20 over such margin. Where the flange 30 joins the portion 28 the metal may be pressed slightly inwardly as at 32 so as to provide a lip or shoulder against which the lower edge of the face plate 16 may abut to limit its downward movement.

The lower edge of the backing plate 18 is curved as at 34 to somewhat complete the cylindrical formation of the portion 28 of the housing 22 and its lower margin is brought down into contacting relationship with respect to the lower wall of the housing 22 and is secured thereto by means of screws 36. It will thus be apparent that a cylindrical chamber 38 is formed by the portion 28 of the housing 22 and portion 34 of the backing plate 18 below and centrally of the glass plate 16. Within this chamber 38 one or more electric lamps 40, preferably of the elongated type shown, are positioned, the sockets of the lamps 40 being removably secured in the end walls of the chamber 38 and the sockets 42 preferably

being of a diameter larger than the lamps 40 so that upon removal of the sockets 42 the corresponding lamps 40 will be removed therewith. This permits ready replacement of the lamps 40.

It will be observed that the lower edge of the glass face plate 16 is exposed to direct illumination from the lamps 40 so that the light from the lamps 40 may be projected into an edge of the face plate 16 and in the direction of the plane thereof. Additionally, the curved portion 34 of the back plate 18 is provided with a series of openings 44 therein which permits light from the lamps 40 to be projected rearwardly and striking the angular lower wall 46 of the housing 22 be reflected upwardly so as to flood the interior of the casing 22 with light. It may be noted that the housing 22 is preferably closed so as to prevent the light projected therein as above explained from escaping except in the manner hereinafter specifically pointed out.

To the rear face of the housing 22 and located within the housing a plurality of instruments are secured as by means of screws 48. These instruments may include, by way of illustration, a speedometer 50, an oil gauge 52, an ammeter 54, a heat indicator 56, and a fuel gauge 58. Additionally the throttle and choke members 60 and 62 respectively may be projected through the housing 22, backing plate 18 and plate 16 if desired. The backing plate 18 in alignment with each of the instruments 50 to 58, inclusive, is provided with apertures 64 to 72, inclusive corresponding with the respective instruments 50 to 58, inclusive, the apertures being of the size sufficient to accommodate the desired pointer size and range of pointer movement for each of the corresponding instruments. Inasmuch as the dial for each of the instruments 50 to 58, inclusive, and the pointers therefor are all of a similar nature, a description will be given of the dial and pointer arrangement for the speedometer 50 only, the construction and relation of the remaining dials and pointer constructions thereby being apparent.

Referring now to Fig. 2, it will be noted that the backing plate 18 around the margins of the dial opening 64 for the speedometer 50 is flanged inwardly as at 74. The shaft 76 of the speedometer 50 has fixed thereto within the opening 64 and substantially in coplanar relation with respect to the backing plate 18 a disc 78. The disc 78 is opaque except for the area of the narrow central portion 79 of the arrow or pointer 80, indicated in Fig. 1, and over the area of the portion 79 it is translucent so that light projected from the lamps 40 through the openings 44 and flooding the interior of the casing 22 may illuminate the portion 79 to an extent sufficient to enable the driver of the vehicle to readily discern it as a narrow pencil or line of light but without producing a glare in the eyes of the driver. This effect may be obtained in a number of different ways but perhaps the most satisfactory manner of accomplishing it is to make the disc 78 of translucent or transparent celluloid or like material and cover the disc, except for the area and shape of the portion 79, with a coating 81 of paint or other suitable material, the coating 81 being shown in exaggerated thickness in Fig. 2 for the purpose of clarity of disclosure only. In this manner the arrow 80 may be of a color contrasting favorably with the color of the disc 78 as painted and be of such dimensions as to render its position quickly and accurately readable in daylight, while the

narrow portion 79 only being illuminated at night renders it clear cut and non-blurring and, therefore, enables the position of the arrow to be quickly and accurately determined at night. Should the arrow 80 be of relatively large size and the whole area thereof be illuminated at night, it would tend to blur and be rendered less distinct when illuminated at night in the manner suggested, whereas in the construction shown this difficulty is eliminated. However, it will be understood that where the arrow is made of sufficiently narrow width and the portion 79 of a corresponding greater width, the portion 79 may coincide with the entire area of the pointer 80 and such is within the spirit of the present invention.

In order to prevent the light which floods the interior of the housing 22 from becoming visibly projected through the clearance space between the periphery of the disc 78 and the backing plate 18, the periphery of the disc 78 is preferably provided with a forwardly opening channel shape rim 82 within which the flange 74 is received. It will be understood, however, that both the disc 78 and the rim 82 are out of rubbing contact with all stationary parts of the device so as not to interfere with the proper movement of the disc 78 and this, of course, applies equally well to all of the other instruments in the assemblage.

The indicia, in other words the numerals, names and other indicating dial marks 84 for each of the instruments in the assemblage are adhered to the rear face of the plate 16 in proper grouped relation with respect to their corresponding instruments. While such indicia may be formed separately and thereafter caused to adhere to the rear face of the glass plate 16, it will ordinarily be found just as satisfactory and more convenient to paint them upon such surface.

It has been found that if a glass plate such as the plate 16 is illuminated from an edge only thereof, with the proper degree of illumination the face of the plate at night, if its surface is uninterrupted, will appear entirely blank and unilluminated. If, however, an object is caused to adhere to a surface of the plate then such object over the area of adherence will be illuminated. Thus in the construction shown the plate 16 being illuminated from an edge and its surface being interrupted only by the indicia 84, the indicia 84 only will be illuminated and visible when viewed at night, the remaining portions or areas of the plate 16 remaining blank or black, and this regardless of the color of the exposed surface of the backing plate 18. Thus the exposed surface of the backing plate may be made of any desired finish regardless of color so as to be properly ornamental when viewed in daylight, and yet at night when the panel is illuminated the backing plate 18 will appear as though black. In view of the fact that light from the interior of the housing 22 will be projected through the pointer portions 79 of the various instruments to illuminate them sufficiently to make them clearly visible and yet not produce a glare, the surface of the glass 16 when illuminated and viewed at night, as above described, will present only the indicia of the various instruments and their respective pointer portions and in such manner that while clearly visible substantially no illumination of parts in the body of the automobile will result, no glare will be presented for the eyes of the driver, and consequently the visibility of the driver will not be interfered with in any respect.

Where throttle, choke or other operating members are projected through the panel as mentioned the openings in the glass face plate 16 provided therefor and the stems of these members where they project through the glass will, of course, be illuminated when the lamps 40 are energized so that their positions will be easily discernible, and it will ordinarily be found desirable to apply the names of these operating members to the rear face of the face plate 16 in adjacent relationship thereto as shown and in the same manner as the indicia 84 previously described.

As above mentioned, only objects which are adhered to or in contact with the rear face of the glass face plate 16 will be illuminated by light projected through an edge of the face plate 16 and only over the area of contact or adherence. For this reason and because of the fact that it is substantially impossible to make both the surfaces of the face plate 16 and a sheet of metal sufficiently accurate to be in complete contact with each other even though clamped to each other over their peripheries, the backing plate 18 may be made flat instead of having its marginal edge portions forwardly offset in the manner shown merely by way of illustration, and in such case the backing plate would merely bear at a relatively small number of spaced points against the rear face of the plate 16 and consequently the effect above described would still obtain. Additionally the application of the indicia 84 to the rear face of the face plate 16 would prevent any material contact of the face plate and backing plate and for these reasons the plate 18 may be made flat and in apparent contact with the rear face of the plate 16 without detracting from the blank appearance of the panel when illuminated at night as above described.

In Figs. 3, 4 and 5 a slight modification of the above described construction is shown and corresponding parts are indicated by corresponding numerals except that such numerals bear a prime mark. In this case the various instruments 50' to 58', inclusive, instead of being mounted upon the rear wall of the housing 22 are mounted directly upon the backing plate 18' by means of straps 90 in accordance with conventional practice. Figs. 3, 4 and 5, however, are shown primarily to illustrate a different method of illuminating the pointers for the various instruments. In connection with some instruments, and this applies particularly to ammeters which are very sensitive and which ordinarily have very little power to move their pointers, the disc type of pointer such as that described in connection with Figs. 1 and 2 may be found to impair the desired sensitiveness of operation of the instrument, and in such case resort may be had to the construction illustrated in Figs. 3, 4 and 5. The speedometer 50' is shown in Fig. 3 as partially broken away to illustrate the construction common to all of the instruments in these figures. As indicated in Fig. 3 the face 92 of the speedometer 50' is exposed through the aperture 64' in the backing plate 18', but the face 92 is set back a material distance rearwardly of the rear face of the glass panel 16'. In advance of the face 92 the shaft of the speedometer 50' is provided with a pointer 94 which thus moves in the space between the face 92 and the rear face of the glass plate 16'. The casings for the various instruments 50' to 58', inclusive, are circumferentially apertured at 96 adjacent the backing plate 18' so that the

light flooding the interior of the housing 22' may be projected into the different instrument casings in a direction parallel to the plate 16' and illuminate the various pointers from the side. Preferably the pointers are of a V section such as that illustrated in Fig. 5 so that the light striking the pointers from a direction parallel to the plate 16' will be reflected forwardly through the plate 16' and thus render the pointers visible to the driver. If the sides of the pointer are curved as indicated in Fig. 5 and suitably polished the effect at night will be that each pointer will be made visible and appear as a pair of parallel lines of light. The effect of this last mentioned construction will be similar to that first described with the exception, however, that because of the method of illumination of the various pointers care must be exercised to prevent excessive illumination of the pointers which will produce a glare.

Formal changes may be made in the specific embodiments of the invention described without departing from the spirit or substance of the broad invention, the scope of which is commensurate with the appended claims.

What I claim is:

1. An instrument panel including, in combination, a glass face plate, an opaque backing face plate overlying the rear face of the face plate, an instrument supported in the rear of the backing plate, said backing plate having an aperture therein, pointer means movable by said instrument and exposed through said aperture, indicia with which said pointer means is adapted to cooperate adhered to the rear surface of the face plate, and means for projecting light into an edge of said face plate in the direction of the plane thereof to effect illumination of said indicia and for reflecting light independently of said face plate to illuminate said pointer means.

2. An instrument panel including, in combination, a glass face plate, an opaque backing plate for said face plate, a housing enclosing the rear face of said face plate and backing plate, a lamp bulb chamber at an edge of said face plate and opening on to said edge, a lamp bulb in said lamp chamber positioned to project light into said edge of said face plate, an opening in said backing plate, an instrument within said housing, pointer means operable by said instrument and visible through said opening, indicia for said pointer means adhered to a face of said face plate, and said chamber being provided with an opening for the projection of light from said bulb to the interior of said housing for the illumination of said pointer means.

3. An instrument panel comprising, in combination, a transparent face plate, an opaque backing plate for said face plate, said backing plate having an opening therein, an instrument mounted in the rear of said opening, a member secured to the operating shaft of said instrument and movable therewith closing said opening, said member having a transparent pointer portion and the remainder being substantially opaque, indicia for cooperation with said pointer portion adhered to the rear surface of said face plate, and means for projecting light into an edge of said face plate in the direction of the plane thereof and through said transparent pointer portion.

4. An instrument panel comprising, in combination, a transparent face plate, an opaque backing plate for said face plate having an opening therein, an instrument mounted in the rear of

said backing plate, a pointer member actuated by said instrument and cooperating with said backing plate around the margins of said opening to prevent the direct projection of light between them, said pointer member comprising a generally opaque member having a translucent arrow thereon, indicia adhered to a surface of said face plate in position to cooperate with said arrow to indicate the relative position thereof, and means for illuminating the indicia by projecting light into an edge of said face plate in the direction of the plane thereof and for illuminating said arrow independently of said face plate by illuminating the space in back of the same.

5. An instrument panel comprising, in combination, a transparent face plate, a backing plate for said face plate arranged in generally non-contacting relation over the greater portion of its area with respect to the rear surface of the face plate, said backing plate having an opening therein, an instrument positioned in the rear of said backing plate, a pointer member movable by said instrument and closing said opening, said pointer member being generally opaque but having a translucent arrow portion thereon, indicia on said face plate arranged for illumination only by light projected into an edge of said face plate, said indicia being arranged in cooperative relation with respect to said arrow, and means for projecting light into an edge of said face plate and for illuminating the space in back of said pointer member.

6. An instrument panel comprising, in combination, a transparent face plate, an opaque backing plate overlying the rear face of said face plate, a housing enclosing the rear face of said face plate and said backing plate, an instrument within said housing supported by said backing plate, an opening in said backing plate through which said instrument is exposed, a pointer movable by said instrument between the face of said instrument and the face plate, indicia adhered to the rear face of said face plate in cooperative relation with respect to said pointer, a light chamber at an edge of said face plate, lamp bulbs in said chamber positioned to direct light therefrom into an edge of said face plate and in the direction of the plane thereof, said chamber having openings therein permitting the escape of light therefrom to within said housing, and said instrument having apertures therein in transverse alignment with said pointer whereby light within said housing may illuminate said pointer from the side thereof.

7. An instrument panel comprising, in combination, a transparent face plate, an opaque backing plate for said face plate, said backing plate having an opening therein, an instrument mounted in the rear of said opening, a member secured to the operating shaft of said instrument and movable therewith closing said opening, said member having a pointer thereon, a narrow line of which extending in the direction of length of the pointer is capable of transmitting light there-through and the remainder of said pointer and member being opaque, means for projecting light into an edge of said face plate in the direction of the plane thereof and through said transparent pointer portion, and indicia in cooperating relation with respect to said pointer and adapted for illumination simultaneously therewith.

HERBERT D. ALLEE.