May 6, 1930. H. SCHWARZE 1,757,395

INSTRUMENT PANEL ASSEMBLY

Filed Aug. 24, 1928

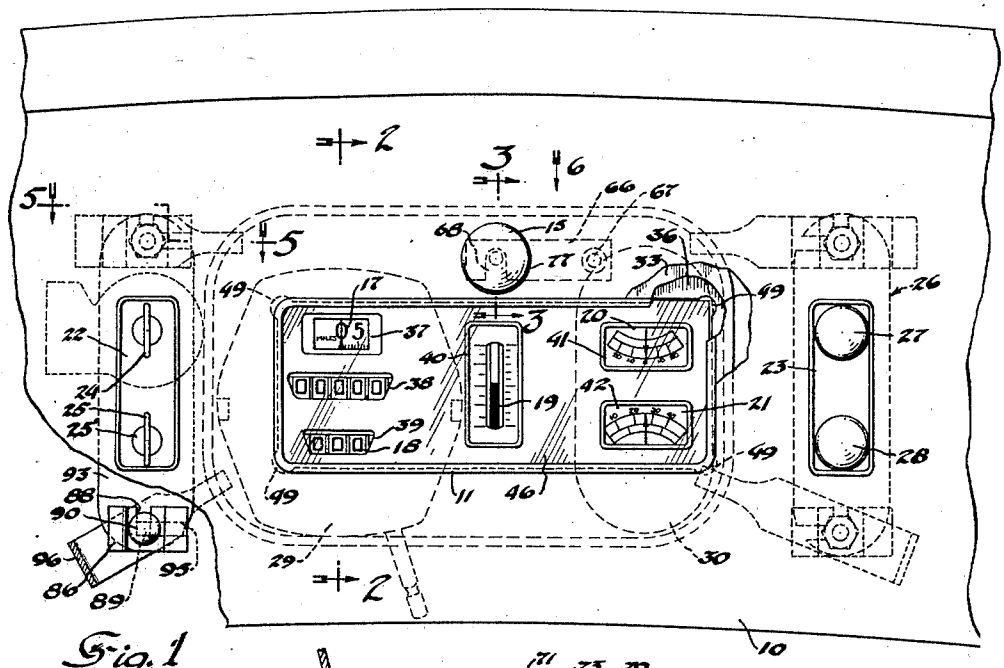


Fig. 1

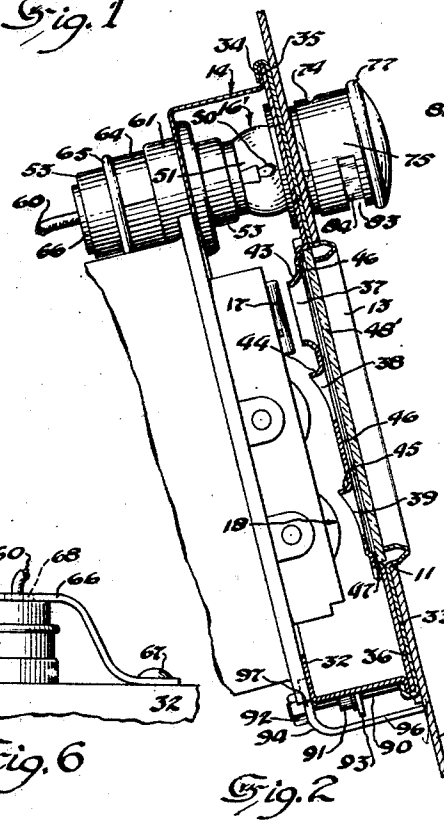


Fig. 2

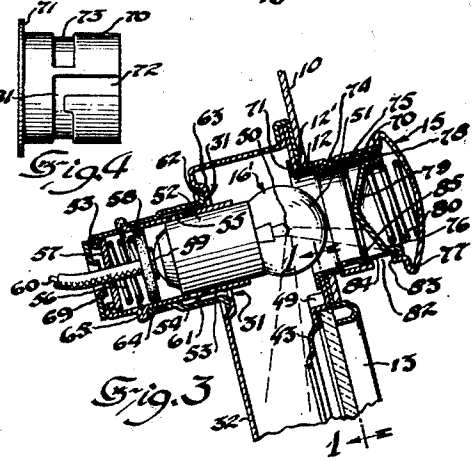


Fig. 3

Fig. 4

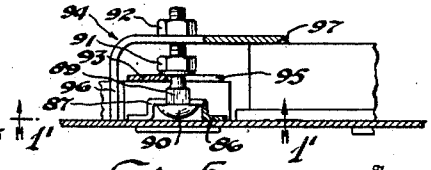


Fig. 5

Fig. 6

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Patented May 6, 1930 1,757,395

UNITED STATES PATENT OFFICE

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INSTRUMENT-PANEL ASSEMBLY

Application filed August 24, 1928. Serial No. 301,908.

The dash boards or instrument boards of automobiles being now commonly provided with means for the illumination of several dials by interior transmission of light from lighting units or sources concealed by said boards (or by face plates, or the like), it is a primary object of this invention to provide, for use in transmitting some light from such a concealed unit or source toward floor boards or toward laterally disposed exterior parts of control devices or other subsidiary units, a novel reflecting unit suitable to be externally disposed opposite to and within range of such a concealed lighting unit but unconnected therewith; and, in preferred embodiments of this invention, said unit may comprise in addition to a fixed shell, which may be provided with attachment means and a special reflector, a second and removable shell provided with a knurled or other head adapted to receive a compression spring, said spring being comprised in releasable interlocking means whereby said shells may be rotatably connected, said shells being respectively provided with variably coincident light-exit openings. One of said shells may be provided also with color screening and/or direct ray obstructing means, as hereinafter described. It is another main object of this invention to provide an instrument board or panel assembly which includes a main or central unit of special construction, this unit being preferably provided with an assembly case having a single inspection window and with an interior source of illumination which may be common to several instruments, said case being optionally equipped as above indicated with means extending through a corresponding opening in an instrument board for providing a limited exterior reflection of light, as for the purpose of moderately illuminating a switch handle and/or a power control handle, or external parts of any preferred subsidiary units; and, in preferred embodiments of this invention, a dash or instrument board being provided with a substantially central main observation aperture (which may be common to several instruments housed in or secured in any desired way to the mentioned central assembly case) smaller apertures of bead-bounded areas, or the like, may be provided for subsidiary units symmetrically or otherwise disposed at spaced intervals from the respective ends of said main aperture; and novel means may be employed to so retain the mentioned central assembly case or unit and/or any subsidiary devices or units that any one or more of said units may be independently removed, as for the purpose of inspection, standardization, repair or replacement.

Other objects of this invention, including various optional but highly advantageous innovations in the construction of a main or central unit comprising a special assembly case, (which may be glazed in advance of its insertion in a suitable aperture in a dash or instrument board, said case being preferably provided with novel means for the removable retention of a concealed light source, and said board and said case being preferably provided with coincident apertures for the transmission of light from said concealed source to the mentioned reflecting unit), may be best appreciated from the following description of one complete illustrative embodiment of this invention, taken in connection with the appended claims and the accompanying drawings.

Figure 1 may be referred to as an elevational view, with parts broken away, to the respective levels indicated by the line 1—1 in Figure 3 and the line 1′—1′ in Figure 5.

Figure 2 is a vertical sectional view, taken substantially as indicated by the line 2—2 of Figure 1.

Figure 3 is a vertical sectional view, corresponding to the upper portion of Figure 2, but taken substantially as indicated by the line 3—3 of Figure 1.

Figure 4 is a detail view separately showing in elevation a fixed shell element hereinafter referred to as comprised in a reflecting unit shown in the upper central portion of Figure 1, and in the upper left-hand portions of Figures 2 and 3.

Figure 5 is an enlarged detail view, taken substantially as indicated by the line 5—5 of Figure 1.

Figure 6 is a detail view, taken from the

direction indicated by the arrow 6 of Figure 1 and showing means, including a pivoted latch element, for removably retaining a concealed lighting unit in front of an instrument case.

Referring first to the general features of that embodiment of the present invention chosen for purposes of illustration, a dash or instrument board 10 is shown as provided with a main observation aperture bounded by a substantially rectangular edge 11 and with a smaller aperture, hereinafter referred to as a reflector opening, bounded by a substantially circular edge 12. The former aperture is adapted to receive a bezel or glass retaining annular element 13, carried by a so-called assembly case 14; and the latter aperture may receive, and permit transmission of light to, a novel reflecting unit 15, shown as disposed opposite a corresponding opening 12′ in case 14 and light source in the form of a removable unit 16′, which may be carried by said case.

The assembly case 14 may contain or carry any desired separate or combined instruments (such as a combined speedometer-odometer 17—18, a hydrostatic or other gasoline gauge 19, an ammeter 20, and an oil pressure indicator 21), and the dash or instrument board 10 may be also provided, at laterally spaced distances, with additional apertures or bounded areas such as are suggested at 22 and 23, Figure 1, these being arranged in an orderly series and suitable to receive or carry subsidiary devices. Said devices may be of any desired character, but preferably comprise parts adapted to interfit within said additional apertures or areas. A switch providing a handle resembling a key is suggested at 24 (a switch lock key being shown at 25 as inserted in a key cylinder 25′); and a power control unit 26 may include a "choke" handle 27 and a "throttle" handle 28; but it should be understood that the specific construction and connection of the mentioned instruments and the mentioned control devices, and also the exact special relationships thereof, are comparatively immaterial to this invention, provided the mentioned parts be favorably located for illumination from the concealed source 16′, or its equivalent.

The assembly case 14, or some element thereof, may naturally contain or be provided with a plurality of openings for housings of separate or combined instruments, such as a housing 29 for the combined odometer and speedometer 17—18, a housing 30 for a combined ammeter 20 and oil pressure indicator 21, and the mentioned gasoline gauge 19; and, regardless of the number of such instrument openings, an additional opening 31 may be provided thereabove, for the removable insertion of the mentioned lighting unit 16′. The mentioned openings are shown as all provided in a main concave assembly case element 32 comprised in case 14; and, in order to adapt any central unit, whether or not comprising an assembly case 14, to be separately assembled in advance of the insertion of the bezel or annular element 13 through the main observation aperture in the board 10, said bezel may advantageously be formed integral with an outer or front cover element 33. This element 33 may advantageously be of such dimensions as to permit peripheral edge portions 34 thereof to be rebent for the engagement of a peripheral flange 35 provided upon the main concave assembly case element 32, somewhat as suggested in Figures 2 and 3.

An inner face element 36, extending parallel with the cover element 33 and shown as peripherally retained thereby, may be provided not only with any desired number of separate inspection or visibility openings such as are shown at 37, 38, 39, 40, 41 and 42, (these openings being preferably depressed in such manner as to provide adjacent reflecting surfaces, as suggested at 43, 44 and 45, Figure 2, for the diffusion of light toward the respective instrument dials), but also with a depressed area 46 approximately corresponding in shape to the mentioned main observation aperture in board 10,—this depressed area being shown as surrounded and defined by a shoulder 47, suitable for co-operation with the bezel or annular element 13 in the retention of a glass plate 48′, optionally common to an entire set of instruments referred to. The corners of the glass-receiving depressed area 46 are preferably pressed away, substantially as indicated at 49, in such manner as to obviate grinding of the corners of the plate 48′; and it will be understood that, although either of the front elements 33, 36 may be provided with shoulders for the firm retention of said plate, in the illustrated instance the bezel 13 serves only to prevent outward movement of said plate,— this construction obviating all necessity for a very exact fit of the plate 48′ within the main observation aperture in board 10.

Although the light unit 16 may be of any preferred character and retained in any desired manner, this unit is shown as including a filament 50, centralized within a bulb 51 and carried by a socket 52,—the latter being removably inserted in a special thimble 53. The socket 52 may be provided with pins 54, engageable, in a known manner, in slots 55 and retained therein by means such as a compression spring 56. The latter may be confined by insulating washers 57 and 58, and may act through an electrode element 59, connected with an insulated wire 60.

The thimble 53 and the bulb 51 are intended to be commonly retained by, but to be forwardly removable through, a known or special receiving element secured in or oppo-

site the opening 31 in the concave case element 32, said receiving element being shown as comprising a flared attachment section 61, including a flange 62 (adapted to be secured, as by soldering, within a depression 63 in said case element) and also a separate skirt section 64; and the entire receiving element is preferably formed of a material whose strength and resiliency adapts the same yieldably to engage the thimble 53, or its equivalent. In order to limit the rearward or inward movement of the thimble 53, assuring such a positioning thereof as properly to centralize the filament 50 for effective illumination of the respective instrument dials in the indicated manner, and to permit advance of a suitable beam of light into reflecting unit 15, said thimble may be provided with means such as an annular bead 65, adapted to engage the edge of the split skirt section 64; and, as a further precaution against unintended relative movement or accidental separation of the mentioned parts, any desired additional latching or retaining means may be employed.

For example, as suggested in dotted lines in Figure 1 and in full lines in Figure 6, a hook or latch element 66 may be pivoted, as at 67, to the concave case element 32, a slot or notch 68 in said latch element being adapted to fit over the mentioned insulated wire or cord 60 and to engage the forward or cord-connected end of the thimble 53,—said thimble being shown as inwardly rebent, at the mentioned end thereof, in a manner favorable to the retention of a washer 57, and the latch element 66 being shown, in Figure 4, as correspondingly bent inward at 69, in such a manner as to assure its removable but quiet retention therein. The construction here referred to may be seen to permit the "forward" removal of the entire lighting unit, through the described receiving element, in a manner which facilitates the replacement of a light bulb or the use of light unit 16′ in "trouble finding"; and said construction is also employed to position and secure the same in a manner favorable to additional functions which may be next described.

As indicated, this invention contemplates the employment of a special reflecting unit 15 within range of or functionally opposite a suitable lighting unit; and said reflecting unit is shown as comprising a fixed or inner shell element 70 adapted to be secured in the opening 12′, as by means of a flange 71, and to one or the other of the cover elements 33, 36 of the assembly case 14, or its equivalent. The fixed shell element 70 is shown in Figure 4 as substantially cylindrical in form, as insertable through opening 12 in board 10, and as provided not only with an almost complete peripheral depression 73, adapted to receive an inwardly extending half-width boss 74, that may be stamped or otherwise provided upon an outer and relatively movable shell 75. The shell 75 is shown as outwardly terminating in a head 76, which may have a milled edge 77, to facilitate installation and rotation of the same; the inner or fixed shell 70 may be terminally engaged by a flange 78 upon a cylindrical body comprised in a conical or other reflector 79,—shown as interfitting within the outer shell 75; the reflector 79 and the head 76 are shown as co-operating in the retention of a compression spring 80, tending outwardly or rearwardly to advance the outer shell 75; and the peripheral depression 73 is shown as provided with a constriction 81, at the point of connection between said peripheral depression and the longitudinal depression 72,—the relationship between the parts here referred to being such that, the boss 74 being brought opposite the outer end of the depression 72, in assembling the described reflecting unit, the outer shell may then be pressed inwardly to such an extent as to permit the boss 74 to pass the constriction 81. The said outer shell is thus removably retained upon the inner shell 70, although freely rotatable thereon, within limits.

The shell 70 being shown as provided, in its lower surface, with a limited aperture 82, the shell 75 is provided with a similar aperture 83, adapted to be brought into partial or complete coincidence with the aperture 82, in order to permit a restricted beam of light from the filament 50 or its equivalent, to be projected from the conical or other surface of reflector 79 toward the floor boards of an automobile and/or toward any handles of control devices or any projecting key cylinders, or other external parts of subsidiary units disposed laterally of the central unit comprising the assembly case 14.

If desired, a cylindrical or other translucent strip 84 may be interposed, between a cylindrical portion of the reflecting element 79 and the interior of the shell 70, in such manner as to exclude dust and to compel any reflected beam of light to pass therethrough,—in order to impart a desired intensity or color to said beam; and, in order to retain the mentioned parts in their indicated relationships and/or to prevent any undesired exit of direct light through apertures such as are indicated at 82, 83 when the shell 75 is so located or adjusted as to bring said apertures into coincidence, means such as a washer-like intercepting element 85 may be interposed in the general manner suggested in Figure 3.

Although an assembly case of the described general construction and control or subsidiary devices disposed in the indicated manner, or any desired central unit and subsidiary units, may be secured, for illumination in the indicated manner, by any one or more of a great variety of means, I suggest

the employment, for the purpose last referred to, of clamping devices such as are best shown in Figures 1, 2 and 5. In these figures, clips 86, secured in suitable proximity to the mentioned units, are shown as each provided with an offset socket portion 87,—having a non-circular slot or other opening 88, to receive a correspondingly non-circular shank or portion 89 of a bolt 90,—the threaded portion of said bolt 90, whether or not said bolt is bodily removable (as by an upward movement) from the clip 86, being preferably of sufficient length to adapt the same to carry a plurality of nuts 91, 92, adapted respectively to co-operate with an apertured plate 93, and with a case-engaging finger 94. In the illustrated instance, it being comparatively immaterial what are the subsidiary units such as the switch unit comprising handle 24 and the power unit comprising handles 27 and 28, and immaterial what parts thereof may extend into or through suitable apertures in the board 10, and immaterial also whether or not said units are actually secured to plates 93, said plates may, if desired, be provided with laterally extending slots 95, to facilitate independent removal thereof; but it will be obvious that a limited play of shanks 89 in slots 88 is favorable to quick assembly and that even in case the mentioned subsidiary units are not permanently secured to the plates 93 or to equivalent elements, the mere loosening of the nuts 91 may facilitate the independent removal and/or replacement of such units. The construction of each finger 94, shown as comprising a board-engaging and pressure-resistant part 96, as well as a flexure-resistant case-engaging portion 97, renders possible the removal or replacement of a central unit, such as the described assembly case 14, without the disturbance of any subsidiary unit or units secured adjacent thereto, the construction here referred to being, in fact, such that four bolts may be employed to retain three units in such manner as to permit a separate removal of any one or two units without disturbing the remaining unit or units.

The foregoing description includes preferred details of case construction, preferred details of lighting unit construction, preferred details of reflecting unit construction, and preferred details of securing device construction, as well as novel features of interrelationship between mentioned parts; and it should be understood not only that various features of this invention might be independently employed but also that numerous modifications thereof, additional to those suggested herein, might easily be devised by workers skilled in the arts to which this case relates,—all without departing from the spirit and scope of the invention, as the same is indicated above and in the accompanying drawings and the following claims.

I claim:

1. In an instrument panel assembly, a board element provided with a main observation aperture and with means for supporting therefrom both an assembly case and subsidiary units spaced from said case, said supporting means comprising concealed bolts, secured to said board near the respective ends of said subsidiary units, and releasable means, on said bolts, for so pressing said case and said subsidiary units toward said board as normally to retain the same in said spaced relationship although permitting any of said units to be separately removed.

2. An instrument panel assembly as defined in claim 1, in which said supporting means comprises pairs of bolts, each bolt being provided with a separate finger for engagement of said assembly case and respective pairs of bolts being provided with plates removably retaining said subsidiary units.

3. In an instrument panel assembly, a board element provided with apertures serially arranged, a central unit, and subsidiary units symmetrically disposed and respectively provided with parts adapted to interfit within said apertures, a pair of bolts secured to said board near each of said subsidiary units, and means, on said bolts, for the application of such pressure to said units as normally to retain said parts in said apertures, said means permitting any one of said units to be separately removed.

4. In means for removably securing an instrument case opposite an opening in a board element, a clip secured to said board element and provided with an offset portion having a non-circular opening therethrough, a bolt having a shank whose cross-sectional outline adapts it to interfit therein, a finger element provided with a board-engaging part and with a case-retaining part, means movable on said bolt for varying the pressure of said case-retaining part on said case, said bolt shank being upwardly removable from said clip.

5. In means for removably securing an instrument case and subsidiary units at spaced intervals to a board element, a pair of clips secured to said board element and each provided with offset portion having a non-circular opening therethrough, a bolt comprising a shank of corresponding cross-sectional outline in each opening, a finger element on each bolt and provided with a board-engaging part and with a case-retaining part, means adjustable on each bolt for varying the pressure of said case-retaining part, and an apertured plate initially movable on each pair of bolts and adapted to retain a subsidiary unit, said fingers and said plates being releasable to permit independent removal of any of said units.

6. In an instrument panel assembly, a board element provided with a main inspection ap-

erture, a case disposed opposite said aperture, an independent subsidiary device disposed at each end of said case, bolts secured to said board near respective corners of said case, and releasable means upon said bolts for so engaging said case and said devices as normally to secure the same in their indicated relationships.

7. In a one-window instrument assembly adapted to be retained opposite a main inspection aperture in an instrument board, a main concave casing element, an outer cover plate element provided with an aperture corresponding to said main aperture, an inner face plate element provided with oppositely effective glass-retaining means and with separate visibility openings for instruments carried by said main concave element, and a glass closure element retained between said plates, one of said plates being provided with side shoulders engaging side edges of said glass closure element and with pressed-away corners.

8. In a one-window instrument assembly adapted to be retained opposite a main inspection aperture in an instrument board, a main concave casing element, an outer cover plate element provided with an aperture corresponding to said main aperture and provided with a glass-retaining element, an inner face plate element provided with oppositely effective glass-retaining means and with separate visibility openings for instruments carried by said main concave element, and a glass closure element retained between said plates, said concave element being provided with a peripheral flange over which said inner face plate element extends, and one of said elements being so rebent as normally to retain said elements in assembled relationship.

9. In an instrument assembly, a main concave casing element, a glass-receiving closure element providing side shoulders which bound a glass-receiving area thereof and are adapted to receive therebetween the side edges of a glass closure element, corners of said area being so pressed away as to obviate grinding the corners of said glass closure element.

In testimony whereof I affix my signature.

HERMAN SCHWARZE.