Nov. 21, 1933. M. M. BLUFSTON 1,935,694

INDICATING DEVICE

Filed July 23, 1931

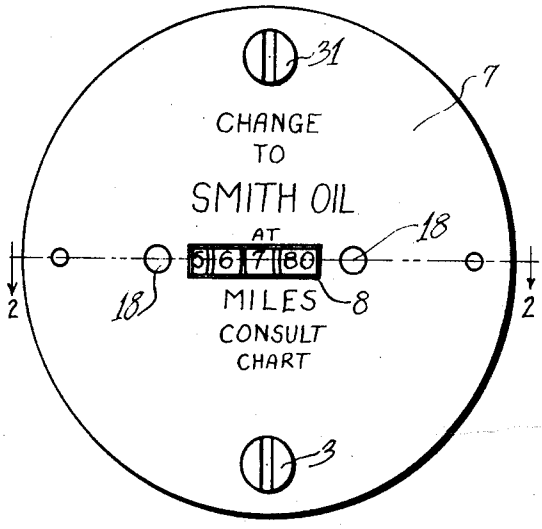

FIG. 1

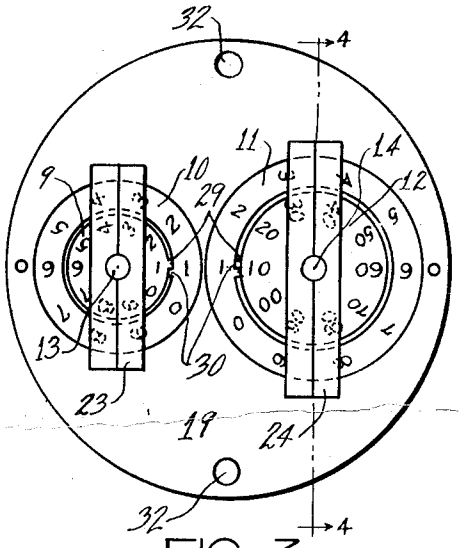

FIG. 3

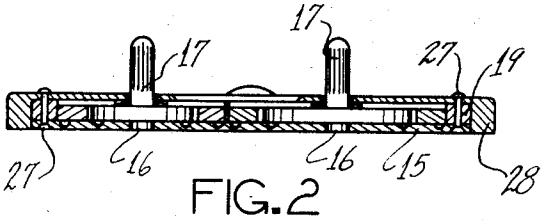

FIG. 2

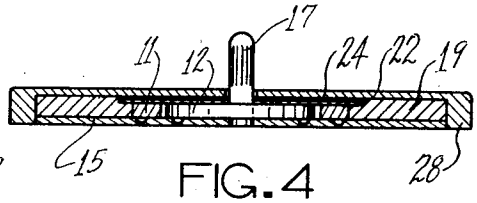

FIG. 4

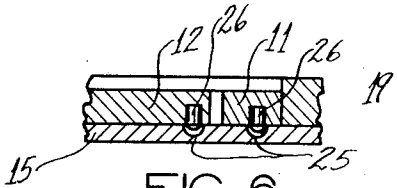

FIG. 6

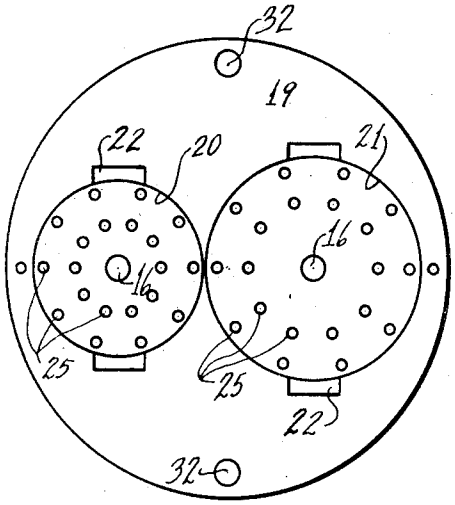

FIG. 5

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INDICATING DEVICE

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6 Claims. (Cl. 40—70)

This invention relates to improvements in indicating devices, and more particularly to an improved arrangement of parts and assembly of indicating devices of a type adapted for automotive use, to apprise a motorist of the mileage figure at which the vehicle is due to receive some routine service, such as oil change, chassis lubrication, etc.

A number of devices for the purpose noted have been available to the trade during the past few years, these devices consisting, in most cases, of a plurality of numeral-bearing rotatable members disposed in mutual adjacence, and adapted for manual rotation to display a mileage figure at which the car is to receive some routine attention. Such devices which have thus far appeared are, however, characterized by a great number of parts of relatively expensive construction and high assembly cost, and are further characterized by substantial dimensions, being particularly of appreciable and objectionable depth or thickness, so as, according to usual methods of mounting, to present a substantial obstruction on or near the instrument board of the vehicle. In view of the objections noted, it is a general object of this invention to produce a device for this purpose which is characterized by a more compact arrangement of movable, legend-bearing numbers, and further characterized by a minimum requirement of space, particularly of depth or thickness, so that the instrument may be disposed to lie substantially flat against an instrument board or other visible surface of an automobile.

A further object of the invention is attained in a device characterized by relatively fewer projecting portions such as the manipulating members for the numeral discs.

Yet another object is attained in the economy of space internal to the instrument, the arrangement being such that the device is of more simple and rugged construction than anything heretofore appearing for a similar purpose, and the arrangement further being such that all space internal of the device is fully occupied so as to minimize the over all dimensions and particularly the depth of the device, and to minimize the possibility of displacement of the discs, pivots and other movable parts.

Yet another objective simplicity of construction is attained in the provision of a plurality of numeral-bearing discs in a common plane; the provision of peripheral bearings for such discs, and the location of characters or legends on the face of the discs, as distinguished from the peripheral or edge portions thereof, according to certain older practices.

A still further object of the invention is attained through an arrangement whereby a single actuating member is operatively connected to a plurality of the numeral-bearing discs, and whereby to simplify the number of actuating members necessary to care for the requisite plurality of separate numeral bearing members.

Further objects and advantages, not necessary herein to be specifically enumerated, will appear from the following detailed description, considered in connection with the accompanying drawing, in which:

Fig. 1 is a front elevation of a device constructed according to the present invention; Fig. 2 is a section along line 2—2 of Fig. 1, certain portions, particularly certain of the numeral discs, being shown in elevation, for clearness; Fig. 3 is a top or plan view of the assembly, with the face or finish plate removed; Fig. 4 is a section along line 4—4 of Fig. 3 and also showing, for clearness, one of the numeral discs in elevation; Fig. 5 is a plan view of a portion of the assembly including a base plate by which is carried an intermediate member such as a bearing plate, hereinafter described, and which may be formed integrally with the base plate, or consist of a separate member, as shown, and Fig. 6 is an enlarged fragmentary section showing the arrangement for frictionally positioning the numeral discs in their adjusted settings.

Referring now by numerals of reference to the drawing, the structure in its presently preferred form, and as illustrated, includes a face plate or finish member 7 provided with a central window or aperture 8 through which is visible a row of numerals, severally borne by a plurality of rotatable members such as discs 9, 10, 11 and 12 (Fig. 3). These discs are by preference disposed in two contiguously arranged groups, the first group comprising a centrally apertured disc 9, and an annulus or disc 10 closely surrounding the disc 9, the arrangement being such that the members 9 and 10 are rotatable about a common axis 13. The second group of numeral discs, consisting in the present example of the members 11 and 12, are of somewhat larger diameter than the discs 9 and 10, but are similarly related for rotation about a common axis 14.

The rearmost or bottom portion of the assembly is preferably constituted by a base plate 15, apertured or recessed as at 16, concentrically with the axes 13 and 14, and thus serving to receive, in journaling relation, a pair of pivot pins 17 to

which the numeral bearing discs 9 and 12 are, respectively, secured. The pivots 17 extend upwardly or outwardly of the assembly through paired apertures 18 in the face plate 7, with one of the apertures 18 on each side of the window 8 and so located that the openings 16 and 18 serve as spaced bearings for the pivots 17.

Superposed on the base plate 15 is a bearing plate 19, the assembly of these two parts appearing in plan in Fig. 5. The bearing member 19 is provided with a smaller aperture 20, the diameter of which corresponds substantially to the external diameter of the numeral disc 10, and thus constitutes a peripheral bearing therefor. A larger opening 21 in like manner serves to embrace the numeral disc 11, as appears in Fig. 3. By reason of certain advantages in manufacture, the plates 15 and 19 are presently illustrated and described as separate members. However, I regard it as entirely within the scope of the present invention to form the plates 15 and 19 as a single element, and thus to utilize only a face plate and a base plate assembled in adjacence to each other. It will also appear obvious that, in the latter case, the openings 20 and 21 may not extend entirely through the base plate, but may be recessed therein either by partially drilling the plate, or by drawing operations, so as to countersink suitable recesses, or provide apertures such as 20 and 21 in a manner to result in peripheral bearings for the numeral discs. According to the latter construction, the discs and bearings therefor will be disposed rearwardly of the forward face of the base plate and rearwardly of the rear face of the finish plate.

Each of the apertures 20 and 21 in the bearing plate 19, of the illustrated embodiment is characterized by a radially disposed recess at each of its opposite sides, these recesses being indicated at 22, and each thereof serving as a seat to receive and position against angular movement, a spring, the springs being indicated at 23 and 24 (Fig. 3). The springs are preferably in the nature of bow springs of slight curvature and formed of a thin resilient material, centrally apertured to receive the pivot 17 and centrally and longitudinally ridged or corrugated for strength. These springs serve to provide the requisite frictional resistance to rotational movement of the numeral discs 9, 10, 11 and 12, so that they will not become altered in position under the influence of vibration, or of casual and unintentional engagement of the pivots 17.

Cooperating with the springs 23 and 24 for positioning the numeral discs in their intended adjusted relations, are recesses or apertures 25 disposed in groups circumferentially arranged about the openings 16. These circles of depressed portions are adapted for engagement by downwardly projecting pins, on integral upset portions, best appearing at 26 (Fig. 6).

Assembly of the device may be effected by superposing the bearing plate 19 on the base plate 15, in case these members are constructed separately as shown in Fig. 5; the numeral disc 9, affixed to its pivot 17 and surrounded by the disc 10 is then inserted in the aperture 20, and over this assembly is disposed the spring 23. In like manner the discs 11 and 12, the latter secured to its pivot 17, are disposed in the opening 21 with the lowermost projecting portions of the pin 17 occupying the journal opening 16 therefor. With the springs 23 and 24 each seated into a pair of diametrally opposed recesses 22, the face plate 7 is applied downwardly over the assembly as effected thus far, with the pivot 17 projecting through the journal openings 18, and the parts then secured in their assembled relation, preferably by the use of rivets 27. Suitable rivet openings are provided in register, in the base plate 15, the bearing plate 19 and face plate 7. It will also be noted (Fig. 2) that the edges of the base plate and bearing plate are enclosed or shrouded by a downwardly or rearwardly projecting rim portion 28 which may be and by preference is formed integrally with the face plate 7. It will appear, however, that with either the two-plate construction, or when employing the separate bearing plate, the device is fully operative even though the rim portion 28 may be omitted.

To the end of minimizing the number of separate control members to be actuated to effect setting of the numeral discs to indicate the desired figure, such as a mileage figure, it will be understood that the pivots 17 are secured respectively to the discs 9 and 12, and that these innermost discs are provided respectively with outwardly extending radial projections 29, (Fig. 3), the outer discs 10 and 11 being formed with companion projections 30 whereby, upon rotation of either of the discs 9 or 12, through its projecting pivot member 17, the outermost disc of the group may be actuated through impingement of one of the projections 29 upon one of the projections 30.

A further economy in number of parts is effected by employing a number of two figures, for example on the inner disc 12 of the right hand group appearing in Fig. 3. For the purpose intended, this provides a reading which is close enough to satisfy the usual requirements as to a mileage figure for routine motor service, etc.

It will appear from the foregoing description of parts that the numeral discs may be dieformed in quantity, of sheet metal; that in like manner, the base plate 15, the bearing plate 19 and the face plate 7 may each be of stamped or punched construction, whether the plates 15 and 19 are formed separately, or of a single piece. When separately formed, as shown, the bearing plate is apertured as at 20 and 21 either by separate drilling operations or through the use of suitable dies in a manner well known in the art, and thus the device may be produced and assembled at a very low manufacturing cost.

Any suitable form of mounting may be employed, for example, a spring clip (not shown) secured to the base plate 15 may serve to hold the device in easily detachable relation, say to the instrument board of an automobile, or, as preferred, a pair of mounting screws as suggested at 31, may be extended through the assembly and into an instrument board or like visibly located portion of an automobile. Apertures 32 (Figs. 3 and 5) permit the screws 31 to extend through and beyond the indicator.

I am aware that devices have heretofore been conceived and marketed, which consist of a plurality of rotatable, numeral-bearing discs, intended to accomplish the purpose of the present invention. The present device is, however, regarded as superior to anything of the sort heretofore offered to the trade, particularly in the compact assembly and novel method of supporting and mounting the numeral-bearing discs, the minimum depth or thickness of the apparatus, and also in the facilities for manufacturing the several component parts of the device entirely by punching or stamping operations.

While the invention has been described by making particular detailed reference to a single preferred executional embodiment, such description is to be understood solely in an illustrative and not in a limiting sense, since a number of changes may be made in the several parts, their combinations and arrangements, without departing from the spirit and full intended scope of the invention, as defined by the claims hereunto appended.

I claim as my invention:

1. In an indicator of the class described, including a base member, a finish member, a plurality of concentric rotatable, numeral-bearing discs mounted between said members, disc-positioning means formed by projections and notches on one disc and the base member, and another projection on one disc forming an operative connection to an adjacent disc.

2. In an indicator of the class described, a base member, a finish member, a pair of rotatable numeral-bearing discs, disposed between said members, in concentric, nested relation, a projection or lug formed on one of said discs and projecting toward the other disc, an abutment for said lug on the other disc, arranged in the path of the lug, whereby upon engagement of the lug and abutment, the discs may be concurrently rotated upon actuation of one disc.

3. In an indicator of the class described, a base, a front closure, numeral-bearing rotatable discs mounted for rotation in a plane adjacent the front closure, a plate carried by the base, forming peripheral bearings for certain of said discs, and springs disposed between the bearing plate and front closure, adjacent said discs, said plate being formed to provide seats for said springs arranged to prevent angular movement thereof as the associated discs are rotated.

4. In an indicator, a case, paired, concentric, numeral-bearing discs within the case, an interlock connection formed by integral, abutting portions of the discs, arranged for engagement to cause the concurrent movement of both discs, upon actuation of one disc in one direction, and permitting individual actuation of said last disc, when moved in the opposite direction.

5. In an indicator, a case, paired, numeral-bearing discs arranged one within the other within the case, a projection formed on one disc, a projection-receiving portion formed on the adjacent disc adapted to permit interengagement of the discs, and a disc-positioning device formed by one disc and a wall of the case, consisting of an upstruck lug and a seat therefor.

6. In an indicator of the class described, a base plate, a bearing plate disposed in parallel adjacence to the base plate, a finish plate overlying the bearing and base plates and provided with a peripheral flange arranged circumferentially to embrace the bearing and base plates, a plurality of numeral-bearing, rotatable discs disposed between the base and finish plates and substantially within, and of even thickness with the bearing plate, the bearing plate having circular openings of a diameter substantially conforming to the diameter of a pair of said rotatable discs, the discs being disposed in contiguous, concentric groups, each group disposed within one of said apertures of the bearing plate; a pivot extending through the innermost disc of each group and journaled in the base and finish plates; means formed by the discs and cooperating portions of the base plate, tending to position the discs in their adjusted relation, bow springs disposed between the respective groups of rotatable discs and the finish plate, and further tending to position the discs against unintended rotation, the finish plate being provided with a slotted opening through which a row of numerals on said discs is rendered visible, means for securing the plates and discs in assembled relation, and means for detachably mounting the assembly to an exposed surface of an automotive vehicle.

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