R. T. NEWTON.

RADIATOR INDICATOR.

APPLICATION FILED OCT. 20, 1917.

1,306,557.

Patented June 10, 1919.

3 SHEETS—SHEET 1.

Fig. 1.

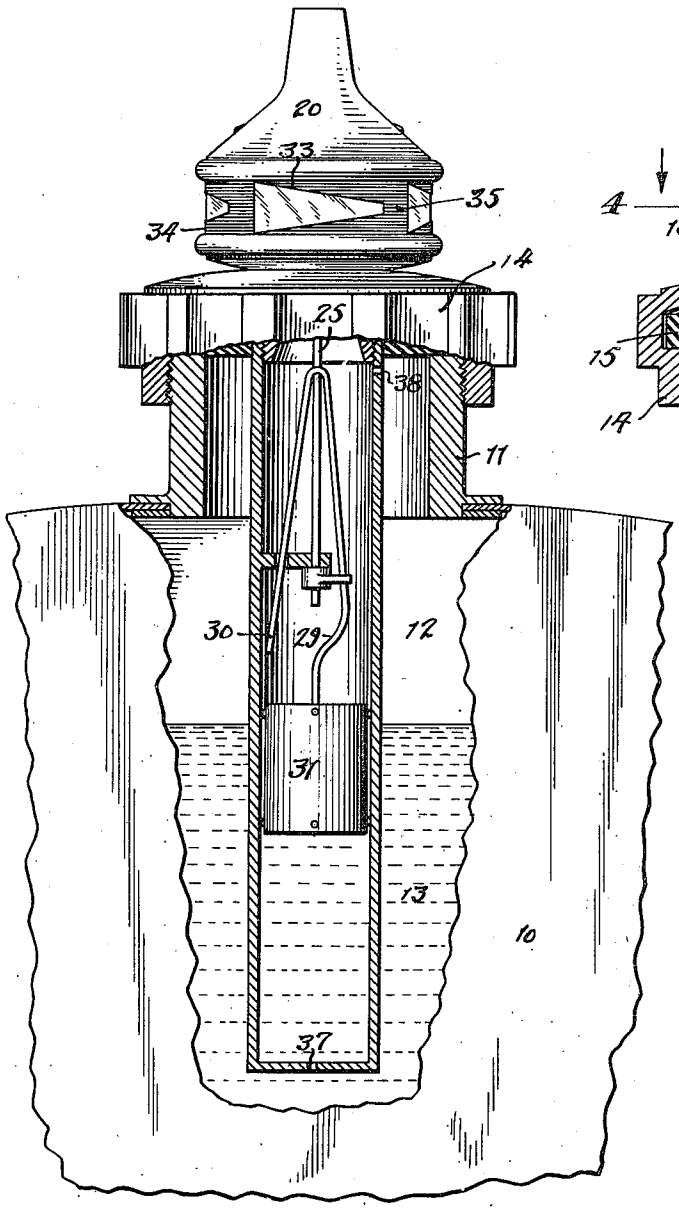
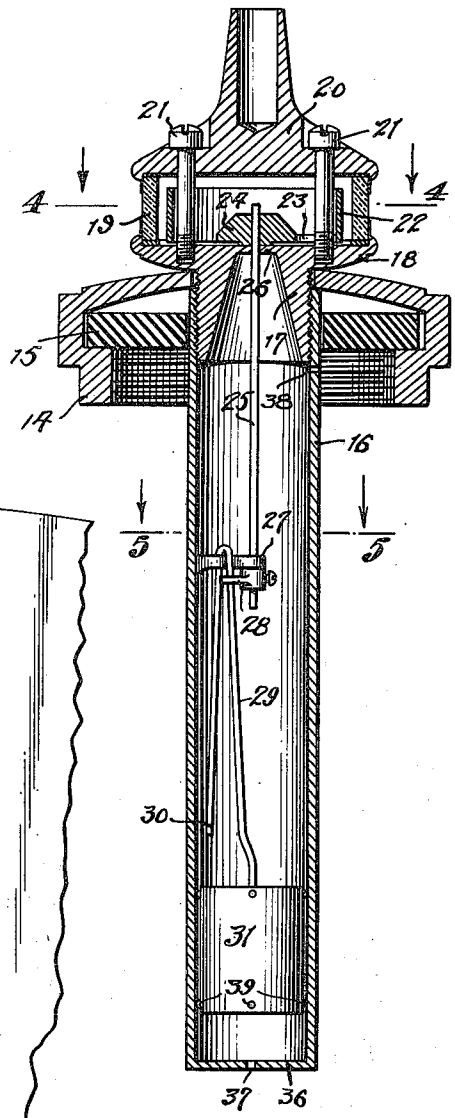


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

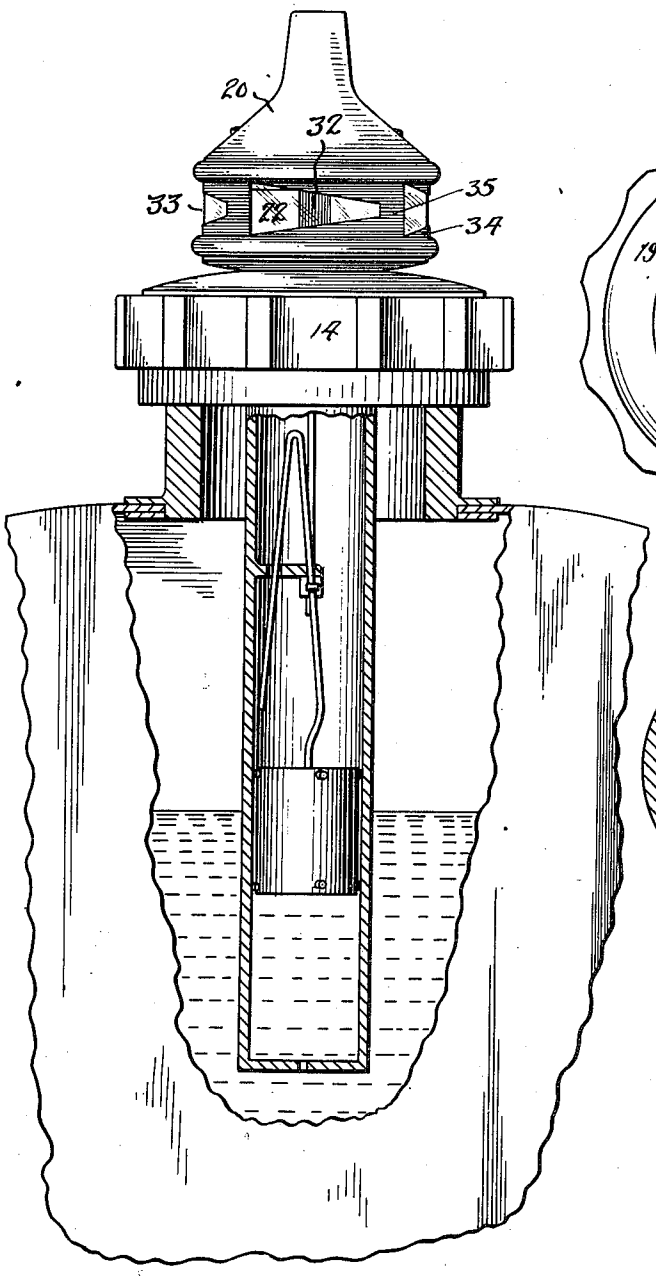


Fig. 4.

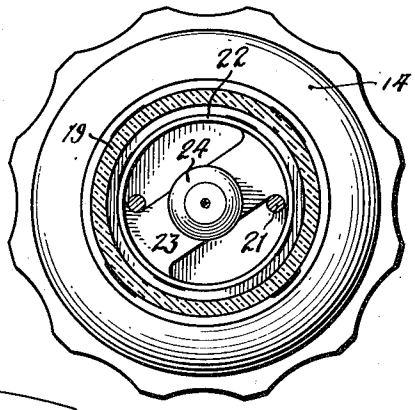
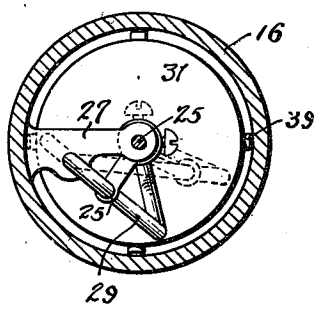


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 8.

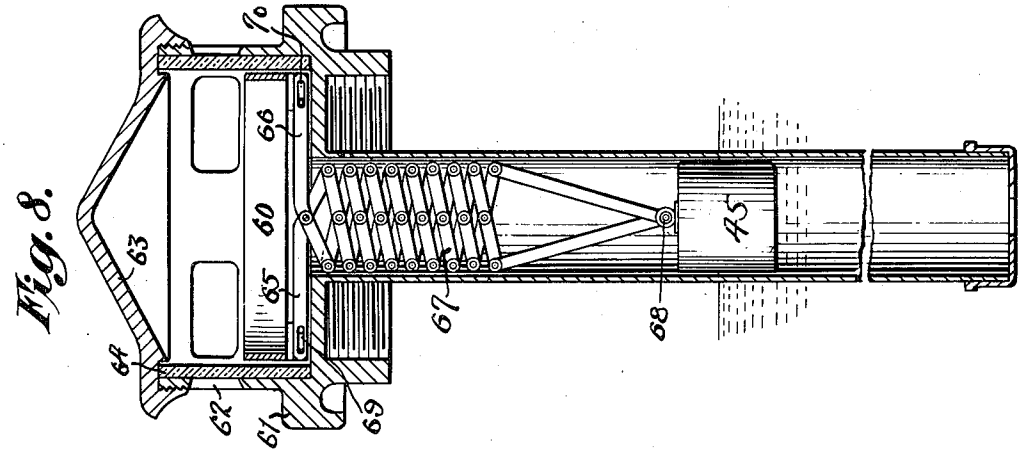


Fig. 7.

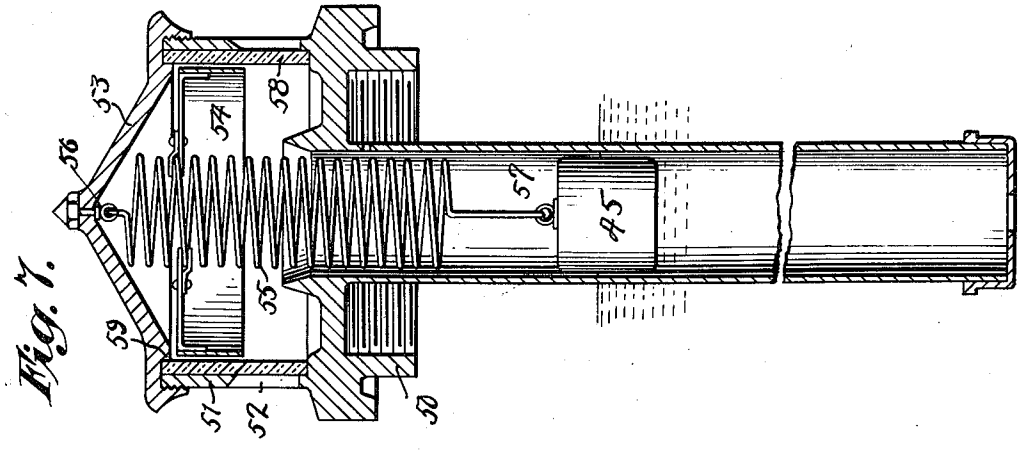
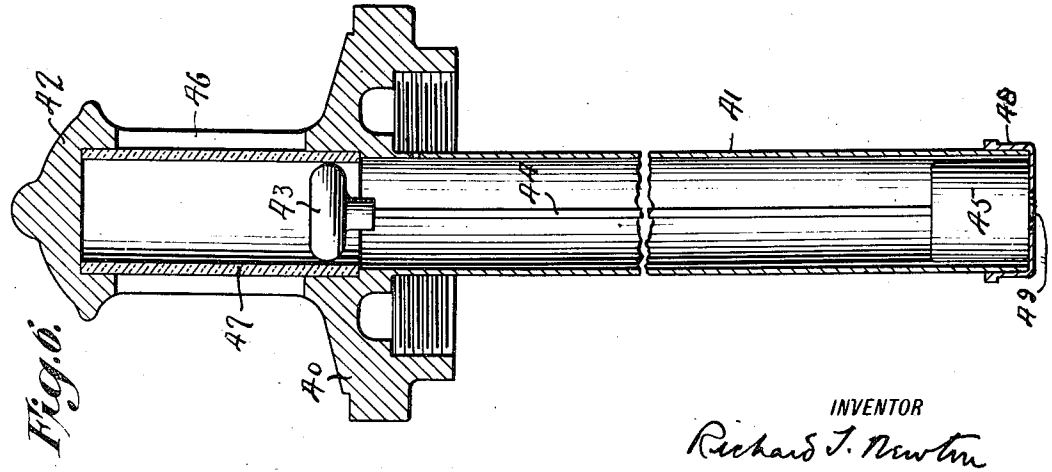


Fig. 6.



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UNITED STATES PATENT OFFICE.

RICHARD T. NEWTON, OF NEW YORK, N. Y.

RADIATOR-INDICATOR.

1,306,557. Specification of Letters Patent. Patented June 10, 1919.

Application filed October 20, 1917. Serial No. 197,573.

To all whom it may concern:

Be it known that I, RICHARD T. NEWTON, a citizen of the United States of America, and residing in the city, county, and State of New York, have invented a certain new and useful Improvement in Radiator-Indicators, of which the following is a specification.

My invention relates to radiator indicators and particularly to a device for graphically displaying the amount of water in the radiator tank of an explosion engine, the object of my invention being to provide an efficient device which may be cheaply made and readily carried by a cap such as is now commonly used to cover the fill opening for an automobile radiator.

In the accompanying drawings,

Figure 1 is a side elevation of a radiator partially broken away and in which my invention is embodied in one form;

Fig. 2 is a vertical section through the cap and indicator alone;

Fig. 3 is a view similar to Fig. 1 showing the indicator in a different position;

Figs. 4 and 5 are horizontal sections on the lines 4—4, 5—5, Fig. 2, respectively; and

Figs. 6, 7 and 8 are vertical sections through indicator devices of modified construction.

Referring to the construction shown in Figs. 1 to 5, my invention is here shown applied to an automobile radiator 10 having the usual fill pipe 11 opening to the interior 12 of the radiator tank and through which the cooling water 13 is introduced. The pipe 11 is externally tapped as usual at its outer end to receive a closure cap 14, carrying a sealing washer 15. This cap I have utilized to support a float-actuated indicator by which the level of the water 13 in the radiator 10 may be readily ascertained.

To this end, the cap 14 and washer 15 are centrally pierced in register to accommodate the indicator which comprises an elongated float chamber 16 in the form of a pipe bearing against the inner face of the cap top and internally tapped at its upper end to receive a threaded thimble 17. The flange 18 of the latter bears against the outer face of the cap thus clamping the float chamber and indicator to the cap. The indicator chamber is formed above the thimble 17 by a spacing ring 19 and a top piece 20, the latter being secured by bolts 21 passing downward therethrough and taking into tapped holes in the thimble 17.

Within the indicator chamber I mount a rotary dial 22 attached by a bridge piece 23 to a central hub 24 fast with spindle 25. The latter passes down through a guide hole in the diaphragm 26 of the thimble 17, and through a bracket 27 secured inside the float chamber. At the lower end of the spindle is rigidly secured a lever arm 28 having at its outer end an eye through which passes one arm 29 of a hairpin stem, the other arm 30 of which passes through a hole in the bracket 27. The float 31 is attached to the lower end of the arm 29 and rises or falls in the float chamber 16 in accordance with the level of the water 13 in the radiator chamber 12. Inasmuch as the arms 29 and 30 are divergent, it is obvious that when the float 31 is up (Fig. 1), the lever arm 28 will take a different angular position from that which it takes when the float falls with the lowering level of the water 13 in the radiator chamber. Inasmuch as the spindle 25 and the indicator dial 22 are rotated with the lever 28, they offer a ready means for disclosing the condition of the water level in the radiator reservoir.

Various types of dial may be employed which would be suitably actuated by the mechanism described, and I do not limit the dial construction to that shown. The dial 22 illustrated, however, comprises an annulus having at intervals vertical bars 32, painted red thereon, which are moved past windows 33 formed in the spacing ring 19. As here indicated, the spacing ring 19 is of glass and the windows are formed by a band of metal 34 in which the windows 33 are cut. To accentuate the indication the windows are made V-shape and the indicator bars 32 move from the narrow end of the windows to the large ends thereof as the water level lowers. When the radiator is full, the bars 32 are substantially hidden by the blank spaces 35 between adjacent windows.

In order to prevent vibration of the float

and dial when the car is in motion and the water in the radiator consequently agitated, I prefer to close the lower end of the float chamber 16 by a diaphragm 36 which is perforated by a slight hole 37 (of a diameter of about $\frac{1}{16}$ of an inch) to admit water thereto from the float chamber. This affords sufficient communication between the float chamber and the tank but also affords a dash-pot action which serves to maintain the water in the float chamber substantially quiescent. A vent hole 38 is drilled through the pipe near its upper end to permit the free escape of air. Surface adhesion of the sides of the float to the inner walls of the float chamber 16 is prevented by providing a series of small teats 39 on the outer face of the float, which serve to space the surfaces apart.

In order to insure the proper operation of the hairpin stem 29, 30, the spacing between the arms when the float is in its uppermost position, is such that the lever arm 28 lies to one side of a plane passing through the two holes in the bracket 27 and consequently the lever 28 is never on a "dead center". To insure this off-center position, irrespective of the exact level to which the radiator is filled, a stop is provided by the engagement of the cross bar 23 (Fig. 4) with the screw bolts 21 which thus limit the arcuate travel of the indicator and thus the angular movement of the lever 28.

In the modification shown in Fig. 6 the radiator cap 40 is provided with an integral tubular extension 41 which forms the float chamber, and with a housing 42 for the indicator 43. The latter is carried at the upper end of the stem 44, rigid with the float 45. Slots 46, in the housing 42, afford sight apertures through which the indicator 43 may be observed. These slots may be closed by transparent windows 47 of glass or the like. A cap 48, at the lower end of the float chamber, limits the downward movement of the float and affords, through its aperture 49, a port for the admission of water to the float chamber from the radiator. Obviously in this construction the movement of the indicator 43 is in direct accord with the rise or fall of the water level in the radiator and the housing 42 must consequently be of considerable height to be practical.

In Fig. 7 I have shown a further modification in which the cap 50 is provided with an upstanding flange 51 with windows 52 and a top closure 53 housing the indicator. The indicator 54 is carried by the coils of a spring 55, the upper end of which is attached at 56 to the cap 53, while the lower end is attached at 57 to the float. A transparent window closure 58 may be secured in position within the flange 51 by the shoulder 59 on the cap. The indicator 54 is shown in the position which it would occupy when the radiator is full. As the float 45 falls, the spires of the spring 55 separate thus gradually bringing the indicator 54 downward into vision at the windows 52.

In Fig. 8 I have illustrated still another arrangement in which the indicator 60 moves upward, instead of downward, as the float 45 falls. In this case the radiator cap 61 also has a housing flange, but the windows 62 are formed in the upper portion of the latter instead of in the lower portion as in Fig. 7. The indicator chamber is closed by a screw top 63 which, in similar manner, holds a transparent closure 64 inside the flange. The dial 60 is carried by the terminal links 65, 66, of a lazy tongs arrangement 67, jointed at its lower end 68 to the float 45, and having pin and slot arrangements 69, 70, between the links 65 and 66 at its upper end and the indicator. As the float 45 falls, the dial 60 is lifted and comes gradually opposite the windows 62.

It is obvious that while in Fig. 6 the movement of the indicator 43 is exactly commensurate with the rise or fall of the water in the radiator, in the remaining constructions the movement of the indicator is materially less than but in precise ratio to that of the float. This feature is highly desirable since it minimizes the height required for the indicator chamber, while at the same time affording an ample range of movement for the float.

It will be noted that in Figs. 6, 7 and 8 I have shown the float tube and portion of the indicator chamber integral with the radiator cap and this feature could be embodied in the construction illustrated in Figs. 1 to 5 by making the tube 16 integral with the cap, as also the flange 18 and diaphragm 26. Similarly, the closure at the lower end of the float chamber may, in any of the construction, be accomplished by means of a supplemental cap 48.

Various modifications in detail of construction and operation will readily occur to those skilled in the art, which do not depart from what I claim as my invention.

I claim:—

1. An indicator for automobile radiators, comprising a rotary dial, a float, a V-shaped pin carried by the float, and a fixed abutment, the branches of said V-shaped pin having a sliding engagement respectively with a dial member and said abutment to cause the dial to rotate on the rise or fall of the float.

2. In a construction such as specified in claim 1, a rod depending from the dial and rigid therewith and having an offset arm engaged by one branch of the V-shaped pin.

3. An indicator for automobile radiators comprising a radiator cap, a tubular chamber extending downward therefrom into the radiator tank, a float arranged in said cham-

ber, a V-shaped pin carried by said float, an abutment on the side of said chamber engaged by one branch of the V-shaped pin, an indicator housing above the cap, a rotary indicator, a rod depending therefrom, an offset arm mounted on said rod and engaged by the other branch of the V-shaped pin on the float whereby the indicator is oscillated by the rise or fall of the float substantially as described.

In testimony whereof I have signed my name to this specification.

RICHARD T. NEWTON.