Aug. 18, 1936. T. N. COFFELDER 2,051,635

DRAIN VALVE FOR RADIATORS

Filed Jan. 17, 1935

FIG. 1

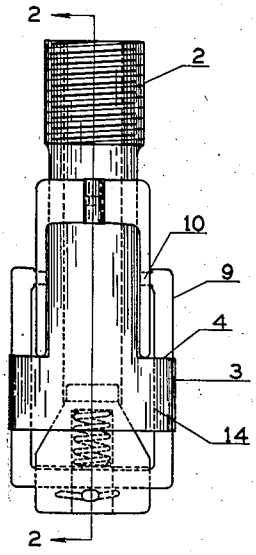


FIG. 2

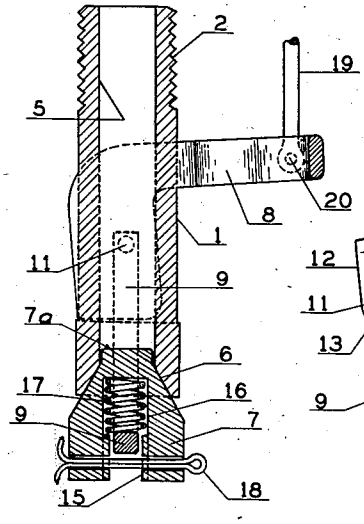
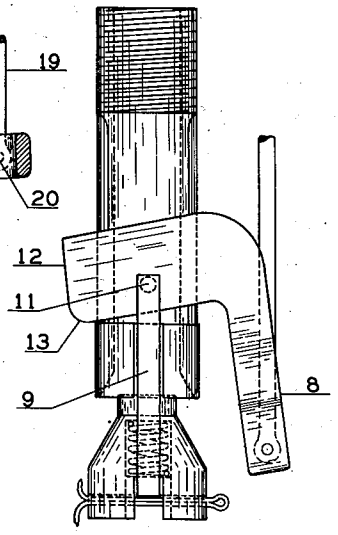


FIG. 3



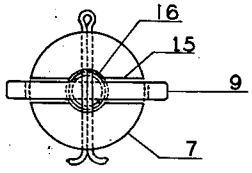


FIG. 4

FIG. 5

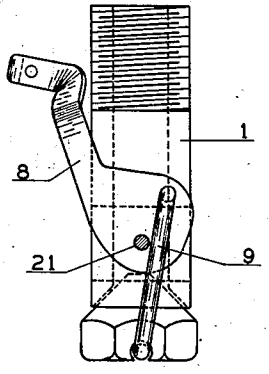
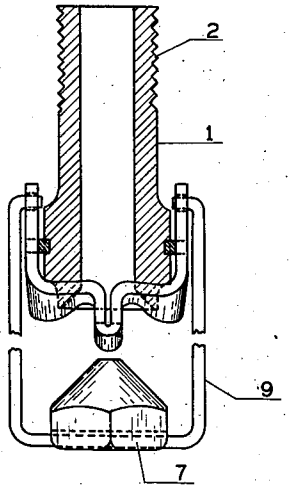


FIG. 6



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Patented Aug. 18, 1936 2,051,635

UNITED STATES PATENT OFFICE

2,051,635

DRAIN VALVE FOR RADIATORS

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Application January 17, 1935, Serial No. 2,262

2 Claims. (Cl. 137—34.2)

This invention relates to new and useful improvements in drain valves for radiators and the like and it is among the objects thereof to provide a valve structure which is conveniently controlled to the opened or closed position without turning the valve member as in the conventional form of drain valve and which shall assure the drainage of the fluid when the valve is open.

A further object of the invention is the provision of a novel form of valve and latch which are adapted to cooperate to open and close the valve by a simple movement of the latch and which cooperate to interlock the valve and latch with the valve housing in the closed position without inducing excessive wear on the contacting surface of the movable members and which will further assure a positive and full size opening of the valve when the latch is moved to the open position.

The conventional form of radiator drain valve embodied a rotary valve stem with an opening which in one position registered with the opening of the valve casing and in another position cooperated with the wall of the casing to seal the flow passage. These valves because of their necessary location at the lowest point of the cooling fluid in the engine jacket or radiator are inaccessible and usually require the use of a tool such as pliers to open and close them. Also, because of rust and scale forming in the water jacket, the drain passage of the valve frequently clogs necessitating the insertion of a prodding member.

The present invention obviates these difficulties as will be apparent from a description of the figures in the accompanying drawing forming a part hereof in which like reference characters designate like parts and in which:

Fig. 1 is a front elevational view of a drain valve embodying the principles of this invention;

Fig. 2 a vertical cross-section taken along the line 2—2, Fig. 1;

Fig. 3 a side elevational view showing the valve in open position;

Fig. 4 an end elevation of Fig. 1;

Fig. 5 a side elevation showing a modified form of valve; and

Fig. 6 a cross-sectional elevational view of the valve shown in Fig. 5.

Referring to Figs. 1 to 4 inclusive of the drawing, the structure therein illustrated comprises a sleeve 1 of bronze or other non-corroding material having a threaded portion 2 for screwing into the bottom of the radiator or water jacket of an internal combustion engine, the sleeve 1 having its axis vertically disposed in its mounted position. The lower portion of sleeve 1 is provided with lateral lugs 3 forming shoulders 4 and a flow passage 5 extends through the member 1, this passage being of relatively large diameter and unobstructed by any of the valve fittings. The lower end of sleeve 1 is countersunk or chamfered to form a seat 6 for a valve 7, the latter being made of a non-corrodible substance such as bronze or brass.

Valve 7 is provided with a pilot 7*a* and is manipulated and secured to the valve sleeve 1 by a lever and link generally designated by reference numerals 8 and 9 respectively which are connected to the valve and member 1 in the following manner.

Both lever and link 8 and 9 respectively are bifurcated members which are cooperatively joined by the in-turned ends of link 9, forming trunnion-like members 10 that fit in perforations 11 in the sides of lever 8 as is clearly shown in Fig. 1. Perforations 11 are off-set from the center line of the side portion of lever 8 but are on the center line of the valve fitting 1 so that the bottom face 12 of the lever forms a cam face rounded at 13 that abuts the shoulder 4 of lugs 3 when raising or lowering the link 9. The lugs 3 of the fitting 1 are slotted at 14 to receive the side members of link 9 which have sliding movement in the slots 14 to maintain constant alignment in the vertical movement of valve 7.

The valve is slotted at 15, the slot extending from the lower face of the valve a substantial distance into a bore or cylindrical recess 16 provided in the center of the valve as shown in Fig. 4. A coil spring 17 is disposed in the bore 16 of the valve and link 9 abuts against the free end of spring 17. A cotter pin 18 extends transversely of slot 15 to maintain the assembly of the spring and link in valve 7. Spring 17 is relatively stiff in compression and functions to provide yielding surface engagement of the faces 12 and 13 of lever 8 with shoulders 4 of lugs 3, while assuring solid contact of valve 7 with the seat 6 of the member 1. The cotter pin 18 furnishes a solid abutment for link 9 when force is applied through the lever 8 to open or unseat the valve 7.

As previously stated, the drain valve is preferably secured at the bottom of the radiator fitting or water jacket of the engine housing and in a vertical position as shown in Figs. 1 to 3 of the drawing and when so located and positioned the valve is rendered accessible through a rod 19 which is pivoted to lever 8 at 20. The rod may

be provided with a loop at its upper end and latched if desired. By use of the rod 19, the lever 8 of the valve is rendered accessible for manipulation to open and close the valve 7. When the lever 8 is depressed or moved downwardly the valve 7 is positively displaced in a downward direction by the link 9 and conversely by raising lever 8 through a pull on rod 19, valve 7 is forced against the seat 6. The pilot 7a will align valve 7 with its seat 6 to assure proper seating in closing.

Because of the relatively large flow passage 5 and the seating of the valve on the exterior of the valve housing, the fluid to be drained will readily escape from the valve nozzle even when scale or other foreign particles have settled in the valve, thus assuring efficient operation of the valve at all times, particularly in the winter time when it is necessary to frequently manipulate the valve for draining the cooling fluid from the engine.

In Figs. 5 and 6 of the drawing, the use of the unobstructed flow passage and valve is shown in a modified form. In this construction valve 7 is connected by the link 9 to a lever 8 as in the above mentioned structure and lever 8 is pivotally mounted by trunnions 21 to the valve sleeve 1. The interlocking of the valve is effected by the eccentric mounting of link 9 on lever 8 as shown in Fig. 5. This construction, while embodying the principles of a valve arrangement, is of simpler construction but, obviously, less efficient for the effective closing and opening of the valve with a minimum strain on the operating parts than the preferred form disclosed in Figs. 1 to 4.

I have thus described specifically and in detail several embodiments of my invention in order that the nature and manner of constructing and operating and using the same may be clearly understood. However, the specific terms herein are used descriptively rather than in a limiting sense, the scope of the invention being defined in the claims.

What I claim as new and desire to secure as Letters Patent is:

1. A drain valve comprising a sleeve-like structure threaded at one end and having lateral lugs at its other end, a flow passage extending straight through the sleeve terminating in a chamfered seat at the open end of the sleeve, a valve adapted to engage the seat of the sleeve, slots formed in the lateral lugs of the sleeve, a U-shaped link having its bight portion loosely joined to the valve and having its leg members disposed in the slots of said lugs, and a bifurcated lever pivotally connected with said link and having its legs rounded to engage the shoulders of said lateral lugs.

2. A drain valve comprising a cylindrical housing adapted to be fitted to a source of liquid at one end and having an enlarged body portion at its other end provided with external parallel slots, an unrestricted flow passage through said housing flared at its lower end to form a valve seat, a valve having a face complementary in shape to the seat of the housing, a link for said valve the legs of which engage the slots of the valve housing, and a lever for said link, said valve having a hollow end constituting a spring seat slotted to receive the link, a coil spring abutting the bottom of the spring seat and the portion of the link in the valve slot, and retaining means for holding the link in said valve housing, said valve being provided with an abutment for engaging the lever to interlock the valve link and lever with the valve housing.

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