F. N. KELSEY.

SIGNAL VALVE.

APPLICATION FILED OCT. 8, 1919.

1,434,708. Patented Nov. 7, 1922.

Fig. 1.

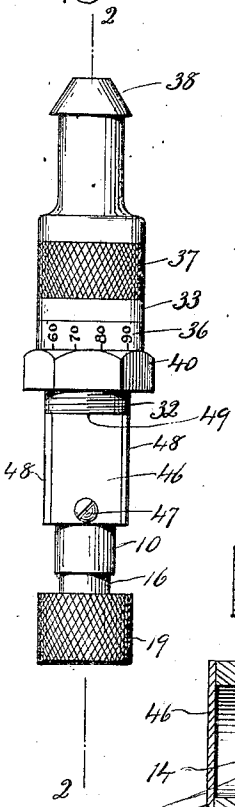


Fig. 2.

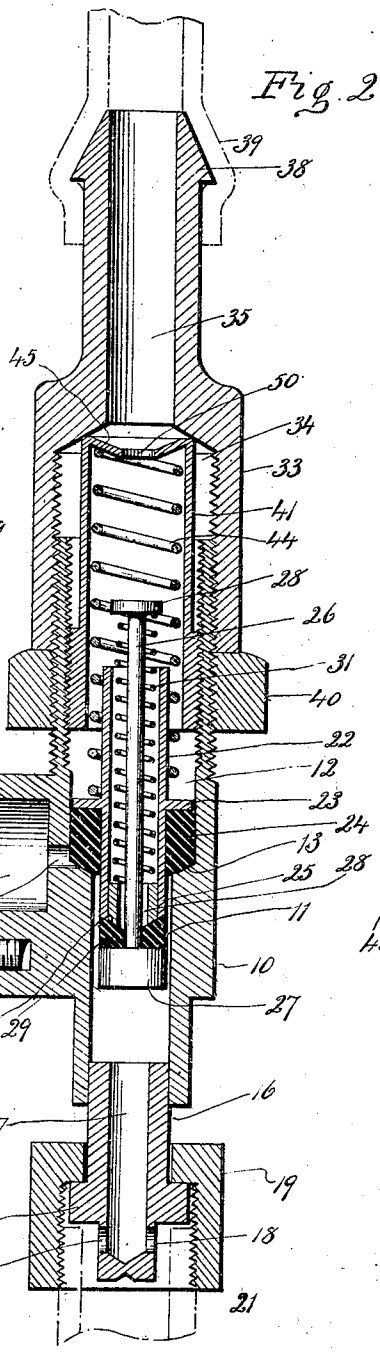


Fig. 3.

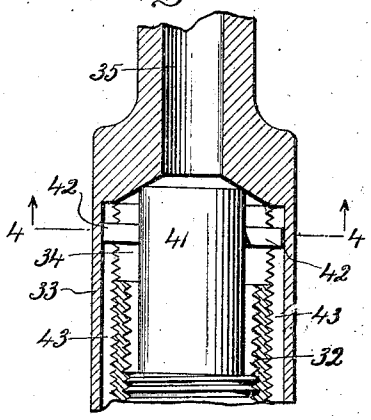
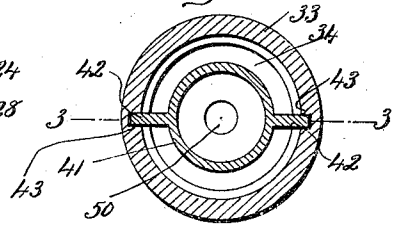


Fig. 4.



Inventor
Frank N. Kelsey
By Young & Young Atty

Patented Nov. 7, 1922. 1,434,708

UNITED STATES PATENT OFFICE.

FRANK N. KELSEY, OF NEW HAVEN, CONNECTICUT, ASSIGNOR OF ONE-HALF TO ARCHIBALD H. BOWDITCH, OF NEW HAVEN, CONNECTICUT.

SIGNAL VALVE.

Application filed October 8, 1919. Serial No. 329,380.

To all whom it may concern:

Be it known that I, FRANK N. KELSEY, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Signal Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in signal valves and is designed to be attached to the valve stem of the inner tube of an automobile tire and to operate when the air therein exceeds a predetermined pressure.

While the invention is herein shown and described as applied to mechanism substantially as above set forth, I desire to have it understood that it has other uses and is applicable in connection with any mechanism wherein air is under pressure in a confined space.

It is the object of my invention, among other things, to produce a device of this character that will be positive in its operation, produced at the minimum cost, which may be readily attached and detached without disarrangement of its parts and will withstand hard wear and usage.

To these, and other ends, my invention consists in the signal valve, having certain details of construction and combinations of parts as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures;

Figure 1 is a view of my improved device complete;

Figure 2 is an enlarged sectional view, taken substantially upon line 2—2 of Figure 1;

Figure 3 is a sectional view of a portion of the mechanism, taken upon line 3—3 of Figure 4; and

Figure 4 is a sectional view of the parts, taken upon line 4—4 of Figure 3.

Referring to the drawings, the numeral 10 designates the valve body having a chamber 11 therein that opens into a larger chamber 12, these being separated by a shoulder or valve seat 13. Upon one side of the valve body is an auxiliary chamber 14 connected with the chamber 12 through the port 15. Fixed in one end of the valve body 10 is a plug 16 having a port 17, from the outer end of which radiate the lateral ports 18.

Loosely mounted upon the plug 16 is a nut 19 which has a free endwise movement thereon between the end of the valve body 10 and the collar 20 and is provided with internal threads, which engage the threaded end of the valve stem 21, connected with the said inner tube and shown in the drawings by broken lines.

Movable within the valve body 10 is a sleeve 22 having a collar 23 thereon against which lies the gasket 24 and fixed in one end of which is a plug 25. Within this sleeve is a rod 26 that passes through the opening 28 in the plug 25, having a head 27 at one end and a head 28 at the opposite end. One of these heads may be integral with the rod and the other secured thereto in any well known manner. Adjacent to the head 27 is a gasket 29, which in one of its positions is held against the valve seat 30 at the end of the sleeve 22 and the plug 25 by the spring 31.

Threaded upon the exterior of the shank 32 of the valve body 10 is the compression cap 33, having a chamber 34 therein, into which opens the port 35. The compression cap 33 is graduated as shown at 36 in Figure 1 to indicate various pounds pressure and is knurled at 37 so as to insure a tight grip while threading it on and off the valve body. This cap is provided at its outer end with an enlarged head 38, which is projected into the opening of a flexible tube 39, which is connected with an air pump.

A nut 40 threaded on the shank 32 provides means for locking the compression cap in its adjusted positions. The walls of the chamber 12 are internally threaded, the pitch thereof corresponding with the external threads on the shank 32, and threaded thereon is the spring cap 41, having radial wings 42 that project into recesses or slots 43 in the compression cap 33. By this connection between the spring and compression caps the movement of the latter is imparted to the former, one however being rotatably mounted within the shank 32 and the other upon the exterior thereof.

A spring 44 lies within the spring cap 41 and abuts at one end against the collar 23 on the sleeve 22 and at the other end against the end wall 45 of said cap, through which is an opening 50.

Secured to the valve body 10 by the screw 47 so as to normally cover the auxiliary chamber 14 is the diaphragm 46, which is held against lateral movement by the lips 48. This diaphragm is provided at one end with a notch 49, which serves as an indicating line with which the graduations 36 are brought into register for determining the air pressures desired.

In practice this device remains attached to the pump tube 39 and is applied to the inner tube by threading the nut 19 on to the valve stem thereof, the end of the plug 16 opening with the valve therein, as is usual. When so applied all of the parts occupy the relative positions shown in Figure 2. The compression cap 33 is now rotated until the graduation 36 thereon indicating the desired maximum pressure of the air within the inner tube registers with the indicating notch 49, when the nut 40 is manipulated so as to lock this cap in its then position. Air is now pumped into the valve through the port 35, opening 50 and sleeve 22 lifting the gasket 29 off its seat 30 against the pressure of the spring 31. This air then passes through the chamber 11, port 17 and lateral ports 18 into the valve stem. These operations continue until the air in the inner tube has reached the predetermined pressure as indicated by the graduations on the compression cap. If the admission of the air into the tube is thereafter continued the pressure against the head 27 and the gasket 24 exceeds that of the spring 44, which yields as a result thereof, causing the sleeve 22 and all of the parts connected therewith to move longitudinally within the valve body 10 and by so doing uncovering the port 15. Air now passes through this port 15 into the auxiliary chamber 14 against the diaphragm 46 which is caused to vibrate by reason thereof and sound the alarm, thereby announcing that the maximum air pressure within the tire has been exceeded. This continues until the air pressure within the tire has been reduced to the predetermined pressure when the spring 44 will return the sleeve 22 to its original position and the gasket 24 to its seat, and closing the port 15. The tension of the spring 44, which determines the pressure necessary to move the gasket 24 off its seat, is of course varied by manipulation of the compression sleeve 33.

With this mechanism, which is quite simple in construction and operation, it is impossible to inflate a tire with air beyond a very limited predetermined amount without giving notice thereof through the action of the diaphragm.

Within a limited range the detailed construction of the parts may be very materially altered within my invention and I would therefore have it understood that I do not limit myself to the exact construction herein described but claim all that falls fairly within the scope of the appended claim.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

A tire alarm including a body having means to connect same to a tire valve stem and having an interiorly and exteriorly threaded part, a valve seat in the body, the body having an exhaust port, a sleeve having a valve thereon engaged with said seat, a spring pressed valve in the sleeve controlling the passage of air therethrough, a cap having an opening to admit air therein and having threaded engagement with the interior threads of said body part, a spring for holding the first named valve to its seat, arranged within the cap and engaging the top of the latter, the outer end of the sleeve projecting into the inner end of the cap so as to have an overlapping relation thereto and the second named spring surrounding the sleeve and engaging the inner circumference of the cap so that a continuous guide is provided for the second named spring by the overlapping of the sleeve and cap, a compression cap threadedly engaged with the exterior threads of the body part, and means between the two caps for causing simultaneous movement thereof so that upon movement of the compression cap the first named cap will move therewith to regulate the tension of the first named spring.

In testimony whereof, I have hereunto affixed my signature.

FRANK N. KELSEY.