

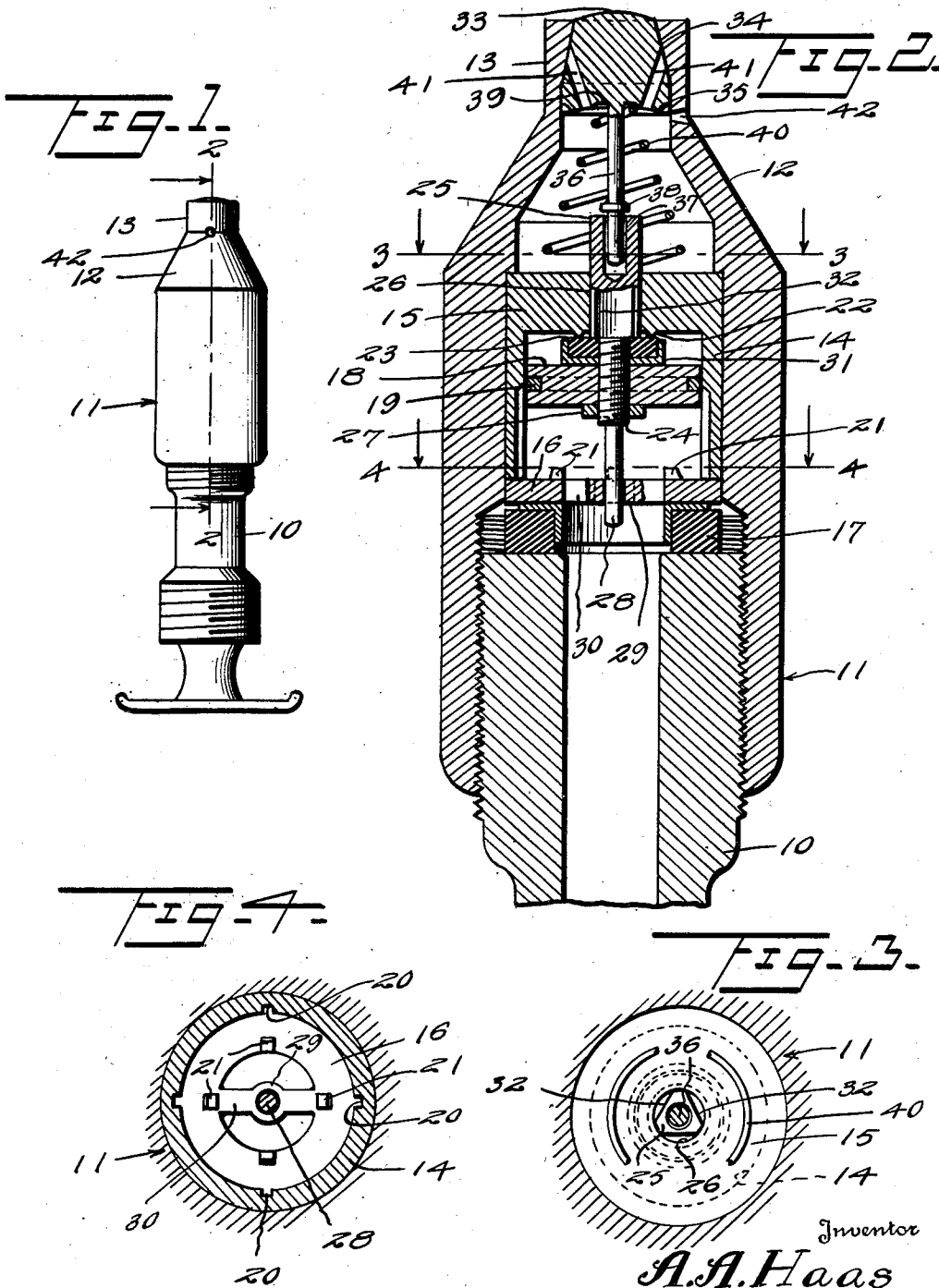
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AIR VALVE

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AIR VALVE

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1 Claim. (Cl. 152—12)

This invention relates to air valves and is an improvement over the air valve construction embodied in my Patent No. 1,996,291, which issued April 2, 1935.

5 An object of this invention is to provide an improved type of air valve of the dust and dirt proof character which is so constructed that the pressure of air within the stem and within the inner tube will act to maintain the valve means in closed position.

10 Another object of this invention is to provide a simplified end valve construction which is constructed in a manner to prevent dirt or dust from entering the interior of the valve so as to interfere with the operation thereof.

15 A further object of this invention is to provide an improved air valve construction of the dust and dirt proof character which is so constructed as to eliminate the use of the usual cap provided on the valve stem and which may be mounted on the stems of inner tubes or other pressure devices without altering or interfering with any of the present parts of the device, it being understood that the usual valve insides is first removed from the interior of the valve stem.

20 The above and various other objects and advantages of this invention will in part be described in, and in part be understood from the following detail description of the present preferred embodiment, the same being illustrated in the accompanying drawing, wherein:

30 Figure 1 is a detailed side elevation of a valve stem having an improved valve construction constructed according to an embodiment of this invention mounted thereon.

35 Figure 2 is a fragmentary enlarged vertical section taken on the line 2—2 of Figure 1.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

40 Figure 4 is a sectional view taken on the line 4—4 of Figure 2.

Referring to the drawing wherein like numerals of reference designate corresponding parts throughout the several views, the numeral 10 designates generally the stem of a valve construction which is adapted to be secured to an inner tube or other container, wherein air or the like is placed under pressure. Where the hereinafter described valve construction is mounted on the stem 10 which is provided with the usual valve insides, the usual valve insides are removed so that air may freely flow through the bore of the stem 10.

55 Air is retained in the valve stem 10 and the container to which the stem 10 is secured by

means of a housing, generally designated as 11, which is threaded at its lower portion on to the exterior threads provided at the outer end of the stem 10. This housing 11 has a tapered upper portion 12 terminating in a substantially cylindrical nipple 13. The housing 11 has a cylinder 14 disposed on the inside thereof which at its upper portion is provided with a head 15, the lower end of the cylinder 14 being open. A plate or annulus 16 is interposed between the inner or lower end of the cylinder 14 and the top or outer end of the stem 10 and preferably a gasket 17 is disposed between the inner side of the annulus 16 and the top of the stem 10 so as to seal the cylinder 14 within the housing 11.

The cylinder 14 has a piston 18 slidable therein and the piston 18 has a ring 19 sealing the piston within the cylindrical wall of the cylinder 14. Preferably, the lower portion of the cylinder 14 is provided with a plurality of air passages 20 so that when the piston 18 is in its lower most position, air may freely pass about the periphery of the piston 18. The downward movement of the piston 18 is limited by upstanding lugs 21 secured to the annulus or plate 16.

25 The inner side of the head 15 is provided with an annular ring 22 and a sealing gasket 23 is disposed on the outer side of the piston 18 and engages the annular ring 22 so that when the piston 18 is in its outermost position, as shown in Figure 2, the gasket 23 will be compressed against the ring 22 and the passage of air out of the cylinder 14 prevented.

The gasket 23 is secured to the outer side of the piston 18 by means of a threaded bar 24 which extends through the piston 18 and is provided with an elongated extension 25 comprising a guide means which is slidable through a bore 26, disposed axially through the head 15. A nut 27 is threaded on to the inner end of the bar 24 and maintains the shaft comprising the guide member 28 and the bar 24 in tight engagement relative to the piston 18. The lower end of the shaft or bar 24 is reduced and extended downwardly, as at 28, so as to provide a lower guide means which is slidable through an eye 29 formed by a diametrically extending bar 30 integral with the annulus 16.

50 A cup shaped member 31 is interposed between the gasket 23 and the top of the piston 18 and acts to prevent lateral displacement of the gasket 23 under pressure of the piston 18. Preferably, the extension 25 of the shaft 24 is provided with longitudinally extending flattened

portions 32 so that air may freely pass through the bore or opening 26.

A plug or closure 33 having an upper tapered portion 34 and a lower cylindrical portion 35 is disposed in the nipple or reduced portion 13 and is provided with an axial stem 36 engaging at its lower end in an opening 37 provided in the upper end of the extension 25. Preferably, a collar or rib 38 is formed on the stem 36 and acts as an abutment or stop to limit movement of the stem 36 in the bore 37. The underside of the plug or closure 33 is recessed, as at 39, and the upper end of a coil spring 40 engages about the stem 36 and within the recessed portion 39.

The lower end of the spring 40 engages the upper side of the head 15, and acts to constantly urge the plug or closure 33 into closed position. Preferably, the plug 33 is provided inwardly of its upper or outer end with air passages 41 so that when this plug 33 has been moved inwardly, a slight degree of air may freely pass about the periphery of the tapered portion 34 of the plug and then through the openings 41 and into the chamber formed between the inner end of the plug 33 and the top of the head 15. The housing 11 is also provided inwardly of the plug 33 with a vent opening 42 which is above the head 15 and extends through the cylindrical portion 35 of the upper end of the housing 11. This vent 42 is closed when the plug or closure 33 is forced inwardly by engagement with a pressure device so that no air from this pressure device will pass out through the vent or opening 42. The vent 42 provides a means whereby air in the neck of the housing 11 between the outer end 15 of the cylinder 14 and the plug 33 may be released so as to facilitate inward movement of the plug 33 when a pressure device is engaged with the outer end of the plug 33. In this manner inward movement of the plug 33 will not be retarded by compression of any air in the space between the plug 33 and the wall 15. This vent 42 also provides a means whereby air pressure between the wall 15 and the plug 33 may be released when the pressure device has been removed from the plug 33 so that where the spring 40 is relatively strong and moves the plug 33 to a closed position ahead of the closing of the valve 23 the closing of the plug 33 will not retard or prevent the movement of the valve 23 to a closed position under the pressure within the tire.

In the use and operation of this device, the usual valve insides are removed from the stem 10 so that air pressure may move the piston 18 to its outermost position wherein air is prevented from flowing outwardly through the housing 11, as shown in Figure 1. The pressure of air against the under side of the piston 18 will cause the gasket 23 to be compressed against the annular rib 22 so that no air will flow out through the bore 26 in the head 15.

When it is desired to fill or test the pressure in the inner tube or container to which this air valve may be attached, the center post of the

tester or the pressure device engages the plug or closure 33 and forces this said plug inwardly to a position opening all air passages with the exception of the vent 42 which is closed at this time. In this movement the rib 38 engages the stem 25 forcing the stem 25 and the piston 18 inward to a position causing a preliminary opening of the gasket 23 at its seat 22 and a preliminary opening of the air grooves 20 so that the pressure is free to flow from the inner tube or the container into the air testing device through the said air grooves 20 between the stem 25 and the bore 26 and air passages 41. In case of the air pressure device the incoming air forces the piston 18 further inward to its extreme inward movement fully moving the gasket 23 off of its seat 22 and moving the piston 18 to a position opening the air grooves 20.

It will, therefore, be understood that an exceedingly simple device has been constructed which may be mounted on any of the present valve stems and that the usual valve insides may be removed. This device, through the medium of the plug 33 will prevent any dust or dirt from entering into the cylinder 14 to thereby prevent seating of the valve gasket 23 on the seat 22.

It is, of course, understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claim.

I claim:—

An air valve comprising an outer housing having a reduced neck at one end provided with a tapered bore for a portion of the length thereof and a straight bore for the remainder of the length thereof, a cylinder within the outer housing having a closed outer end and an open inner end and provided with longitudinally extending grooves for a portion of the length, said grooves terminating inwardly of the outer end of the cylinder, a piston slidable in the cylinder, said closed cylinder end having an axial bore, a longitudinally grooved stem secured to the piston and extending outwardly through said axial bore, a valve seat carried by the inner side of said closed cylinder end, a valve member secured to the outer side of said piston end engageable with said seat, a plunger operating plug slidable in the neck and having a tapered surface for a portion of the length thereof engageable with the tapered bore of the neck and also provided with a cylindrical surface for the remainder of the length thereof engageable with the straight bore of the neck, an axial stem carried by said plug engageable with said piston stem, and a spring constantly urging said plug to closed position, said housing between the closed position of the plug and the outer end of the cylinder having a vent to the atmosphere.

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