Nov. 11, 1930. E. H. McFARLAND 1,781,121

AIR TESTER

Filed Oct. 2, 1928

Fig. 1.

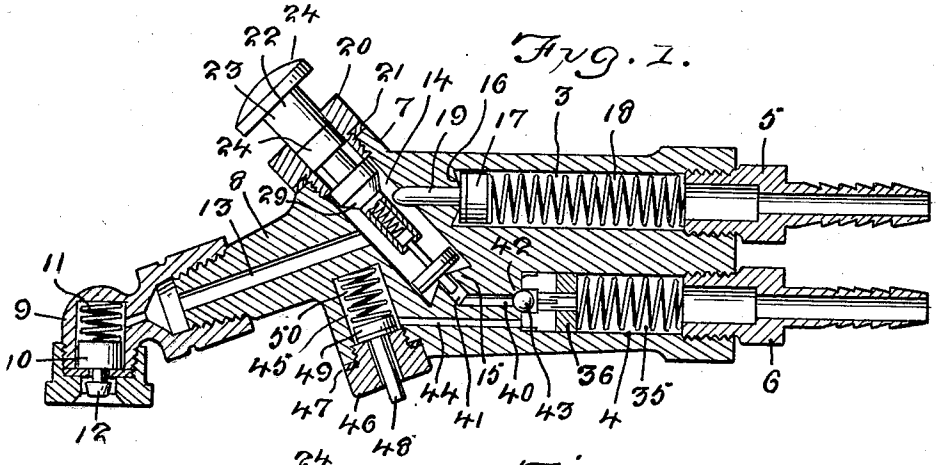


Fig. 2.

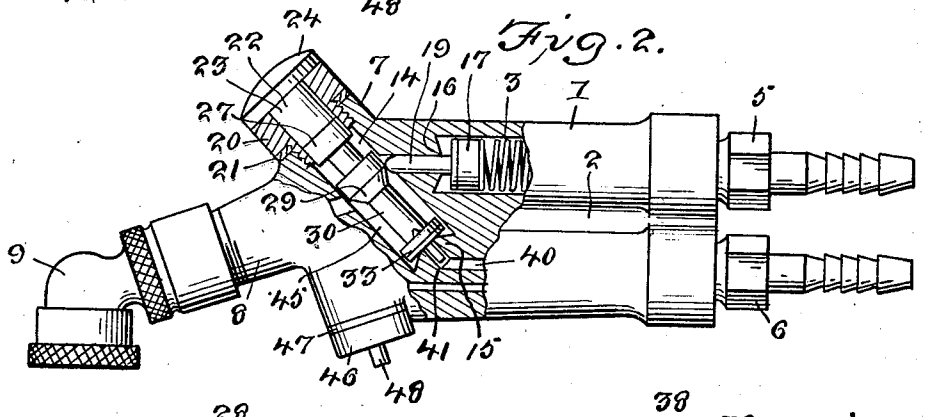


Fig. 3.

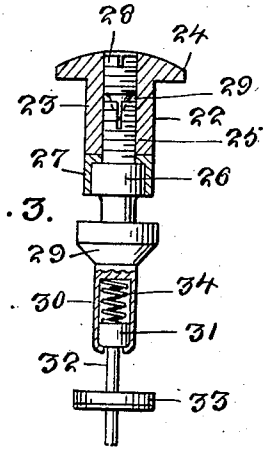


Fig. 4.

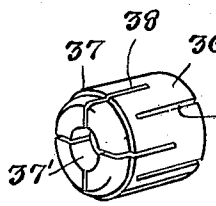
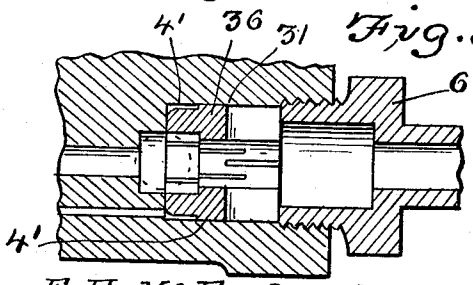


Fig. 5.



E. H. McFarland INVENTOR

BY Victor J. Evans

ATTORNEY

Patented Nov. 11, 1930 1,781,121

UNITED STATES PATENT OFFICE

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AIR TESTER

Application filed October 2, 1928. Serial No. 309,811.

My present invention has reference to new and useful improvements in air control valves which are designed to be placed in the air line used to fill automobile tires.

An object of my invention is to provide a valve of this character which will show the pressure of the air in the tire being filled without removing the same from the stem, and which will relieve any excess air pressure in a simple, effective and accurate manner.

A further object is to improve the construction upon which I have filed application for U. S. Patent on Jan. 14, 1928, and which bears Serial No. 246,864.

To the attainment of the foregoing and other objects which will present themselves the improvement further resides in certain other novel details of construction, combination and operative association of parts, one satisfactory embodiment of which is disclosed by the accompanying drawings.

In the drawings:

Figure 1 is an approximately central longitudinal sectional view through the improvement.

Figure 2 is a side elevation with parts in section.

Figure 3 is an elevation of the plunger and the elements associated therewith, parts being in section.

Figure 4 is a perspective view of the removable cage for the ball valve.

Figure 5 is a detail sectional view through one end of the improvement to illustrate the manner in which the cage for the ball valve is held positioned by contact with the nipple.

As disclosed by the drawings my improved device comprises a somewhat elongated body 1, which has both of its edge portions round in cross section and these rounded portions are connected by a central web 2. Each of the rounded portions is provided with a longitudinally extending round bore, the upper bore being indicated by the numeral 3 and the lower bore by the numeral 4. In each of these bores there is screwed the threaded ends of nipples 5 and 6, respectively, and these nipples are provided with outwardly extending shouldered stems to which are attached the air hose, the air hose connected with the stem of the nipple 5 being connected with the source of air supply, and the hose connected with the nipple 6 being connected with a suitable air gauge.

The rounded portions of the casting which provides the body 1, at the ends of the rounded or barrel portions thereof opposite those in which the nipples are screwed, is formed with an angle portion 7, the same being provided with an outwardly extended portion 8 which is rounded and tapered and has screwed on its end a collar portion of a chuck 9. The chuck is provided with an inwardly opening plunger 10 which is normally forced on its seat by a spring 11 and the valve is formed with an outwardly projecting knob or extension 12 that is designed to contact with the stem of the tire valve and by virtue of such contact the said plunger 10 will be moved into the body of the chuck, the spring 11 being comparatively weak.

The conical extension 8 is formed with a central bore 13 which communicates with the chuck and which likewise communicates with an annular chamber 14 in the angle portion 7 of the casting. The lower wall of the annular chamber 14 is provided with an inwardly directed conical valve seat 15 and the inner wall of the bore or passage 3 is provided with a similar valve seat 16. The valve seat 16 is normally occupied by a valve 17 which is forced against the seat by a spring 18. The valve 17 carries a stem 19 that passes through a suitable air opening between the bore 3 and the chamber 14, and the end of the stem which extends into the chamber 14 is cone-shaped.

Screwed in the mouth of the chamber 14 there is the reduced end of a nut member 20 and the said nut forces a gasket 21 against the shoulder provided at the mouth of the chamber 14. The bore of the nut member 20 is non-threaded and receives therethrough a plunger which is broadly indicated by the numeral 22. The outer element of the plunger is for distinction indicated by the numeral 23 and has a headed portion 24. In the bore of the plunger there is screwed a stem 25 that has a shouldered portion 26, and arranged over the shouldered portion and in contact

with the inner face of the part 23 there is a cup washer 27. The threaded end of the stem 25 has a conical bore and the said stem surrounding the bore is slitted. There is screwed in the bore of the element 23 a headless bolt 28 that has a conical end 29 that is received in the conical bore of the stem.

The bolt 28 has its outer end kerfed and it will be apparent that by turning the said bolt the slit end of the stem 25 will be expanded and tightly compressed in the bore of the headed portion 24 of the plunger 22. Below the enlarged portion 26 of the stem 25 the said stem is formed with a second enlargement that has a lower hollow extending portion 30. The lower end of the stem is slitted and inbent to provide shoulders for the head 31 on the stem 32 of a valve 33, which is designed to occupy the seat 15 and to be forced thereagainst by a spring 34 which is received in the hollow portion or bore of the part 30 of the plunger. The bolt 28 having the conical end 29, received in the bore of the stem 25 will hold all of the parts constituting the plunger element 22 properly associated and will prevent undue wear upon the rubber cup washer 27 and likewise prevent any tendency of free turning of the plunger in the nut or bushing 20 in the chamber 14.

The conical element 29 on the plunger will, when the plunger is depressed, as disclosed by Figure 2 of the drawings contact with the conical end of the stem of the valve 17, thereby unseating such valve and permitting air to flow through the nipple 5, the body of the casting and find an outlet through the chuck 9, when the plunger 10 is moved inwardly in the chuck by contact with the stem of a tire valve. Also it will be noted that such movement of the plunger will through the medium of the compression of the spring 34 force the valve 33 against the seat 15 to effectively close the passage through the bore 4 of the body, while obviously a return pressure of air will force the plunger 22 to its initial position as disclosed by Figure 1 of the drawings.

In the bore 4 there is received a cylindrical valve cage that forms an important part of this invention. The cage is best illustrated by Figure 4 of the drawings. One end of the cage is in contact with the inner end of the bore 4, and in the preferred embodiment of the invention is forced thereagainst by a helical spring 35. The cage member 36 has a longitudinal bore therethrough, and the wall provided by this bore (and the end of the seat which is in contact with the end wall of the bore 4) is for a suitable distance enlarged, as at 37 to provide a valve seat. By reference to the drawings it will be seen that this end of the cage 36 is peripherally reduced, as at 37 and also that the cage from this end is provided with spaced slits 38 which communicate with the bore of the said cage. In addition to these slits the outer end of the cage is provided with similar slits or openings 39 which are disposed intermediate with respect to the slits or openings 38.

The bore 34 terminates in a reduced passage 40 that has an angle branch 41 directed through the seat 15 and leading into the chamber 14. The wall provided by the passage 40 at its juncture with the bore 4, is concaved to provide a seat 42. The seat 42 is only slightly spaced away from the seat provided by the inner wall of the enlarged portion 37' of the bore of the cylindrical cage 36 and arranged between the seats 37' and 42 there is a ball valve 43. The seats 37' and 42 being only slightly spaced permits of only a small movement of the ball valve 43 to occupy either of said seats. The ball valve is influenced by air pressure from the chamber 14 to occupy the seat 37' in the cage 36 and is likewise influenced by air pressure from the cage through the bore 4 to occupy the seat 42.

The numeral 44 designates an air passage which is arranged between the inner wall provided by the bore 4 and which passage communicates with a chamber 45 in the casting or body 1. There is screwed in the mouth of the chamber 45 a nut or gasket 46 that compresses a washer 47 against the said mouth of the chamber. The nut 46 is centrally provided with a longitudinal bore through which passes the stem 48 of a disc bleed valve 49 that is provided with a suitable gasket and the valve 49 is normally forced on its seat through the medium of a spring 50 which, of course, is arranged in the chamber 45.

After the tire has been inflated, as above described the pounds pressure of air therein is tested by releasing pressure upon the plunger to unseat the valve 33. The air passing from the chuck through the passage 40 will cause the ball valve 43 to be seated in the cage 36, but the slits or openings 38 in the seat will permit air to flow through the bore of said cage and likewise through the bore 4 of the casting, nipple 6 and the hose connected thereto to the gauge. When the operator is of the opinion that the desired amount of pounds pressure of air is received in the tire he will remove the chuck from the air inlet valve for the tire. The air from the gage will influence the ball valve 43 to occupy the seat 42, thereby holding air in the gage. The operator with the improvement still in his hand, glances at the gage and notes the amount of air pressure indicated thereby. This will inform him whether or not additional air is to be supplied to the tire or an overpressure of air discharged from the same by opening the tire valve. If more air is required the device is, of course, again arranged upon the tire valve. If the tire is over inflated air

will be relieved from the tire by opening the bleed valve 49 and after the operator has once ascertained the amount of pounds pressure indicated by the gage it is a comparatively easy matter for him to fill the tire with the desired amount of air. My improvement is especially desirable because in the vast majority of instances elevated air testing devices have become largely out of use because they are so located that the automobile cannot be positioned so that the operator inflating the tire can observe the gage thereon while holding the chuck in his hand. With the improvement it will be noted that the amount of pounds pressure of air delivered into the tire will be accurately indicated on the dial after the device has been brought out of engagement with the air inlet valve of the tire and with this knowledge and as previously stated the operator may thereafter properly fill the tire with the desired amount of air pressure. It may also be stated that in the majority of instances motorists or attendants at filling stations employ a hand gage and such gages are frequently misplaced and because of their size are not altogether accurate. To relieve air pressure from the gage it is merely necessary to unseat the bleed valve 49 which permits the air passing through the port 44 to the atmosphere.

My improvement while extremely simple provides an apparatus that accurately sets the gauge for any desired amount of pounds pressure of air to be directed into the tire and does not permit of any inaccuracy as to the result to be obtained which is a common deficiency in all constructions of this type with which I am acquainted.

In Figure 5 I have illustrated a slight modification in which I dispense with the spring 35 and which shows the seat 36 for the ball valve held in the port 4′ by simply reducing the length of the said port and permitting the outer end of the seat 36′ being contacted by the inner end of the nipple 6′.

While I have herein disclosed a simple and satisfactory embodiment of the improvement, obviously I do not wish to be restricted to the precise details and, therefore, hold myself entitled to make such changes therefrom as fairly fall within the scope of what I claim.

Having described the invention what is claimed is:

1. An air tester for tires comprising a casting having an air inlet passage normally closed by a valve, a passage to be connected to a gage, a chamber between the passages and an air outlet passage leading from the chamber, a plunger for unseating the valve and a spring influenced valve carried by the plunger for closing the passage to the gage when the first mentioned valve is unseated, a tubular valve cage in the gage passage which has slits communicating with its bore, a ball valve in the cage movable by air pressure between the passage and gage to close the passage to the chamber, said casting having an air bleed passage communicating with the tubular valve cage and a normally closed release valve for said passage.

2. A device of the class described having spaced longitudinal passages and a chamber bisecting one of the passages and communicating with the inner end of the second passage, a stem carrying valve movably received in the first mentioned passage and designed to be influenced by air pressure to close this passage and to project its stem into the chamber, a plunger movable in the chamber, stop means for limiting the outward movement of the plunger, said plunger having a conical part to engage with the valve stem to unseat the valve, said plunger having a hollow portion extending from its said conical part, a slidable valve for closing the communication between the second passage and the chamber and having a stem provided with a head which is freely received in the hollow portion of the plunger and retained therein, said last mentioned valve being designed to be raised from its seat by the outward movement of the plunger and to be partially moved toward its seat when the plunger is depressed and to be forced tightly against its said seat by the pressure of air passing through the first mentioned passage and entering the chamber.

In testimony whereof I affix my signature.

ERNEST H. McFARLAND.