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TIRE AIR VALVE

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Fig. 1.

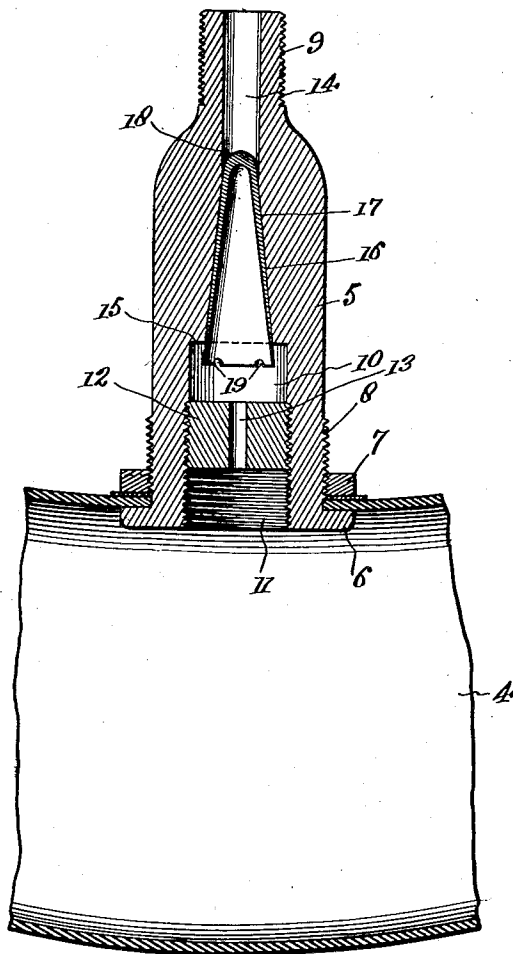


Fig. 2.

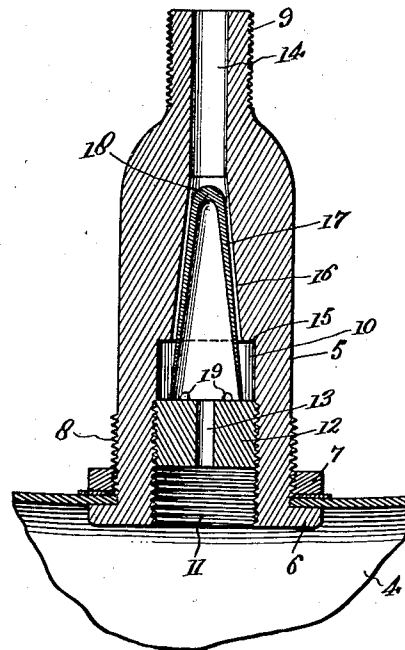
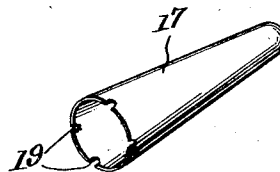


Fig. 3.



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TIRE AIR VALVE.

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The present invention relates to improvements in tire air valves, and has for an object to provide a valve structure which will be leak-proof to a considerably higher degree than existing forms now employed generally in practice; and in which the expense incident to manufacture is reduced, spring and rubber parts, stems and guides eliminated.

Another object of the invention consists in providing a more durable valve construction in which the necessity for renewing the valve insides will not arise.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views.

Figure 1 is a fragmentary longitudinal section taken through an inner tube and the improved tire valve structure showing the valve in the closed position.

Figure 2 is a similar view with the valve open, and

Figure 3 is a perspective view of the valve body above.

Referring more particularly to the drawings 4 designates generally an inner tube which is adapted to fit within the casing or shoe (not shown).

The tube 4 is provided with the valve stem 5, the connection being made in any appropriate manner, as for instance by providing the foot of the valve stem or tube 5 with an outstanding flange 6 to fit against the inner wall of the inner tube 4, the valve stem being inserted through an opening in the inner tube made to receive same. The wall of the inner tube adjacent this opening is clamped between the flange 6 and the ring 7 internally threaded to engage with the external threads 8 upon the valve stem 5 near the base portion.

The valve stem 5 may be of a usual external configuration with the upper reduced and externally threaded end 9 for receiving the small screw cap (not shown) now quite generally in use. The base threads 8 may also subserve the further function of receiving the large dust cap (not shown).

Within, the construction of the valve stem 5 differs in accordance with the present in-

vention, there being generally a passage extending longitudinally or axially of the stem in communication at its base end with the interior air chamber of the inner tube 4 and opening outwardly to the atmosphere whereby to receive the nozzle of an air hose to inflate the tire. The longitudinal or axial opening is provided at the base portion by an enlarged chamber 10 having the inner portion of its internal wall threaded, as indicated at 11 to admit of the externally threaded plug 12 being engaged within the chamber. This plug forms a partition or diaphragm at an intermediate portion of the chamber, access being had from one end of the chamber to the other through one or more ports 13 in the plug 12.

As the threads 11 are preferably cut directly in the wall of the chamber 10 and are continued only a distance over slightly half the length of the chamber, the adjacent unthreaded blank chamber wall will act as a stop to arrest the further axial movement of the plug 12 and also to form an abutment against which the plug may be tightly secured, so as to avoid its retrograde movement in use.

Outwardly of the chamber is a longitudinal passage 14 of smaller diameter thereby forming a shoulder 15 at the outer end of the chamber 10. The inner portion of the passage 14 is widened or flared in a section or frustum of a cone to provide the valve seat 16 which may be ground, access for this purpose being had through the chambered end 10 prior to assembling the valve and plug 12. The valve is indicated generally at 17 and is preferably made of copper or some other material possessing a high ductility and resiliency. This valve body 17 is frusto-conical in form, hollow within and provided with an open base which is adapted to engage the plug 12 in the open position of the valve, shown in Figure 2. The truncated apex or nose 18 is blunt and thickened to provide strength and to impart to the exceedingly thin and tapered skirt 17 an appropriate backing. It will be noted from Figures 2 and 3 that the cross section of the valve body tapers from the thickened nose 18 downwardly in all directions through the skirt to an exceedingly fine base, which is provided with the notches or ports 19 for permitting the incoming air to pass to the port 13 in the plug 12.

In the use of the device the internal air pressure within the inner tube 4 will normally have access to the hollow interior of the valve body through its open base and consequently the valve will be held tightly against its seat 16, as shown in Figure 1. The contact is a metal to metal one, no rubber being employed. The apron or skirt 17 is yieldable due to the material employed and to the thinness thereof, which will admit of dispensing with rubber, while securing an accurate seating of the valve throughout all of its extensive frusto-conical area. Perhaps, a copper alloy might be preferred in order to increase the inherent resiliency to enable the skirt or apron to return to its normal position of shape in readiness for proper reseating after the valve has been once opened. A permanent deformation of the valve is rendered impracticable. This deformation is further prevented by the tapering character of the skirt or apron 17 and the presence of the thickened nose 18 which acts as the backing before referred to.

It will be noted that the conical valve member is of appreciably greater length than the tapered valve seat 16 and that when said valve member is in its closed position as seen in Fig. 1 of the drawings, the thin flexible large diameter wall section of the hollow valve member projects beyond the shoulder 15 formed in the valve stem at the inner end of the seat 16. Thus this thin wall section of the valve expansibly yields under the air pressure from the tire tube acting against the inner surface of the valve wall, and forces the outer surface of said wall uniformly into positive contact against the shoulder 15 at its juncture with the valve seat, thus producing an absolutely air tight seal of the passage through the valve stem without the use of packing rings or additional manually adjustable parts coacting with the valve member.

I have illustrated and described a preferred and satisfactory embodiment of my invention, but it is obvious that changes may be made therein within the spirit and scope thereof as defined in the appended claims.

What is claimed is:—

1. A tire valve comprising a valve stem provided with an air passage having a metallic valve seat intermediate of its ends and a hollow metallic valve member arranged in said passage, said valve member being open at one end and having a wall section gradually decreasing in thickness to said open end thereof and expansibly yieldable under internal air pressure in the closed position of the valve to maintain an air tight

seal between the outer surface of said wall and the valve seat.

2. A tire valve comprising a stem having an air passage formed with a frustro-conical valve seat intermediate of its ends; and a hollow metallic conical valve member in said passage, said valve member having a relatively thick blunt apex end and the wall of said member gradually decreasing in thickness to its opposite end, said latter end of the valve member being open to receive the tire pressure acting internally upon the wall of said member to move the same to closed position on the valve seat, and the relatively thin section of the wall of said member at the open end thereof expansibly yielding under the internal air pressure to maintain an air tight seal between the outer surface of said wall section and the valve seat.

3. A tire valve comprising a stem provided with an air passage having a metallic valve seat intermediate of its ends and an enlarged section forming a shoulder at one end of the valve seat, and a hollow metallic valve member in said passage open at one end to receive the tire pressure and having a relatively thin yieldable wall section adjacent the open end thereof, said valve member being of greater length than the valve seat and said wall section projecting beyond said shoulder in the closed position of the valve, said wall section expansibly yielding under the internal air pressure whereby the outer surface of said wall section is urged by the air pressure into air tight contact against said shoulder.

4. A tire valve comprising a stem having an air passage provided with a frustro-conical valve seat intermediate of its ends and a shoulder surrounding the valve seat at the larger end thereof, stop means spaced from said shoulder, and a hollow metallic conical valve member of greater length than the valve seat, said valve member having a thickened blunt apex and the wall of said valve member gradually decreasing in thickness to its other end, and the wall section of said member adjacent the latter end thereof being resiliently yieldable, said end of the valve member being open to receive the tire pressure whereby said member is urged to closed position upon the valve seat, and said thin wall section of the wall member expansibly yielding under the internal air pressure to maintain the outer surface of said wall section in air tight contact against said shoulder.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

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