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PNEUMATIC TUBE VALVE
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2,272,548

Fig. 1.

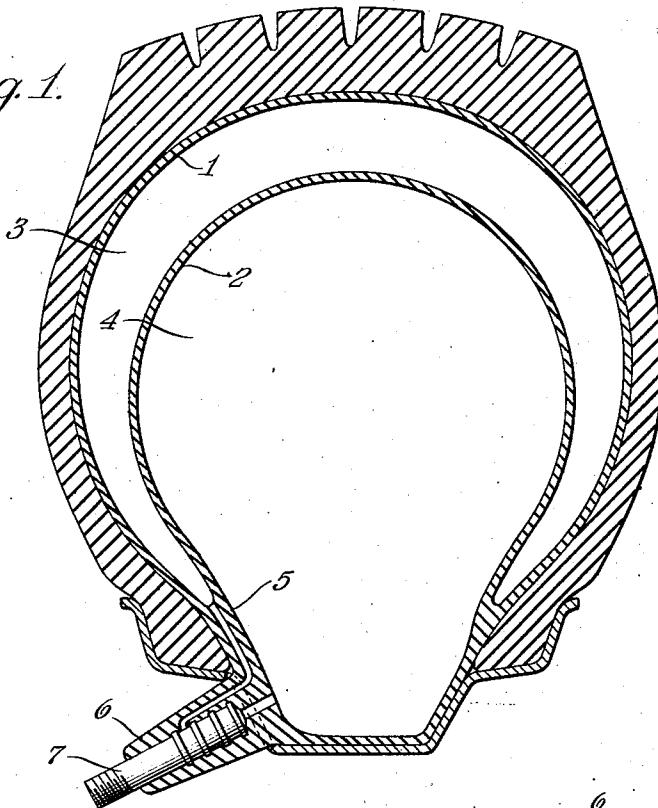


Fig. 2.

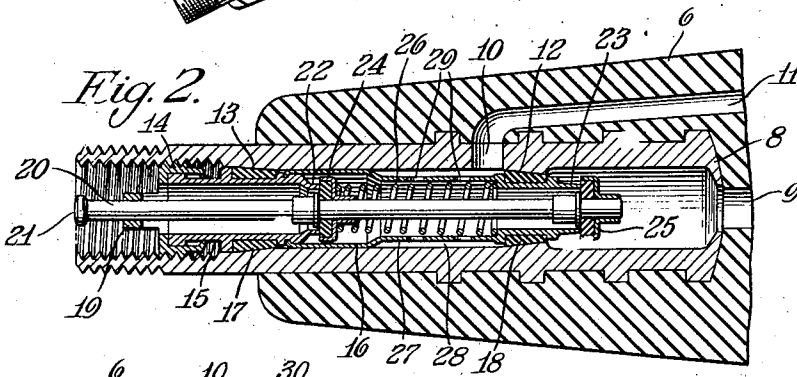
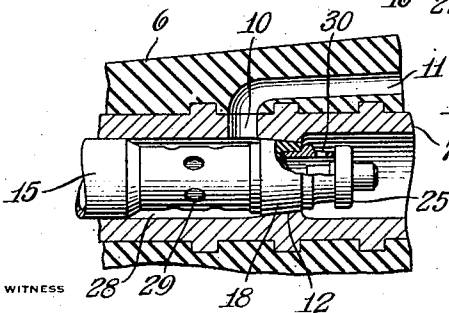


Fig. 3.



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PNEUMATIC TUBE VALVE

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5 Claims. (Cl. 277-20)

This invention relates to pneumatic tubes for vehicle tires, and its general object is to provide a novel valve for a duplex inner tube, the tube consisting of inner and outer sections, one within the other and connected together in a manner to form separate non-communicating air chambers, and each section is inflated or purposely deflated through a single valve stem, the latter having separate valve members therein, one for each chamber for individually controlling the same, as well as being carried by a single pin for simultaneously opening and closing the valve members, and so that the valve parts can be easily and expeditiously removed and applied with respect to the stem.

From the foregoing, it will be seen that my tube not only eliminates the danger and resulting damage brought about by the puncture or blow-out of single chambered tubes now in general use, but by the use of my valve, both sections of my tube can be simultaneously inflated and deflated, as rapidly as the single chambered tube, thus materially reducing the length of time now required in inflating and deflating double chambered tubes having direct communication between the chambers thereof.

A further object is to provide a valve that is simple in construction, inexpensive to manufacture and extremely efficient in operation, use and service.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a transverse sectional view taken through my tube and illustrates the valve in elevation.

Figure 2 is a longitudinal sectional view taken through the valve.

Figure 3 is a view partly in section of a slightly modified form.

Referring to the drawing in detail, it will be noted that my tube is shown within a rim mounted casing and inflated to better illustrate the same, and the tube includes an outer section 1 and an inner section 2, the latter acting in the capacity as a partition within the outer section and is formed therewith adjacent the inner periphery thereof, so that the sections provide an outer air chamber 3 and an inner air chamber 4. The tube at the juncture of the sections is laterally thickened to provide a web 5 and formed on and extending outwardly at an inclination from the thickened portion or web is a tapered

nipple 6 having fixed therein and extending outwardly therefrom a hollow stem 7.

The inner end of the stem is flanged as at 8 and registers with a duct 9 extending to the inner chamber 4, and the stem has a lateral port 10 therein registering with a duct 11 extending to the outer chamber 3. The outer end of the stem is both exteriorly and interiorly threaded in the usual manner, it being obvious that the outer threads are for the purpose of receiving a closure cap, not shown. Inwardly of the port 10, the stem is reduced in tapered formation to provide a seat 12 and the stem is further reduced in tapered formation adjacent the threaded outer end to provide a seat 13.

Mounted in the stem is a sleeve that includes an outer cap section 14, an intermediate short section 15 and a long inner end section 16, the sections 15 and 16 each being formed with spaced annular ribs providing recesses for collar gaskets 17 and 18, the seat 12 having the gasket 18 mounted therein while the seat 13 receives the gasket 17, so as to provide a leakproof connection between the sleeve and the stem, as will be apparent upon inspection of Figure 2.

The cap section is threaded within the stem for holding the sleeve therein, as shown in Figure 2 and is not only swiveled on the intermediate section 15 but is mounted for limited slidable movement thereon, and has a cross member 19 formed on its outer end, with an opening therein for slidably receiving and guiding a pin 20 that extends centrally through the sleeve and has the usual head 21 formed on its outer end. The inner end of the intermediate section 15 is reduced to provide a seat 22 and the inner end of the inner section is tapered to provide a seat 23, the seats 22 and 23 being for gasket carrying cup valve members 24 and 25 respectively, that are fixed to the pin to be carried thereby and are normally held seated by a coil spring 26 sleeved on the stem, with one end engaged with the valve member 24 while its opposite end is engaged with a shoulder formed within the inner section 16, as clearly shown in Figure 2.

The inner end section 16 is reduced between its ends for a portion of its length, and that portion which is indicated by the reference numeral 27 is spaced from the stem to provide a chamber 28 communicating with the duct 11, and the reduced portion 27 is perforated or provided with openings 29, with the result it will be seen that when the valve members 24 and 25 are unseated, and the tube is being inflated, the incoming air will pass from the sleeve into the duct 11 for inflating the outer section, and into the duct 9 for inflating the inner section, and of course these sections can be deflated by holding the valve members 24 and 25 unseated through the medium of the stem 20. It will be

further seen that the tube sections 1 and 2 can be simultaneously inflated and deflated as rapidly as the single chambered tube now in general use, due to the fact that there is no direct communication between the chambers, and each chamber has direct communication with the sleeve, with the means of communication being individually controlled by the valve members that are operated simultaneously by the single stem.

In the form of Figures 1 and 2, it will be obvious that in the event the outer section should become punctured, the air cannot escape from the inner section, thus the casing will be supported by the air within the inner section, and thereby prevent an accident and in any event damage to the tube or casing, brought about by riding thereon when in a deflated condition.

While the inner section 2 of the form of Figures 1 and 2 remain inflated even though the outer section 1 is punctured, due to the fact that there is no communication between the chambers 3 and 4, in the form of Figure 3 it will be noted that the inner end section 16 of the sleeve has a minute opening 30 therein, so that in the event the outer section 1 in the latter form becomes punctured, the air will slowly leak from the inner chamber 4 to the puncture, through the medium of the sleeve, the chamber 28 and duct 11. However, the escape of air will be very slow, and the inner section 2 will remain inflated for an ample time to allow the vehicle to come to a stop, thus avoiding an accident or damage to the tube or casing.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:

1. A valve for a dual chambered vehicle tire tube, comprising a hollow stem having an open inner end for communicating with one chamber and an opening between its ends for communicating with the other chamber, a sleeve within the stem and having leakproof connection therewith adjacent the ends of the sleeve, said sleeve provided with an intermediate perforated portion spaced from the inner wall of the stem and disposed for communication with said opening, a spring pressed pin slidably mounted in the sleeve, and valve members carried by the pin and normally closing the inner end of the sleeve and the latter between its ends for individually controlling the chambers.

2. A valve for a dual chambered vehicle tire tube, comprising a hollow stem having an open inner end for communicating with one chamber and an opening between its ends for communicating with the other chamber, a sleeve within the stem and having leakproof connection therewith adjacent the ends of the sleeve, said sleeve including a section having a tapered end providing a seat, and a section connected to the first section about the seat, the second section having its end remote from the first section reduced to provide a seat, an intermediate perforated portion included in the second section and spaced from the inner wall of the stem, said perforated portion communicating with said

opening, a spring pressed pin slidably mounted in the sleeve, and valve members carried by the pin and normally engaged with the seats for individually controlling the chambers.

3. A valve for a dual chambered vehicle tire tube, comprising a hollow stem having an open inner end for communicating with one chamber and an opening between its ends for communicating with the other chamber, a sleeve within the stem and having leakproof connection therewith adjacent the ends of the sleeve, said sleeve including an outer cap section, an intermediate short section and a long inner end section, said cap section being swivelly and slidably mounted on the intermediate section and threaded in the stem for securing the sleeve therein, said intermediate and end sections terminating at their inner ends in seats, said end section provided with an intermediate perforated portion spaced from the inner wall of the stem and disposed in communication with said opening, a spring pressed pin slidably mounted in the sleeve and guided by the cap section, and valve members carried by the stem and normally engaged with the seats for individually controlling the chambers.

4. A valve for a dual chambered vehicle tire tube, comprising a hollow stem having a reduced open inner end for communicating with one chamber and an opening between its ends for communicating with the other chamber, a sleeve within the stem and having leakproof connection therewith adjacent the ends of the sleeve, said sleeve including an outer cap section, an intermediate short section and a long inner end section, said cap section being swiveled and slidably mounted on the intermediate section and threaded to the stem for holding the sleeve therein, said intermediate and inner end sections terminating into seats and the end section surrounding the seat of the intermediate section, said end section provided with an intermediate perforated portion spaced from the inner wall of the stem and disposed for communication with said opening, a cross member included in the cap section, a stem slidably mounted within the cross member for movement within the sleeve, cup valve members carried by the stem and engageable with the seats for individually controlling the chambers, and a spring sleeved on the stem for normally holding the valve members in closed position.

5. A valve for a dual chambered vehicle tire tube, comprising a hollow stem having an open inner end for communicating with one chamber and an opening between its ends for communicating with the other chamber, a sleeve within the stem and having leakproof connection therewith adjacent the ends of the sleeve, said sleeve provided with an intermediate perforated portion spaced from the inner wall of the stem and disposed for communication with said opening, a spring pressed pin slidably mounted in the sleeve, valve members carried by the pin and normally closing the inner end of the sleeve and the latter between its ends for individually controlling the chambers, and said sleeve having an opening therein between the valve means to provide communication between the sleeve and the open inner end of the valve stem when the valve members are in closed position.

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