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J. C. CROWLEY

**1,854,784**

## VALVE INSIDES

Filed July 3, 1930

Fig. 1.

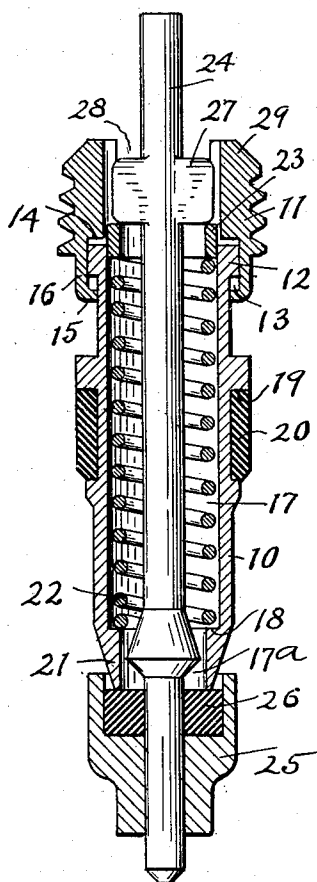


Fig. 2.

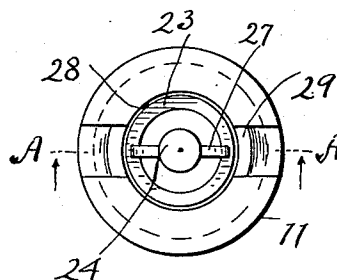
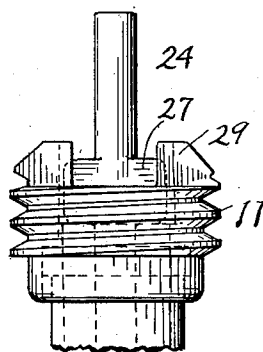


Fig. 3.

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## UNITED STATES PATENT OFFICE

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## VALVE INSIDES

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This invention relates to a valve insides and particularly to a valve insides adapted to be arranged in the valve stem of a pneumatic tire.

5 An object of the invention is to provide a valve insides which is so constructed that a maximum passage through the insides will be provided whereby a tire equipped with the insides may be inflated or deflated in a minimum amount of time.

10 Another object is to provide a valve insides of this character which is simple in construction and which may be economically and expeditiously manufactured.

15 Additional objects and advantages will appear hereinafter, during the detailed description of an embodiment of the invention that follows:

20 An embodiment of the invention is illustrated in the accompanying drawings wherein,

Figure 1 is a longitudinal sectional view through the valve insides taken substantially on line A—A of Figure 3;

25 Figure 2 is a fragmentary side elevational view showing the upper portion of the valve insides; and,

Figure 3 is a top plan view of the valve insides.

30 As is well understood in the art, a valve insides is adapted to be secured within the bore of a valve stem. The conventional valve stem in general use on pneumatic tires is provided with a longitudinal bore the upper portion of which is internally threaded and is larger than the lower portion, such upper portion usually being connected to the lower portion by a tapered or conical shoulder.

40 The usual or conventional valve insides comprises a barrel part having a threaded plug swivelly connected to its upper end, the barrel and plug being provided with aligned longitudinal bores through which the valve pin extends. The valve insides is positioned in the valve stem with the threaded plug cooperating with the threaded portion of the bore of the stem and with a packing member usually arranged on the barrel cooperating with the tapered or conical shoulder in the

bore of the stem to form a seal between the stem and the valve insides.

It is important that the valve insides be so constructed as to present a minimum restriction to the passage of air therethrough, whereby a tire equipped with the insides may be inflated or deflated quickly.

In the embodiment of the invention disclosed herein, the valve insides comprises the barrel part 10 and the threaded plug part 11 which is swivelly connected to the upper end of the barrel 10.

The swivel connection between the barrel and plug is effected by providing the upper end of the barrel 10 with an outstanding annular flange 12 which is arranged in an annular recess 13 formed in the plug 11 between a shoulder 14 and the inturned end 15 of the depending skirt portion 16 of the plug.

The barrel 10 is provided with a longitudinal bore 17 extending longitudinally through the barrel and of constant diameter for substantially the entire length of the barrel, with the exception that the barrel is provided with an internal annular flange 18 projecting into the bore 17 adjacent its inner end and forming a short restricted bore 17a.

Intermediate the ends of the barrel an exterior annular groove 19 is provided to receive a packing member 20 adapted to cooperate with the tapered or conical shoulder in the bore of the valve stem as previously set forth. The inner end of the barrel 10 is tapered as indicated at 21 to provide a narrow edge forming a valve seat.

A spring 22 is arranged in the bore 17 of the barrel 10 and abuts at its inner end the flange 18 and at its outer end a ring washer 23 having a sliding fit within the bore 17. A valve pin 24 extends through the valve insides and carries at its lower end a valve member 25 provided with packing 26 adapted when the valve is seated to engage with the edge of the tapered portion 21 of the barrel, as clearly shown in Figure 1 and as is well understood in the art.

The valve pin 24 is provided with a plurality of outstanding fin portions 27 at that portion of the pin which is normally within the bore of the threaded plug 11, it being

noted that the bore 28 of the plug 11 is slightly larger than the bore 17 of the barrel 10 and that the fins 27 do not extend the entire width of the bore 28. However, it should  
5 be noted that the fins 27 engage with the outer end of the ring washer 23 and it will be appreciated that the spring 22 working against the inner end of the washer 23 serves to push the pin 24 outwardly of the insides and to  
10 seat the valve 25 on the edge of the tapered portion 21.

It will also be seen that when the valve pin 24 is depressed, the fins 27 will cause the washer 23 to move inwardly of the barrel to com-  
15 press the spring 22 and that the valve 25 will be moved by the valve pin and unseated.

The outer end of the barrel is provided with a pair of diametrically opposed outwardly extending portions 29 so that a suitable tool  
20 may be engaged therewith to rotate the plug 11 in assembling the valve insides within the valve stem.

It will be seen, in the construction of the insides just above set forth, that a maximum  
25 passage for air therethrough is provided, since the construction eliminates the usual "bridge" at the upper end of the insides and provides a bore through the insides of substantially constant diameter from end to end  
30 thereof. It will further be seen that this construction lends itself to economic manufacture and may be readily assembled.

In the construction of valve insides having the spring encased in the barrel, it is necessary  
35 to make the top coil of the spring of a smaller diameter than that of the other coils in order to prevent the wings on the pin from spreading the top coil and wedging it in the bore of the barrel when the spring is de-  
40 pressed.

This small end coil of the spring restricts the air passage through the barrel. By position-  
ing a washer between the top coil of the spring and wings on the pin, the necessity  
45 of a small top coil is eliminated thereby providing a maximum air passage through the valve insides.

Although a preferred embodiment of the invention has been described herein, it should  
50 be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claim.

Having thus described my invention, I claim:

55 The combination in a valve insides of the type having a tubular barrel member, a valve pin extending through the valve insides and having a valve spring thereon and being provided with laterally extending fins; of a ring  
60 washer having both ends entirely open and arranged in said member and surrounding said pin and having an external diameter such that the washer engages the wall of the bore of said member with a sliding fit, the said  
65 washer having a thin wall in a transverse

direction, and being interposed between one end of the valve spring and the fins on the valve pin.

In testimony whereof, I hereunto affix my signature.

JOHN C. CROWLEY.