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STEM CONSTRUCTION FOR INNER TUBES USED ON DROP CENTER RIMS

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Fig. 1.

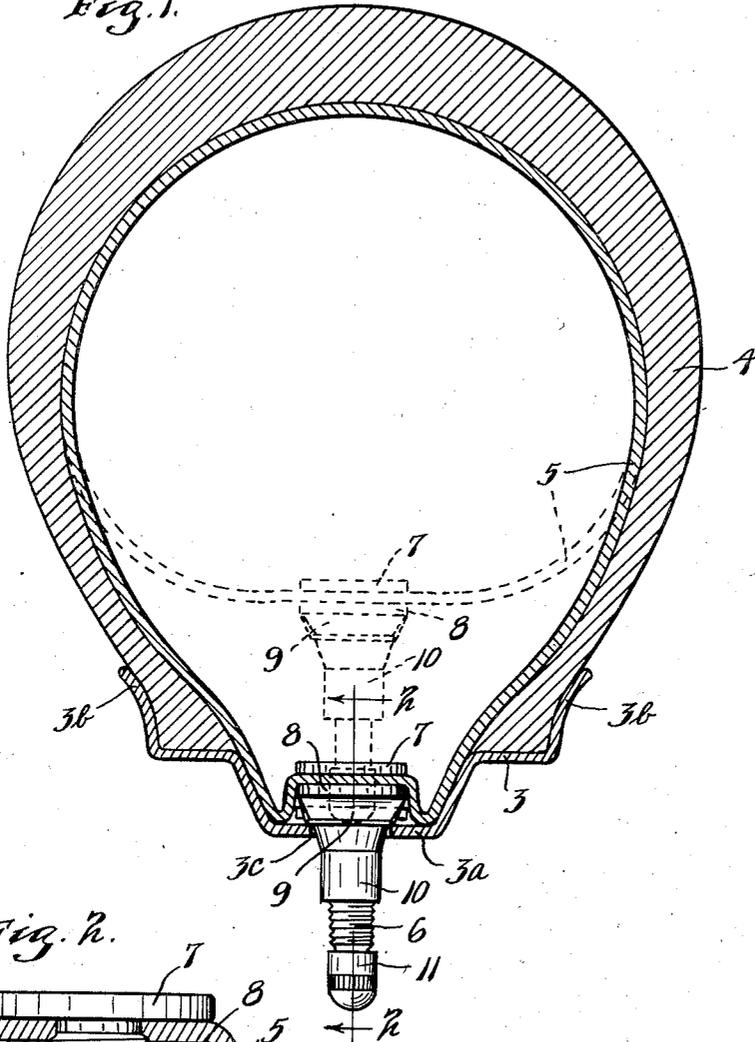
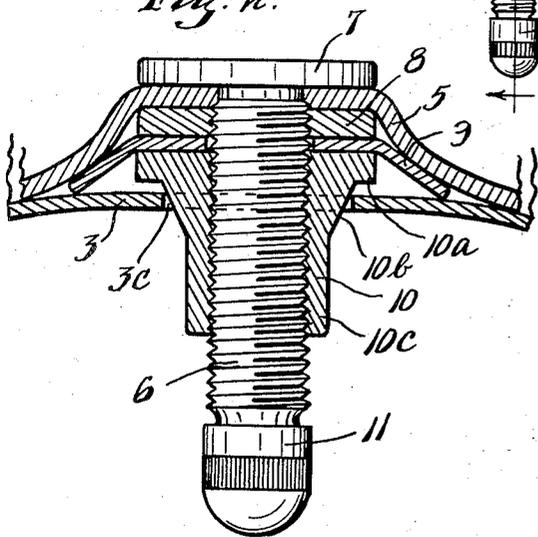


Fig. 2.



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STEM CONSTRUCTION FOR INNER TUBES USED ON DROP CENTER RIMS

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2 Claims. (Cl. 152—12)

It is the object of this invention to provide a novel and improved valve stem construction for the inner tubes of pneumatic tires used in connection with drop center rims.

To this end, generally stated, the invention consists in the novel parts and novel combinations of parts, hereinafter defined in the claims and described in the following specification, made in connection with the accompanying drawing, wherein like reference characters refer to the same or similar parts throughout the various views, and in which,

Fig. 1 is a vertical section taken through a portion of a drop center rim to which an outer casing and an inner tube are applied, the inner tube being equipped with a valve stem construction embodying the invention and the inner tube and parts connected thereto, being shown in full lines in the normal inflated condition of the tire and the inner tube and parts connected thereto, being shown in dotted lines in the position they will assume when the inner tube is punctured; and

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1, as indicated by the arrows.

Referring to the drawing, a drop center rim 3 of standard construction is illustrated having the usual channel portion 3a and the side flanges 3b. Applied to this rim is a tire casing 4 and within the tire casing is an inner tube 5. Under normal conditions, when the inner tube 5 is inflated, it will assume approximately the shape in cross section shown in Fig. 1, at the point where the usual valve stem is applied to the tube. If the inner tube 5 should be punctured, there will not be sufficient air pressure in the tube to cause the tube to be maintained in engagement with the channel portion 3a of the rim and as a result, the tube will tend to take a substantially circular form in cross section, as indicated by dotted lines Fig. 1. The ordinary type of valve stem applied to the tube will, accordingly, tend to pull out through the valve stem opening of the rim but with the ordinary valve stem construction, this will be prevented due to the length of the valve stem and due to the fact that the stem will catch near its outer end against the edge of the usual valve stem opening in the rim. Therefore, the valve stem will extend in a tipped position relative to the rim and will project somewhat above the side flanges 3b of the rim and as the tire rotates shortly after being punctured, the stem together with the parts applied thereto will tend to cut the tube and lacerate the same beyond repair.

The present valve stem construction has been

provided to prevent injury to the tube, as the tube is punctured. In accordance with the invention, a valve stem opening 3c of considerably greater diameter than usual, is provided in the channel portion 3a of the drop center rim 3. An externally and internally threaded valve stem 6 is provided, which is of much shorter length than valve stems now commonly used. This stem, in accordance with the usual practice, runs through an opening in the inner tube 5 and is equipped at its inner end with an apertured flange or washer 7, which bears against the inner surface of the tube 5. Threaded on the stem 6 and bearing against the outer surface of the tube 5 in opposition to the flange 7, is a nut 8 and the tube is tightly clamped between this nut and the flange 7 to prevent leakage of air through the valve stem opening in the tube. The usual arched plate 9 is placed about the stem 6 to bear against the nut 8 and to rest at its ends against the channel portion 3a of the rim. Unlike the usual valve stem, the stem 6 is equipped with a threaded metal nut 10 having a polygonal-shaped inner portion 10a, a conical intermediate portion 10b and a cylindrical outer portion 10c. This nut is threaded onto the stem 6 and tightly drawn up against the arched plate 9. When the tube 5 is in place on the rim, the cylindrical portion 10c of the nut 10 will project outwardly from the rim, while the conical portion 10b will fit within the valve stem opening 3c of the rim, so that the surface of the conical portion adjacent its inner end bears against the edges of the rim forming the opening 3c. The valve stem 6, as has been stated, is internally screw-threaded and is equipped with the usual valve not illustrated. The extreme outer end of the stem 6 is reduced slightly and screw-threaded to receive a small removable cap 11 having a diameter approximately the same as the stem 6 and having a semi-spherical outer surface.

In use when the inner tube 5 is inflated, the parts will take the position shown in full lines Figs. 1 and 2. If when in use on a vehicle, the inner tube 5 is punctured, there will not be sufficient air pressure in the tube to cause the tube to be maintained in engagement with the channel portion 3a of the rim and the tube will tend to take the approximately circular shape in the casing 4 as illustrated in dotted lines Fig. 1 in cross section. The stem 6 together with the nut 10 will thus be drawn into the space enclosed by the casing 4 and the stem 6 together with the cap 11 applied thereto is of such a length that the stem and cap may be drawn completely 55

through the stem opening 3c in the rim to the inner side thereof. The conical portion 10b together with the cylindrical portion 10c of the nut 10, will act to guide the nut and stem through this opening 3c as the puncture occurs and the cap 11 being shaped as described will not catch to prevent the movement of the stem. As the tire rotates after the puncture and after the stem 6 and nut 10 have been drawn inwardly to the dotted line position, the stem can readily tip to lie between the edges of the flanges 3b and the channel portion 3a of the rim, whereupon as the portion of the casing 4 opposite the valve stem strikes the ground and is compressed, the stem and the arched plate 9 will do no injury to the tube 5. Accordingly, the tube will not be injured beyond repair as a puncture occurs.

It will be seen that a simple and effective valve stem construction has been provided to prevent injury to the inner tubes of tires as punctures occur.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departure from the scope of the present invention.

What is claimed is:—

1. In combination with a rim having thereon a tire including an inner tube, a valve stem, the inner end of said stem normally being connected to said inner tube and the outer portion thereof normally extending through an opening in said

rim, said opening being materially larger than said stem and a conical rigid sleeve mounted on said stem with the smaller end located outwardly with respect to the larger end, the medial portion of the conical surface of said sleeve normally abutting the edges of said opening but being adapted to be readily disengaged therefrom to freely permit the natural contraction of a deflating inner tube to draw said stem through said opening completely into the space enclosed by said tire.

2. In combination with a rim having thereon a tire including an inner tube, a valve stem, the inner end of said stem normally being connected to said inner tube and the outer portion thereof normally extending through an opening in said rim, said opening being materially larger than said stem and a conical sleeve mounted on said stem with the smaller end located outwardly with respect to the larger end, the medial portion of the conical surface of said sleeve normally abutting the edges of said opening but being adapted to be readily disengaged therefrom, said sleeve being carried wholly by and being affixed to said stem to move bodily therewith and being unattached to any other part to thereby freely permit the natural contraction of a deflating inner tube to draw said stem through said opening completely into the space enclosed by said tire.

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