

C. E. W. WOODWARD.  
 AUTOMOBILE TIRE.  
 APPLICATION FILED OCT. 24, 1906.

943,505.

Patented Dec. 14, 1909.

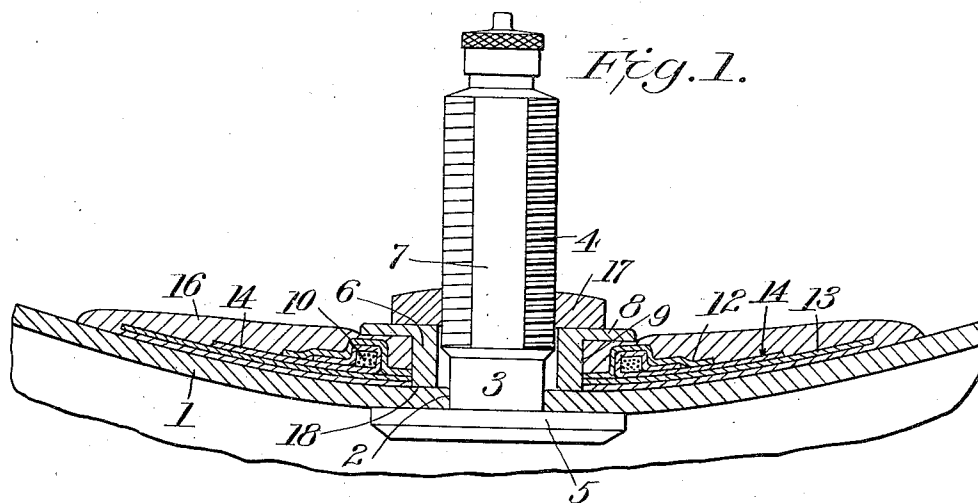


Fig. 3.

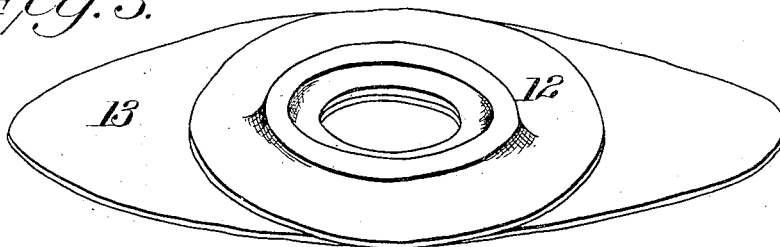


Fig. 2.

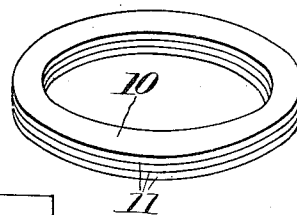
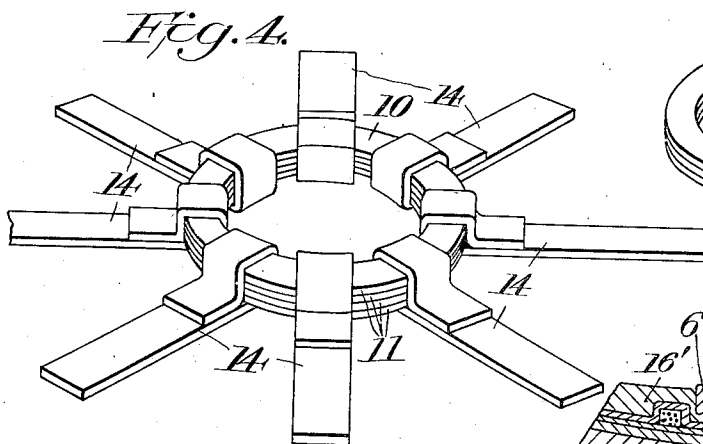
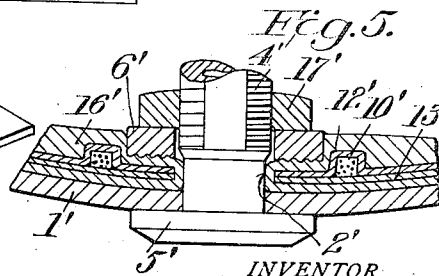


Fig. 5.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## AUTOMOBILE-TIRE.

943,505.

Specification of Letters Patent.

Patented Dec. 14, 1909.

Application filed October 24, 1906. Serial No. 340,300.

*To all whom it may concern:*

Be it known that I, CHARLES E. W. WOODWARD, a citizen of the United States of America, residing at Chicopee Falls, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Automobile-Tires, of which the following is a specification.

My invention relates to improvements in the securing means for inflation valves of the type similar to the well known valves for the inner tubes of automobile tires.

At the present time, in the manufacture of inner tubes, it is the practice to secure the inflation valve to the same and then cement on the outer surface thereof, concentric with the stem, a suitable patch for strengthening this portion of the tube so that the valve stem can be easily clamped to the tube and also easily removed therefrom.

When it is desired to replace the valve for any purpose, it is first necessary to remove the patch before the head of the valve can be drawn through the stem opening of the tube, with a consequent result that the tube is more or less weakened at this point. The patch is generally removed by dissolving the cement off with some well known rubber solvent, which more or less attacks the tubes and consequently weakens the same where the valve is mounted.

By means of my improvement, I dispense with the necessity of removing the patch, and in order to prevent accidental removal of the valve, I embody in the patch a non-elastic but pliable or collapsible ring, the internal diameter of which is substantially equal to the external diameter of the clamping member and inner head of the valve, which ring is firmly anchored in the body of the patch, concentric with the valve stem opening.

With the above and other objects in view, the present invention consists in the combination and arrangement of parts herein-after more fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings:—Figure 1 is a vertical sectional view through a portion of the inner tube of a pneumatic tire showing one form of my improvement. Fig. 2 is a detail view of the non-elastic ring illustrating the strands of which the ring is composed.

Fig. 3 is a detail view illustrating the method of cementing the ring between layers of fabric. Fig. 4 is a detail perspective view of a ring the same as the ring illustrated in Figs. 1 and 2, but which is provided with a series of radiating cloth tabs. Fig. 5 is a sectional view illustrating a modified form of the invention.

Referring now more particularly to the accompanying drawings, 1 indicates a portion of the inner tube of the tire having the usual opening 2 to receive the stem 3 of the inflation valve 4, the inner end of the valve being provided with the ordinary disk shaped end or enlargement 5.

Loosely mounted on the stem of the valve is a washer 6 that is prevented from rotation by the flattened surface 7 on the valve 4 and which is provided with an overhanging flange or ledge 8, producing the notch 9.

The character 10 designates an inelastic circular ring composed of strands 11 of some suitable inextensible thread and wound into the shape shown clearly in Figs. 2 and 4. This ring, after being wound to the required size and shape is placed between two layers of fabric 12 and 13. If desired, tabs 14 of cloth or other fabric may be passed through the ring 10, and secured on the same or have their folded ends adhered to the body of the tabs by cement or in any other suitable manner. These layers of fabric 12 and 13 are thoroughly cemented together and also to the tabs 14, thus holding the ring 10 firmly in place. If desired, the tabs 14 may be eliminated from the structure shown in Fig. 1. In any event, the assembled ring and layers of fabric, with or without the tabs 14 are cemented together and then inclosed in a suitable rubber patch 16 which is cemented to the tube 1, said patch in the structure illustrated in Fig. 1 being first cut away to receive the washer 6, the flange portion 8 of which firmly clamps the non-elastic ring which latter is equal in diameter to the greatest diameter of the washer 6. The base of the washer 6 compresses the area of the tube 1 which is inclosed by the ring between it and the head 5 of the valve.

The head 5 of the valve 4, after the patch is cemented to the tube, can be inserted through the opening 2 of the tube, bringing the head of the same against the inner surface of the tube, the stretching of the por-

tion of the inner tube adjacent the opening 2 permitting the insertion of the valve from the outside, because the ring, while inextensible, is not a rigid ring, and therefore, may be pinched together to considerably elongate its diameter in one direction, whereby the head 5 may be passed through it, after which, the ring, springing out again to its true circular form, will lie substantially within the diameter of the head to be supported thereby, so that if it is desired to employ the form of washer 6 the flange 8 thereon may overlap the ring.

When the nut 17 is turned down firmly in place on the washer 6, the overhanging flange portion 8 of the washer 6 is brought firmly down on the patch 16 and over the embedded ring 10 and at the same time clamps the portion of the tube 1 between the head 5 and the washer 6, the shoulder portion 18 of the washer 6 dropping within the non-elastic ring 10, as shown in Fig. 1. This construction, I have found, thoroughly secures the valve to the tube and prevents the head 5 from being drawn through the opening 2, since the inelastic ring 10 will prevent the opening 2 from stretching or assuming an oval or irregular shape, thereby maintaining the opening 2 circular.

Referring now particularly to Fig. 5, it will be seen that the ring 10' is not provided with the tabs 14, but is simply cemented between the two layers of fabric 12' and 13'. The layers of fabric 12' and 13' are not cutaway within the ring, as in the other form of the invention, but on the other hand they are left intact, and only an opening 2' large enough to receive the stem of the valve is made. The clamping nut 17' of this last form forces the washer 6' downwardly so that the portion of the tube 1' beneath the head 5' and the patch 16' are firmly clamped between the head 5' and the washer 6'. This form I consider as efficient and reliable to hold the stem in place as the other form hereinbefore described, because the inelastic ring 10' will prevent the opening 2' from stretching or assuming an oval shape when any undue strain is placed on the valve stem 4'. The outer face of the washer 6' has a close fit within the area of the inner surface of the inelastic ring 10', which will prevent the opening 2' from stretching, should any attempts be made to draw the head 5' through the opening 2', as readily understood.

From the foregoing, it will be understood that in the form of invention illustrated in Fig. 1, the non-elastic ring 10 is secured between layers of fabric and reinforced by cloth tabs 14, so that the ring cannot move in any direction, the tabs being evenly distributed around the ring so that any undue stretching or strain in one direction will be counteracted by the tabs on the opposite side

of the ring. It will also be understood that the head 5 and the washer 6 of Fig. 1 being of a diameter equal to the outside diameter of the ring, the ring will be effectually prevented from moving.

It will also be understood that in the employment of the structure illustrated in Fig. 5 that the layers of fabric in which the ring is embedded are not cutaway within the ring so that the washer in this last form of invention will effectually grip the fabric between the head 5' and its inner surface and prevent the layers of fabric within the area of the ring from stretching. That area of the patch lying inside of the ring of Fig. 5 may be distended sufficiently to allow the head of the valve stem to be passed through the stem opening therein and also through the opening in the wall of the tube. However, this portion of the patch 16' within the area of the ring, when clamped between the washer and the head of the valve stem, serves to more securely bind the ring in place on the tube. Obviously, it would be entirely within the scope of the present invention to use a nut on the valve stem bearing directly on the area of the tube within the ring and thereby omit the washer, but it would not be considered desirable to do so, owing to the abrasive action on the surface of the tube due to the screwing up of the nut.

What I claim is:—

1. In a securing means for inflation valves for the inner tubes of tires for automobiles, an inelastic ring secured to the same adjacent the valve-opening therein and having an internal diameter greater than that of said opening, means on the valve-stem for retaining the tube and said ring in place, whereby the opening in the tube is prevented from assuming a shape other than circular when the valve-stem is in place, and whereby the inelastic ring is permitted to assume a form other than circular when the valve-stem is removed from the tire, as described.

2. An improvement in inner tubes for automobile tires comprising a non-stretchable ring secured to the same and concentric with the valve-stem opening thereof, said ring having an internal diameter greater than that of said opening, means on the stem for maintaining said ring in place and in a circular form, whereby said opening is prevented from assuming an oval shape when the stem is in place, when undue outward strain is exerted upon the valve-stem, as described.

3. As an improvement in inner tubes for pneumatic tires, an inelastic ring, layers of fabric inclosing said ring, means for securing said layers of fabric to the tube, the ring being arranged concentric to the opening in the tube, a valve-stem, means thereon for clamping the tube to the same whereby the

opening in the tube is maintained in circular form, and whereby the head of the valve is prevented from withdrawal by outward strain on the same.

5 4. Means to secure the inflation valve to inner tubes of pneumatic tires comprising a pliable inextensible ring permanently secured to the tube concentric to the valve-stem opening in the latter, the internal diameter of said ring being greater than said opening, a valve-stem extending through the opening, the head of the valve being inside the tube, and a washer on the valve-stem to prevent lateral movement of the ring and to compress the wall of the tube around the valve-stem opening to seal the latter.

5. An improvement in inner tubes for pneumatic tires consisting in securing an inextensible pliable ring to the tube concentric with the valve-stem opening therein and inclosing a certain area of the wall of the tube around said opening, said ring constituting a raised abutment extending around said opening; a valve-stem having a head on the inner end thereof, and a washer on the stem to compress the area of the tube inclosed by the ring.

6. An improvement in inner tubes for pneumatic tires consisting of a ring capable of resisting lateral strains attached to the tube concentric to the valve-stem opening therein and having a greater internal diameter than that of said opening whereby a portion of the tube lies within the area of the ring, said inclosed area of the tube being distensible to permit the introduction of the head of the valve into the tube.

7. An improvement in inner tubes for pneumatic tires consisting of a ring capable of resisting lateral strains, attached to the tube concentric to the valve-stem opening therein and having a greater internal diameter than that of said opening, said ring being collapsible and the area of the wall of the tube inclosed thereby being distensible to permit the introduction of the head of the valve into the tube.

8. An improvement in inner tubes for pneumatic tires which consists in securing a

pliable inextensible ring to the tube concentric with the valve-stem opening therein, said ring constituting a raised abutment whose internal diameter is greater than the diameter of the stem-opening; means to secure the ring to the tube consisting of pieces of fabric between which the ring is inclosed, a covering for said layers of fabric, said covering being cemented to the surface of the tube, a part of said fabric lying within the area inclosed by the ring, whereby it will be clamped to the surface of the tube when a valve is secured in the tube in the usual manner.

9. A valve-holding pad adapted for attachment to a pneumatic tube, said pad having a recess fitted to receive the valve washer, and an inextensible, flexible ring embodied in said pad and constituting the peripheral wall of said recess.

10. In a securing means for inflation valves for the inner tubes of tires, said tube having a valve opening, a valve including a headed stem, a ring secured to the tube adjacent said valve opening and having an internal diameter greater than that of said opening, and means on the valve stem to clamp the tube between the head of the stem and said means.

11. In a device of the character described, an inner tube provided with an opening, an inextensible ring secured to the tube and having a greater diameter than the diameter of said opening, said ring being disposed concentric to said opening, a valve stem having a head on one end, the headed end of the stem being passed through said opening and said ring, said head being of greater diameter than said opening, and a member on the valve stem to center the stem relative to the ring and simultaneously clamp the wall of the tube within the ring against the head on the valve stem to secure the latter in the tube.

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Witnesses:

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