

No. 819,387.

PATENTED MAY 1, 1906.

C. R. TWITCHELL.
PNEUMATIC TIRE.

APPLICATION FILED JUNE 20, 1905.

Fig. 1.

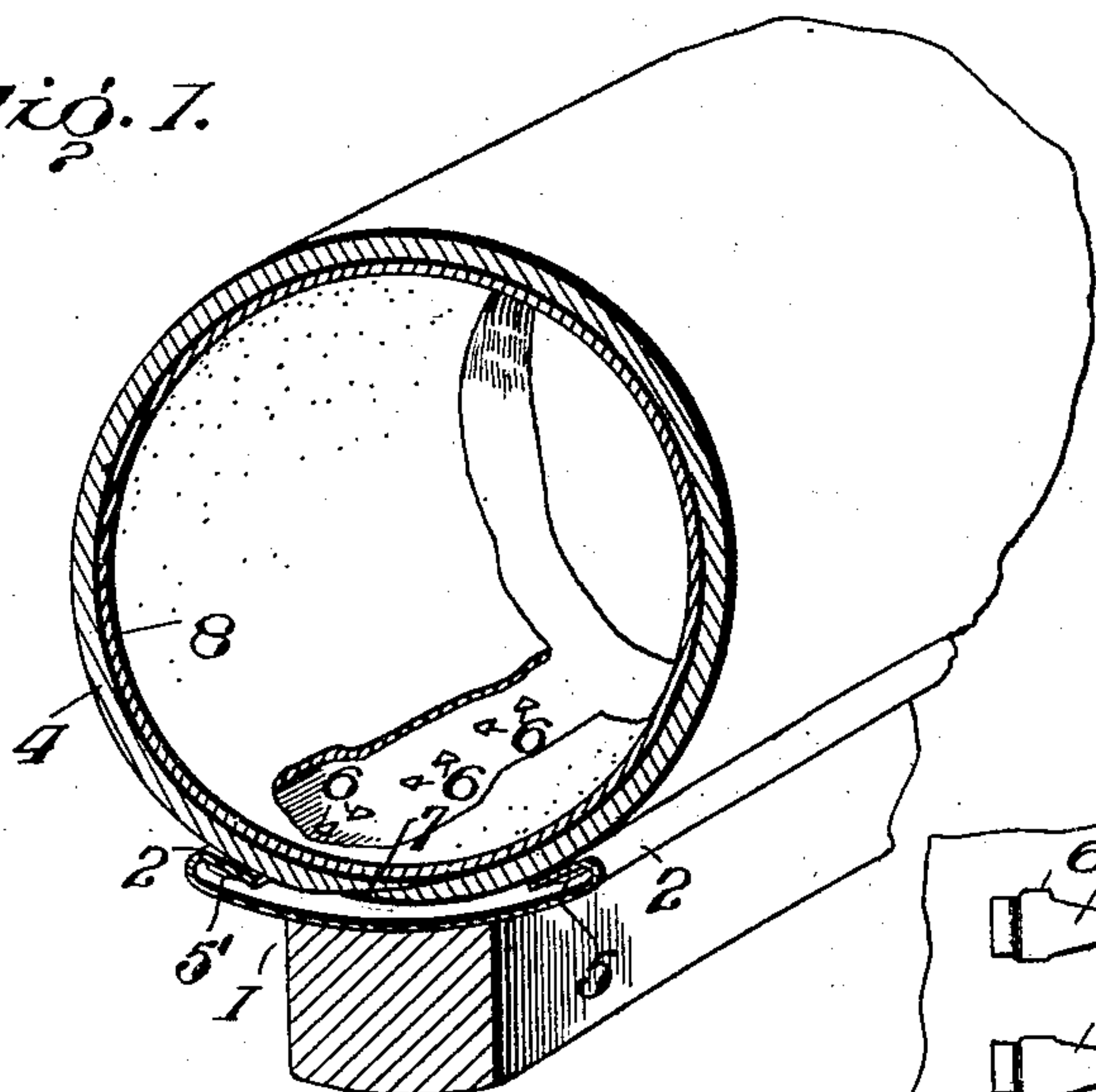


Fig. 5.

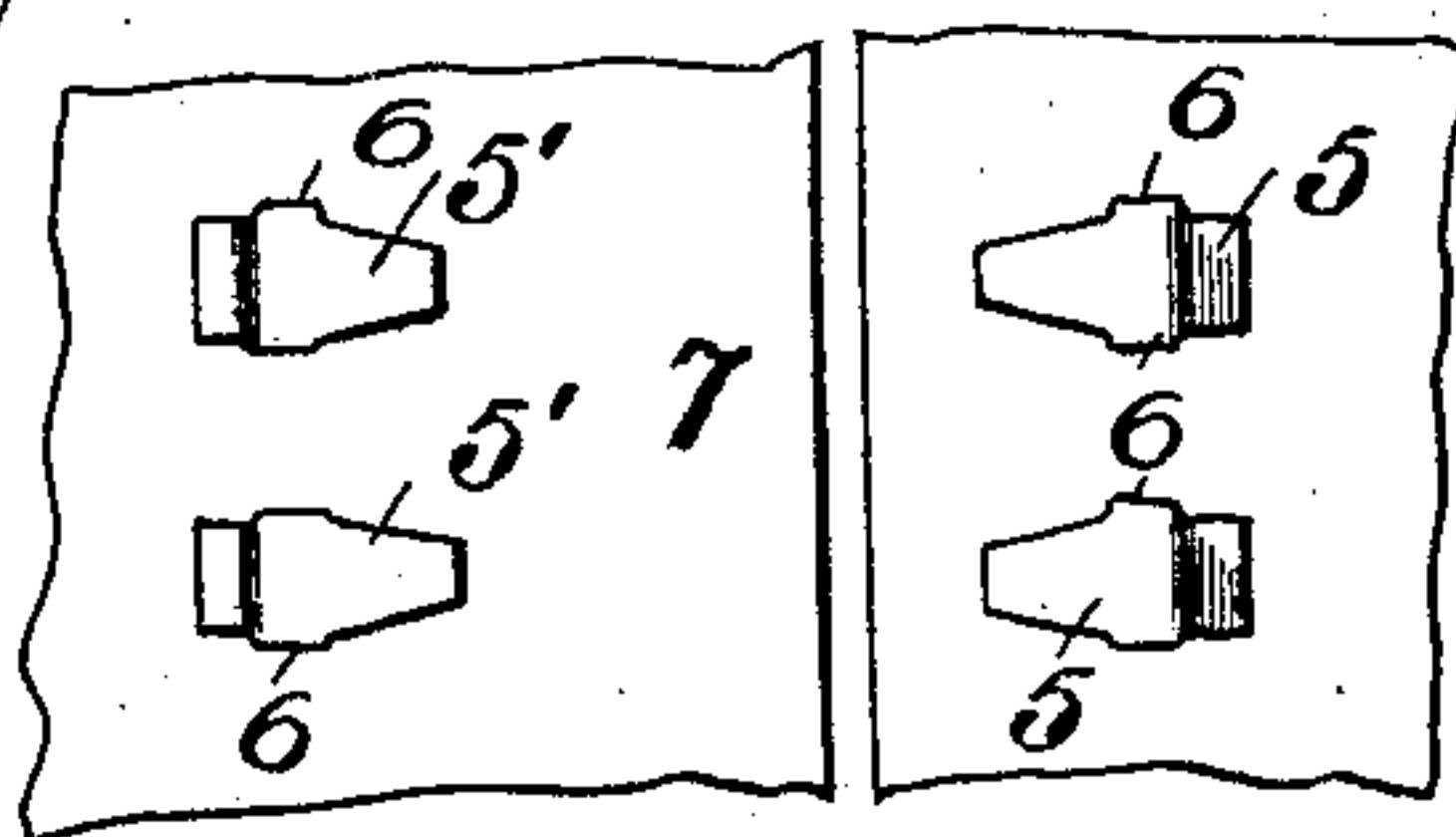


Fig. 2.

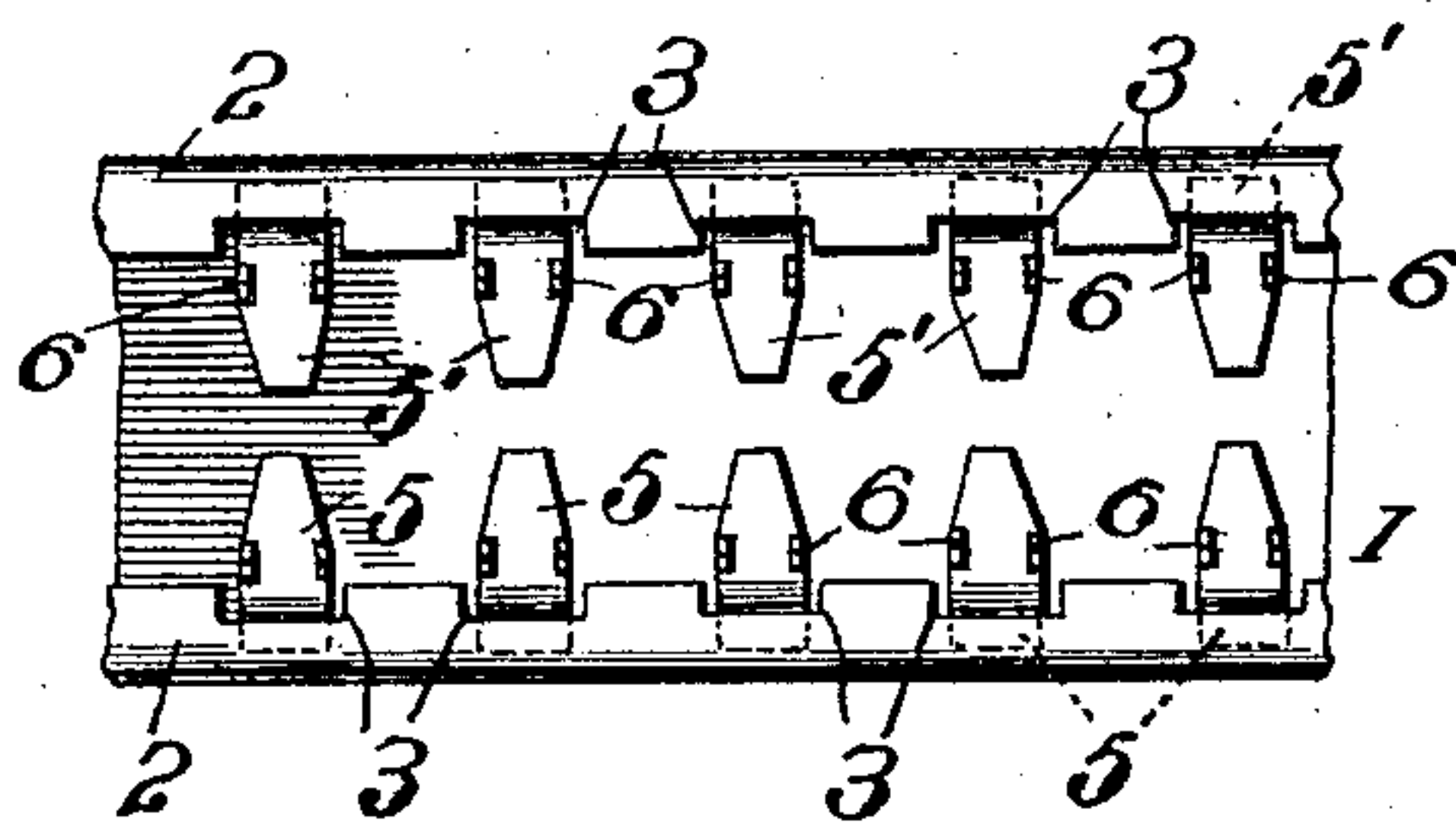


Fig. 3.

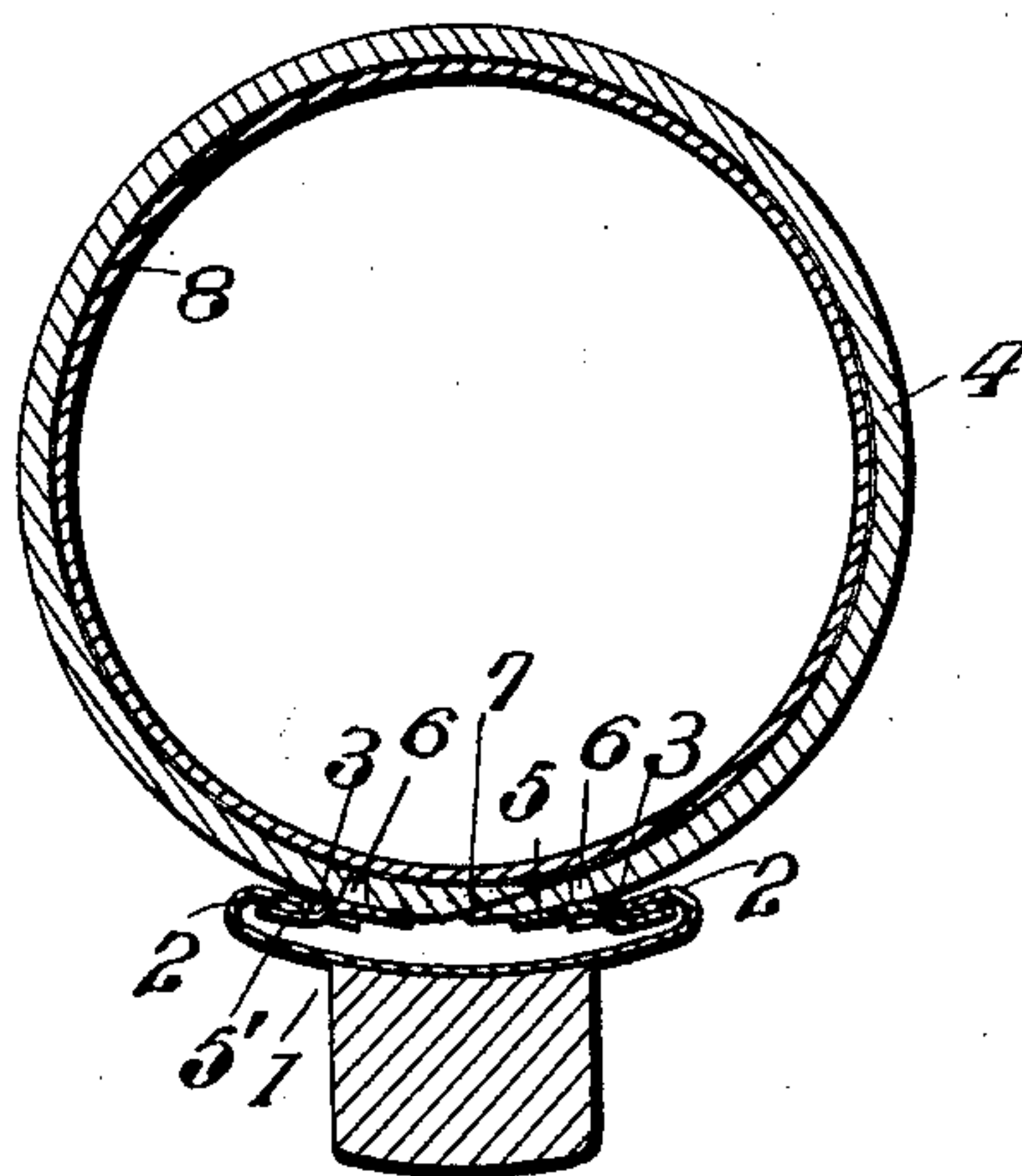
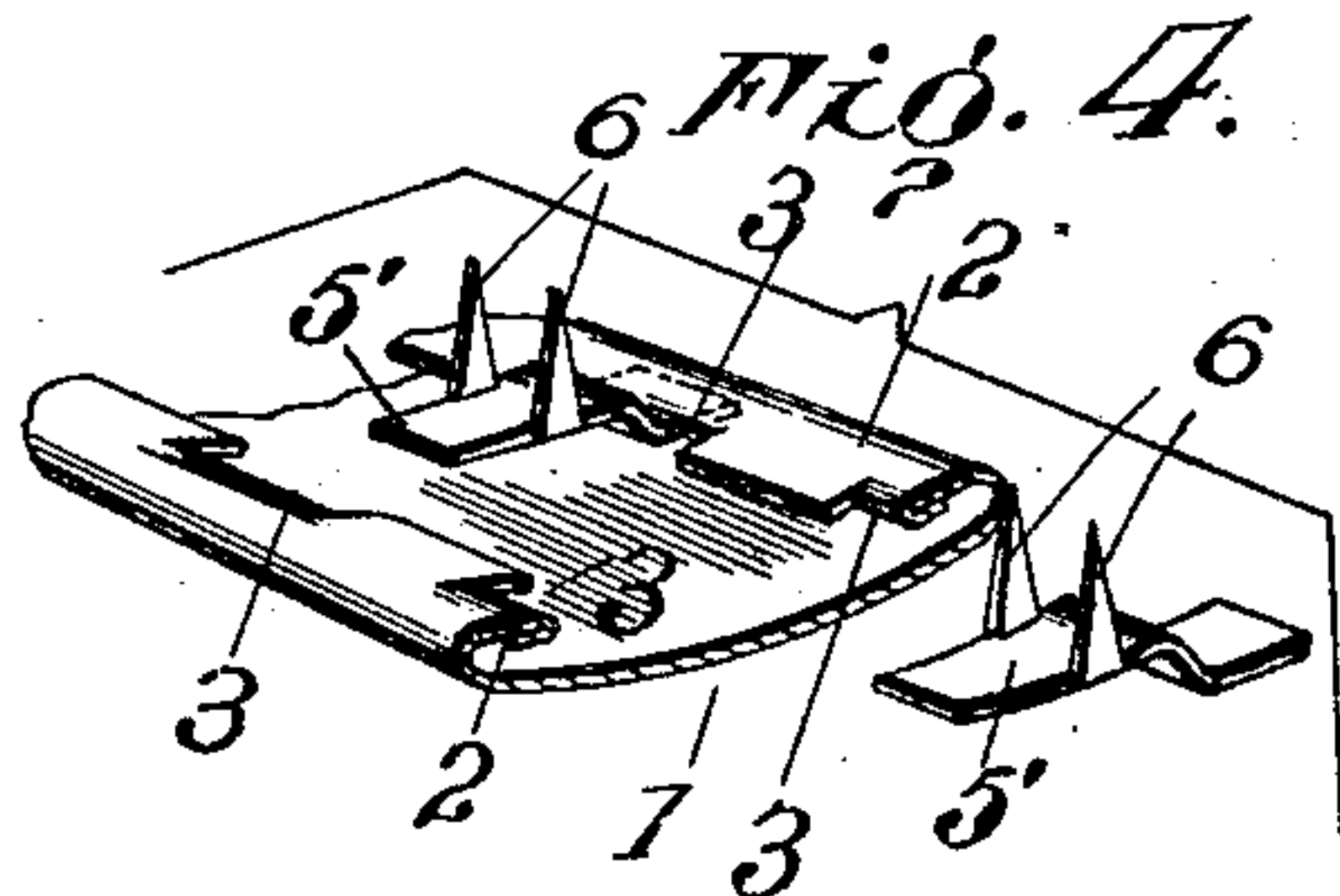


Fig. 4.



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PNEUMATIC TIRE.

No. 819,387.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed June 20, 1905. Serial No. 266,152.

To all whom it may concern:

Be it known that I, CHARLES R. TWITCHELL, of Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Pneumatic Tires; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Double-tube pneumatic tires now in general use are of what is known as the "clencher" type, each edge of the outer shoe or casing being formed with a continuous bead for interlocking with the overhanging edge flanges of the wheel-rim. These beads are liable to creep on the rim, resulting in disengagement of the shoe or casing. To prevent this, stay-bolts or lugs are employed to clamp the shoe against the rim-flanges, the heads of such stay-bolts conforming to the opposite inner faces of the sides of the shoe when the beads are in engagement with the rim-flanges. These bolts, while advantageous, not to say absolutely essential, in connection with the wheel-tires as heretofore constructed, are frequently the cause of serious difficulty, since if they be not properly manipulated the positioning or removal of the casing may not be accomplished without injury to either the casing or the inner tube, and, furthermore, the latter is frequently pinched by the heads of the bolts, unless great care is exercised such pinching resulting in a puncture. Then, too, no little attention has to be paid to these bolts in positioning and removing the tires. It has been sought in some instances to avoid the danger of pinching the tube by the heads of the stay-bolts by providing the inner beaded edge of the casing with a flap; but this has been found troublesome and necessitates the complete deflating of the tube before it is placed in the casing, as well as the coincidence of a hole in such flap with the hole in the rim for the passage of the air-valve of the inner tube.

The primary object of my invention is to provide a tire which may be secured to the wheel-rim without the continuous bead formations, one which will render the use of stay-bolts unnecessary, which will avoid all danger of pinching the inner tube, and one

which will be of substantially uniform thickness at every point save its extreme edges, which are somewhat beveled, so that the necessity of thickening or building up the casing at the meeting edges thereof is rendered unnecessary. This I accomplish by forming the casing of a strong pliable leather of uniform thickness, having overlapping ends or edges, with raised hooks projecting therefrom designed to enter recesses in the rim of the wheel and engage the edge flanges thereof, so that upon inflating the inner tube the casing will be securely held to the wheel-rim without the aid of stay-bolts, since the engaging hooks are prevented from creeping on the wheel-rim by engagement with the walls of the recesses in the flanges thereof. One set of hooks is placed farther from one edge of the casing than is the other set of hooks from the other edge, so that the overlapping of the former will prevent the inner tube from being pinched. Then, too, that portion of each of the outwardly-bent hooks which connects the inner and outer portions thereof has direct contact with the edges of the wheel-rim, thereby rendering engagement between the casing and the wheel-rim unnecessary.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective of a section of a tire and wheel-rim, showing my improvement. Fig. 2 is a face view of a segment of the wheel-rim. Fig. 3 is an enlarged transverse section through the casing, the rim, and two of the engaging hooks. Fig. 4 is a fragmentary view showing the interlocking of one of the hooks with the wheel-rim. Fig. 5 is a detail.

Referring to the drawings, 1 designates the wheel-rim, and 2 2 the flanged edges thereof, which are bent back over the rim a somewhat greater distance than is customary in the clencher type. In these flanges are formed opposite spaced-apart recesses 3, having parallel end walls, each recess being of approximately elongated U shape, although it may be differently formed, if desired.

4 designates the shoe or casing, which I preferably make of a special kind of leather previously subjected to treatment which renders it as waterproof as rubber and yet which

possesses greater tenacity and will endure harder usage. To this shoe or casing near the outer edge is secured a series of metallic hooks 5, which are preferably stamped up from a single piece of metal having prongs 6, which are passed through the shoe, the engaging ends of such hooks being bent outwardly away from the face of the shoe, so as to accommodate the flanged edge of the wheel-rim with which the hooks are designed to interlock, such hooks entering the recesses 3. That portion of each hook connecting the outwardly-bent portion with the inner secured portion is designed to engage with the edge of the wheel-rim, and thereby arrest the outward movements of the casing under the inflation of the inner tube and prevent any undue strain on the shoe proper, as would occur if the latter engaged directly with the rim-flanges. In other words, the inner and outer portions of each hook are on different planes, with the result that when the outer portions are placed beneath the rim-flanges the intermediate connecting portions will engage with the extreme edges of such flanges, and thus avoid having to depend upon an engagement between the shoe itself and the wheel-rim for the locking of the former to the latter. A corresponding series of hooks 5' is secured to the inner portion of the shoe, but some distance from the edge thereof, so as to form a flap 7, which will overlap or be overlapped by the other or outer edge of the shoe. (See Fig. 5.) These hooks 5' are intended to engage the flanged edge at the inner side of the rim, being also placed in engagement with the recesses the same as the hooks adjacent the outer edge of the shoe. The shoe or casing is of uniform thickness throughout its length, with the exception that its extreme edges are slightly beveled, so that the flap 7 will fit snugly over the other beveled edge of the casing.

The inner tube 8 may be of any preferred type.

The use of the metallic hooks is rendered possible by the making of the shoe or casing of leather, whereas if it were of rubber or rubber and fabric such hooks could not be employed, the rubber or rubber composition not being sufficiently firm to retain the hook-points. The use of these hooks and the formation of recesses in the flanged edges of the wheel-rim results in a great saving of labor and time in removing the tire. After allowing the air to escape from the inner tube the shoe or casing immediately becomes pliable, being soft and not hard and stiff, as is the rubber tire. Thereupon the outer series of hooks may be pressed inwardly until they are free of the recesses of the outer flanged edge. The use of levers for removing the shoe or casing is not necessary. Furthermore, the shoe may be

removed and replaced without danger of pinching the inner tube.

The advantages of my invention will be at once apparent to those skilled in the art.

I claim as my invention—

1. The combination with a wheel-rim having opposite edge flanges, of a tire-casing of substantially uniform thickness and having two series of hooks secured thereto at or near its edges, each of said hooks having an inner secured portion and an outer flange-engaging portion, which latter is spaced away from the casing so as to accommodate and interlock with the rim-flanges, the connecting portions between said inner and outer portions of the hooks being designed to contact with the edges of the rim as the casing is expanded.

2. The combination with a wheel-rim having opposite edge flanges, of a tire-casing having two series of hooks secured thereto near the edges thereof, one series being located a greater distance from one edge of the casing than the other series is in respect to the other edge, said former edge constituting a flap, and all of said hooks being spaced away from the casing so as to accommodate and interlock with said edge flanges, and means for preventing the casing from creeping on the rim.

3. The combination with a wheel-rim having opposite flanges formed with edge recesses, of a tire-casing having two series of hooks secured thereto near the edges thereof, one series being located a greater distance from one edge of the casing than the other series is in respect to the other edge, said former edge constituting a flap, and all of said hooks being spaced away from the casing and of width substantially equal to that of said recesses, the interlocking of the hooks with the recessed edges of the wheel-rim preventing the casing from creeping on the latter.

4. The combination with a wheel-rim having opposite flanges formed with spaced-apart edge recesses, of a casing of substantially uniform thickness, from edge to edge, and two series of hooks secured to the casing near its edges, one series being located a greater distance from one edge of the casing than the other series is in respect to the other edge, said former edge constituting a flap, said hooks being designed to enter said recesses of the rim-flanges, the interlocking of the hooks with the latter preventing the casing from creeping on the rim.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLES R. TWITCHELL.

Witnesses:

E. A. MILLER,
A. NORRIS.