

No. 639,951.

Patented Dec. 26, 1899.

B. F. TAYLOR.
PNEUMATIC TIRE.

(Application filed July 31, 1899.)

(No Model.)

Fig. 1.

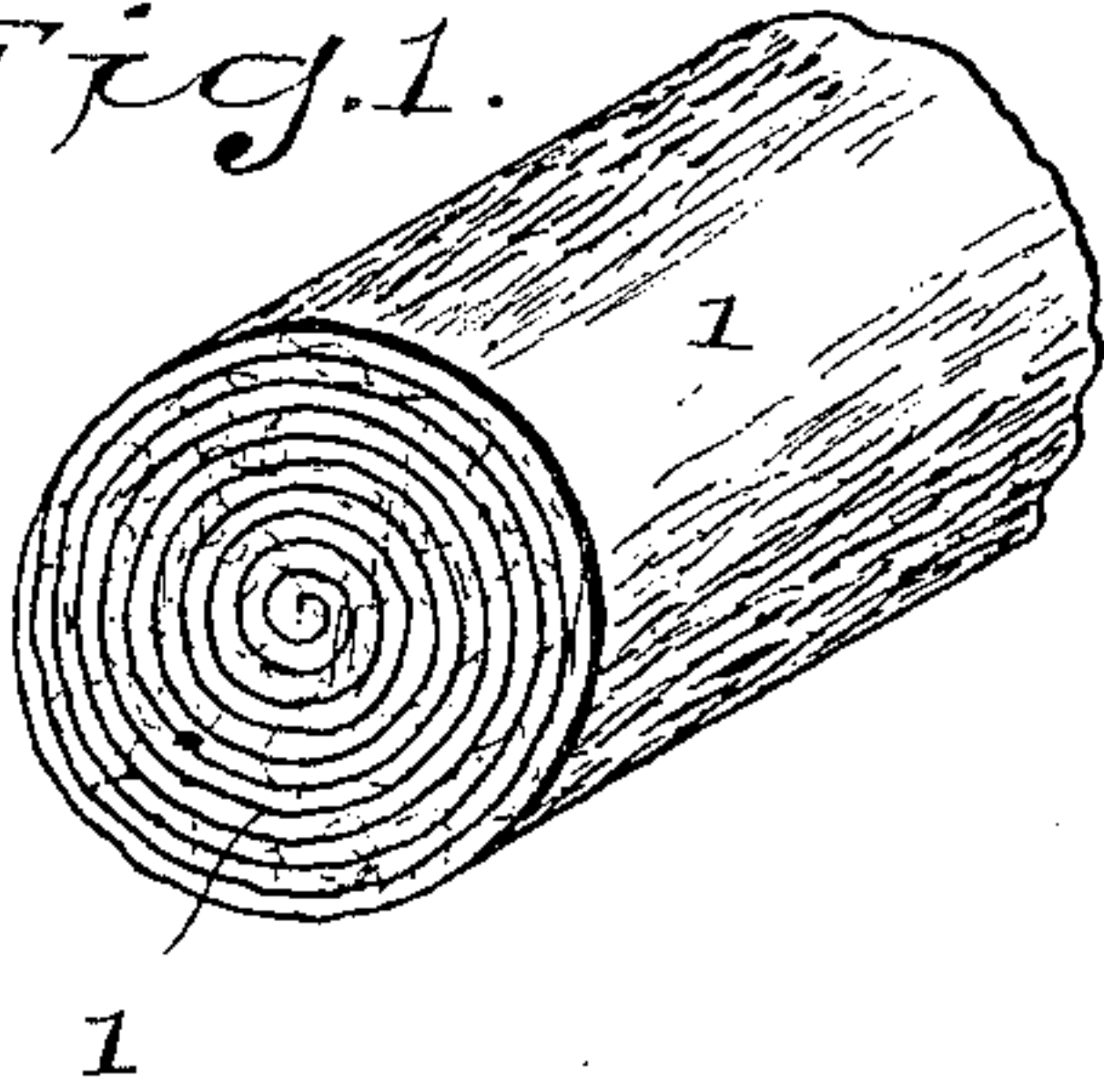


Fig. 3.

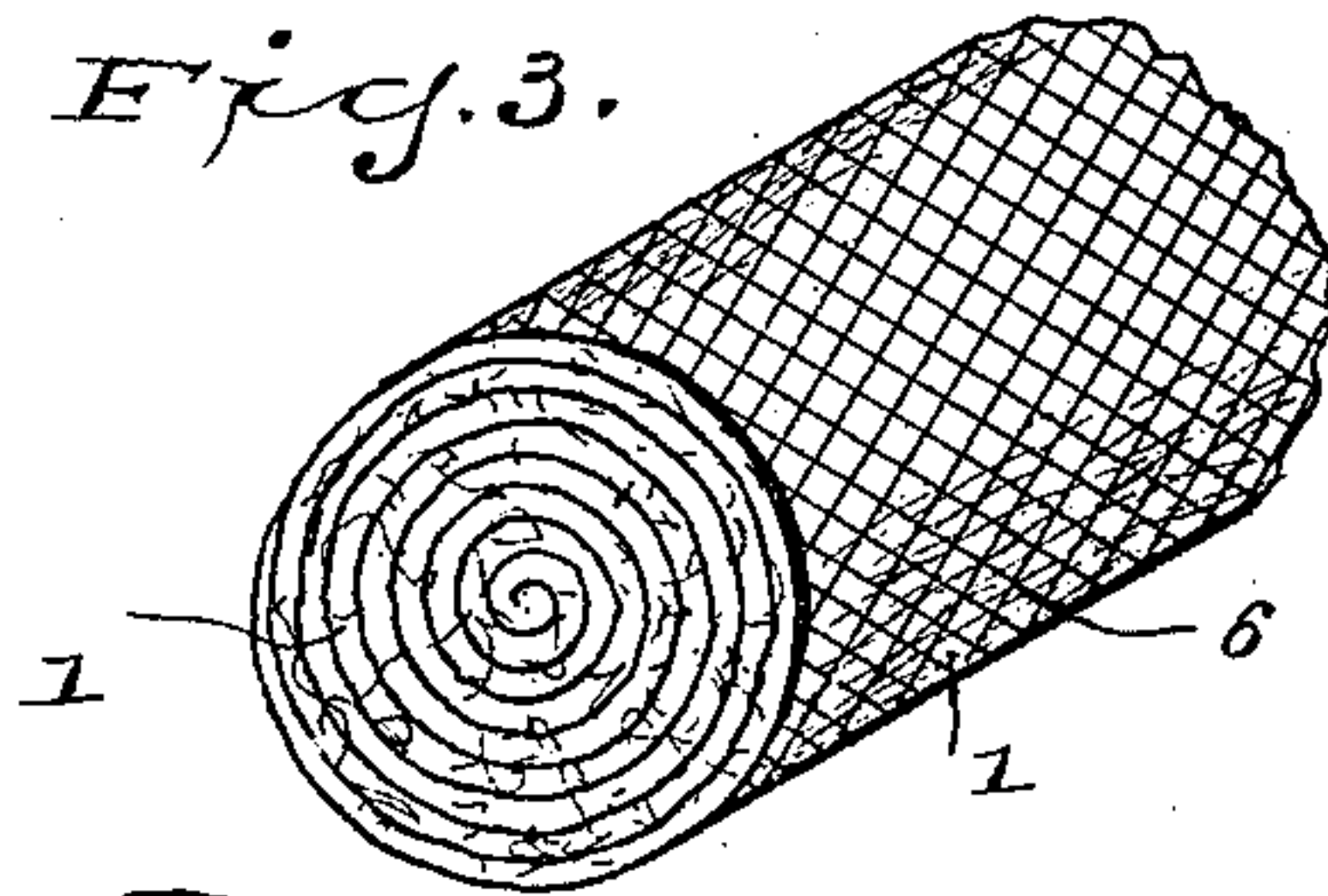


Fig. 2.

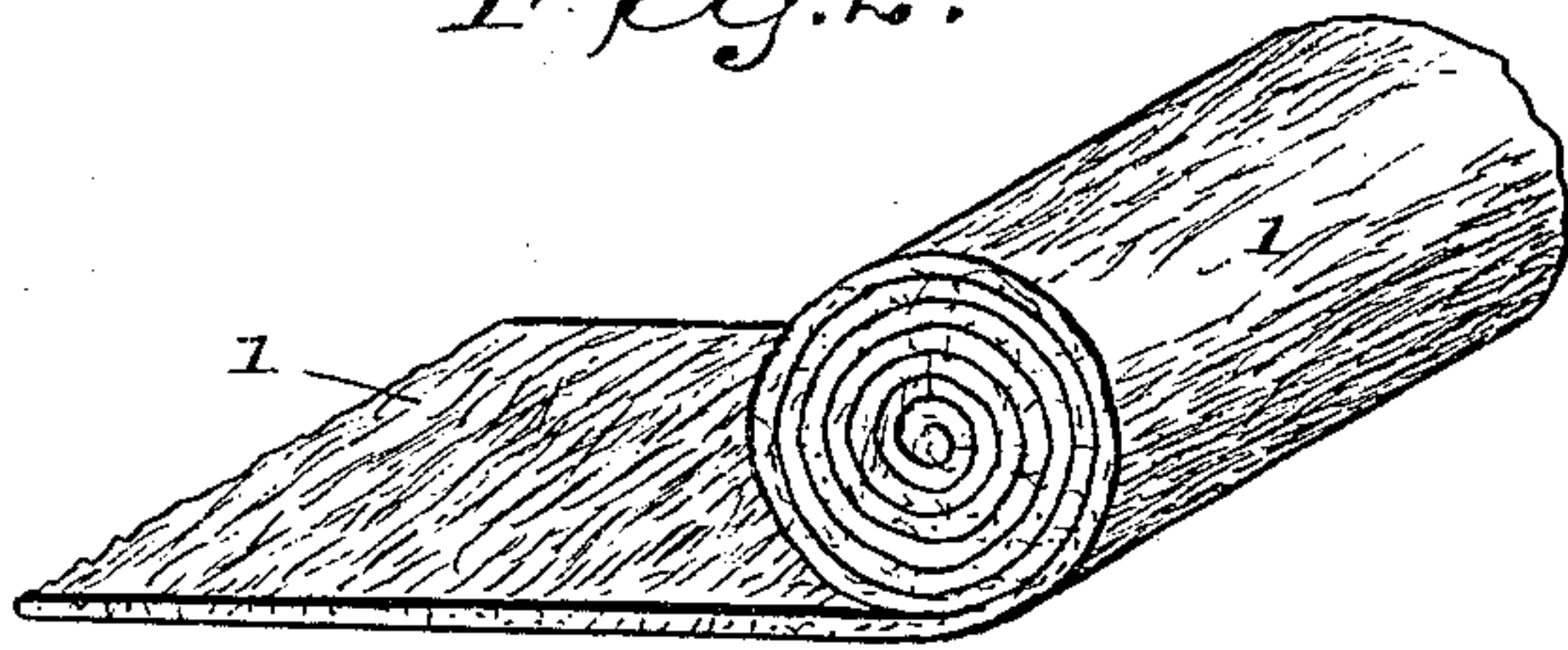


Fig. 4.

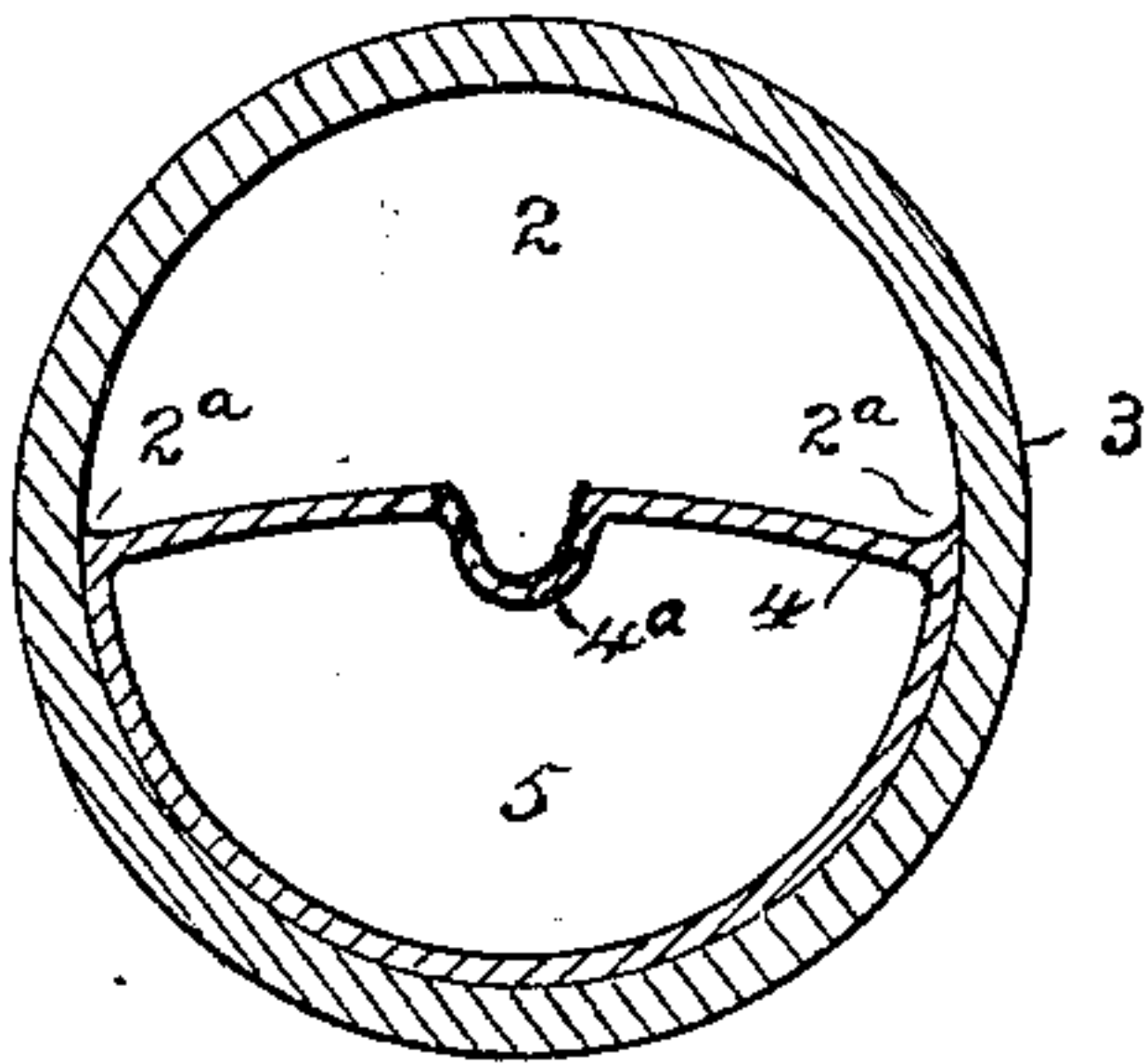


Fig. 5.

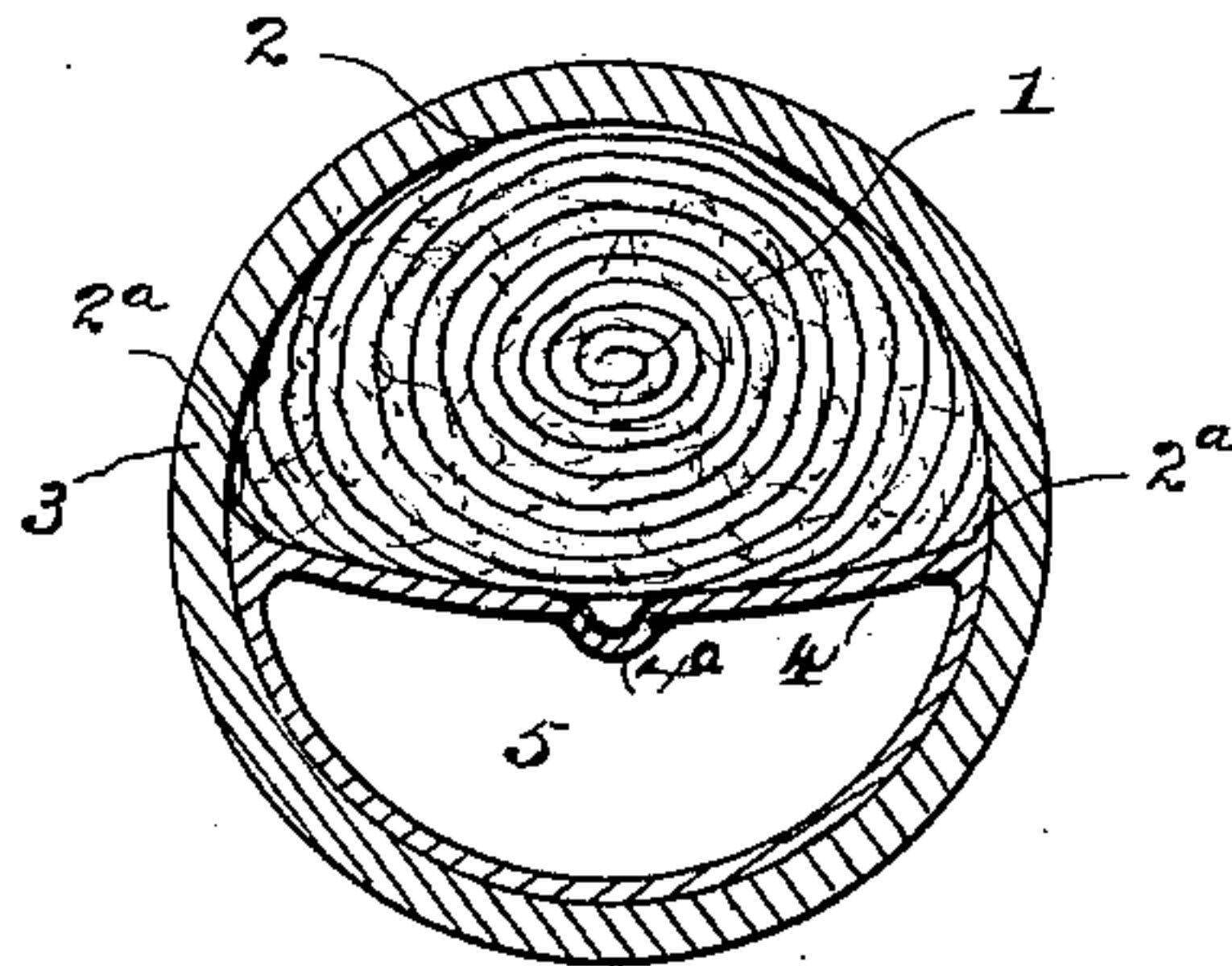


Fig. 6.

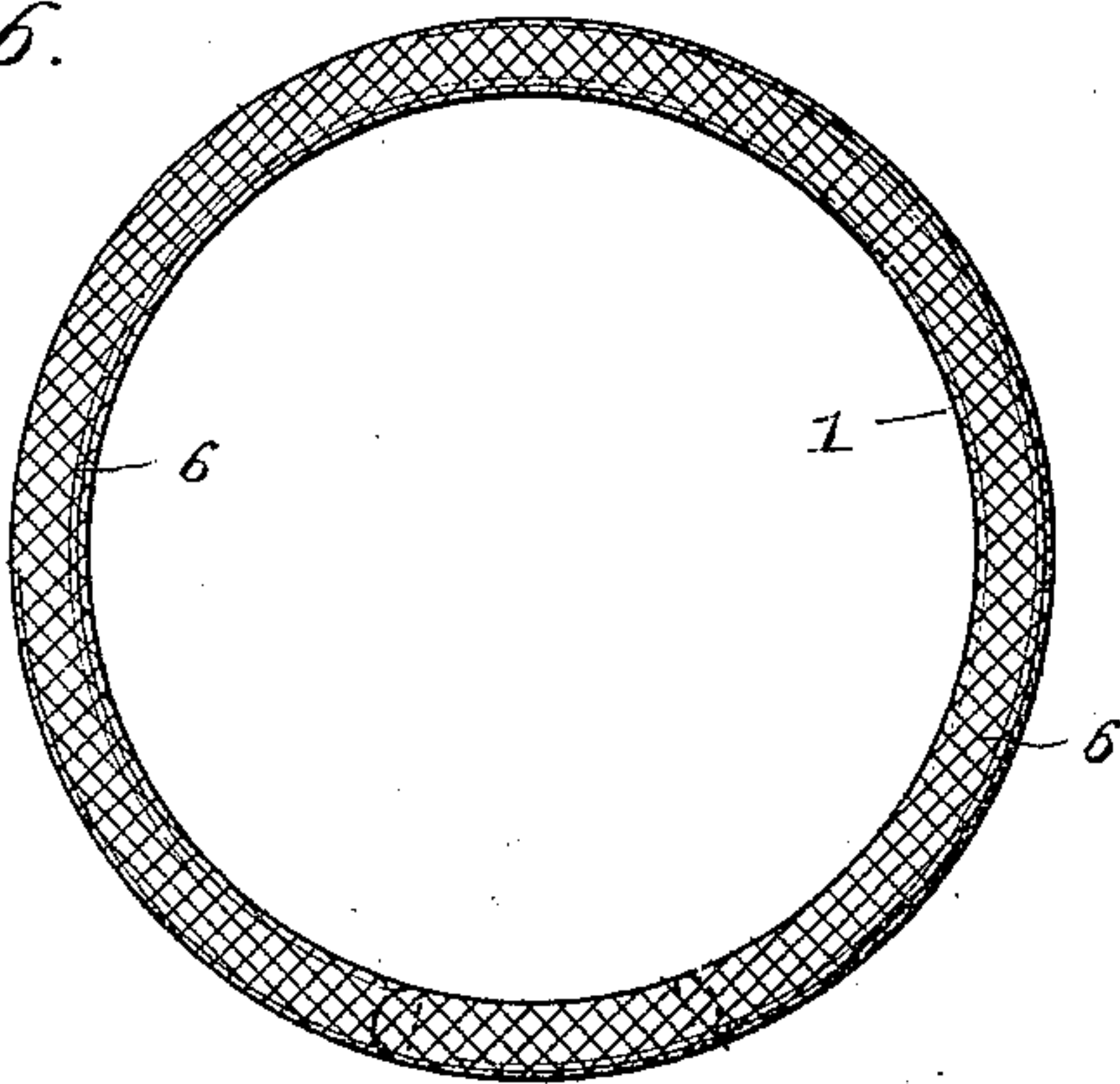


Fig. 8.

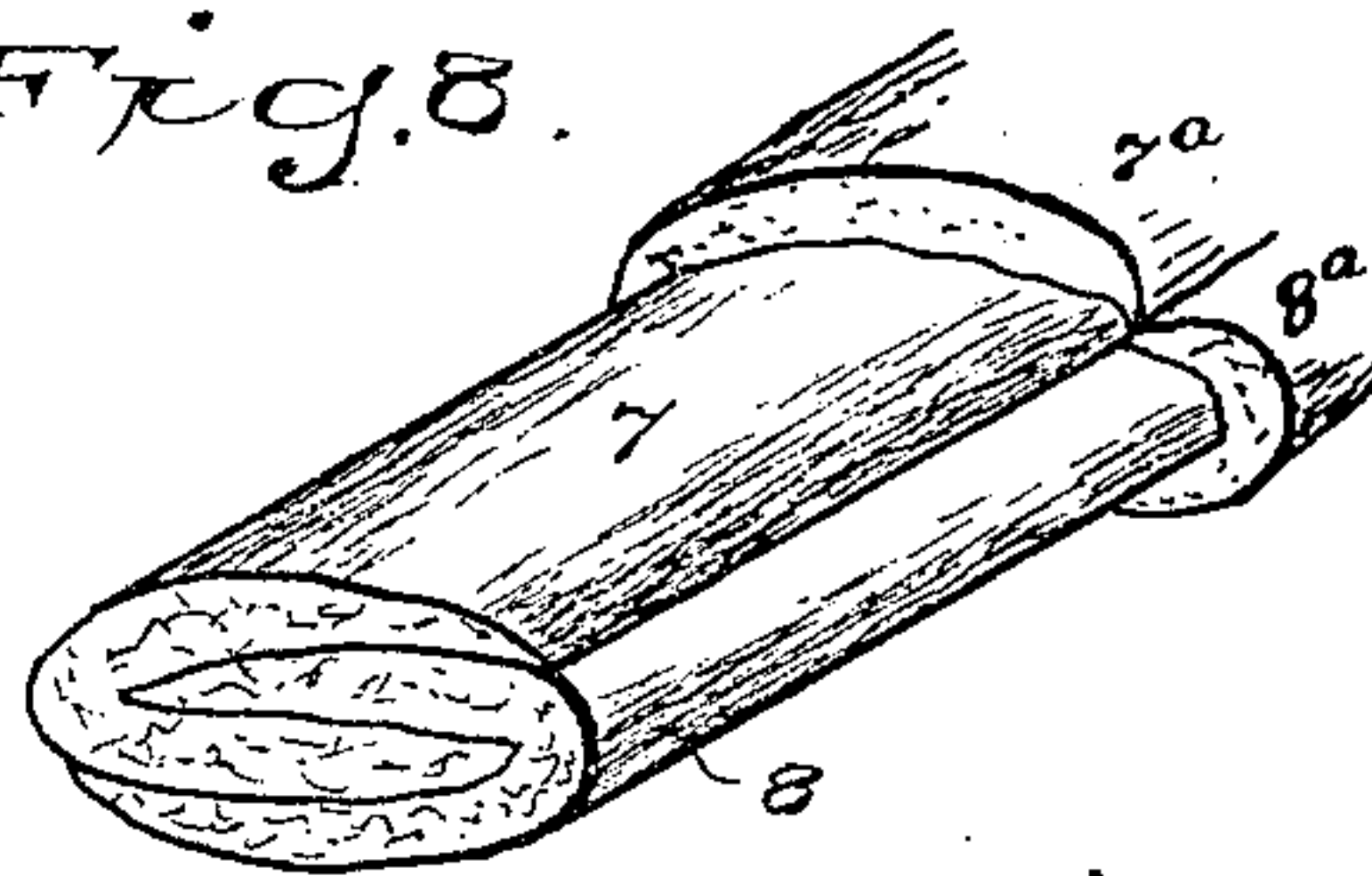
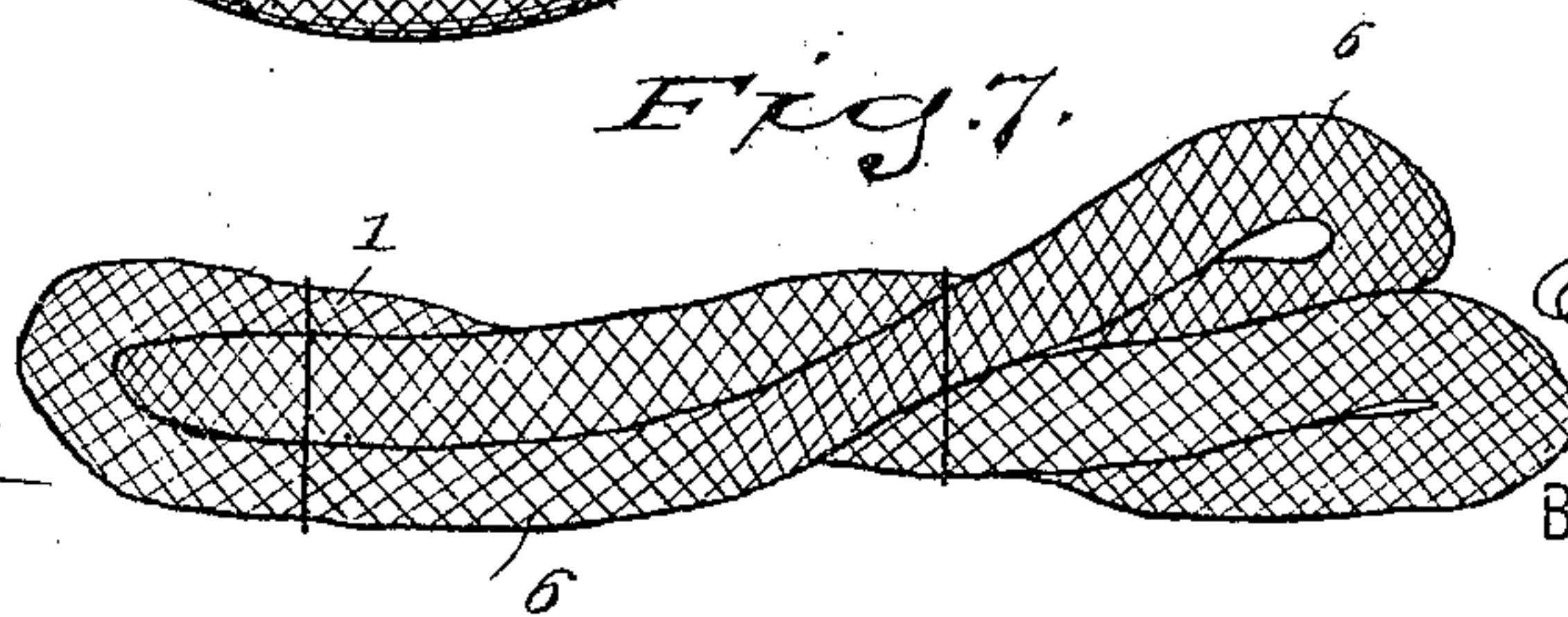


Fig. 7.



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BENJAMIN F. TAYLOR, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE
TAYLOR TIRE AND DEVELOPEMENT COMPANY, OF SAME PLACE.

PNEUMATIC TIRE.

SPECIFICATION forming part of Letters Patent No. 639,951, dated December 26, 1899.

Application filed July 31, 1899. Serial No. 725,561. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. TAYLOR, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Pneumatic Tires, of which the following is a specification.

My invention relates to an improved armored tire for bicycles or other class of vehicles wherein the tire is divided into two compartments, one for compressed air and the other filled with a non-puncturable material. Heretofore raw cotton has been used as a filler for this purpose; but my invention consists more particularly in the form or shape which the raw cotton is made to assume, whereby greater resiliency and resistance are acquired. For this purpose I select long-staple cotton and card it in sheets, so that the fibers of the cotton will interlock more readily, and then with an unbroken sheet whose length represents the circumference or distance around the tire roll such sheet spirally in cross-section.

Further, my invention consists in knitting an open-mesh cover around this roll, so as to keep it in shape during the continuous handling which it is subjected to between the rolling process and its insertion into the mold for vulcanizing.

To enable others to understand my invention, reference is had to the accompanying drawings, in which—

Figure 1 represents a broken perspective view of a sheet of raw cotton rolled up the full size required. Fig. 2 shows the sheet partially rolled. Fig. 3 is a broken perspective view of a section of the cotton filler rolled and enveloped with a net or cover. Fig. 4 is a cross-section of a rubber tire, showing the two compartments—viz., one for compressed air and the other for the cotton filler or armor. Fig. 5 is a cross-section of the rubber tire, showing the cotton filler or armor placed in the upper compartment. Fig. 6 is a view showing the rope-like form of the filling material having its ends lapped and secured together in readiness to be placed in the mold for vulcanizing. Fig. 7 shows the completed

filler folded up for transportation. Fig. 8 is a modified form of constructing the filler, which is done by dovetailing or lapping the ends of two sheets together, so as to prevent creeping or separating of the sections.

While, as before mentioned, raw cotton has been used as a filler for rubber tires, it has in most cases been packed into the chamber of the tire in broken masses, thus forming no effective protection against separation. In cases where it has first been stuffed into a cloth tube the cloth will interfere with the expansion of the cotton, so as to prevent its completely filling the crescent-shaped upper chamber of the rubber tire when the lower chamber of such tire is inflated.

1, Fig. 2, represents a sheet of raw cotton partially rolled upon itself with the long-staple carded lengthwise of the sheet and when fully rolled will assume the shape as shown at Fig. 1. When, therefore, it is inserted into the upper chamber 2 of the tire 3, (shown at Fig. 5,) it will readily fill the lower corners 2^a, where the diaphragm 4 connects with the interior wall of the tire, so that when the lower chamber 5 is inflated the outward pressure against said diaphragm will compress the roll of cotton and permit it to expand sufficient to completely fill these corners. If, however, the cotton be too closely confined, as when enveloped in a close wrapper or case, it cannot expand under the pressure of the air, so that a wrinkle will be formed in the wall of the tire at the junction of the diaphragm with such wall.

The rolled construction shown at Fig. 1 is admirably adapted to operate as a filler, not only in its ability to completely fill the crescent-shaped chamber of the tire when placed therein, as above described, but such rolled construction will offer much better protection against puncture than in any other form in which cotton can be used; but before it is placed in the mold for vulcanizing it is extremely delicate, and the slightest strain will elongate the rope or roll, and instead of having a uniform diameter throughout its whole length there will be places where the diameter is more or less reduced, so that when the tire is removed from the mold and inflated

soft spots will appear in the tire wherever the thin or narrow places occurred in the roll before vulcanizing.

To protect the roll of cotton against the 5 disturbing influences above described, the roll as soon as formed is covered with a knit web 6, Figs. 3, 6, and 7, which completely envelops its outer circumferential surface. This web is not knit firm enough to increase 10 the density of the roll, but simply to retain its original form intact, so that when rolled or folded up for transportation, as shown at Fig. 7, its original shape or size will not be altered. In fact, the loose open-mesh web- 15 bing will effectually prevent the elongation of the roll of cotton which it envelops, as such webbing will not give or stretch sufficient to separate the fibers of the cotton. When thus protected, the roll can be roughly handled 20 with perfect safety. Besides, this webbing will also protect the outer surface of the roll, so that it cannot be defaced or torn, which would also give bad result, for it is absolutely imperative that the roll should be ac- 25 curately and evenly placed in the mold in order to insure a perfect tire.

In Fig. 8 is shown a modified form of the filler, which consists of the two sheets 7 and 8, which are folded U shape and dovetailed 30 together. These sheets may be of sufficient length to extend entirely around the tire or they may be made in short lengths, as shown, in which case a second pair of sheets 7^a and 8^a will be lapped onto the others.

35 To permit the diaphragm 4 to expand or move in either direction and not draw on the sides of the tire, so as to distort such tire, I have provided the depression or corrugation 4^a on the under side of said diaphragm and 40 running circumferentially around the tire. This will give extra stock to draw from and not pull on the side walls of the tire.

In practice I hold myself at liberty to use the filler with or without the network.

45 Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a double - compartment pneumatic tire, of a non-puncturable filler or armor composed of an unbroken 50 sheet of cotton-wool, rolled upon itself so as to present a spiral appearance in cross-section, for the purpose set forth.

2. The combination, with a double - compartment pneumatic tire, of a non-puncturable 55 filling material or armor composed of an unbroken sheet of cotton adapted to extend entirely around the tire, said sheet rolled spirally in cross-section, a loose open network encircling said rolled construction so as to 60 protect the same from being damaged preparatory to the operation of vulcanizing, for the purpose set forth.

3. The combination, with a double - compartment pneumatic tire, of a filler or armor 65 composed of an unbroken sheet of long-staple cotton-wool carded so as to increase its density and tenacity, said sheet rolled spirally in cross-section, a loose open network encircling such rolled construction so as to 70 protect the same against damage preparatory to the process of vulcanizing, for the purpose set forth.

4. The combination, in a double-compartment pneumatic tire, one of said compart- 75 ments adapted to hold a non-puncturable filler or armor, the other adapted to hold compressed air and having a diaphragm separating such compartments, of a depression in said diaphragm adapted to increase the width of such 80 diaphragm when internal pressure is applied to said tire, as shown and for the purpose set forth.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 15th day 85 of July, A. D. 1899.

BENJAMIN F. TAYLOR.

Witnesses:

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HILDA ECKLER.