

No. 614,278.

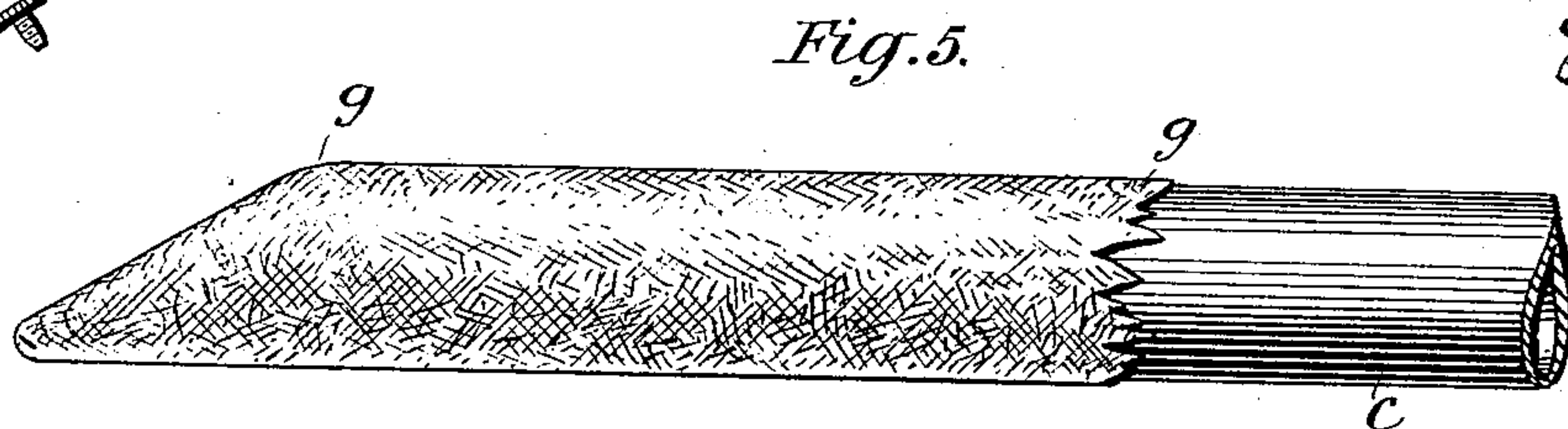
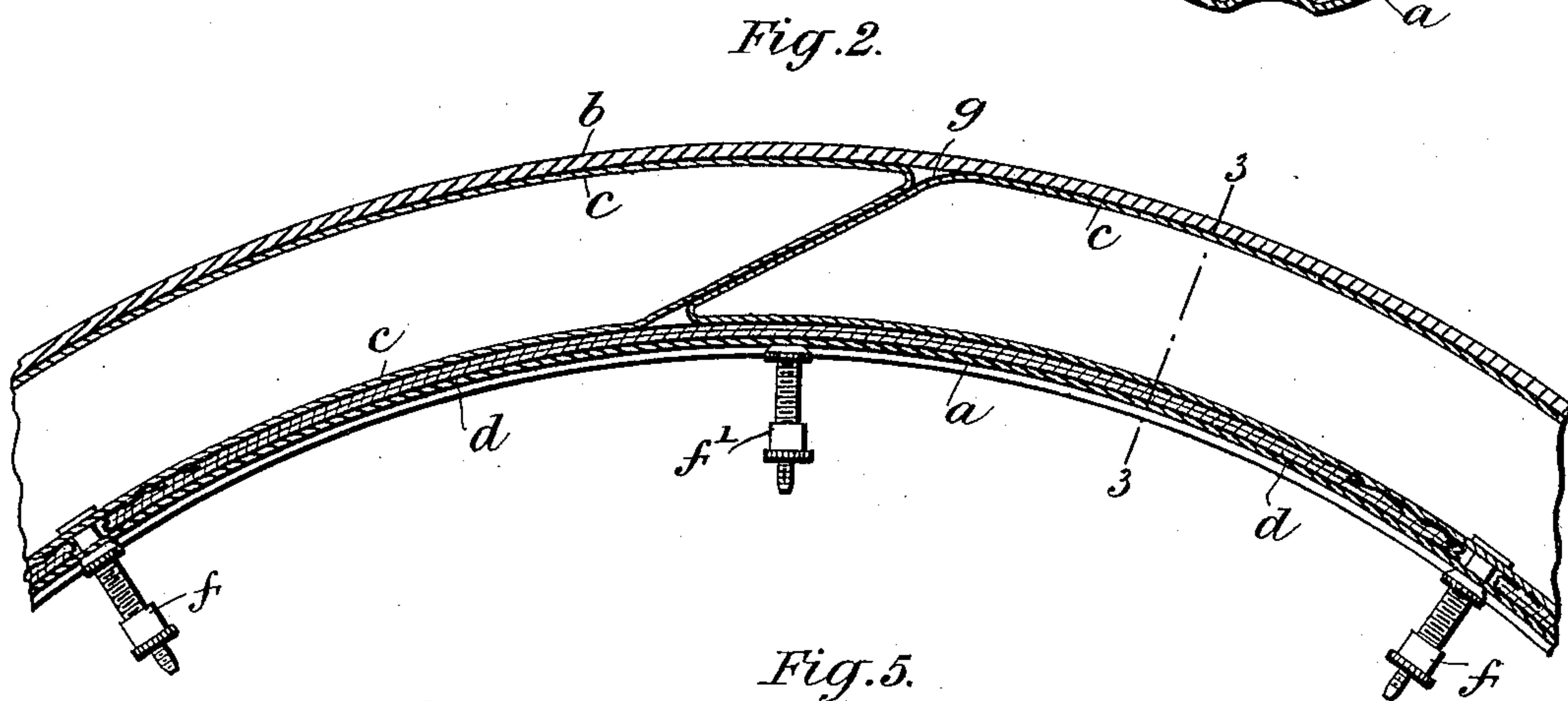
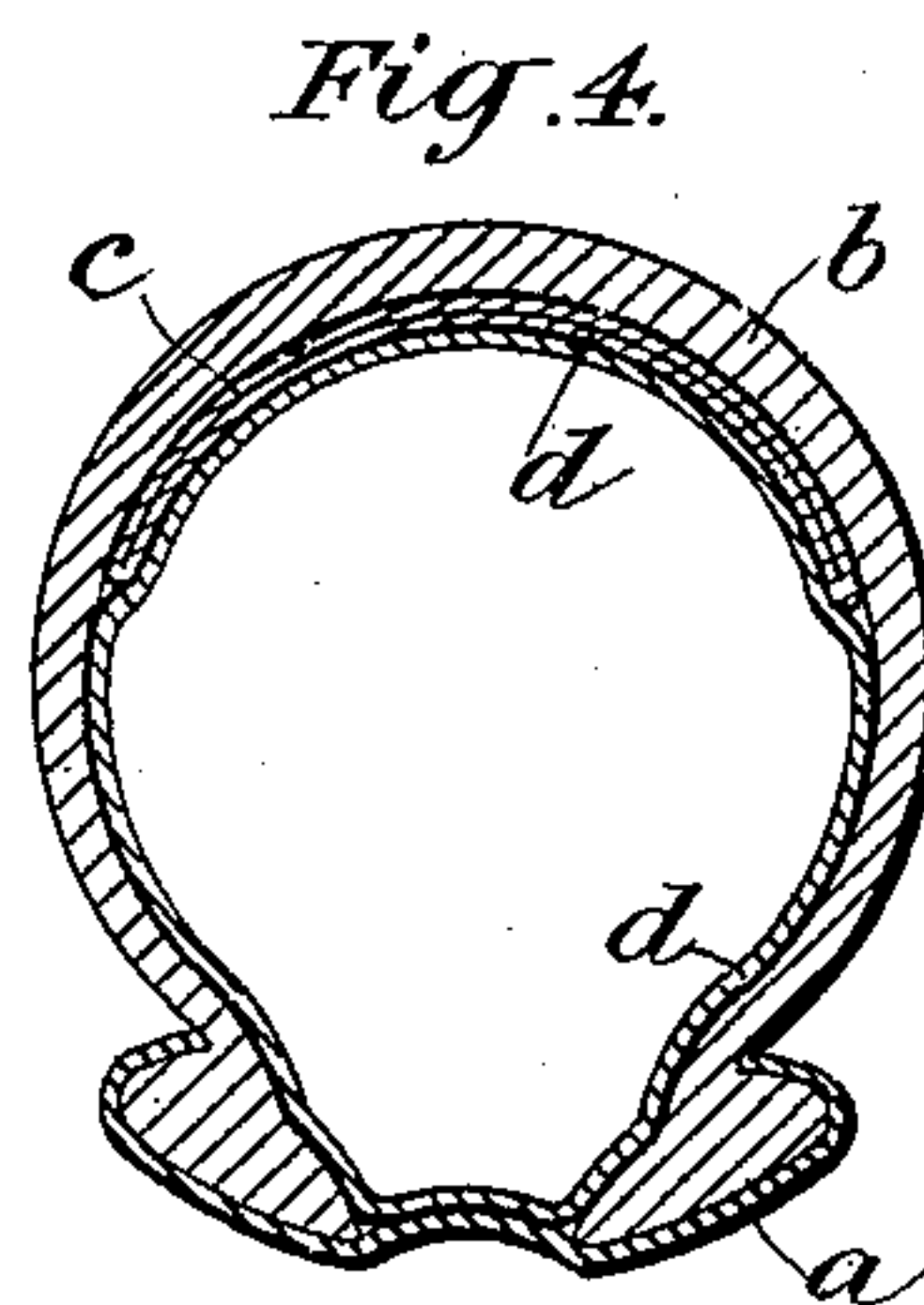
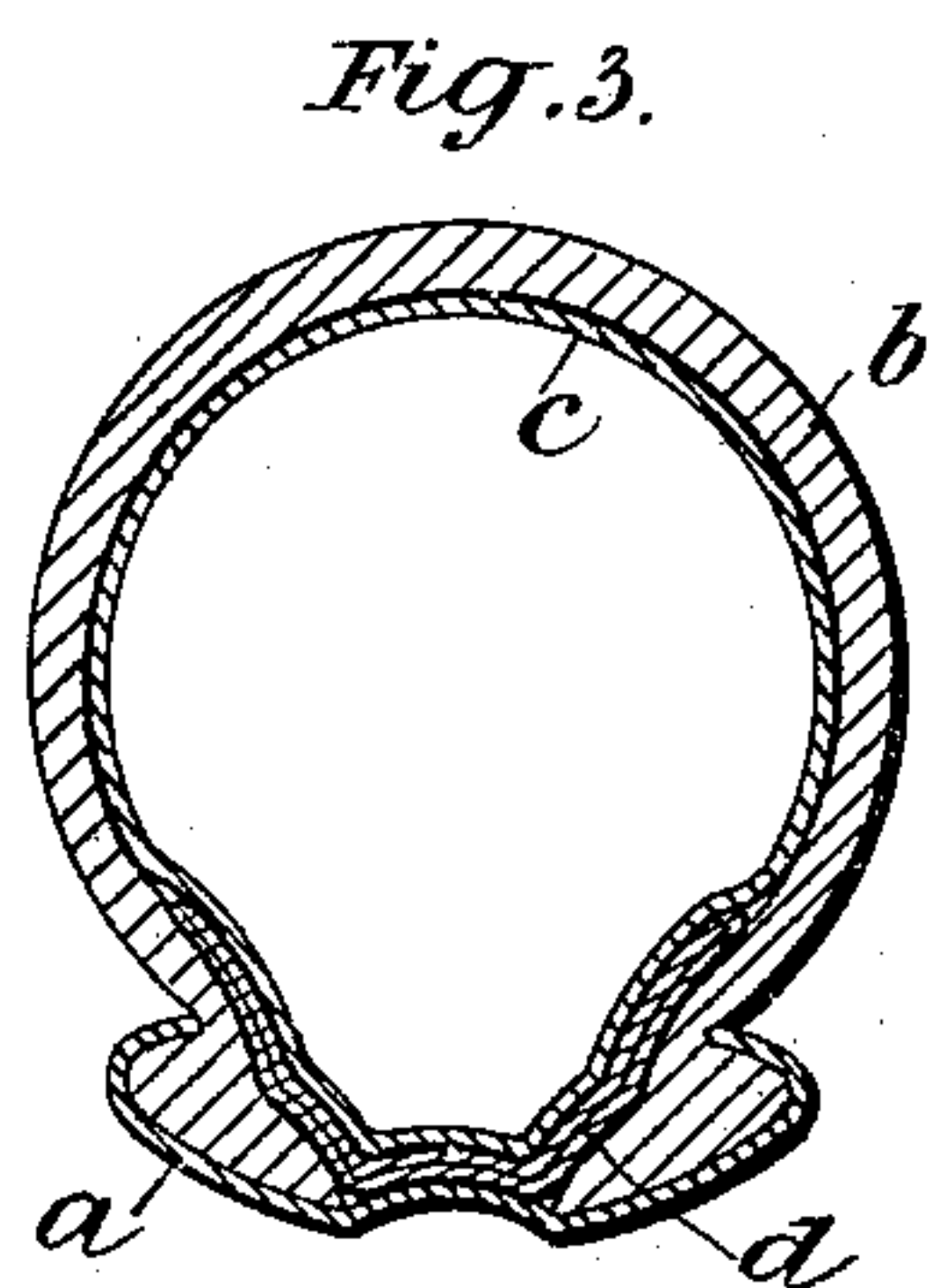
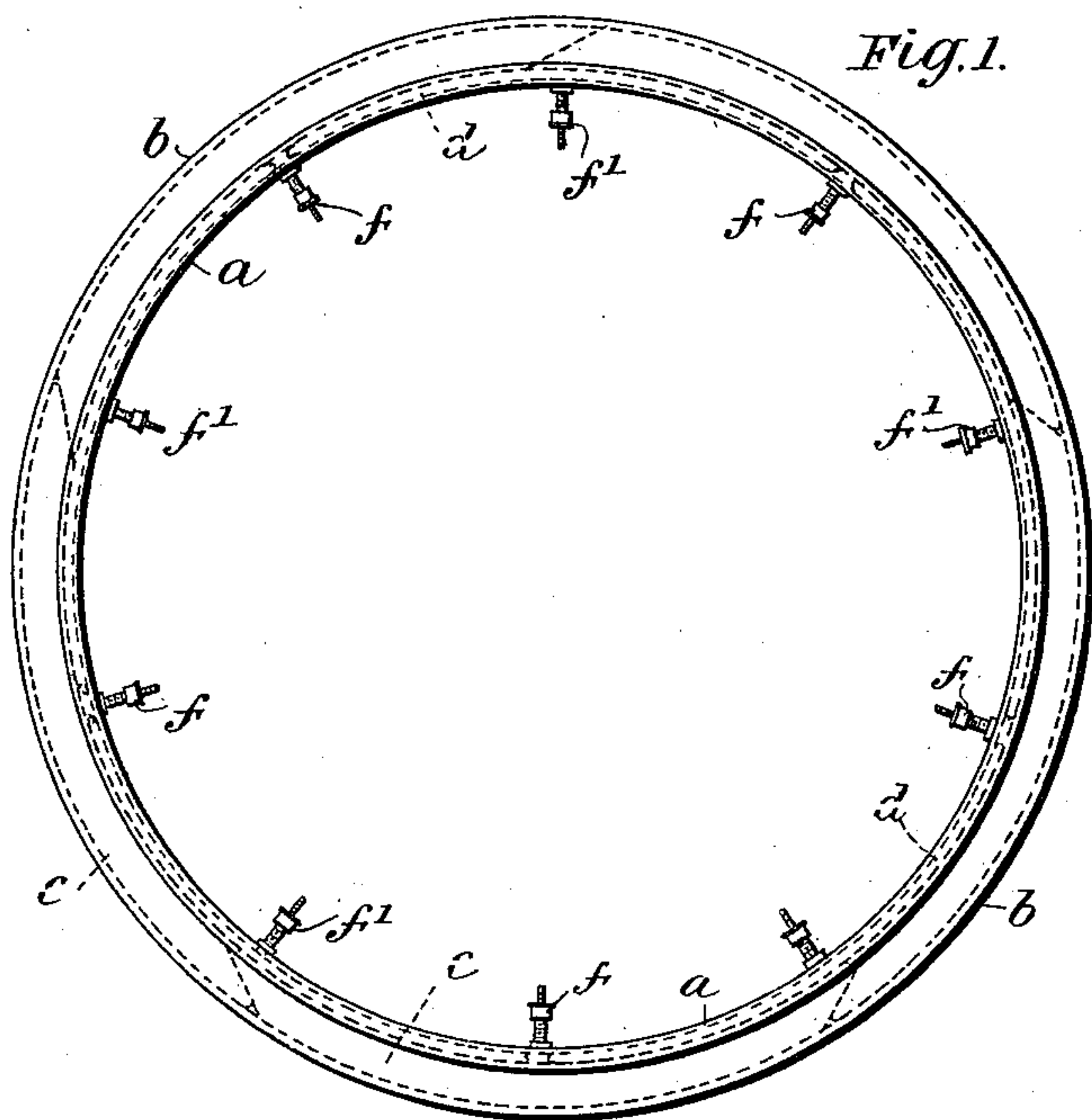
Patented Nov. 15, 1898.

J. H. G. SEALE.
PNEUMATIC TIRE.

(Application filed Dec. 29, 1897.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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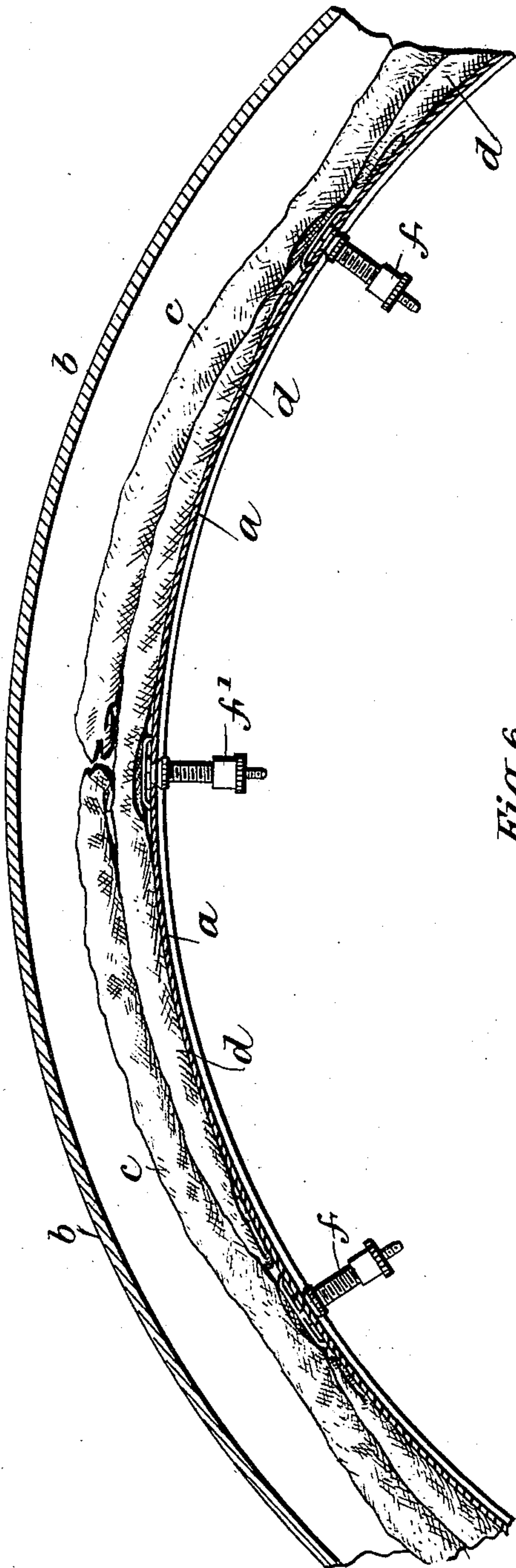


Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN HUGH GILBERT SEALE, OF LONDON, ENGLAND.

PNEUMATIC TIRE.

SPECIFICATION forming part of Letters Patent No. 614,278, dated November 15, 1898.

Application filed December 29, 1897. Serial No. 664,376. (No model.)

To all whom it may concern:

Be it known that I, JOHN HUGH GILBERT SEALE, gentleman, a subject of the Queen of Great Britain, residing at 14 Gloucester road, Peckham, London, England, have invented certain new and useful Improvements in or Relating to Pneumatic Tires, of which the following is a specification.

This invention has for its object improvements in or relating to pneumatic tires for the wheels of cycles or other vehicles.

According to my present invention I arrange and use a number of air-tubes within any suitable cover or wrapper or outer tube or envelop secured to or in position on the rim (which may be of any suitable shape or formation) in any suitable manner, such air-tubes being each very much shorter in length than the circumference of the wheel and arranged and adapted to overlap or break joint with one another, so as to form two complete systems of air-tubes around the rim, each such tube being provided with a separate and independent air-valve of any suitable character, such as those at present in common use, so that each such tube is adapted to be inflated independently of the other or others.

In carrying out my present invention I insert a sufficient number of these short tubes (which are each separately covered with a suitable fabric—such as cotton cloth, canvas, or silk—or otherwise protected or reinforced, such covering being advantageously of larger dimensions in diameter than the utmost extent to which the air-tubes will be inflated when the latter are in position on the rim and inflated under the outer cover or wrapper forming the tread of the tire, while the independent covering of each short tube is inextensible longitudinally—that is to say, each such bag or independent covering is formed of a material, such as cotton cloth or canvas or silk fabric, which will not be extensible beyond a certain point lengthwise—or same may be quite inextensible lengthwise, so as thereby to prevent the ends of said short tube being burst or blown off) to completely encircle the wheel in such wise that these tubes lie double (or even treble or more, if desired) all around the wheel. I now inflate certain of the tubes, advantageously the outside ring of

tubes, so as to form a complete series of air-cushions all around the rim, and when these inflated tubes are the outside ring of tubes the non-inflated inner ring of tubes are compressed between the inflated tubes and the rim, or vice versa where the inner ring of tubes or any of them is inflated. If now a puncture of one of the short inflated tubes takes place, it is only necessary to then inflate the spare short tube or tubes overlapping or underlapping the punctured tube, and the complete pneumatic tire is restored.

Referring to the accompanying drawings, Figure 1 is a side view of the rim of a wheel having my present improvements applied thereto, the short tubes being indicated in dotted lines. Fig. 2 is a local longitudinal sectional view on a greatly enlarged scale. Fig. 3 is a cross-sectional view on line 3 3, Fig. 2, but on a still larger scale, showing the outside tube inflated and the inside tube compressed between said inflated tube and the rim. Fig. 4 is a similar view to Fig. 3, only showing the outside tube deflated and the inside tube inflated, and the outer tube being thereby compressed between said inside tube and the detachable outer cover or wrapper *b*. Fig. 5 is a part view of one of the short tubes showing said tube in its bag or casing of inextensible material. Fig. 6 is a "local" longitudinal sectional view of a slightly-modified arrangement according to my present invention, the short tubes being shown deflated or partially so.

Similar letters of reference indicate corresponding parts throughout.

a is the rim, and *b* the detachable outer cover or wrapper, each being of any known or suitable construction and of any desired shape in cross-section, neither of same forming any part separately of my present invention.

c c is the outer system or outside ring of short tubes.

d d is the inside system or inside ring of short tubes.

f f' are the ordinary tire-valves, of any known or suitable construction, one such valve *f* being fitted in any suitable manner to each of the said outer short tubes *c* and one such valve *f'* to each of the inner short tubes *d*, respectively.

g is the bag or covering, of any suitable fabric, such as cotton cloth, &c., as aforesaid, each short tube *c* being arranged—for instance, by lacing—inside a separate and independent bag or covering *g*, as shown in Fig. 5, and similarly each short tube *d* is arranged within a separate and independent inextensible bag or covering *g*, so that the extent to which any short tube *c* (or any short tube *d*) can by inflation be distended longitudinally is limited by its said bag or covering *g*, while its extension diametrically is limited by the ordinary detachable outer covering or wrapper *b*, and thus the bursting of these short tubes by overpressure in any direction is prevented.

The ends of the short tubes *c c* (and similarly the ends of the short tubes *d d*) may be beveled off, so that said ends will overlap or overlies one another, as shown in Figs. 1, 2, and 5, or the ends of said tubes may be of any other desired form or shape. For instance, the adjoining ends may abut squarely, or the ends of said tubes may be formed as shown in Fig. 6.

On referring to Figs. 1, 2, and 6 it will be seen that two complete rings of tubes are arranged around the circumference of the wheel, these individual short tubes being of such a length that when inflated the ends of said tubes will either abut closely together or, if desired, overlap, as shown in the drawings, while if the outer ring of tubes *c* be inflated they compress the deflated inner ring of tubes *d* tightly against the rim *a*, as shown in Figs. 1, 2, and 3, while in the event of puncture or collapse of one of these outer tubes *c* by pumping air through the valves *f' f'* on each side of the valve *f* of said collapsed tube *c* the adjoining ends of said adjacent inner tubes *d d* are thereby inflated and completely fill the space formerly occupied by said collapsed tube *c*, which latter is thereby compressed by said inflated tubes *d* against the under side of the detachable outer cover or wrapper *b*, as shown in Fig. 4, or the whole of said inner ring of tubes *d* may be inflated, thus compressing the whole of said outer ring of tubes *c* between same and the under side of the wrapper *b*, as shown in Fig. 4.

In order to prevent or reduce the possibility of the inner tubes *d* being punctured or in-

jured by any sharp point which may enter and puncture the outer tubes *c* when the latter are the inflated tubes, I provide each of the outer tubes *c* in or on the under side thereof with a strip or lining of non-puncturable or puncture-resisting material, such as a strip of closely-woven silk fabric or other suitable material, and same being on the under side alone of said tubes *c* consequently will in no way interfere with the resilience of said tubes *c*.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, with the rim of a wheel and a detachable outer cover or wrapper adapted to be secured to said rim by the inflation of the tire, of an inner and an outer ring or series of short tubes, each of these two rings or series of tubes completely encircling the rim of the wheel, and a separate and independent valve for each such short tube, substantially as and for the purposes hereinbefore described.

2. The combination, with the rim of a wheel and a detachable outer cover or wrapper adapted to be secured to said rim by the inflation of the tire, of an inner and an outer series or ring of short tubes, each of these two rings or series of tubes completely encircling the rim of the wheel, a separate bag or covering over each separate short tube, said bag being formed of a material inextensible in the direction of its length, and a separate valve for each said tube, substantially as and for the purposes set forth.

3. The combination, with the rim of a wheel and a detachable outer cover or wrapper adapted to be secured to said rim by the inflation of the tire, of a series of short tubes arranged around the circumference of said rim, said short tubes overlapping one another around the wheel, so that a double system of tubes is formed entirely around the circumference of the wheel, and a separate valve for each said tube, substantially as and for the purposes set forth and illustrated in the drawings hereunto annexed.

JOHN HUGH GILBERT SEALE.

Witnesses:

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A. NUTTING.