

(No Model.)

J. S. DOUGHTY & E. Z. COLLINGS.
GUARD FOR BICYCLE TIRES.

No. 588,221.

Patented Aug. 17, 1897.

Fig. 1.

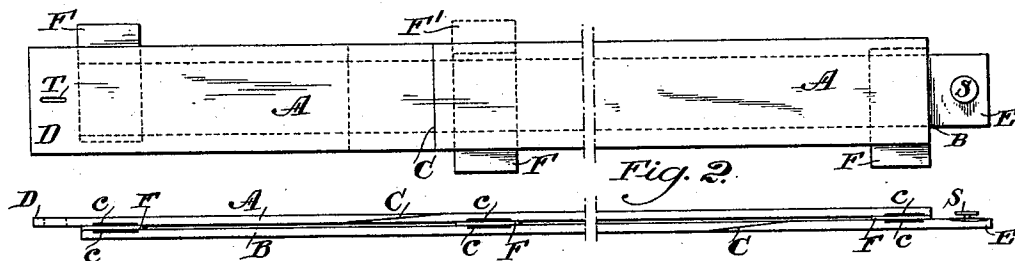


Fig. 2.



Fig. 3.

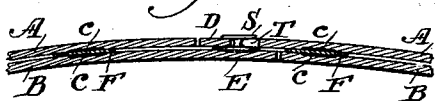


Fig. 4.

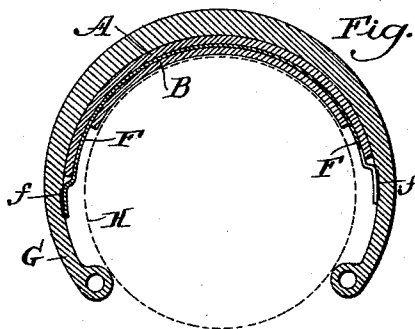


Fig. 6.

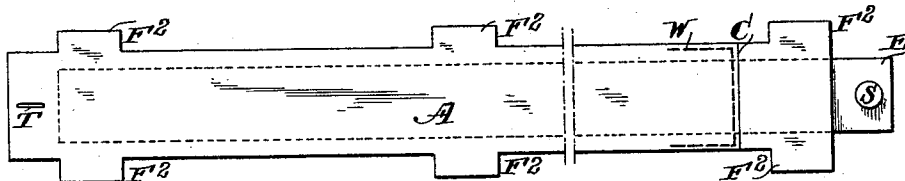


Fig. 5.



Fig. 7.

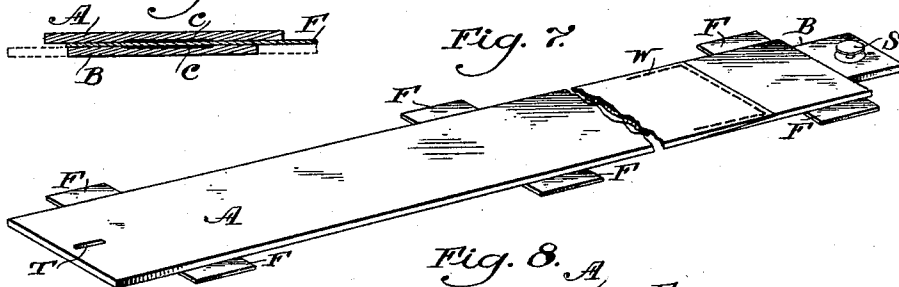


Fig. 8.



Witnesses.

Henry Doughty
E. Z. Collings

Inventors

J. S. Doughty and
E. Z. Collings
By *[Signature]*
Attorney.

UNITED STATES PATENT OFFICE.

JOHN S. DOUGHTY, OF HADDONFIELD, AND EDWARD Z. COLLINGS, OF
LAUREL SPRINGS, NEW JERSEY.

GUARD FOR BICYCLE-TIRES.

SPECIFICATION forming part of Letters Patent No. 588,221, dated August 17, 1897.

Application filed January 28, 1897. Serial No. 621,022. (No model.)

To all whom it may concern:

Be it known that we, JOHN S. DOUGHTY, of Haddonfield, and EDWARD Z. COLLINGS, of Laurel Springs, Camden county, New Jersey, have invented an Improvement in Guards for Bicycle-Tires, of which the following is a specification.

Our invention has reference to guards for bicycle-tires; and it consists of certain improvements, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

The object of our invention is to provide a suitable guard for bicycle-tires which shall prevent the ready puncturing of the pneumatic tube thereof by interposing between the inner pneumatic tube and outer cover of rubber a guard of tough material having great softness and flexibility and attached in a suitable manner in position and preferably to the inner surface of the outer tube.

By practical use we have found that when two strips of goatskin or its equivalent, such as deerskin, be interposed between the inner and outer tubes of a pneumatic bicycle-tire the resistance to puncturing is most satisfactory. The result of these tests show that when a sharp tack is forcibly driven through the outer rubber tube or shoe and into the first layer or strip of goatskin the action of the point upon the second strip is to press it into the soft pneumatic tube, which in turn becomes depressed under the action, and no actual penetration results. This is due to the fact that goatskin is exceedingly tough as to penetration and, secondly, is so soft and pliable that it readily bends and sinks in under the pressure of the point, pushing before it the soft rubber of the inner tube. Ordinarily the tack cannot penetrate the first layer or strip of goatskin because of its density and toughness, and the penetration of the pneumatic tube is fully guarded against by the use of the second strip, as aforesaid.

More particularly our invention comprehends in its preferred form a compound strip or band constituting the guard and composed, essentially, of one or more long flat strips of tough, soft, and flexible material—such as goatskin, kid, or deerskin—having its sec-

tions united by skived joints, to which is secured textile material transverse strips, such as woven fabric or felt, and arranged in a manner that it projects or extends beyond the lateral edges of one or both of the strips of tough material to form soft attaching extensions or parts by which the guard may be secured at intervals by cement to the tire.

In practice we prefer to employ two layers of tough material, one of which is wider than the other to prevent a ridge, combined with interposed transverse strips or layers of textile material. The guard formed in this manner is bent into a circle and the ends united by means of a button of rubber and fitted within the under side of the outer tube, as aforesaid.

Our invention will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a plan view of our improved tire-guard. Fig. 2 is a side elevation of same. Fig. 3 is a side sectional elevation of the buttoned ends. Fig. 4 is a cross-section through a tire, showing method of attaching our improved guard. Fig. 5 is a cross-section of the guard on line *xx* of Fig. 1. Fig. 6 is a plan view of a modification of our improved guard. Fig. 7 is a perspective view of another modification of our invention, and Fig. 8 is a cross-section of another modified form of our improved guard.

A and B are two long strips of tough material having a soft and flexible character, which is best answered by goatskin. Kid or deer skin may be employed in lieu of goatskin.

As it is impossible to obtain strips sufficiently long in one integral piece to go all the way around the tire, we make up a strip of short sections by skiving their edges, as at C, and uniting them by cement or by sewing, as at W, the joint being of the same thickness and resistance as at all other parts, so as not to form ridges. We prefer also that the skived joints in the two superimposed strips shall not come above each other to enable the elasticity to be maintained more uniform. These two strips A and B are so superimposed that the ends of one preferably projects beyond the other, as clearly shown

at D and E. Interposed between these two strips at intervals are transverse strips or pieces of textile fabric F, which are of shorter length and greater width than the strips A and B, so that the lateral edge or edges thereof shall project or extend beyond the side edges of the strips A and B, as indicated at F and F'. These strips or pieces of textile fabric or material are cemented or otherwise secured at c to one or both strips A B, so that the two strips A B and transverse fabric strips or pieces shall be firmly yet flexibly secured together.

It is preferable that the fabric strips or pieces F be formed on the bias to enable them to fit better to the double curvature of the tire. This is especially important when the strips are made of great area or width in the length of the strips A B. By employing a pliable rubber cement the parts may be perfectly secured or attached together without interfering with the softness and flexibility of the guard.

In view of the fact that the guard is to be bent into a loop or circle it is desirable, though not essential, that the inner strip B shall be slightly shorter than the outer layer, which may be secured in the making of the guard by excessively stretching the strip A when cementing the parts. By taking this precaution the smaller diameter of the inner layer or strip B will not cause the guard to crease or crinkle. We prefer to form the outer strip A of greater width than the inner strip B, as shown, so that when bent into the curved position, Fig. 4, the lateral edges will not form so abrupt a shoulder as would occur if the width of said strips A and B were of the same width. This also secures better economy in the cost of manufacture, since it takes less leather.

If desired, the pieces of fabric F may only be cemented to the inner strip B intermediate of its ends, because when the lateral edges F are cemented to the inner surface of the outer tubes G at f, Fig. 4, they confine between such points the outer strip A and hold it in position.

The dotted circle H in Fig. 4 represents the inner or pneumatic tube of the tire and that for which the protection against puncturing is required.

It is further evident that the strip B may be dispensed with, if preferred, to reduce the thickness where less liability to puncturing exists, in which case the pieces F will be attached only to the strip A at one or more places, and if carefully applied the strip A may be attached in place by the textile strip while securing the latter to the inside of the outer tube, as at f, without the necessity of cementing the parts F and A together at all. For commercial purposes, however, it will be found most expedient to unite these parts before being applied to the tire. By using only a small amount of cement and at intervals the best results will be secured.

When the guard is bent into a loop or circle,

the ends D and E are lapped and buttoned together, as shown at S T in Fig. 3. We prefer to use a rubber button S, which we cement upon the face of the end E of strip B and form the buttonhole T in the end D of strip A, as the rubber button is soft and flexible and does not objectionably increase the thickness. It enables the guard to be easily applied and fitted to the tire. By cutting off more or less of the ends D E the diameter of the finished guard may be varied to make a good fit within the tire.

In place of using a strip F of textile fabric or material, as shown in Figs. 1 and 2, we may provide the outer strip A with lateral projections F² for attachment to the tire, as in Fig. 6. The lateral free edges F² are adapted to be cemented to the outer tube, as above described, and may be upon the strip A. The manner of applying the textile material F (shown in Figs. 1 and 2) may be equally applicable whether the strips A and B both be used or only one employed.

In Fig. 7 we have shown a single strip A with textile-fabric strips F cemented to it, and said strips projecting beyond either edge, if desired.

We do not confine ourselves to any particular textile fabric or material, as it may be woven or felted, but it should be soft and pliable.

If desired, the textile-fabric parts F may extend all the way across the strip A and project at either side, as shown in Fig. 1 at F', or in Fig. 7, or the several strips may project alternately from opposite side edges, as indicated in Fig. 1.

It is evident that the strip B may be of greater width than strip A, if so desired, as indicated in dotted lines in Fig. 5, but preferably it is of less width, as hereinbefore explained.

While the textile fabric is most advantageous as a means for attaching the goatskin strips to the outer tube, it is to be understood that said fabric may be dispensed with and the goatskin strip attached by flexible cement directly to the outer tube of the tire.

In place of interposing the pieces of flexible fabric F between the strips A and B they may be secured to the outside thereof, as shown in Fig. 8.

By employing a soft goatskin as the strip or strips of tough material great pliability is secured, together with resisting qualities to puncturing. By employing such material or its equivalent the strips may be of uniform thickness, and hence have flexibility and thus avoid in any way interfering with the constantly-changing shape of the tire in use due to its flattening at the tread.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. As a new article of manufacture a non-puncturable guard for a bicycle-tire consisting of two superimposed continuous strips of

soft pliable leather of uniform thickness such as goatskin each of a length corresponding to the circumference of the tire and fastened together the outer of which strips is considerably wider than the inner strip whereby it overlaps the side edges of the latter when in operative position, in combination with short transversely - arranged retaining fabric - attaching portions secured to the leather strips and part of which extend laterally to one side and part to the other side beyond the lateral edges of the leather strips for cementing to the inner surface of the outer tube or shoe of the tire, whereby the guard is attached at intervals only throughout the circumference of the tire.

2. As a new article of manufacture a non-puncturable guard for a bicycle-tire consisting of the combination of two long continu-

ous strips of goatskin of substantially uniform thickness throughout and each formed of two or more pieces of skin united end to end by skived joints, with textile-fabric pieces of short length secured intermediate of said strips at intervals in their length and having portions projecting beyond the lateral edges of the strip which comes adjacent to the inner surface of the outer tube or shoe of the tire whereby the guard is connected with the said tire only at intervals throughout its circumference.

In testimony of which invention we hereunto set our hands.

JOHN S. DOUGHTY.
E. Z. COLLINGS.

Witnesses:

R. M. HUNTER,
J. W. KENWORTHY.