(No Model.)

A. L. SMITH.

PUNCTURE PROOF PNEUMATIC TIRE.

No. 563,691. Patented July 7, 1896.

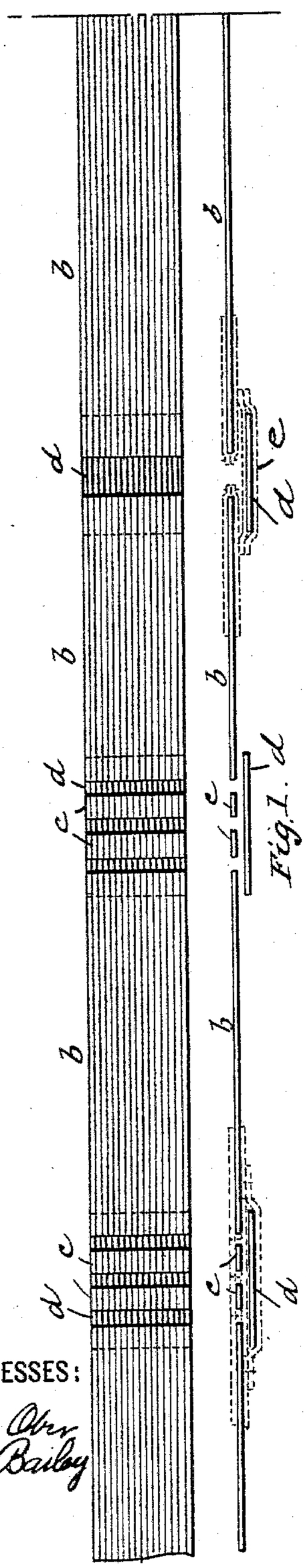

Fig. 1.

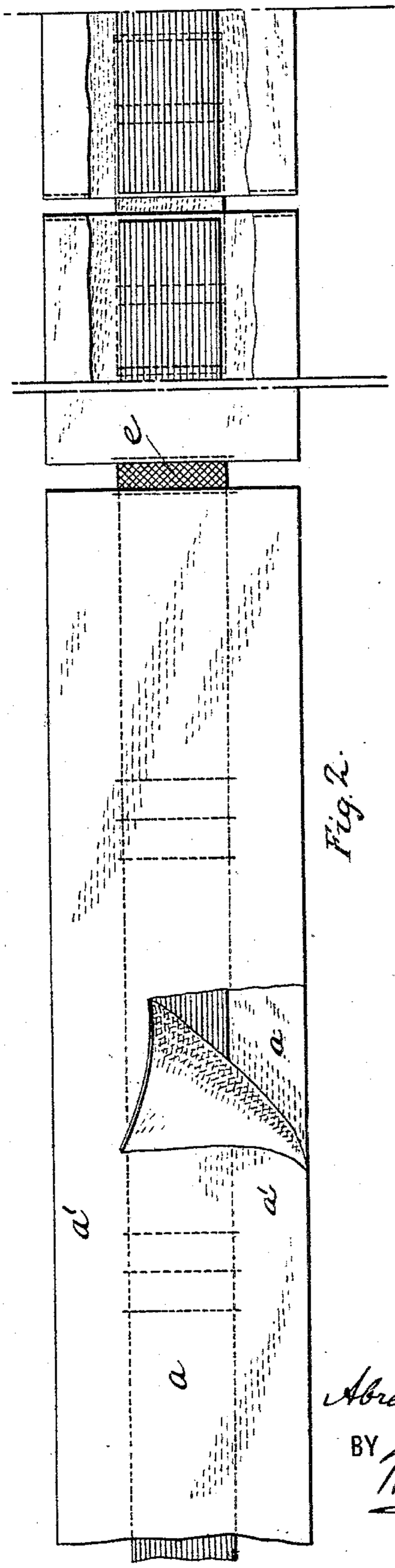

Fig. 2.

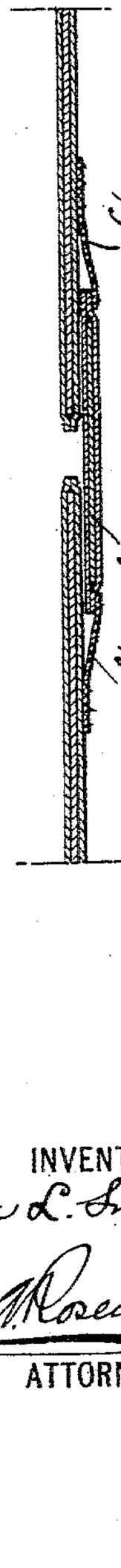

Fig. 3.

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PUNCTURE-PROOF PNEUMATIC TIRE.

SPECIFICATION forming part of Letters Patent No. 563,691, dated July 7, 1896.

Application filed February 18, 1896. Serial No. 579,751. (No model.)

To all whom it may concern:

Be it known that I, ABRAM L. SMITH, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Puncture-Proof Pneumatic Tires, of which the following is a full, clear, and exact description.

This invention relates to devices for preventing the puncturing of the inflated chamber of a pneumatic wheel-tire by sharp bodies, such as tacks, bits of glass, &c., with which a wheel may come in contact upon the road.

The object of the invention is to provide a cheap, effective, and easily-applied device adapted to be inserted either inside or outside of the wheel-tire.

The invention consists of a puncture-proof strip built up of a series of plates of various sizes and located in a suitable sheathing or envelop of flexible material in such a manner that the strip will be resilient and responsive to compressions to which a wheel-tire is ordinarily subjected, and provided with means whereby it may accommodate itself to different lengths of tires, or to variations in length due to the degree of inflation of the tire.

In the accompanying drawings, Figure 1 is a plan of a number of metallic strips, showing the relative positions they occupy in the flexible envelop. Fig. 2 is a plan of a section of the strip, showing elastic sections. Fig. 3 is a longitudinal section through one of the elastic joints.

The major part of the strip is made up of two pieces of cloth sewed together along certain lines in order to form pockets, and in these pockets are placed metallic plates to form the armor preventing the puncturing of the tire.

Referring to the drawings by letter, *a* and *a* represent the two layers of cloth or flexible material of which the envelop is made. Between them is placed a series of metallic plates *b* in line with each other and with their ends located a short distance apart. In the spaces between the ends of these plates one or more comparatively small plates *c* are located. The two layers of cloth are then stitched together, the lines of the stitching passing close to and around all of the edges of the several plates. This forms a number of pockets, each of which contains a metallic plate. Underneath each of the spaces in which are located the plates *c* I place an overlapping plate *d*, which extends across the entire space, overlapping the ends of plates *b*. The plates *d* are inclosed in a separate small envelop of cloth, the edges of which are sewed to the main envelop. The strip thus completed forms a very flexible puncture-proof structure. By using two or three of the plates *c* in the space between plates *b* a very flexible joint is obtained, and this joint is effectually protected against puncture by the plate *d*. In order to make this strip fit various sizes of tires, or to provide for inequalities in the construction, &c., I propose to insert in the strip at one or more points a section *e* of doubled elastic material, such as elastic webbing, the edges of which are sewed to the respective separated ends of the strip. To prevent puncturing these elastic sections, I place inside of them a metallic plate *d*.

As a modification of the means for enabling the strip to lengthen I may inclose a metallic plate *f* in a small separate envelop and sew to its ends short sections *f' f'* of elastic webbing, and then sew the extremities of the elastic webbing to the main flexible envelop at points each side of any joint or point in the main strip where two plates *b* come together. It is understood, of course, that wherever these elastic sections are inserted the main envelop is severed, and in the arrangement last above described the plate *f* bridges the severed ends, and their movements toward and away from each other are permitted by the elasticity of the two sections *f' f'*.

The puncture-proof portion of the strip extends, as will be observed, through the center, leaving the side flaps *a'*, which may be cemented to the tire, to hold the strip in place. These side strips are, however, not essential to the invention.

While I have described the various pockets in the strip as being formed by stitching,

it is to be understood that cement, or any other means of securing the cloth together, may be adopted.

Having thus described my invention, I claim—

1. A puncture-proof strip for pneumatic tires consisting of a flexible envelop divided into long and short pockets located in line with each other, metallic plates located in and fitting said pockets, the shorter plates being inserted between the separated ends of the longer plates, and a bridging-plate overlapping the adjacent ends of the longer plates, and backing up the shorter ones, substantially as described.

2. A puncture-proof strip for pneumatic tires severed at one or more points and having an elastic section inserted between the severed ends, in combination with a backing plate of puncture-proof material bridging the elastic section.

3. A puncture-proof strip for pneumatic tires having its ends bridged by a short puncture-proof strip said short strip being connected with the ends of the main strip through elastic sections, as set forth.

In testimony whereof I subscribe my signature in presence of two witnesses.

ABRAM L. SMITH.

Witnesses:

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