No. 829,009. PATENTED AUG. 21, 1906.

G. HELPS.

ELASTIC CHAIN.

APPLICATION FILED MAY 22, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

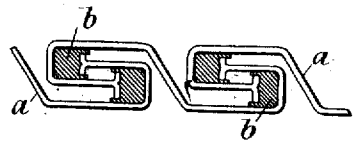


Fig. 2.

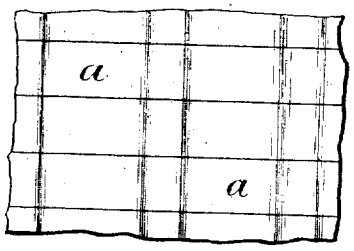


Fig. 3.

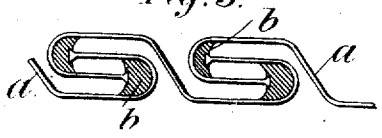


Fig. 4.

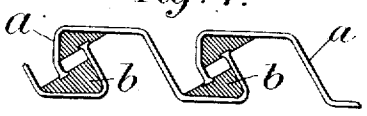


Fig. 5.

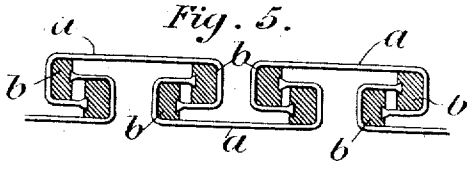
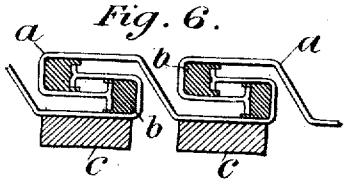


Fig. 6.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 7.

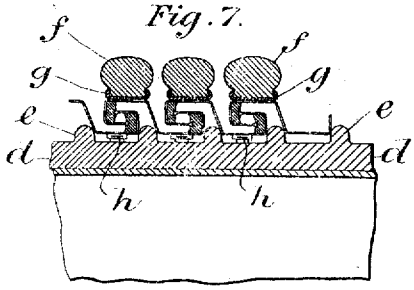


Fig. 8.

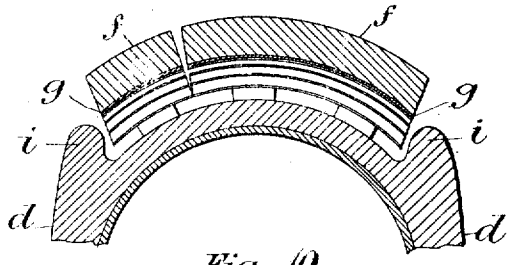


Fig. 9.

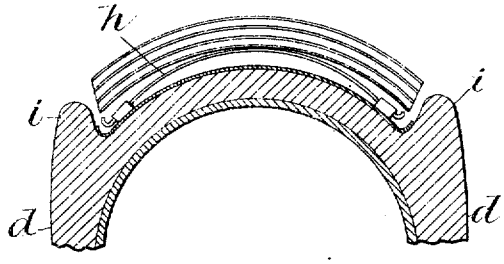


Fig. 10.

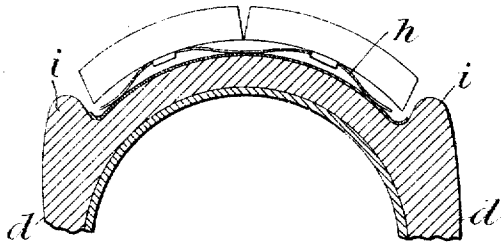


Fig. 12.

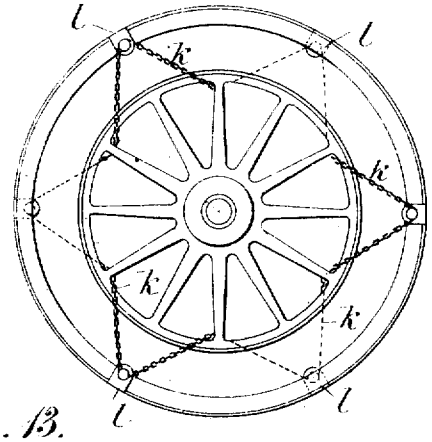


Fig. 11.

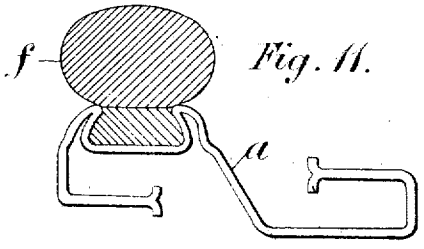
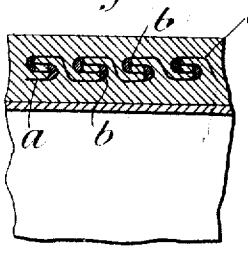


Fig. 13.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE HELPS, OF NUNEATON, ENGLAND.

ELASTIC CHAIN.

No. 829,000. Specification of Letters Patent. Patented Aug. 21, 1906.

Application filed May 22, 1905. Serial No. 261,689.

To all whom it may concern:

Be it known that I, GEORGE HELPS, civil engineer, a subject of the King of Great Britain, residing at Nuneaton, in the county of Warwick, England, have invented a certain new and useful Elastic Chain, of which the following is a specification.

The object of this invention is to provide an elastic chain which may be used as a band or belt for conveying power and also as a protective cover for pneumatic tires and for other purposes.

I form my chain of a series of transverse interlocking links with pads of elastic material inserted between the links—that is to say, instead of the edge of any link touching the inside of a bend in the next link in the chain it abuts against a pad situated in that bend.

The details of the chain may vary within wide limits; but in the embodiment of my invention, which is illustrated in the drawings, the chain is composed of a series of flat links, preferably **S**-shaped and formed of metal, such as steel, with pads of india-rubber between, though the links may be of varied cross-section and the pads may be made of other material than india-rubber and may be replaced by springs.

The chain may be used as a driving-belt, strips of leather or other material being secured to the links. It also makes a very efficient protection for pneumatic tires, being either secured to the outside or inside of the ordinary pneumatic-tube cover or embedded in the same.

In the drawings, Figure 1 is a side view, and Fig. 2 a plan, of a portion of such a chain formed of flat **S**-links. Figs. 3 and 4 are views similar to Fig. 1, but with modified forms of links. Fig. 5 is a side view of a part of a chain formed of **C**-links. Fig. 6 shows part of a chain with strips of material secured to the links to fit it for use as a driving-belt. Fig. 7 is a longitudinal, and Fig. 8 a transverse, section of part of a tire made according to this invention. Figs. 9 and 10 are views of modifications similar to Fig. 8. Fig. 11 is a view of a modified form of link with an outer tread carried by it. Fig. 12 is a side view of a wheel, showing a method of securing the chain thereto; and Fig. 13 is a section of a tire-cover with a chain embedded in it.

In Figs. 1 to 4, *a* represents flat links of a general **S** shape, interlocking with one another and having pads *b* of resilient material interposed between the end or edge of one link and the bend of the next link with which it engages, so that as the string of links is put into tension the rubber pads are put into compression, and thus the elasticity of a few links is considerable.

In Fig. 5 the links are shown of **C** shape, and each may be regarded as half of one of the links shown in Fig. 1, two links and four pads going to comprise a unit instead of one link and two pads, as before. When it is desired to use such a chain in connection with pulleys to transmit power, pads *c*, of leather or other suitable material, may be secured to the links, as shown in Fig. 6.

In Figs. 7 and 8 *d* is the rubber cover of a pneumatic tube. This may have beads *e* formed upon it to project between the links and prevent creeping of the chain. The links are preferably arranged at right angles to the central plane of the wheel, but may be inclined thereto. The links may also be provided with rubber or other treads *f*, which may be studded, if desired. These may be carried by special troughs formed in the links, as shown in Fig. 11, or by separate troughs *g*, secured to the links, as in Fig. 8. To give greater flexibility, the links, in place of stretching right across the tire, may be made in two or more lengths, as seen in Fig. 8, in which case interlocking links should be arranged to break joint. The links may, if desired, be mounted on springs *h*.

Sidewise movement of the links is prevented by beads *i* at the sides of the covers *d*, and the chain may be further secured by a cord or chain *k*, passed through eyes *l* on the ends of some of the links.

Instead of arranging the chain outside the cover *d* it may be embedded in it, as shown in Fig. 13.

What I claim is—

1. The combination of a series of interlocking **S**-shaped links and a series of resilient pads interposed between the links substantially as described.

2. In a tire the combination with an elastic cover of a series of interlocking links and a series of resilient pads interposed between the links substantially as described.

3. In a tire the combination with an elastic cover of a series of interlocking links, a series of resilient pads interposed between the links, and a series of treads carried by the links substantially as described.

4. In a tire the combination with an elastic cover of a series of interlocking links, a series

of resilient pads interposed between the links, and a series of beads on the cover projecting up between the links substantially as described.

5. In a tire the combination with an elastic cover of a series of interlocking links, a series of resilient pads interposed between the links, a series of beads on the cover projecting up between the links, and a series of treads carried by the links substantially as described.

6. In a tire the combination with an elastic cover of a series of interlocking links, a series of resilient pads interposed between the links and means for preventing lateral movement of the links substantially as described.

7. In a tire the combination with an elastic cover of a series of interlocking links, a series of resilient pads interposed between the links, a series of treads carried by the links, and means for preventing lateral movement of the links substantially as described.

8. In a tire the combination with an elastic cover of a series of interlocking links, a series of resilient pads interposed between the links, a series of beads on the cover projecting up between the links and means for preventing lateral movement of the links substantially as described.

9. In a tire the combination with an elastic cover of a series of interlocking links, a series of resilient pads interposed between the links, and means for preventing lateral movement of the links substantially as described.

GEORGE HELPS.

Witnesses:
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A. NUTTING.