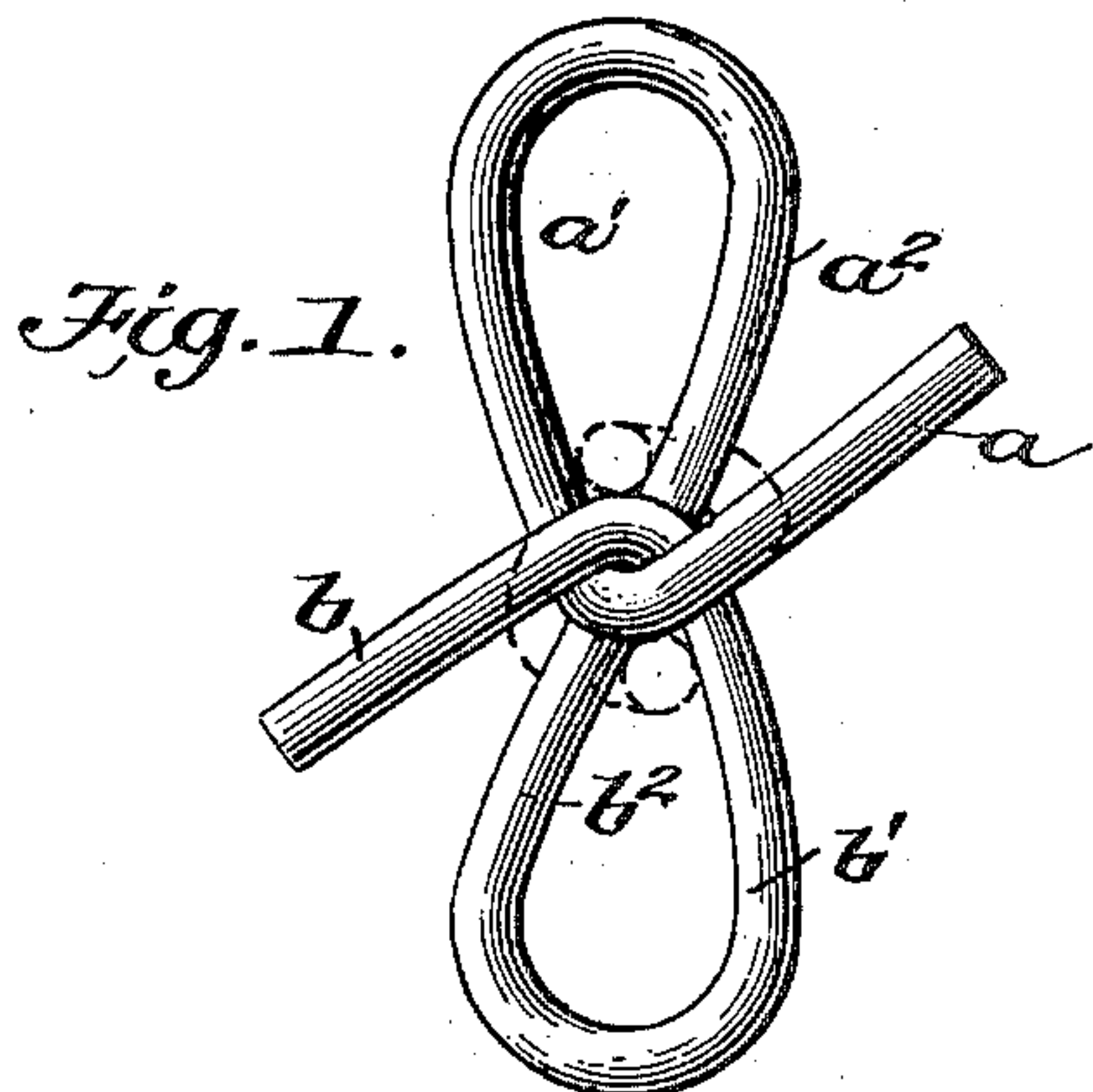


(No Model.)

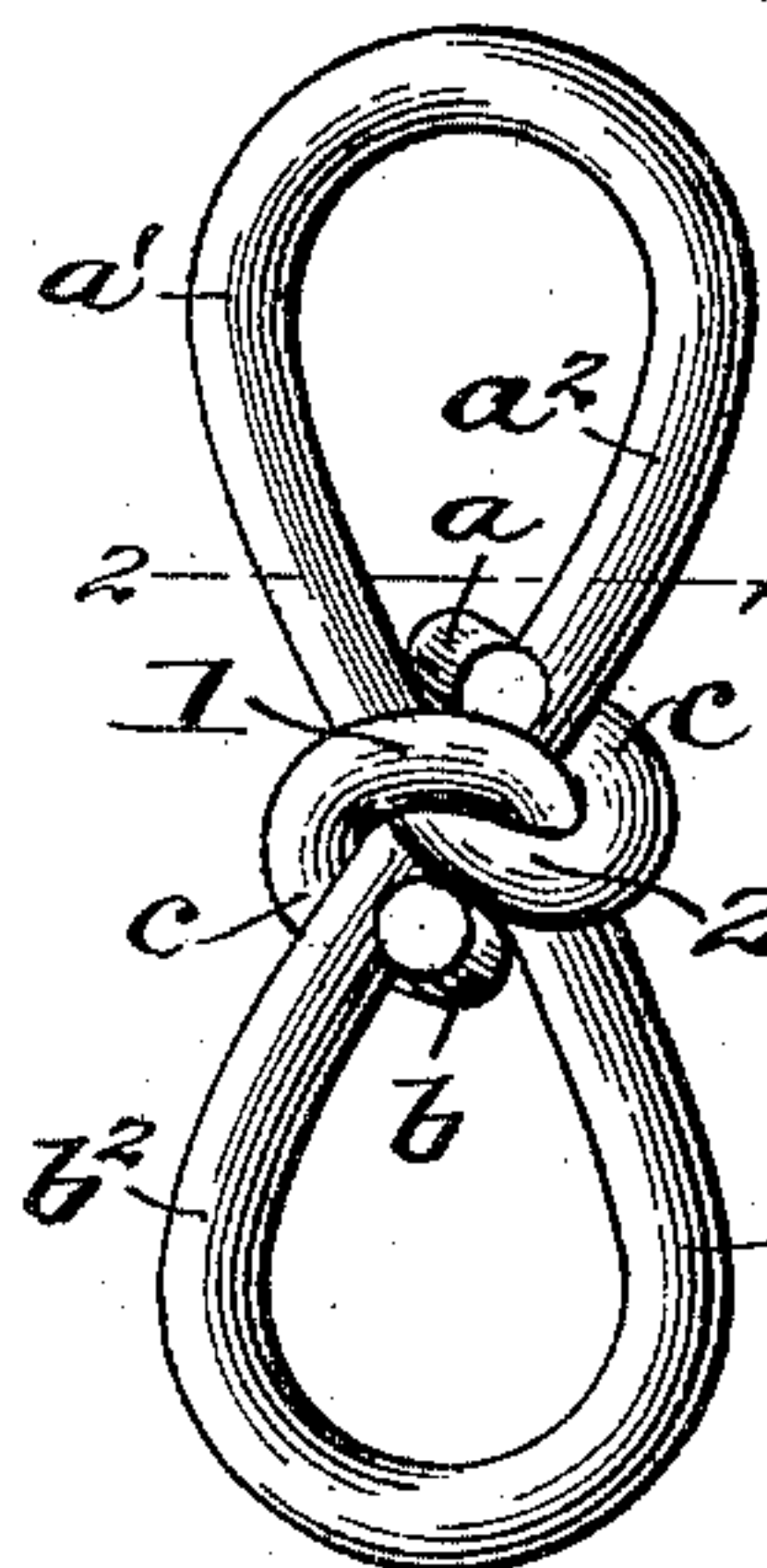
W. H. GRIFFITH.  
CHAIN LINK.

No. 599,232.

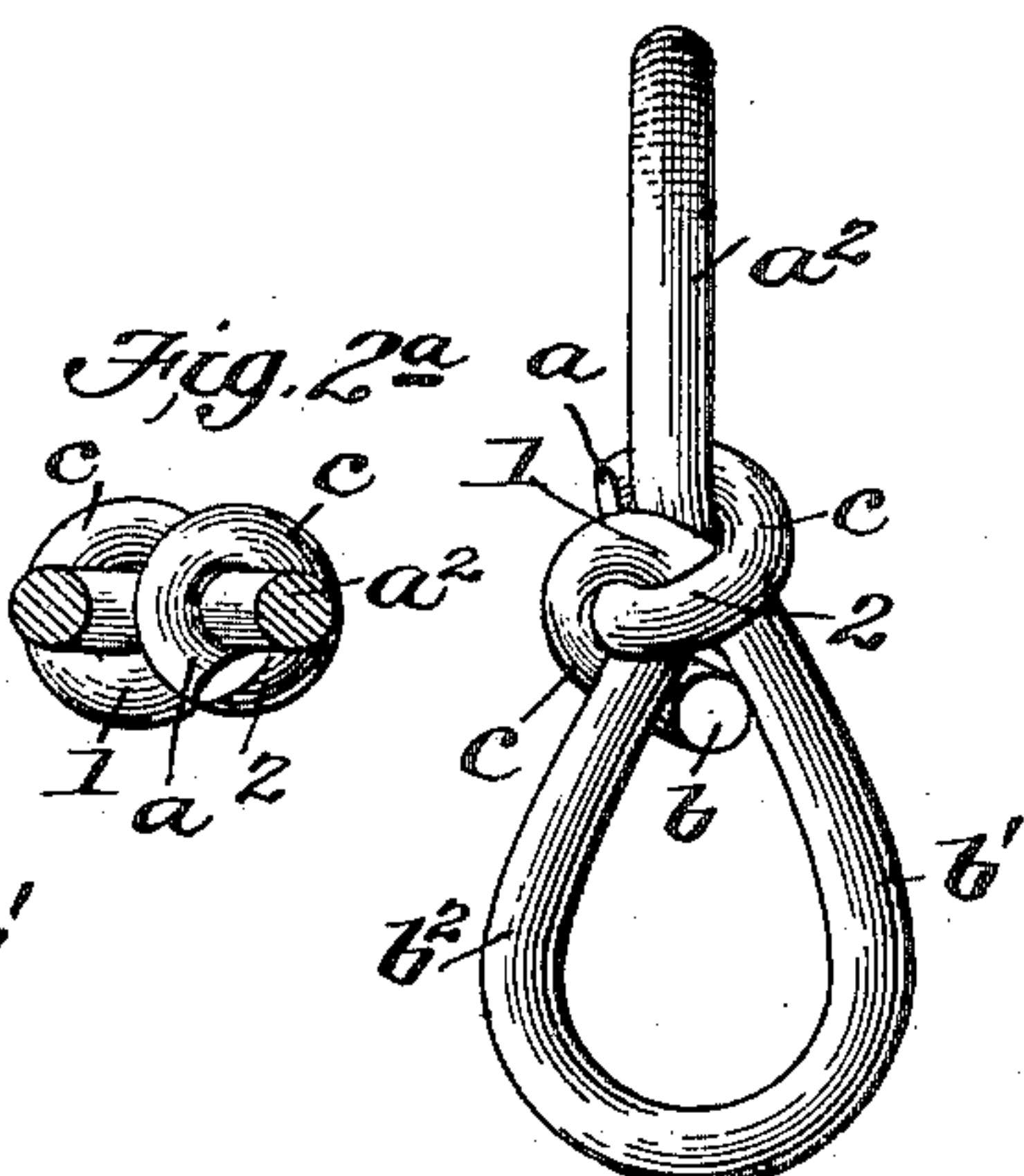
Patented Feb. 15, 1898.



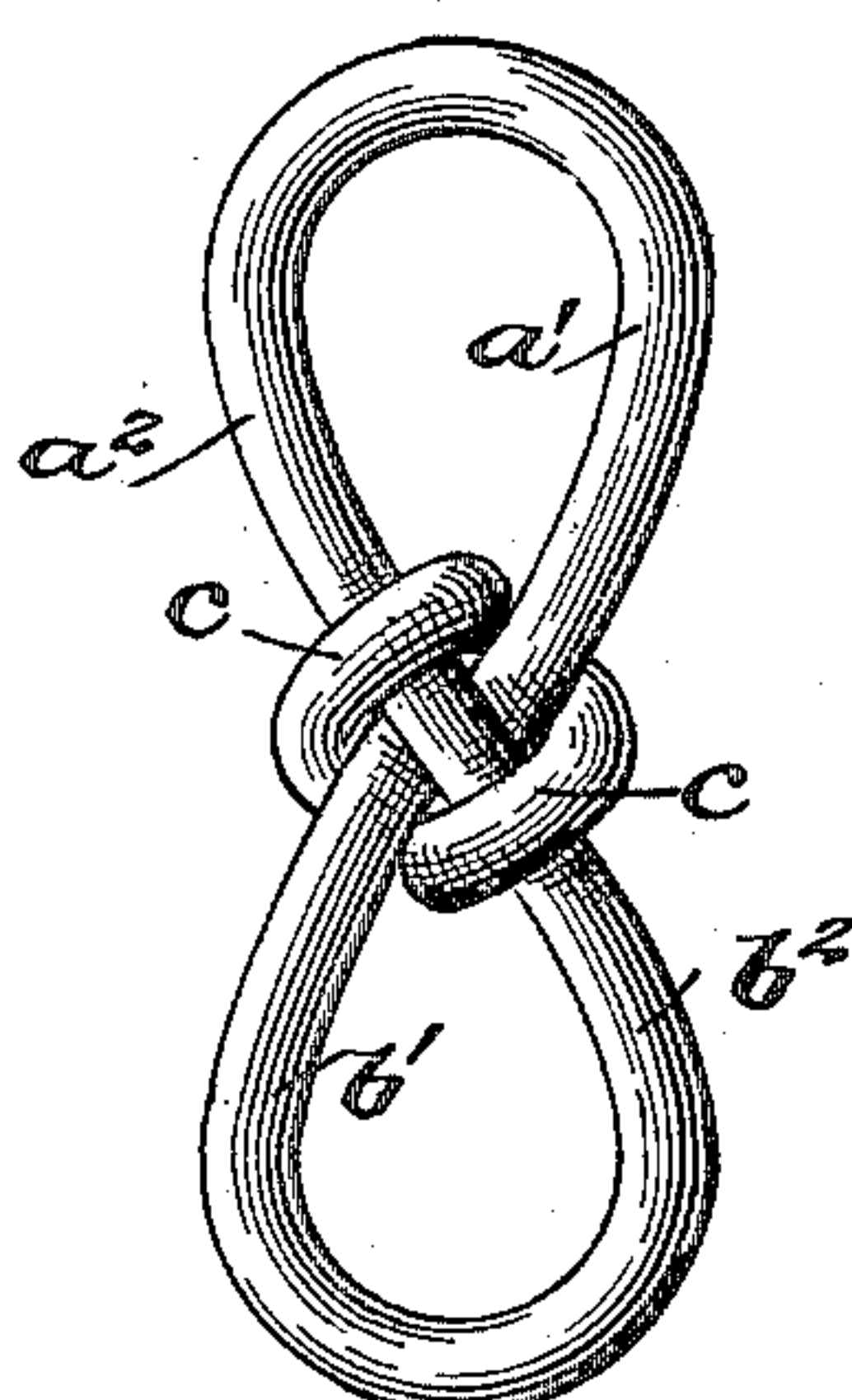
*Fig. 2.*



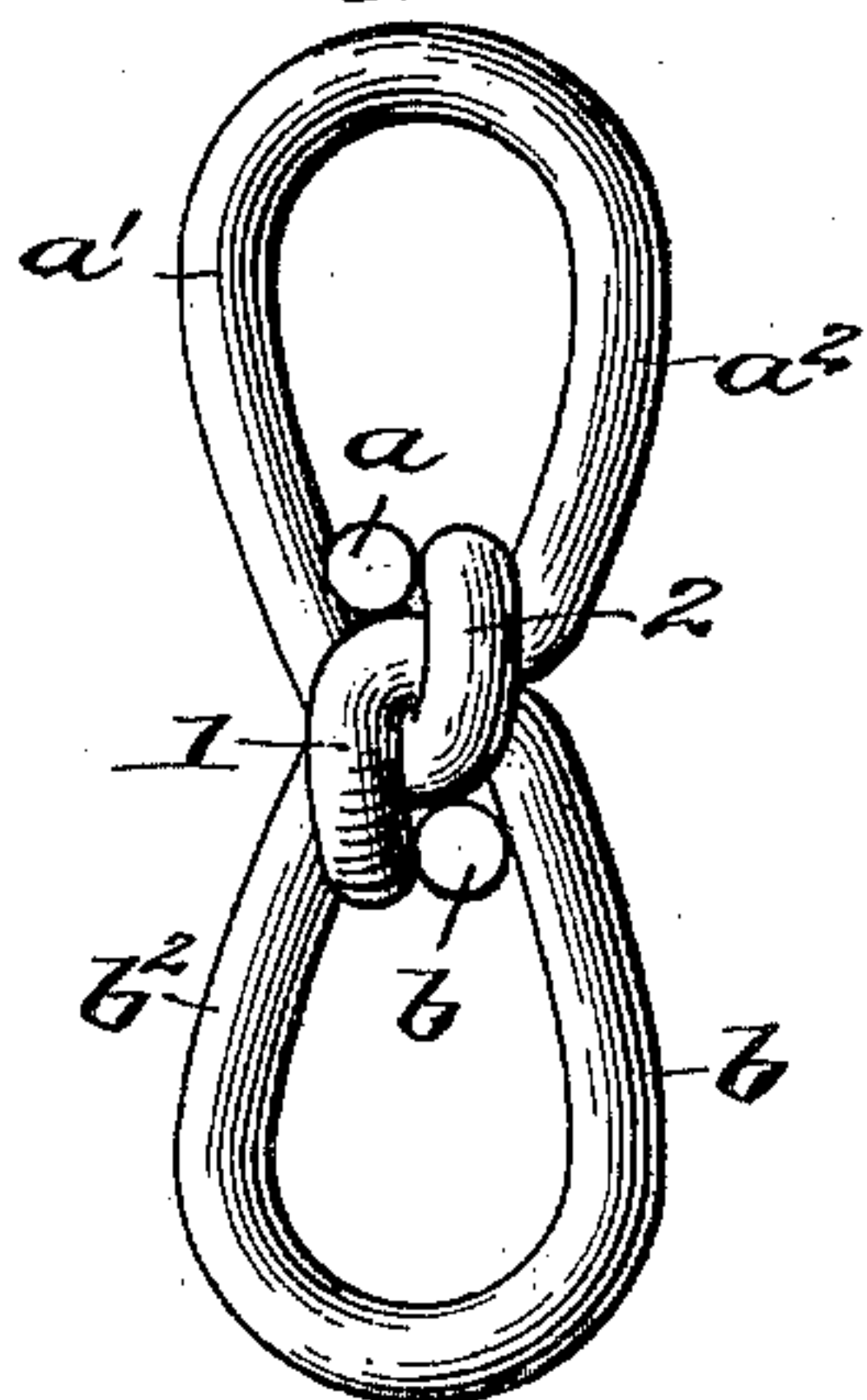
*Fig. 3.*



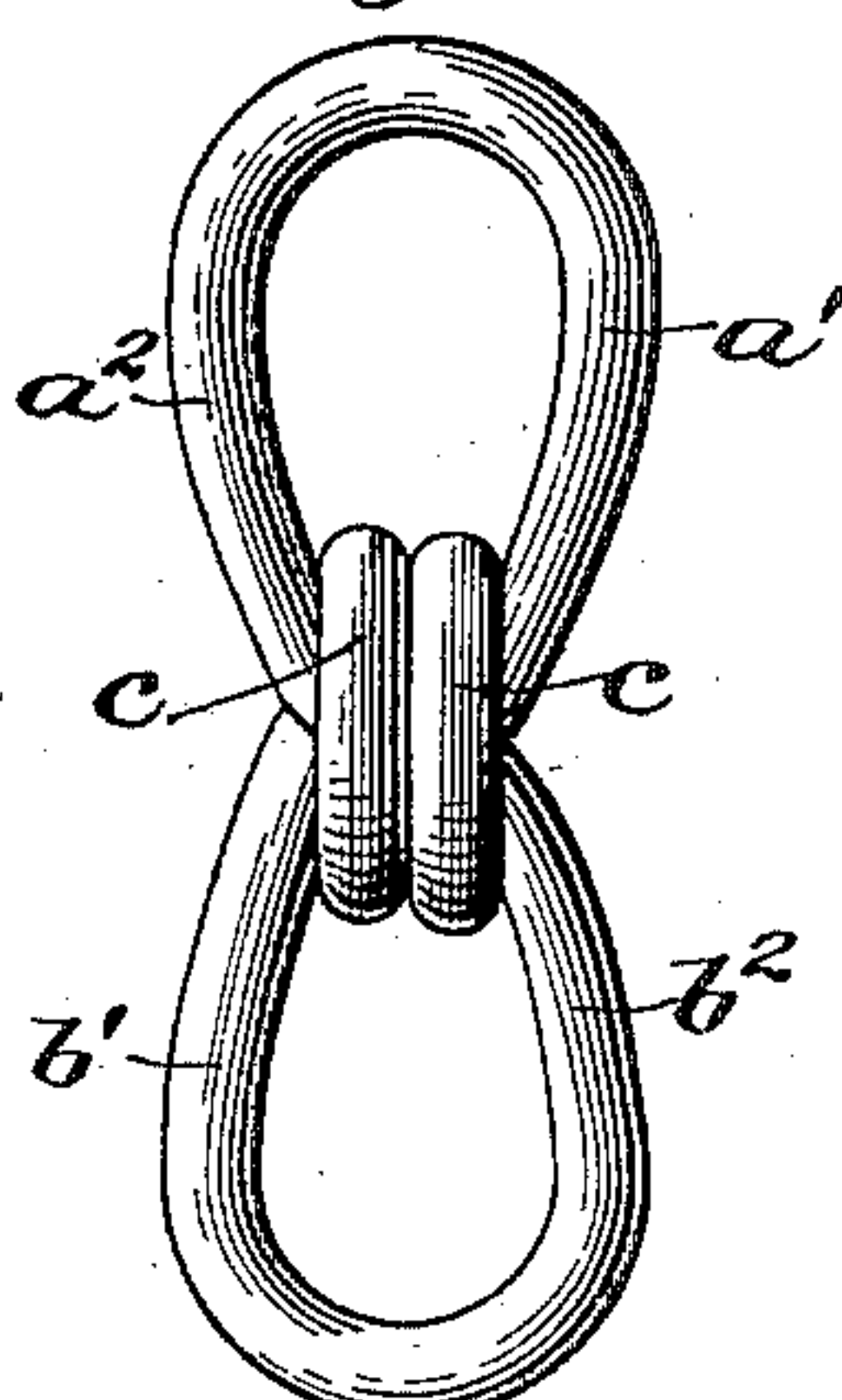
*Fig. 4.*



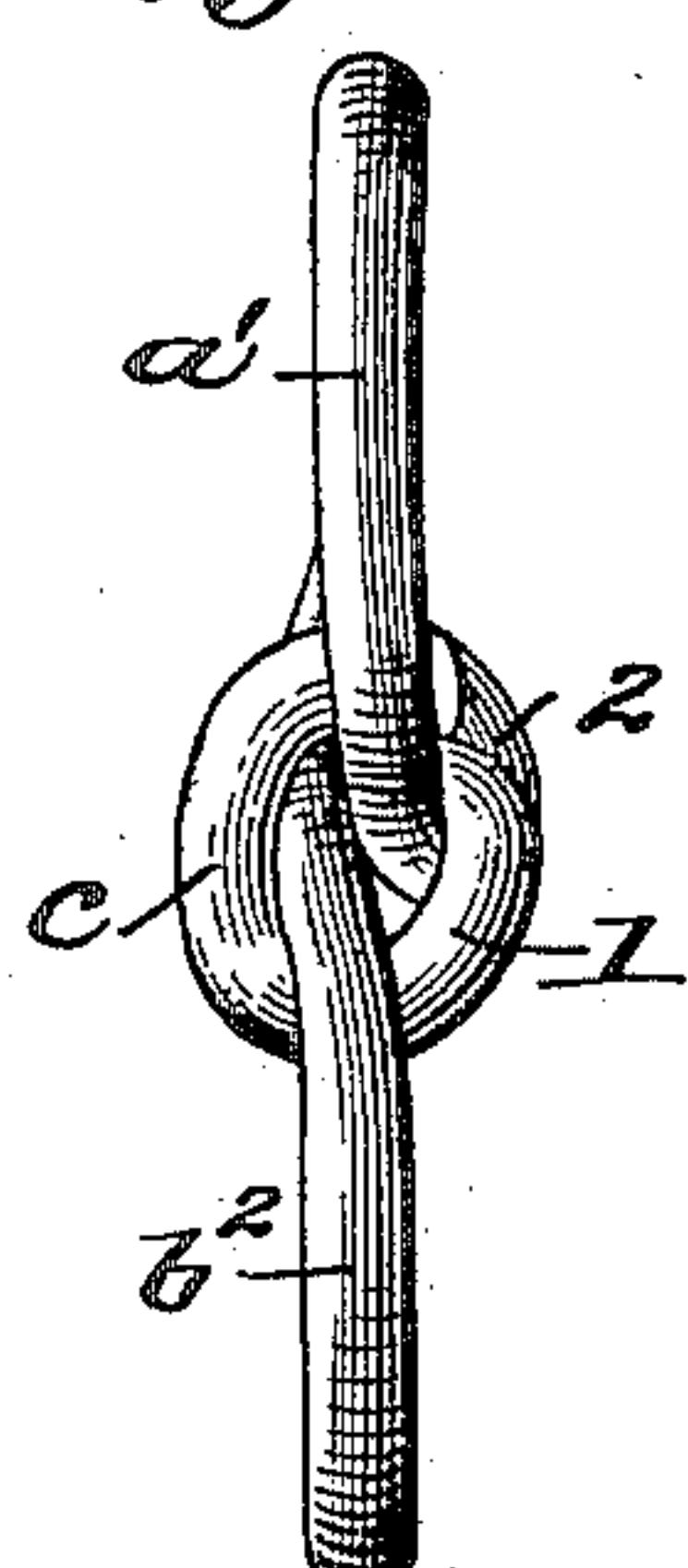
*Fig. 5.*



*Fig. 6.*



*Fig. 7.*



WITNESSES:

*M. R. Blondel*  
*Edw. W. Byrnes*

INVENTOR

*William H. Griffith.*

BY *Munn & Co.*

ATTORNEYS.



# UNITED STATES PATENT OFFICE.

WILLIAM H. GRIFFITH, OF NEW YORK, N. Y.

## CHAIN-LINK.

SPECIFICATION forming part of Letters Patent No. 599,232, dated February 15, 1898.

Application filed June 28, 1897. Serial No. 642,723. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. GRIFFITH, of New York, in the county of New York and State of New York, have invented a new and useful Improvement in Chain-Links, of which the following is a specification.

My invention is in the nature of an improved bent-wire link for making chains, and especially trace-chains, in which the greatest possible strength shall be combined with the most secure and unobtrusive manner of knotting or securing the ends, so as to avoid chafing the team or catching on and wearing other parts of the harness. Much has been done in this particular art, and many ingenious modes of knotting the ends have been devised. Strong links have been made; but the manner of knotting and securing the ends involves a bulky and obtrusive knot, and, on the other hand, smaller, simpler, and more sightly methods of knotting are weak and easily pull out under a severe strain.

My invention seeks to secure the advantages of strength and durability combined with compactness and symmetry; and to these ends it consists in the peculiar construction and arrangement of the link, with special reference to the method of knotting and securing its ends, as will be hereinafter more fully described.

Figure 1 is a view of a section of wire as bent to form the initial step in making the link. Fig. 2 is the front view of the link complete, and Fig. 2<sup>a</sup> a cross-section on line 2 2. Fig. 3 is a slight modification in which the loops of the link are at right angles to each other. Fig. 4 is a rear view of the link shown in Fig. 2; and Figs. 5, 6, and 7 are respectively front, back, and side views of a further modification.

All my links are of the pattern known as the "figure-8" link, and the two halves of my link are exactly symmetrical—that is to say, the opposite ends and also the opposite sides are exactly alike, as shown in Figs. 1 and 2, but the front and back differ, as shown in Figs. 2 and 4.

I take a piece of wire and first bend it symmetrically, as shown in Fig. 1, to form a figure 8 with the two loops  $a' b'$ , in which the sides  $a^2 b^2$  run continuously one into the other, while the ends  $a$  and  $b$  are twisted together across each other and also across the middle

part  $a^2 b^2$ . The ends  $a$  and  $b$  project upon opposite sides of the middle part  $a^2 b^2$ , and these ends are to be bent and secured as follows:  $a$  is bent back and around the member  $a^2$  and into loop  $a'$ , and  $b$  back and around the member  $b^2$  and into the loop  $b'$ , as shown in dotted lines in Fig. 1 and full lines in Fig. 2. When thus bent, a perfectly symmetrical knot is formed, in which the initial folds 1 and 2 form a sort of flat knot, in which the ends  $a$  and  $b$  encircle the middle member  $a^2 b^2$  in the form of a pair of parallel collars  $c c$ , Fig. 4, and in which the extreme ends themselves lie in the acute-angle fork of the two loops (see Fig. 2) and terminate in the depression or crotch formed by the flat-knot fold 1 2 with the two legs of each loop. This accomplishes two very desirable results. In the first place the ends  $a$  and  $b$  are pinched by the two sides of the legs of the loops in such a manner that the acute angle makes a great frictional hold upon the ends, resisting the tendency to pull out, and, secondly, housing the extreme ends in the crotch formed by the flat-knot folds 1 2 and the two legs of each loop allows the ends to be sunken into the general contour of the knot to a very compact and unobtrusive position, thus making the knot very small as well as symmetrical. With this knot it will be seen that when a tensile strain comes on the link the sides  $a' b'$  of the links have the strain distributed first to the flat-knot folds 1 and 2 and back of this to the collars  $c c$ , and behind these to the final coils of the ends  $a b$ , as they lie closely constricted with a short bend between the acute angles of the loops and into the crotch between the same and the flat-knot folds 1 and 2. It will therefore be seen that while the link has its ends connected in the most compact and unobtrusive form of knot it also is of very great strength and durability.

In modifying my invention the loops of the link may stand at right angles to each other, as in Fig. 3. This involves no change in the form of the knot or the manner of making it, as a slight twist given to the link shown in Fig. 2 will produce that shown in Fig. 3.

In Figs. 5, 6, and 7 I show a still further modification, in which the only difference is that the collars  $c c$ , instead of being transverse and carried around one member of the



link, are in this modification wrapped longitudinally, and both pass from one loop into the other. The same principles are involved, however, in the formation of the flat-knot folds, the extension of the ends through the acute angles of the forks of the loops, and the housing or sinking of the ends in the crotch formed between the flat-knot folds and the legs of the loops.

10 I am aware that approximations to my invention in various directions have been made, and I therefore only claim the special form of link as shown and described, which possess the important advantages, as heretofore  
15 described.

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

20 1. A wire link made in the form of a figure 8 with its ends crossed upon each other on the same side of the middle member to form a flat-knot fold, and then extended respectively around the middle member in opposite directions in the form of eyes each of which

embraces both the middle member and a part of the other eye, and having their ends passed through the fork of the loops and compactly constricted and sunken into the crotch or recess formed between the flat-knot folds and the two legs of the loop substantially as shown and described.

2. A wire link made in the form of a figure 8 with its ends crossed upon each other on the same side of the middle member to form a flat-knot fold, and then extended around the middle member and through the two loops in opposite directions to form eyes lying as parallel longitudinal collars, each eye embracing both the middle member and the bend of the other eye and having their ends terminating in and sunken into the crotch or recess formed between the flat-knot fold and the two legs of the loop substantially as described.

WILLIAM H. GRIFFITH.

Witnesses:

EDWD. W. BYRN,  
SOLON C. KEMON.