

(No Model.)

I. L. ATWOOD.
METHOD OF MAKING CHAIN.

No. 507,347.

Patented Oct. 24, 1893.

Fig. 7.



Fig. 1

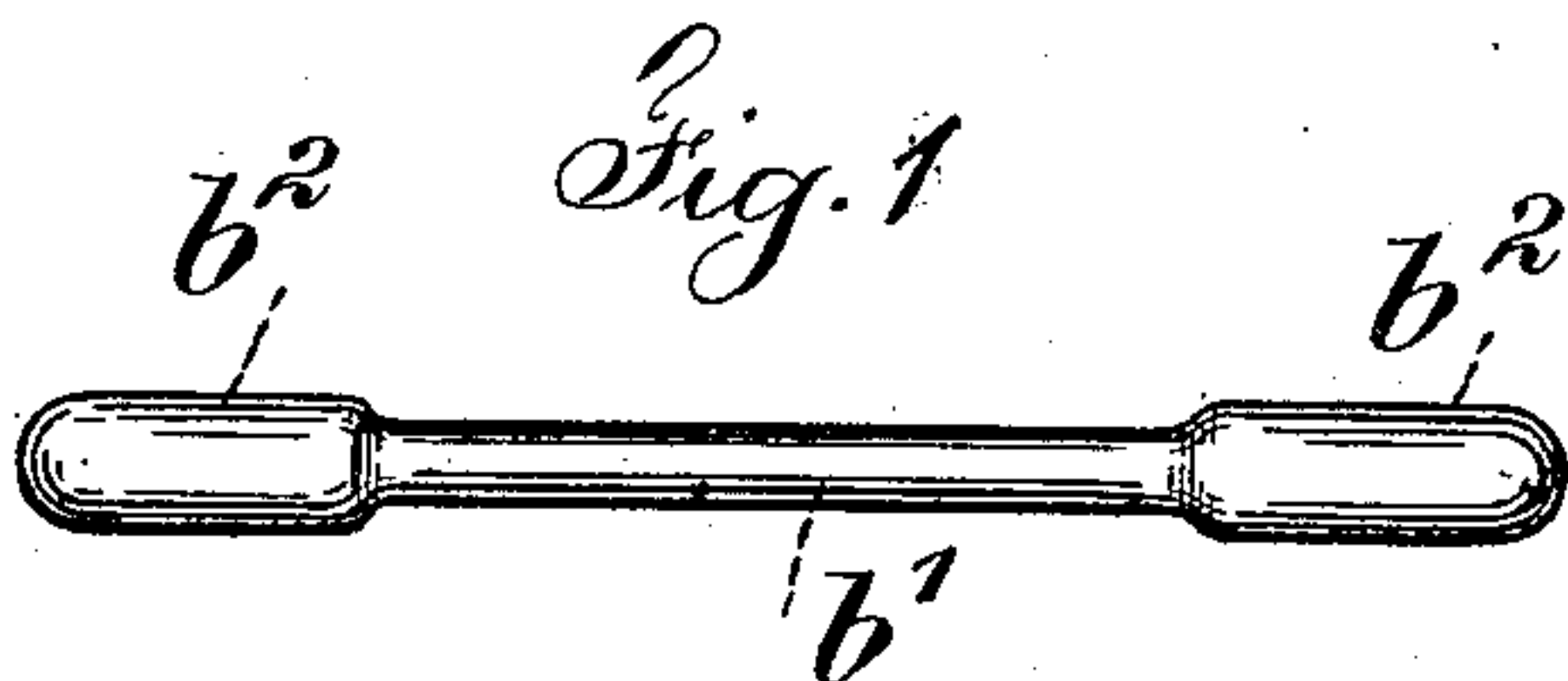


Fig. 2.

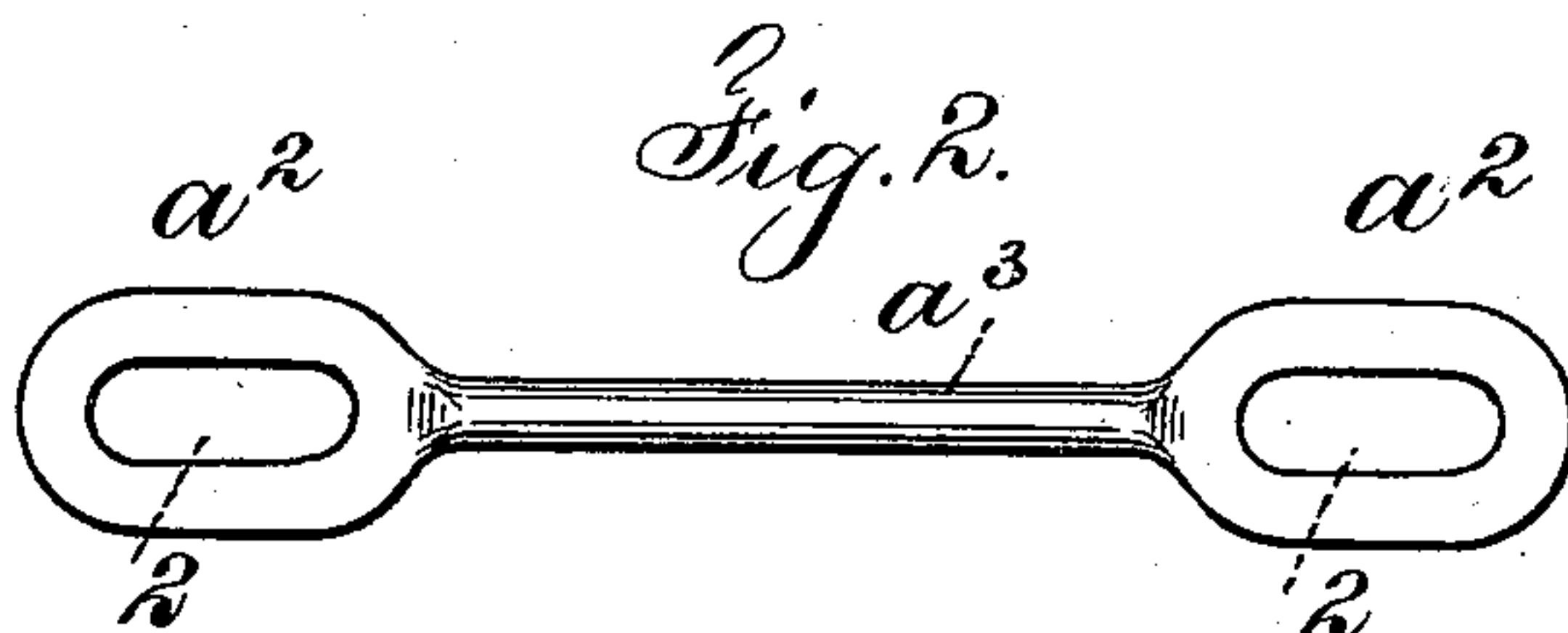


Fig. 3.

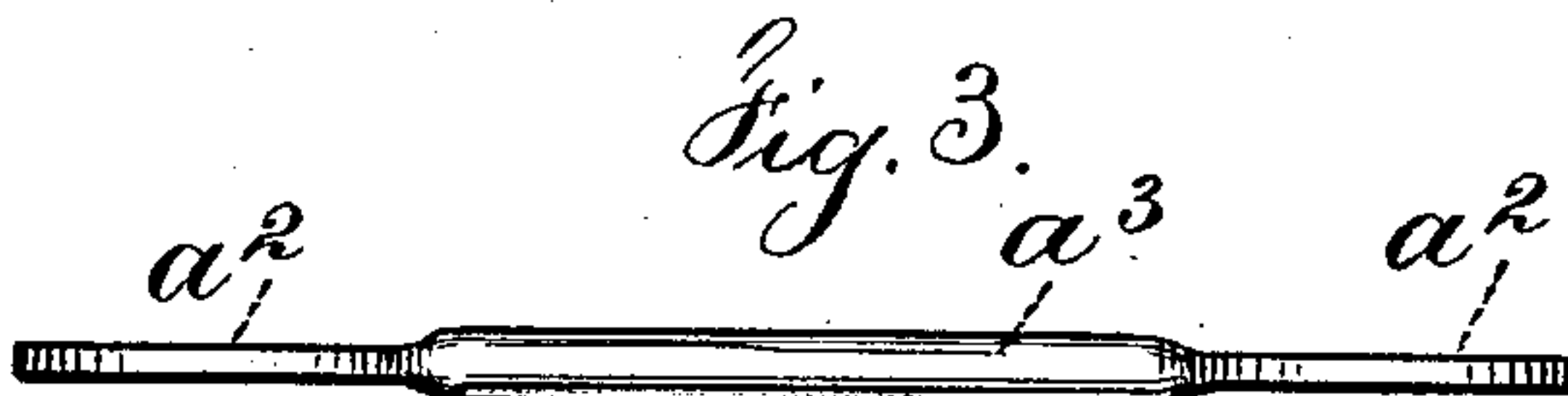


Fig. 4

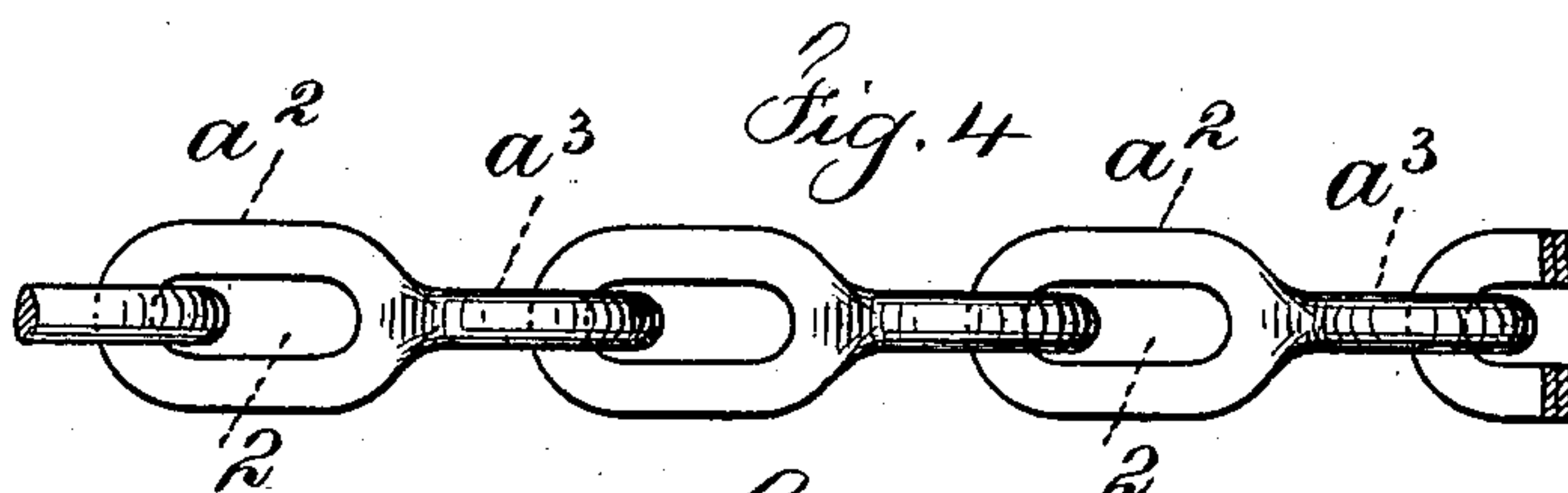


Fig. 5

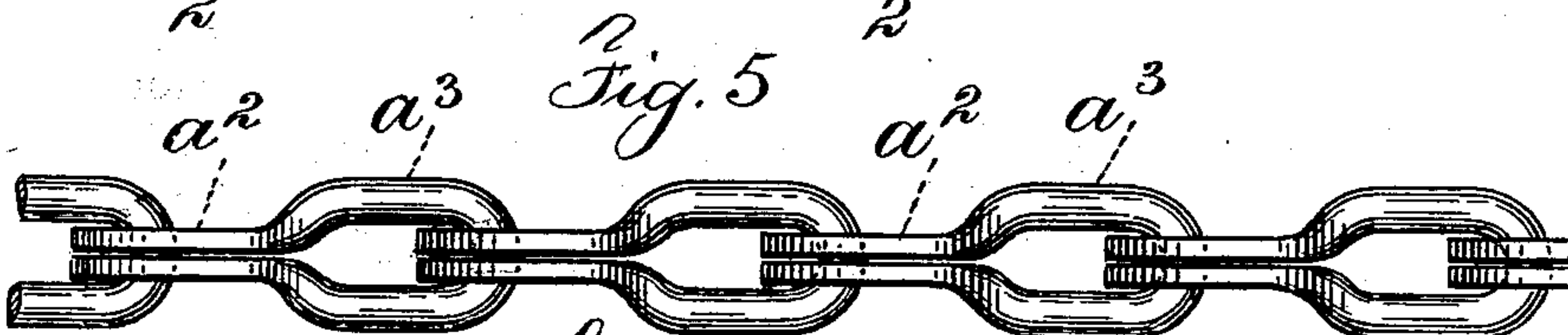
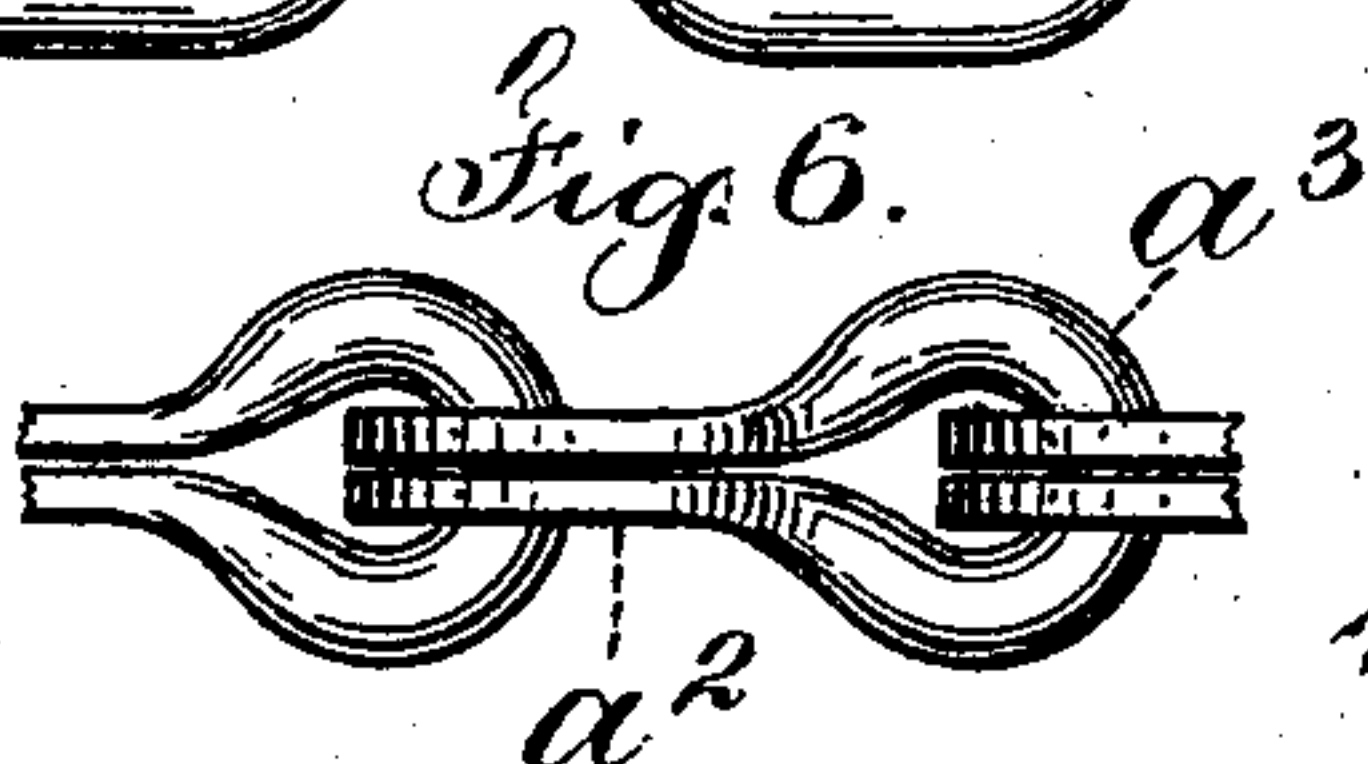


Fig. 6.



Witnesses

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METHOD OF MAKING CHAIN.

SPECIFICATION forming part of Letters Patent No. 507,347, dated October 24, 1893.

Application filed December 21, 1892. Serial No. 455,867. (No specimens.)

To all whom it may concern:

Be it known that I, IRVING L. ATWOOD, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented an Improvement in Methods of Making Safety or Plumbers' Chains, of which the following is a specification.

Chains known by the name of safety or plumbers' chains are those employed in connection with basins, bath tubs and other plumbing fixtures, where the plug or stopper is connected to one end of the chain and the other end of the chain is connected to a fixed point, the object of such chain being to prevent the plug or other device to which it is connected becoming lost. These chains consist of links each having a central eye and two flat adjacent portions with mortises, the eye of each link passing through the mortises of the adjacent link. Heretofore these chains have been cut out of sheet metal, the mortised portions being at the ends and the central portion being of reduced width and bent up to form the eye. In this method of making chain there is great waste of stock and the reduced central portion which forms the eye is weaker than the mortised portions of the link through which the said eye passes. Consequently the chain when manufactured is not of even strength throughout, and the object of my present invention is to overcome these objections.

My improved chain is made entirely of wire and I reduce the central portion of each wire section or blank and spread the end portions and open mortises or eyes in the end portions, and these operations are performed as hereinafter described, so that the wire link is consolidated and rendered sufficiently stiff and hard to obtain the maximum strength.

My present improvement is to be distinguished from chains heretofore made from cast or forged blanks in which wire is not made use of and in which provision is not made for obtaining uniformity of strength and stiffness in the wire links.

In the drawings, Figure 1 is an elevation of a link blank. Fig. 2 is a plan, and Fig. 3 a side view representing the link with the ends flattened and made with mortises. Figs. 4,

5 and 6 represent the completed chain, the links in Fig. 6 being shorter than those in Figs. 4 and 5, and Fig. 7 represents a length of wire as cut off preparatory to forming a blank.

The wire from which my chain is made is in an annealed or more or less softened condition, in order that the after operations may not render the wire too hard and brittle. The wire is cut off in suitable lengths and the central portions of each length are reduced in diameter, as shown at *a*, Fig. 1, leaving the end portions *a'* of the original size of the wire, and the extreme ends are preferably rounded as shown. In this operation the soft or annealed wire is sufficiently hardened in the middle portion of the link to obtain the required stiffness and the end portions *a'* are still in an annealed or sufficiently soft condition. The end portions *a'* of the blank are flattened and spread laterally and mortises or openings made in the ends to form eyes, as represented at 2, Fig. 2, the metal *a²* being flat and of a thickness to approximate the central portion *a³* of the link in strength, as illustrated in Fig. 3.

The central portion of each link is bent up to form a wire eye and the end portions *a²* are brought together flatwise as illustrated in Figs. 5 and 6, and the wire central portions of the links are slightly less in diameter than the width of the eyes 2. Hence the respective parts of the links take an even bearing upon each other, and the flattened end portions being brought together, the strength of the double end portions is equal or nearly so to the single middle portion or eye of each link, and in the flattening operation to which the ends of the wire blank are subjected the metal is sufficiently hardened and consolidated for obtaining the proper stiffness in the flat end portions of the wire links, and the mortises or openings 2 may either be formed by cutting out the metal with a die and punch or by spreading the metal by suitable tools. In either instance the proper strength is obtained in the chain and no portion of the chain is liable to draw down or bend under the ordinary strain to which the chain is subjected. Hence the chain retains its appearance and there is sufficient freedom of movement of one

link upon the other and sufficient surface where the parts come in contact to cause the chain to be durable and trustworthy.

I remark that these safety or plumbers' chains are usually made of brass and in consequence of the operations heretofore described the wire is in a comparatively soft or annealed condition and is hardened with uniformity in all parts of the links.

It is usually advantageous to reduce the wire blank at the central portion before flattening the ends, and the central portions of the links are usually bent up partially to form the central wire eye before one link is threaded through the other link, but the order in which the respective operations are performed may be varied, and the chain may be made from wire of any desired sectional shape.

I claim as my invention—

The method herein specified of making safety or plumbers' chains from wire, consisting in reducing the central portions of the wire link blanks in diameter, flattening the end portions of the link blanks and opening through the same mortises or eyes slightly larger in width than the diameter of the wire in the center of the link, and threading one link through the end eyes of the next link and bending the links to form central wire eyes, substantially as set forth.

Signed by me this 29th day of November, 1892.

IRVING L. ATWOOD.

Witnesses:

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JOHN C. SCOTT.