(No Model.)

R. A. BREUL.

METHOD OF MAKING CHAINS.

No. 533,433. Patented Feb. 5, 1895.

Fig. 1.

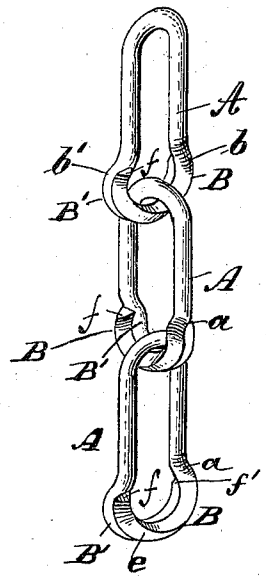


Fig. 2.

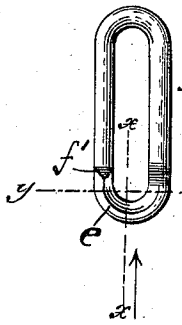


Fig. 3

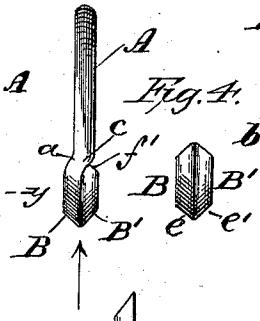
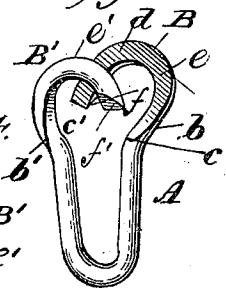


Fig. 4.

Fig. 5.



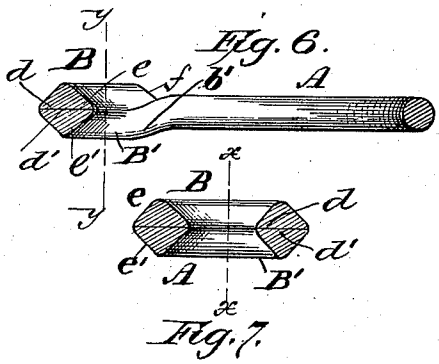


Fig. 6.

Fig. 7.

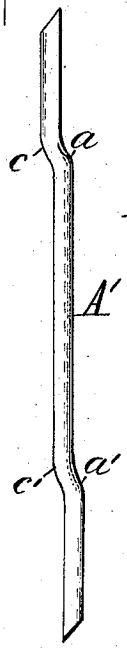


Fig. 8.

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UNITED STATES PATENT OFFICE.

RICHARD A. BREUL, OF BRIDGEPORT, CONNECTICUT.

METHOD OF MAKING CHAINS.

SPECIFICATION forming part of Letters Patent No. 533,433, dated February 5, 1895.

Application filed May 8, 1894. Serial No. 510,488. (No model.)

To all whom it may concern:

Be it known that I, RICHARD A. BREUL, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Methods of Manufacturing Wire Chains; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of a short length of chain, made of wire-links of my improved construction. Fig. 2 is a plan view of one of the links composing the chain. Fig. 3 is a side view of the same. Fig. 4 is an end elevation of the link, looking at it in the direction of the arrow shown in Figs. 2 and 3. Fig. 5 is a detail view of the same link, showing its overlapping ends open and apart, as before the "swaging" process, so as to illustrate the novel and peculiar formation of the bent and overlapping ends, according to my method. Fig. 6 is a transverse sectional view of the link, on line *x*—*x*. Fig. 7 is a sectional view of the same on line *y*—*y*; and Fig. 8 is a side view of the wire-blank, as it appears before being doubled and having its ends bent to form a link.

Like letters of reference designate corresponding parts in all the figures.

My invention relates to wire-chains composed of a series of split links which interlock with one another to form a continuous chain; and my improvement consists in the novel method of forming and swaging the split and overlapping and interlocking ends of each link, as will be hereinafter more fully described and claimed.

On the accompanying drawings, the reference-letter A denotes the wire-links composing a chain of my improved construction, the length and thickness of wire of each link being optional. In forming the link according to my improved method, I first cut wire of the desired size into lengths, A′, each of which forms a blank. The second step in the process consists in slightly bending or deflecting both ends of this straight blank, as shown at *a* and *a′* on Fig. 8, after which the blank is doubled upon itself and closed to form the link, simultaneous with which operation each bent overlapping end or shank, B B′, is twisted slightly, as shown at *b* and *b′*. Finally, the overlapping bent and open ends B B′ are brought together and swaged, which last finishing operation involves five distinct and separate steps, all of which, however, are performed simultaneously, or practically so, by the use of swaging-dies of suitable construction. These five steps of the "swaging" process are the following, viz: first, formation of the sharp shoulders or offsets *c* and *c′* at the inner ends of the curved and deflected ends *a a′*; second, flattening the inside of the overlapping ends of the wire-link upon and against each other, at *d*, *d′*; third, compressing the outside of the wires into a broad V-shape, or obtuse triangle, having the flattened sides *d d′* as their base, as illustrated at *e*, *e′*; fourth, tapering off the overlapping ends of the wire-link, as shown at *f*, *f′*; and fifth and finally, partially straightening out the bent and deflected shanks *a*, *c*, *a′ c′*, and thereby setting and uniting the bent and overlapping ends B and B′ firmly together.

By this method, involving a succession of the several separate and distinct steps and processes hereinbefore described, I produce, at small expense, a wire-chain of exceptional strength and durability, and, at the same time, of a neat and smooth finish. Owing to the peculiar construction and conformation of the overlapping and swaged ends, the individual links comprising the chain will resist greatest strain in the direction of their length without danger of opening and coming apart; thus adapting a chain of this construction to a variety of purposes where a light and yet very strong and durable chain is a desideratum.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

In the manufacture of wire-chains made of "split" links, the described method of forming and uniting the bent and overlapping ends of each individual link, which consists in: first, cutting a straight blank of the proper length from a piece of wire of the required dimensions; next, deflecting the ends of said

blank in opposite directions; next, bending and closing the ends of the link; and finally, swaging (either hot or cold) the bent and overlapping ends of the link and thereby, and during the same process, flattening the adjacent overlapping sides of the wire upon and against each other and compressing the metal of the same into a V-shape; said several steps being carried out successively substantially in the manner and for the purpose shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

RICHARD A. BREUL.

Witnesses:

NATHAN C. HERZ,

SIG. DORMITZER.