B. HERSHEY.

Machine for Welding Chain Links.

No. 166,377. Patented Aug. 3, 1875.

Fig. 1.

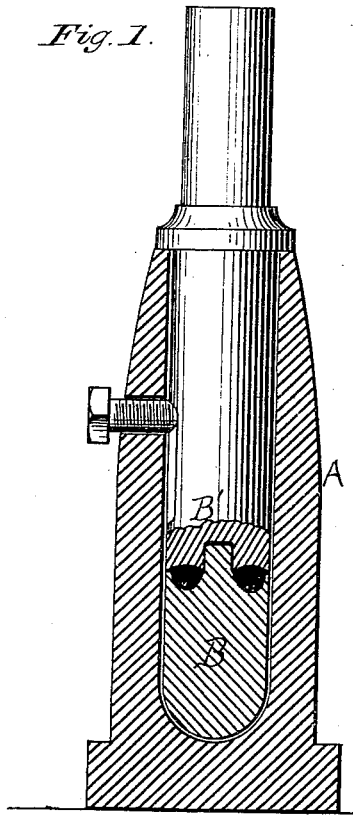


Fig. 2.

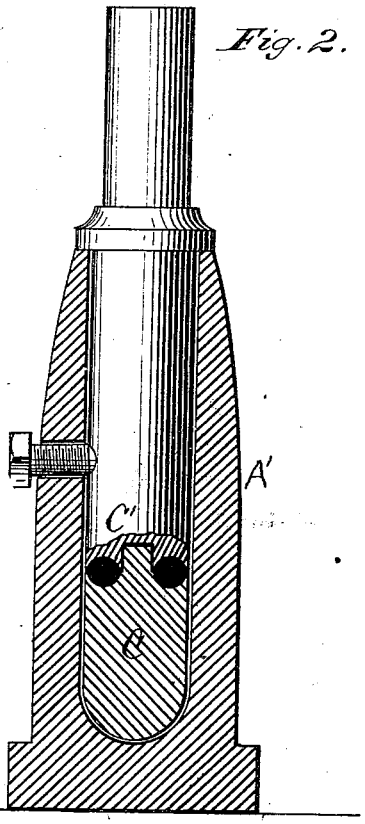


Fig. 4.

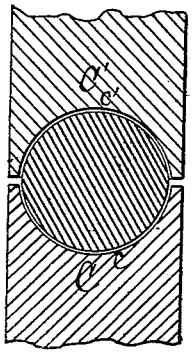


Fig. 3.

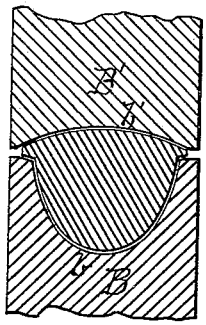
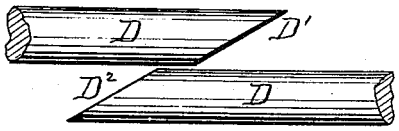


Fig. 5.



Witnesses:
Edwin James
John D. Jones

Inventor:
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UNITED STATES PATENT OFFICE.

BENJAMIN HERSHEY, OF ERIE, PENNSYLVANIA, ASSIGNOR TO PITTSBURGH CHAIN AND CAR-LINK MANUFACTURING COMPANY.

IMPROVEMENT IN MACHINES FOR WELDING CHAIN-LINKS.

Specification forming part of Letters Patent No. **166,377**, dated August 3, 1875; application filed March 15, 1875.

CASE C.

To all whom it may concern:

Be it known that I, BENJAMIN HERSHEY, of the city and county of Erie, and State of Pennsylvania, have invented certain Improvements in Welding-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, and the letters of reference marked thereon, making part of this specification, in which—

Figures 1 and 2 are vertical sectional views. Figs. 3, 4, and 5 are views illustrating the link in different stages of its formation.

In welding the lapped scarfed ends of a chain-link, it is well known that if the excess of metal caused by the lapping is not properly worked, a breakage or tearing of fiber of the iron, and consequent weakening of the link, results. This is almost universally the case, and is the cause of so many breaks occurring at the point of welding.

To obviate this difficulty is the object of my invention; and to this end it consists in the combination of two sets of dies, in the first set of which the cavity in the upper die is slightly concave, while the cavity in the lower die of the same set is of semi-elliptic form, this set being used to perform the first operation and, by the shape of its cavities, accommodating and controlling the excess of metal caused by the lapping of the ends of the blank. The second set is for finishing the welded section—that is, bringing it to the shape in cross-section of the rest of the blank, and the cavities are shaped accordingly.

The construction and operation of my invention are as follows:

A and A′ represent die-boxes, and which contain the two sets of dies. B and C represent the stationary dies, and are secured in their respective boxes or bearings A and A′ in the usual manner; and B′ and C′ are two plunger-dies, and operate in connection with the stationary dies in the usual manner.

No operating mechanism for the dies is shown in the accompanying drawing, because my present invention has reference entirely to the dies, or more particularly to the contour of their cavities, and has no reference whatever to any particular kind of machinery for working the same, as the effect of their action on the bar to be welded will be the same, no matter what the mechanism may be in connection with which they are used.

The dies C C′, Figs. 2 and 4, are counterparts of each other, and their cavities *c c′* are of such contour that, through their action, the welded section of the link will be caused to conform in shape to the original form of the blank out of which the link was produced. But with the dies B B′, Figs. 1 and 3, it is entirely different, as their cavities *b b′* are most dissimilar, and are designedly so to accommodate and properly distribute the excess of metal which the lapping of the scarfed ends D^1 D^2 of the bent blank and link D leaves. In Fig. 5 the lapping of the scarfed ends of the link is shown. Now, it will readily be understood that if these scarfed ends are to be united in the cavities of the dies, which, when they meet, inclose an opening of the form and dimensions of the original blank, it is impossible to hammer and pound down these scarfed edges of the link to conform to the cavity in form and dimensions, and through the vertical plunge and pressure of the die without in a degree so breaking the fibers of the iron as to weaken the link at its welded section. This objection and difficulty I avoid by giving to the cavities *b b′* of the dies B B′ the form shown in Fig. 1, and in enlarged section, Fig. 3.

The cavity *b* of the die B, instead of being in cross-section an arc of a circle, as has invariably been the contour of such dies in previous welding-machines, when the open sections of a round blank were to be welded, is of a semi-oval or semi-elliptical form, while the cavity *b′* of the upper or hammer die is of a slightly-concave form, and which, when the dies meet, produces a cavity of the form shown in cross-section, Fig. 3. Now, the great advantage of this form, in connection with the fact that the diameter of the cavity is greater than that of the link, is, (and herein lies the very essence of the present invention,) that it read-

ily receives and accommodates the excess of metal which the lapping of the links, as shown in Fig. 5, produces at this section, and, through the hammering and pounding action of the die B′, forms the weld by spreading the metal, as it were, by a rolling movement which does not break or in any manner injure its fibers, and distributing the same in manner as to greatly strengthen the link at its welded section, and also works up the scarf. The action of these dies produces a print of the form shown in Fig. 3, and leaves at its sides fins *d d*. The link, having been thus welded, is now submitted to the action of the dies C C′, whose cavities *c c′* are of the same contour as is the blank, and which serve as finishing-dies, tucking in the fins and reducing the welded section of the link to the desired form. These dies are described as being designed to work a round link. Should a blank of any other form be required to be welded, the cavities would have to be altered to correspond thereto.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

The dies B B′, having cavities *b b′* of the form shown, for welding chain-links, in combination with finishing-dies C C′, the whole being constructed and arranged to operate substantially as described, as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

B. HERSHEY.

Witnesses:
JOS. T. K. PLANT,
EDWIN JAMES.