2 Sheets—Sheet 1.

B. HERSHEY.

MACHINES FOR WELDING CHAIN-LINKS.

No. 193,084. Patented July 17, 1877.

Fig. 1.

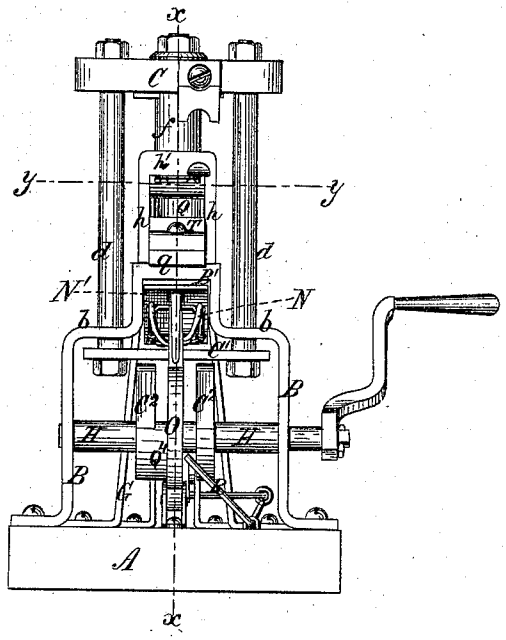
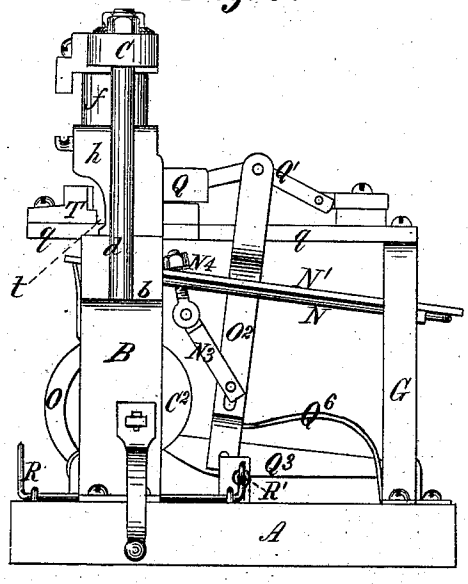


Fig. 2.



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2 Sheets—Sheet 2.

B. HERSHEY.

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Fig. 3.

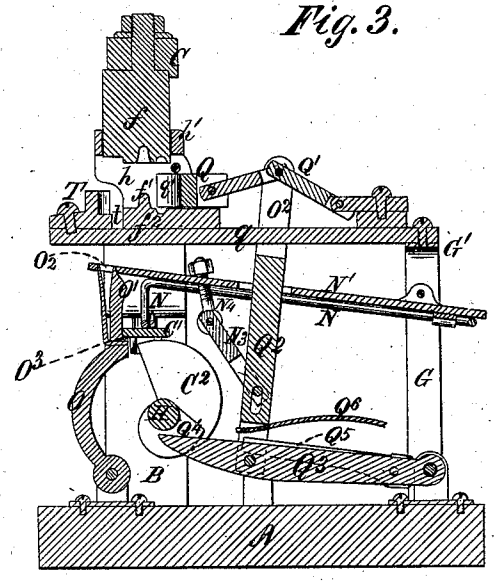
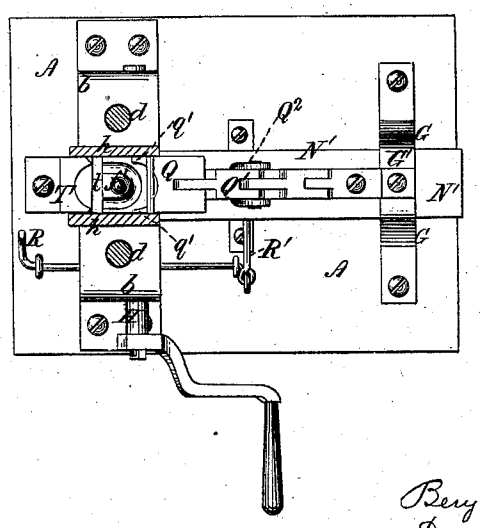


Fig. 4.



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UNITED STATES PATENT OFFICE.

BENJAMIN HERSHEY, OF ERIE, ASSIGNOR TO PITTSBURG CHAIN AND CAR LINK MANUFACTURING COMPANY, OF NEW BRIGHTON, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR WELDING CHAIN-LINKS.

Specification forming part of Letters Patent No. **193,084**, dated July 17, 1877; application filed June 20, 1877.

CASE B.

To all whom it may concern:

Be it known that I, BENJAMIN HERSHEY, of Erie, Pennsylvania, have invented certain Improvements in Machines for Welding Chain-Links, of which the following is a specification:

My improvements relate to that class of chain-link-welding machines shown and described in the Letters Patent of the United States No. 166,373, granted to me August 3, 1875; and my present invention consists of combined swaging and compressing dies, and of the organization in a machine of the devices by which these swaging and compressing dies are made to co-operate in welding and finishing chain-links.

Nearly similar swaging and compressing dies are shown in my application of even date herewith, in connection with dies for compressing the link sidewise. In that application, which I designated "Case A," the combined swaging and compressing dies are used to finish the chain-links after they have been first welded in swaging-dies.

My present invention is designed to weld and finish chain-links in a single set of dies without any preliminary welding operation performed in another set of dies.

In the present case, the endwise-compressing die is deeply recessed, and by means of its projecting side wings administers a sidewise compression to the link, preparatory to and in conjunction with the endwise compression, which it effects by the pressure of its concave surface upon the end of the link.

The accompanying drawings are as follows: Figure 1 is a front elevation of my machine. Fig. 2 is a side view; Fig. 3, a longitudinal vertical section through the line *x x* on Fig. 1, and Fig. 4 a horizontal section through the line *y y* on Fig. 1.

Referring to the drawings, it will be seen that the bed-plate A affords a support for the standards B B G G. The standards B B afford horizontal bearings for the cam-shaft H, and are each bent inwardly to afford vertical bearings *b b* for the bars or guide-rods *d d* of the gate or frame which carries the drop-die *f*. The drop-die is bolted to the under side of the cross-piece C, which is secured to the upper ends of the guide-bars *d d*. The lower ends of the guide-bars are secured to the cross-piece C^1, which receives the upward thrust of the twin lifting-cams C^2 C^2. The cross-piece B′, connecting the upper ends of the front standards B B, affords a support for the front portion of the die bed-piece *q*, the rear end of which is supported upon the cross-piece G′ of the standards G G. The side walls *h h* of the die-chamber are secured to the bed-piece *q*, and the roof *h′* of the die-chamber is perforated to afford a vertical bearing for the reciprocating drop-die *f*. The drop-die *f* has its face recessed to conform to the shape of the link, and is provided with a central recess to receive the tongue f^1 of the recessed stationary die f^2.

The chain-link in the process of welding is supported against the endwise thrust of the compressing-die Q by the back-rest T, which is secured to the front end of the bed-piece *q*, and presents a concave face corresponding to the shape of the end of the link.

The outer end of the stationary die f^2 is cut away, so as to leave the space *t* between the outer end of the stationary die and the inner end of the back-rest T to contain the chain-link upon which the link to be welded is hung.

Reciprocating motion is imparted to the compressing-die Q by means of the toggle-joint Q^1, which is actuated, through the pitman Q^2 and cam-lever Q^3, by the cam Q^4. The cam-lever Q^3 is capable of lateral motion, and when the machine is not in use is thrown out of the plane in which the cam Q^4 revolves by the flat spring Q^5. The pitman Q^2 and its connections are pushed upward by the curved spring Q^6, one end of which is secured to the bed-plate of the machine, while the other end catches under the lower end of the pitman.

In this machine, as in my others, to which I have already referred, torsion-springs N are used to act upon the cross-bars C^1 of the gate, and increase the force with which the gate falls. These springs are secured to the under side of the plate N^1, which is pivoted to the rear standards G G, and is slotted at its

forward end to engage the stop-bar O. The upper end of the stop-bar O^1 is inclined outwardly, and passes through the slot O^2 in the spring-plate N^1. Thus when the plate N^1 descends the slot O^2, acting upon the end O^1 of the stop-bar, throws the stop-bar outward, and withdraws from under the lower cross-bar C^1 the shoulder O^3, upon which the cross-bar C^1 rests, as shown in Fig. 3, when the machine is not in operation. The spring-plate N^1 is connected with the pitman Q^2 by means of the link N^3 and adjustable bolt N^4, so that when the pitman is drawn down by the action of the cam Q^4 upon the cam-lever Q^3 the link N^3 pulls the plate N^1 down, and thus compresses the ends of the torsion-springs N against the upper surface of the cross-bar C^1.

When it is desired to set the machine in operation the cam-lever Q^3 is pushed sidewise into the plane in which the cam Q^4 revolves, by means of the push-bar R′, which is actuated by the rocking foot-lever R.

It will be seen that a single cam, Q^4, performs the combined functions of operating the toggle mechanism, and of bringing the torsion-springs into action, and of throwing the stop-bar out of engagement with the die gate or frame.

In operating my machine a heated blank, bent into the proper shape, and hung upon the end link of a chain, is deposited upon the stationary die f^2 in front of the back-rest T. The rocking foot-lever R is then pressed down, thus bringing the dies into action.

The reciprocating cam Q has its face deeply recessed, giving to it the shape of the letter U. When brought into action, therefore, the side wings q' of the die embrace the blank, and prevent the blank from expanding laterally.

The side wings q' derive lateral support from the walls of the die-chamber, and act as wedges, respectively, entering between the opposite walls of the die-chamber and the blank, and thus administering to the blank a cross-wise compression.

The back-rest T supports the link during its subjection to the endwise compression effected by the forward movement of the compressing-die Q, and at the instant when the compressing-die Q has completed its forward movement the drop-die f administers its stroke, and welds the ends of the blank together. The link is thus welded and finished to the size required.

I claim as my invention in a machine for welding and finishing chain-links—

1. A drop-die and a stationary die, having their opposed faces suitably recessed to contain one end and a portion of both sides of a chain-link, in combination with a deeply-recessed concave-faced compressing-die and a concave-faced stationary die or back-rest, such compressing-die having a reciprocating motion perpendicular to the direction of the motion of the drop-die, substantially as and for the purposes set forth.

2. The transverse recess or space t between the outer end of the stationary die f^1 and the inner end of the back-rest T, for the purpose of containing the chain-link, upon which the link to be welded is hung, as set forth.

3. The cam Q^4 and the cam-lever Q^3 in combination with the toggle mechanism (consisting of the pitman Q^2 and the toggle-joint Q^1) and the torsion-spring plate N^1, the adjustable bolt N^4, and the link N^3.

4. The foot-lever R, push-bar R′, cam-lever Q^3, and cam Q^4, in combination with the toggle mechanism, link N^3, adjustable bolt N^4, torsion-spring plate N^1, and stop-bar O.

BENJAMIN HERSHEY.

Witnesses:
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GEORGE S. SMITH,