J. H. HELM.

Machine for Forming Links.

No. 164,682. Patented June 22, 1875.

Fig. 1.

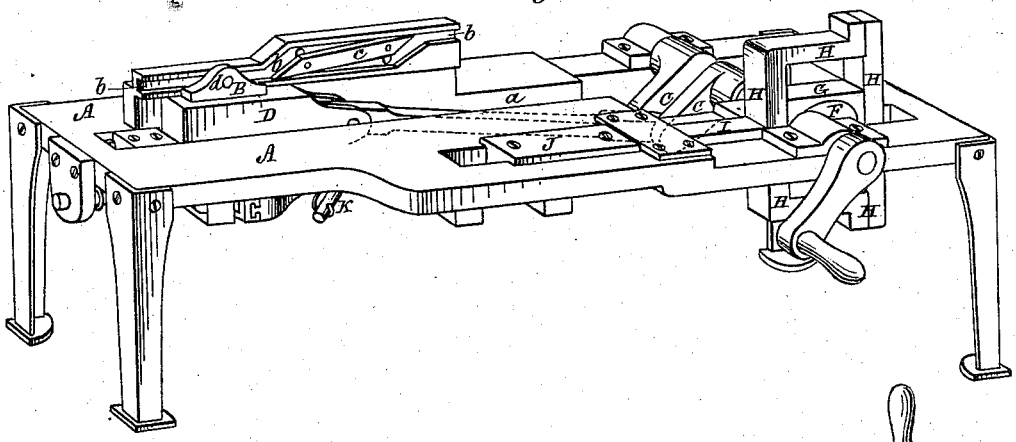


Fig. 2.

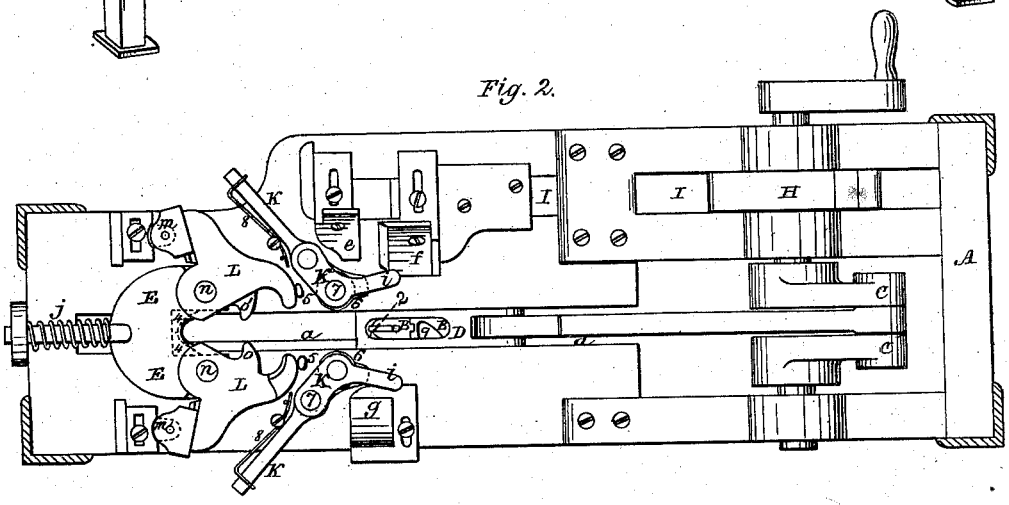


Fig. 3.

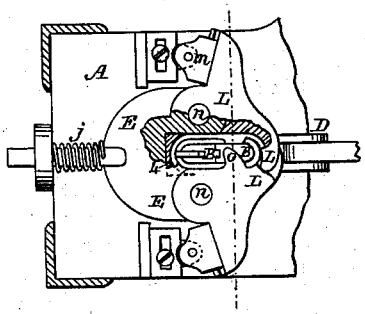


Fig. 4.

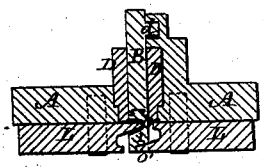


Fig. 5.

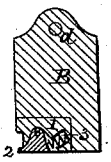
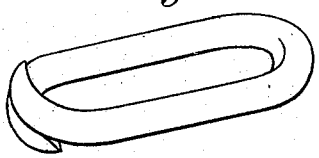


Fig. 6.



Witnesses.

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IMPROVEMENT IN MACHINES FOR FORMING LINKS.

Specification forming part of Letters Patent No. **164,682**, dated June 22, 1875; application filed May 12, 1875.

To all whom it may concern:

Be it known that I, JOHN HENRY HELM, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Bending, Forming, or Shaping Car or Chain Links; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of the machine. Fig. 2 represents a plan view of the under side of the bed or frame, to show the mechanism on the under side thereof. Figs. 3, 4, and 5 represent details of the machine, which will be more specifically referred to in the specification. Fig. 6 represents one of the bent or formed links ready for welding.

My invention consists, first, in the combination of a switch mechanism with the reciprocating bending-die, for the purpose of raising said die to deliver the link just formed, and which it carries back with it, and to pass over the blank or rod fed in to form the next link. It further consists in the combination of the cutters, guide or gage, traversing die, and pair of bending-levers, for scarfing off and gaging the blank, and bending it into a U form. It further consists in the combination of the traversing die, the head or rest, and the second pair of dies, for bending the scarfed ends of the partially-formed link, and laying them in certain position for welding. It further consists in the combination of a yielding holder with the reciprocating die or bender, for holding the bent link to the die until it is carried far enough back to be delivered, and then, as the die rises, to yield and allow the link to drop off.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

The bed or frame of the machine is shown at A, in a cut-away portion, *a*, of which a bending-die, B, is traversed by a crank, C, on a shaft driven by any first moving power. On the bed A, and at one side of the line traversed by the die B, there is arranged a camway, *b*, in which is placed a pivoted spring-switch, *c*, and upon the die B there is a stud, pin, or roller, *d*, which traverses through the camway *b*, guided and controlled by the switch *c*, so that as the die moves forward it shall be held down in its ways, and when it moves backward shall be raised up to pass over the previously fed-in blank and drop the link just formed. The die B is arranged in a carrier, D, and is traversed with the carrier, but it has a vertical movement independent of the carrier, for the purposes above mentioned. The die itself, though having the general shape and form of the inside of the link to be made, has connected with it a removable piece, 1, so as to form links of different sizes by changing the length of the die, and a pivoted nose or holder, 2, for holding the link to the die until the die rises to drop it off, when said holder swings back against the action of a spring, 3, drops the link, and then returns to its holding position, to be ready for the next succeeding similar operation. When the piece 1 is removed and replaced by another to change the length of the link a head-die, 4, in the moving piece E is also changed, or set out or in, to correspond with the changed part of the die B. An adjustable, but rigid when adjusted, cutter or shear, *e*, is attached to the under side of the bed, and a reciprocating shear or cutter, *f*, works in connection with that, *e*, to cut off the blank from the rod or bar in an oblique line of cut, said shear *f* being operated from the driving-shaft by a cam, F, sliding block G, yoke H, connecting-bar I, and shear or cutter head J. The rod from which the blanks are cut is fed in between the cutters *e* and *f*, and the bevel or obliquity of the previously cut-off blank fits into, under, or against a similarly-beveled guide and gage, *g*—a guide because it compels the line of cut to be made to correspond with that previously made, so that when the blank is bent into the form of a link, as seen in Fig. 6, the two beveled ends will so lap and lie, one upon the other, as to be in proper position for welding—and a gage, as it defines the length to be cut off for the link to be made, being first adjusted for that particular length. The blank so fed in and cut off from the rod is held up by the arms *i i* of the bending-levers K K until the die B in its traverse takes against it and carries it and the

bending-levers until the latter come against their studs or stops 5 5, where they rest; but the die B, moving on, bends the blank against the grooved rolls 6 6 in the levers K until it assumes a U form, when it passes beyond said levers, and is brought up against the head-die 4 in the movable piece E, and, moving said piece E, causes the dies L L to close up against the partially-formed link and complete the bending or shaping of the same. The bending-levers K are pivoted to the bed A, as at 7, and have a spring, 8, behind them, to return them into holding position for the next succeeding blank cut off. The dies L are pivoted to the bed A through adjusting-pieces at *m*, and are also pivoted to the movable piece E at *n*, and behind the piece E there is a spring, *j*, to move forward said piece E and swing open the dies L after the die B in its traverse has moved out from between them, carrying with it the formed link. Upon the dies L L are spurs *o* *o'*, one, *o*, being on the face of its die, and the other, *o'*, being on the back of its die, and these spurs are inclined where they move against the link, and are designed to bring the lapped beveled ends of the link, as in Fig. 6, close together. As the dies L L close while the die B, with the partially-formed link, is between them, recesses 9 are made on opposite sides of said die B, for the spurs *o* and *o'* to pass into, so that the dies L may close up against the link to give it proper form and shape.

When the die B, with the link adhering to it, passes out from the dies L, then opened, the stud *d* in the top of the die B moves over the top of the switch *c*, and so raises up the die B, which is done to pass it back over the blank which has been fed in while the dies are or were shaping the previous one into a link form, and as the die B rises up through its carrier D the link which it held is forced off from it and drops down.

Having thus fully described my invention, what I claim is—

1. The combination of the switch mechanism with the traversing die B and its carrier, for the purpose of raising said die in its carrier on its rearward movement, to pass over the blank which was previously fed in and is to form the next succeeding link, substantially as described and represented.

2. The combination of the cutters *e f*, guide and gage *g*, traversing die B, and bending-levers K K, as and for the purpose described and represented.

3. The combination of the traversing die B, the head-die 4, and the double-hinged dies L L, as at *m n*, with their spurs and recesses, for lapping the beveled ends of the blank, as and for the purpose described and represented.

4. The combination of the yielding holder 2 with the reciprocating and rising and falling die B, as and for the purpose described and represented.

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