(No Model.)

A. OWEN.

WIRE FORMING MACHINE.

No. 390,514. Patented Oct. 2, 1888.

Fig. 1.

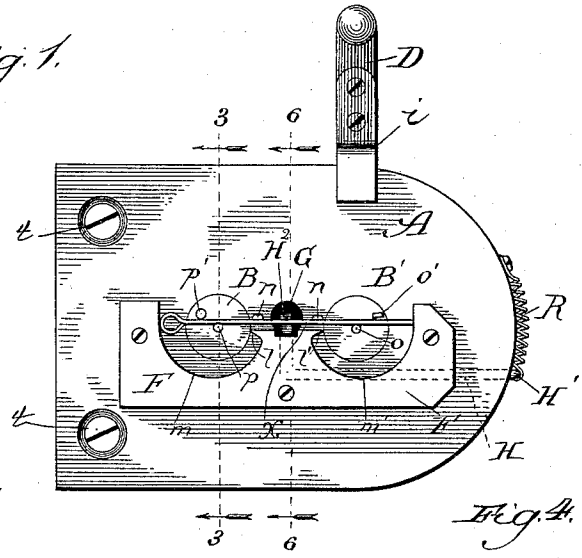


Fig. 2.

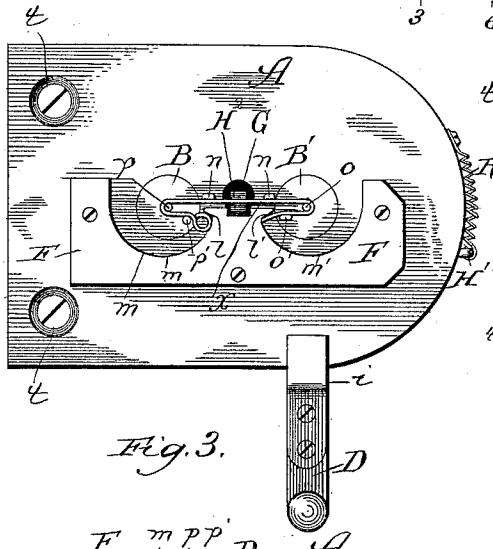


Fig. 3.

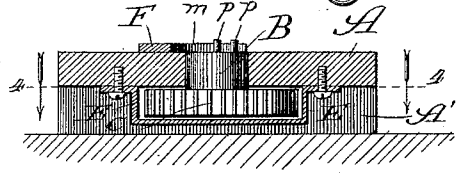


Fig. 4.

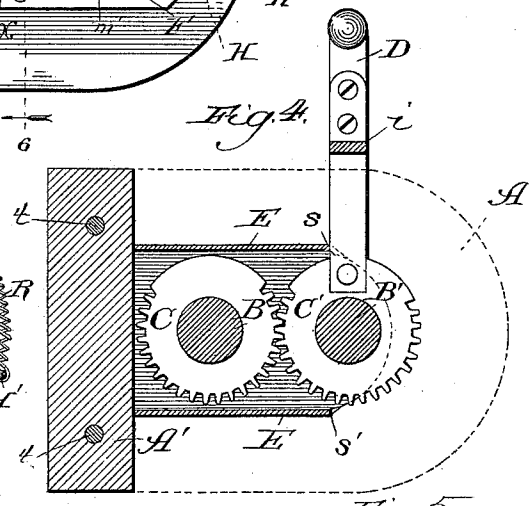


Fig. 5.

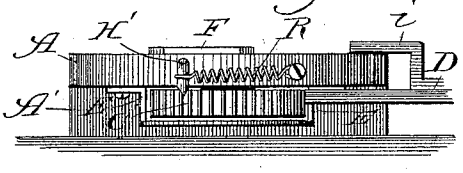
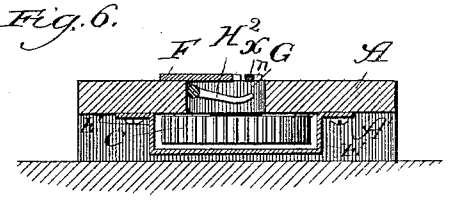


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALVA OWEN, OF CHICAGO, ILLINOIS.

WIRE-FORMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 390,514, dated October 2, 1888.

Application filed August 2, 1888. Serial No. 281,792. (No model.)

To all whom it may concern:

Be it known that I, ALVA OWEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Wire-Forming Machines, of which the following is a specification.

My invention relates to an improved machine for bending toward each other the opposite extremities of strips of wire; and it relates more particularly to a machine for forming a certain "clip," used by me in the construction of an electric belt, for which Letters Patent of the United States No. 368,546 were granted to me August 16, 1887.

My object is to provide a machine for bending the opposite ends of sections of wire toward each other to produce the clips above referred to as being used in my electric belt.

To this end my invention consists in the general construction of my improved machine, as well as in the more particular construction and combinations of parts.

In the drawings, Figure 1 is a plan view of a machine for forming the clips, showing a blank or section of wire adjusted upon it to be operated upon and the relative positions of parts previous to their operation to reduce the blank to a clip; Fig. 2, a similar view showing the wire bent to form the clip and the relative positions of the parts of the machine at the end of the operation; Fig. 3, a cross-section taken on the line 3 3 of Fig. 1 and viewed in the direction of the arrows, the blank being omitted to avoid obstructing parts which it is desired to present to view; Fig. 4, a horizontal section taken on the line 4 4 of Fig. 3 and viewed in the direction of the arrows; Fig. 5, an end view of the machine, and Fig. 6 a section taken on the line 6 6 of Fig. 1 and viewed in the direction of the arrows.

A is the bed-plate, rounded at one end and provided toward its opposite end with screw-holes *t t*, through which the device may be fastened upon a support.

B and B′ are turn-plates fitting snugly in circular openings through the plate A, their faces lying flush with the upper surface of the latter. On the under side of the base-plate are gear-wheels C C′, rigidly secured to the turn-plates B B′, or integral therewith, the latter serving as journals for the gear-wheels, their bearings being the circular openings through the bed-plate before mentioned. The gear-wheels C C′ are in mesh with each other, as shown, and the teeth extend, preferably, only part way around the periphery of each. A lever, D, secured eccentrically to the gear-wheel C′, serves as a means to rotate the latter and turn-plate B′ in one direction and the gear-wheel C and turn-plate B in the opposite direction.

Toward the end of the plate A, provided with the screw-holes *t*, the plate carries a downward-projecting extension, A′, which may be a thickening of the plate A or a separate plate, through which the screw-holes *t* extend, and which reaches to a point below the lower surface of the gear-wheels C C′. A casing, E, secured to the under side of the plate A, serves to house the gear-wheels C C′ and retain them against displacement from their operative positions. The casing E abuts against the projection A′ at one end, and its sides toward the opposite end terminate at points *s s′*, the bottom extending beyond these points a short distance, as shown by dotted lines in Fig. 4, to hold the gear-wheel C′ and turn-plate B′ in place. The lever D projects through the open end of the casing E, the limits of its play being the points *s s′*.

The turn-plates B B′ are provided with formers, comprising, respectively, studs *p p′* and *o o′*, arranged, substantially, in the relative positions shown, the studs *o p* at the centers of their respective turn-plates, and the studs *o′ p′* (when the turn-plates are in their initial positions to permit the insertion of the blank, as hereinafter described) toward the outer edges of the latter. Between the turn-plates B B′ two studs, *n*, arranged as shown, are secured to the bed-plate A. A plate, F, having concavities *m m′* in one edge and projections or stops *l l′* between the concavities, is secured to the bed-plate A in the position shown.

The operation of my device as thus far described to form a clip from a blank is as follows: The blank consisting of a straight strip of wire, X, curled at one end into the form of an eye and of the proper length is inserted, as shown in Fig. 1, between the studs *o p* on one of its sides and the studs *o′*, *n*, and

p' on its other side, the opposite extremities of the blank touching or approaching very closely the edges of the concavities m and m' in the plate F. The lever D is then operated to turn the gear-wheel C C′ and turn-plates B B′, which causes the studs p' and o' to bear against the blank toward its opposite ends and bend it around the studs p o. As the lever approaches the stop s' the opposite ends of the wire come into contact with the stops l and l', whereby further turning of the lever until it reaches the stops s' causes the studs p' o' to bend the wire between its ends and the respectively adjacent studs o p, and thus complete the clip. (Shown in Fig. 2.) The studs n assist in keeping the wire in position during the operation and prevent the latter from bending between the points p o. The edges of the concavities m m' are exactly upon the lines which the ends of the wire during the operation of bending the latter must necessarily describe to insure perfect uniformity in the clips produced, and the edges thus prevent the possibility of shifting of the wire, which would spoil the symmetry of the clip, and also serve, with the studs n, to hold the wire in place during the bending operation. The wire during the formation of the clip becomes tightly drawn about the studs p o, and, as it requires more force to remove the clip from the machine than the operator can readily exert with his fingers or an instrument in the hand, I have provided mechanism for automatically discharging the clip after its completion. An opening, G, is provided in the bed-plate A between the turn-plates B B′ and a rock-shaft, H, having a lateral extension or wiper, H′, at one end extends longitudinally of the bed-plate A through a hole in the latter from the opening G to its rounded end, where the wiper H′ extends normally downward into the path of the lever D, and is held in a vertical position by the helical spring k, to be moved therefrom only against the expansion or contraction of said spring, which on the release of the wiper H′ forces the latter to its normal position. At its opposite end the shaft H carries a finger or striker, H^2, the free upturned end of which lies normally just below the wire X when the latter is in position. As the lever D is turned from the stop s' after the formation of a clip around to the stop s—its initial position—it strikes the wiper, thereby turning the shaft H to cause the finger H^2 to strike the clip and force the latter upward out of engagement with the studs which hold it, thus throwing it out of the machine. A guide-clip, i, attached to the lever D, extends over the edge of the upper side of the base-plate A, and prevents the lever during its engagement with the wiper from being forced downward.

While I prefer to employ the lever D and gear mechanism shown for the purpose of communicating motion to the disks B B′, any other mechanical agency operating to produce the same effect upon the turn-plates would be the mechanical equivalent of the lever D and gear mechanism shown, and therefore within the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. A wire-forming machine comprising, in combination, a bed-plate, A, turn-plates B B′, suitable gear mechanism for rotating the turn-plates, projections p p' and o o' on the turn-plates to engage a wire toward its opposite ends and bend it as they turn, and stops l l' on the bed-plate to obstruct the ends of the wire during a part of the bending operation, substantially as described.

2. A wire-forming machine comprising, in combination, a bed plate, A, turn-plates B B′, gear-wheels C C′, fixed to the turn-plates, a lever, D, connected with the gear-wheel C′ to rotate the latter, and through it the turn-plates, projections p p' and o o' on the turn-plates to engage a wire toward its opposite ends and bend it as they turn, and stops l l' on the bed-plate to obstruct the ends of the wire during a part of the bending operation, substantially as described.

3. A wire-forming machine comprising, in combination, a bed-plate, A, turn-plates B B′, carrying formers to engage a wire toward its opposite ends, a plate, F, upon the bed-plate A, having concavities m m', projections n upon the bed-plate between the concavities, and suitable gear mechanism for rotating the turn-plates, substantially as described.

4. A wire-forming machine comprising, in combination, a bed-plate, A, turn-plates B B′, carrying formers to engage a wire toward its opposite ends, and means for operating the turn-plates, comprising a lever, D, and gearing C C′, and discharge mechanism comprising a finger, H^2, upon a rock-shaft, H, and a wiper, H′, upon the outer end of the shaft extending into the path of the lever D, the whole being constructed and arranged to operate substantially as and for the purpose set forth.

5. A wire-forming machine comprising, in combination, a bed-plate, A, turn-plates B B′, carrying, respectively, projections forming studs p p' and o o', studs n upon the bed-plate A, between the turn-plates B B′, a plate, F, having concavities m m' and stops l l', discharge mechanism comprising a rock-shaft, H, wiper H′, finger H^2, and spring k, gearing C C′, lever D, and stops s s', the whole being constructed and arranged to operate substantially as and for the purpose set forth.

ALVA OWEN.

In presence of—
J. W. DYRENFORTH,
M. J. BOWERS.