J. SENFT.

LINK FORMING MACHINE.

APPLICATION FILED MAY 10, 1920.

1,432,573. Patented Oct. 17, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

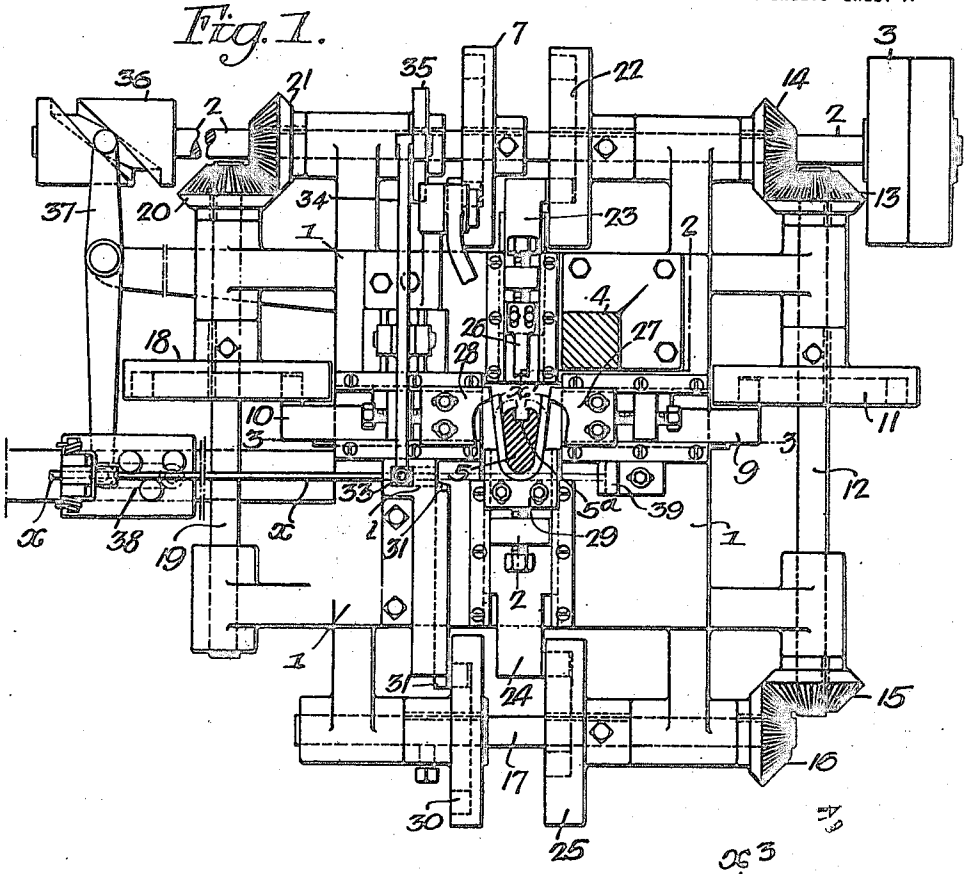
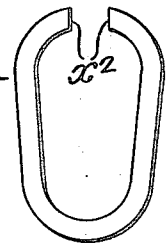


Fig. 5.



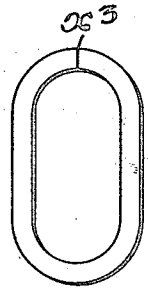


Fig. 6.

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2 SHEETS—SHEET 2.

Fig. 2.

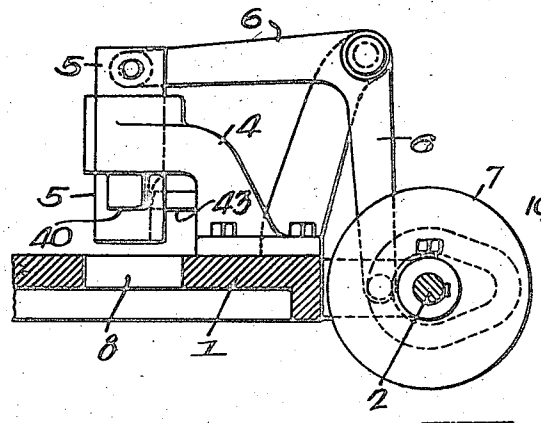


Fig. 3.

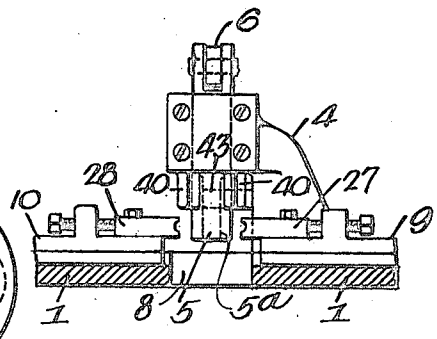
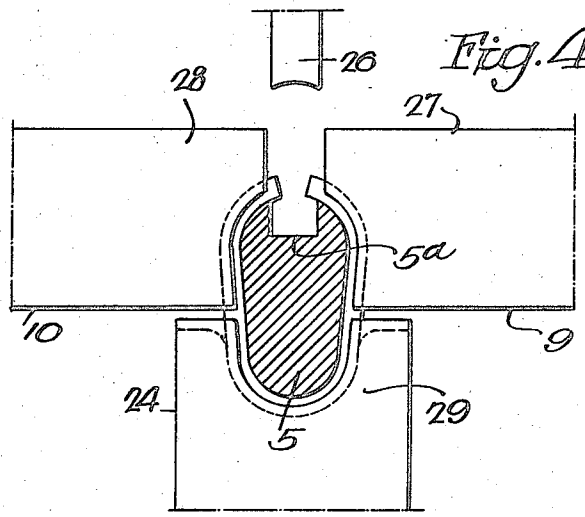


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN SENFT, OF YORK, PENNSYLVANIA, ASSIGNOR TO UNITED STATES CHAIN AND FORGING COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF DELAWARE.

LINK-FORMING MACHINE.

Application filed May 10, 1920. Serial No. 380,210.

To all whom it may concern:

Be it known that I, JOHN SENFT, a citizen of the United States, residing in York, Pennsylvania, have invented Link-Forming Machines, of which the following is a specification.

One object of this invention is to provide a relatively simple, substantial mechanism for forming a chain link blank which shall have the faces of its ends plane and parallel, so that when closed, it will form a perfect link, or when welded less current and time will be required.

Another object of my invention is to provide a link forming machine with novel means for cutting or forming the ends of the blank so that they may be later closed and when in this position will be perfectly opposed and substantially in contact over their entire surfaces.

I further desire to provide a machine of the character noted which shall have its parts so arranged as to permit of its operation at high speed and with a minimum of attention and repair, the arrangement being such that the length of wire from which the blank is to be formed has its ends trimmed or cut so as to be parallel after it has been given its final form.

These objects and other advantageous ends I attain as hereinafter set forth, reference being had to the accompanying drawings, in which,

Fig. 1 is a plan of a link forming machine showing my invention as applied thereto;

Figs. 2 and 3 are respectively vertical sections on the lines 2—2 and 3—3, Fig. 1;

Fig. 4 is an enlarged plan, to some extent diagrammatic, illustrating the operation of the machine; and

Figs. 5 and 6 are plans illustrating the link blank made by my machine after its ends have been trimmed and after it has been closed respectively.

In the above drawings 1 represents a supporting frame or table, having bearings for a main driving shaft 2 to which power is applied through a pulley 3. At or adjacent its center this table is provided with a standard or upwardly extending bracket 4 (omitted from Fig. 1 for the sake of clearness), providing a guideway for a vertically slidable king post 5. The latter is actuated through a lever 6 controlled by a cam 7 fixed to the main shaft 2.

Immediately under the king post is formed an opening 8 in the table 1 which is provided with two guideways on opposite sides of the king post 5 in which are operative transversely movable slides 9 and 10, the first being actuated by a cam 11 on the shaft 12. The latter is carried in bearings supported by the frame or table 1 and is driven from the main shaft 2 through bevelled gears 13 and 14. It likewise transmits power through a pair of bevel gears 15 and 16 to a shaft 17 journalled at the front side of the frame or table 1.

The second transverse slide 10 through a cam 18 is actuated from a shaft 19 supported in bearings in the side of the frame 1 opposite the shaft 12, and like it is driven from the main shaft 2 through a pair of bevel gears 20 and 21. The main shaft also has fixed to it a cam 22 which actuates a slide 23 guided by a suitably formed portion of the frame 1 so as to be movable toward and from the king post 5.

In a fourth guideway formed in the front portion of the frame 1 is a slide 24 actuated by a cam 25 fixed to the front shaft 17. The king post has formed in its rear side or face a vertically extending groove or slot 5^a having substantially parallel sides designed to coact with a cutter 26 supported on and movable with the slide 23. The two slides 9 and 10 respectively have mounted on them a pair of formers 27 and 28 which with a third former 29 carried by the slide 24 are designed to cooperate with the king post 5 to form a link blank open at one end.

The front shaft 17 has fixed to it a second cam 30 designed to reciprocate a cutter 31 positioned to cooperate with a die 32 for cutting off predetermined lengths of the wire or rod material x from which the link blanks are to be made; and immediately to one side of this die is mounted a gripper 33 having two gripping surfaces designed to engage between them the material x. The gripper is actuated by a lever 34 controlled by a cam 35 on the shaft 2, and the latter also has fixed to it a cam 36 which through a lever 37 is caused to periodically feed said wire x through a straightening device 38.

Under conditions of operation the main

shaft 2 is driven by power applied to the pulley 3 and through the cam 25 the former 29 is retracted to permit of the wire x being fed by the lever 37 between said former and the king post 5 until its free end strikes a stop or abutment 39. Thereupon the cam 35 actuates the gripper 33 to cause the parts of it to engage the wire and hold it in its given position while the feed lever 37 moves back or away from said gripper and the cam 30 moves forward the cutter 31 with cooperates with the die 32 to cut off a definte length of said wire. Shortly thereafter the cam 25 moves rearwardly the former 29 so as to bend this length of wire around the front portion of the king post into the position indicated at x^1, and while said partially bent length of wire is held in this position, the two side formers 27 and 28 are moved toward each other by their respective cams 11 and 18, thus bringing the ends of the wire together as indicated in Fig. 4, so that they overhang the recess 5^a of the king post.

The cam 22 then moves the cutter 26 forwardly so that it shears off the inclined ends of the blank in such a manner as to make them perfectly parallel. The cutter 26 with the three formers 27, and 29 and 28 are then all retracted and the king post 5, through the cam 7 and lever 6, is moved vertically upward whereupon a pair of strippers 40 carried by the standard 4 on opposite sides of the king post force the completed blank off of the same, permitting it to drop through the opening 8 into a suitable receptacle.

In order to remove the sheared ends of the blank which in some instances have a tendency to remain in the recess 5^a I also mount on the standard 4 a clearing finger 43 which extends into said recess, and as the king post is raised, forces out of it any pieces of metal which may be held therein. Immediately after the former 29 is retracted to its former position, another length of the wire x is fed by the lever 37 through the straightening device 38, and between said former and the king post 5;—the gripper 33 being released to permit of its passage.

After the ends of the formed blank have been sheared off by the cutter 26 said blank has the appearance indicated in Fig. 5 at x^2 and after delivery from the machine, it may be closed as indicated at x^3 in Fig. 6, so that its parallel ends are brought into contact, it being thus possible to make a link which is mechanically perfect and completely closed. Moreover as will be appreciated by those skilled in the art, not only is the construction of the machine simple and substantial, but its arrangement and the disposition of its parts are such that it may be run at a high speed. If the link blanks in the form shown in Fig. 5 are to be welded, it is obvious that a minimum of current and time would be required owing to the parallelism of their ends and the completed link would have a finished appearance, without projections or fins.

I claim:—

1. The combination of means for bending a length of wire into the form of a link blank; and means operative after the bending of said length has been completed for cutting the end faces of said blank substantially parallel.

2. The combination of a king post; means for bending a length of wire around said post to form a link blank; and a member operative to simultaneously cut both ends of the blank to give them predetermined form.

3. The combination of a king post having a recess therein; formers for bending a length of wire around said post to form a link blank; and a cutter coacting with the edges of the recess of said post to make the end surfaces of the blank parallel.

4. The combination of a king post having a recess; means for feeding and cutting off a length of a wire adjacent the king post; formers for bending the wire around the post with its ends adjacent said recess; and a cutter coacting with the edges of the recess to give said ends a predetermined form.

5. The combination of a movable king post having a recess; means for feeding and cutting off a length of a wire adjacent the king post; formers for bending said length of wire around the post with its ends adjacent said recess; a cutter coacting with the edges of the recess to give said ends a predetermined form; with means for moving the king post to disengage the formed blanks therefrom.

6. The combination of a king post having a longitudinally extending recess therein; means for moving said king post; a member extending into the recess to clear material therefrom when the post is moved; means for bending a length of wire around the post to form a link blank; and a cutter cooperating with the edges of the recess to give the ends of the blank a predetermined form.

7. The combination of a king post having a longitudinally extending recess therein; means for moving said king post; a member extending into the recess to clear material therefrom when the post is moved; means for bending a length of wire around the post to form a link blank; a cutter cooperating with the edges of the recess to give the ends of the blank a predetermined form; with at least one stripping member positioned to remove a formed blank from the post when the latter is moved.

8. The combination of a king post wider

on one side than on the other and having a longitudinally extending recess in its wider side; means for bending a length of wire around said king post with its ends overhanging said recess; and a cutter cooperating with the edges of the recess to make said ends parallel.

9. The combination of mechanism for forming an elongated plane link blank open at one end; and means for thereafter cutting the adjacent faces of the ends of said blank to make them parallel.

10. The combination of a series of wire bending formers movable in substantially the same plane; a longitudinally recessed king post cooperating with said formers to shape a link blank and movable in a line substantially at right angles to their plane of movement; and a cutter cooperating with the walls of the recess of the king post to give the ends of a formed blank a predetermined form.

JOHN SENFT.