2 Sheets—Sheet 1.

J. SCHINNELLER & L. FITZPATRICK.

Machine for Forming Chain-Links.

No. 198,417. **Patented Dec. 18, 1877.**

fig 1

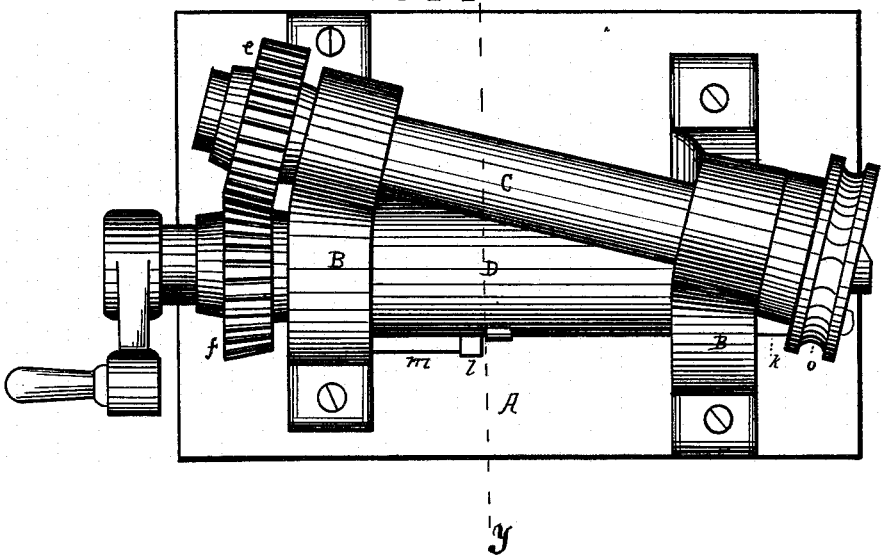
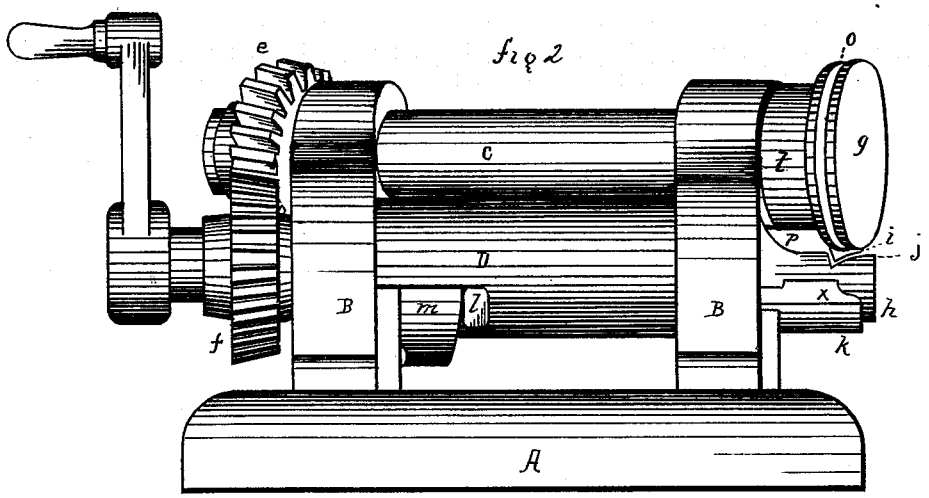


fig 2



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2 Sheets—Sheet 2.

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fig. 3

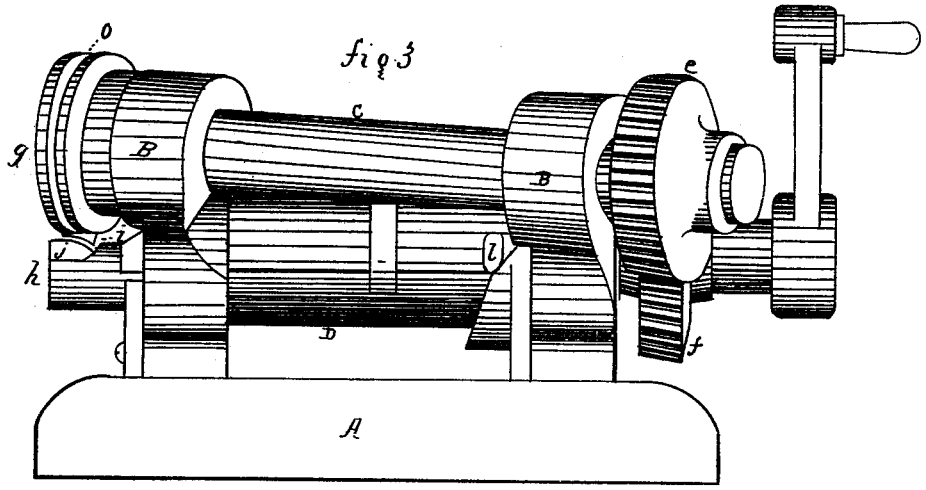


fig. 4.

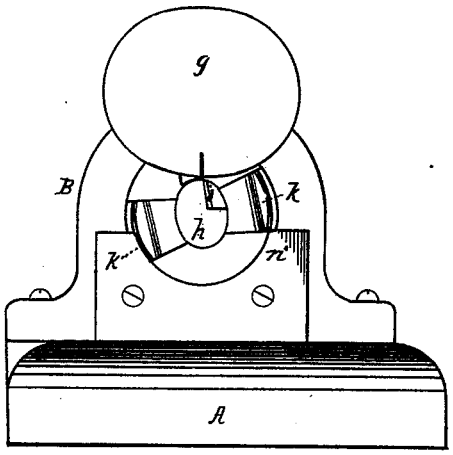
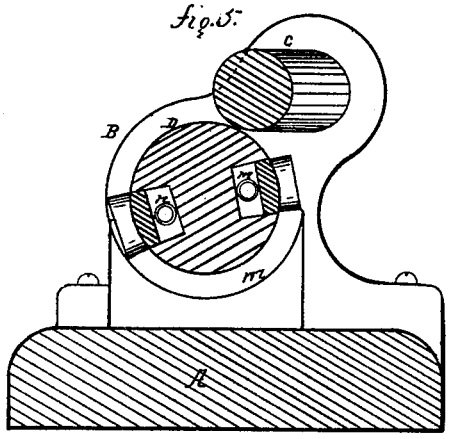


fig. 5.



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UNITED STATES PATENT OFFICE.

JACOB SCHINNELLER, OF PITTSBURG, PENNSYLVANIA, AND LUKE FITZPATRICK, OF BENWOOD, WEST VIRGINIA.

IMPROVEMENT IN MACHINES FOR FORMING CHAIN-LINKS.

Specification forming part of Letters Patent No. **198,417**, dated December 18, 1877; application filed October 1, 1877.

To all whom it may concern:

Be it known that we, JACOB SCHINNELLER, of Pittsburg, in the county of Allegheny and State of Pennsylvania, and LUKE FITZPATRICK, of Benwood, in the county of Marshall and State of West Virginia, have invented a new and useful Improvement in Link-Machines; and we do hereby declare that the following is full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The link-machine constructed in accordance with our improvement, and embodying our invention, has a revolving mandrel upon a shaft which is provided with one or more griping-fingers. These griping-fingers are thrown forward by the contact of a stop upon the same with a cam or eccentric, and retracted by means of suitable springs. A roller is employed in connection with the mandrel, and it is made of an oval shape in cross-section, and corresponding to the oval shape of the mandrel, so that the peripheries of the two at an intermediate point will be equidistant as the machine is operated. The shafts or axes of the mandrel and roller are set at an acute angle to each other, and operated so that the iron from which the link is formed will be wound around the mandrel spirally, and at each revolution of the mandrel a link-blank will be separated by a revolving cutter arranged in the periphery of the roller, and acting in conjunction with a corresponding cutter arranged in the mandrel.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

In the accompanying drawings, which form part of our specification, Figure 1 is a top view or plan of our improvement. Figs. 2 and 3 are side elevations of the same. Fig. 4 is an end elevation. Fig. 5 is a transverse section at line *y y* of Fig. 1.

In the drawings, A represents the base of the machine; B B, the bearings for the shafts or axes C D of the mandrel *h* and roller *g*. *e* and *f* are driving-gears, which are adapted in form to the angle of the axes C D. The mandrel *h* is of oval form when viewed in cross-section, and the roller *g* is of corresponding form, so that during the operation of the machine their peripheries will, at a point intermediate between the two, be at all times equidistant. The roller is provided with a groove, *o*, in which is placed a cutter, *i*, which operates in conjunction with a cutter, *j*, placed in the mandrel *h*.

Within a groove or grooves formed longitudinally in shaft D of the mandrel we arrange one or more sliding fingers, *k*. These fingers are thrown forward toward the mandrel by means of a stop or projection, *l*, upon the finger, which, as the shafts are rotated, strikes against a cam or eccentric, *m*, and thereby causes the said finger to slide in the direction above indicated. After a finger has been thus thrown forward to its fullest extent by the cam and stop, as described, the finger will be retracted toward the gear-wheels, or, in other words, away from the mandrel, and to a point where the stop will come into contact with the commencement of the cam incline by means of a suitably-arranged coiled spring, *n*, which is here represented as adapted to operate within a recess upon the inner or under side of the body of the finger.

During the outward movement of the finger or fingers *k* the plate *n'* will press the finger or fingers *k* toward the mandrel, so as to grasp the iron between said finger and mandrel.

The operation of our improvement is as follows: The rod of iron from which the link is formed is entered at *p* between the roller *g* and mandrel *h*, the point of the iron being placed in the recess *x* of the finger *k*, and the revolving of the mandrel and roller will wind the iron in a spiral form around the mandrel *h*, and at each revolution of the mandrel and roller the cutters *i* and *j* will separate a link from the rod. The cutters are set at an angle for the purpose of giving the desired scarf for welding. The office of the fingers *k* is to hold the iron in close contact with the mandrel *h*, and at the same time shove the iron under the roller and give it the proper spiral. The finger *k*, after the iron has been wound around the mandrel sufficiently to form a link, is withdrawn by the spring *n*, and is projected

outward at each revolution of the mandrel and discharge of a link therefrom. The driving-gears *e f* are of peculiar construction, and must in all cases have their axes and teeth or cogs correspond to the angle of the axes C D of the roller and mandrel. The periphery of the roller *g*, being of greater circumference than the periphery of the mandrel *h*, will tighten the coil on the mandrel; but the part *t* of the roller *g* should not bear tightly on the iron from which the link is formed, but merely enough so that it will not carry the iron ahead.

Having thus described the nature, construction, and operation of our improvement, what we claim is—

1. In a link-machine, the revolving mandrel *h*, with a griping finger or fingers, and roller *g*, provided with cutters *i j*, and having the axes of said mandrel and roller arranged at an acute angle to each other, whereby the iron from which the link is formed is spirally wound around the said mandrel, and a link separated therefrom at each revolution of said mandrel and roller, as and for the purposes set forth.

2. In a link-machine, the combination of the fingers *k*, provided with a projection, *l*, cam *m*, plate *n'*, and spiral spring *n*, with the mandrel *h* and roller *g*, operating with relation to each other substantially as herein described, and for the purpose set forth.

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Witnesses:
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