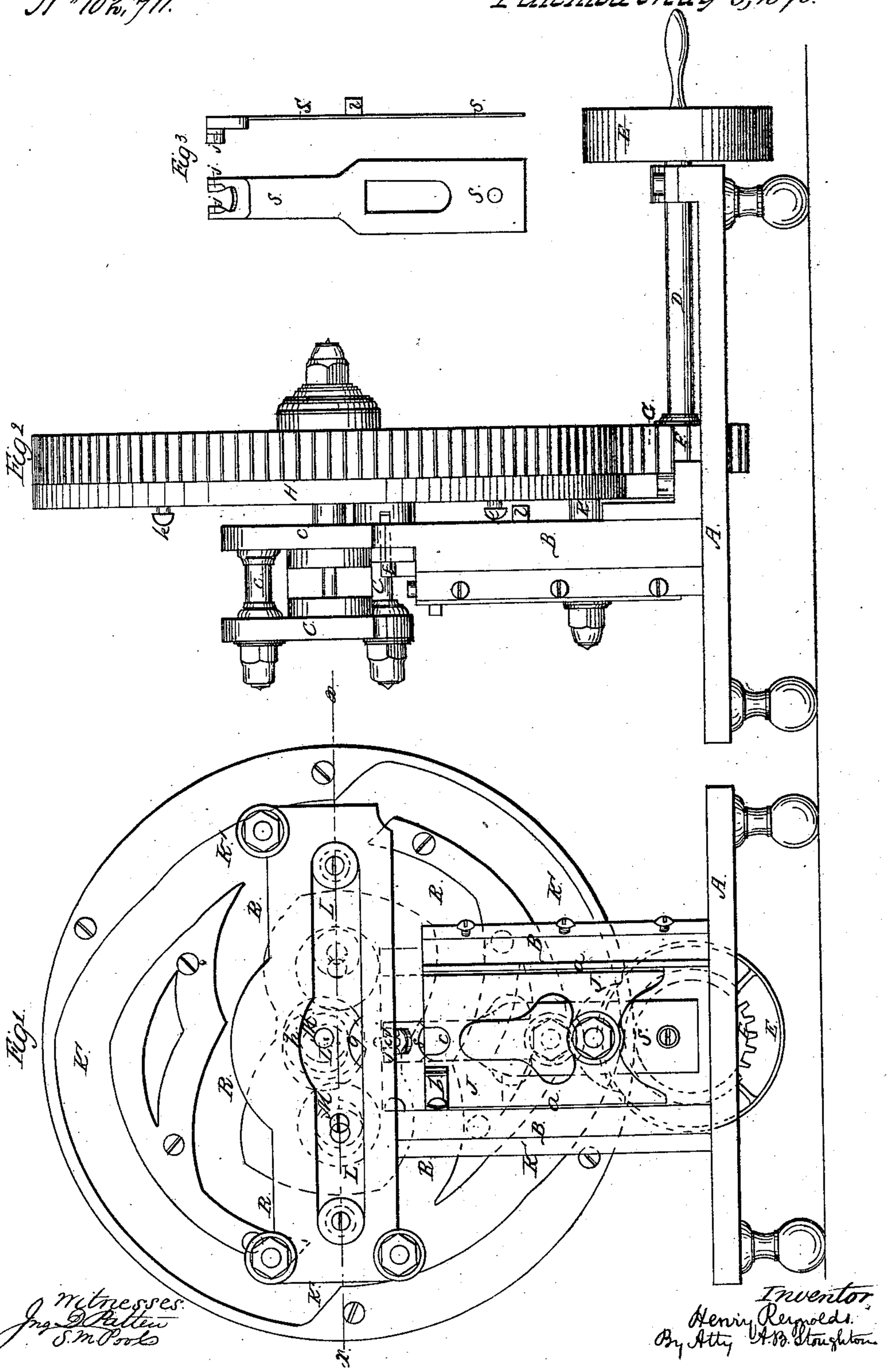
Sheet 1, 2 Sheets.

H. Reynolds.

Making Chain.

No. 102,711. Patented May 3, 1870.



Witnesses:
Jno. D. Patten
S. M. Pool

Inventor.
Henry Reynolds.
By Atty A. B. Stoughton

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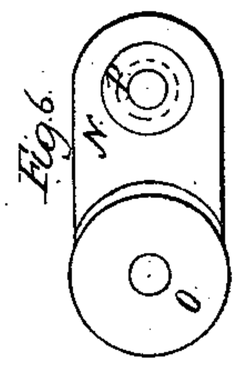

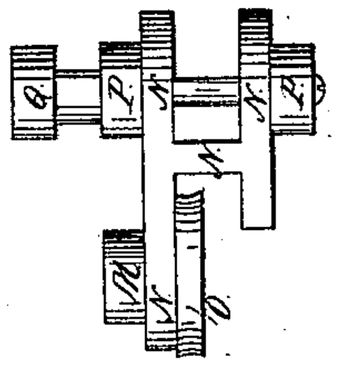

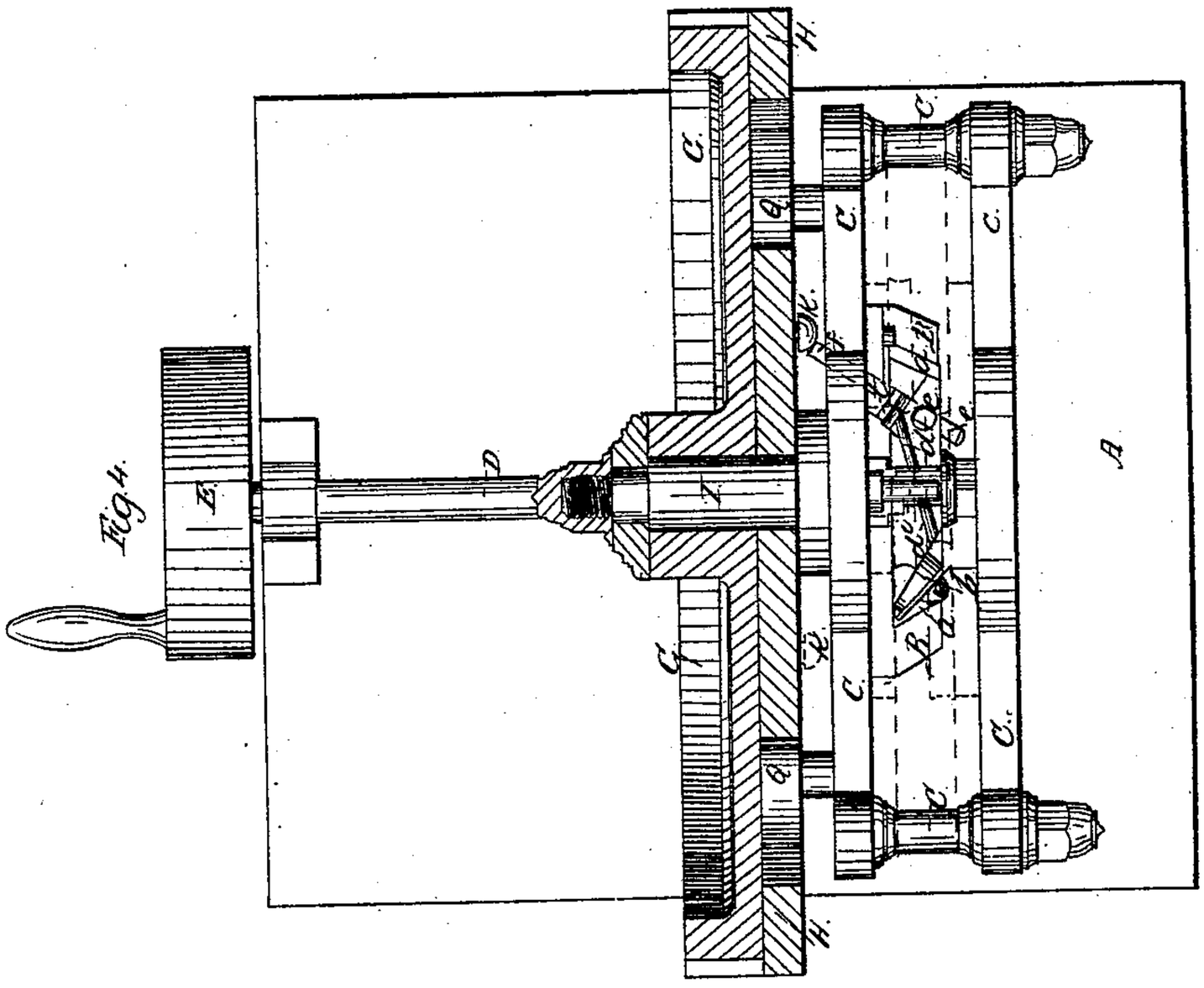

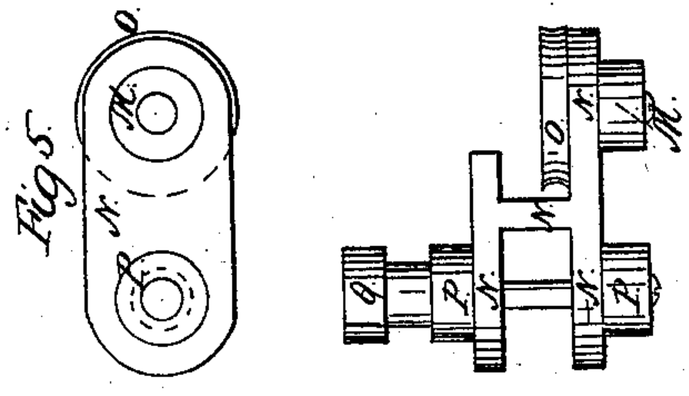

Witnesses.
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Inventor:
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UNITED STATES PATENT OFFICE.

HENRY REYNOLDS, OF AURORA, NEW YORK.

IMPROVED MACHINE FOR MAKING CHAIN-LINKS.

Specification forming part of Letters Patent No. **102,711**, dated May 3, 1870.

To all whom it may concern:

Be it known that I, HENRY REYNOLDS, of Aurora, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Machines for Cutting Off, Bending, and Shaping Links for Chains; 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 front elevation of the machine. Fig. 2 represents a side elevation thereof. Fig. 3 represents the tripping device detached from the machine, that throws the shaped link from the "former," over which it is bent. Fig. 4 represents a horizontal section through the machine, taken at the red line *x x* of Fig. 1. Figs. 5 and 6 represent the bending and shaping rollers and their traversing carriages detached from the machine.

Similar letters of reference, where they occur in the separate drawings, denote like parts of the machine in all of the drawings.

My invention relates to a machine for bending or shaping chain-links, which are afterward welded up into a chain; and to enable others skilled in the art to make and use the invention, I will proceed to describe the same with reference to the drawings.

A is a bed or base, upon which is mounted a pillow-block, B, with a horizontal slotted cross-head, C, secured to its upper end, these parts being made strong and rigid to support the operative parts of the machine.

On the base A there is a shaft, D, which may be driven by an endless belt or band extending from any first-moving power and passing around the pulley E. The shaft D carries a pinion, F, which works in the cogged gears G on the perimeter of a disk or cam-wheel, H, supported by and turning on a journal, I, secured to the pillow-block B. In the face of the disk or wheel H there is a series of cam grooves or ways for giving a regulated motion to the moving parts of the machine, as will be explained.

In suitable guiding-ways, *a a*, in the pillow-block B there is arranged a vertically-moving plate, J, which has upon it an adjustable gage, *b*, a die or former, *c*, an oblique groove, *d*, and a shear-cutter, *e*, Fig. 4, that works in connection with a stationary cutter, *f*, Fig. 2, for cutting off a blank from the rod or bar. The plate J has a stud, K, projecting from its rear, upon which a friction-roll is placed, that runs in the cam-groove K′ in the disk or wheel H, which camway is so made as that the rotation of the wheel H will cause the plate J to move up and down in the pillow-block.

In the cross-head or cross-frame C, on top of the pillow-block B, there is formed a slot or opening, L, having at its center a projection, *g*, on the under side, and a corresponding cut-away portion, *h*, on the upper edge, so that the friction-rolls M on the carriages N, that traverse in said slot or slots, (for there are two of them, one in each side piece,) may roll over said eminence *g*, for a purpose that will be explained. Each of the carriages N carries a grooved shaping and bending roll, O, and so arranged that they will pass by each other, as each one bends its end of the link or link-blank over the former *i*, and each bending-roll O rides up upon the elevation or swell *g*, and bend down or around the two ends of the link. Upon the two carriages N are other rollers—viz., those, P, which run in the slots L in the side pieces, C C, and are simply guiding and friction rolls, and those, Q Q, which extend into the cam grooves or ways R R in the face of the wheel H, and which camways cause the two carriages to move toward and from each other in bringing up and carrying back their respective bending-rolls O.

The former *i*, which is of the shape and size of the opening in the links, is of steel, and securely fastened to the pillow-block B. On two sides of this former *i* the forks or projections *j* of the spring delivering apparatus S stand, and as the delivery apparatus is moved by the studs *k* in the wheel H striking against the projection *l* of the delivery-plate and moving it outward, it throws off the bent link in a condition ready to be welded.

The blank is cut off from the rod or bar so as to leave a scarfed end; and when the two scarfed ends are brought up together by the bending-rolls they lap past each other, so that they are readily and uniformly welded by a lap-weld; but the scarfs or oblique cuts of the bent-up link do not face each other. On the contrary, as shown underneath Fig. 4, the weld

is formed by contact of the backs of the links, calling those the backs that are on the opposite sides from the scarfs.

m shows one of the pieces as cut off between the gage *b* and the cutters *e f*, and *n* represents said piece as bent up into a link and ready to to be welded.

The operation is as follows: The bar is fed in obliquely in the groove *d*, Fig. 4, until it reaches the gage *b*. The cutter *e* comes up and cuts off the piece between itself and the fixed cutter *f*. The moving plate J, which has the cutter *e* as well as the die *c* upon it, takes the piece cut off and carries it up and bends it around the former *i*. The two grooved bending-wheels *o* now approach each other, and each of them takes its end of the U-shaped piece and bends it over the top of the former, so that the two ends shall lap past each other and the scarfed ends on the outside. In this form the links are welded into a chain and a better weld attained than when the lap is made by the scarfed edges.

Having thus fully described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. In combination with a fixed former and a vertically-moving die-plate that receives, holds, and carries up the blanks obliquely to the former, the horizontally-traversing bending-rolls for bending and shaping said blanks into chain-links, substantially as described.

2. The arrangement herein described in relation to one another of the oblique holding-groove, the cutters, the former, and the rolls, in virtue of which the ends of the bent-up link shall lap each other, so that the weld shall be on the round part of the rod and not on the scarfed ends or surfaces, substantially as described.

HENRY REYNOLDS.

Witnesses:
E. T. BROWN,
TALLMS. DELAFIELD.