J. RUSSELL.

Making Cut Nails.

No. 49,653. Patented Aug. 29, 1865.

Fig. 2.

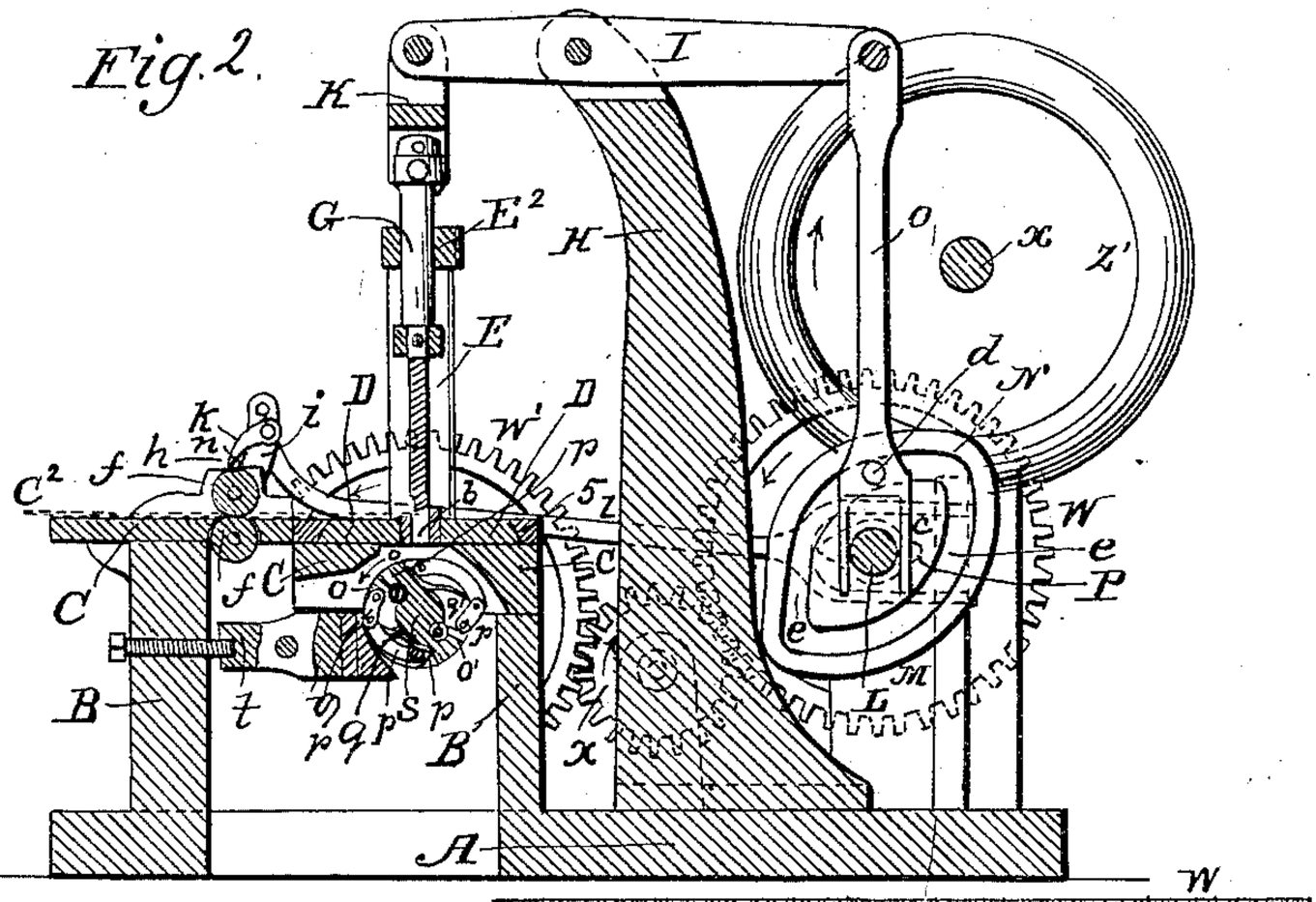

Fig. 1.

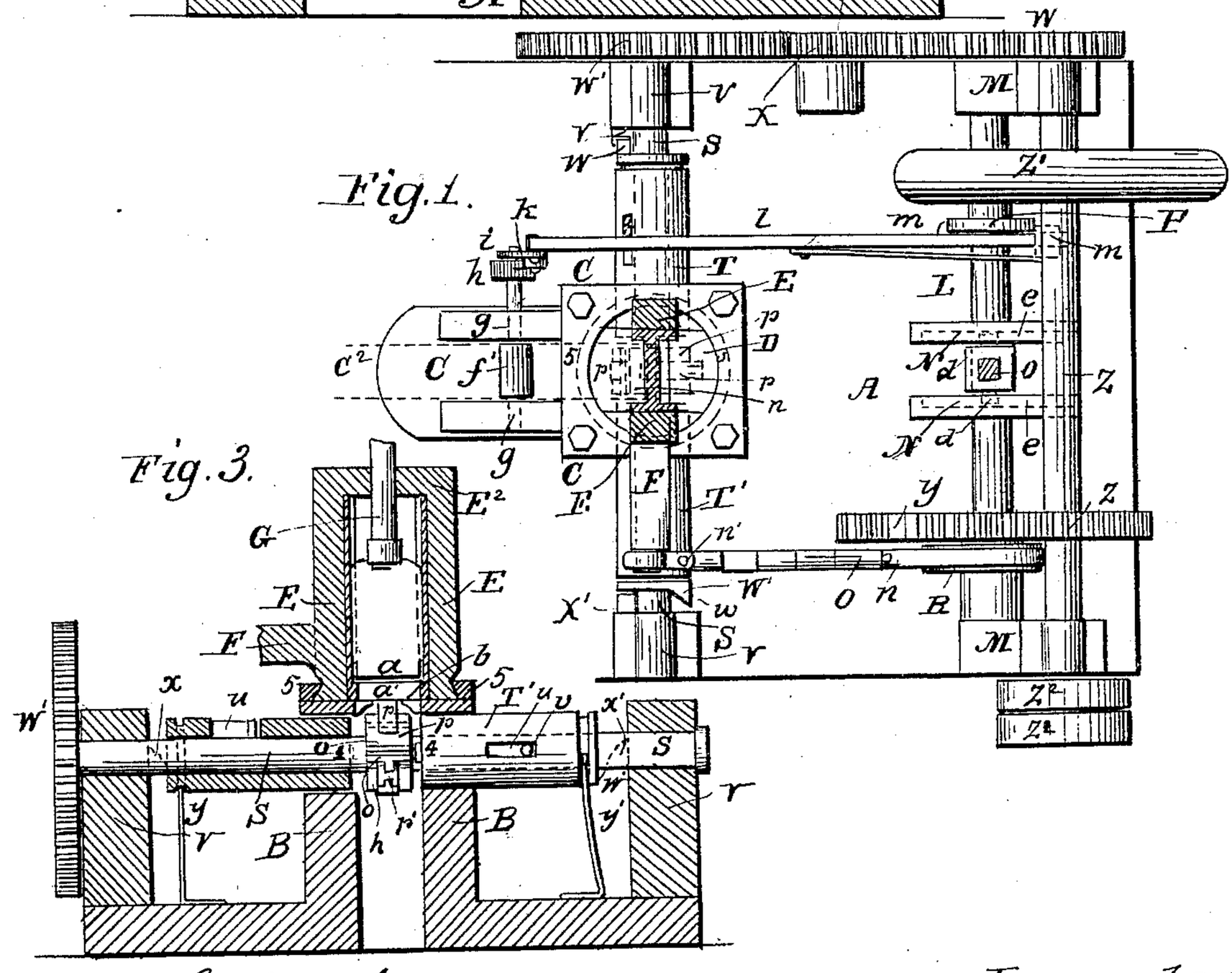

Fig. 3.

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JACOB RUSSELL, OF BROOKLYN, NEW YORK.

NAIL-MACHINE.

Specification forming part of Letters Patent No. **49,653,** dated August 29, 1865.

To all whom it may concern:

Be it known that I, JACOB RUSSELL, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Machine for Cutting and Heading Nails; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan of the machine, partly in section. Fig. 2 is a central vertical section of the same, taken at right angles to the shafts. Fig. 3 is a sectional view at right angles to Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in the combination, in a machine for cutting and heading nails, of a pair of cutters having an oscillating motion about an axis perpendicular, or nearly so, with their cutting edges, a direct forward-feeding mechanism, and a pair of reciprocating headers.

It also consists in a novel arrangement of revolving clamps and revolving and reciprocating headers, the said clamps receiving the nail-blanks as they are cut from the plate and holding them while the said headers operate upon them.

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

Upon a bed-plate, A, several standards are erected for the support of the different parts of the machine. The standards B B support a table, C, and the cutter-frame with the cutters *a a'*.

The cutter-frame consists of a horizontal circular base, D, which is fitted into a suitable bearing, 5, on the table C, in which it is free to oscillate on a vertical axis. To this circular base D, on the top of it, are firmly attached two vertical guides, E E, and a horizontally-projecting arm, F, Figs. 1 and 3. The guides E E are connected at the top by a cross-bar, E^2, Figs. 2 and 3, through the center of which I fit a plunger, G. The base D has an opening, *b*, Fig. 2, in line with the guides E E, into which is inserted the lower cutter, *a*, securing it firmly to the base D. The upper cutter, *a'*, Figs. 2 and 3, is fitted between the guides E E, and attached firmly to the plunger G, Figs. 2 and 3, in such a manner that when the cutter *a'* moves downward the cutting-edges of both cutters will come in close contact, so as to cut a plate of iron with a shear-like action.

The standard H supports in proper bearings a lever, I, Fig. 2, to one end of which I connect the plunger G by means of a swivel connecting-link K.

Back of the standard H, at right angles to the lever I, the main shaft L is placed, supported by suitable standards, M M. The said main shaft L has upon it two grooved double cams, N N.

To the back end of the lever I a rod, O, is attached, having on its lower end two prongs, *c c'*, said prongs passing between the two double cams N N, one prong on each side of the main shaft L. The ends of a pin, *d*, Fig. 2, passing through the lower part of the connecting-piece O, just above the prongs *c c'*, fit into the grooves *e e* in the opposite inner faces of the double cams N N.

In front of the cutter-frame I place two feed-rolls, *f f'*, Fig. 2, one above and one below the face of the table C, supported in suitable bearings, *g g*, which bearings also act as guides for the nail-plate C^2, (shown in red color,) to be fed by the rolls *f f'*. The upper feed-roll, *f'*, has attached to one end of its shaft a ratchet-wheel, *h*, and a pawl-lever, *i*, with a pawl, *k*.

From the pawl-lever *i* a connecting-rod, *l*, passes to the main shaft L, where this connecting-rod *l* is forked, one prong passing below and one above the main shaft L. The main shaft is here provided with a double cam, P, and the connecting-rod *l* is provided with proper projections, *m m'*, against which the double cam P may work and cause the feed-rolls *f f'* to operate.

The horizontal arm F of the cutter-frame is connected by a rod, Q, with an eccentric, R, on the main shaft. This rod Q is provided with joints *n n'*, so that it may accommodate itself to the different positions it has to assume while it is giving the oscillating movement to the cutter-frame.

Directly under the opening *b* in the base D of the cutter-frame there is arranged, in bearings in standards V V, a shaft, S, which carries two pairs of clamps, *o o* and *o' o'*, (see Figs. 2 and 3,) and two headers, T T'. The

said clamps are to receive the nails or nail-blanks after they are cut, and to gripe and hold them while they are being headed. They are hinged together, and are attached to suitable stocks, *p p'*, which are fastened to the shaft S. The clamps are closed by means of toggle-joints *r r'*, coming in contact with the curved surface *s*, Fig. 2, of a piece, U, held in a stationary position, and connected with a screw, *t*, by which it can be adjusted so as to give more or less gripe to the clamps, according to the size of the nails intended to be held by them. The opening of the clamps is effected by springs *q q'*, attached to the stocks *p p'* and acting upon the toggle-joints.

The headers T T' consist of sleeves, which are fitted to slide lengthwise upon the shaft S, and should be provided with steel dies 4 4 on those parts of their ends where the nails are headed, and they are made to revolve with the shaft S by means of slots *u* in the sleeve and pins *v* fastened to the shaft S, Figs. 1 and 3. The outer ends of the sleeves or headers are provided with inclined projections *w w'*, Figs. 1 and 3, and likewise the two standards V V, Figs. 1 and 3, have inclined projections *x x'*, by which means the headers, as they revolve, are moved lengthwise of the shaft S to produce the heading operation. The headers are drawn back again by means of springs *y y'*, Fig. 3.

The ends of the shafts L and S are provided with gear-wheels W W', Figs. 1 and 2, and connected by an intermediate gear-wheel, X, Figs. 1 and 2.

The main shaft L is provided with a larger geared wheel, Y, Fig. 1, which gears with a pinion, Z, on the driving-shaft *z*, which shaft *z* is provided with a fly-wheel, Z', and pulleys Z^2.

The operation is as follows: Power being applied to pulleys B^2 will set the driving-shaft *z* in motion, and this will impart motion to the main shaft L by means of the pinion Z and the gear-wheel Y. The main shaft L will impart motion to the shaft S, which carries the clamps *o o* and *o' o'* and headers T T, by means of the gear-wheel W, intermediate gear-wheel, X, and gear-wheel W'. Now, when the nail-plate C^2, as shown in red ink, Figs. 1 and 2, is placed upon the table C, between the feed-rolls *f f'*, and brought forward to the cutter-edges, the feed-rolls being turned by the action upon the ratchet-wheel *h* of one of the cams P, Fig. 2, through the connecting-rod *l*, pawl-lever *i*, and pawl *k*, carry the plate of iron C^2 the width of a nail beyond the edge of the cutter *a*. Then the upper cutter, *a'*, being operated by the cams N N' through the connecting-piece O, the lever I, and connecting-link K, will come down and cut off one nail-blank from the plate C^2. When the blank is cut off it will drop through the opening *b* into one of the two pairs of clamps, where it will be firmly grasped and held, as shown in Fig. 3, by means of the toggle-joint coming in contact with the curved surface *s*, and while the clamps are thus holding the nail one of the headers T T' will receive a sudden longitudinal impetus by means of the inclined projections *w* and *x*, and thus be made to strike the end of the nail and to form its head, after which the nail will be released from the clamp and allowed to drop into a receptacle provided for that purpose below. During the operation of the cutting of a nail the cutters will stand oblique to the feed-line of the plate, and after one nail has been cut the cutter-frame will oscillate and place the cutters in another oblique position, the direction of which relatively to the line of feed is the reverse of the first-mentioned oblique position. This oscillation is produced and governed by the eccentric R on the main shaft L through the connecting-rod Q. In this manner the nails will be cut of the right taper and be fed by a simple forward feed motion.

Having thus fully described my improved machine for cutting and heading nails, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The combination, in a machine for cutting and heading nails, of a pair of cutters having an oscillating motion about an axis perpendicular, or nearly so, with their cutting-edges, a direct forward-feeding device, and a pair of reciprocating headers, the whole operating substantially as herein specified.

2. Two or more pairs of jaws attached to one revolving shaft of a nail cutting and heading machine, when constructed, arranged, and operating substantially as and for the purpose herein specified.

3. The revolving and reciprocating headers, applied and operating, in combination with the revolving clamps and oscillating cutters, substantially as herein described.

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