(No Model.)

E. P. HURD.

NAIL MACHINE.

No. 399,410. Patented Mar. 12, 1889.

Fig: 1.

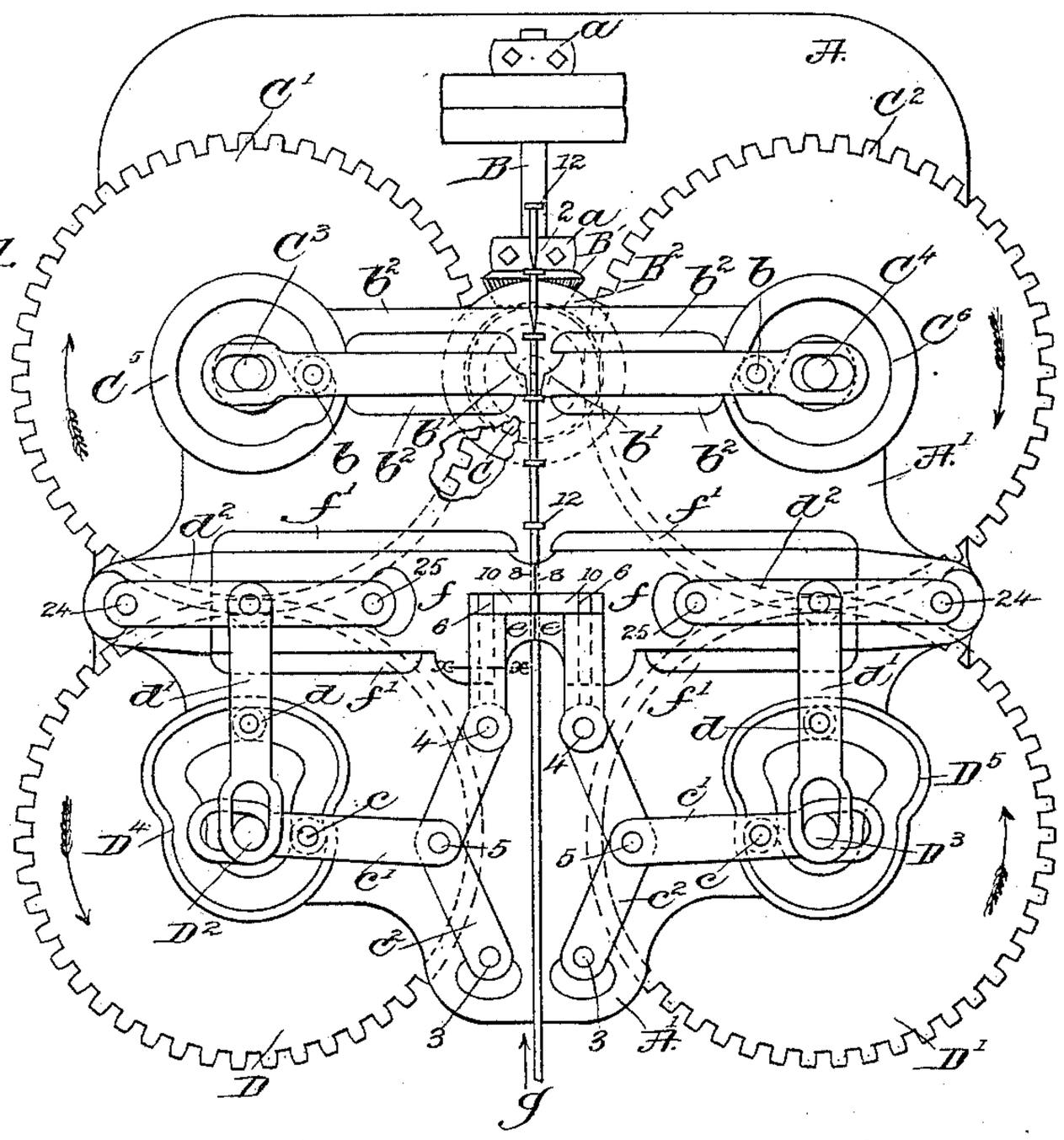

Fig: 2.

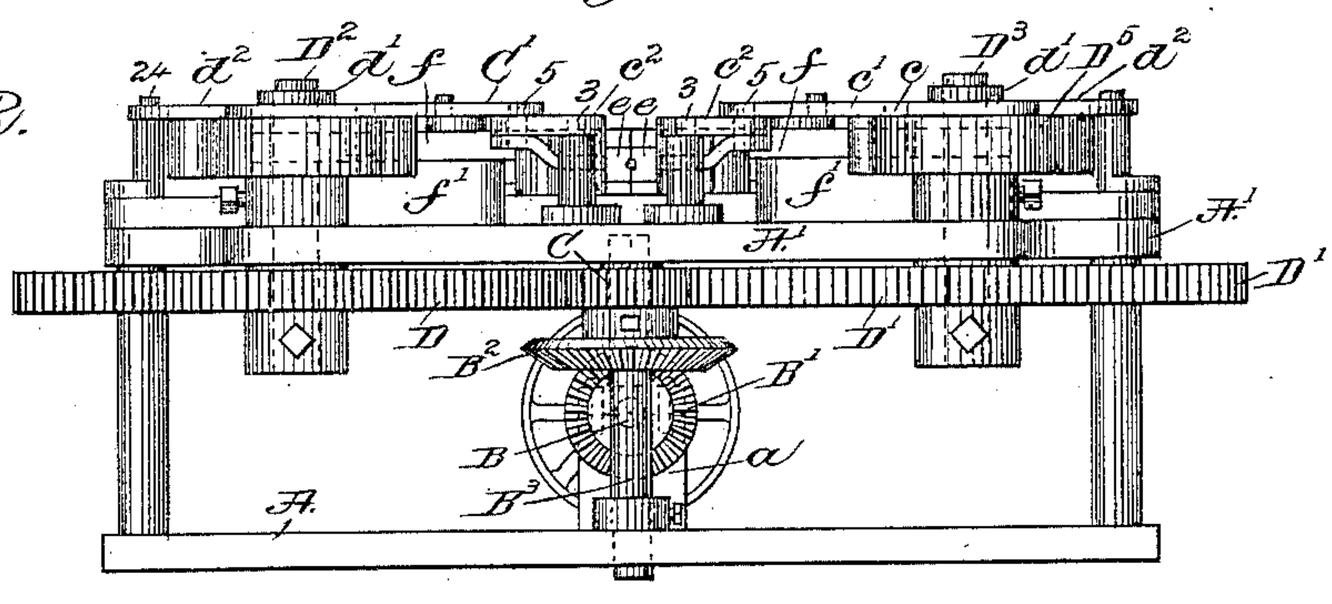

Fig: 3.

Witnesses.
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UNITED STATES PATENT OFFICE.

EDWARD P. HURD, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE McKAY & COPELAND LASTING MACHINE COMPANY, OF PORTLAND, MAINE.

NAIL-MACHINE.

SPECIFICATION forming part of Letters Patent No. 399,410, dated March 12, 1889.

Application filed November 15, 1887. Serial No. 255,200. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. HURD, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Machines for Manufacturing Nails, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of a machine for the manufacture of nails from wire.

In accordance with my invention the wire to be used is intermittingly grasped at points between its ends by clamping and upsetting dies which have a movement toward and from each other to not only grasp and release the wire at intervals, but also to enable a short length of the said wire between the clamping and upsetting dies to be upset at regular intervals to constitute a series of substantially equidistant enlargements of proper shape to form heads for a series of nail-blanks, which are left, preferably, in string form or joined together, the points for the nails being thereafter formed by point-compressing dies, which act upon the metal between adjacent heads and close to what is to be the top of the head of the next nail, the said point-forming dies serving to compress the body of the blank and form a tapering point, the point being formed, however, without necessarily severing the nails from the string and without waste of metal.

My invention consists, essentially, in a nail-making machine adapted to operate upon a wire, the clamping-jaws, the upsetting-jaws to grasp the wire near the clamping-jaws, and means to move one set of the said jaws toward the other to upset the wire grasped between them, combined with the independent pointing-dies and with means to actuate them, whereby the headed blanks yet connected together are pointed, substantially as will be described.

Figure 1 is a top or plan view of a machine embodying my invention, the same being partially broken out to show some of the gearing below the bed-plate; Fig. 2, a front elevation, and Fig. 3 a sectional detail in the line *x*.

The frame-work consists, essentially, of a base-plate, A, having suitable legs or uprights which support the table A′. The base-plate has suitable uprights which contain bearings *a a* for the power-shaft B, having usual fast and loose pulleys. The shaft B has a bevel-pinion, B′, which engages a bevel-gear, B^2, on and rotates the vertical shaft B^3, which above the said gear has a toothed wheel, C, that engages the toothed wheels C′ C^2, fast on the upright shafts C^3 C^4, the said shafts having fast to them, respectively, the face-cams C^5 C^6. The grooves in these face-cams receive like rollers or other studs, *b*, (shown by dotted lines,) of the point-compressing dies *b*′, fitted to slide in guideways b^2 on the table A′, the front end of the said dies being adapted, as best shown in Fig. 1, to act in succession upon each nail or blank of the connected series of blanks and form by compression a point, as 2, for each blank or nail next the head of the blank or nail to which it is joined in the string of nails.

The toothed wheel C′ C^2 engage, respectively, the toothed wheels D D′, fast on the vertical shafts D^2 D^3, the said shafts above the table A′ having fast on them, respectively, the face-cams D^4 D^5, each cam having a groove which receives in it like rollers or other studs, as *c d*, carried, respectively, by the links *c*′ d^2, the links *c*′ being connected to the toggle-levers c^2, while the links *d*′ are connected to like toggle-levers, d^2.

Each set of toggle-levers c^2 d^2 is composed of two links. Referring to the toggle-levers c^2, one of the links of each set is mounted on a fixed stud, 3, while the other links thereof are joined by pins 4 with the upsetting jaws *e*, the adjacent ends of the two links being united by a pin, 5, the latter also serving to join the link *c*′ to the said toggle-lever c^2.

The upsetting dies *e*, as herein shown, are composed of short bars provided, preferably, with T-shaped or equivalent-shaped grooves, (see Fig. 3,) to fit and be guided upon correspondingly-shaped guide-ribs 6, fast upon or forming part of the clamping-jaws *f f*, fitted to slide horizontally in guideways *f*′ *f*′, erected on or forming part of the table A′. The upsetting-dies have acting faces, as in Fig. 3, grooved to enable them to readily grasp snugly between them the wire to be made into nails.

The extent of reciprocation of the upsetting-dies toward the grooved acting faces 8 of the clamping-dies *f f*, and consequently the size of the head, is determined by the length of the open or other space, 10, between the upsetting and clamping jaws.

One link of each pair of links forming the toggle-levers d^2 is pivoted or mounted to turn on a stud, 24, erected on the table A′, while the other co-operating link is pivoted on a stud, 25, erected on the clamping-jaw *f*. The shape of the grooves in the cams D^4 D^5 are such as to cause the clamping-jaws to close upon the wire between them before the upsetting-jaws *e* start to move longitudinally toward the clamping-jaws to upset the wire between them.

Fig. 1 shows the wire *g* as held firmly by the clamping-jaws *f* and as grasped between the acting faces of the upsetting-jaws, both the said sets of jaws grasping the wire very firmly. In this condition the toggles c^2 are straightened, the cams D^4 and D^5 keeping the jaws *f* closed on the wire, and as the upsetting-jaws *e* move toward the clamping-jaws *f* the short length of metal or wire between the said jaws is upset, throwing out a collar or flange, which constitutes a head, as 12. The wire *g*, taken from a suitable coil, ball, or reel and led through, preferably, a straightening apparatus, (not shown,) will be passed to and through between the jaws *e f*, and will be upset, as stated, to form heads, and thereafter the wire provided with a series of collars or heads thereon at intervals will be fed longitudinally by usual feeding devices, (not shown,) which will present it, as shown, to the action of the point-compressing dies *b′*, which, acting upon the blank close to the head, will form by compression a point, as 2, upon the nail. The wire having been acted upon to form heads and points, as stated, leaving a series of nails connected head to point, will then be wound as a string of nails upon a suitable block or into a coil.

If desired, each nail may be severed or detached from the wire as it is pointed.

I have shown a series of links, levers, and cams by which to actuate the clamping and upsetting jaws; but I do not desire to limit my invention to the exact form of devices shown, but intend to include as within the scope of my invention any well-known or mechanical equivalents for the said devices.

I have not herein shown a feeding mechanism for the wire, as the same may be of any usual construction commonly used for feeding wire intermittingly.

I claim—

1. In a nail-making machine adapted to operate upon a wire, the clamping-jaws, and the upsetting-jaws to grasp the wire near the clamping-jaws, and means to move one set of the said jaws toward the other to upset the wire grasped between them to form the head of a nail, combined with the independent pointing-dies to act on the upset wire after it has been released by the clamping-jaws and fed forward, and with means to actuate the said pointing-dies, whereby the headed blanks yet connected together are pointed, substantially as described.

2. In a nail-making machine, the clamping-jaws *f*, having the guiding portions 6, combined with the upsetting-jaws *e*, adapted to slide thereon, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD P. HURD.

Witnesses:
G. W. GREGORY,
B. DEWAR.