2 Sheets--Sheet 1.

D. DODGE.

Machines for Finishing Horseshoe Nails.

No. 153,759. Patented Aug. 4, 1874.

Fig. 1.

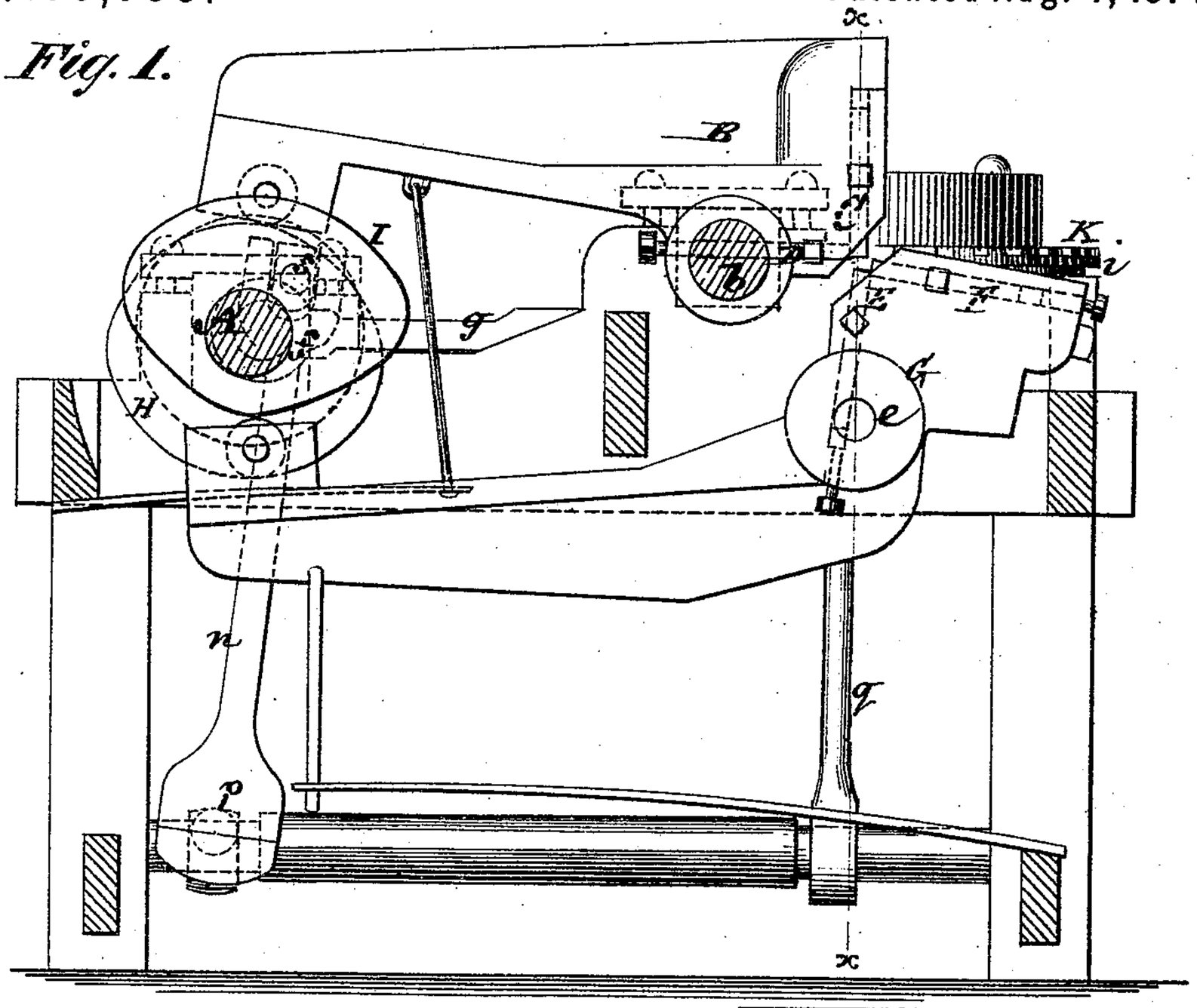
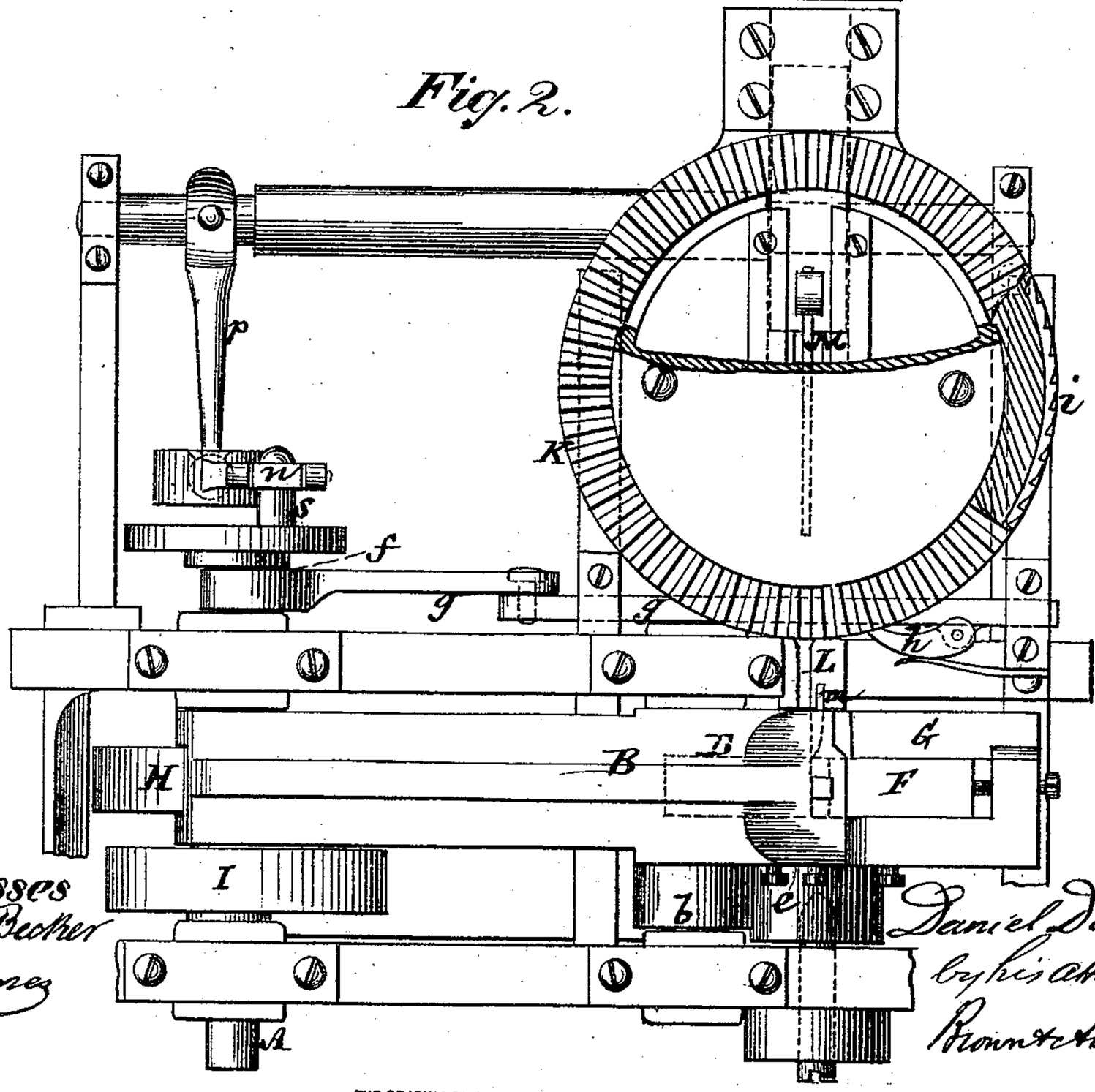


Fig. 2.



Witnesses
John Becker
F. Haynes

Daniel Dodge
by his attorneys
Brown & Allen

2 Sheets--Sheet 2.

D. DODGE.

Machines for Finishing Horseshoe Nails.

No. 153,759. Patented Aug. 4, 1874.

Fig. 3.

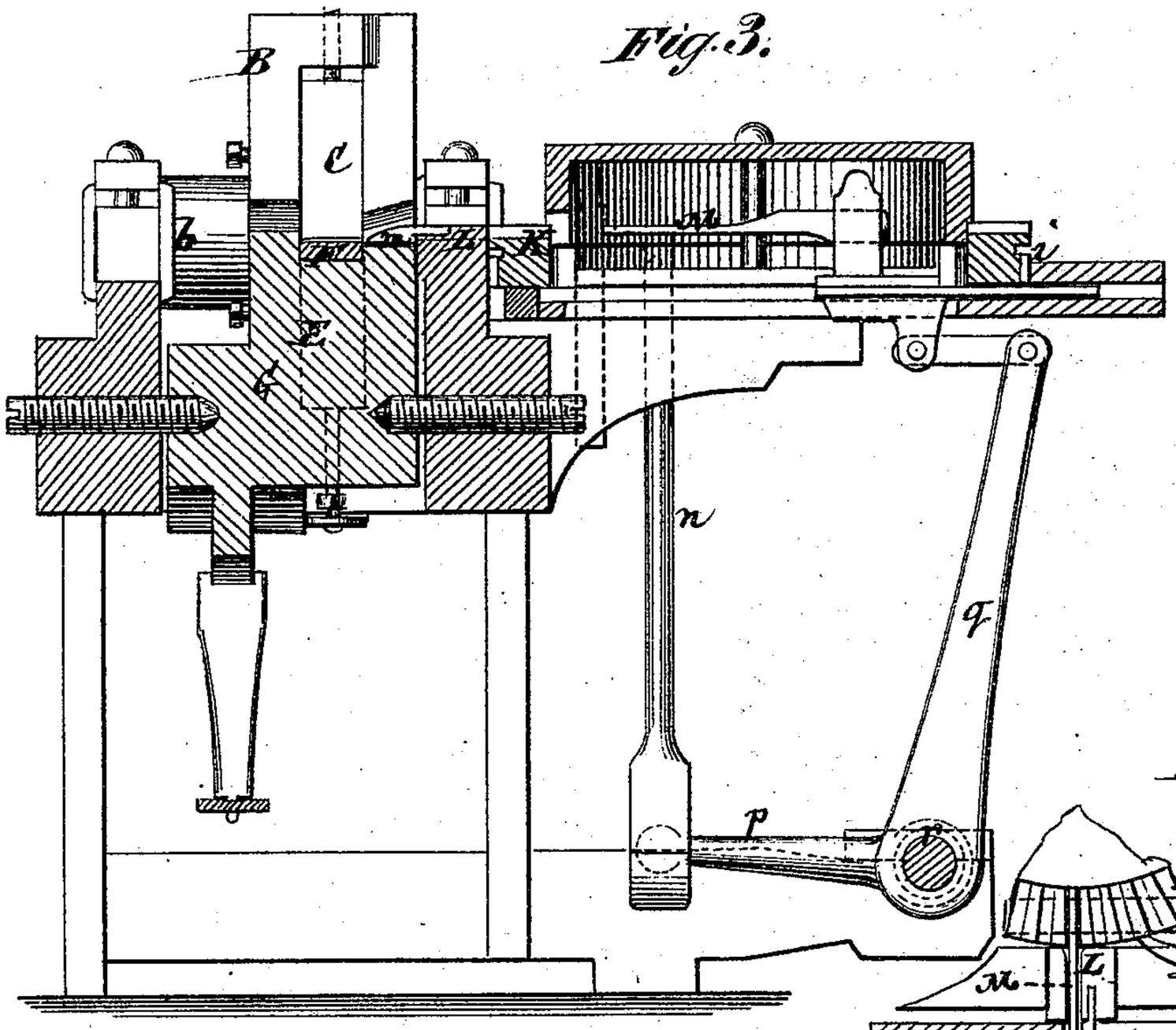


Fig. 4.

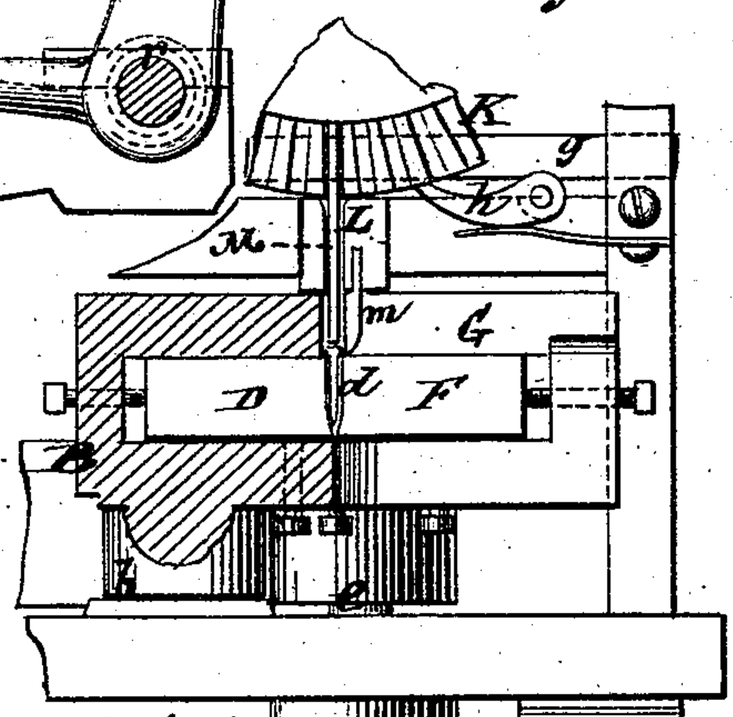


Fig. 7.

Fig. 6

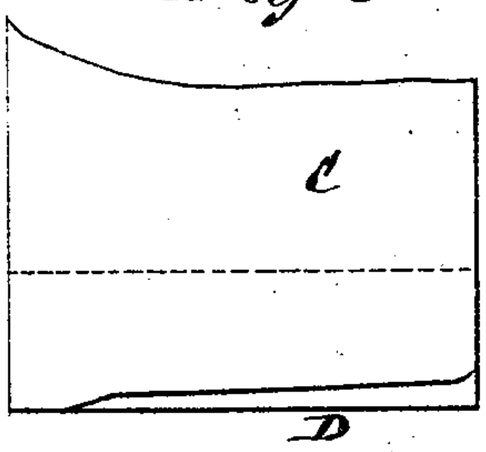


Fig. 8.

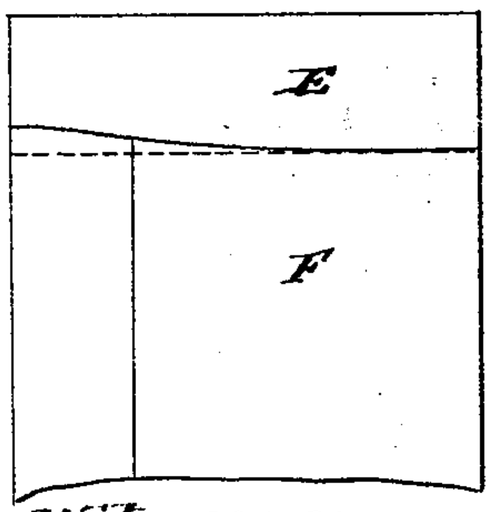


Fig. 5.

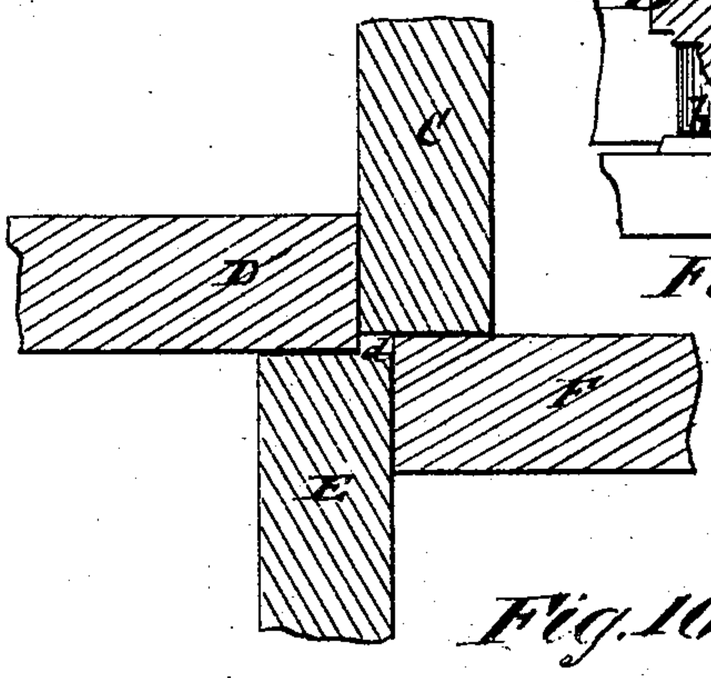


Fig. 10.

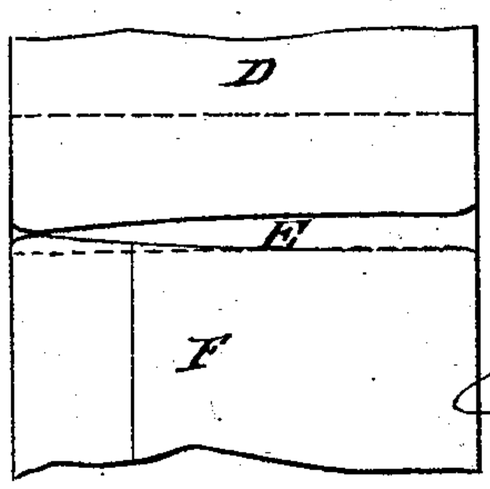
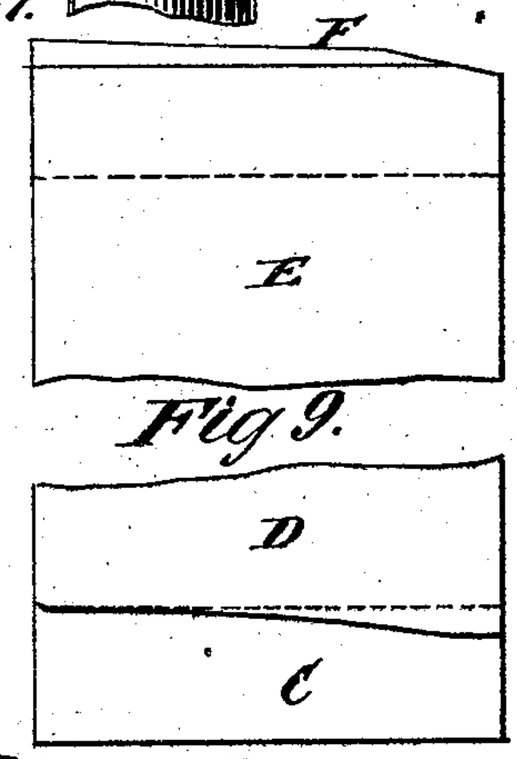


Fig. 9.



Witnesses.
John Becker.
Fred Haynes

Daniel Dodge
by his attorneys
Brown & Allen

UNITED STATES PATENT OFFICE.

DANIEL DODGE, OF KEESEVILLE, NEW YORK.

IMPROVEMENT IN MACHINES FOR FINISHING HORSESHOE-NAILS.

Specification forming part of Letters Patent No. **153,759**, dated August 4, 1874; application filed May 14, 1874.

To all whom it may concern:

Be it known that I, DANIEL DODGE, of Keeseville, in the county of Essex and State of New York, have invented an Improved Machine for Cold-Finishing Horseshoe and other Nails, of which the following is a specification:

This machine is more especially designed for cold-finishing horseshoe-nails, or more particularly the points thereof, after said nails have been forged, or rather forged and pickled to remove the scale. The invention generally consists in a combination of dies arranged for operation in pairs, which have a separate and independent action, and form a matrix by overlapping each other. It also consists in various novel combinations of devices for feeding in the nails and for carrying out the main or general principle of the invention.

In the accompanying drawing, Figure 1 represents a partly-sectional side elevation taken immediately within the one side frame. Fig. 2 is a plan of the machine. Fig. 3 is a transverse vertical section mainly on the line *x x*. Fig. 4 is a partly-horizontal section mainly in illustration of the feeding in of the nail. Figs. 5, 6, 7, 8, 9, and 10 are views, on a larger scale, of the dies used in the machine in certain relative positions with each other; Fig. 5 being a vertical section of the dies taken transversely to the working axes of the devices which carry them, showing said dies in their closed position. Fig. 6 is a longitudinal elevation of the upper and one of the side dies, carried by the same moving head or lever. Fig. 7 is a like view of the lower and other side dies. Fig. 8 is a plan of the two last-named dies in relation with each other; Fig. 9, an under view of the upper and its accompanying side die; and Fig. 10, a plan view of the lower and two side dies in relation with each other.

Similar letters of reference indicate corresponding parts.

In the machine represented in the accompanying drawing, A is a main revolving shaft, from which the several motions are derived, and B a main or upper lever, having its fulcrum at *b* and carrying an approximately-vertical upper die, C, and side die D, lying at right angles to each other, or thereabout, and fitted so that the front end of the die D butts or bears up against the back of the die C; and the meeting surfaces of the dies are so cut away that they leave a space or form a pressing-surface below the die C for the one edge of the nail *d* against the forward end of the die D, and for the one face of the nail on which the pcint is beveled against the under surface or end of the die C on or by which the point of the nail is beveled, the die C in such arrangement overlapping the die D, all substantially as shown in Figs. 1, 5, 6, and 9. E and F are the other dies of the opening and closing or contracting matrix, which latter the several dies constitute when closed. These last-mentioned dies, E and F, are carried by a separate rocking head or lever, G, having its fulcrum at *e*, and are arranged in rectangular relation with each other, and so that the bottom die E overlaps the accompanying side die F. The meeting surfaces of these dies are so cut away that they leave a space or form a pressing-surface above the die E for the remaining edge of the nail *d* against the forward end of the die F, and for the back or remaining face of the nail against the upper surface of the die E, all substantially as shown in Figs. 1, 5, 7, 8, and 10.

Prior to introducing the nails between the several dies, and which is done from the one side of the latter, said nails are forged and left with blunt points, and afterward pickled, and then submitted to the action of this cold-finishing machine, which serves to stiffen them and condense the metal, and draw out or form the points; also, to make uniform the general shape of the nails. To thus cold-finish the nails, the contiguous dies C D or E F, carried by their respective heads or levers B G, are not only arranged to overlap one another, as hereinbefore described, but, when closed to form the matrix, the dies of the one head or lever overlap the dies of the other head or lever, as represented in Fig. 5, the face of each die corresponding with one side or edge of the nail.

The nails are fed in between the dies, or into the matrix at its one side, when the top die C, by the operation of the lever B, is down, and the swinging head G is thrown partially back or open, after which said head is swung into

a closing position, so as to bring its side die F up against the nail, and, in conjunction with the dies C, D, and E, to form and point it. Then the levers B and G move so as to open the two pairs of dies C D and E F for the purpose of discharging the cold-finished nail, after which the swinging head G moves forward so as to partially close, or put into a receiving position, the dies E F, to be subsequently fully closed after the lever B has brought the die C fully down, and the nail to be acted on has been introduced between the dies. Thus the dies E F have three operations for each two actions of the other dies C D. Said swinging heads or levers B G are thus moved in timely relation with each other, as described, by means of cams H I on the main shaft A operating in conjunction with springs or weights.

By reason of the overlapping dies, arranged and operating as described, the matrix formed by the dies contracts after the same is closed, and no space is left for the metal to squeeze out or form a fin when pressure to cold-finish the nails is brought to bear upon the dies.

The nails are fed into the dies one at a time, at the periods hereinbefore named as regards the action of the dies, by means of an intermittently-revolving radially grooved or notched table, K, operated by an eccentric, *f*, on the main shaft A, rod or rods *g*, a pawl, *h*, and ratchet-wheel *i*, on the under side of the table—that is to say, these devices serve to bring the nails one at a time, the heads of which occupy an innermost position on the table, opposite, as regards their points, a grooved guide, L, having a finger or extension, *m*, on the one side of its groove, and operating, conjointly with the lever B, to direct the nail into between the dies. The nail is thus projected at the proper time into the matrix or between the dies by means of a follower or feeder, M, operated at intervals to project the nails, one at a time, out of the grooves in the intermittently-revolving table K as they come successively opposite the grooved guide L, a cam or eccentric pin, *s*, on a disk carried by the shaft A, rod *n*, lever or levers *p q*, and rock-shaft *r* serving to effect the action of the follower M, as described.

The two dies in either head or lever, instead of being made separate, might be made in one; but it is preferred to make them separate for the convenience of grinding and repair. In either case, said dies may be referred to as two pairs. The levers B G may also be differently operated to effect the desired result.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the two pairs of rectangularly-arranged dies C D and E F, having their faces made to correspond with the sides and edges of the nail, and the one die overlapping the other in either pair, and the dies of the one pair overlapping the dies of the other pair when closed to form the matrix, substantially as and for the purpose herein set forth.

2. The combination of the levers B G, having overlapping dies C D and E F, for operation in relation with each other, as described, for the purpose specified.

3. The combination of the intermittently-revolving grooved table K, the reciprocating feeder M, the grooved guide L, and the overlapping dies C D E F, substantially as specified.

DANIEL DODGE.

Witnesses:
MICHAEL RYAN,
FRED. HAYNES.