

A. D. BINGHAM.

Machines for Finishing Horseshoe-Nails.

No. 149,185.

Patented March 31, 1874.

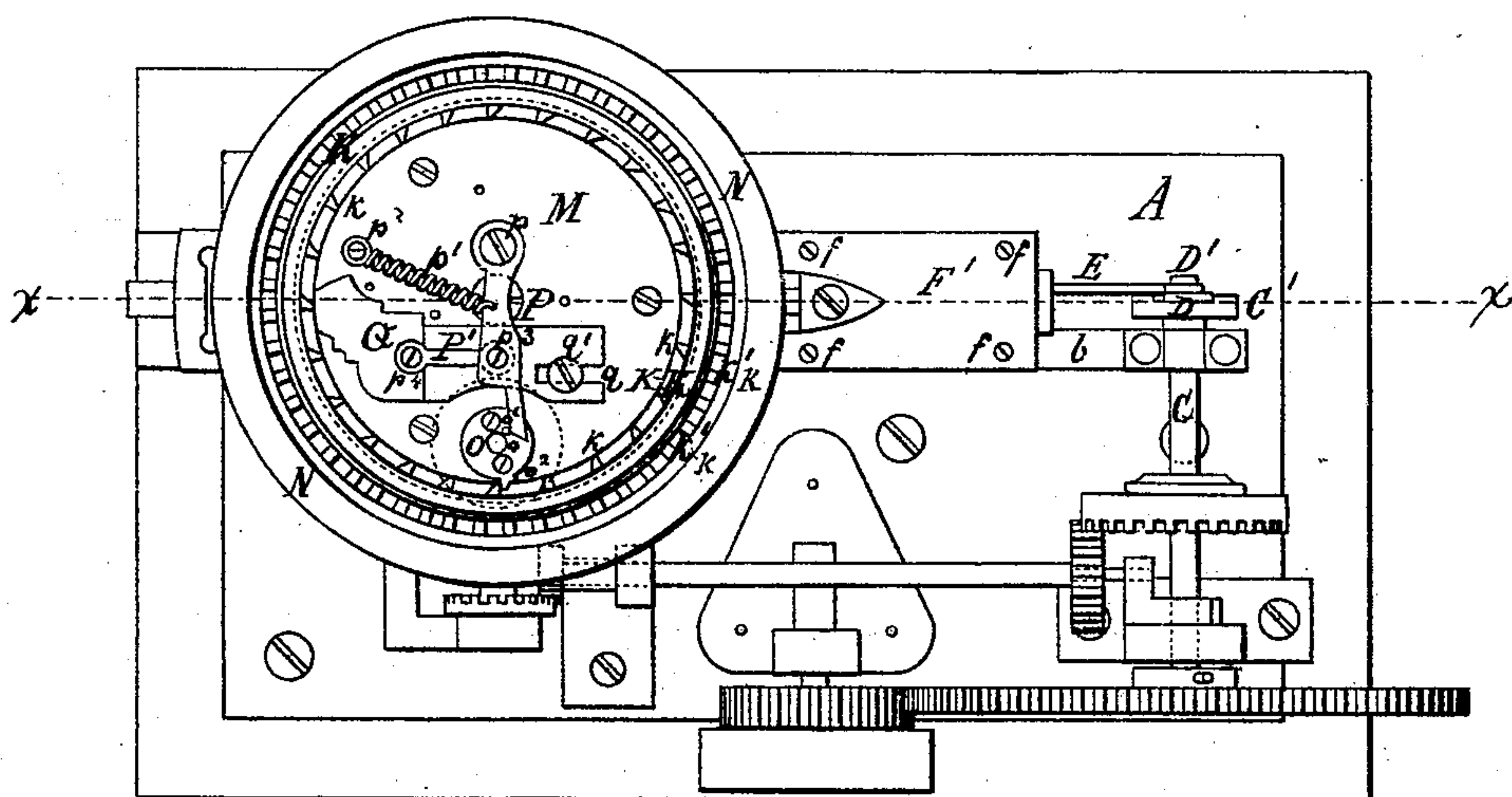


Fig. 1.

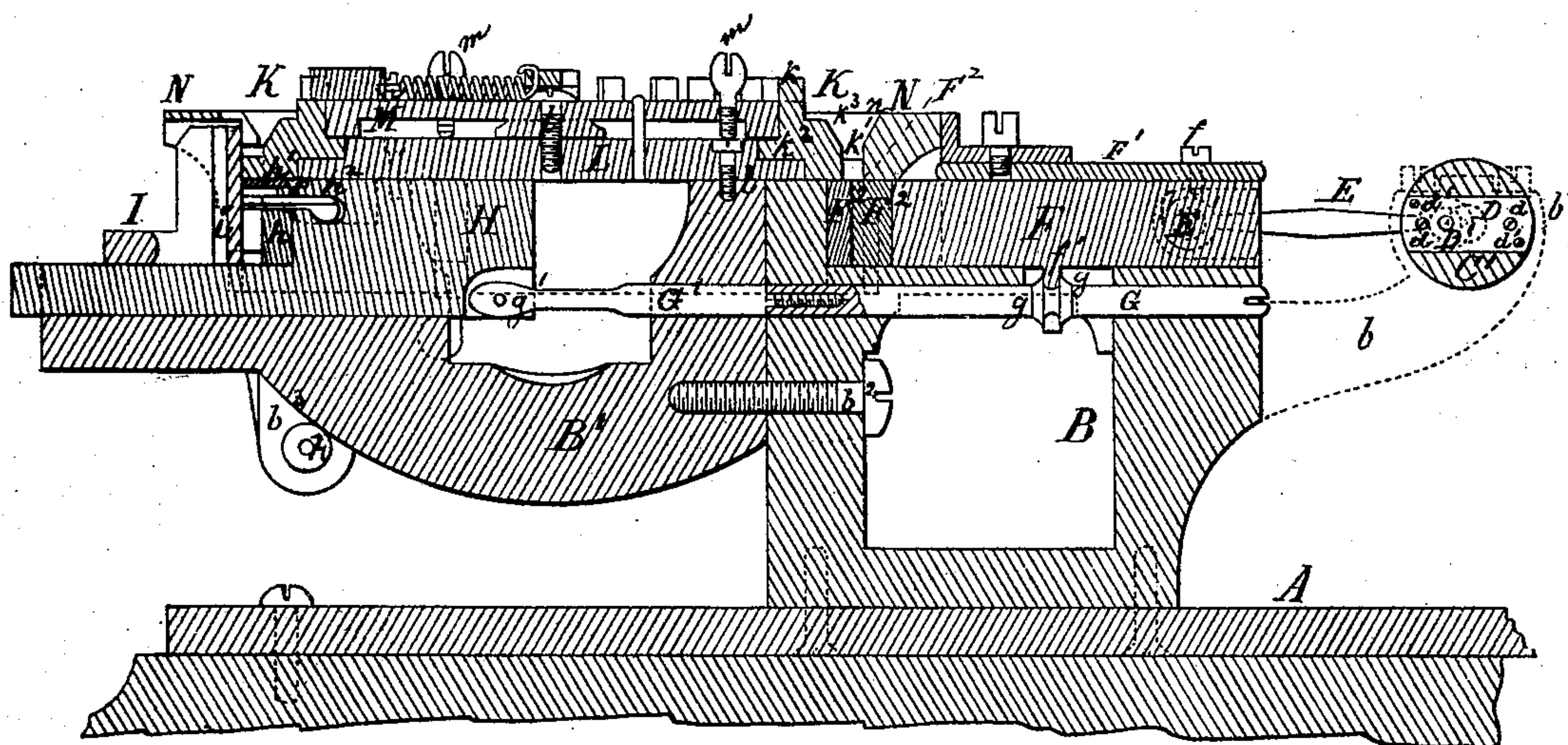


Fig. 2.

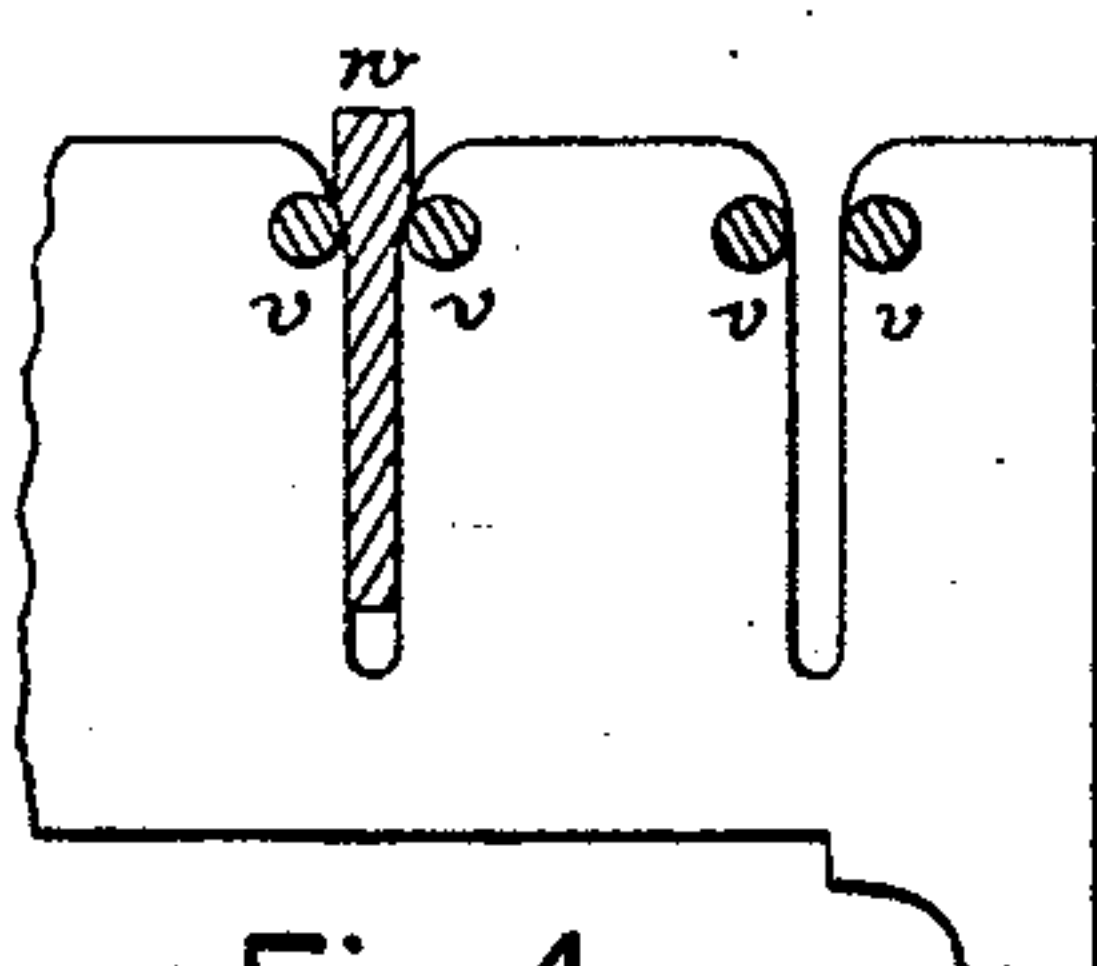


Fig. 4.

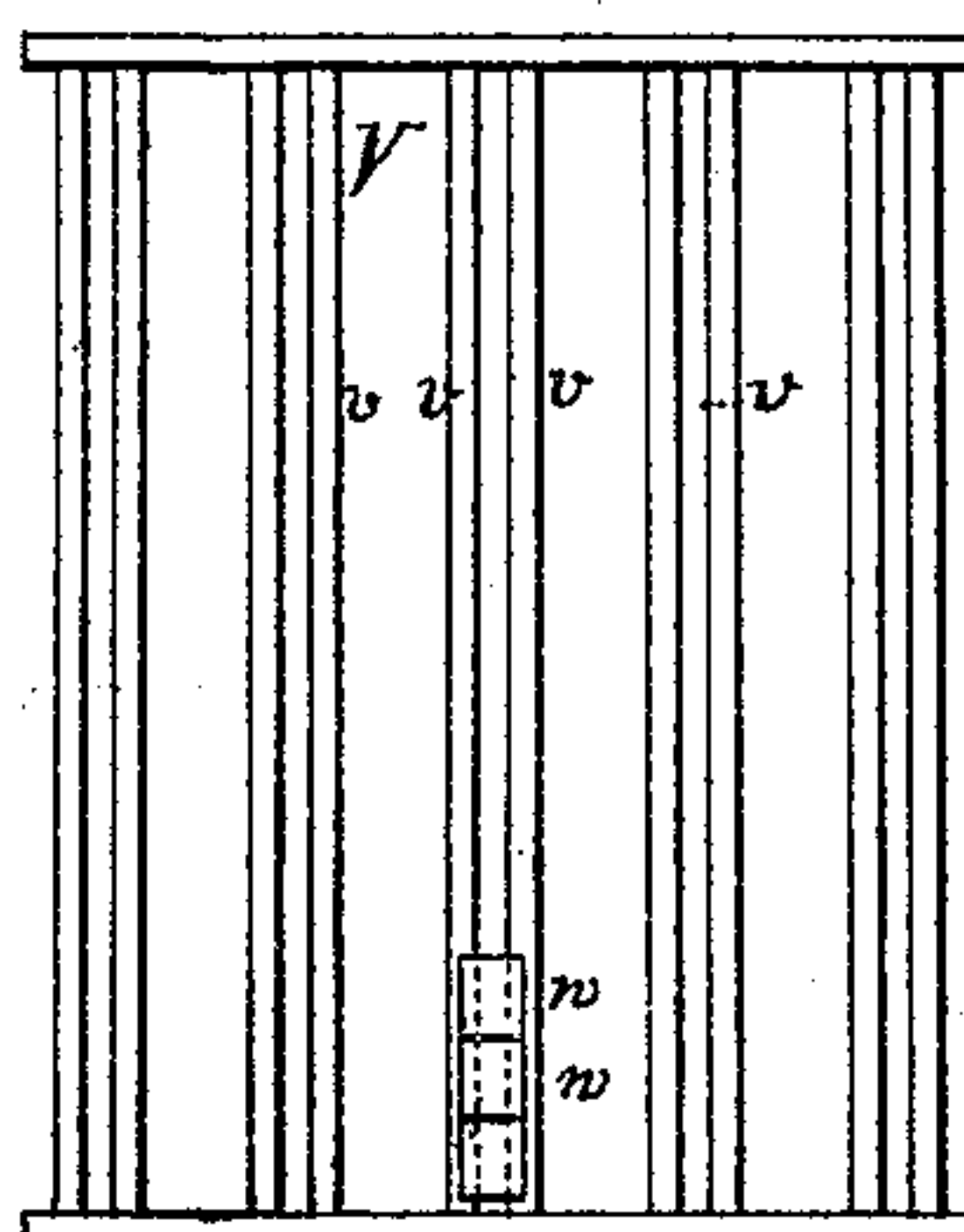


Fig. 3.

WITNESSES.

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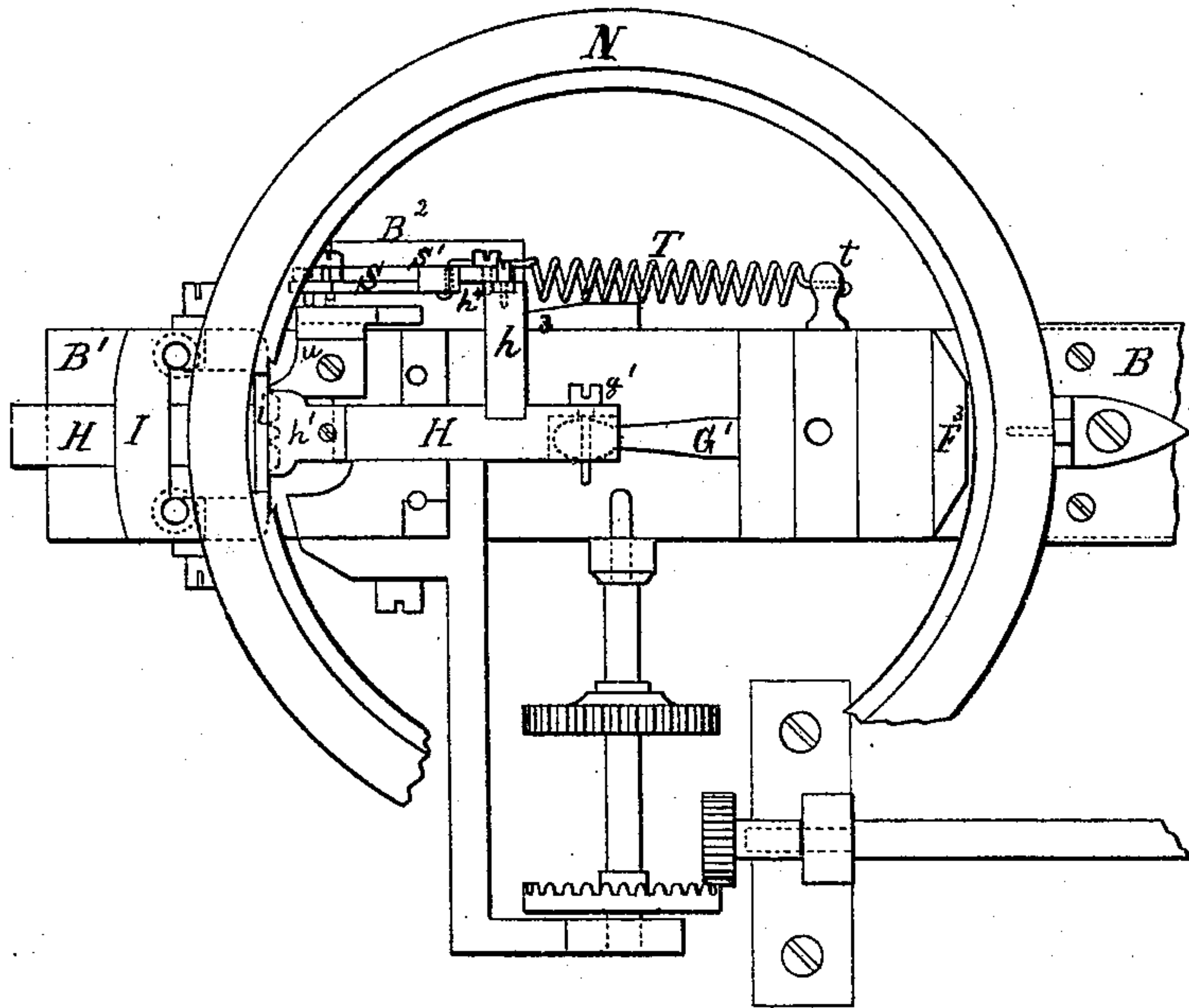


Fig. 5.

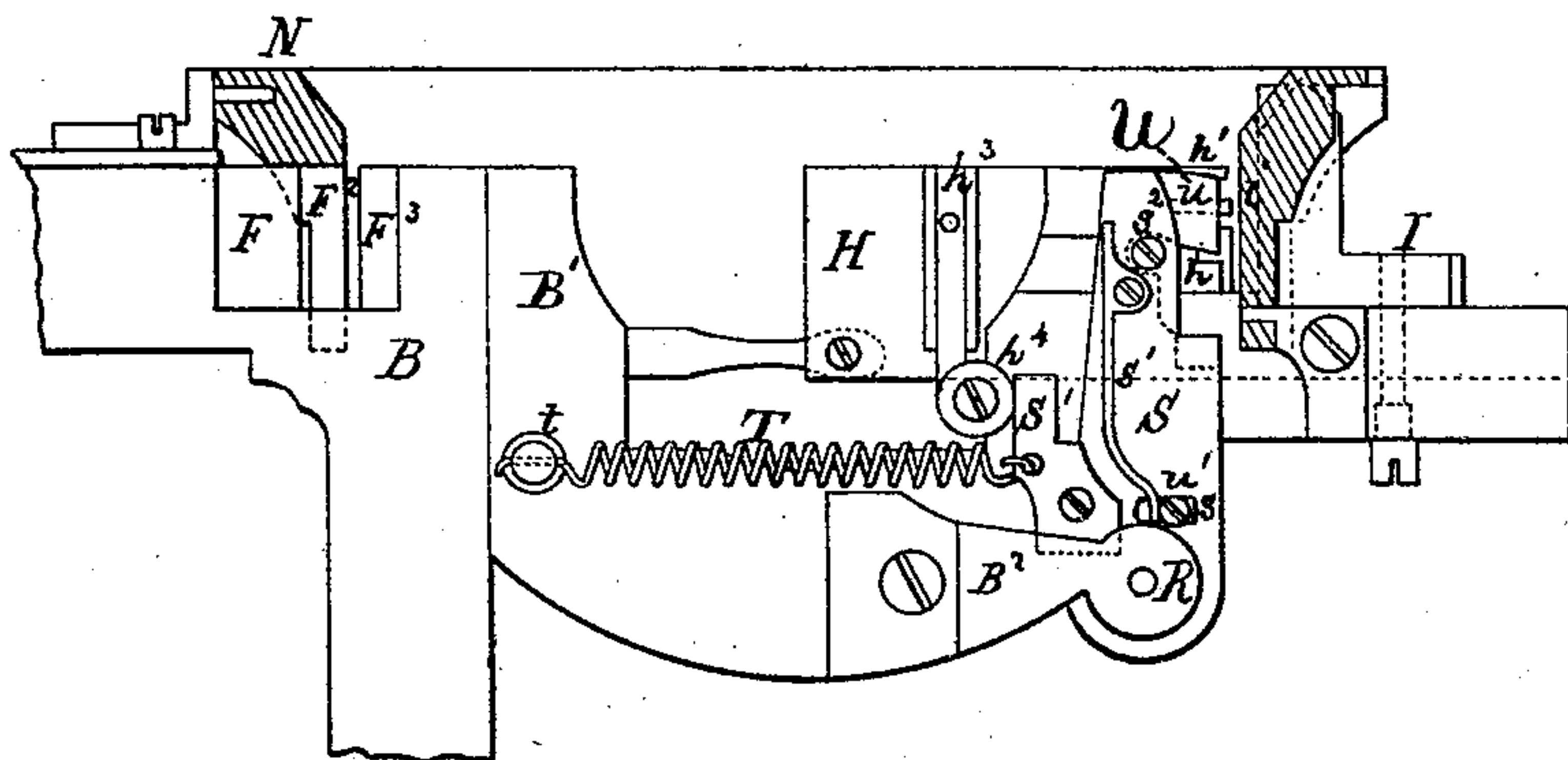


Fig. 6.

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UNITED STATES PATENT OFFICE.

ALBERT D. BINGHAM, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR TO HIMSELF AND BELDIN D. BINGHAM, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR FINISHING HORSESHOE-NAILS.

Specification forming part of Letters Patent No. **149,185**, dated March 31, 1874; application filed April 24, 1873.

To all whom it may concern:

Be it known that I, ALBERT D. BINGHAM, of Nashua, in the county of Hillsborough and State of New Hampshire, have invented a new and valuable Improvement in Horseshoe-Nail Pointer and Stiffener; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a top view of my machine. Fig. 2 is a longitudinal vertical section of the same according to line *x x*. Fig. 3 is a top view and a cross-section of an auxiliary implement. Fig. 4 is a top view of the back part of the machine with the feeding apparatus removed. Fig. 5 is a view of the clamping apparatus of my machine.

The first part of my invention relates to an improved construction of the pistons, to which the swaging-dies and the shearing-dies and punches are fastened, whereby the operator is enabled to multiply or reduce the number of nails simultaneously acted upon. The second part of my invention relates to an adjustable coupling of the swaging and shearing piston. The third part of my invention relates to the addition of a gridiron, in which the nail-blanks are placed in file to facilitate the operation of feeding the machine.

A is a foundation-plate, to which the frame B is fastened, which supports the working end of the main shaft C by an arm, *b*, and journal-box *b*¹, and which has an auxiliary frame, B', attached to it by a bolt, *b*². The shaft C is provided with a crank-plate, C', which has a diametrical recess or groove for the reception of an exchangeable plate, D, fastened thereto by set-screws *d d* and steady-pins *d' d'*. To the plate D the wrist-pin D' is fastened, which conveys motion to the piston F by means of the connecting-rod E and pin E'. The said piston is of rectangular shape, and is embedded in the frame B. It has a cover or bearing plate, F¹, secured to frame B, with set-screws *f f f f*, and it has a steel plate or swaging-die, F²,

fastened to its face. This swaging-die F² has a mate, F², which is fastened to the frame B opposite to it. The piston F has a forked projection, *f'*, which fits between two collars, *g g*, on a connecting-rod, G, so that the connecting-rod may be turned for the purpose of adjustment of the stroke of the second piston H. The front end of the connecting-rod G is provided with a slot for operation by a screw-driver, or an equivalent device. The other end of said connecting-rod is hollow and split, and is provided with inside screw-threads for the reception of the threaded end of a rod, G', which is connected to the piston H by a pin, *g'*. The face of the piston H carries the punches *h h'* securely fastened to it, and the matching-die *i* is fastened to an upright frame, I, attached to the frame B'. A revolving feeding-table, K, provided with upright ratchet-teeth *k* and horizontal rack-pins *k*¹ is secured between the lower bearing-plate L and the upper bearing-plate M by an annular rim, *k*². The plate L is fastened to the frame B by set-screws *l*, and forms thereby the top bearing of the piston H. The feeding-table K is surrounded by a cylinder, N, which is fastened to the frames B and B', and serves to keep the blank nails between the rack-teeth *k'*. The upper and opposite parts of the feeding-table K and cylinder N are chamfered down, so as to form a groove of V shape, between which the heads of the nail-blanks are traveling with their shanks downward. The plate M is fastened to the plate L by a set-screw, *l*, and it is also provided with set-screws *m m* to adjust the wear on the rim *k*² by pressure on the plate L. The machinery for imparting motion to the feed-table K is secured to the plate M, and consists of a cam-plate, O, fastened to an upright revolving shaft, *o*, and provided with an upright eccentric pin, *o*¹, which engages a lever, P, on a fulcrum, *p*, for the purpose of operating a bolt, Q. Motion is received from the main shaft C and transferred by a system of wheels and shafts of any suitable construction to the upright shaft *o*, which, by means of the projection or cam *o*² on the cam-plate O, engages the ratchet-teeth *k* on the feed-table K, and thereby revolves the said table at inter-

vals of such duration as is needed for the operation of swaging and trimming. During said operation the table K is held stationary by the bolt Q, as at the same time the lever P is relieved from the eccentric pin o^1 and drawn by the tension of the spring p^1 toward the ratchet-teeth. It communicates the same motion, by aid of a connecting-rod, P' , and pins p^3 and p^4 , to the bolt Q, which is provided at the free end with a longitudinal slot, q , and a guide-pin, q' , to steady its motion. The spring p^1 is fastened with one end to the lever P in any suitable manner, and with the other end to a pin, p^2 , in the plate M. The head of the bolt Q is so shaped that it fits perfectly into the spaces between the teeth k .

The punch h on the piston H serves to force the shank of the nail through the die i . For the head of the nail another punch, h^1 , is fastened to the same piston to suit the difference in the thickness of the head and that of the shank. There is room between the two above-mentioned punches, and also a slot, h^2 , in the piston H, for the purpose of allowing free sway to a clamp, which holds the nails in position until they are struck by the punches h h^1 . The said clamp is operated by a combination of levers with a common fulcrum, R, in the arm b^3 of the frame B^1 . Motion is applied by an arm, h^3 , on the piston H, with the aid of a friction-roller, h^4 , to a lever, S, on the shaft R. The lever S is provided with an exchangeable bearing-plate, S^1 , which receives the thrust of the roller h^4 . A spring, T, fastened to a pin, t , on the frame B^1 with one end, and to the plate S' with the other end, serves to keep the roller h^4 and the plate S' in contact, and causes the back motion of the lever S. Behind the lever S is another lever, U, swinging on the shaft R, which carries a serrated clamp-plate, u , on its end. This said lever receives motion from the lever S by means of a pin, w' , fastened to it and protruding through a slot, s , in the lever S. A spring, s^1 , fastened to the lever S, bears on the pin w' , which is thereby pressed against a pin, s^2 , on the lever U. The roller h^4 moves in an elevation which causes the lever of action on the plate S' to be considerably shorter than the lever of the clamp-plate u . Consequently the motion of the said clamp-plate is proportionally faster, and it travels a greater distance than the piston H. For the same reason it arrives in the forward motion at the die i , in advance of the punches h h^1 , and with its tapered notches seizes a number of nails right before the openings in the die i and holds them in the proper position until the punches h h^1 give the final thrust, and so finish the shearing operation. After the clamp-plate u has arrived before the die i its motion stops until the lever S has finished its forward motion and has moved so far back again that the pin s^2 comes in contact with the lever U, at which instance both

levers, S and S^1 , move back simultaneously. The slot s has to be made of such length that the pin w' will not touch its opposite end during the interrupted motion of the lever S. The shaft R may be supported at the other end by an additional arm, B^2 , fastened on the frame B^1 . The cylinder N has one opening for the admission of the piston F and another one for the admission of the die i , which must be close to the rack-teeth k' .

The operation of supplying the feed-table K with nail-blanks may be greatly facilitated by the use of a gridiron, V, with parallel rods v , between which the nail-blanks may be arranged in rows in the very position in which the operator wants to insert them between the rack-teeth k' in the feeding-table K.

The nail-blanks are taken in succession from the gridiron and inserted into the groove between the feed-table K and the cylinder N, and they will settle themselves with their heads between the rack-teeth k' , so that their shanks are exposed below the said teeth to their full length, and with their flat sides toward the center of the feed-table K. They are carried around by the motion above described until they are between the swaging-dies F^2 F^3 , where they are swaged by the forward movement of the piston F, while the bolt Q keeps the table K stationary, in the manner described. After being relieved from the swaging-dies, they are carried to the shearing-die, where they are seized by the clamp-plate u and held rigidly against the apertures in the said die, until the punches h h^1 force them through, whereby all irregularities in the shape of those blanks are cut away in passing the sharp edges of the said apertures, and the nails drop forth finished.

I am aware that a notched and intermittingly-rotating nail-carrying wheel, a swaging-die, and a trimming-die are not new, and, therefore, I do not claim invention thereof broadly.

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

1. The combination of the cam-plate O, lever P, bolt Q, and spring p' , substantially as specified.
2. The combination of the piston F, the swaging-die F^2 , the piston H, with shearing-punches h h^1 and die i , substantially as specified.
3. The combination of the piston H, roller h^4 , lever S, lever U, spring T, spring s^1 , pin w' , pin s^2 , and clamp-plate u , substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ALBERT DART. BINGHAM.

Witnesses:

H. T. MORRILL,
J. B. FASSETT.