

(Model.)

5 Sheets—Sheet 1.

L. S. PARRÉ.
Machine for Forging Horseshoe Nails.

No. 238,804.

Patented March 15, 1881.

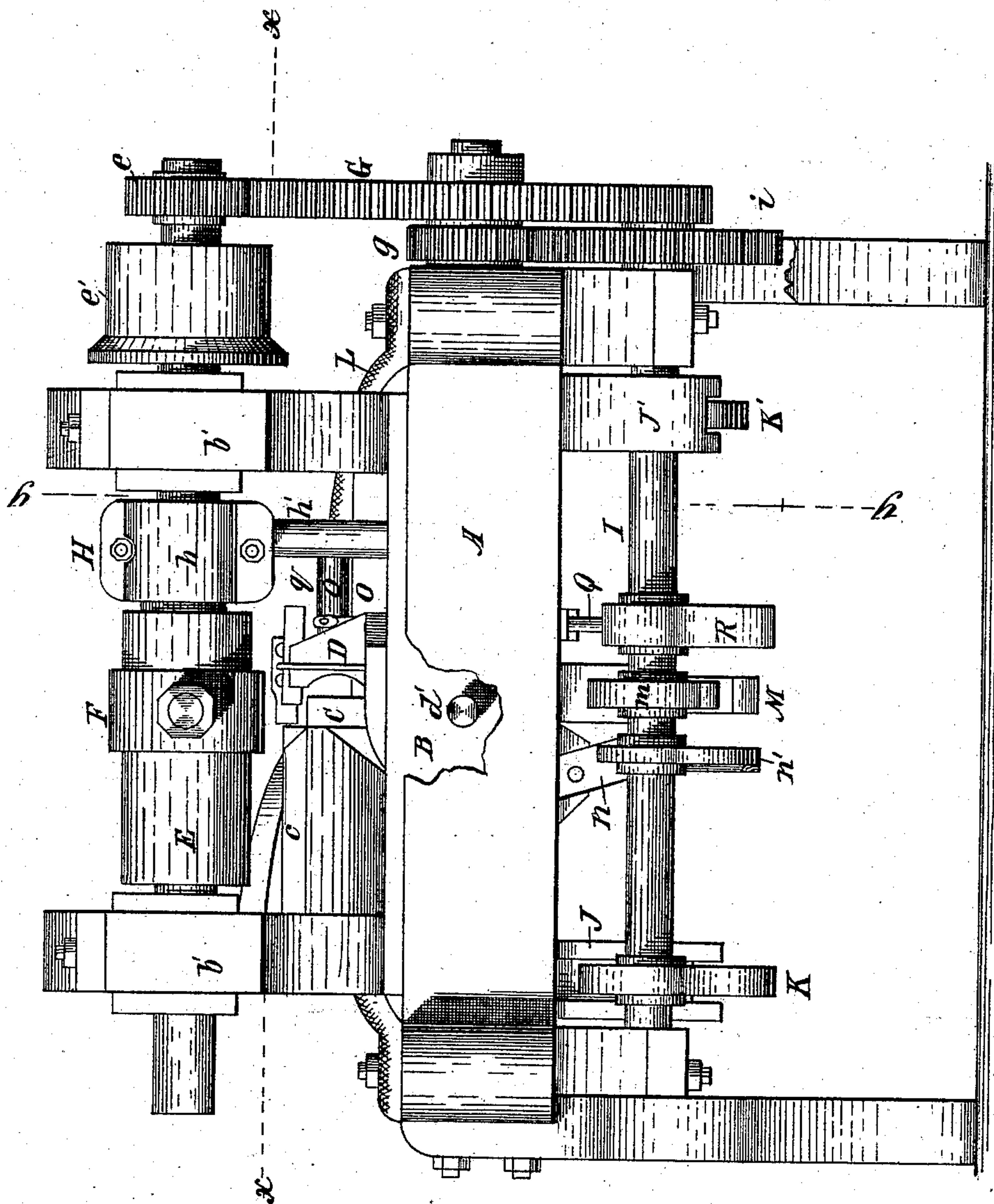


Fig 1

Witnesses

W. C. Corlies
L. A. Bunting.

Inventor

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By *Robert M. Thacher*
Attorneys

(Model.)

5 Sheets—Sheet 2.

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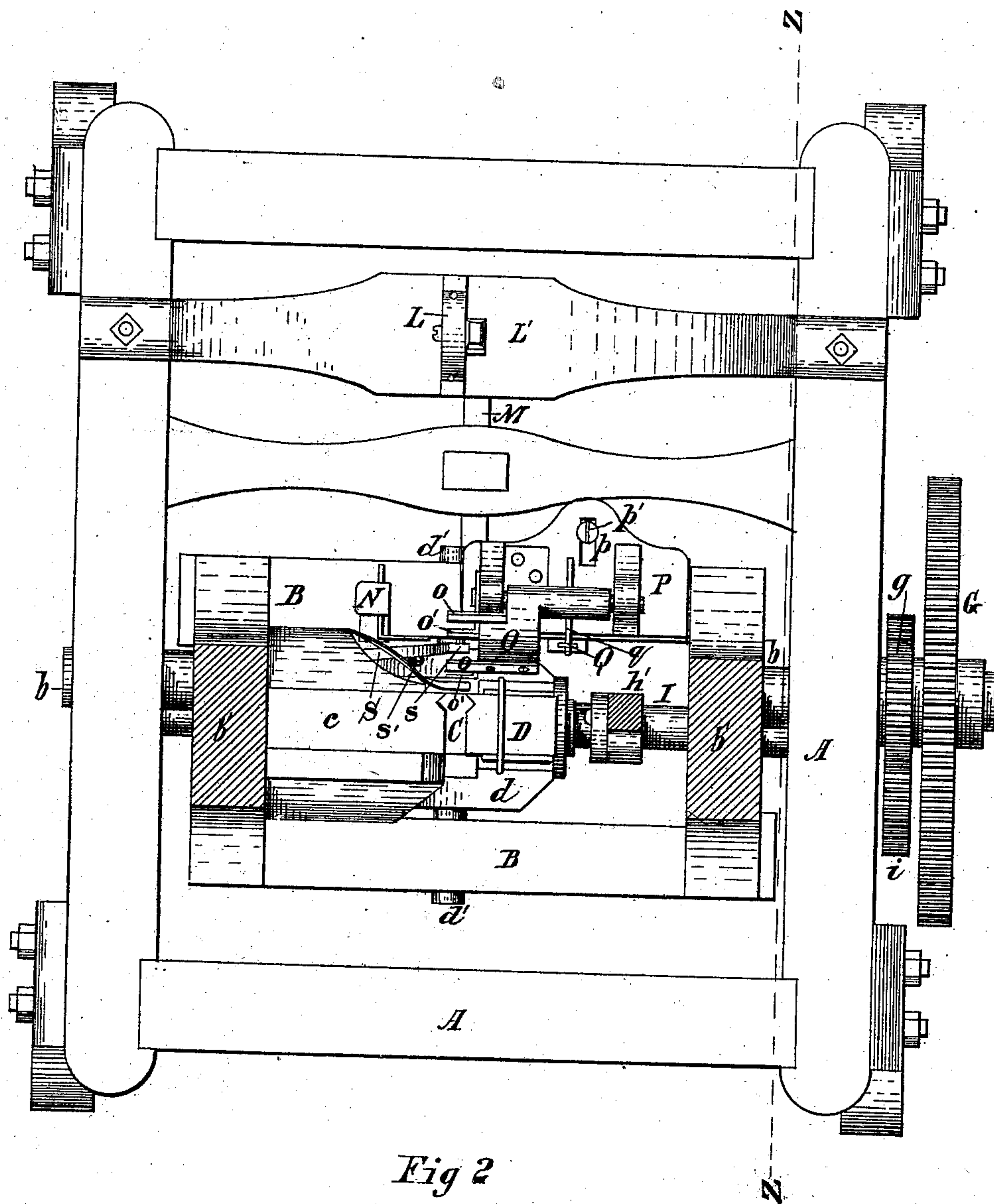


Fig 2

Witnesses

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(Model.)

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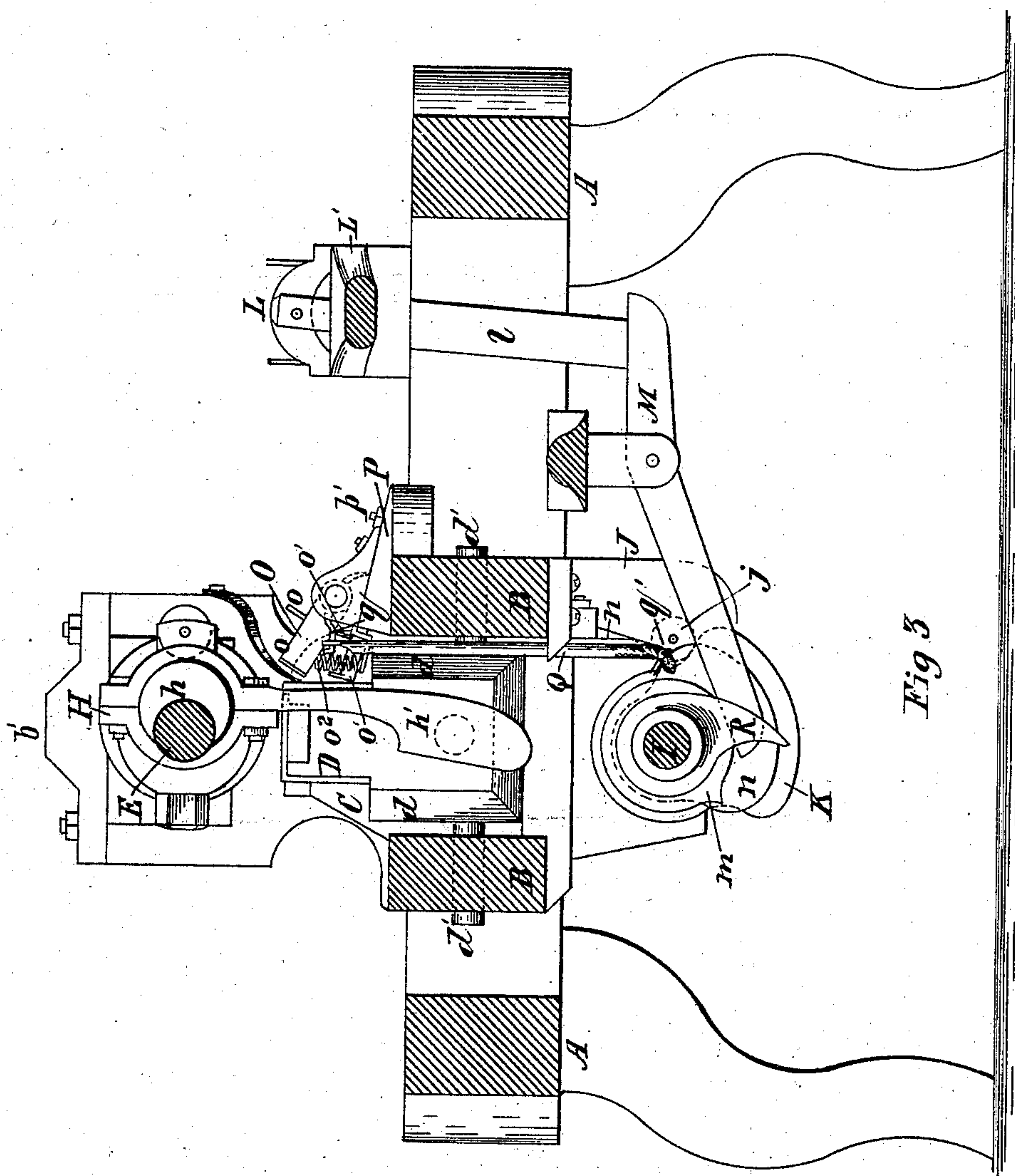


Fig 3

Witnesses

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(Model.)

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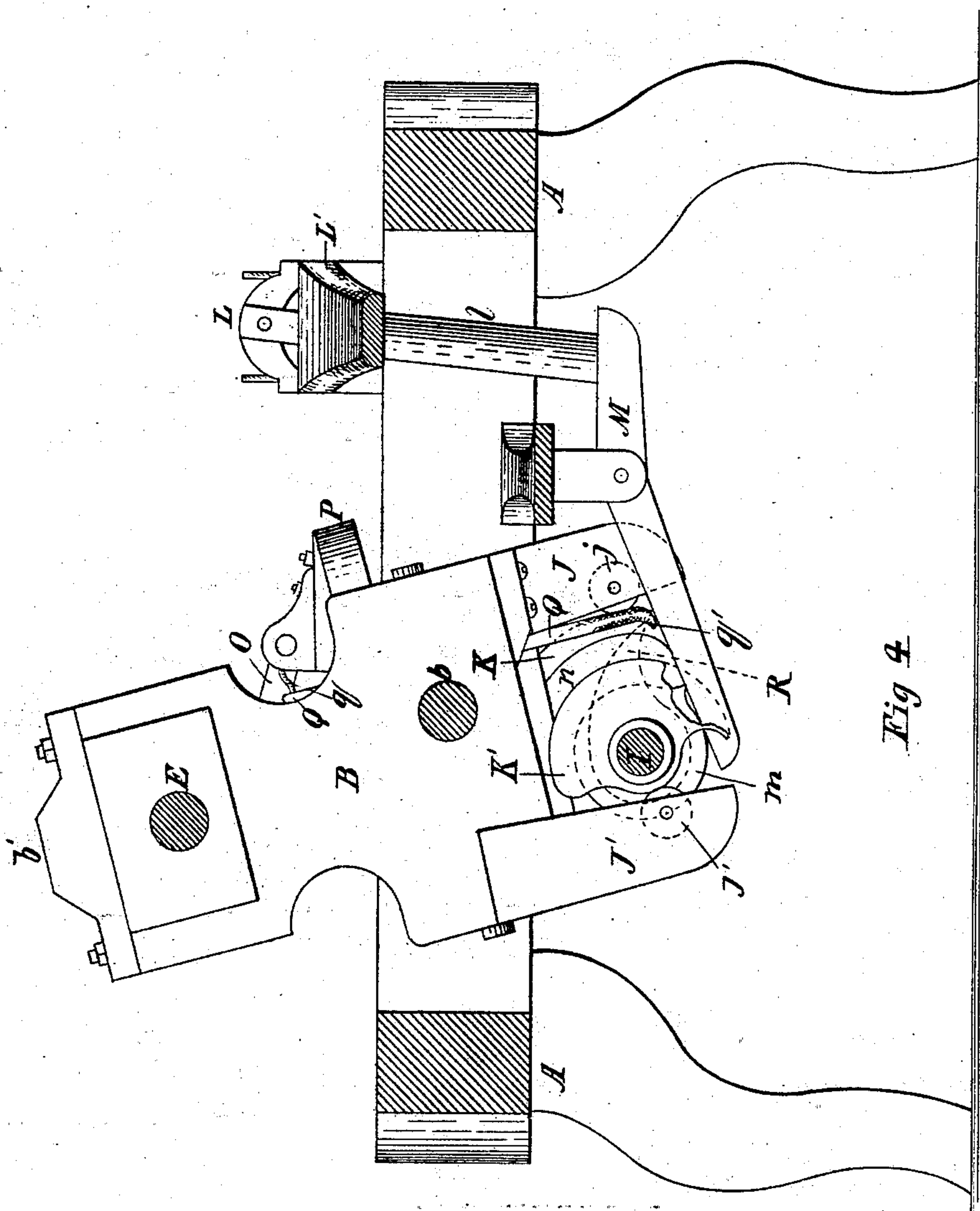


Fig 4

Witnesses

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(Model.)

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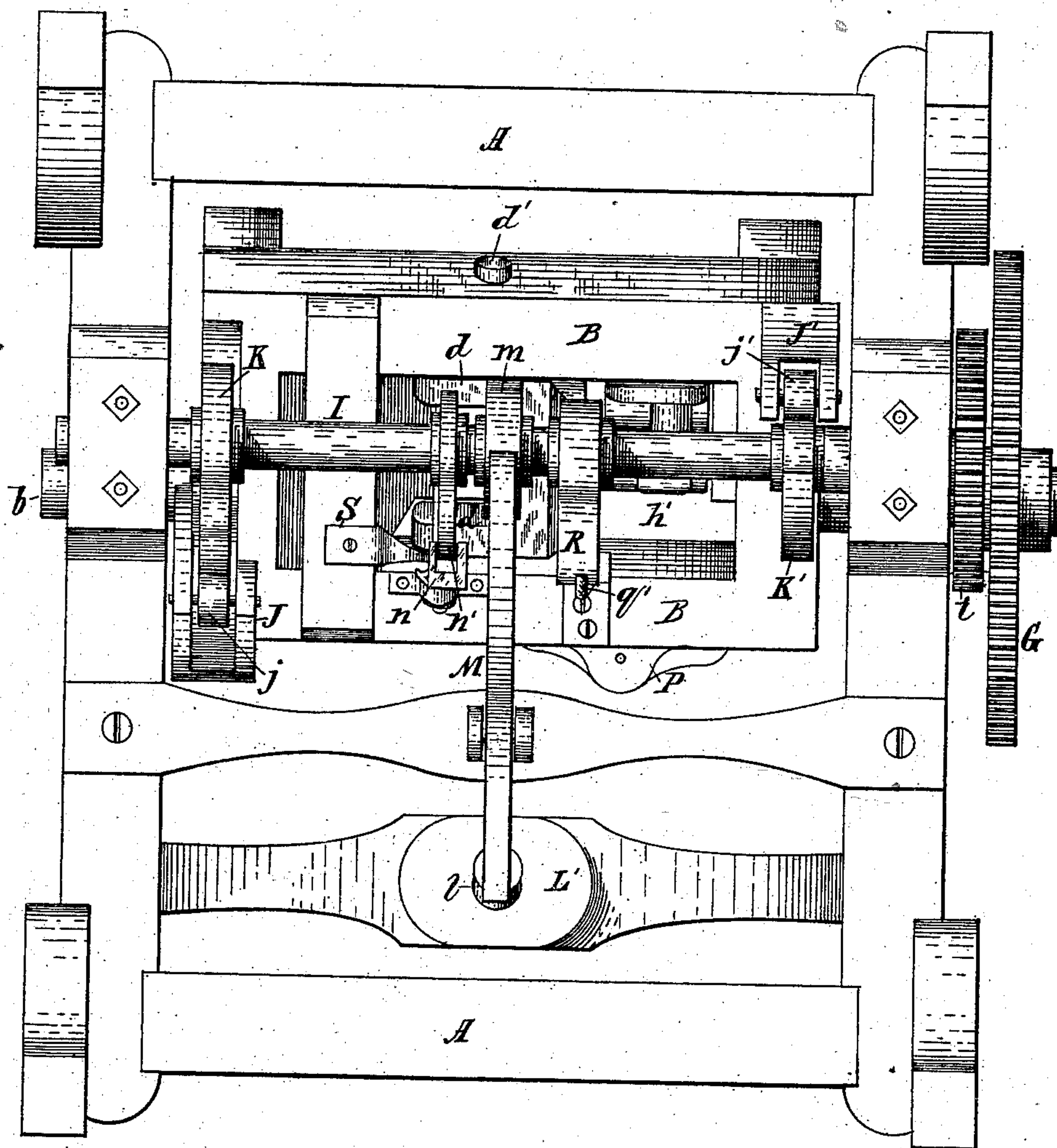


Fig 5

Witnesses

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Inventor

Louis S. Parré

By *Charles H. Thacher*
Attorneys

UNITED STATES PATENT OFFICE.

LOUIS S. PARRÉ, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO ABRAHAM W. KINGSLAND, OF SAME PLACE.

MACHINE FOR FORGING HORSESHOE-NAILS.

SPECIFICATION forming part of Letters Patent No. 238,804, dated March 15, 1881.

Application filed August 18, 1880. (Model.)

To all whom it may concern:

Be it known that I, LOUIS S. PARRÉ, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Machines for Forging Horseshoe-Nails, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a rear-end elevation of
10 a machine embodying my improvements; Fig. 2, a plan section of the same, the section being taken on the line $x x$, Fig. 1; Fig. 3, a vertical section of the same, taken on the line $y y$, Fig. 1; Fig. 4, a vertical section of the same,
15 taken on the line $z z$, Fig. 2; and Fig. 5, a bottom plan of the same.

My invention relates to machines for forging horseshoe-nails in which a revolving roller-hammer and a side striking-hammer are employed;
20 and the object of my invention is to provide for moving the anvil and hammers away from the nail when forged, to permit it to be cut off without changing its position.

The invention consists in special mechanisms
25 and combinations of devices whereby this result is accomplished. The construction of these devices and one mode of organizing them in an operative machine will be hereinafter fully described, and the particular improvements which
30 are believed to be new pointed out more definitely in the claims.

In the drawings, A represents the main or supporting frame of the machine, which may be of any suitable material and construction
35 adapted to support the mechanism mounted therein, and to provide bearings for such parts as require them. Within this frame is a block or carriage, B, mounted on trunnions b , which are arranged in suitable bearings at the sides
40 of the supporting-frame, to permit the block or carriage to be rocked or oscillated thereon.

The anvil C is rigidly mounted on the block B, about midway of its length, and at one side thereof is the stationary side hammer or side
45 anvil c .

The side striking-hammer D is mounted on a suitable support, d , which is provided near its lower end with trunnions d' , having their bearings in the side pieces of the frame d ,
50 which extend across the main frame A, there-

by providing for the necessary vibration of the striking-hammer.

At each end of the block or carriage B is an upright standard, b' , and in suitable bearings in the upper ends of these standards a shaft, 55 E, is mounted, arranged above the anvil and carrying an ordinary roller-hammer, F, which is attached to the shaft by any suitable means, and is arranged so that its path is directly over the anvil. The shaft E projects at the
60 front side of the machine, and is provided with a pinion, e , mounted on the end thereof, which is arranged to engage with a large gear-wheel, G, mounted on the main frame and arranged concentrically with the axis of the carriage B. The shaft upon which the wheel G
65 is mounted may, in fact, be an extension of one of the trunnions of the carriage; but this is a mere matter of detail in the construction of the machine, which may be adopted or not. 70 The shaft E is the driving-shaft, and is provided with a band-pulley, e' , by which motion is communicated to the said shaft; or any other suitable means may be employed for this purpose. Obviously the revolution of the shaft 75 E will cause the rotation of the wheel G by means of the pinion e . An eccentric, H, is also mounted on the shaft E, outside of the plane of the striking-hammer, and the eccentric-strap h is connected, by the pitman h' , to the lower 80 portion of the hammer-support d , thereby providing means for vibrating the striking-hammer support by the revolution of the driving-shaft.

A cam-shaft, I, is arranged below the carriage B, being mounted in suitable bearings attached to the under side of the main frame. At one end this shaft is provided with a gear-wheel, i , which engages with a gear-pinion, g , arranged inside of the gear-wheel G and rotating with it. 90

At each end of the carriage B is an arm or bracket depending from the under side of the carriage, one of which, J, is arranged at the front side of the carriage, or in front of the 95 cam-shaft, and the other, J', at the other end of the carriage, and at the rear side thereof, or in rear of the cam-shaft. These pendants are provided, respectively, with anti-friction rollers $j j'$. 100

At one end of the shaft I is a cam, K, fixed to the shaft and arranged to act at certain intervals upon the lower end of the pendant J, to throw the latter forward, and at the other end of the shaft is a cam, K', fixed to the shaft, and arranged to act at intervals upon the lower end of the pendant J', to throw it backward or toward the rear of the machine. These cams are relatively constructed and arranged so that for a certain period of time neither is in operation; but at the proper moment, when the forging of the nail is completed, the cam K commences to act upon its corresponding pendant, pushing it forward, and thereby rocking the block or carriage B, carrying the upper part thereof and everything mounted thereon to the rear, and as soon as this cam passes the roller *j* the cam K' is brought into action upon the pendant J', driving it to the rear, and thereby vibrating the carriage back again, and so bringing the parts into their normal working position. The cam K' remains in contact with the roller *j'* until it is time for the vibration of the carriage to the rearward again, thereby holding the latter in proper position. As the axis of the block or carriage B is in line with the axis of the gear-wheel G, obviously the vibration or rocking of the carriage will not in the least interfere with the engagement of the pinion on the driving-shaft with the wheel G. In other words, the pinion will be carried back and forth around the wheel, always in gear therewith.

In front of the machine is a clamp, L, arranged upon a cross-bar, L'. A connecting-rod, *l*, attached at its upper end to this clamp, extends down through the cross-bar, and is seated at its lower end on the short arm of a lever, M, pivoted underneath the main frame, and extending rearward underneath a cam, *m*, also mounted on the shaft I. The clamp is held down by suitable springs, and raised at the proper moment by the cam acting on the lever. The nail-rod is held in position by this clamp, the raising of the latter being effected at the proper moment for the feed of the rod, which is thrust forward by the hand to the anvil.

A gage, N, is mounted on the upper end of an arm, *n*, pivoted to the front portion of the vibrating frame B, so as to be vibrated transversely of the machine. The lower end of this arm is provided with a fork, within which a cam, *n'*, rotates, the cam being also attached to the shaft I, and arranged to vibrate the gage inward just at the time the feed is to take place, thereby enabling the attendant to give the proper length of rod to the anvil to form a nail. The gage-support is vibrated outward by the cam soon after its inward movement takes place.

Just in front of the anvil is a vibrating block, O, mounted in suitable bearings on a table, P. This block carries the upper cutters, *o*, arranged on the front and rear edges of the block, and just below are the lower cutters, *o'*, which are attached, in a fixed position,

to the table or some other stationary piece on the vibrating frame, being arranged to correspond with the upper vibrating cutters, and the front and rear cutters being arranged at such distance apart as is desired for the length of the nail. A spring, *o*², arranged underneath the front edge of the block O, throws the latter up and keeps it up after the nail is cut off. The table P is provided with a slot, *p*, through which a set-screw, *p'*, passes to fasten the table to the vibrating frame B, thereby permitting it to be adjusted backward or forward on the frame.

The rod Q is attached at one end to a small arm, *q*, projecting from the cutter-block O, and extends downward below the frame until its lower end is about in front of shaft I. On its lower end is a hook or projection, *q'*, which is caught and pulled down by a toe, R, fastened on the shaft I, thereby depressing the block O at the proper time for cutting off the nail.

An elastic arm, S, is attached to the lower part of the frame B. At its upper end it is provided with a loop, *s*, which is sufficiently large to pass over the nail-rod in front of the anvil. A cam-projection, *s'*, on the inside of the vibrating hammer-support works against this elastic arm, thereby giving it a slight movement in a direction transverse to the machine with every movement of the hammer, which serves to slightly move the rod to prevent its sticking on the anvil.

It will be noticed from the above description that the forging devices and cutting devices are all mounted on the vibrating frame B, while the clamp which holds the nail-rod in position is mounted on the main frame. Obviously, therefore, when the frame is vibrated or rocked toward the rear, the anvil and hammers will be carried away from the nail which has been forged, and the cutters carried forward along the rod, and the latter are so arranged with reference to the anvil that they will be brought into about the position occupied by the anvil when the frame is in its normal position and the nail is being forged, so that the cutters are in proper position to cut off the nail from the rod.

The operation of the mechanism above described is as follows, the several devices being relatively arranged to come into operation at the proper moment to perform their several functions: The vibrating frame being in upright position, the nail-rod is introduced into the machine, being run forward to the anvil and placed under the clamp. The revolution of the driving-shaft now forges the nail upon the anvil in the usual way, and just as the operation is completed the vibrating frame is rocked backward by the cam designed for this purpose, as described above, thereby removing the anvil from underneath the nail, and bringing the cutters into place above and below the latter. The upper cutters are now brought down by the toe catching the hook on the end of the rod, and the nail is cut off, and at the same time the clamp is released and the

gagethrowninward. Theattendantnowfeeds the nail-rod in until the end strikes against the gage, which, at the instant, is vibrated back again, and the clamp is brought down upon the rod, and the vibrating frame is rocked forward into its former position, bringing the anvil under the end of the nail-rod and the hammers in proper position for forging a new nail, when the operation above described is repeated. The vibration of the frame back and forth, the cutting off of the nail, and feeding forward of the rod are all accomplished in the machine shown in the drawings during two strokes of the roller-hammer—that is, during two revolutions of the driving-shaft—and the gear-pinion on the driving-shaft is constructed relatively to the gear-wheel G so as to give one revolution to the latter for each eight revolutions of the former, thereby providing for six working-blows of the roller-hammer to every vibration of the frame. This number I have found sufficient for forging the nail, and so am enabled to make a nail for every eight strokes of the hammer, which is a considerable saving as compared with other machines, so far as known to me. The rocking of the frame is designed to be commenced just as the sixth blow of the roller-hammer is made. The next two blows are lost, the operation of cutting and feeding being in the meantime performed and the frame brought back into position for forging, in which position the ninth blow will find them, and so will become the first blow in forging a new nail. It will be seen that this result is accomplished by the simple mode of moving away the anvil and simultaneously moving up the cutters, so that the nail is cut off without changing the position of the rod. I have heretofore effected this result, broadly considered, in a machine shown in Letters Patent No. 215,768, granted to me May 27, 1879; but in that machine the frame which carries the anvil and cutters reciprocates back and forth in straight lines. The mounting of the frame carrying these parts upon an axis so as to accomplish the result by simply rocking it back and forth is simpler and much more desirable.

In the present machine the large gear-wheel and its shaft, together with the cam-shaft, are detached from the movable frame and mounted in fixed bearings on the main frame, thereby simplifying the structure and making the working of the machine easier and not so liable to get out of order.

Some parts of the machine described above and shown in the drawings obviously may be modified in construction and arrangement without losing the gist of my improvement, which has just been stated above; hence I do not limit myself to the precise devices constructed and arranged in all particulars as herein shown and described.

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

1. In a horseshoe-nail machine, the combination of the following elements: a main supporting-frame, a vibrating frame mounted in bearings on the main frame, a clamping device mounted on the main frame, and an anvil and cutters mounted on the vibrating frame and arranged relatively to each other so that when the frame is rocked to the rear the anvil is removed from under the nail and the cutters are brought into position to cut off the latter, substantially as described.

2. In a horseshoe-nail machine, the combination of the following elements: a main or supporting frame, a vibrating or rocking frame mounted upon bearings the axis of which is in line with the axis of the main transmitting-gear, which receives its motion from the driving-shaft, the driving-shaft, forging mechanism and cutters mounted on the vibrating frame, and a clamping device mounted on the main frame for holding the nail-rod in position, whereby the forging devices are removed from the nail when forged, and the cutters brought into position to cut off the nail by the vibration of the frame, substantially as described.

3. In a horseshoe-nail machine, the combination of the following elements: a main or supporting frame, a vibrating frame mounted therein and arranged to rock backward and forward on the axis of the main transmitting-gear, a main drive-shaft mounted on the vibrating frame, a transmitting-gear mounted on the main frame and engaging with a pinion on the drive-shaft, forging-hammers mounted on the vibrating frame and operated by the drive-shaft, cutting mechanism mounted on the vibrating frame, a rod-clamping device mounted on the main frame, a cam-shaft mounted on the main frame and receiving its motion from the main transmitting-gear, and mechanism operated by said shaft, whereby the frame is rocked and the cutters are operated, substantially as described.

4. The main frame A, in combination with the vibrating frame B, anvil and forging-hammers mounted thereon, drive-shaft E, mounted on the vibrating frame and provided with pinion e, gear-wheel G, having its axis the same as the axis of frame B, clamp L on the main frame, cutters o o' on the vibrating frame, and shaft I on the main frame, provided with cams for rocking the frame B and operating the cutters, substantially as described.

5. The main frame A, in combination with the vibrating frame B, carrying the forging devices and cutters, and provided with pendants J J', and cam-shaft I, provided with cams K K', substantially as described.

6. The main transmitting-gear G, mounted on the main frame, in combination with the vibrating frame B, carrying the anvil and forging-hammers, the drive-shaft E, mounted on the vibrating frame and provided with a pinion, e, engaging with the gear G, and the roller-hammer fixed on the drive-shaft, where-

by the frame B may be rocked back and forth without changing the relation of the gearing, substantially as and for the purposes set forth.

7. The vibrating frame B, in combination
5 with the movable cutters *o* and fixed cutters *o'*, mounted thereon, the pivoted block O, to which the movable cutters are attached, the link-rod Q, and the toe R on the shaft I, constructed and operating substantially as de-
10 scribed.

8. The cutters *o o'*, mounted on the vibrat-
ing frame, in combination with the clamp L,
mounted on the main frame, the gage N on
the vibrating frame, and the shaft I, mounted
15 on the main frame and provided with the

cams *m n'* and toe R, substantially as de-
scribed.

9. In a horseshoe-nail machine, the combi-
nation of the following elements: a main or
supporting frame, a vibrating frame mounted 20
on bearings therein and arranged to oscillate
back and forth in the arc of a circle, and forg-
ing and cutting mechanism mounted on the vi-
brating frame and arranged to be brought
into operation alternately by the oscillation 25
of the carrying-frame.

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Witnesses:

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