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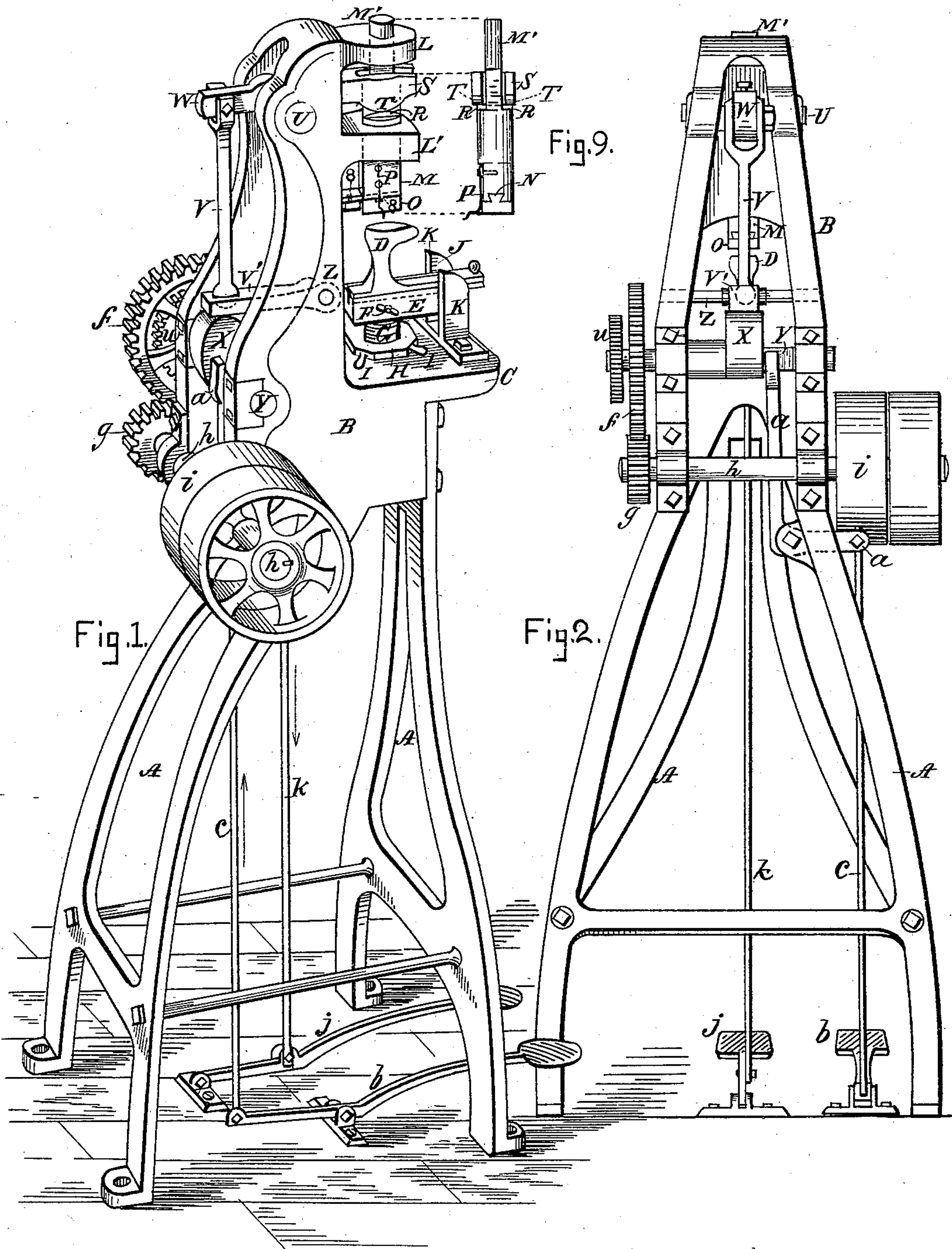
2 Sheets—Sheet 1.

M. VAN BUREN ETHRIDGE.

HEEL NAILING MACHINE.

No. 285,596.

Patented Sept. 25, 1883.



Witnessed
Wm. H. Miller
J. D. Osborne

Inventor.
Martin Van Buren Ethridge

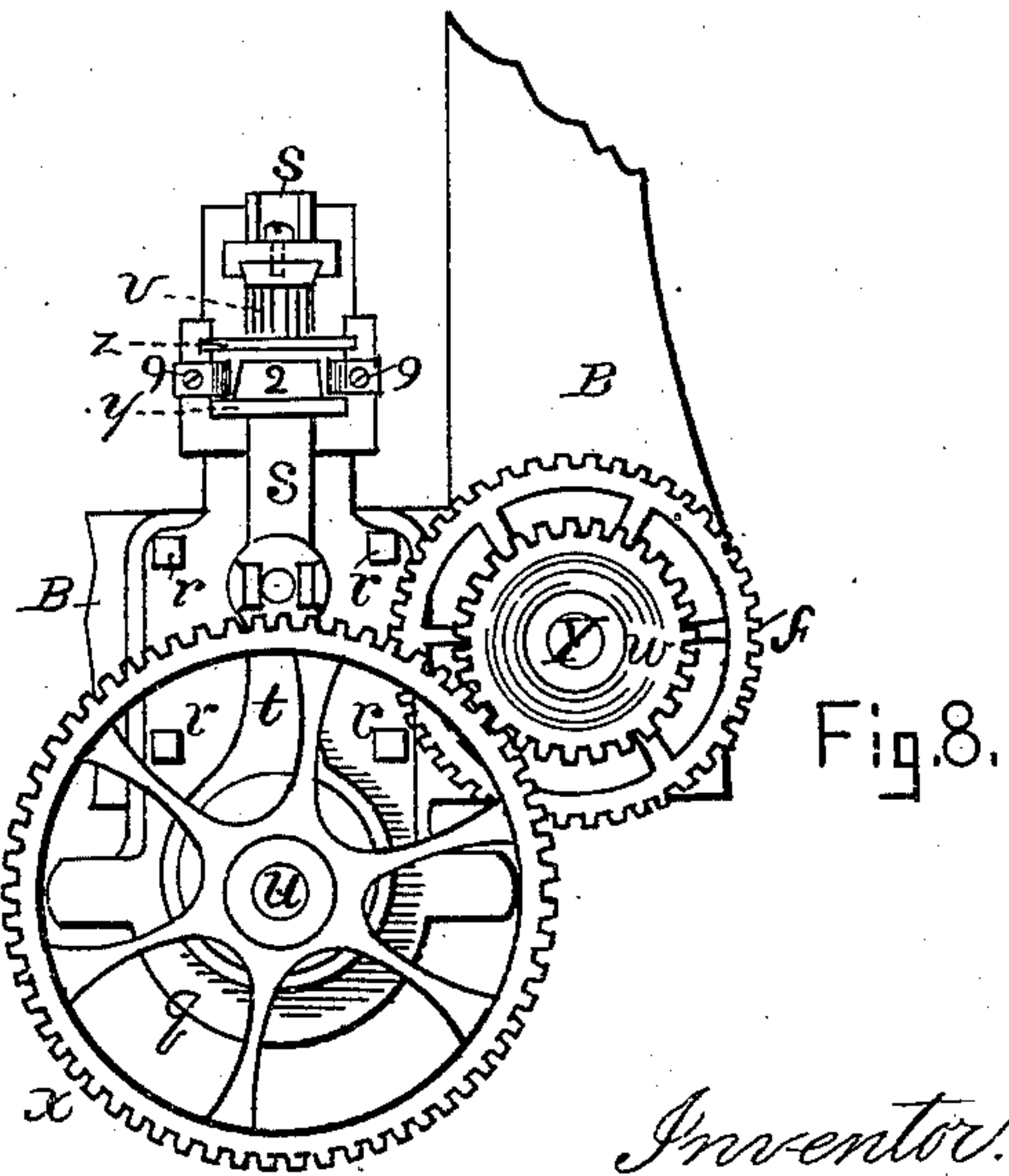
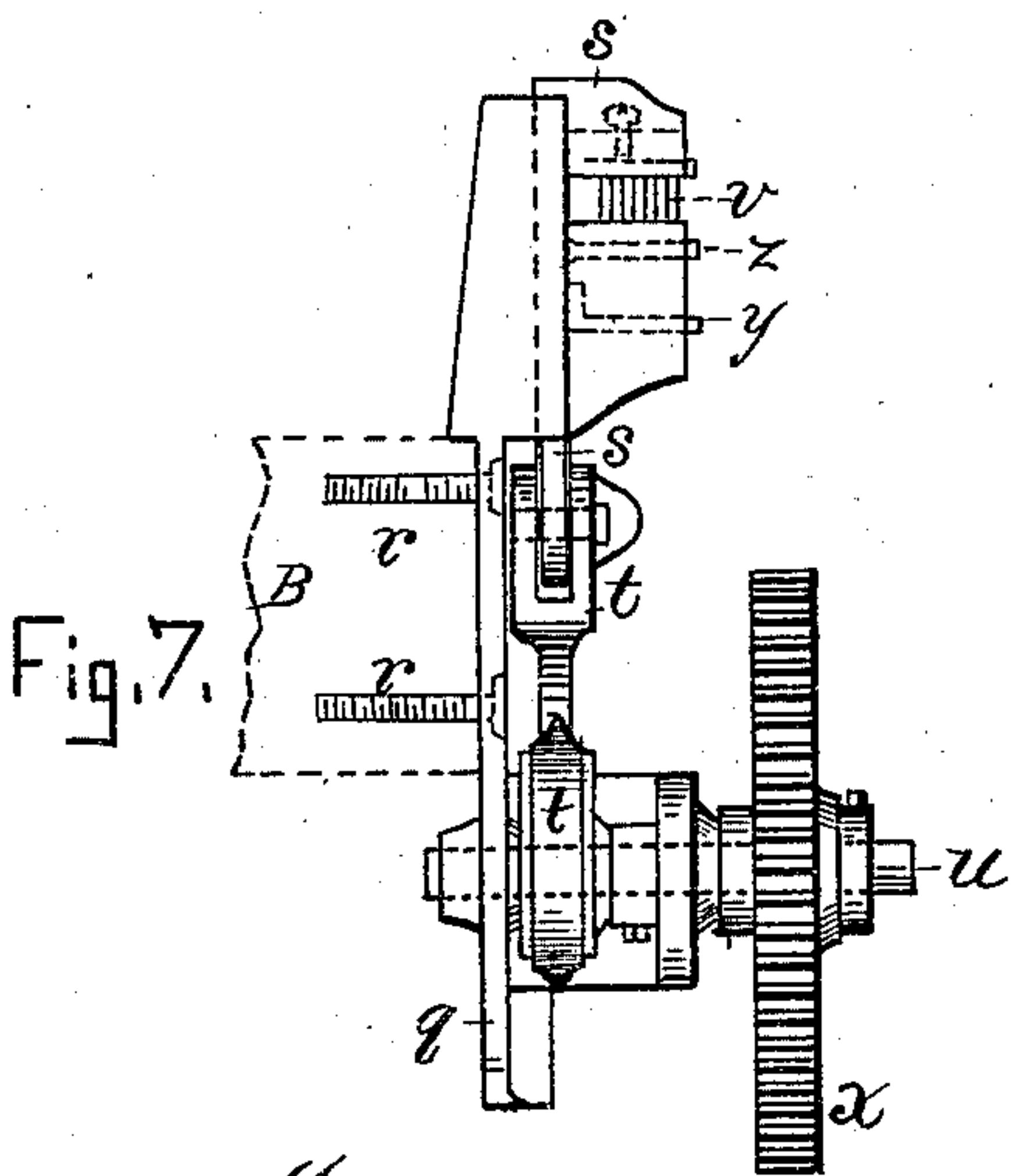
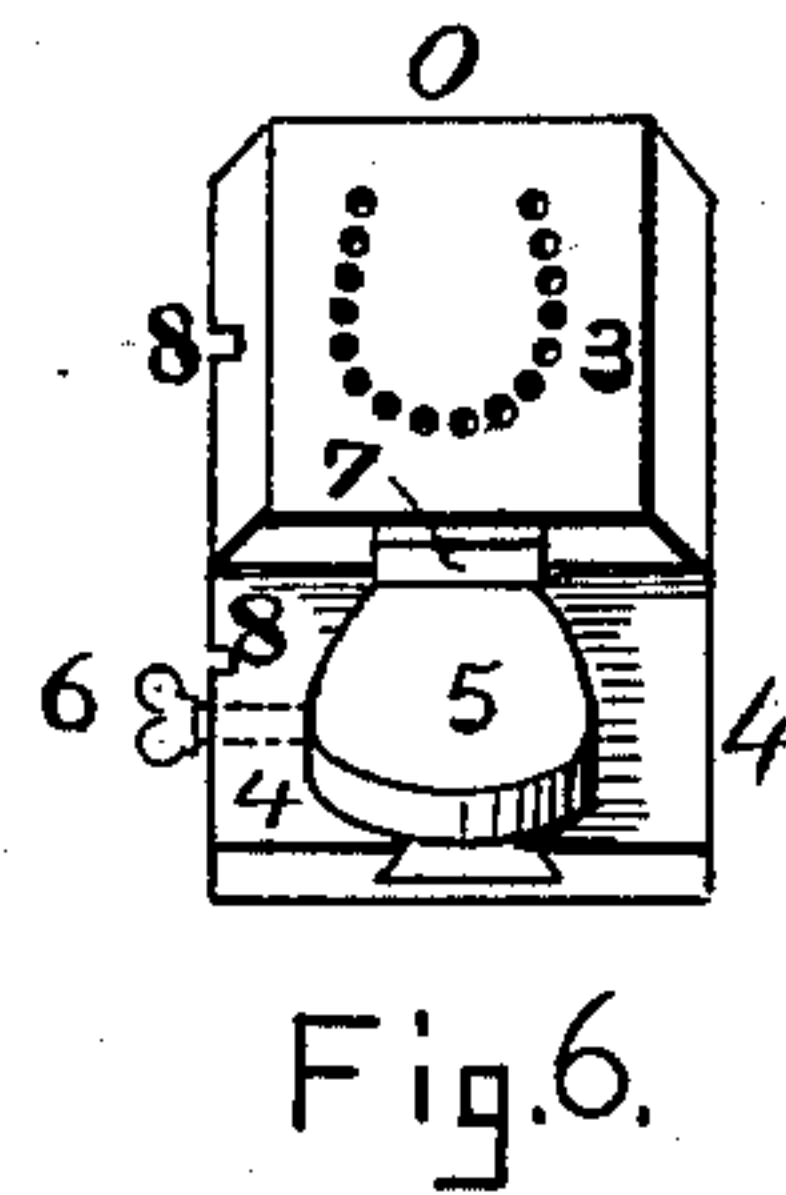
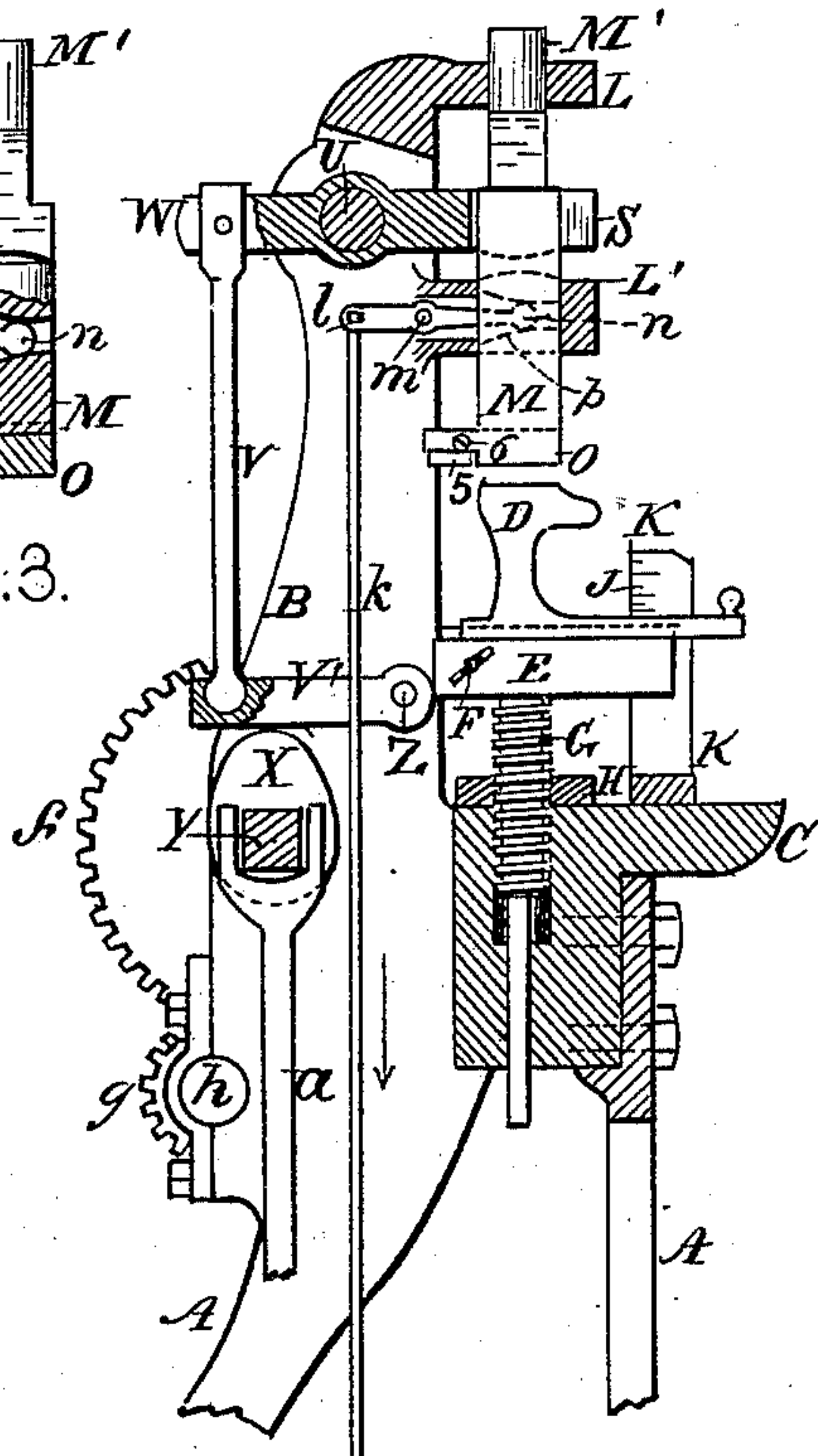
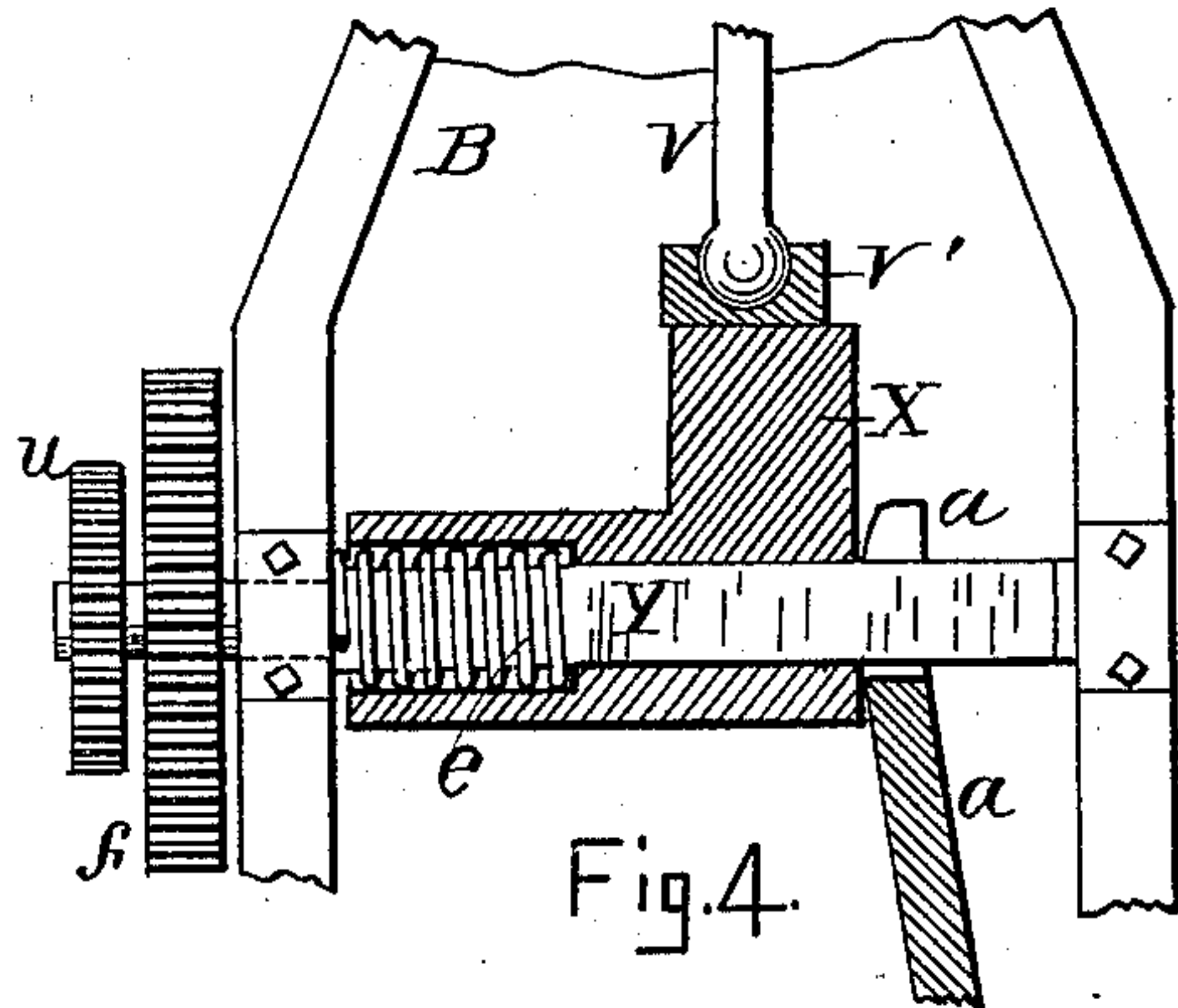
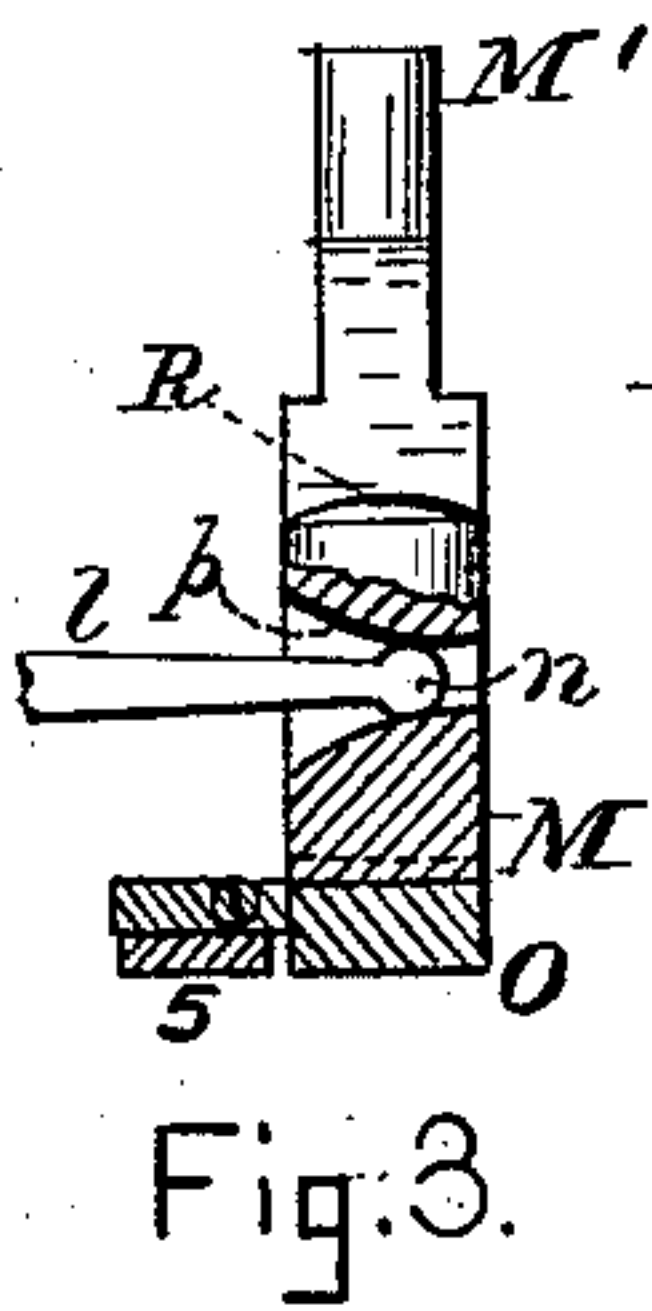
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

MARTIN VAN BUREN ETHRIDGE, OF BOSTON, MASSACHUSETTS, ASSIGNOR
TO THE ETHRIDGE HEELING MACHINE COMPANY, OF SAME PLACE.

HEEL-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 285,596, dated September 25, 1883.

Application filed June 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, MARTIN VAN BUREN ETHRIDGE, of Boston, in the county of Suffolk and State of Massachusetts, have invented
5 an improved machine for nailing heels on boots and shoes and piercing said heels preparatory to applying the same to the shoe or boot sole, of which the following is a specification.

My invention relates to an improved shoe
10 and boot heeling machine; and it consists in an upright frame carrying two horizontal shafts with attached gears, cam, rocker-levers, vertical plunger, last-jack, and table, the various functions and construction of which are
15 hereinafter more fully described by reference to the drawings forming a part of this specification, in which—

Figure 1 illustrates a perspective view of my improved heeling-machine from the rear,
20 Fig. 2 being an elevation also of the rear. Fig. 3 is a detailed view of the plunger in part sectioned. Fig. 4 shows enlarged view of cam and connecting parts. Fig. 5 represents the upper part or head of machine in section. Fig.
25 6 is a face plan of the adjustable heel-plates. Fig. 7 indicates the attached mechanism for preparing the heels. Fig. 8 is a side elevation of the same as attached to the head of machine. Fig. 9 is a front elevation of the
30 plunger and lever-hammer actuating the same.

Referring to the drawings, A A is the supporting-frame, secured to and upholding the head B of the machine, said head projecting in front to form a table, C, which supports the
35 last-jack D, moving in a horizontal direction forward and backward in a suitable cut groove in its bed E, and secured in its proper position directly under the heel-plate by the set-screw F. A vertical movement is also im-
40 parted to said last-jack through the medium of the screw G and nut H, rotated by the finger-pieces I I, and depressed or raised to the vertical scale of measurement J, cut in the inner walls of the guide-brackets K K, which
45 brackets serve also to confine within a proper limit the movement of the last-jack bed E.

Above the table C, and integral with the upper portion of the head B, are two projecting arms or brackets, L L', vertically arranged,
50 receiving and supporting the plunger M, the lower end of which has a dovetailed recess, N,

Fig. 9, for the reception of an adjustable perforated heel-driving plate, O, said plate being held in position by the spring P, attached to the plunger M, entering suitable recesses, 8 8,
55 in the side of said plate. The upper part of the plunger M' is reduced in circumference, so as to form at the base of the smaller portion two convex or rounded shoulders, R R. Said convex surfaces are to receive the blow from
60 the oscillating forked lever-hammer S, the opposing surface of which is also curved in a manner reversed to the shoulders R R to insure a rocking contact of the parts, as shown at T, Fig. 1. To secure the uniform move-
65 ment of the plunger M in the brackets L L', that portion of its smaller circumference in juxtaposition to the shoulders R R is squared to receive the forked end of the lever-hammer S, which latter is fulcrumed in the machine-
70 head at U. The oscillating movement is given to said hammer S by the upright ball-jointed lever V, secured to the lever-hammer at W, and actuated vertically by the cam X on the shaft Y. Interposed between the cam and
75 upright lever V is a socket-bar, V', receiving the ball-joint of said lever, and loosely secured at its opposite end to the shaft Z. The cam X has a horizontal sliding motion on its shaft Y, and is made operative by the throw of the
80 shipper a, which is worked by the side foot-treadle, b, its rod c communicating with the shipper a. When the cam X is inoperative, it is thrown to the left on its shaft through the action of a spiral spring, e, surrounding the
85 right end of the cam-shaft, inclosed in a recess within the sleeve of said cam. At the right of the cam, upon its shaft Y, is keyed the gear f, rotating the cam, and to which power is transferred through the pinion-gear g, shaft h,
90 and belt-pulley i.

The central foot-treadle, j, communicates with the rod k, to whose upper end is secured a short rocker-lever, l, Fig. 5, fulcrumed to the head B at m, and operating in a chamber
95 in the lower bracket, L'. The free end of this rocker-lever, n, terminates in a ball or globe, and operates against the converging walls of a chamber, p, in the plunger M, to raise said
100 plunger preparatory to placing the nail-prepared heel under the heel-plate O before the operation of nailing the heel upon the shoe or

boot. The face of the adjustable heel-plate O, Fig. 6, is drilled with a row of holes, 3, conforming to the shape of the heel, to a depth corresponding with the thickness, or slightly less, of the heel tread-lift. This permits the nails to remain above the surface (after the first blow of the plunger) for the second operation of the cam and subsequent blow of said plunger, which secures the tread-lift and completes the process of heeling. The back of the heel-plate O extends beyond the floor or bottom of the plunger, and is thinned from the face, so as to form a projecting flange, 4, which has a beveled groove centrally in its lower face, parallel with its sides, to receive a detachable plate, 5, secured in its position by the set-screw 6. Said plate has a polished level surface to secure the tread-lift without defacement. The heel-breast guide 7 limits the movement of the tread-lift, and the indentations 8 8 receive the holding-spring P on the plunger M.

Upon one side of the table C, preferably the right, is attached the mechanism for piercing the leather heels, (see Fig. 7,) wherein the bracket *q* is rigidly secured to the head B of the machine by the bolts *r r*. The upper part of the bracket has a depressed bed or dove-tailed groove receiving the movable plate *s*, carrying the gang of awls *v*. The lower end of said plate is pinned to the arm of an eccentric, *t*, rotating on the stub-shaft *u*, and communicating motion to said awls through the medium of the gears *w* and *x*.

In the process of preparing the leather heels the same are placed by the workman upon the shelf *y*, forming a part of the bracket *q*. The awls *v* then descend through holes in the plate or shelf *z*, which is closely fitted in grooves in each inner side of said bracket *q*, so as to be removable, the number of holes in the shelf *z* corresponding with the number of awls in the awl-plate, which is also removable, and the heel is pierced for the reception of the nails. In the ascending movement of the awls the heel is drawn against the under side of the shelf *z*, which resistance frees the heel from the awls, allowing it to be removed, ready for the nails to be inserted by hand. For the greater accuracy in adjusting the leather heel centrally upon the shelf *y*, two suitable curved flat springs, 9 9, Fig. 8, are secured by screws to each front edge of the bracket *q*. Said springs are of thin flexible metal, in width proportionate to the leather heel, and whose rear and free ends are curved inwardly, conforming to the shape of the sides and back of said heel, and acting, in conjunction with the rear stop piece or guide, 2, forming a part of the shelf *y*, to quickly and accurately receive the heel in a proper position.

The operation of my improved heeling-machine is as follows: The workman, standing in front of the table, raises the last-jack verti-

cally to the required height, determined by the scale upon the guide-brackets. The last-jack is now moved horizontally toward the operator, the shoe adjusted over the last, the plunger is raised by foot-pressure applied to treadle *j*, the heel-pile being held in position while the jack is run under said plunger, which, being released, falls upon the heel-pile, and by its weight holds said pile in position. Foot-power is now applied to side treadle, *b*, connecting with the shipper, throwing the cam to its working position, as depicted in Fig. 1, and bringing the hammer down upon the plunger, forming the first stage in nailing the heel. Foot-pressure is now transferred to treadle *j*, the cam becomes inoperative, while the plunger is raised to its normal position. The auxiliary heel-plate 5 is now drawn forward by hand over the heel, receiving the tread-lift, adjusted quickly by hand against its guide, pressure is again applied to treadle *b*, operating the cam and the plunger, giving the second and final blow, and completing the operation of heeling.

Having described the operation and construction of my improved invention, what I claim is—

1. In an organized machine for nailing and pricking heels, the head B, provided with the oscillating hammer S, and operating as described, the plunger M, the adjustable heel-plate O, the last-jack D, and gaging-rules J, operating substantially as and for the purpose described.

2. In a heel-machine, the oscillating hammer S, having the duplex convex shoulders T T, combined with the driver M, as herein described.

3. In a heel-machine, the plunger M, provided with duplex receiving-shoulders R R, in combination with the oscillating hammer S, the ball-jointed lever V, and socket-bar V', as specified.

4. The adjustable perforated heel-plate O, in combination with a detachable driving-plate, 5, and gaging-spring P, for the purpose specified.

5. In an organized heeling-machine, the detachable bracket *q*, in combination with the reciprocating awl-carrying plate *s*, actuated by the eccentric *t* and gears *x* and *w*, substantially as and for the purpose set forth.

6. In a heel-machine, the vertical plunger M, combined with the rocker-lever Z, actuated by the rod K and foot-treadle *j*, to hold the heel-pile and heel tread-lift, as herein described.

In testimony whereof I have signed this specification in presence of two subscribing witnesses.

MARTIN VAN BUREN ETHRIDGE.

Witnesses:

WM. H. MILLER,
S. D. OSBORNE.