

C. W. GLIDDEN.

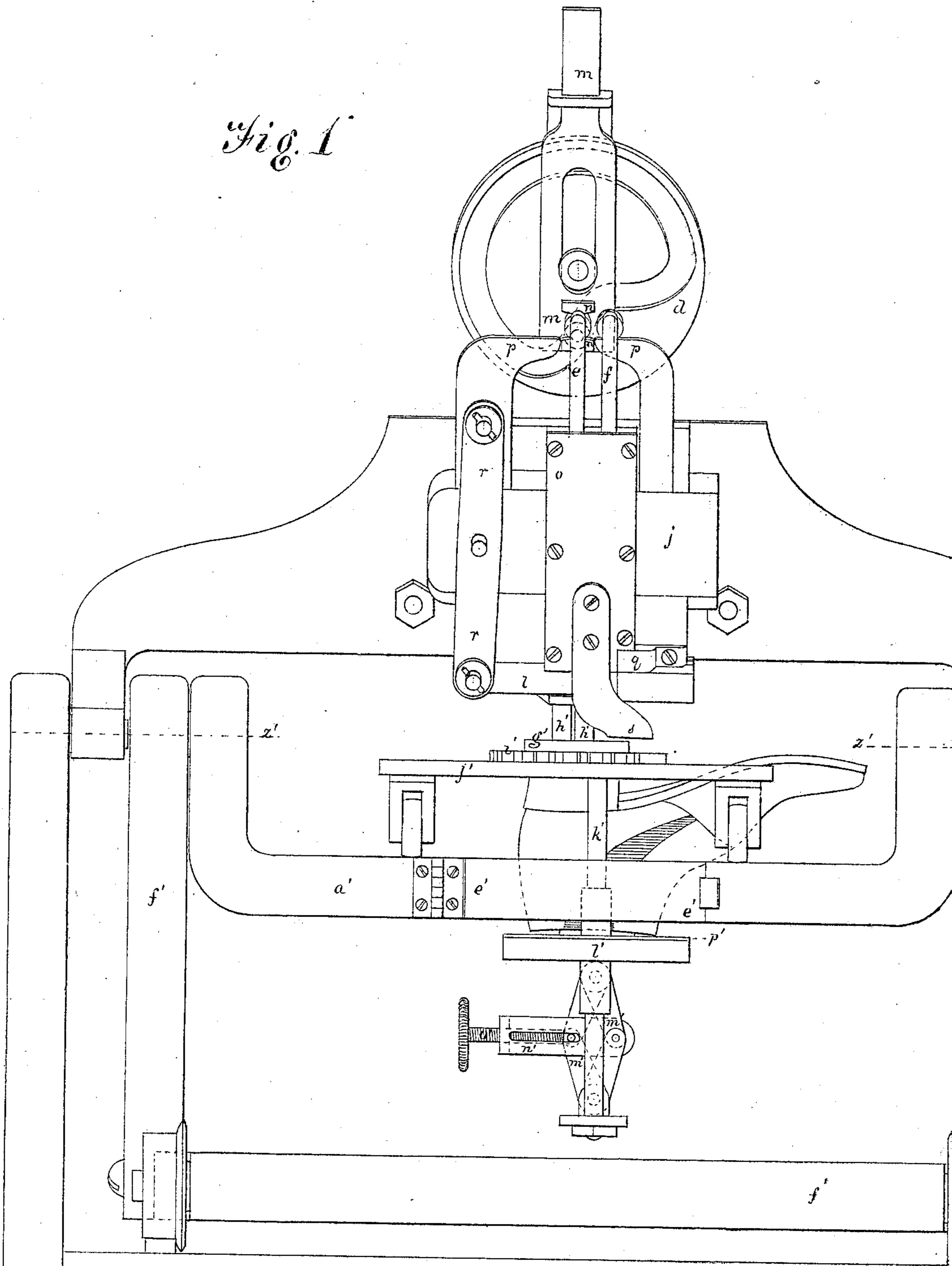
4 Sheets--Sheet 1.

Improvement in Heel Nailing-Machines.

No. 129,811.

Patented July 23, 1872.

Fig. 1



Witnesses.
M. W. Frothingham.
S. B. Kidder.

Charles W. Glidden.
By his Atty.
Crosby & Foulke.

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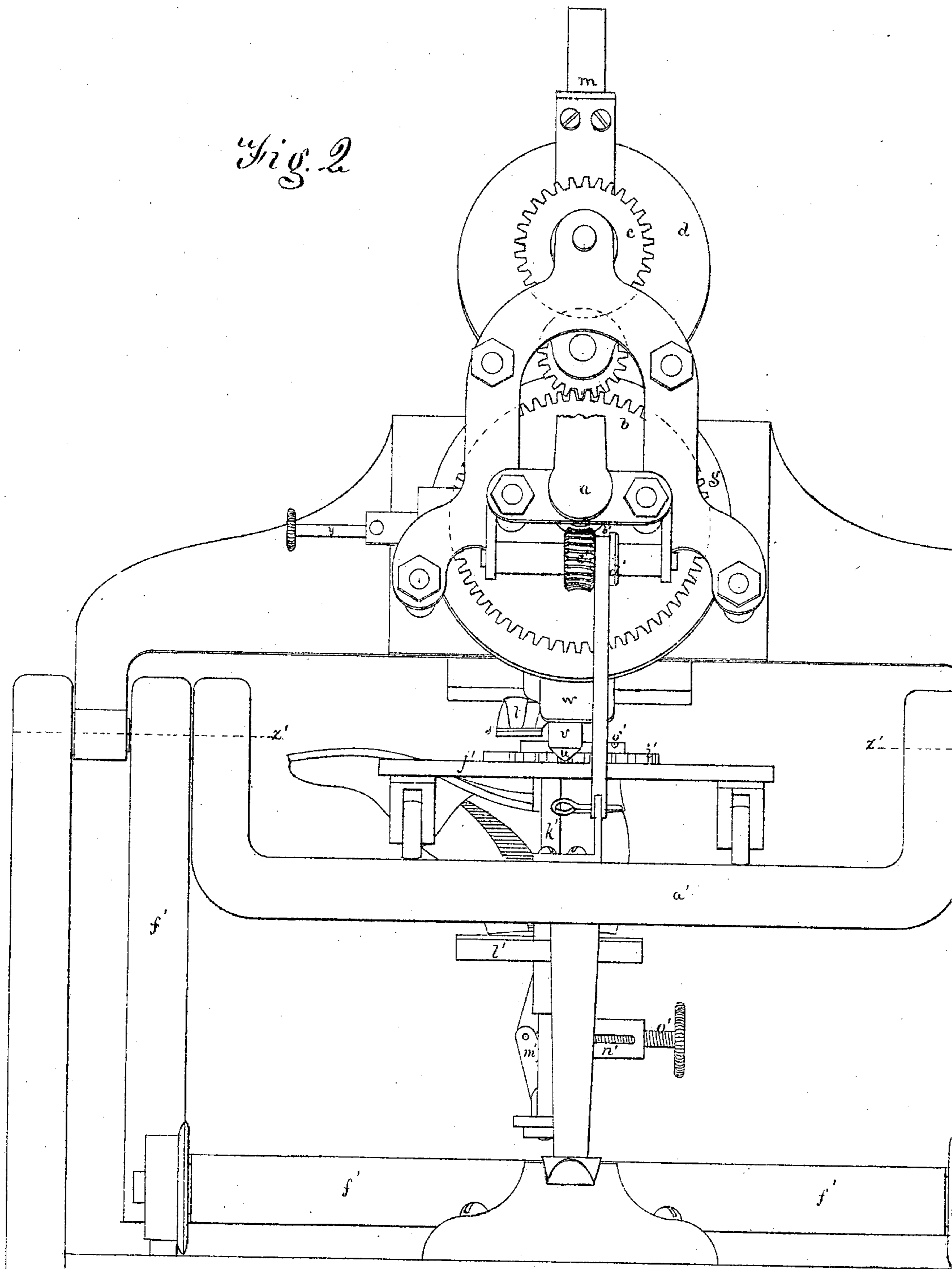
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Fig. 2



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Crossy & Gould

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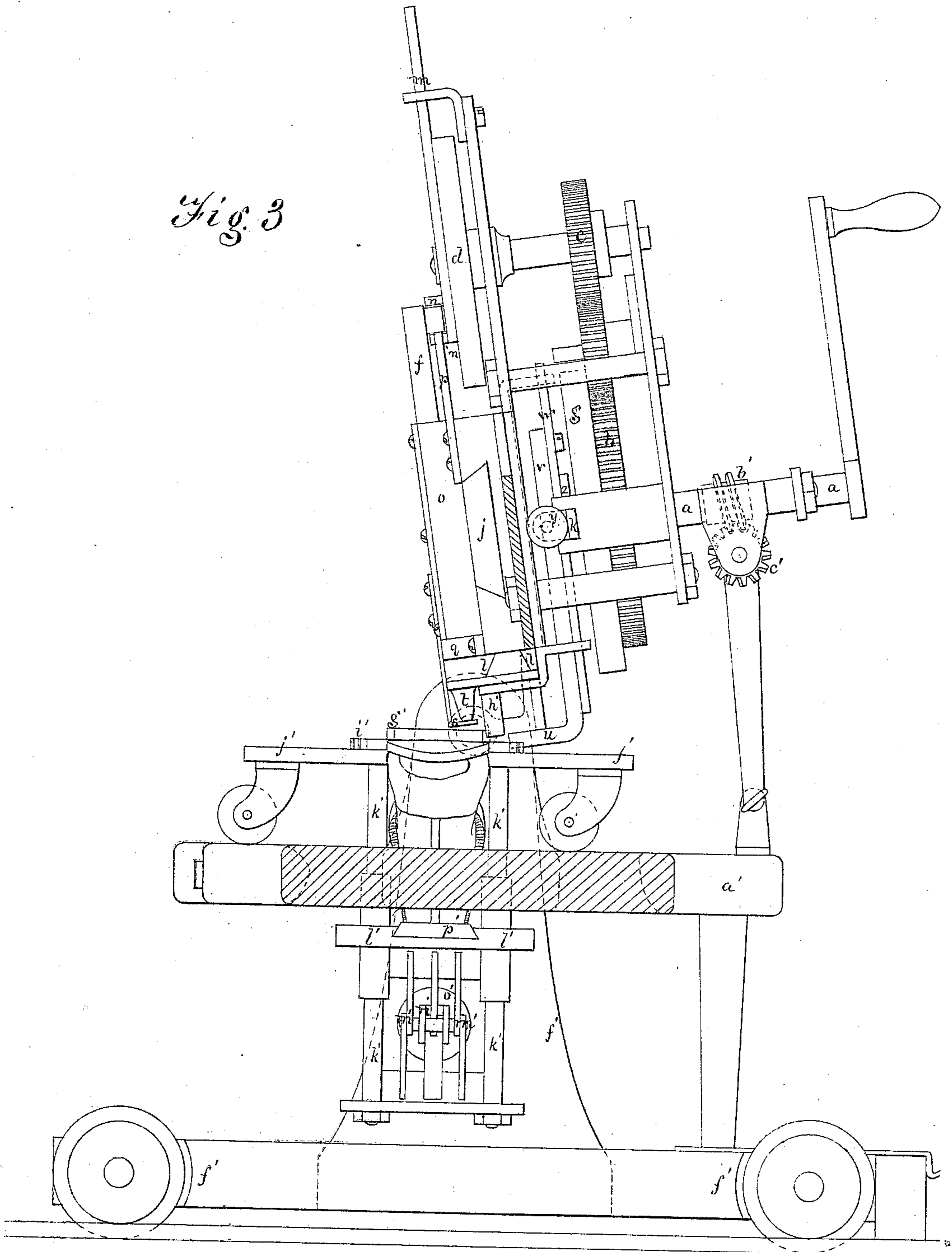
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Fig. 3



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Fig. 5

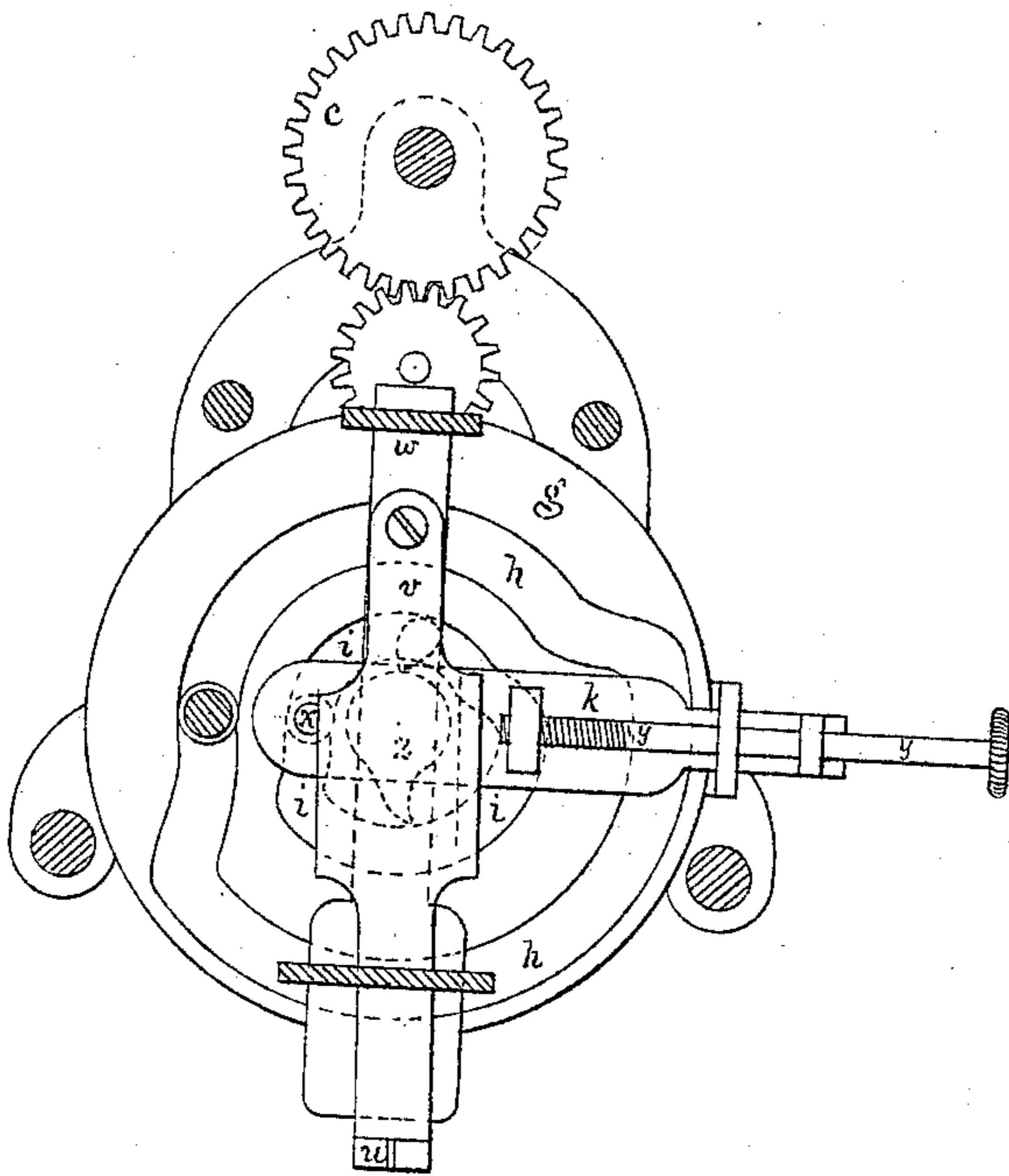
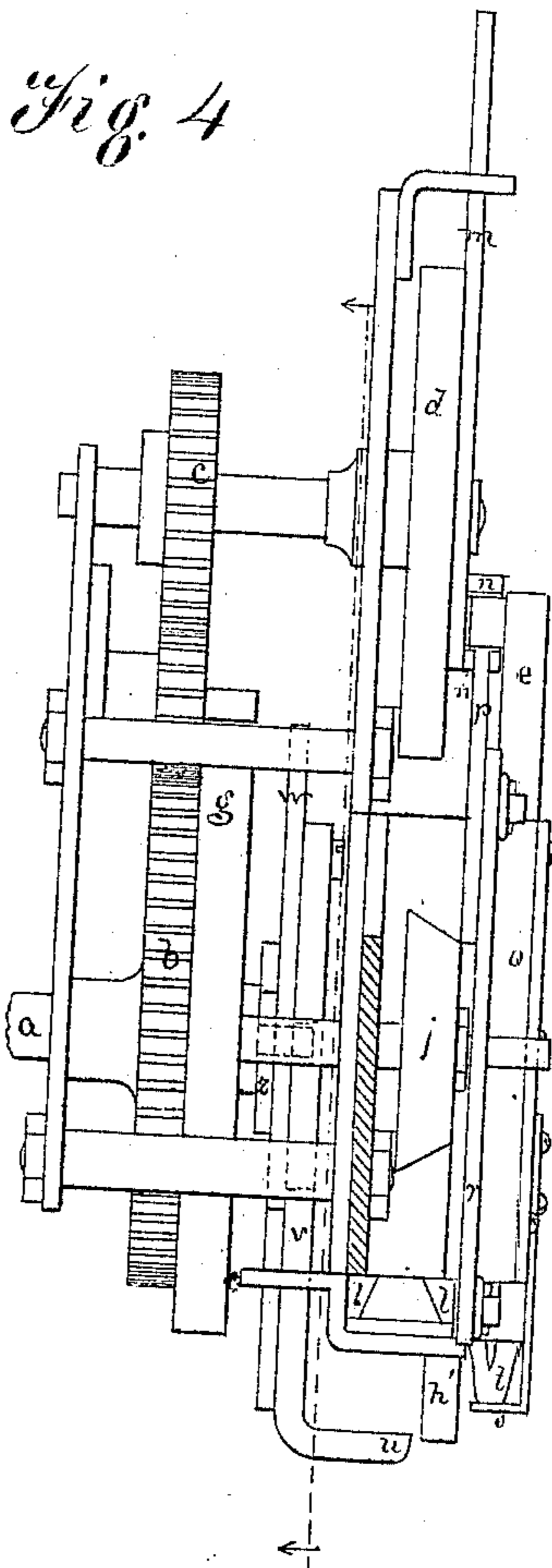


Fig. 4



Witnesses.
 M. W. Frothingham.
 P. B. Kidders.

Charles W. Glidden.
By his Atty.
Crosby & Gould

UNITED STATES PATENT OFFICE.

CHARLES W. GLIDDEN, OF LYNN, MASSACHUSETTS.

IMPROVEMENT IN HEEL-NAILING MACHINES.

Specification forming part of Letters Patent No. 129,811, dated July 23, 1872.

To all whom it may concern:

Be it known that I, CHARLES W. GLIDDEN, of Lynn, in the county of Essex and State of Massachusetts, have invented certain Improvements in Nailing Heels; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of the specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

There is now in public use mechanism for pricking, simultaneously, inclined holes in heels for reception of nails, and also mechanism for simultaneously driving nails through heels into and through the rear part of boot and shoe soles, to the invention of which mechanism I have been a contributor, as may be seen by reference to existing United States patents.

My present invention relates to improvements by which holes are pricked, one after another, in a general outward inclination, and when required in varying degrees of inclination, in the same heel, and by which said holes are supplied with nails one after another, the nails being driven immediately after their reception in the heel through it into the sole of a boot or shoe when properly located on one, or when the nails are by another mechanism to be driven simultaneously into and through the sole of a boot or shoe. In the latter case, they are, by the herein-described mechanism, simply crowded into the holes a part of their length.

Figure 1 of the drawing shows, in front elevation, a machine embodying my invention. Fig. 2 shows the same in rear elevation, and Fig. 3 in side elevation. Fig. 4 is the side elevation of the nailing-head opposite to that shown in Fig. 3. Fig. 5 is a sectional elevation of the pegging-head, the section being taken in the plane of the dotted line seen in Fig. 4.

The nailing mechanism is of that kind which makes a hole and fills it before imparting a feed movement to the boot or shoe, and it embraces some novelties which are of my invention.

a is the main shaft, to which power is applied, and on which is fixed a gear, *b*, which, by means of an intermediate gear, drives gear *c* twice the number of times that gear *b* makes.

On the shaft of gear *c* is fixed the cam *d*, by which the awl and driver-bars *e* and *f* are reciprocated alternately in a peculiar manner, as hereafter described. On shaft *a* is fixed a disk, *g*, in one plane face of which are cut cam-grooves *h* and *i*, the former of which acts on a stud-pin made fast in slide *j*, to reciprocate it horizontally in its guides, and the latter of which operates to reciprocate slide *k*. To cause reciprocations of the awl and driver-bars by the action of the same cam, the slide *m* is arranged to move in guides vertically against the face of cam *d*, a pin or roll fixed to slide *m* projecting into the cam-groove. On the outer face of the lower end of slide *m* are projections *n n*, between which first one and then the other of the rolls or pins fixed in the bars *e f* are conveyed alternately, so that by rotation of cam *d* the necessary vertical movements are imparted to both the awl and the driver.

The guides containing the awl and driver-bars are found in piece *o*, which is fixed to slide *j*, so that it will be obvious how, as said slide reciprocates and cam *d* rotates, the awl and driver-bars receive their compound motion. The lateral motion given to bars *e* and *f* on each side of the vertical plane passing through the axis of the cam *d* is equal to the distance apart of the centers of said bars. Outside of the bars are located pieces *p p*, which receive and hold in their highest position the awl and driver-bars, said position being the one from which they are taken and made to descend, and to which they are restored. The nails may be supplied to the machine in continuous lengths, or in the form of separate nails; but in this description no special devices for said supply are shown or described. But in the drawing the piece *q* is shown, having in it a vertical hole for reception of one nail of suitable length, or for reception of the end of a wire or nail-rod. To the slide *l* is fixed a piece in which a nail-tube is formed, which comes in line with the nail-hole in *q* when the driver-bar is at rest. Said piece, in conjunction with piece *q*, forms a shears, by which the length of wire or nail-rod fed downward into it is cut off, and by movement of slide *l* is conveyed directly into line with the driver-bar when the driving-stroke is made. The mechanism described will convey equally well the ordinary shoe-nails. Though move-

ment of slide *l* is imparted by the same cam which moves slide *j*, the required extent of movement is obtained by the intervention of lever *r*. To prevent the nail from dropping from its carrier when it is conveyed from the point of its reception to the point where it is driven, a rest-piece, *s*, is located under the lower open mouth of the tube *t*, through which the driver descends, said tube being a continuation of the nail-hole formed in the slide *l*; and said rest is so located that the lower end of the nail-tube *t* is uncovered from it only at the point of the arrival of said tube over the hole made by the pre-action of the awl. Located equally on either side of the plane in which the piercing and driving implements make their strokes are two guide-rolls, *h' h'*, or pins, against which the operator presses the form or guiding-pattern which determines the form of the line or row of nails to be driven. The feeding implement is marked *u*, and acts in teeth formed in or on the heel or boot or shoe carrier like one tooth of a coacting gear. The movement imparted to the feeder *u* is similar to that of the well-known four-motioned feed in sewing-machines—that is to say, the feeder, being in gear between two teeth on the heel-holder, moves horizontally and carries the heel the distance desired between the centers of two nails; then with an upward motion the feeder becomes disengaged from the teeth on the heel-holder; next with a downward movement it engages in the next space between two teeth; and then a horizontal feeding movement is given to the feeder, and so on. The feeder *u* is formed by a right-angled bend in the radius-arm *v*, which is pivoted at its upper end to the vertically-guided slide *w*. On slide *k* is a projection, *z*, between which and the end of the adjustable screw *y* the radius-arm *v* hangs, so that it will be obvious how the reciprocations of slide *k* communicate vibratory motions to arm *v* and its feeding part *u*, and also that the extent of such motions may be varied by allowing more or less loss of motion between the radius-arm *v* and the slide *k*, consequent upon adjustment of screw *y*. The cam *z*, (seen in Fig. 3 and in dotted lines in Fig. 5,) fixed on the main shaft *a*, in its rotations strikes a projection on slide *w* and lifts it, and consequently lifts the feeder, which at the proper time, as the cam rotates, falls by gravity or is moved downward by a spring. As heels are made taper, increasing in size from the tread toward the seat, and as such taper or rake is usually greater at the rear than it is at the sides of the heel, it becomes very desirable to make the nail-holes and to drive the nails in lines substantially parallel with the inclination of the periphery of the heel. In this relation I may say that my invention consists in a manner of combining a puncturing and nail-inserting or driving mechanism which operates to make hole after hole, and to drive or insert nail after nail, with the mechanism by which the work is held and presented, so that the lines of puncture and inser-

tion shall form obtuse angles with the plane of the heel-tread, instead of acute angles; also, with such combination, the addition of an element by which the degree of obtuseness of the angle may be varied; also, with such combination, the addition of an element by which the angles of relative presentation may be changed automatically, so as to conform to the difference in the bevel or rake of the heel at the sides, rear, and intermediate portions. I show in the drawing two ways of obtaining an angular insertion of the awl and nails, and two ways of automatically varying the degree of angle at the sides and rear of the heel. The head-work may be pivoted, as seen in Figs. 1 and 2, on an axial line about in line with the end of the nail-tube *t*, said line being denoted by a dotted line in said figures, marked *z' z'*; and if the heel is of uniform bevel at sides and rear, then the head may be adjusted and clamped at any angle suited to the angle of the heel. Or the head may be fixed, and the table *a'*, on which the jack is supported and moved under the nailing mechanism, may be pivoted, as indicated in Figs. 1 and 2, on the line where the end of the nail-tube *t* delivers the nails. Either the head or the table may be pivoted, preferably in the line indicated; but when one is pivoted the other should be fixed. To vary the inclination either of the head or of the table the screw or worm *b'* is fixed on shaft *a*, and meshes into a screw or worm gear, *c'*, on a shaft placed below shaft *a* and at right angles thereunto. By the gear *c'* an eccentric, *d'*, is rotated, which, by proper connection, will automatically tip either the head or the table, according as one is fixed and the other left movable on pivots. The arrangement of the gears *b' c'* and the eccentric is such that the head or table will be inclined at a given angle when the nailing mechanism is over the front of the heel at one side, will increase the inclination gradually until the rear of the heel is reached, and will then decrease the inclination until the front of the heel is reached on the other side thereof. The table *a'* may be kept from tipping; or it may be pivoted to a carriage, *f'*, which is made to draw toward the operator from beneath the nailing mechanism, for convenience in placing and removing work when the head is made to tip, and then, in such case, the connection from the eccentric *d'* should be with some convenient immovable point; but when the head is fixed and the table is made to tip, then I make an opening or door, *e'*, in the table, through which I can draw forward a part of the jack with the work thereon. Even when the table *a'* is made to move with the carriage *f'* the opening or door *e'* may be retained in the table *a'*. The carriage *f'* is provided with a suitable latch or catch and a stop so as to bring the opening in the table *a'* concentric with the line of action of the awl and driver. The jack, which clamps the lifts of the heel together and presents the heel properly to the mechanism to be pricked and loaded, may also be used to

carry a boot or shoe and a heel thereon, to be fastened by driving the nails through the lifts of the heel, and into and through the rear or heel-seat portion of the sole. When a heel is to be fastened to a boot or shoe, then the driver may be allowed to come into contact with the tread-lift; but when heel-lifts are assembled and tacked together into a heel-blank, and are put into the machine to be pricked and loaded merely, so as to leave the nail-heads projecting, to be afterward driven flush by another mechanism, in uniting the heel to a boot or shoe, then a perforated plate, g' , is placed so that the awl has to enter the perforations before reaching the leather, and so that the nails drop into said perforations when they come one after the other into line with the nail-tube. I prefer to have the plate g' of a thickness equal to the length of the projection of the nails beyond the tread-lift, but the thickness may be equal to the greatest projection ever required; and for less projections the driver may be adjusted to enter more or less deeply into the perforations made in the plate. The edge of plate g' is the pattern, which is kept pressed by the operator constantly against the guide pins or rolls $h' h'$, while the automatic feeder u operates in teeth i' of a plate connected with plate g . Said plate and the irregular gear provided with teeth i' are made interchangeable with others, to suit various sizes of heels. The plate j' is mounted on casters, which rest and can be moved in any direction on the top of table a' by the operator in keeping the pattern g' against the gage-rolls $h' h'$. Two rods, $k' k'$, are made fast in plate j' , on which rods the plate l' slides, being forced up by straightening the toggles $m' m'$ and lowered by allowing the toggles to assume an angular position. The toggles are operated by means of the strap n' and the screw o' ; or a cam might be substituted for the screw as being more conveniently and quickly worked. In the plate l' is a slide, p' , in which are fixed the last-pins

which enter the last, and in the plate j' is a cavity conforming to the shape of the heel, said cavity extending to the plate g' . By adjustment of slide p' in slide l' the heel is set forward or back upon a boot or shoe, as may be desired. In simply pricking and loading heel-blanks a mere anvil-block of proper material would take the place of the last.

I claim—

1. For alternately reciprocating the awl and driver-bars, the combination of the cam d , the slide m , its projections n , the supports p , and slide j , substantially as described.

2. Also, in combination with a cogged guide or pattern, a feeder, u , to which the described movements are imparted, substantially as set forth.

3. Also, the combination, with a rigid-fastening inserting mechanism and a heel-support, of the mechanism, substantially as herein described, by which the angles of inclination of the fastenings are changed automatically to conform to the rake of the heel around its contour.

4. Also, the combination, with an awl-inserting mechanism and a heel-support, of the mechanism, substantially as herein described, by which the angles of inclination of the perforations or punctures by the awl are changed automatically to conform to the rake of the heel around its contour.

5. Also, in the formation of nail-loaded heel-blanks, I claim the described process of loading the blanks, the same consisting in pricking each nail-hole separately and consecutively around the heel, and in dropping or inserting into each pricked hole, directly after it is made a nail, with its head protruding from and its point concealed in the heel-blank, which will then be ready for application to a boot or shoe.

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Witnesses:

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M. W. FROTHINGHAM.