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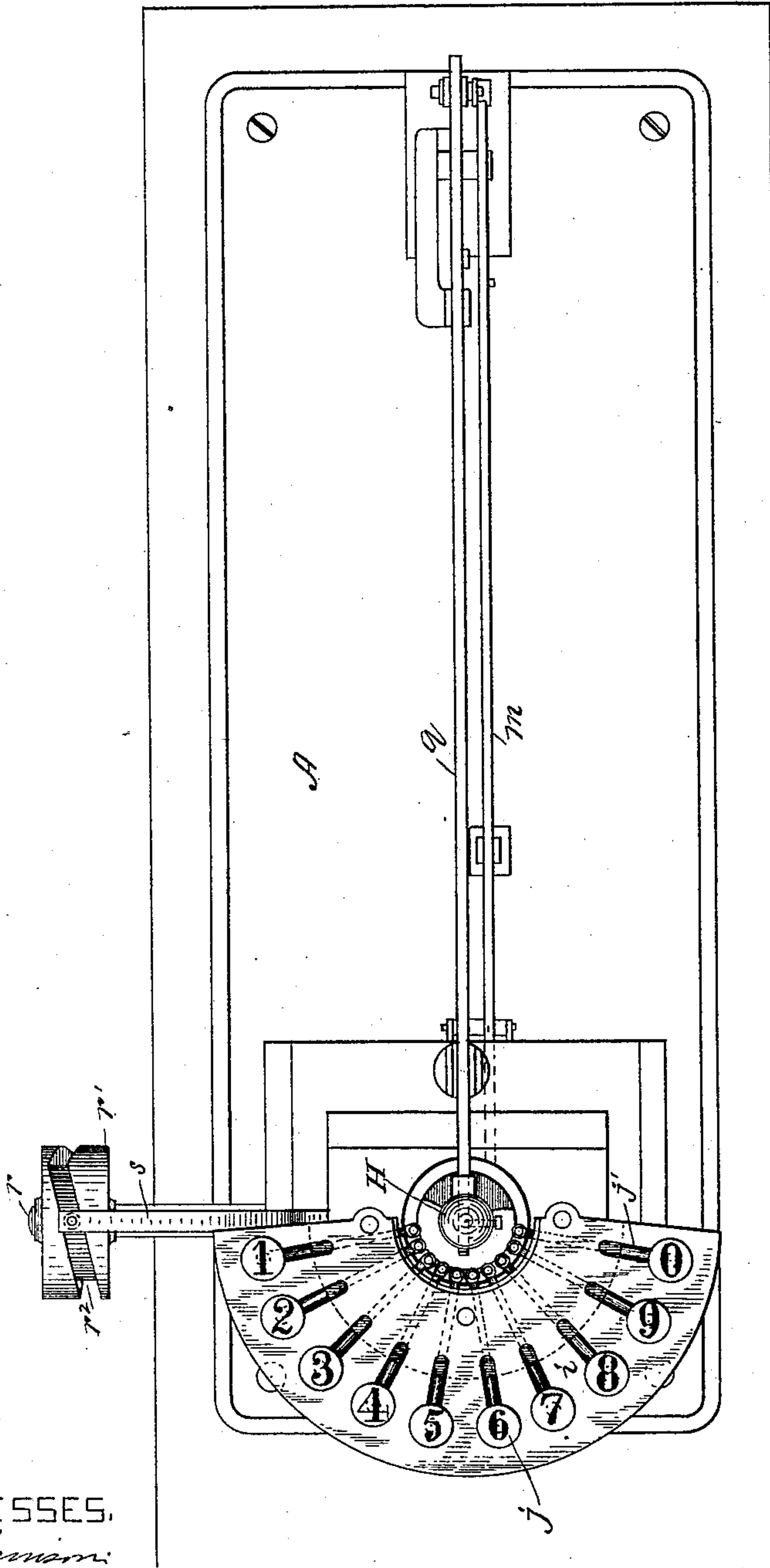
W. A. HILL & W. F. FOSS.

MACHINE FOR INDENTING LETTERS AND FIGURES IN METAL.

No. 452,605.

Patented May 19, 1891.

FIG. 1.



WITNESSES.

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(No Model.)

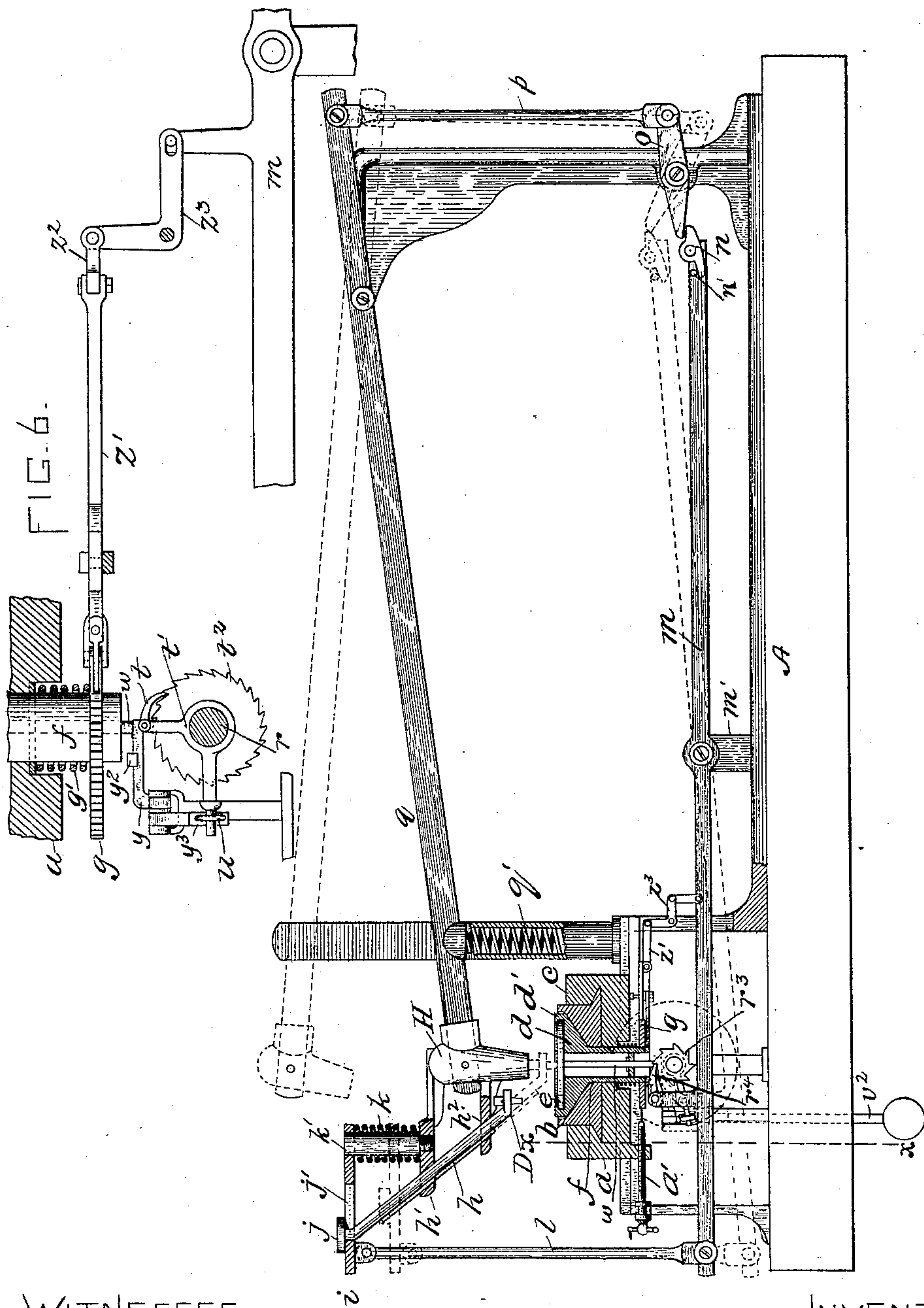
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W. A. HILL & W. F. FOSS.

# MACHINE FOR INDENTING LETTERS AND FIGURES IN METAL.

No. 452,605.

Patented May 19, 1891.



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(No Model.)

3 Sheets—Sheet 3.

W. A. HILL & W. F. FOSS.

MACHINE FOR INDENTING LETTERS AND FIGURES IN METAL.

No. 452,605.

Patented May 19, 1891.

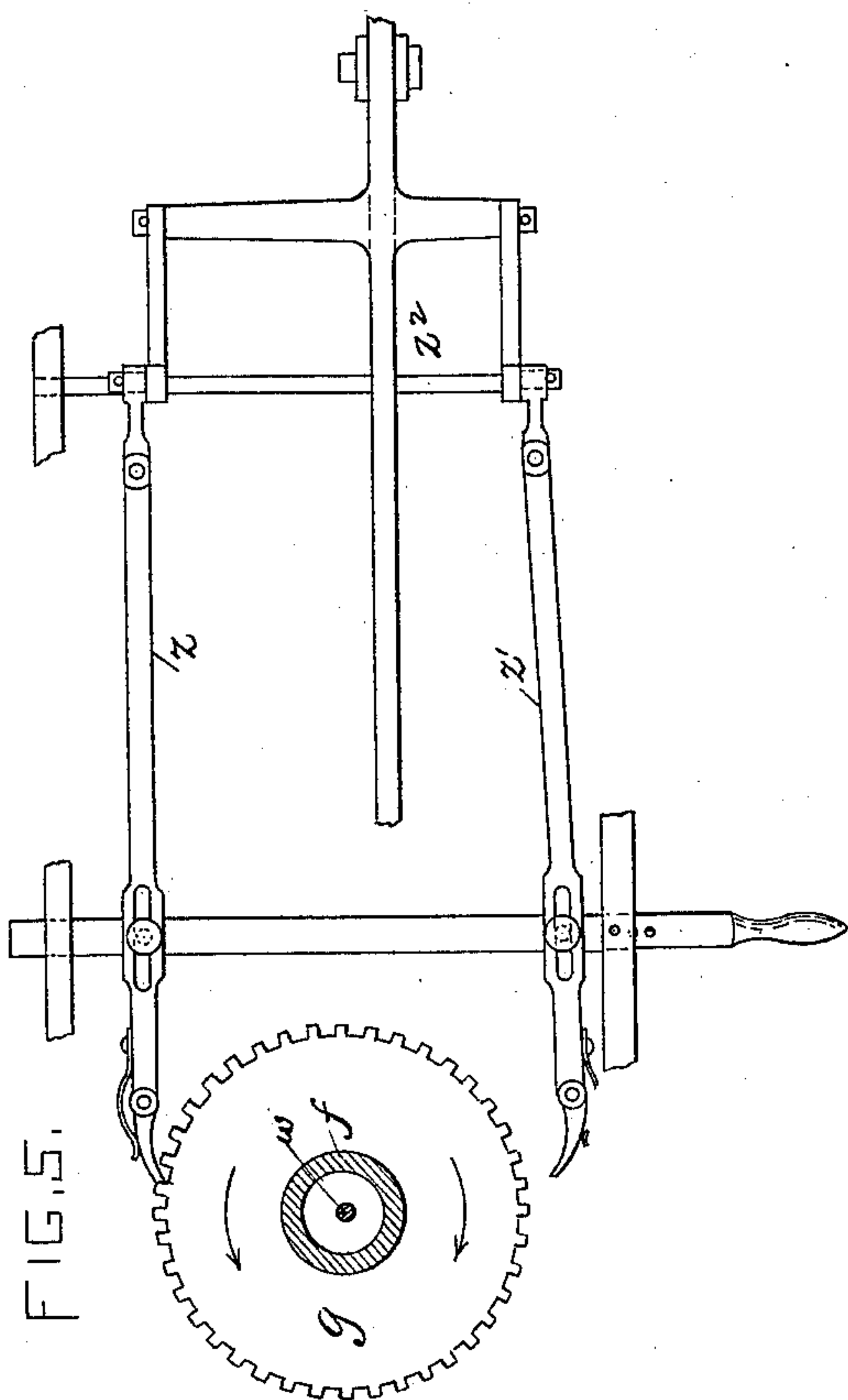


FIG. 4.

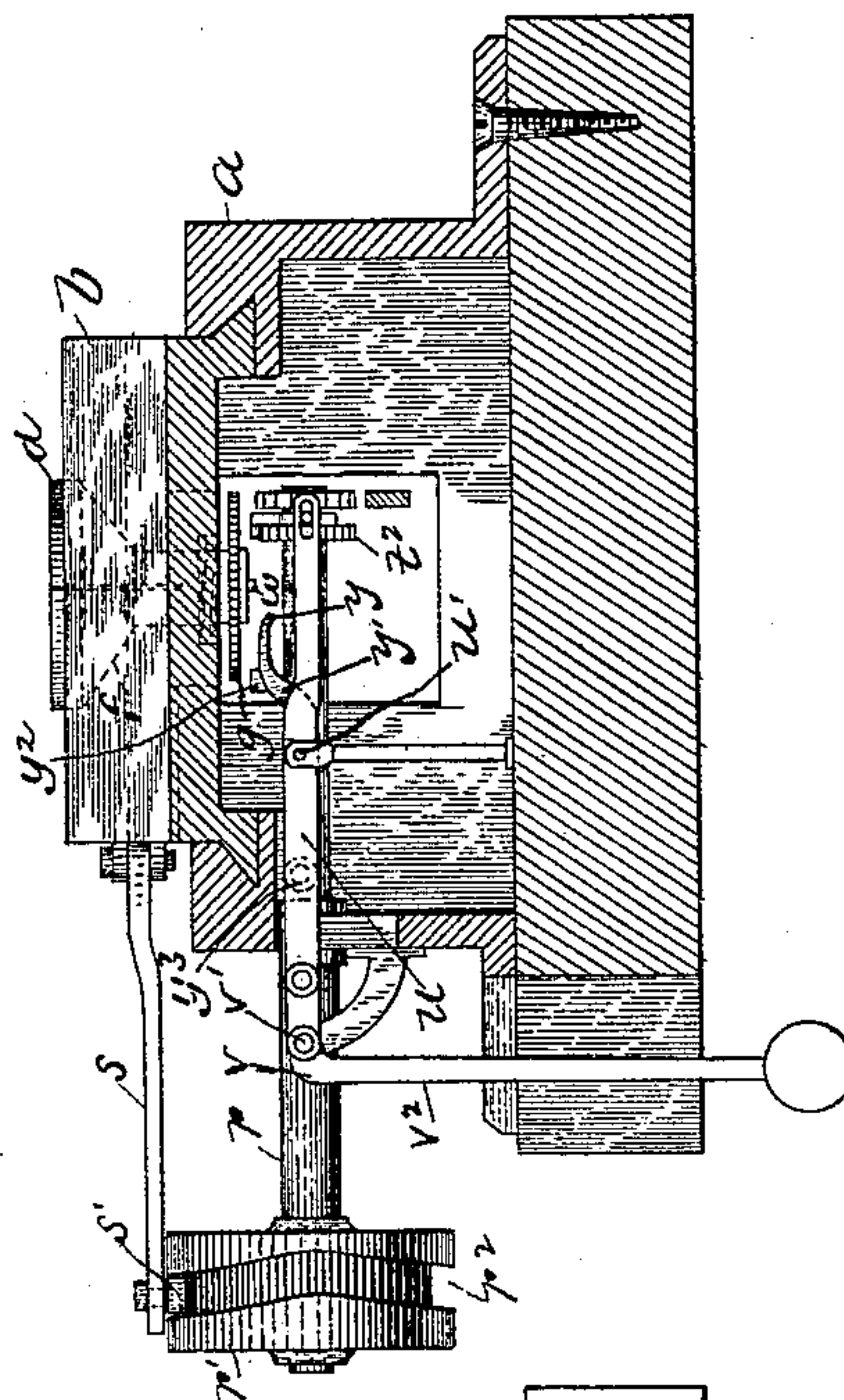
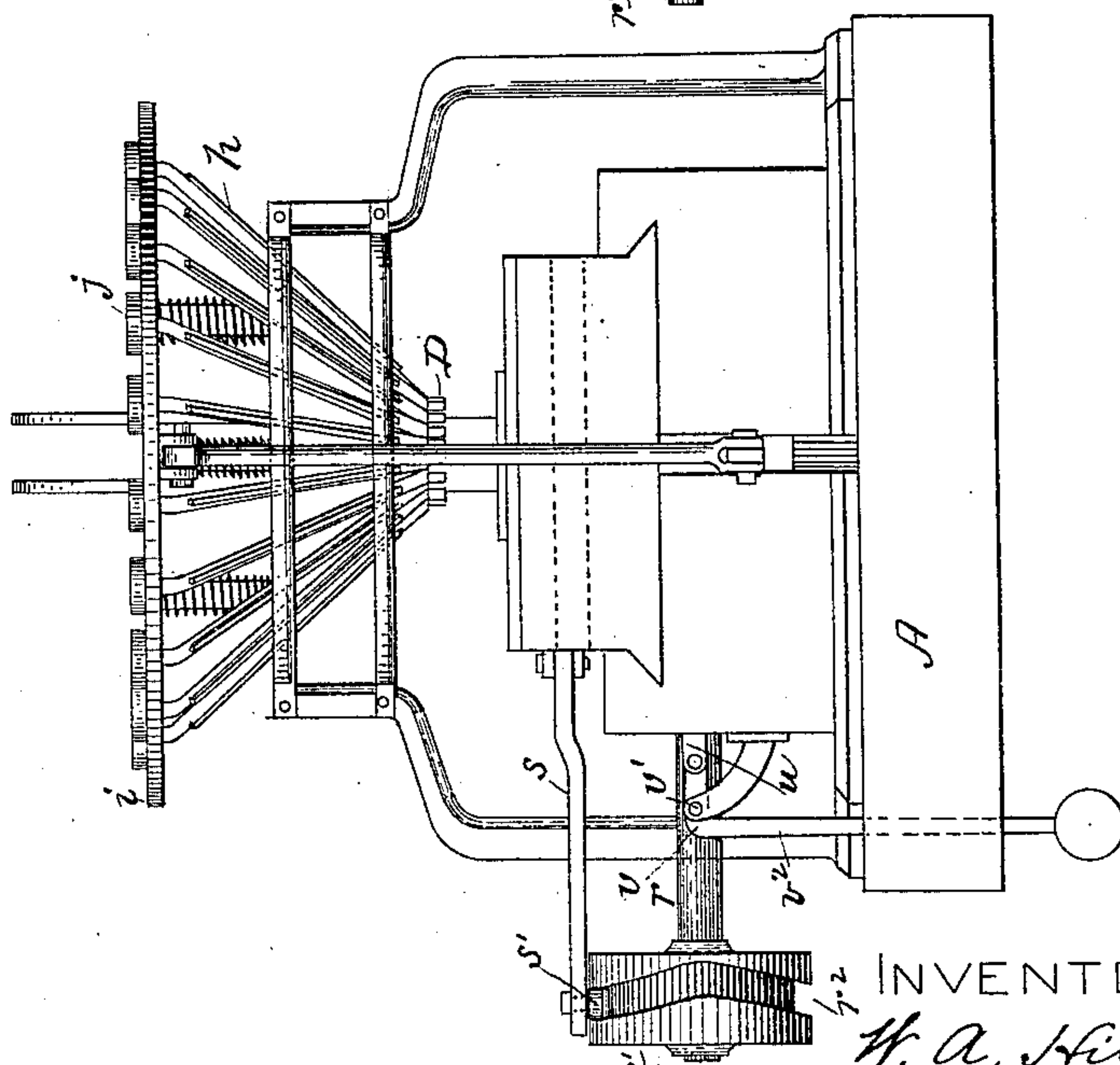


FIG. 3.



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# UNITED STATES PATENT OFFICE.

WILFORD A. HILL AND WEBSTER F. FOSS, OF WALTHAM, MASSACHUSETTS.

## MACHINE FOR INDENTING LETTERS OR FIGURES IN METAL.

SPECIFICATION forming part of Letters Patent No. 452,605, dated May 19, 1891.

Application filed August 30, 1888. Serial No. 284,149. (No model.)

*To all whom it may concern:*

Be it known that we, WILFORD A. HILL and WEBSTER F. FOSS, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Indenting Letters or Figures in Metal, of which the following is a specification.

Our invention has for its object the production of a machine whereby figures or numbers, letters or characters may be indented or stamped in or embossed upon metal in an efficient and expeditious manner, employing a process and means somewhat analogous to type-writing and type-writing machines.

Our invention consists of a contrivance or machine so organized that by depressing a key, which may be accomplished by the movement of a finger of the operator, the desired die will be brought into proper position on the metal to be stamped, and a hammer will be tripped to strike a blow on the die, and by releasing the key the die and the hammer operating parts will return to their normal position and the metal being operated upon will be moved or fed along, so that a line or circle of figures or letters may be stamped thereon.

Our invention also consists of improvements incidental to the foregoing, the whole being hereinafter fully described and explained, and distinctly pointed out in the appended claims.

Reference is to be had to the accompanying drawings and the letters of reference marked thereon, forming a part of this specification, the same letters designating the same parts, in which—

Figure 1 is a top plan view of the machine comprising the invention. Fig. 2 is a longitudinal sectional view, parts being omitted in order to the more clearly show the construction of the machine. Fig. 3 is a front elevation of the machine. Fig. 4 is a sectional view taken on the line  $x x$  of Fig. 2. Fig. 5 is a detail view showing means which may be employed to so move the plate-holding bed as to have the figures or letters stamped on the metal in a circular line. Fig. 6 is a sectional detail view hereinafter more particularly referred to.

The machine illustrated in the drawings is adapted to be employed in the stamping of

numbers on top plates of watches, and the present description is for the most part confined thereto, though it will appear obvious that the machine may be used to stamp figures, letters, or characters on metal of substantially any kind or form.

In the drawings, A designates the frame of the machine, which may be of suitable size, strength, and form, and be provided with a suitable base  $a$  to support the bed  $b$ , movable thereacross in ways  $c$ .

$d$  is a chuck split or divided at intervals, as is common in the construction of such devices, and provided with a vertical flange  $d'$ , which is capable of being closed on the periphery of a plate  $e$ , which may be placed within the limits of said flange and so hold the plate firmly therein. The chuck  $d$  is provided with an inclined base and rests in a seat of corresponding form made in the bed  $b$ . A stem  $f$ , which may be an integral part of the chuck, projects downward therefrom and has a toothed wheel  $g$  secured to its lower end, between which wheel and the base  $a$  is interposed a spring  $g'$ , which serves to hold the chuck firmly down in its seat, causing the flanges  $d'$  of the same to close on the plate  $e$ , all as will be fully understood by reference to Fig. 2 of the drawings.

$h$  designates movable arms, of which in the present instance there are ten, each provided on its lower end with a die D. The die-carrying arms  $h$  have an inclined position in the machine, and when viewed from above all appear to radiate from a common center—the center of hammer-head H. The arms  $h$  are longitudinally movable, being guided in such movements by ways formed in plates or brackets  $h' h^2$ , so that the die of each arm may be moved down upon the plate  $e$  directly under hammer-head H, as indicated by dotted lines in Fig. 2, or be moved out from under the hammer-head and raised to a position considerably above the plate  $e$ , as shown by the full lines in the last-mentioned figure. The arms  $h$  are normally held in raised position by means of a finger-board  $i$ , which bears against the under side of a button  $j$ , attached to the upper end of each die-carrying arm, the latter projecting through a slot  $j'$  in the finger-board. The finger-board is normally held in raised position by means of a light



spring  $k$ , surrounding a stud or standard  $k'$  and interposed between the bracket  $h'$  and said finger-board.

$l$  designates a link-rod pivoted or hinged at its upper end to the finger-board  $i$ , and in like manner connected at its lower end with the forward end of a lever  $m$ , fulcrumed on a stud  $m'$ , projecting upward from the frame A, and provided on its rear end with a pivoted dog  $n$ , adapted to operate on the forward end of a short lever  $o$ , fulcrumed on the frame, the rear end of which lever  $o$  is connected by means of a link-rod  $p$ , similar to rod  $l$ , with the rear end of hammer-lever  $q$ , also fulcrumed on the frame and provided on its forward end with hammer-head II. The rear end of dog  $n$  extends under the forward end of short lever  $o$ , and is held in such position by means of a stud or stop-pin  $n'$ , as will be understood by reference to Fig. 2. If now the operator should place his or her finger on and depress one of the buttons  $j$ , the result would be to carry the die D of the arm  $h$  to which such button is secured down upon the plate  $e$  under the hammer-head II, and at the same time to depress finger-board  $i$  against the stress of spring  $k$ , depressing the forward end of lever  $m$  through the medium of link-rod  $l$ , raising the rear end of said lever  $m$ , and through the medium of dog  $n$  rocking short lever  $o$  on its fulcrum, so as to draw down link-rod  $p$  and the rear end of hammer-lever  $q$ , raising hammer-head II until dog  $n$  slips off from engagement with short lever  $o$ , when the hammer-head will fall on the die D, indenting the figure or letter thereon in the plate  $e$ . Toward its forward end hammer-lever  $q$  rests upon a light spring  $q'$ , which has sufficient tension to barely raise the hammer-head off the die D after the latter has been struck by the fall of the former, when the operator will remove his or her finger from the button  $j$ , and the several parts will be returned to their normal positions chiefly through the influence of spring  $k$ , operating between the bracket  $h'$  and finger-plate  $i$ , dog  $n$  being so constructed and arranged as to again engage the under face of the forward end of short lever  $o$ .

The operation just described may be repeated by depressing the finger-board  $i$  through the medium of any of the buttons  $j$ , and so bringing any one of the dies carried by arms  $h$  under hammer-head II; but before so doing it will be necessary to feed or move the plate  $e$  along a short distance in order that the next die may not make its indentation or mark over or upon that made by the preceding one, and this movement of the plate may be effected in various ways.

When it is desired to stamp the letters or figures on the plate  $e$  in a straight line, we may move the said plate and its bed  $b$  along step by step, and this may be accomplished by the devices which we will next describe.

$r$  designates a rotary shaft journaled in suitable bearings in the frame or bed-support

and provided on its outer end with a drum or barrel  $r'$ , having a cam-groove  $r^2$  formed in its face in which travels an anti-friction roller or bowl  $s'$ , connected with the outer end of a pitman or link  $s$ , pivotally connected at its inner end with the bed  $b$ . To the inner end of shaft  $r$  is secured a ratchet-wheel  $r^3$ , the teeth of which are engaged by a pawl  $r^4$ , pivoted on the upper end of a stud  $r^5$ , projecting up from the forward portion of lever  $m$ , so that as the forward end of said lever  $m$  is depressed pawl  $r^4$  will be drawn back to take a fresh tooth of ratchet-wheel  $r^3$ , and as the forward end of lever  $m$  rises pawl  $r^4$  will move the said ratchet-wheel, and consequently shaft  $r$  and its drum  $r'$ , to the extent of one tooth of the ratchet-wheel, and cam-groove  $r^2$ , acting through the medium of pitman  $s$  and its roller or bowl  $s'$ , will move the bed a short distance—say to the right, as Fig. 3 is viewed—and this will occur each time that finger-board  $i$  is depressed and the machine is operated to indent a figure or letter on the plate  $e$ . Cam-groove  $r^2$  is so formed that bed  $b$  and the plate carried thereby may be moved slowly step by step in one direction, as when a line of letters or figures is being indented in the metal plate on the bed, and quite rapidly in the opposite direction, as when a line of figures or letters has been finished and when it is intended to commence a new line or a line on a new plate, and this quick return of the bed may be effected by the operation of a pawl  $t$ , pivoted in the end of the upright arm of a bell-crank lever  $t'$ , fulcrumed on shaft  $r$ , said pawl  $t$  engaging a ratchet-wheel  $t^2$ , secured to shaft  $r$ . The inner end of a lever  $u$ , fulcrumed at  $u'$ , engages the laterally-projecting arm of bell-crank lever  $t'$ , and the outer end of said lever  $u$  is pivotally connected with the end of the horizontal arm of a bell-crank lever  $v$ , fulcrumed on a stud  $v'$ , the pendent arm  $v^2$  of which lever  $v$  is adapted to be moved by the knee of the operator, whereby the pawl  $t$  may be made to actuate ratchet-wheel  $t^2$  and shaft  $r$  without depressing finger-plate  $i$  or buttons  $j$  to return bed  $b$  to position to begin the indentation of a line of figures in a plate  $e$ .

In order to eject a plate  $e$  held by the chuck  $d$  and bring the latter to position to receive a fresh plate on the return of the bed  $b$  to its first position, we arrange an ejecting-rod  $w$  in the stem  $f$  of the chuck, (which stem is made hollow, as shown,) the upper end of said rod resting against the lower face of the plate and the lower end projecting slightly below the lower end of stem  $f$ , so that the forward end of a prong  $y$  on the inner end of a lever  $y'$  may strike the lower end of ejecting-rod  $w$  as said lever is rocked on its fulcrum and when the bed  $b$  is near the extreme left, as viewed in Fig. 3, by which operation the ejecting-rod will be moved upward and the chuck and plate with it, the plate being ejected from the chuck. In order that the chuck may be held up from its



seat to permit of the insertion of a new plate therein, we provide the prong  $y$  with a projecting lug or block  $y^2$ ; which, when the bed  $b$  is moved to the extreme left, will be brought under the stem  $f$  of the chuck and so raise the latter and hold it raised until the bed is again moved toward the right, so that the stem  $f$  will move off from over the block  $y^2$ . Lever  $y'$  is fulcrumed at  $y^3$  to lever  $u$ , and is at its outer end pivotally connected with the end of the horizontal arm of bell-crank lever  $v$ , so that levers  $u$  and  $y'$  will be operated in unison.

In order to so move the plate as that figures or letters may be stamped thereon or indented therein in a circular line instead of a straight line, we hinge or pivot two pawl-carrying arms  $z z'$  to a yoke  $z^2$ , which is connected by means of a bell-crank lever  $z^3$  with lever  $m$ , as is clearly shown in Figs. 5 and 6. The pawl-carrying arm  $z$  extends forward on one side of toothed wheel  $g$ , and that of arm  $z'$  on the other side of said wheel, and the construction and arrangement of parts are such that the pawl of either arm may be brought into engagement with the teeth of said wheel, or both may be so adjusted as that neither shall engage with said teeth, pawl  $r^4$  (see Fig. 2) being thrown out of engagement with ratchet-wheel  $r^3$ , and either the pawl carried by arm  $z$  or that carried by  $z'$  being adjusted to engage the teeth of wheel  $g$  in the operation of the machine, by which lever  $m$  will be rocked upon its fulcrum-wheel  $g$ , and the chuck to which it is attached, as also the plate held by the chuck will be given a step-by-step rotary movement, as will be fully understood by an inspection of Figs. 2, 5, and 6. When pawl  $r^4$  is engaged with ratchet-wheel  $r^3$  to move the bed  $b$  laterally of the machine, as before described, pawl-carrying arms  $z z'$  will be removed.

$a'$ , Fig. 1, designates an adjusting-screw, whereby the support  $a$  for the bed  $b$  may be adjusted longitudinally with respect to the frame A.

Though we have been particular to describe the construction, arrangement, and relationship of all the parts as herein shown, it is obvious that these may be varied without departing from the nature or spirit of the improvements.

What we claim is—

1. In combination with the bed or support for the article to be stamped, a longitudinally-sliding arm provided with a die or type and

guides for said arm, a lever provided with a hammer for striking said die, and a series of intermediate levers and links connecting the movable arm with the hammer-lever, whereby the movement of the die-arm in position to bring the die over the goods to be stamped at the same time operates the hammer to strike the die, all as set forth.

2. An intermittingly-movable bed and a chuck or plate holder supported on and carried by the bed, combined with a die or type, a movable arm carrying the same for moving the die into position on the plate and removing it therefrom, a lever provided with a hammer for striking said die, and a series of intermediate levers and links connecting the movable arm with the hammer-lever, whereby the movement of the die-arm in position to bring the die over the goods to be stamped at the same time operates the hammer to strike the die, all as set forth.

3. A machine for stamping or indenting letters or other characters upon metal or other material, consisting of the combination of a bed or support for the article to be stamped, a longitudinally-sliding arm provided with a die or type situated above said bed, a lever and a link connection between said lever and the die-arm, a trip-lever engaging with said former lever, a lever provided with a hammer for striking the die, and a link connecting said hammer-lever with the trip-lever, all operating as set forth.

4. A plate-holder and bed or support therefor, combined with a series of movable arms provided with dies, a movable spring-plate supporting the die-arms and adapted to be actuated against the pressure of its spring by said arms, a lever provided with a hammer for striking said dies, and a series of intermediate levers and links connecting the movable arm with the hammer-lever, whereby the movement of the die-arm in position to bring the die over the goods to be stamped at the same time operates the hammer to strike the die, all as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 25th day of August, A. D. 1888.

WILFORD A. HILL.  
WEBSTER F. FOSS.

Witnesses:

ARTHUR W. CROSSLEY,  
W. C. RAMSAY.