

(No Model.)

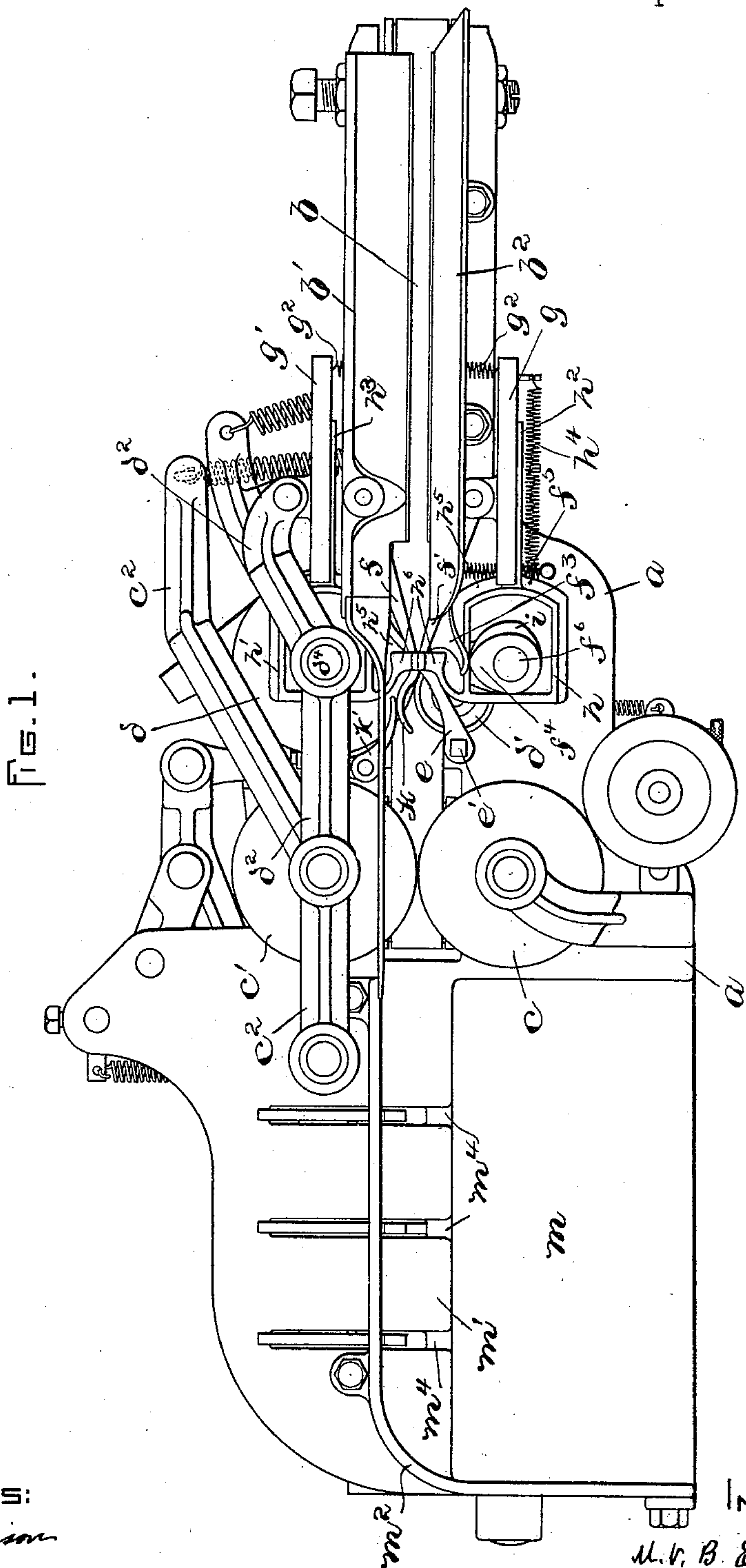
5 Sheets—Sheet 1.

M. V. B. ETHRIDGE & H. E. WAITE.

MAIL MARKING MACHINE.

No. 538,018.

Patented Apr. 23, 1895.



WITNESSES:

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J. Davis.

INVENTORS:

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(No Model.)

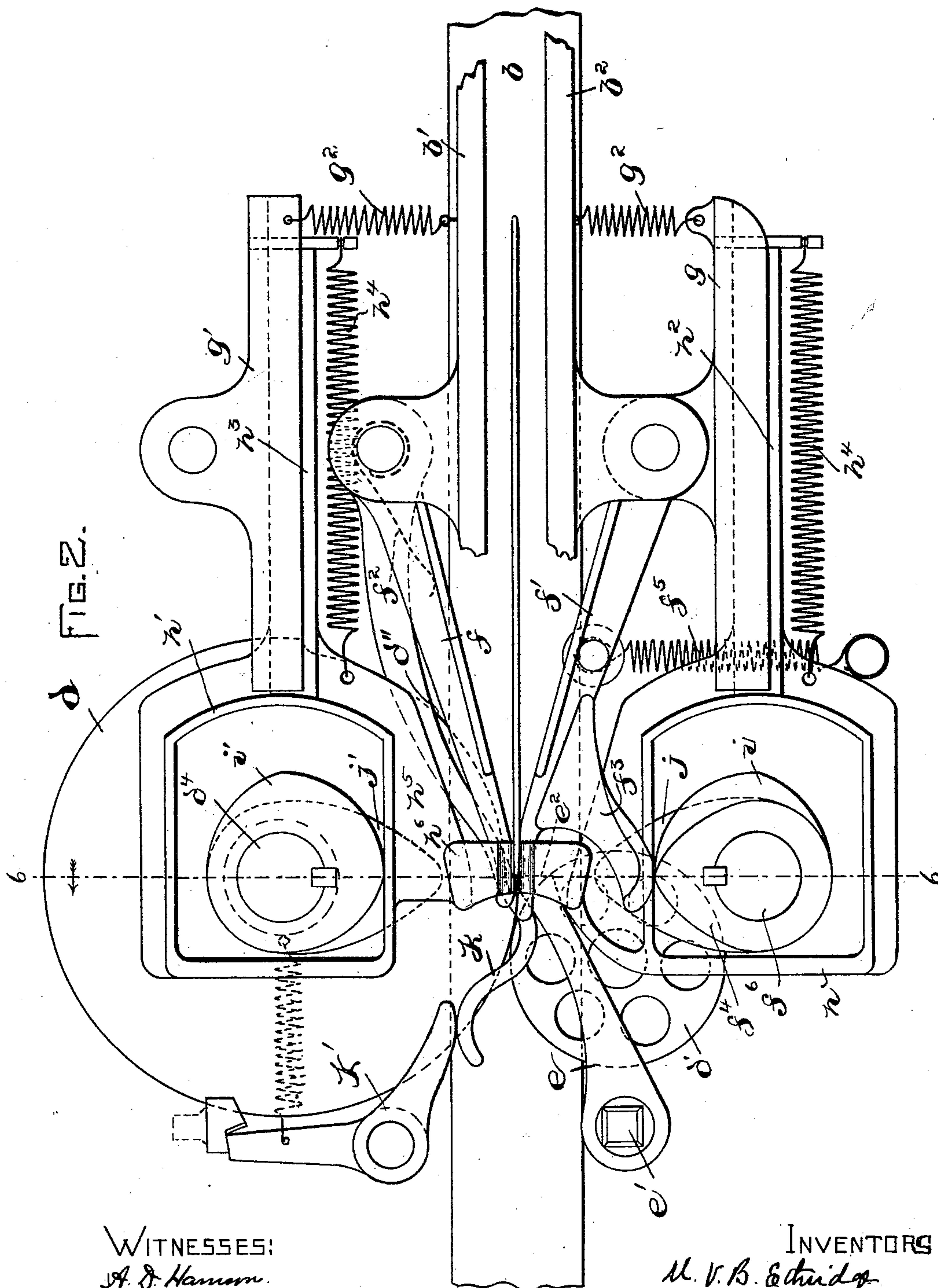
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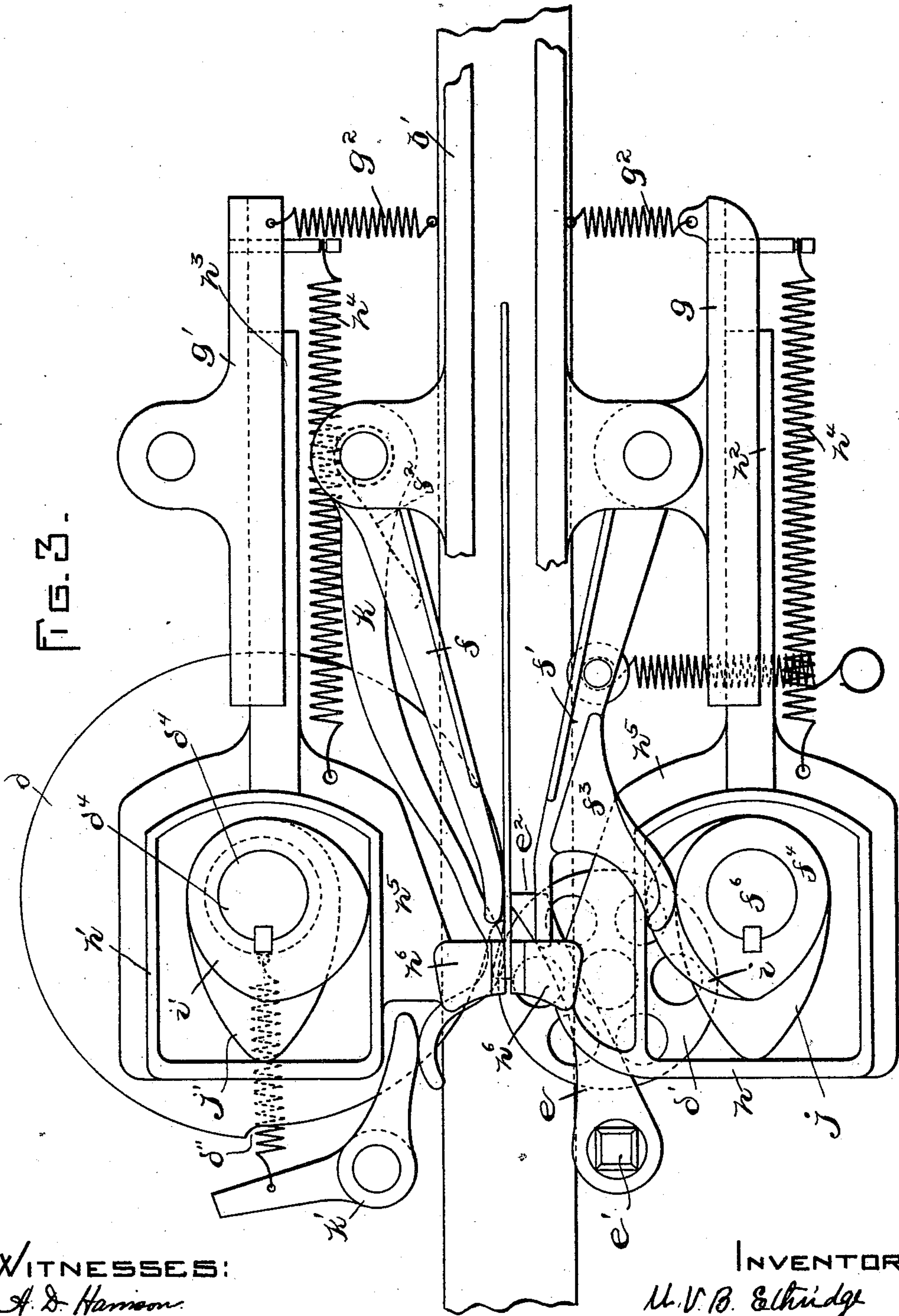
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5 Sheets—Sheet 4.

MAIL MARKING MACHINE.

Patented Apr. 23, 1895.



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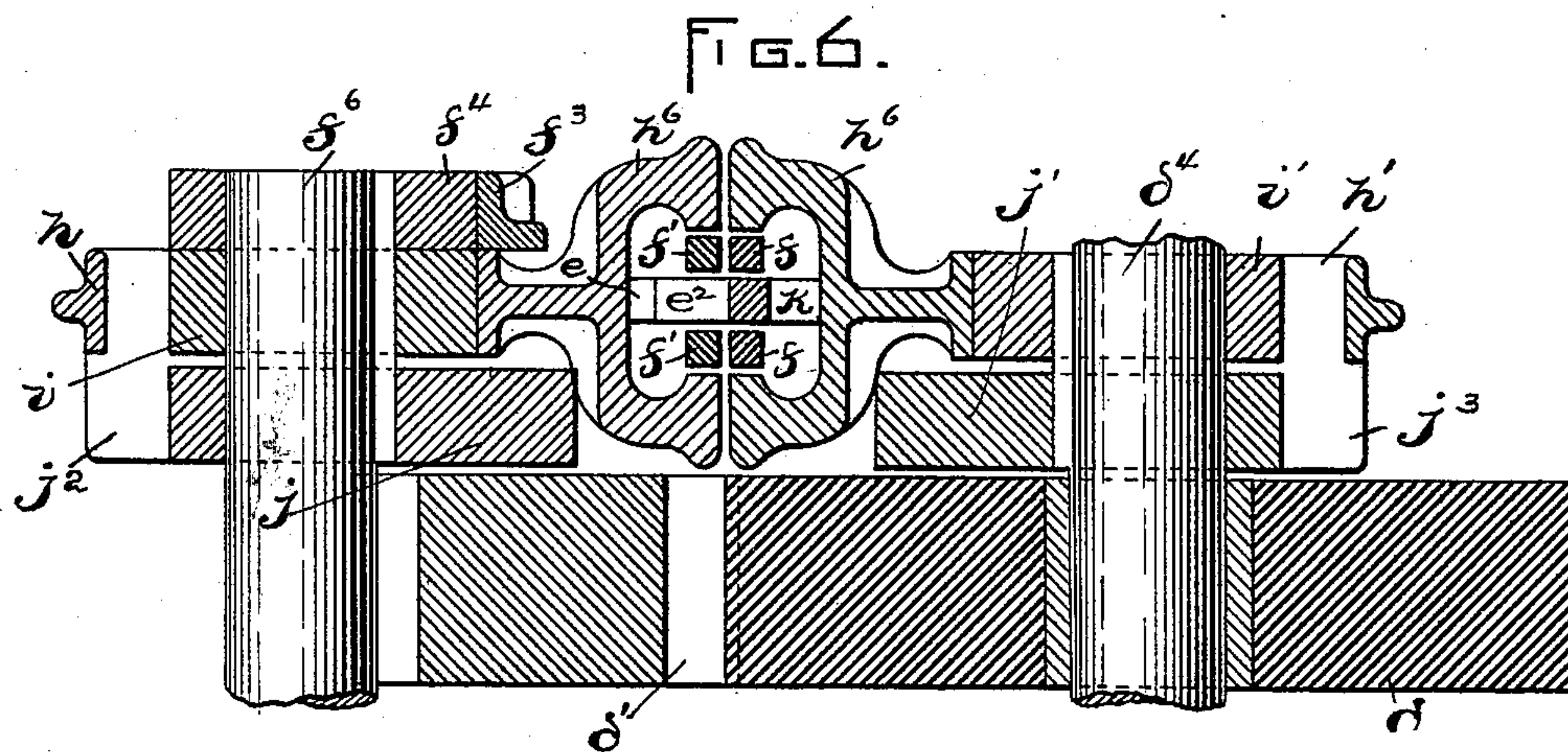
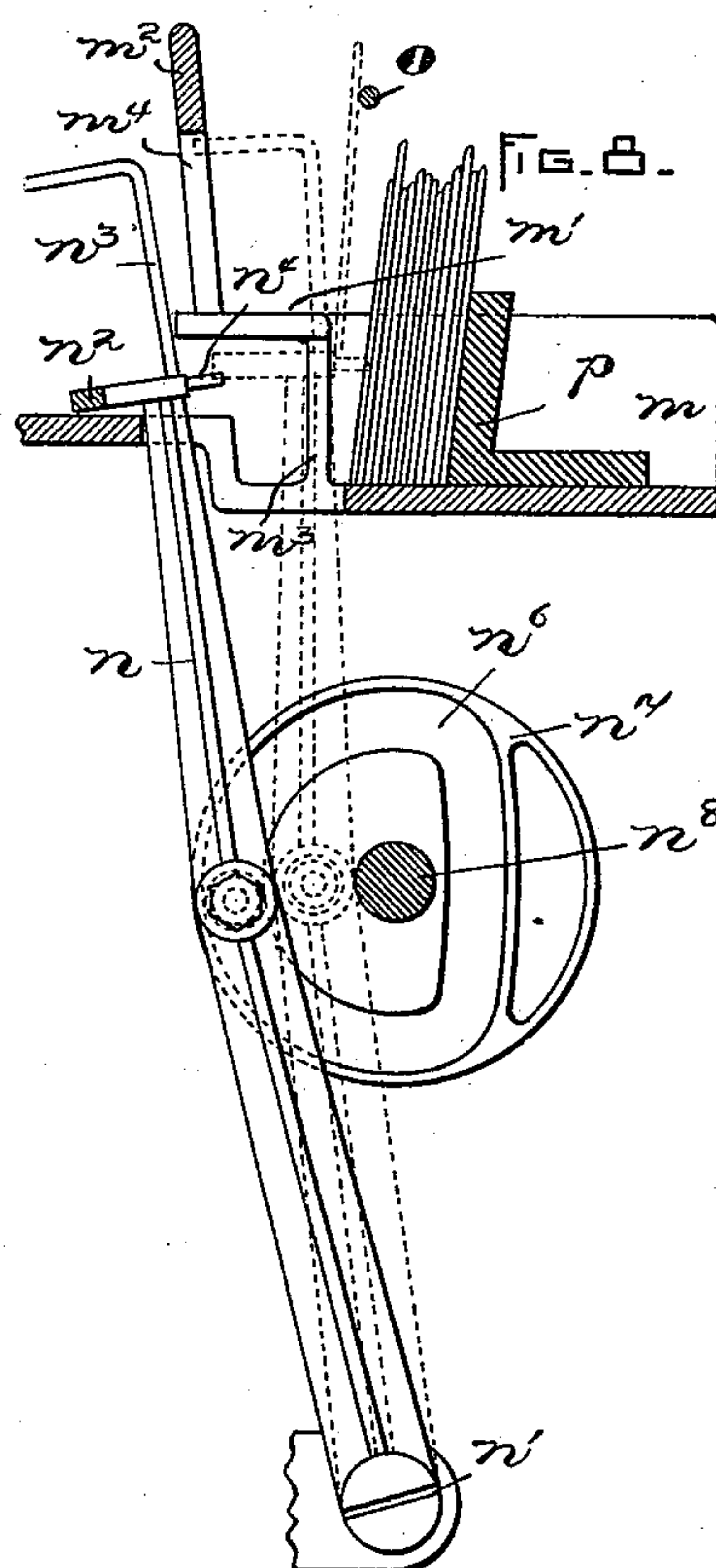
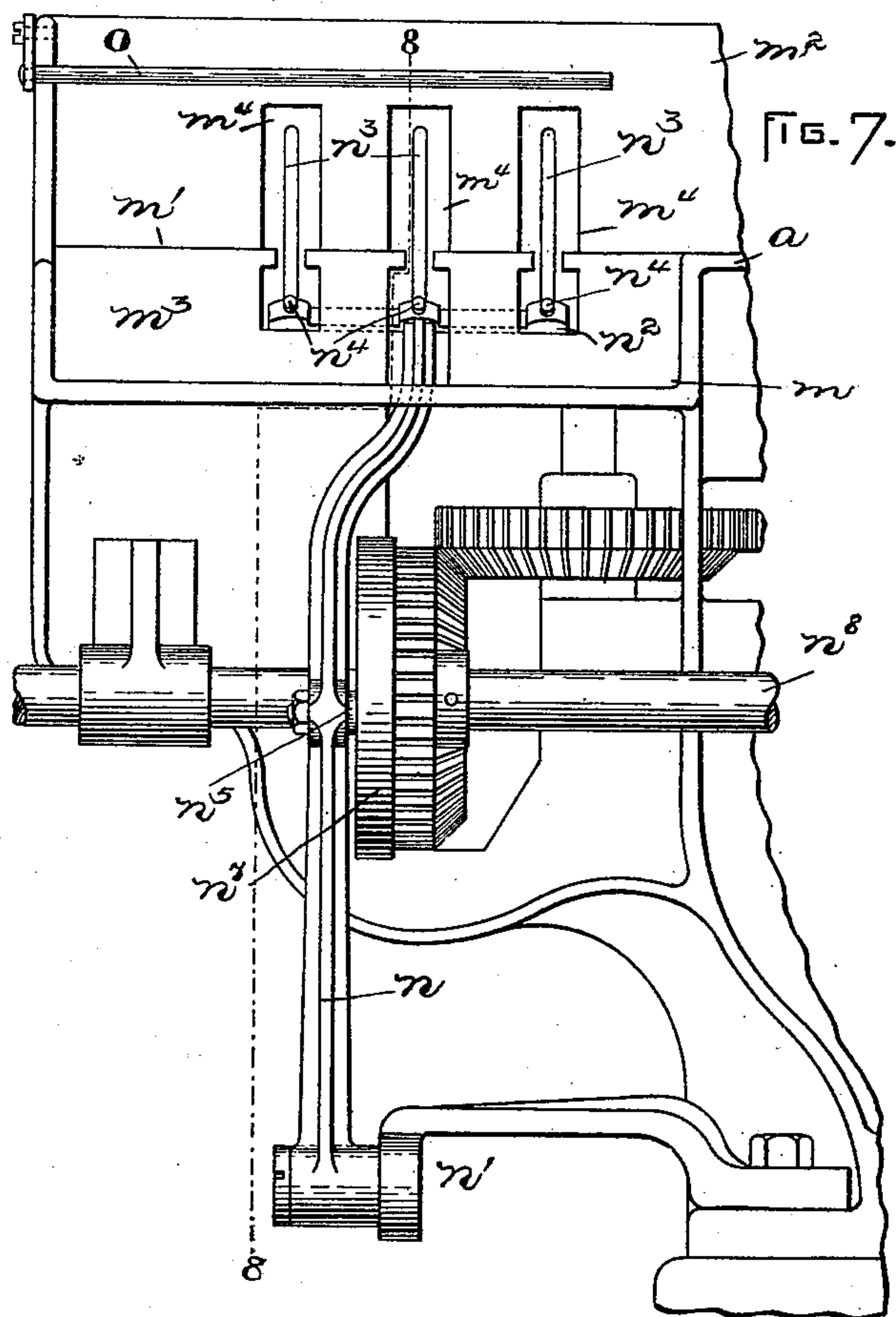
5 Sheets—Sheet 5.

M. V. B. ETHRIDGE & H. E. WAITE.

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UNITED STATES PATENT OFFICE.

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MAIL-MARKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 538,018, dated April 23, 1895.

Application filed November 15, 1894. Serial No. 528,852. (No model.)

To all whom it may concern:

Be it known that we, MARTIN V. B. ETHRIDGE, of Everett, and HENRY E. WAITE, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Mail-Marking Machines, of which the following is a specification.

This invention relates to machines for stamp-canceling and post-marking mail-matter, wherein the mail-matter is deposited piece by piece in a suitably formed hopper and thence fed automatically to marking devices, and after being marked is stacked in regular order automatically.

Among the essentials to a successfully operating machine of this character is a feed-mechanism which will so time the letters in their departure from the hopper as to insure marking of each letter at the same place. Feed mechanisms heretofore used in these machines have been a source of annoyance from the fact that they could not be relied upon to act positively and maintain regularity in governing the passage of the letters to the marking devices.

One object of our present invention is to provide an absolutely positive feed-mechanism which cannot fail to accurately and uniformly time the letters in their departure from the hopper, and this we accomplish by an arrangement of gripping devices having a compound gripping and feeding motion and operating in conjunction with a letter-switch and a letter-abutment, so that a letter arriving out of time encounters the abutment and is taken clear of the same by the switch and at the exact moment the letter clears the abutment the grippers close upon it and then advance it positively. The switch and the grippers are connected through positive means with the marking devices, so that there is a fixed relation of movement between these parts, and each letter advanced by the grippers is acted on by the marking devices at exactly the same place.

Another essential to a successfully operating machine of the character specified is a stacking mechanism which will always be ready to receive a letter from the marking devices and will stack the letters in the order

received without crumpling them or allowing them to escape. Our invention provides for this in a stacking mechanism of improved construction calculated to insure a proper disposition of each letter received from the marking devices, escape or misplacement of a letter being impossible.

The accompanying drawings illustrate an embodiment of the invention.

Figure 1 shows a plan view of the complete machine. Fig. 2 shows a plan view on an enlarged scale of the feed mechanism, with the parts positioned as when a letter is first taken by the grippers. Fig. 3 shows a similar view, with the grippers advanced. Fig. 4 shows the feed mechanism in front elevation. Fig. 5 shows the same in end elevation, with some parts in section. Fig. 6 shows a section on line 6—6 of Fig. 2. Fig. 7 shows the stacking mechanism in front elevation. Fig. 8 shows a section on line 8—8 of Fig. 7.

The letter *a* designates a horizontal table having a longitudinal opening occupied by the horizontal upper stretch of a conveyor-belt *b* forming the bottom of the hopper, the sides *b'* and *b''* of which are erected on the table. At some distance from the discharge end of the hopper, the printing and impression cylinders *c* and *c'* are located, the former being in fixed bearings and the latter in bearings on a pivoted spring-pressed frame *c''*. These cylinders are connected by gearing so as to have a fixed relation of movement.

Just beyond the discharge end of the hopper, there are located a pair of feed-rollers *d* and *d'*, the former of which is positively driven through gearing connecting it with the impression cylinder, and is journaled in bearings on a frame *d''* pivotally connected with the frame *c''* and spring-held to create pressure of the roller *d* against the roller *d'* which is an idler in fixed bearings. It will now be seen that the feed-rollers have a fixed relation in their movements to the printing and impression cylinders, so that the place of marking a letter can be determined by the time of entrance of that letter between the feed-rollers. The feed-roller *d* has a segmental portion of its periphery cut away, as shown at *d'''* in Figs. 2 and 3, for a purpose hereinafter explained.

One feature of our invention resides in means for positively entering the letter between the feed-rollers at that exact time, and we will next describe the means here shown for accomplishing that result. There is a fixed abutment in the form of an arm e fastened to a post e' rising from the table a just beyond the roller d' , and to one side of a central longitudinal line of the machine. The said arm extends obliquely toward said line, and has an end face e^2 extending transversely to the center line and terminating close beside the same, this line being the normal letter-path. A pair of arms f and f' are pivoted to ears on the hopper-sides b' and b^2 respectively, and they converge toward the abutment-arm e and are bifurcated at their ends to embrace the latter. The arm f is pressed toward the arm f' by a comparatively light spring f^2 , and the latter arm has a heel-piece f^3 which is held in contact with a pointed cam f^4 by a spiral spring f^5 . The said cam is affixed on a shaft f^6 , which is in gear with the printing cylinder and rotates synchronously therewith, and in each revolution of these parts the cam moves the arm f' inward to the end of the abutment-face e^2 , the arm f being pushed back by its mate f' . The two arms constitute a switch, which by its vibration times the escape of a letter past the abutment, said switch at just the proper moment arriving at the end of the abutment-face and at all other times diverting a letter fed into it against the said face.

Simultaneously with the arrival of the switch at the end of the abutment-face, certain grippers close on the letter, said grippers being of the following description: Slide-ways g and g' are pivotally supported on opposite sides of the hopper, so as to move in a horizontal plane, and springs g^2 connecting their rear ends with the hopper-sides act to press the forward ends of the slide-ways outward. Rectangular frames h and h' have shanks h^2 and h^3 which fit in the slide-ways g and g' , and the said frames are actuated rearwardly in said ways by spiral springs h^4 . Each frame has a web h^5 which is widened on the inner side, there being formed at this part a forked gripping foot h^6 whose gripping faces are covered with rubber to secure a better effect. The forked gripping feet of the two frames face each other above and below the abutment-arm e and switch-arms f and f' .

The gripping and feed movements of the grippers are produced by cams which are constructed and arranged as follows: The frames h and h' embrace the shaft f^6 and the shaft d^4 of roller d , respectively, and affixed to these shafts are cams i and i' which act against the two inner sides of the frames to move the grippers toward each other, the said cams having extended acting surfaces so as to hold the grippers closed during their feed-movement.

On the shafts h^6 and d^4 below the cams i and i' there are affixed other cams j and j' which act against pendent portions j^2j^3 of the front

sides of the frames to move the grippers forward.

The operation of the grippers is as follows: At the exact moment the switch arrives at the inner end of the abutment-face e^2 under impulse of the cam f^4 . The grippers are closed by the cams i and i' and they are held closed while the cams j and j' move them forward. (See Fig. 3.) When the limit of the feed-motion is reached, the high portions of both sets of cams are carried past the surfaces of the frames which they act against, and the springs g^2 and h^4 then open the grippers and draw them back to position for gripping the next letter.

The feed movement of the grippers carries an interposed letter positively between the feed-rollers d and d' ; and as the movement of the feed-roller d is much faster than the movement of the grippers, said roller is cut out as at d'' , so that it does not engage the letter until the grippers release it. This avoids crumpling the letter.

It will now be seen that our invention provides positive means for timing the departure of the letters from the hopper.

An arm, k , is pivoted concentrically with the arm, f , and extends into the letter-path, and a bell-crank lever, k' , bears against said arm, k . These devices constitute a trip for releasing the marking mechanism. A letter advanced by the gripper displaces the arm k and therefore the detent.

Passing on now to the stacking mechanism, it is to be said that the table a at a point beyond the printing and impression cylinders and to one side of the center line is depressed, forming an inclosure m for the stack of letters. The table extending along the rear side of this inclosure forms a ledge m' on which the marked letters land, and there is erected on this ledge a guard m^2 which also extends around the forward end of the inclosure m . The guard, the ledge, and the wall m^3 which extends down from the ledge are all slotted, as shown at m^4 , and a stacking device is arranged to work through these slots and push the letters off the ledge as fast as they arrive. This stacking device consists of a vibrating arm n pivoted to a stationary support at n' and having at its upper end a cross-head n^2 carrying upstanding fingers n^3 and laterally projecting pins n^4 in line with the fingers respectively. The arm n carries a roller-equipped pin n^5 which engages a cam-groove n^6 in a disk n^7 affixed to a shaft n^8 which is in gear with the printing cylinder. Thus there is a fixed relation of movement between the printing cylinder and the vibrating stacker.

The stacking operation is as follows: A letter issuing from between the printing and impression cylinders lands on the ledge m' and is prevented from escaping by the guard m^2 . Immediately upon the arrival of the letter, the forward swing of the arm n carries the fingers n^3 , through the slots m^4 , and these fingers move the letter off the ledge while the

pins n^4 coming against the previously stacked letters, move them back so that when the new letter leaves the ledge it drops between the vertical wall m^3 and the previously stacked letters, and lands on the pins n^4 . When the stacker recedes, the said pins retire behind said wall m^3 , and the letter drops and is added to the stack. There is a sliding back-rest p for the stack on the bottom of the inclosure.

As a safe-guard against escape of the letter when impelled by the stacker, we provide a rod o against which the top part of the letter strikes, said rod being supported by arms fastened to the guard m^2 .

It will be seen that the above-described arrangement insures stacking of the letters in the order they are received.

The gearing which connects the moving parts of the machine is not shown, as it involves no innovation but can be set up in any suitable manner, which would naturally suggest itself to any one skilled in the art.

What we claim as our invention is as follows:

1. In a mail-marking machine, the combination of a hopper, a conveyer therein, a fixed abutment for letters issuing from the hopper under impulse of said conveyer, a timing switch vibrating transversely of the abutment and adapted to direct letters against the same and time their departure therefrom, and grippers adapted to close on the letter at the moment it is free of the abutment and to then advance the letter.

2. In a mail-marking machine, the combination of a hopper, a conveyer therein, means for timing a letter in its departure from the hopper, opposed grippers each movable in a substantially rectangular course, said grippers adapted to close on a letter and advance it, and means for imparting to the grippers motion of the character above named.

3. In a mail-marking machine, the combination of a hopper, a conveyer therein, a fixed abutment for letters issuing from the hopper under impulse of said conveyer, vibrating switch-arms yieldingly held in contact and movable together transversely of the abutment, and means applied to one of said arms for vibrating it.

4. In a mail-marking machine, the combination of a hopper, a conveyer therein, a fixed abutment for letters issuing from the hopper under impulse of said conveyer, pivoted switch-arms one spring-actuated against the other, and a cam acting against that other in opposition to a spring.

5. In a mail-marking machine, the combination of a hopper, a conveyer therein, means for timing a letter in its departure from the hopper, grippers on slides in pivotal supports, and cams actuating the supports and slides separately in opposition to springs.

6. In a mail-marking machine, the combination of a hopper, a conveyer therein, a fixed abutment for letters issuing from the hopper under impulse of said conveyer, a timing switch vibrating transversely of the abutment and adapted to direct letters against the same and time their departure therefrom, feed-rollers beyond the abutment, grippers arranged to close on the letter at the moment it is free of the abutment and advance it between the feed-rollers, and printing and impression cylinders beyond the feed-rollers.

7. In a mail-marking machine, the combination of an inclosure for a stack of letters, a horizontal ledge on which each new letter lands, a movable back-rest for the stack, and a vibrating stacker working through a wall which rises from the ledge and across said ledge and provided with projections to act against the stack through the wall of the inclosure which rises to the ledge, said projections adapted to receive each new letter moved off the ledge, substantially as described.

8. In a mail-marking machine, the combination of printing and impression cylinders, a ledge on which marked letters land, an inclosure for a stack of letters adjacent to the ledge, a movable back-rest for the stack, and a vibrating stacker working across the ledge and having projections which act against the stack and receive each new letter, substantially as described.

9. In a mail-marking machine, the combination of a hopper, a conveyer therein, means for timing a letter in its departure from the hopper, grippers having a compound gripping and feed motion, and feed-rollers between which the letter is taken by the grippers, one of said rollers being positively driven and having a segmental portion of its periphery cut away, substantially as and for the purpose described.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 30th day of October, A. D. 1894.

MARTIN V. B. ETHRIDGE.

HENRY E. WAITE.

Witnesses:

F. P. DAVIS,

A. D. HARRISON.