

(No Model.)

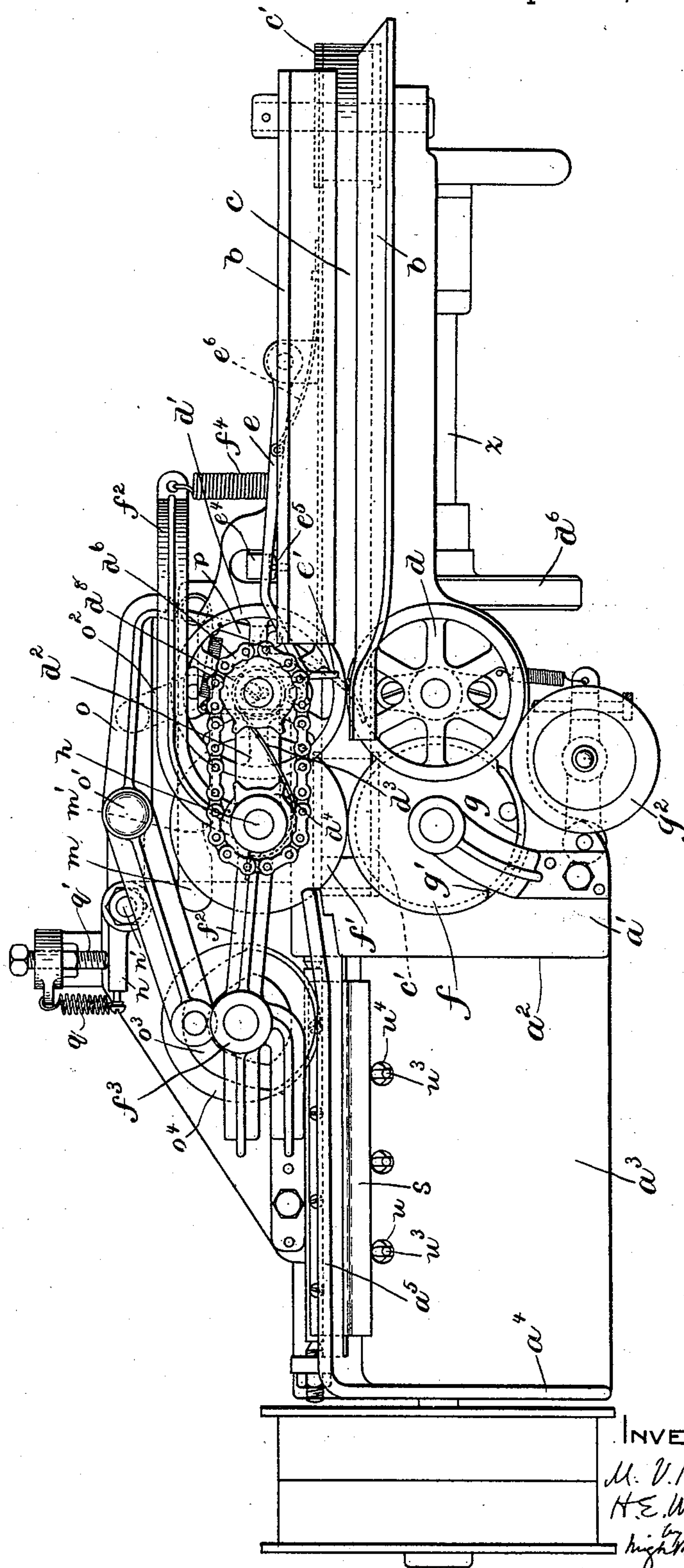
6 Sheets—Sheet 1.

M. V. B. ETHRIDGE & H. E. WAITE.
MAIL MARKING MACHINE.

No. 538,017.

Patented Apr. 23, 1895.

FIG. 1.



WITNESSES:
Arthur H. Abell.
E. Batchelder

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H. E. Waite
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Attys.

(No Model.)

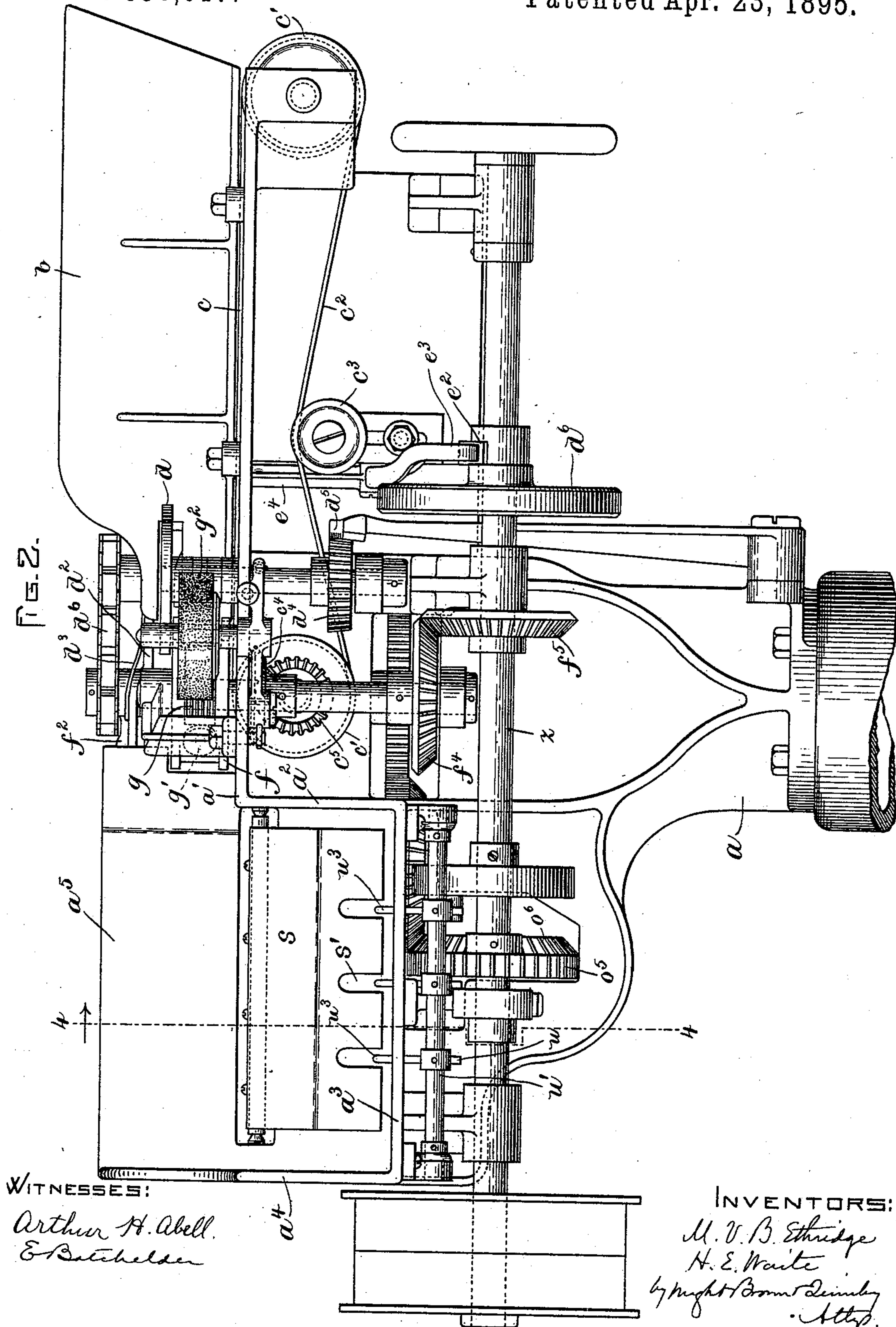
6 Sheets—Sheet 2.

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

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

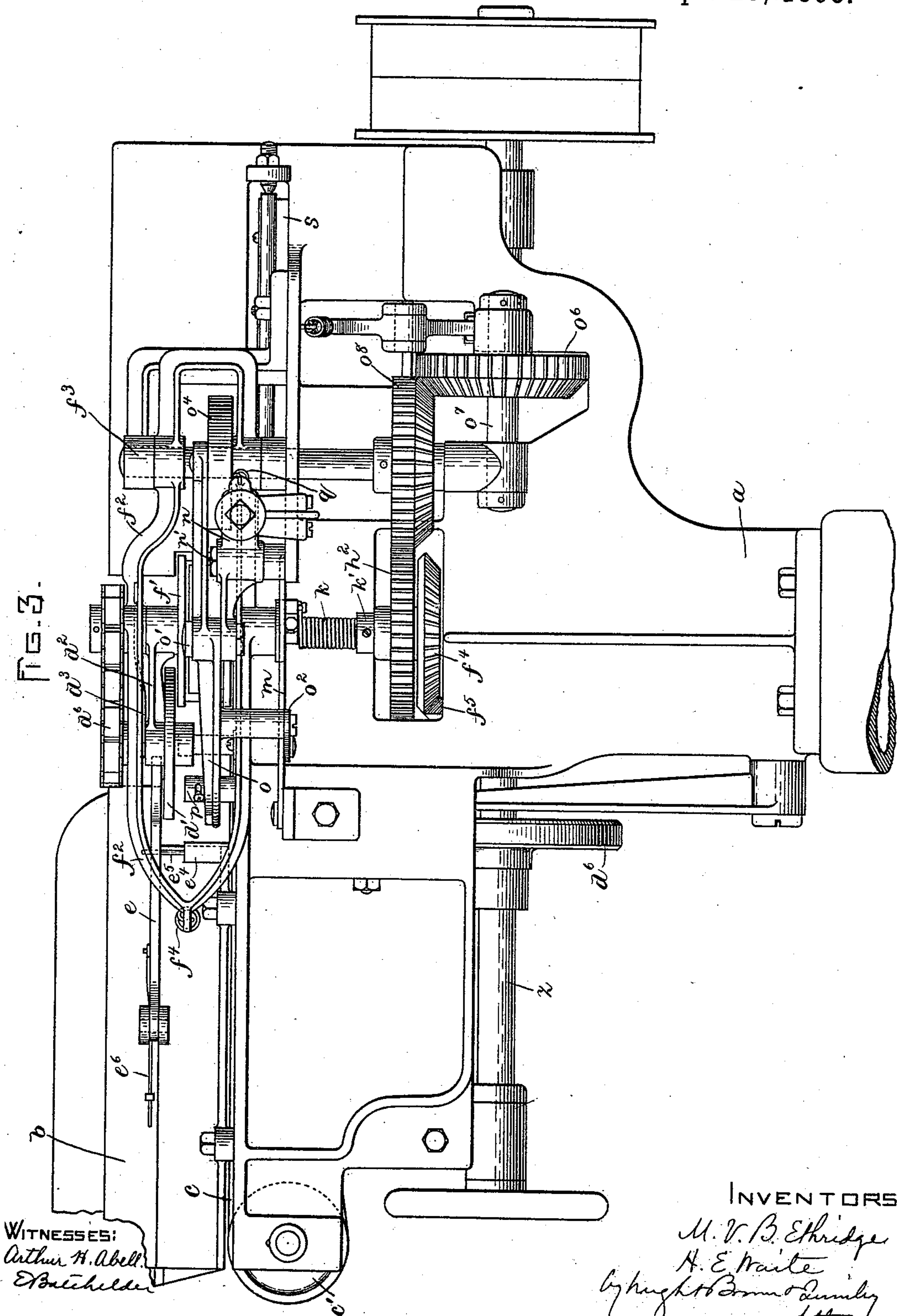
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6 Sheets—Sheet 3.

M. V. B. ETHRIDGE & H. E. WAITE.
MAIL MARKING MACHINE.

No. 538,017.

Patented Apr. 23, 1895.



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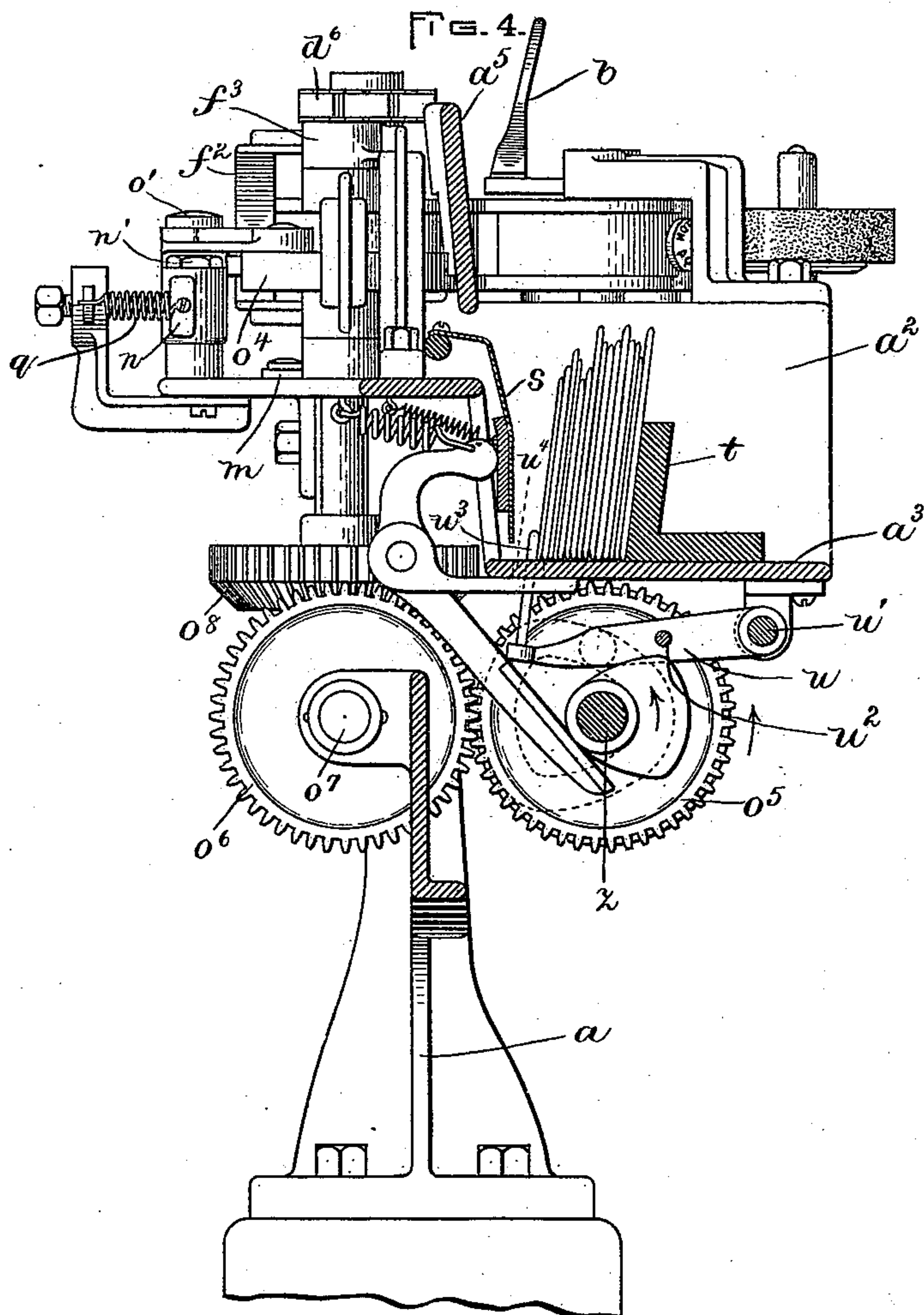
6 Sheets—Sheet 4.

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

MAIL MARKING MACHINE.

No. 538,017.

Patented Apr. 23, 1895.



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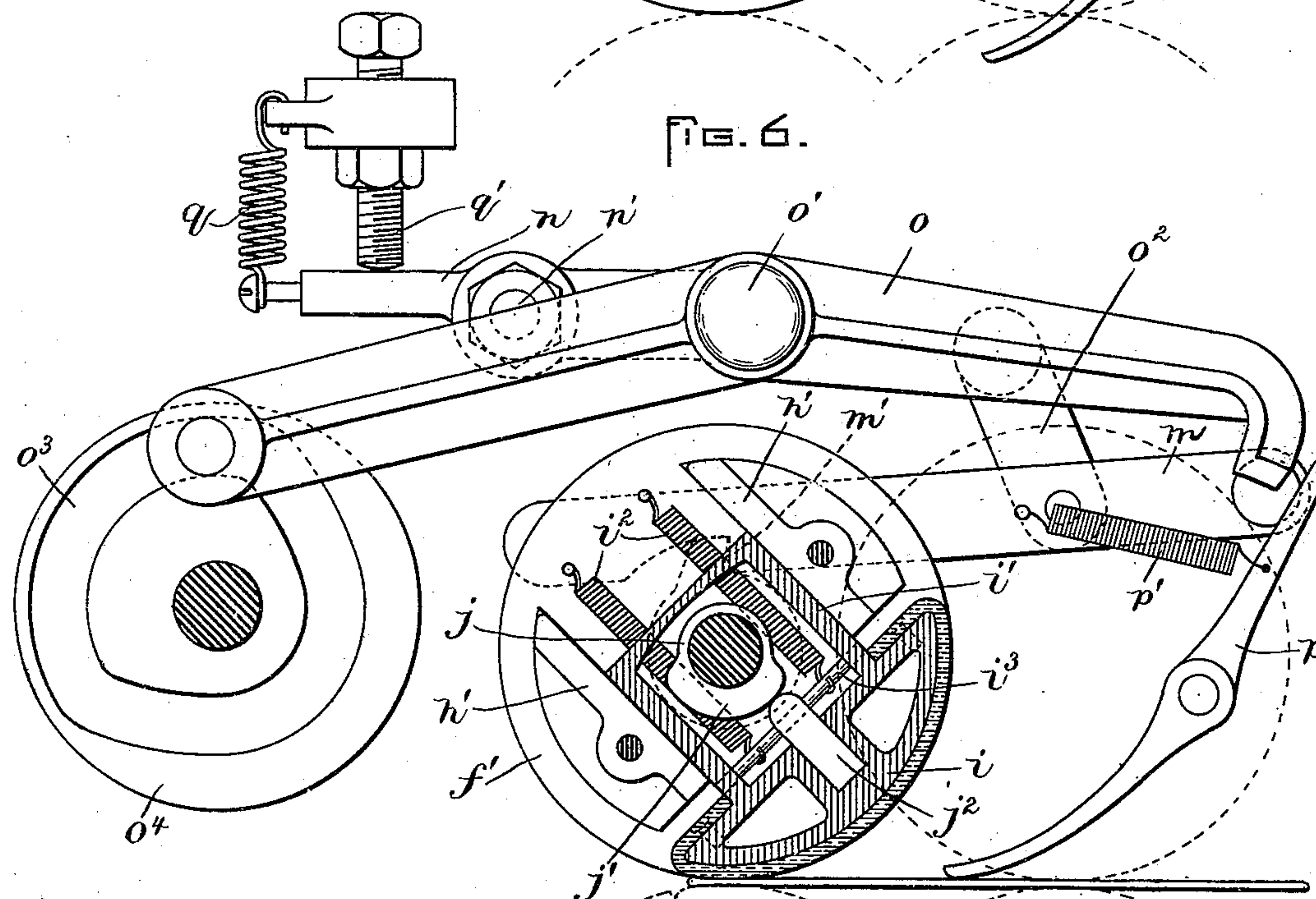
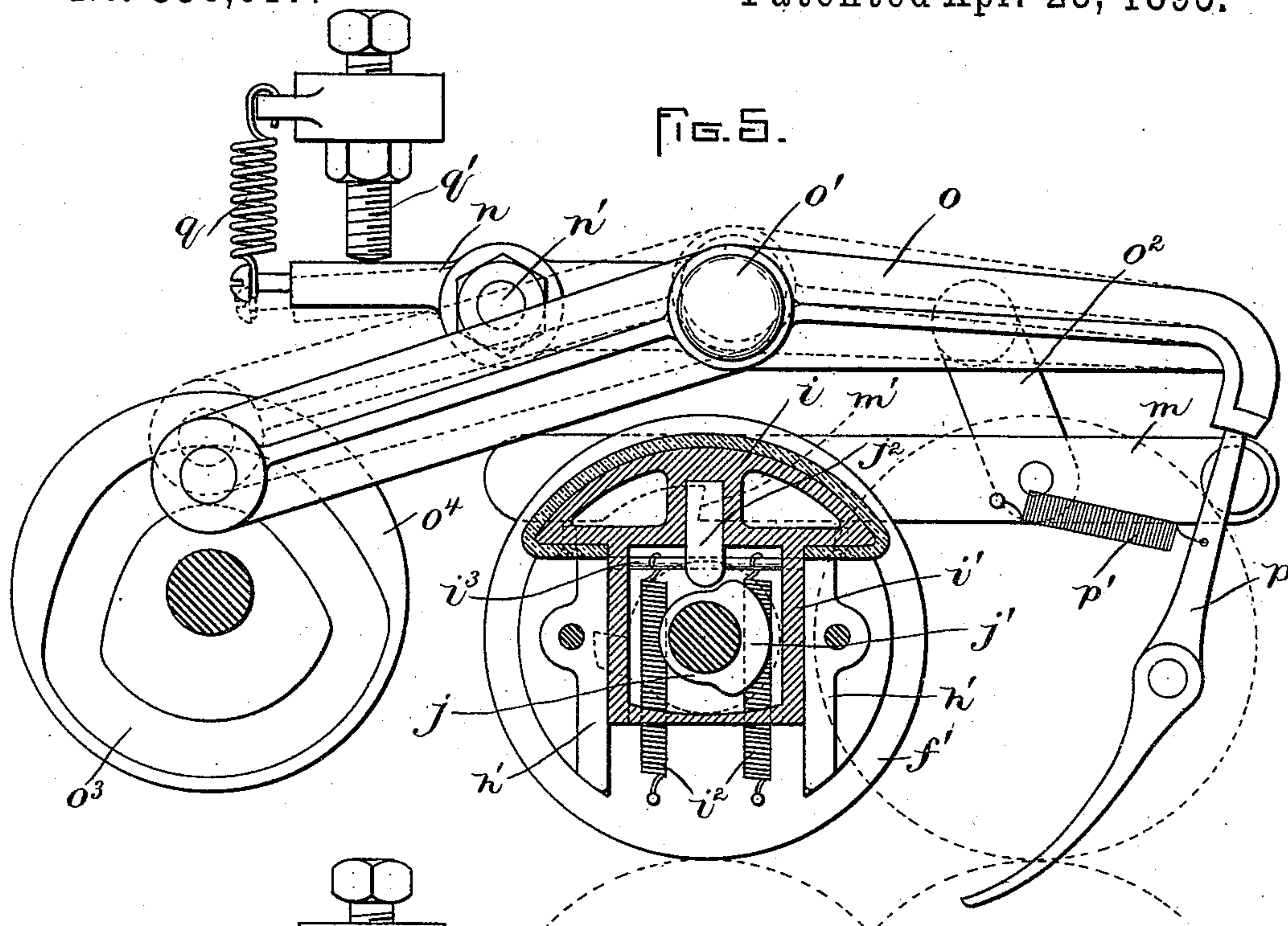
(No Model.)

6 Sheets—Sheet 5.

M. V. B. ETHRIDGE & H. E. WAITE.
MAIL MARKING MACHINE.

No. 538,017.

Patented Apr. 23, 1895.



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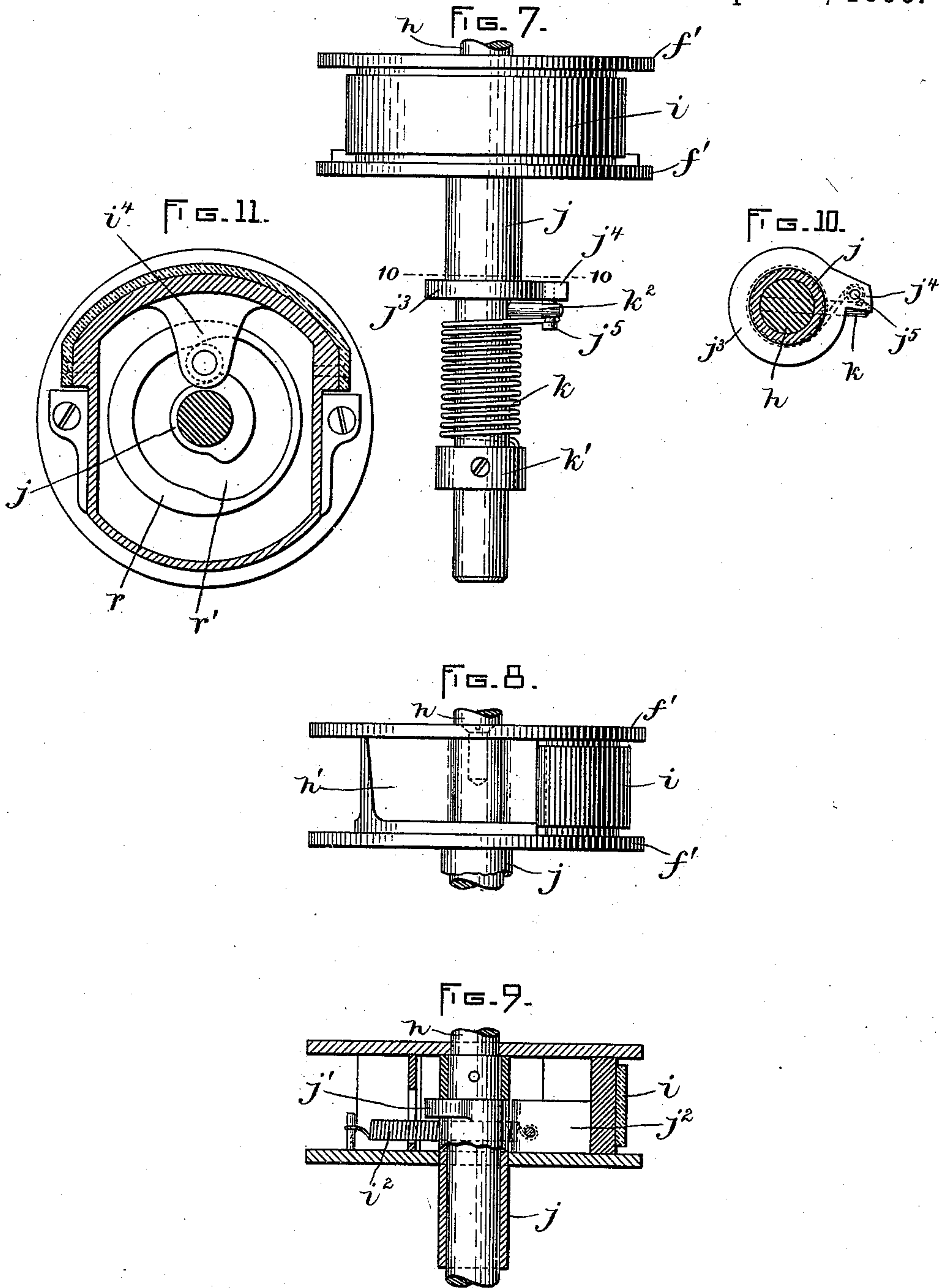
(No Model.)

6 Sheets—Sheet 6.

M. V. B. ETHRIDGE & H. E. WAITE.
MAIL MARKING MACHINE.

No. 538,017.

Patented Apr. 23, 1895.



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UNITED STATES PATENT OFFICE.

MARTIN V. B. ETHRIDGE, OF EVERETT, AND HENRY E. WAITE, OF NEWTON,
ASSIGNORS TO CHARLES F. BROWN, OF READING, MASSACHUSETTS.

MAIL-MARKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 538,017, dated April 23, 1895.

Application filed September 8, 1894. Serial No. 522,455. (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
5 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
10 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
15 order automatically.

There are certain recognized essentials to a successfully operating machine of this character. There must be a feed which will so time the mail-pieces in their escape from the
20 hopper as to positively insure a uniformity in their presentation to the marking devices so that each piece will receive the canceling marks at the same place. Again coaction of the marking devices to mark an interposed
25 piece must be controlled by the approaching piece so as to avoid the possibility of these marking devices coming into co-operative relation in the absence of interposed matter which would result in deposit of ink from the
30 marking die onto the impression surface or backing and subsequent smutching of the backs of letters. The stacking mechanism should always be ready to receive a marked
35 letter and immediately add it to the stack, and to absolutely insure the stacking of the letters in the order in which they are marked, there should be provision for holding up the stack while the new piece is received. Finally to secure a perfect operation of the machine as a whole all its moving parts should
40 be relatively timed with great accuracy. These things are of special importance from the fact that these mail-marking machines to be profitable must be capable of high speed.

All points above enumerated have been
45 taken into consideration in evolving the present invention, and a complete machine is here shown and described which fulfills every requirement as to speed, accuracy, and cleanliness.
50

Of the accompanying drawings which illustrate the machine and form part of this specification,—Figure 1 shows a top plan view of the machine. Fig. 2 shows an elevation of the front side of the machine, which is the
55 lower side in Fig. 1. Fig. 3 shows an elevation of the rear side of the machine which is the upper side in Fig. 1. Fig. 4 shows a cross section on the line 4—4 of Fig. 2 looking in the direction of the arrow crossing said line
60 so that many of the parts appear in end-elevation. Fig. 5 shows on an enlarged scale a partial plan and partial section of the mechanism for controlling co-operative relation of the marking devices, the parts appearing in
65 their normal positions. Fig. 6 shows a similar view illustrative of the change effected by an approaching mail-piece. Fig. 7 shows the impression roll and its adjuncts in elevation as viewed from the side toward which the im-
70 pression pad or bed faces. Fig. 8 shows an elevation of said roll as viewed at right angles to the direction of vision in Fig. 7. Fig. 9 shows an axial section of this roll. Fig. 10 shows a cross-section on line 10—10 of Fig. 7.
75 Fig. 11 illustrates a modification in the construction of the impression roll, being a section similar to that in Fig. 5.

The base-casting or frame, *a*, of the machine is made with a horizontal platform or table, 80
a', upon which is erected an elongated hopper composed of sides *b*, straight as to longitudinal extent and flaring in their upward extent so as to readily receive matter deposited and reduce as much as possible the friction on the
85 sides of the mail-pieces in their passage through the length of the hopper. The table, *a'*, is open between the sides of the hopper and the opening is occupied by the upper stretch, *c*, of an endless belt which forms a constantly
90 moving bottom for the hopper. The opening in the table extends from the outermost end of the hopper to a point beyond the marking devices, and the belt is supported by pulleys, *c'*, in bearings below the opposite ends of the
95 opening. The under stretch, *c*², of the belt is carried over a tension pulley *c*³.

The inner end of the hopper is open and there is formed at this point a throat into which the endless belt is constantly carrying
100

the mail-pieces. This throat is formed by the peripheries of two wheels, d , d' which stand in juxtaposition to each other. The wheel, d , is supported in fixed bearings whereas the wheel, d' , is supported in a pivoted bearing, d^2 , which is pressed inward by a spring, d^3 , the purpose of this arrangement being to allow for varying thickness of the mail-pieces passing between the wheels. The wheel d' , is driven continuously in a forward direction, *i. e.*, in a direction to advance the mail-pieces which come in contact with it, whereas the wheel, d , is run alternately in opposite directions, so that it alternately acts to advance and retard the mail-pieces. In conjunction with these wheels there is arranged a vibrating stop in the form of an arm, e , pivoted at a point back of the hopper and formed at its free end, with a head so as to provide a finger, e' , adapted to cross the throat when the stop-arm is vibrated. The design of this stop-device is to hold back a following mail piece while one is being marked so as to prevent this following one passing prematurely to the marking devices. When the stop is retracted to allow a mail-piece to escape, the wheel, d , runs backward so as to hold the mail-piece in the throat until the proper time arrives for it to pass on, when the wheel, d , receives and assists the wheel, d' , in advancing the mail-piece. The stop only opens momentarily, and after it has allowed the forward mail-piece to pass by, it immediately returns to check the following piece. Such an arrangement as above described provides an unfailing means for timing the departure of the mail-pieces from the hopper.

Beyond the feed-wheels is the marking device comprising a printing roll, f , and an impression roll, f' , the former being supported in fixed bearings, and the latter in bearings on a frame, f^2 , which is pivoted at, f^3 , and pressed inward by a spring, f^4 , connecting its free end with the machine-frame. The above mentioned bearing, d^2 , for the wheel, d' , is an arm pivoted on the journal of the roll, f' . The roll, f , carries the segmental canceling die, g , and post-marking die g' , and these receive ink from a roller g^2 . Both rolls f and f' , are rotated continuously in a forward direction and their peripheries are normally in contact. In order to prevent transfer of ink from the marking dies to the impression roll, coaction of the marking dies and the impression-bed must be controlled by the approaching mail-pieces, and this is accomplished by the construction which will next be described.

The impression roll above referred to is made up of a pair of separated disks fixedly mounted on a spindle, h , which is the journal of the roll, and between these disks there are clamped a pair of blocks, h' , which form a diametrical slide-way. The impression-bed or pad is a rubber-faced segment i , having a shank-portion i' , fitting the slide-way h' , and of skeleton form so as to embrace the spindle

h , and permit the required movement of the segment. Said segment is normally held back from the periphery of the roll by spiral springs, i^2 , attached at one end to a rod, i^3 , extending across the shank, i' , and the other end to one of the disks forming the roll. The back side of the segment seats against the ends of the blocks h' as clearly shown in Fig. 5. On the spindle, h , there is loosely mounted a sleeve, j , which extends up into the roll and is there formed with a cam, j' , of segmental form which is designed to coact with a stud j^2 , projecting from the back side of the segment, i , to project the latter in a manner, hereinafter described, and bring its periphery out flush with that of the roll.

The sleeve, j , is formed at its lower end (see Figs. 7 and 10), with a flange j^3 , having a projection, j^4 , which provides a stop-shoulder as will hereinafter appear, and a pin, j^5 , fastened in said projection and pendent therefrom has one end of a spiral spring, k , fastened to it, said spring loosely surrounding the spindle and being fastened at its opposite end to a collar, k' , affixed to the spindle. It will be seen that this spring constitutes an elastic connection between the sleeve and spindle which will cause said sleeve to be carried around with the spindle in the absence of sufficient resistance.

A pin, k^2 , fastened in the spindle projects across the pin, j^5 , which normally bears against it so as to insure rotation of the sleeve and spindle as though fixedly connected. As long as this condition obtains the impression-segment i , will be held back from the periphery of the roll, f' , as there is then no coaction of the cam, j' , with said segment. It will be seen however that if the cam is held stationary the segment will then be moved outward by reason of its stud, j^2 , riding upon the cam. We therefore arrange a movable abutment to be thrown into the path of the projection, j^4 , by means rendered operative to accomplish this purpose, by an approaching mail-piece. The arrangement is best illustrated by Figs. 5 and 6, and is of the following description: The movable abutment is in the form of an arm, m , pivoted at one end to a stationary support so as to swing in a horizontal plane, and having near its opposite end a notch providing a stop-shoulder, m' , for the projection, j^4 , to abut. In conjunction with this arm, m , there is arranged a compound lever composed of a primary member, n , pivoted to a stationary support at, n' , and a secondary member, o , pivoted intermediate of its ends, to one end of the primary member at o . This latter or secondary member of the compound lever is connected with the arm, m , by a link, o^2 . A roll on one end of the member o , engages a cam-groove, o^3 , in a continuously rotating disk, o^4 , and the opposite end of this member, o , is formed to bear against the end of a bar, P , which is pivoted intermediate of its ends to a fixed support, and normally held by a spring, p' , in a position with its outer end directly in front of the le-

ver, o , and its inner end in the letter-path at the point of meeting of the peripheries of the feed-wheels. While this normal condition obtains (see Fig. 5), vibration of the lever-member, o , on its own center, o' , is so restricted by the bar, p , which then constitutes a fulcrum for this lever-member, that the abutment-arm, m , is kept out of the path of the projection j^4 . The motion transmitted by the cam-groove, o^3 , is taken up for the most part by the primary member, n , of the compound lever as indicated by dotted lines in Fig. 5. A spiral spring, q , exerts itself to hold the primary member, n , against a stop, q' , so that when the member, o , is free to do so, it will partake of its full vibration and there will be no motion of the member n . An approaching mail-piece by acting against the inner end of the bar, p , displaces its outer end from in front of the lever-member, o , which will then partake of its full movement and carry the arm, m , inward so as to bring its shoulder m' , in the path of the projection, j^4 . The abutment of the latter against said shoulder causes the cam, j' , to be held stationary so that the continued rotation of the roll, f' , brings the segment, i , out to the periphery of the roll. (See Fig. 6.) When the mail-piece has passed the bar, p , the latter is drawn into the path of the lever-member, o , the arm, m , is retracted and the spring K , quickly restores the sleeve, j , to its normal position, the springs, i^2 , drawing in the impression segment.

In the modification illustrated in Fig. 11, the springs for retracting the impression segment are dispensed with and the sleeve, j , carries a disk, r , with a cam-groove r' , formed in its upper side. An ear, i^4 , on the rear side of the segment carries a roller in a said cam groove. Heretofore it has been common to vibrate the impression roll to take it into and out of co-operative relation with the printing roll, but this has been found objectionable as producing a jarring of the machine and being noisy, and also hard on the type of the dies. It is to be particularly noted that we have done away with this objectionable feature of prior machines, and there is no such disastrous impact of the impression-bed against the printing dies as formerly.

The table, a' , terminates beyond the marking rolls, in a vertical wall, a^2 , at the base of which there is a horizontal platform, a^3 , for the marked mail-pieces to drop down upon, there being a vertical end-wall, a^4 , which prevents escape of the pieces. There is also a slightly-inclined back-wall, a^5 , slotted to accommodate a stacking-plate s , which journals at its top edge on bearings back of the said rear wall, and depends over the front of the same so that its lower edge is in proximity to the platform, a^3 . This plate has a row of notches, s' , in its lower edge as seen in Fig. 2, for a purpose hereinafter described.

There is a sliding block, t , on the platform a^3 , and as each mail-piece drops down in front of the plate, s , the latter is swung forward so

as to carry the mail-piece toward the said block, and in this manner the mail-pieces are stacked in regular order as they arrive from the marking devices.

To hold the stack while the plate recedes, we provide a frame composed of bars, u , affixed to a horizontal rock-shaft, u' , and connected by a tie-rod, u^2 , said frame carrying up standing pins, u^3 , which are accommodated in openings u^4 , in the platform and designed to be projected up in front of the stack each time the stacking plate adds a mail-piece thereto and to recede below the platform to allow the free movement of the mail-pieces when carried along by the stacking plate. When the latter recedes its notches, s' , allow it to pass the then projected pins.

It will be seen that the above arrangement positively insures the stacking of the mail-pieces in regular order as they arrive from the marking devices.

The driving mechanism, of the machine is of the following description: The letter, z , designates the main driving shaft on which there is a cam, e^2 , which periodically retracts the stop, e' , through the medium of a bent lever, one of whose arms, e^3 , stands on the path of the cam while the other arm, e^4 , extends vertically and has a pin, e^5 , at its upper end in front of the arm e . After being shifted by the cam, said arm is returned by a spring, e^6 , so as to bear yieldingly against the passing mail-piece and check a following piece.

The wheel, d , is oscillated through the following described connections with the driving shaft: The journal of said wheel carries affixed to it a bevel gear, d^4 , which is engaged by a segment, d^5 , pivoted to the base-casting, a , and carrying a roll in engagement with a cam-groove in a disk, d^6 , affixed on the main shaft. Continuous rotation of the printing roll, f , is secured through intermeshing bevel-gears, f^4 , f^5 , on the journal of the roll and on the driving shaft respectively. The belt is driven by intermeshing bevel-gears, c^4 , and, c^5 , affixed on the journal of the printing roll, and on the journal of one of the pulleys, c' , respectively. A gear, o^5 , affixed on the driving shaft meshes with the spur section of a compound gear, o^6 , on a counter-shaft, o^7 , and the bevel section of said compound gear meshes with a corresponding section of a compound gear o^8 on the journal of the cam-disk o^4 . The spur-section of said gear, o^8 , is in mesh with a gear, h^2 , on the spindle h . The wheel, d' , is continuously rotated through the medium of a sprocket-chain, d^6 , which engages with sprocket-wheels, d^4 and d^8 affixed on the spindle h , and the journal of the wheel, respectively.

In practice the upper half of the machine as viewed in Fig. 1, is covered by a board on which the mass of mail-matter is placed. The attendant standing in front of the machine, deposits the mail-pieces one by one in the hopper, b . The machine is speeded up beyond the speed attainable by the attendant in feeding

the mail-pieces so that there will never be two mail-pieces moving together out of the hopper. A mail-piece dropped anywhere in the hopper will be carried forward by the belt, *c*, against the stop, *e'*, and held back by the same until it is retracted, and then the mail-piece advances into the throat formed between the two wheels *d*, and *d'*, but does not pass on between said wheels because the wheel, *d*, is running backward. The mail-piece is thus held between the two wheels until the wheel, *d*, runs forward and then said piece is carried on to the marking rolls.

It will be seen that by timing the wheel *d*, with respect to the printing roll, the mail-piece will be presented for marking at exactly the right time and place. The impression roll is of course timed so that the segment, *i*, meets the printing dies of the roll, *f*, and the mail-piece having tripped the bar, *P*, in its passage between the feed-wheels, the said segment will be out flush with the periphery of its roll, and ready to co-operate with the printing dies in marking the mail-piece.

The machine as a whole will do its work accurately and speedily with little noise, and is very well calculated to fulfill every requirement of a machine of its kind.

It is evident that the invention is not limited to the embodiment thereof which is here shown, for it is capable of assuming numerous different forms.

What we claim as our invention is as follows:

1. In a mail-marking machine, the combination of a rotary support located at one side of the letter-path, a segment carried by said support and movable toward and from the center thereof, said segment being normally retracted, an opposed support for co-action with the segment in marking a mail-piece and letter-controlled means for projecting the segment for engagement with the passing mail-piece.

2. In a mail-marking machine, the combination of a printing and an impression roll having letter-engaging segments, that on one roll being movable toward and from the center of that roll and normally retracted, and letter-controlled means for projecting said segment for engagement with the passing mail-piece.

3. In a mail-marking machine, the combination of a printing and an impression roll having letter-engaging segments, that on one roll being movable toward and from the center of that roll and normally retracted, a normally inactive cam, and letter-controlled means for rendering said cam operative to project the segment.

4. In a mail-marking machine, the combination of a printing and an impression roll having letter-engaging segments, that on one roll being movable toward and from the center of that roll and normally retracted, a sleeve loose on the journal of said roll and carrying a cam to project the segment and having a

stop-projection, an elastic connection between the journal and the sleeve, and a letter-controlled abutment for coaction with the stop-projection to render the cam operative, substantially as described.

5. In a mail-marking machine, the combination of a printing and an impression roll having letter-engaging segments, that on one roll being movable toward and from the center of that roll and normally retracted, a sleeve loose on the journal of said roll and carrying a cam to project the segment and having a stop-projection, an elastic connection between the journal and the sleeve, a movable abutment for coaction with the stop-projection to render the cam operative and normally retracted from the path of said projection, a compound lever connected with said abutment, means for constantly vibrating one member of said lever, and a movable support which normally constitutes a fulcrum for said member and limits vibration thereof on its own pivot effecting vibration of the lever on its other pivot, said support adapted to be displaced by a passing mail-piece to permit full vibration of the aforesaid member of the compound lever and a consequent movement of the abutment into the path of the projection.

6. In a mail-marking machine, the combination of a printing and an impression roll having letter-engaging segments, that on one roll being movable toward and from the center of that roll and normally retracted, a sleeve loose on the journal of said roll and carrying a cam to project the segment and having a stop-projection, an elastic connection between the journal and the sleeve, a pivoted arm having a shoulder for abutment of the stop-projection, a compound lever composed of a primary member pivoted to a fixed support and yieldingly held against a stop, and a secondary member pivoted intermediate of its ends to said primary member, a link connecting said secondary member with the abutment arm, a cam coacting with one end of the secondary member of the compound lever, and a pivoted fulcrum for the opposite end of said lever-member adapted to be displaced by a letter.

7. In a mail-marking machine, the combination of a continuously rotating printing roller, a continuously rotating opposed roller, a segmental impression-pad carried by the latter and normally retracted from the periphery thereof, and letter-controlled means for projecting said pad for coaction with the printing dies in marking a passing mail-piece.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 17th day of August, A. D. 1894.

MARTIN V. B. ETHRIDGE.
HENRY E. WAITE.

Witnesses:

FRANK PARKER DAVIS,
HORACE BROWN.