

4 Sheets—Sheet 1.

PRINTING DEVICE FOR REGISTERING MAIL BOXES.

Patented Oct. 13, 1891.

Fig. 1.

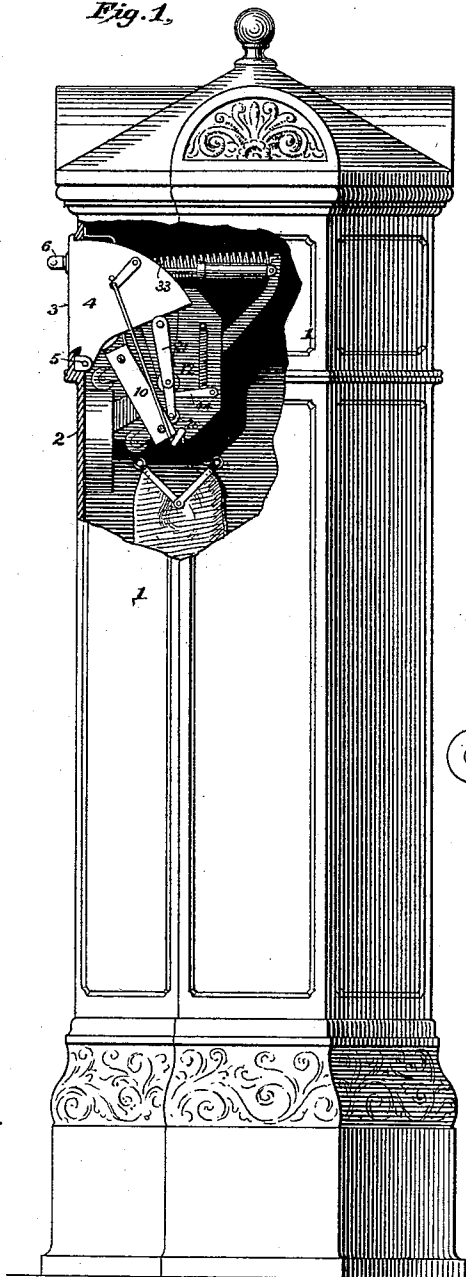


Fig. 5,

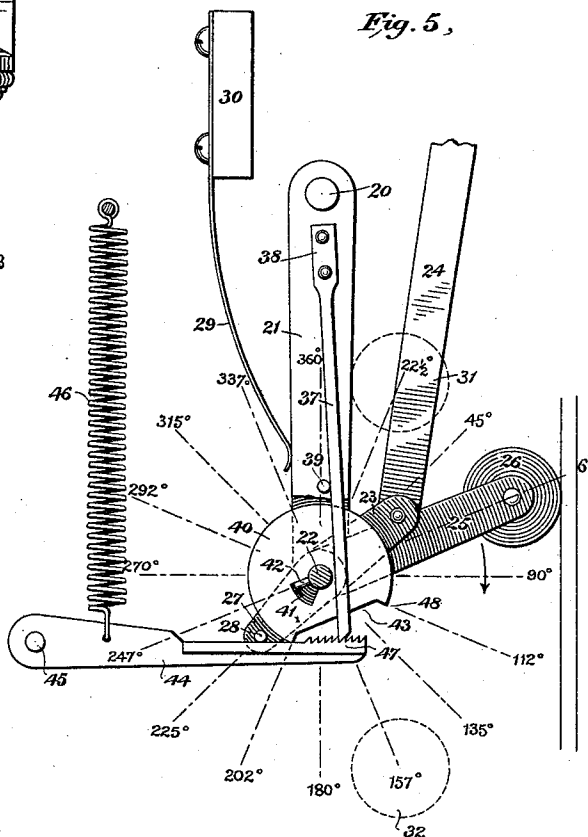
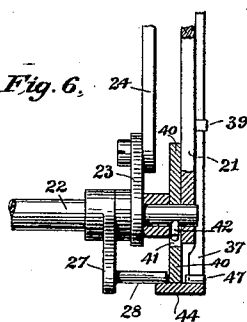


Fig. 6.



Edwin W. Morton
Inventor

By his Attorney
Price & Linnard

(No Model.)

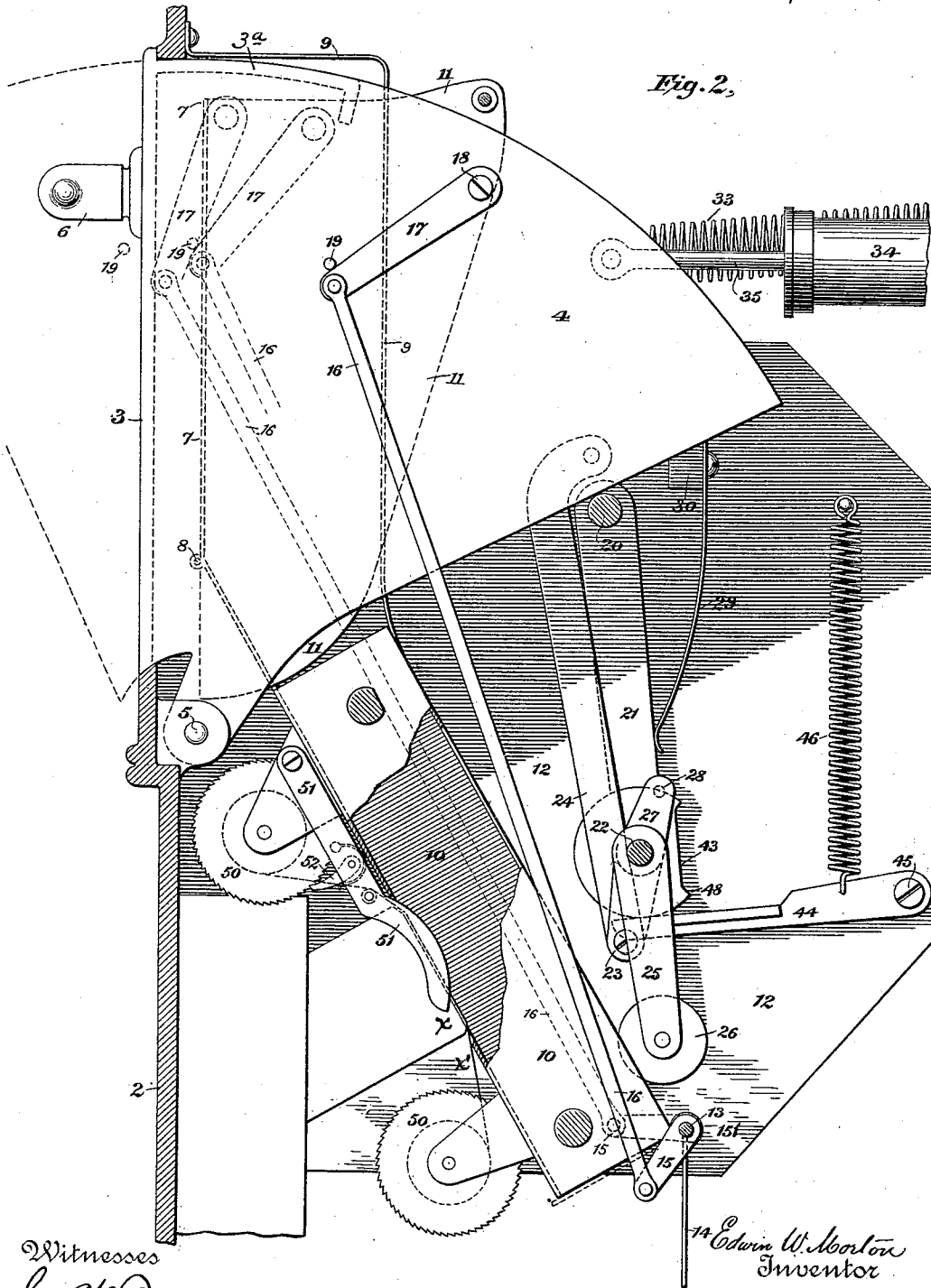
4 Sheets—Sheet 2.

E. W. MORTON.

PRINTING DEVICE FOR REGISTERING MAIL BOXES.

No. 461,362.

Patented Oct. 13, 1891.



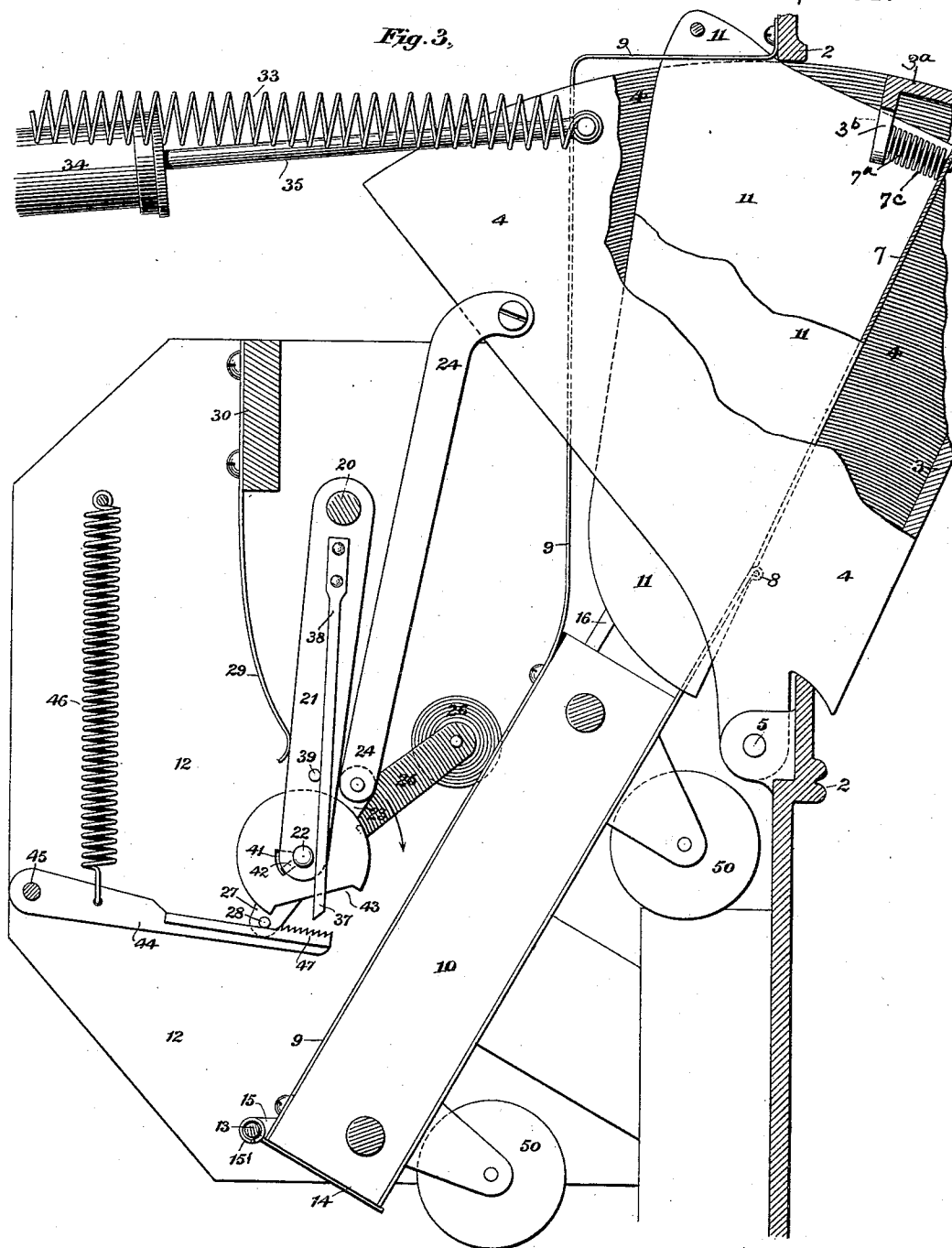
Witnesses
Geo. W. Dreyer.
Edward Thorpe.

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4 Sheets—Sheet 3.

PRINTING DEVICE FOR REGISTERING MAIL BOXES.

Patented Oct. 13, 1891.



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(No Model.)

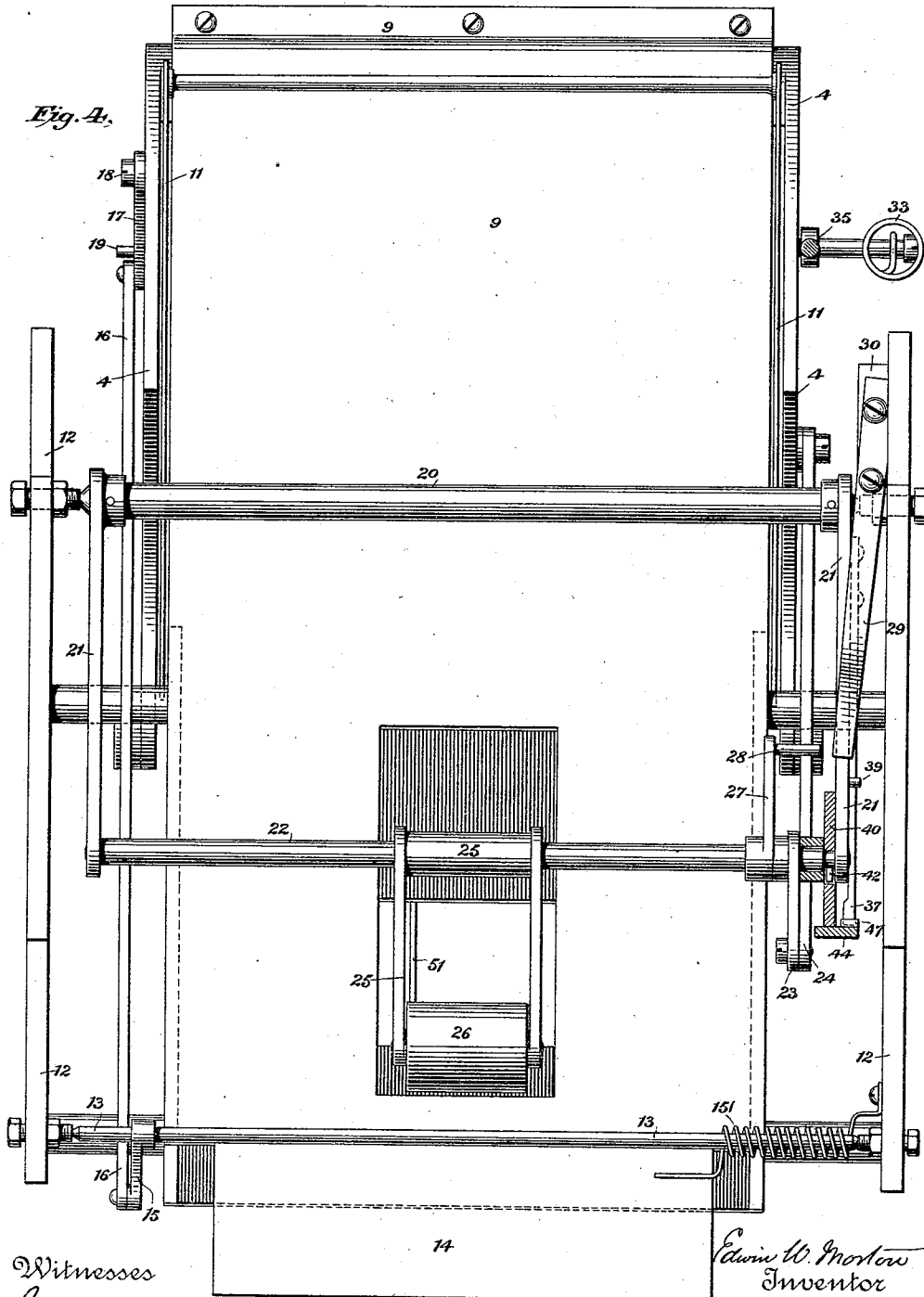
4 Sheets—Sheet 4.

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PRINTING DEVICE FOR REGISTERING MAIL BOXES.

No. 461,362.

Patented Oct. 13, 1891.



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UNITED STATES PATENT OFFICE.

EDWIN W. MORTON, OF WHITE PLAINS, ASSIGNOR TO JOHN H. ALLEN, OF
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PRINTING DEVICE FOR REGISTERING MAIL-BOXES.

SPECIFICATION forming part of Letters Patent No. 461,362, dated October 13, 1891.

Application filed January 30, 1890. Renewed September 19, 1891, Serial No. 406,267. (No model.)

To all whom it may concern:

Be it known that I, EDWIN W. MORTON, a citizen of the United States, and a resident of White Plains, in the county of Westchester, State of New York, have invented certain new and useful Improvements in Automatically Postmarking Letter-Boxes, of which the following is a full and complete specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of my letter-box, partly broken away, showing the device by which the postmarking mechanism is attached to the interior of the box. Fig. 2 is a side elevation of the postmarking mechanism and printing mechanism, with part of the casing removed, so as to show an inside elevation of part of device. Fig. 3 is a side elevation of the opposite side of the postmarking mechanism, with parts removed, so as to show the printing mechanism. Fig. 4 is a rear elevation of the printing mechanism, viewed from the interior of the box. Fig. 5 is a diagrammatic view of a device by which an additional tension is given to the printing-roller at the instant at which the printing is done. Fig. 6 is a side elevation of the parts of the same, showing cam and some other parts in section.

Referring to Fig. 1, 1 represents the letter-box, and 2 the side of the box in which the door or opening for the insertion of mail is placed and against the interior of which printing mechanism is secured. 3 is a door or shutter which is drawn out when it is desired to insert a letter.

Referring to Fig. 2, 4 4 are the quadrant-shaped sides of the shutter, which is hinged at 5. They are generally cast in one piece with the shutter and arranged at right angles to it on either side, so as to form a shield on either side of the shutter as it is swung open upon its hinge 5. 6 is a handle secured to the shutter 3 at its upper end and by which it may be opened. 7 is a letter-chute secured to the interior of the shutter 3 between the quadrant-shaped sides 4 4 and hinged to the lower section of the letter-chute at 8, some distance above the hinge 5. At the upper end of the shutter 3 is an inwardly-projecting extension 3^a, which is in the form of a

segment of a cylinder, and in which is the drop-letter slot. At the inner end of the segment 3^a is a downwardly-projecting extension 3^b. To the side of this downward extension 3^b is secured the upper end of the chute 7 by means of two bolts 7^a 7^a, which are passed freely through holes in the upper end of the chute, and also in the downward projection 3^b, and upon this bolt is placed, surrounding it, a spiral spring 7^c, which bears between the chute 7 and the downward extension 3^b and softens the motion of one by the other and prevents breakage of the sides of chute when the shutter is quickly drawn open and the upper extremities of the sides of the chute come into contact with the interior of the box above the shutter-opening. The drop-letter slot is so located in the segment 3^a that the shutter must be drawn out some distance before a letter can be inserted. This motion of the shutter is provided for the purpose and is sufficient to operate the postmarking mechanism. 9 is a shield or casing which is connected to the printing-box 10 at the lower end and to the interior of the wall 2 at its top at the upper end and is bent, so as to form a complete cover to the letter-chute. 10 is a printing-box. This is situated immediately below the letter-chute, and the upper end of it is connected to the chute at the hinge 8. The sides of the printing-box are at right angles to its bottom, and by these sides it is connected to the inclosing-walls of the printing mechanism. These are vertical walls which stand out at right angles from the interior of the box and are marked 12 12. It will be noticed that as the chute 7 is hinged at 8 and is provided with sides at right angles to the bottom these sides 11 11 must be so constructed at the lower end as to meet with the vertical sides of the printing-box and form a shield to prevent the escape of mail-matter. A shaft 13 is secured transversely of the printing mechanism in the walls 12 12. Upon the shaft 13 is keyed a crank-arm 15, and to the shaft is also secured a shutter 14. The shutter 14 is held close against the bottom of the printing-box by a spring 15', which is wound upon the shaft 13. One end of this spring is secured to this shaft and the other to a stud fixed in the interior surface of one

of the walls 12 and by its torsion holds the shutter in its highest position against the bottom of the printing-box. When a letter is placed in the drop-letter slot, it falls into the printing-box and rests upon the shutter 14 until said shutter is removed. The crank-arm 15, keyed to the shaft 13, has connected to one end of it a rod 16, the other end of which is secured to another crank-arm 17, pivoted upon a stud 18, set in the outside of the shield 4. The crank-arm 17 is limited in its motion in one direction by the stud 19. The location of the stud 19 and of the stud 18, upon which the arm 17 is pivoted, the length of the rod 16, and the length of the arm 15 are also so arranged in relation with one another that when the shutter is closed the stud 19 will press upon the arm 17 and press it downward, thereby forcing down the rod 16 and the arm 15, and with it the shutter 14, thus opening it. When, however, the shutter 3 is opened, so as to be in position for the insertion of the letter, the stud 19 will have been drawn forward sufficiently far, as shown in dotted lines in Fig. 2, corresponding to the full open shutter, so as to be removed from the arm 17. The spring 15 will then close the shutter 14 and hold it so until the shutter 3 begins to close. As this takes place, the angle formed by the arm 17 and the rod 16 will begin to decrease, and the pin 19 will approach the arm 17 until it reaches the position indicated in dotted lines as the second position to said arm. The pin 19 will then begin to press upon the arm 17, and by so doing will press the rod 16 downward, also the arm 15, and begin to open the shutter 14. This motion will take place at the same instant at which the impression-roller has descended far enough to catch the letter and begin to print upon it, thus holding the letter firmly while the shutter is being opened. The relative positions of these parts are easily determined by calculation. It is desired that when the shutter 14 is closed by the opening of the door for the insertion of the letter it shall remain closed and hold the letter against the printing-surface which is in the bottom of the printing-box until the impression-roller has been operated, so as to descend upon the letter, catch it, and hold it firmly between itself and the printing-surface before the shutter 14 shall be opened. This is done by mechanism which will be hereinafter described, and which is also operated by the motion of the shutter 3. The position of closed shutter 3 and open shutter 14 is shown in Fig. 2 in full lines. The position of open shutter 3 and closed shutter 14 is shown in dotted lines. It will be seen from the dotted lines in that figure that the rod 16, when the shutter first becomes closed, assumes a position shown in dotted lines of said figure before the shutter 3 is entirely opened. Said shutter then moves to a position of wide open without moving the shutter 14 or the arm 15, the rod 16 merely revolving about the end of the arm 15 as a

center, the stud in the meanwhile moving farther and farther away from the arm 17 until it has reached its extreme position. Now when the shutter begins to close the stud 19 will continue to approach the arm 17 until it reaches the second position, (shown in dotted lines,) when it will begin to press upon the arm 17 and consequently press the rod 16 downward and begin to open the shutter 14. This constitutes such a part of the motion of the shutter 3 as will be sufficient to accomplish a sufficient motion of the impression-roller to cause it to catch a letter and hold it. This correlation of parts will be described hereinafter.

Referring now to Fig. 3, shutter 3 is held closed by a spring 33, and its sudden action under the influence of said spring is prevented by a dash-pot 34 and rod 35, which is connected to the shutter, the dash-pot 34 and spring 33 both being connected to the interior of the box on the opposite side from the opening. 20 is a shaft set in the walls 12 of the printing mechanism. Hung upon it are the swinging arms 21, in the ends of which are secured the ends of the shaft 22. Upon this shaft is hung the printing-frame 25, in which is secured the impression-roller 26. To this frame is rigidly secured the crank 23, to the end of which is connected the rod 24, which is pivoted to the outside of the shield 4 of the shutter 3. The rear end of the crank 23 extends in an opposite direction and is marked 27. In the end of it is set a projecting pin 28, which is parallel to the shaft 22. The spring 29 is a flat spring secured to a lug 30 on the side of one of the incasing-walls 12 of the printing mechanism. Spring 29 bears upon the swinging-frame arms 21, and thereby presses all the parts of that frame toward the printing-box 10, particularly the roller 26, which is thereby forced against the bottom of said box. This spring is sufficient to retain these parts in their relative positions at all times except when printing is to be accomplished. When the shutter 3 is opened, the rod 24, connected thereto, will swing outward, and thereby draw the crank 23 and the swinging frame secured to it, in which the impression-roller is carried, upward to a position shown in dotted lines 31 in Fig. 5, which is on a level with the top of the side of the printing-box. When the door is released, the spring 33 will draw it in and cause the impression-roller 26 to descend, thereby passing over the bottom of the printing-box, pressing the letter upon the printing-surface and descending to a position shown in the dotted lines and marked 32.

It will be readily understood that in a letter-box it will be necessary to provide that the printing mechanism should operate with equal efficiency upon packages of any size—that is to say, any size that will pass through the drop-letter slot. This is accomplished in the following manner: When the door is opened, the impression-roller is raised up to

the position 31. (Shown in dotted lines.) When the door is released, it begins to descend. As it does so it strikes upon the letter and presses the spring 29 backward, according to the thickness of the letter to be stamped. This spring is rather weak and will yield to the thickness of the letter, which will cause said roller to be pressed backward. Spring 29 is, however, not strong enough to perform the act of printing, and it is necessary that some additional pressure be exerted upon the printing-roller after it has adjusted itself to the thickness of the letter, but before it has begun to print. This is accomplished in the following manner: 37 is a stiff steel spring riveted to the swinging arm 21 at 38 and extending below the shaft 22, but held out of contact with said shaft by the stop 39. 40 is a cam-disk which is journaled loosely upon the shaft 22. This disk has two segments cut out of it—one upon the side of its central aperture, forty-five degrees in extent, included between radial lines which are forty-five degrees apart, and the other on its periphery, included between radial lines ninety degrees apart. The section at the center is marked 41, and that on the periphery is marked 43. 42 is a key secured to the shaft 22 and operating in the section 41 to turn the disk at such times as it shall engage the sides of the said section 41. 48 is a point upon the periphery of said disk 43 where one of the extremities of the section terminates.

In Fig. 5 a series of lines are shown radiating from the center of shaft 22 and separated from one another a distance of one-sixteenth of the circumference, or twenty-two and a half degrees, and they are marked with the number of degrees between each line and the vertical line moving from the vertical to the right. The segments 41 and 43 are shown, 41 as included between the line indicating 202° and that indicating 247° , and the segment 43 between the lines representing 112° and 202° . 44 is a lever pivoted at 45 and maintained at a high position by the spring 46, secured to it at one end and the other to a fixed stud set in the side of the box. 47 is a ratchet which is secured to the top surface of the lever 44 at its end. The bar 44 is shown in section in Fig. 6. The impression-roller frame 25 and the printing-roller 26 are shown in the drawings as intersected by the line indicating 67° . The arm 27 is located so as to be intersected by a line indicating 225° , which is twenty-two and one-half degrees below the axial line passing through the centers of the impression-roller and the shaft 22. The relative position of this arm will be hereinafter described. It is desirable when printing to exert a strong pressure upon the impression-roller at the instant of printing and to relieve this pressure at all other periods. The printing with this device is accomplished while the shutter is being closed by the spring 33. The impression-roller 26 is drawn up to its point of highest elevation when the shutter 3 is opened. A

letter may now be dropped in, the shutter 14 having been closed by the operation of opening the shutter 3. When the impression-roller is at its point of highest elevation, the arm 27 will be in a vertical position and the pin 28 will be resting upon the top surface of the lever 44 and will hold the ratchet 47 out of engagement with the end of spring 37. As the impression-roller 26 descends from the position indicated by $22\frac{1}{2}^{\circ}$ to the position indicated by 67° the arm 27 will have moved to the position indicated by 225° and will permit the arm 44 to rise under the action of the spring 46 and the ratchet 47 to engage the end of the spring 37. Before this is accomplished, however, it will be observed that the impression-roller 26 will come in contact with the matter to be printed and will have pressed the spring 29 back and the frame 21 with it sufficiently to have adjusted itself to the thickness of the letter to be stamped. The end of the spring 37 will then engage with a tooth of the ratchet 47 which will be within its reach, thereby insuring an equal amount of pressure to be exerted upon the printed surface with any thickness of letter. This is a very important feature. The teeth of ratchet 47 are made fine, so that, whatever the adjustment of the frame 21 and the impression-roller, due to the variation in the thickness of a letter, the end of the spring 37 will always fall approximately into a notch and maintain the proper amount of pressure upon the impression-roller. The further motion of the impression-roller 26 in describing an arc upon the thing to be printed will cause a backward pressure upon the shaft 22 and the other parts connected to it. This will bend the spring 37, which is held rigidly to the arm 21 at 38, and also by the ratchet 47 to the arm 44 and to the stud 45. This spring will exert requisite pressure for the purpose of printing. When the impression-roller reaches the position represented by 67° the disk 40 will be in the position shown in Fig. 5, in which the segment 43 cut away from said disk will prevent the disk from engaging with the top of the bar 44, and, in consequence, will leave the ratchet 47 undisturbed in contact with the spring 37. As the impression-roller descends, shaft 22 turning with it, the disk 40 will be revolved, and the point 48 will move from the position of 112° to the position of 157° . It will there meet the upper surface of the lever 44, and as it turns beyond that point will depress said lever and disengage the ratchet 47 from the spring 37. This motion will be continued until the roller 26 has assumed its extreme lowest position, (indicated by 32,) which will be the position occupied by it when the shutter 3 is closed. The point 48 of the disk 40 will then have reached the point indicated by the line 202° , where it will remain. When now the shutter 3 is opened and the impression-roller 26 begins to ascend from the position 32 upward, the feather or key 42, turning with the shaft 22, will turn in the space 41 and not move the

disk 40 during forty-five degrees of the revolution—that is to say, the impression-roller 26 will move from the position of the line 157° to a line 112° before the disk 40 will be moved. The disk 40 will then begin to turn and will turn as the impression-roller ascends from the position of rest, when the impression-roller was at line 157, until it reaches its point of highest elevation at line 22½°. This will carry the point 48 from line 202 to the line 112, shown in the drawings. It will be observed that as the disk 40 turns upon its axis and the point 48 is carried from the position of line 202 to the position of line 157 the disk 40 will hold the lever 44 and the ratchet 47 out of engagement with the spring 37 and thereby prevent the pressure of this spring being exerted upon the impression-roller. As soon as the point 48 has passed the point 157° the pin 28, being just behind it, will strike upon the top of bar 44 and press it down and keep the ratchet 47 out of engagement with the spring 37. In the meantime the impression-roller 26 will have traveled from its position as indicated in dotted lines at 32 to the position as indicated in dotted lines at 31, during the whole of which period the spring 37 will have been held out of engagement with the ratchet 47, and the extra pressure of this spring will have been kept off of the impression-roller. Thus the roller will be prevented from pressing the inking-ribbon or other inking device against the type hard enough to print except at the instant of the printing. It will thus be seen that the operation of the impression-roller may be divided into six sections, three in descent and three in ascent. The first of descent moves the roller down, while permitting the ratchet to rise and engaging the spring 37. The second section of the descent does the printing, while the spring 37 is engaged by the ratchet 47. The third section brings the cam 40 in contact with the top of the lever 44 and throws the ratchet 47 out of engagement with the spring 37 and relieves the pressure of this spring upon the impression-roller. Upon the ascent the cam 40 holds the ratchet 47 out of contact with the spring 37 for two sections, and the pin 28 on the end of the arm 27 holds it out for the third section. It will be remembered that it was stated in describing Fig. 2 that the shutter 14 must remain closed during a period sufficient for the impression-roller 26 to descend from its position of highest elevation to a position where it will engage and hold a letter between itself and the printing-surface. This is the position described by the angle between the lines 22½ and 67 degrees. I have not shown any type-exposing device in this case, except inclosed in a casing beneath the printing-box in Fig. 2. The type-exposing device α may consist of any structure. It may consist of fixed types for printing upon the letters a number and location of the box, or I may employ a more complicated mechanism,

such as I have made the subject of application for Letters Patent of even date herewith, Serial No. 338,672, for indicating the date and the exact time of the day at which a letter is inserted into a box.

I have shown a simple structure for inking the types in Fig. 2, which consists of a ribbon α' , charged with ink, stretched across the face of the type employed for printing, and passing through apertures in the printing-box and wound upon reels 50 50, which are journaled in the casing of the machine.

51 represents a lever journaled upon the bearing of one of the ribbon-reels and sustained above the level of the printing field, but in said field and in the path of the impression-roller. To this lever is pivoted a pawl 52, which engages with a ratchet-wheel upon the periphery of one of the ribbon-reels. By this pawl the ribbon-reel is revolved and the ribbon wound upon it, so as to expose a fresh portion of ribbon above the type at each operation of printing. The impression-roller strikes the lever 51 and depresses it and operates the ribbon-reel.

What I claim as new is—

1. In a printing device for automatically postmarking letters or other analogous purpose, the combination of a shutter with a spring which is stretched by the opening of the shutter so as to store power for the operation of the printing mechanism, a printing-box in the bottom of which are located the type to be used for printing, a shutter arranged to close the lower end of said printing-box when the entrance-shutter is opened and provided with a spring whereby said printing-box shutter is held closed while the main shutter is being closed half-way, and a printing-roller hung from a swinging frame pivoted in the side walls of the device, a crank-arm rigidly secured to the roller-frame and which is connected by a rigid rod to the entrance-shutter to which it is pivoted, and a spring attached to the casing of the device and bearing upon the swinging frame, whereby the printing-roller is caused to exert a pressure upon the thing to be printed, substantially as described.

2. In a printing device for automatically postmarking letters and other analogous purpose, the combination of a shutter with a spring which is stretched by the opening of the shutter so as to store power for the operation of the printing mechanism, a printing-box in the bottom of which are located the type to be used for printing, a chute connected to the entrance-shutter and hinged to the upper end of the printing-box, a shutter arranged to close the lower end of said printing-box when entrance-shutter is opened and provided with a spring whereby said printing-box shutter is held closed while the main shutter is being closed half-way, and a printing-roller hung from a swinging frame pivoted in the side walls of the device, a crank-arm rigidly secured to the roller-frame and

which is connected by a rigid rod to the entrance-shutter, to which it is pivoted, and a spring attached to the casing of the device and bearing upon the swinging frame, whereby the printing-roller is caused to exert a pressure upon the thing to be printed, substantially as described.

3. In a printing device for automatically postmarking letters or other analogous purpose, the combination of a shutter with a spring which is stretched by the opening of the shutter so as to store power for the operation of the printing mechanism, a dash-pot one member of which is secured to the shutter and the other to the casing of the device to check the force of the action of the spring in closing the shutter and operating the printing mechanism, a printing-box in the bottom of which are located the type to be used for printing, a shutter arranged to close the lower end of said printing-box when the entrance-shutter is opened and provided with a spring whereby said printing-box shutter is held closed while the main shutter is being closed half-way, and a printing-roller hung from a swinging frame pivoted in the side walls of the device, a crank-arm rigidly secured to the roller-frame and which is connected by a rigid rod to the entrance-shutter, to which it is pivoted, and a spring attached to the casing of the device and bearing upon the swinging frame, whereby the printing-roller is caused to exert a pressure upon the thing to be printed, substantially as described.

4. In a printing device for automatically postmarking letters or other analogous purpose, the combination of a shutter with a spring which is stretched by the opening of the shutter so as to store power for the operation of the printing mechanism, a printing-box in the bottom of which are located the type to be used for printing, a shutter arranged to close the lower end of said printing-box when the entrance-shutter is opened and provided with a spring whereby said

printing-box shutter is held closed while the main shutter is being closed half-way, and a printing-roller hung from a swinging frame pivoted in the side walls of the device, a crank-arm rigidly secured to the roller-frame and which is connected by a rigid rod to the entrance-shutter, to which it is pivoted, and a spring attached to the casing of the device and bearing upon the swinging frame, whereby the printing-roller is caused to exert a pressure upon the thing to be printed, and an additional spring and mechanism for causing it to exert pressure upon the printing-roller during the period of printing, but not at other times, which consists of a stiff spring secured to one side of the swinging frame, carrying the printing-roller and extending below the shaft upon which the roller-frame is hung, a lever pivoted to the casing of the device and provided on its upper surface at its extremity with a ratchet-surface, a spring secured to said lever and sustaining it in such position that its ratchet will engage the end of the spring, a cam-disk freely journaled upon the shaft upon which the roller-frame is hung and having a section cut from one side of it and a segment from its center, the former ninety degrees in extent, the latter forty-five degrees, the shaft upon which the disk is mounted being provided with a key working in the segment in the center of the disk, and a crank keyed to said shaft and provided on its extremity with a pin which bears upon the ratchet-lever and holds it out of engagement with the spring during a portion of the motion of the roller, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name hereto, in presence of two witnesses, this 13th day of November, 1889.

EDWIN W. MORTON.

Witnesses:

P. E. RICHTER,
JAMES L. STEUART.