

(No Model.)

3 Sheets—Sheet 1.

E. W. MORTON.
TIME INDICATOR FOR LETTER BOXES.

No. 466,019.

Patented Dec. 29, 1891.

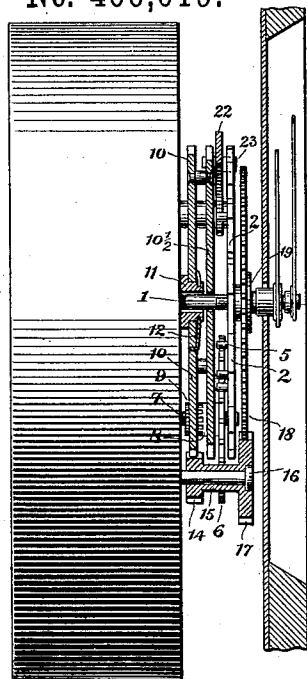


Fig. 1.

Fig. 2.

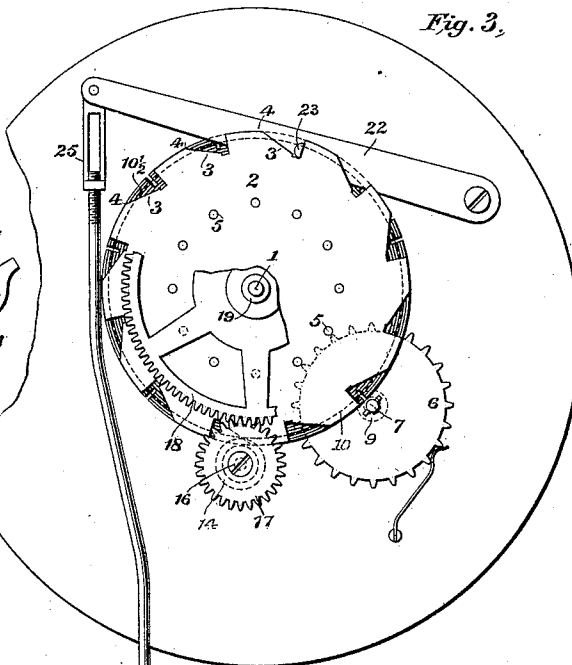


Fig. 3.

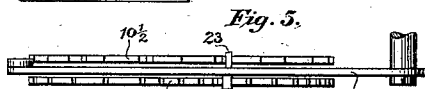


Fig. 5.

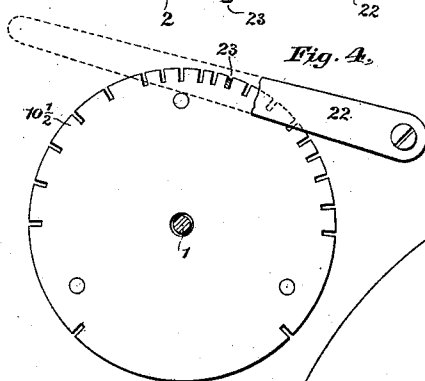


Fig. 4.

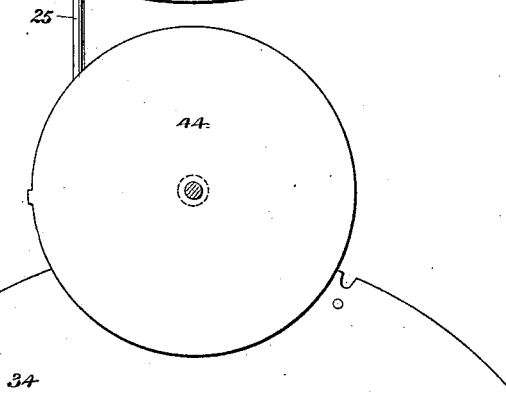


Fig. 6.

Witnesses
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Fig. 6,

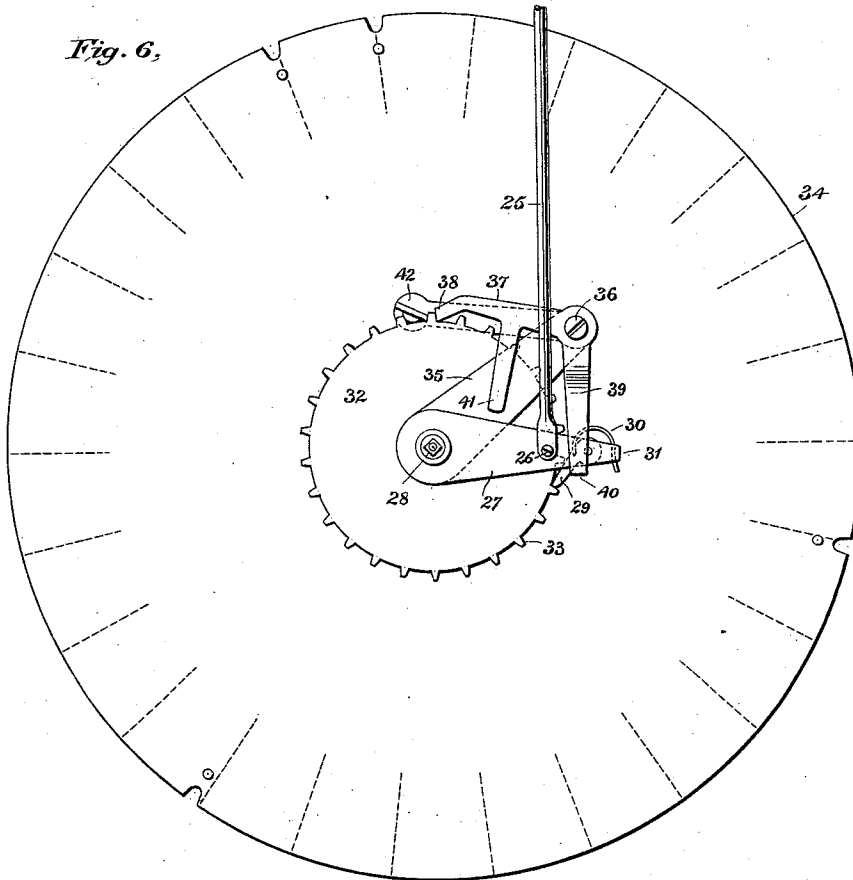


Fig. 7,

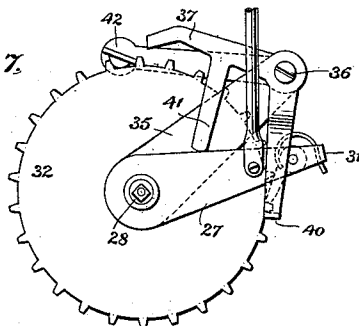
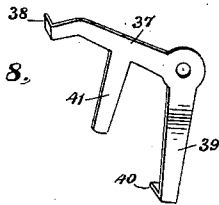


Fig. 8,



Witnesses

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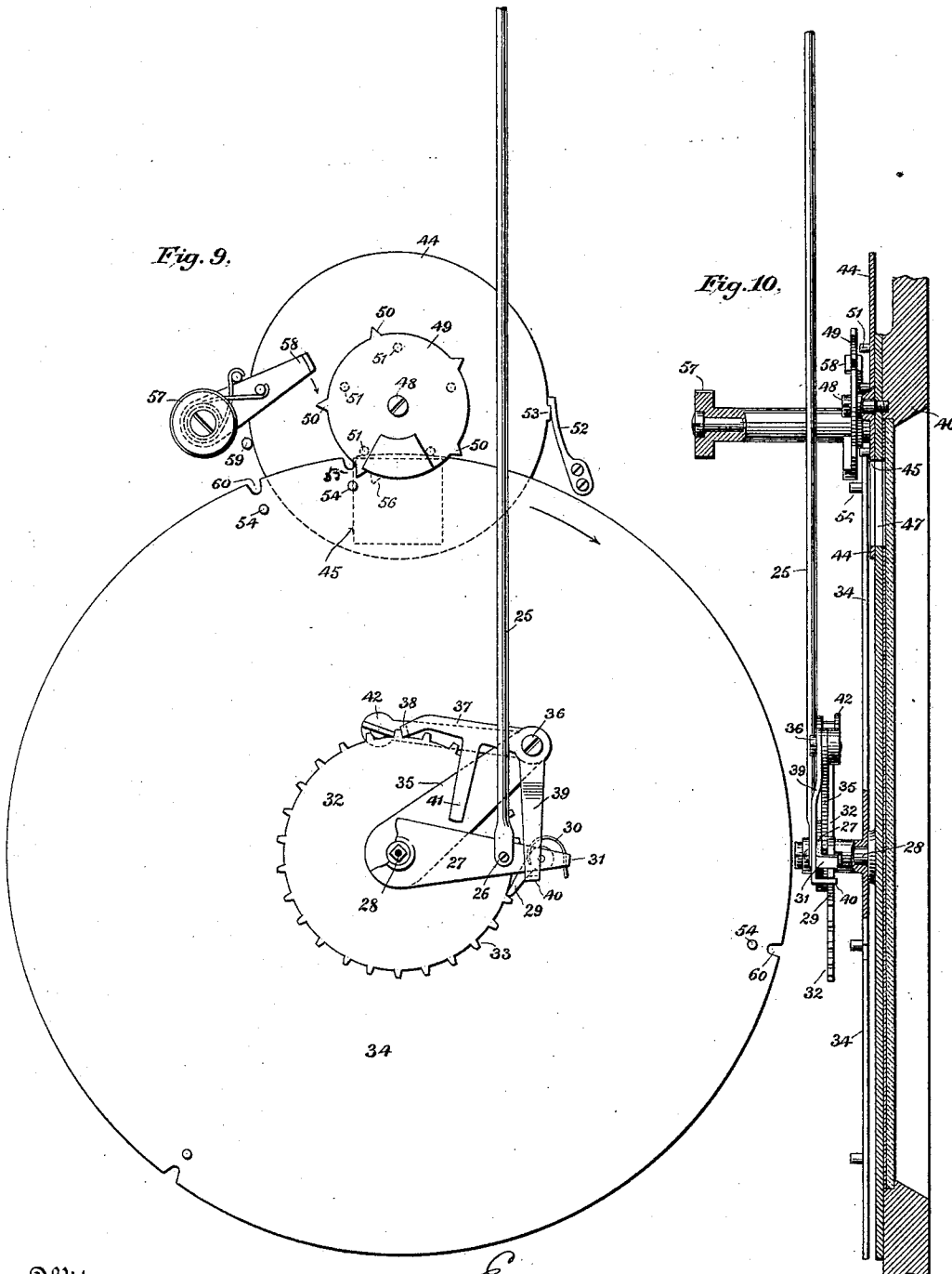
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UNITED STATES PATENT OFFICE.

EDWIN W. MORTON, OF WHITE PLAINS, ASSIGNOR TO JOHN H. ALLEN, OF
NEW YORK, N. Y.

TIME-INDICATOR FOR LETTER-BOXES.

SPECIFICATION forming part of Letters Patent No. 466,019, dated December 29, 1891.

Application filed January 30, 1890. Renewed September 19, 1891. Serial No. 406,266. (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, in the State of New York, have invented certain new and useful Improvements in Devices for Indicating Succeeding Time Periods at which Some Act is to be Performed, of which the following is a specification.

This device is generally to be employed for the purpose of indicating the time at which the next collection from a mail-box will take place; but it may be employed for any other similar purpose in which it is desired to indicate the time in the future at which some event will happen. I employ for this purpose a clock mechanism for operating the device, which at predetermined intervals exposes figures indicating the time it is desired to indicate.

It will be seen that this device may be employed for any purpose—such as advertising, for instance—where it is desired to expose different words or figures at succeeding periods of time.

Figure 1 is a side elevation, partly in section, of the clock mechanism and the train of wheels which are connected directly with it and by which the mechanism by which numbers indicating time is operated. Fig. 2 is a detail view of a spring employed for holding one of the gears upon its bush or bearing. Fig. 3 is a front elevation of one of the ratchet-wheels or detent-wheels of this train. Fig. 4 is a front elevation of another of the ratchet-wheels or detent-wheels of this train. Fig. 5 is an elevation of the detent-bar and hook resting upon the two detent-wheels. Fig. 6 is a rear elevation of the mechanism operating the disk upon which the numbers or words to be exposed are placed. Fig. 7 is a view of the same mechanism in a different position. Fig. 8 is a detail view of a dog in perspective. Fig. 9 is a rear elevation of the disk upon which the numbers to be exposed are placed and of the mechanism by which it is rotated. Fig. 10 is a side elevation of the devices shown in Figs. 6 and 9.

In the drawings, Fig. 1 shows a clock mechanism, the minute-arbor of which is indicated by 1. This arbor is of the usual form and driven in the usual way by a clock and makes

one revolution in one hour and carries the minute-hand on its extremity. Keyed to this arbor is a detent-wheel 2, which is shown in front elevation in Fig. 3. This wheel is divided into twelve parts, having in its periphery twelve notches, one side of which is in the radial line and the other side of which extends from the bottom of the notch to a point midway between two notches—that is to say, to a one twenty-fourth division-line of the periphery of the wheel. In this wheel are also set twelve pins 5 5, which project from the face of the wheel. They are located in a circle some distance from the periphery and immediately beneath the bottom of the notches in the radial line which forms one side of said notches. The notches are numbered 3 3, the points intermediate between them are marked 4 4, and the distance between each 3 and 4 is one twenty-fourth division of a circle.

Referring to Fig. 1, a stud 7 is inserted in the face of the clock mechanism, and upon it is mounted the star-wheel 6, the teeth of which are engaged by the pins 5 5 as they pass it. The star-wheel 6 is secured to a sleeve 8, which is journaled upon the stud 7, to the other end of which is secured the pinion 9, which meshes with the gear 10. Gear 10 is secured to a bush 11 by the U-shaped spring 12, which is provided on its rear extremity with a teat 13, which enters a hole in gear 10 and holds it to the bush. The pinion 9 must be so proportioned to gear 10 that it will cause said gear to make one revolution in twenty-four hours. The detent-wheel 2 makes one revolution in one hour. The star-wheel 6 has twenty-four teeth and is moved one twenty-fourth of a revolution by each pin of wheel 2. Thus, as there are but twelve pins upon the wheel 2 and it makes one revolution in one hour, two revolutions in said wheel will be necessary to cause one revolution of the wheel 6. Wheel 6 makes one revolution in two hours. Pinion 9 makes a similar number, and therefore must be so small as to turn the gear 10 one revolution in twenty-four hours—that is to say, as it turns once in two hours it must have one-twelfth of the number of teeth in the larger gear. Gear 10 meshes with and turns the pinion 14, which is secured to one end of the

sleeve 15, which is journaled upon the stud 16, secured in the face of the clock mechanism. Upon the other end of the sleeve 15 is the pinion 17, which meshes with the gear 18.

Said gear 18 is secured to a sleeve 19, fitting over the minute-arbor and turning upon it. The gear 17 must be of such size that it will cause the wheel 18 to revolve once in twelve hours, because said wheel carries the hour-hand and must move, accordingly, two revolutions in twenty-four hours.

Referring to Fig. 3, the gear 2 is divided into twelve parts and has twelve pins upon it. The star-wheel 6 has twenty-four teeth and must be placed in such position relative to the pins on detent-wheel 2 that the circle described by said pins will intersect the circle described by the end of the teeth of wheel 6, and the segment of the circle of pins 5 5 between the points of intersection of said circle by the circle of the ends of the teeth of the star-wheel will be equal to the distance between the pins 5 5. This being the case, it will be seen that when a pin 5 engages a tooth of the star-wheel 6 and moves it as far as it can it will leave it just where the circles part and leave the tooth behind it, which is one twenty-fourth of the circumference of wheel 6 midway between two pins 5 5, and leave the tooth behind this latter one just out of the reach of the succeeding pin 5. When now this latter pin 5 continues to move, it will not meet a tooth of star-wheel 6 until it has made one twenty-fourth of a revolution. It will then come into contact with the tooth left in the center of the segment and move it through one-half of said segment, hence one twenty-fourth of a revolution upon its own axis. This movement will cause the wheel 6 and the frame to which it is geared to be stationary during one twenty-fourth of the revolution of the wheel 2 and move during a second twenty-fourth. By this arrangement all of the wheels which are geared to the star-wheel 6 will be stationary during one twenty-fourth of its revolution and will move during the next twenty-fourth of its revolution. Thus, as it makes one revolution in two hours, it will give movement to the wheels to which it is geared once every five minutes, and they will remain stationary for five minutes.

Referring to Fig. 4, the ring 10½ is mounted upon the side of the wheel 10, as will be seen from Fig. 1. It therefore turns with the wheel 10 and makes one revolution in twenty-four hours. The periphery of this wheel 10 is divided into two hundred and eighty-eight parts, each of which represents five minutes of twenty-four hours. The ring 10½ is a detent-wheel and governs the periods at which the numbers to be indicated are exposed. Any number of notches may be made in this wheel, according to the number of exposures that it is desired to make in twenty-four hours. They may be located at any distance apart as to time, provided the periods of five minutes are adhered to or any number of two-

hundred-and-eighty-eighths placed between the notches—that is to say, $\frac{3}{888}$ would represent fifteen minutes, $\frac{1}{888}$ would represent one hour, and so on. In the structure which is here described the notches are not put closer than three two-hundred-and-eighty-eighths to one another. This is probably as close as convenience will permit in this size of construction. If the whole device is made very large, each two-hundred-and-eighty-eighth would be much larger, and the notches might therefore be put closer together.

22 is a lever pivoted to the sides of the machine and provided with a cross detent-bar through its center, which extends on either side. The detent-bar is numbered 23 and rests on either side of the lever 22 upon the detent-wheels 2 and 10½. The operation of these detent-wheels may now be understood. As the detent-wheel 2 makes its revolution, moving constantly, revolving once every hour, the detent-pin 23 will be raised by the inclined plane between the bottom of each notch and the points 4 4 upon the periphery of said wheel and will lie upon the periphery of said wheel and also upon the periphery of wheel 10½. It will be seen at once that this detent-pin will not fall into a notch and permit the lever 22 to descend and perform its function of moving the register unless a notch in the wheel 2 and also a notch in the wheel 10½ shall become coincident to permit both ends of the detent-pin 23 to fall at the same time. As the wheel 2 makes one revolution in one hour and as the wheel 10½ makes one revolution in twenty-four hours, it will be seen that, as the wheel 2 moves constantly, while the wheel 10½ moves intermittently, the wheel 2 performs the function of raising the detent-pin out of its notches and also out of those in wheel 10½ while said wheel is stationary. The reason for this will be readily seen. The notches in the wheel 10½ must be rather close together if the number of registers to be exposed are numerous. They must therefore be in radial lines, and in order that the detent-pin 23 may be raised out of them it must be raised while said wheel is stationary and held out of the notches while the wheel is turning. This is accomplished by the inclined plane of the notches 3 3 upon the wheel 2. As the wheel 2 turns, the inclined plane of one of the notches 3 raises one end of the detent-pin 23 until it rests upon the periphery of the wheel 2, where it rests while one of the pins 5 engages a tooth on the star-wheel 6 and turns the train and with it the ring 10½. If now it should happen that the notches on the wheel are more than five minutes apart, the detent-bar 23 will rest upon the periphery of said ring and will not fall into the succeeding notch in the wheel 2. If the notches in the wheel 10½ are placed fifteen minutes apart—that is, three two-hundred-and-eighty-eighths—three notches representing five minutes each in the wheel 2 will have to pass be-

neath the detent-hook 23 before the wheel 10½ will be turned far enough to bring the succeeding notch in it beneath the detent-pin 23. When this is done, the notches in the wheel 2 and in the wheel 10½ becoming coincident immediately beneath the pin 23, it will fall into them and permit the rod 25 to descend, thereby operating another mechanism, which will be hereinafter described.

As before stated, the notches in ring 10½ may be placed at any variation of two hundred and eighty-eight from one another.

Referring to Fig. 10, 46 is the wall of the casing in which the device is located. 47 is an aperture through which the number is to be exposed.

Referring now to Fig. 6, 28 is a stud set in the wall of the casing 46. 32 and 34 are disks secured to one another and mounted upon the stud 28. Disk 34 is much larger than 32. 32 is provided with teeth 33 upon its periphery, located any distance apart, but in number equal to the number of exhibits to be exposed. 27 is an arm journaled upon the stud 28 and to which the rod 25 is attached. To the end of this arm is secured a pawl 29, pivoted to it and provided with a spring 30, which encircles the rear end of said pawl and engages with a finger 31 on the end of the arm 27. Pawl 29 engages with the teeth 33 of the disk 32. The arm 35 is an arm rigidly secured to the stud 28 and extending beyond the periphery of the disk 32. On the end of this arm is pivoted a bell-crank lever, which operates as a dog. One arm of said bell-crank lever 37 has upon its extremity a laterally-extending finger 38, which is in a position to engage with the teeth 33 of the disk 32. The other end of the bell-crank lever has a similar extension 40 upon its extremity and is similarly in position to engage with a tooth of disk 32 when the finger 38 is out of engagement with said teeth—that is to say, the distance between the two extremities of this bell-crank lever is such that only one of them can be in engagement with the teeth 33 of the disk 32 at the same time. On the under side of the arm 37 of the bell-crank lever is a foot 41, so located and of such a length that when the arm 27 is raised by the bar 25 it will strike upon said foot and lift the end 38 out of engagement with a tooth of the disk 32, but at the same time throw the end 40 of the arm 39 into engagement therewith. 42 is a dog also pivoted to the stud 36 and engaging the teeth 33 of the disk 32 immediately beyond the end 38 of the dog 37, thus holding the tooth on both sides and preventing its motion in either direction. It will now be observed that as the bar 25 is raised the arm 27 will raise the pawl 29 until it engages with another tooth of the disk 32, and in doing so it will strike upon the foot 41 of the bell-crank lever and raise the dog 38 out of engagement with the teeth of the disk 32, but throw the end 40 into engagement with said teeth. Thus when the pawl 29 engages another tooth of the disk

32 it will leave the dog 40, holding that tooth on the opposite side, thus preventing the motion of the disk in either direction. As soon as the rod 25 begins to descend the dog 37 will also descend and throw the end 40 of arm 39 out of engagement with a tooth 33 and permit the arm 27 by gravity to turn the disks 32 and 34, thus exposing another set of numbers. This arrangement of ratchet and dogs permits the disks 32 and 34 to be held stationary by a dog on either side of a tooth, whatever position it may be in, preventing its movement unless actuated by mechanism. The disk 34 has the figures or other exhibit to be exposed upon its face, and said numbers and figures are seen through the opening 47 in the casing 46. The number of teeth 33 in the disk 32 are made to correspond with the number of figures to be indicated upon the face of the disk 34. This structure is generally employed for the purpose of indicating the period of time for the collection of mails on week-days. When, however, it is desired to indicate the collection for Sunday, which generally differs from those of the week-days, it can be done in the following manner:

Referring to Fig. 9, the stud 48 is secured in the casing 46 of the device and the disk 44 is journaled upon it. To this disk is secured another disk 49. The periphery of the disk 49 is provided with the pins 50 50, which are distributed upon the said periphery at any desired intervals, except that the interior of the disk 34 has set into it a series of pins 54 54, which are of a number equal to the teeth 50 upon periphery of the disk 49. These pins are provided for the purpose of engaging the teeth 50 and turning the disk a definite distance. They are located in such position that they will cause the disk to be moved as the disk 34 revolves. The disk 34 revolves on Sundays, as on week-days, at the same periods of time; but the disk 44 has in it an aperture which stands between the opening 47 and the disk 43. On week-days this aperture is so located that the numbers and figures upon the disk 34 show through it; but on Sunday when the disk 44 is rotated it covers the disk 34 and exposes the numbers upon the disk 44 only through the aperture 47. This movement is accomplished in the following manner: The teeth 50 are so located upon the disk 49 that when on Sunday night the last tooth 50 preceding the aperture 45 of the disk 44 has been moved by a pin 54 it will leave the tooth 55, which is the one immediately succeeding the aperture 45, in such position that it will be out of the reach of the pin 54 and will not be caught by the said pin until it is moved into the path of said pin by some means. This means consists of the knob 57 and the stud to which it is attached, and which are journaled in the casing 46 of the machine. On the inner end of this stud is the lever 58, which is held by a spring against a stud 59, which is a stop limiting the

movement of the finger 58. On Saturday night, after the last collection, the collector must turn the knob 57 as far as it will go and allow it to return under the influence of its spring. The turning of this knob will throw the finger 58 in contact with a tooth 50 and move the disk 49 forward a short distance. This distance is predetermined and is sufficient to throw the tooth 55 into the position indicated in dotted lines by 56, which will be in the path of the coming pin 54. The pin 54 will then strike tooth 55 and move it as far as the point where the circle of that pin intersects the circle of the tooth 55. This will leave the succeeding tooth in the path of the succeeding pin 54 and cause it to be turned. In this way the revolution of the disk 44 may be accomplished, exposing its numbers through the aperture 47. When the last number on said disk has been reached, as before stated, the pin 55 will be left in such position that the pin 54 will not strike it and the aperture 45 will be coincident with the aperture 47, and the numbers upon the disk 43 will be visible through the coincident apertures 47 and 45. It is desirable that the disk 44 should be held stationary during the week-days and also prevented from turning too far when it is in operation. This is accomplished by the pins 51 51, which hold the disk 49 to the disk 44. They are so located that when the last pin 54 leaves its tooth 50 and leaves the aperture 45 coincident with the aperture 47 then a pin 51 will rest upon the periphery of the disk 34. On the periphery of the disk 44 is a teat 53, which is engaged by a spring-stop 52 and held by it, thus preventing the disk 44 from turning in one direction. The pin 51, which rests upon the periphery of the disk 34 immediately above the tooth 50, which was last acted upon by the pin 54, will prevent the disk 44 from turning in a reverse direction. It will thus be prevented from turning in either direction. When the disk 44 has made a complete revolution and the tooth 55 is left in position to be out of engagement with the pin 54, then its pin 51 must be in such location that the disk 44 may be turned by the finger 58, so as to throw the tooth 55 into the position of 56. In order to do this, it is necessary that the pin 51 above the tooth 55 should not rest upon the disk 34, but should be sufficiently far from it to permit that motion and yet to stop that motion at a proper point. This is accomplished, as will be readily seen from the drawings. Pin 51 of tooth 55 is so located as to permit exactly the proper amount of motion and stop the motion at the proper point. This tooth 55 and the others would of course prevent the motion of the disks 44 and 49 if there were no means provided in the disk 34 to permit them to descend into that disk. This means consists of notches 60 60, cut into the periphery of the disk 34 immediately above the pin 54. Into these notches the pins 51 enter and permit the disk 44 to turn.

It will be observed that I have described this device as applied to a letter-box and for the purpose of indicating the succeeding collections that are to be made by the post-office. This is probably one of its best applications. It may, however, be used in various ways, and I do not limit myself to its application to a letter-box or to any other specific device.

What I claim, therefore, and desire to secure by Letters Patent, is—

1. In an indicating device, the combination of a time-train upon the minute-arbor of which is secured a disk the periphery of which is provided with twelve notches, one side of each of said notches being in an approximately radial line while the other is inclined, each of said notches occupying one twenty-fourth of the circumference, said disk also having twelve pins set into it and projecting from one side thereof, and a spur-wheel provided with twenty-four teeth, which is so located that the pins of the disk will engage said teeth as the disk turns and at each impact of a pin with a tooth turn the spur-wheel one twenty-fourth of a revolution, a pinion upon the arbor of the spur-wheel, a gear-wheel loosely mounted upon the minute-arbor of the time-train and meshing with the pinion upon the arbor of the spur-wheel, a disk or ring secured to the side of the gear-wheel and which is about the same size as the notched disk, said disk or ring being provided with radial slots or notches in its periphery, a lever pivoted to the casing of the device and arranged to move vertically between the two disks and provided with a pin projecting on either side of it, which rests upon them and engages the notches in them, a disk bearing numbers or other thing to be exhibited, to which is secured a ratchet-wheel, and a rod secured to the lever of the time mechanism at one end and to a rocking arm at the other, said rocking arm carrying a pawl which engages the ratchet and by which the disk is turned.

2. In an indicating device, the combination of a time-train upon the minute-arbor of which is secured a disk the periphery of which is provided with twelve notches, one side of each of said notches being in an approximately radial line while the other is inclined, said notches occupying one twenty-fourth of the circumference, said disk also having twelve pins set into it and projecting from one side thereof, and a spur-wheel provided with twenty-four teeth, which is so located that the pins of the disk will engage said teeth as the disk turns and at each impact of a pin with a tooth turn the spur-wheel one twenty-fourth of a revolution, a pinion upon the arbor of the spur-wheel, a gear-wheel loosely mounted upon the minute-arbor of the time-train and meshing with the pinion upon the arbor of the spur-wheel, a disk or ring secured to the side of the gear-wheel and which is about the same size as the notched disk, said disk or ring being provided with radial slots or notches in its periphery, a lever pivoted to the casing of

the device and arranged to move vertically between the two disks and provided with a pin projecting on either side of it, which rests upon them and engages the notches in them, 5 a disk bearing numbers or other thing to be exhibited, to which is secured a ratchet-wheel, and a rod secured to the lever of the time mechanism at one end and to a rocking arm at the other, said rocking arm carrying a pawl 10 which engages the ratchet and by which the disk is turned, and a dog secured to the rocking arm and engaging the teeth of the ratchet-wheel to lock it and the disk bearing exhibits when it is not in motion, substantially as described. 15

3. In an indicating device, the combination of a time-train upon the minute-arbor of which is secured a disk the periphery of which is provided with twelve notches, one 20 side of each of said notches being in an approximately radial line while the other is inclined, said notches occupying one twenty-fourth of the circumference, said disk also having twelve pins set into it and projecting from one side thereof, and a spur-wheel 25 provided with twenty-four teeth, which is so located that the pins of the disk will engage said teeth as the disk turns and at each impact of a pin with a tooth turn the spur-wheel one twenty-fourth of a revolution, a pinion 30 upon the arbor of the spur-wheel, a gear-wheel loosely mounted upon the minute-arbor of the time-train and meshing with the pinion upon the arbor of the spur-wheel, a disk 35 or ring secured to the side of the gear-wheel and which is about the same size as the notched disk, said disk or ring being provided with radial slots or notches in its periphery, a lever pivoted to the casing of the 40 device and arranged to move vertically between the two disks and provided with a pin projecting on either side of it, which rests upon them and engages the notches in them, a disk bearing numbers or other thing to be 45 exhibited, into the interior surface of which are inserted a series of pins near its periphery, to which is secured a ratchet-wheel, and

a rod secured to the lever of the time mechanism at one end and to a rocking arm at the other, said rocking arm carrying a pawl which 50 engages the ratchet and by which the disk is turned, and a second disk bearing other exhibits, which overlaps the first one, but which is provided with an aperture through which the exhibits of the first disk are seen, said 55 disk having secured to it another disk of less diameter, which is provided upon its periphery with a number of spurs equal in number to the pins in the interior surface of the first exhibiting-disk and which will be engaged 60 by said pins to turn said disk and the second exhibiting-disk with it, said spurs being located upon the periphery of said disk an equal distance apart, except two, which are a greater distance than the others, the distance 65 between these two being so great that when the first of said spurs has been struck by a pin and carried as far as the point of separation of the circles of their motions the next succeeding spur will not have reached the 70 point of intersection of the circle of the motion of the spurs and that of the pins; between these spurs is located the aperture through which the exhibits on the first disk are seen, the balance of the spurs being closer 75 together than the distance between the points of intersection of the circles of motion of the pins and spurs; the next spur will always be left in the path of a pin when the next preceding one has been pushed as far as the 80 point of separation of the two circles, and an independent device operated by hand or otherwise to move the second disk, when desired, so as to throw the second of the two most widely-separated spurs into the path of the pins, sub- 85 stantially 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.