

No. 676,084.

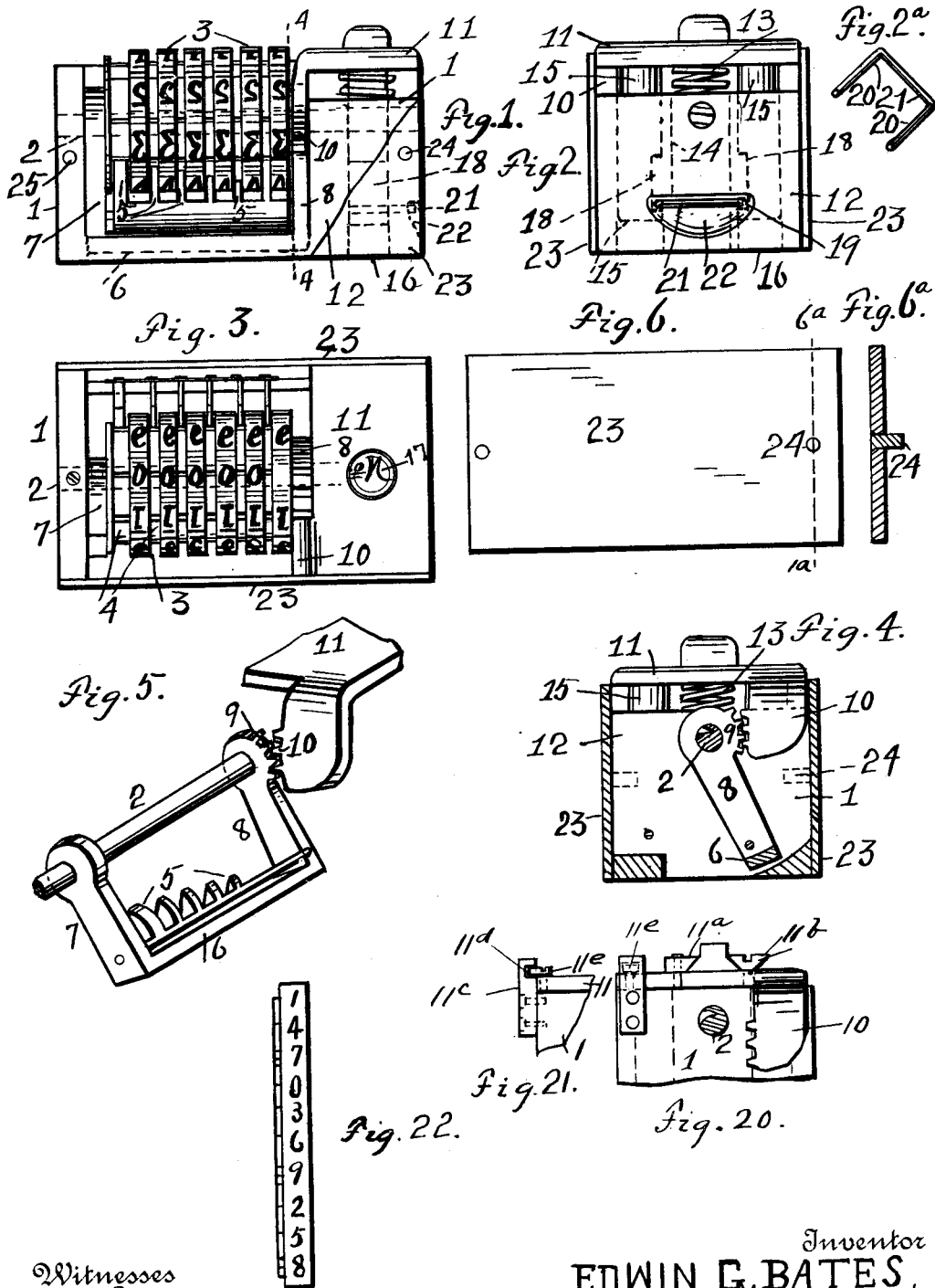
Patented June 11, 1901.

E. G. BATES.
AUTOMATIC NUMBERING MACHINE.

(Application filed Aug. 4, 1900.)

3 Sheets—Sheet 1.

(No Model.)



Witnesses
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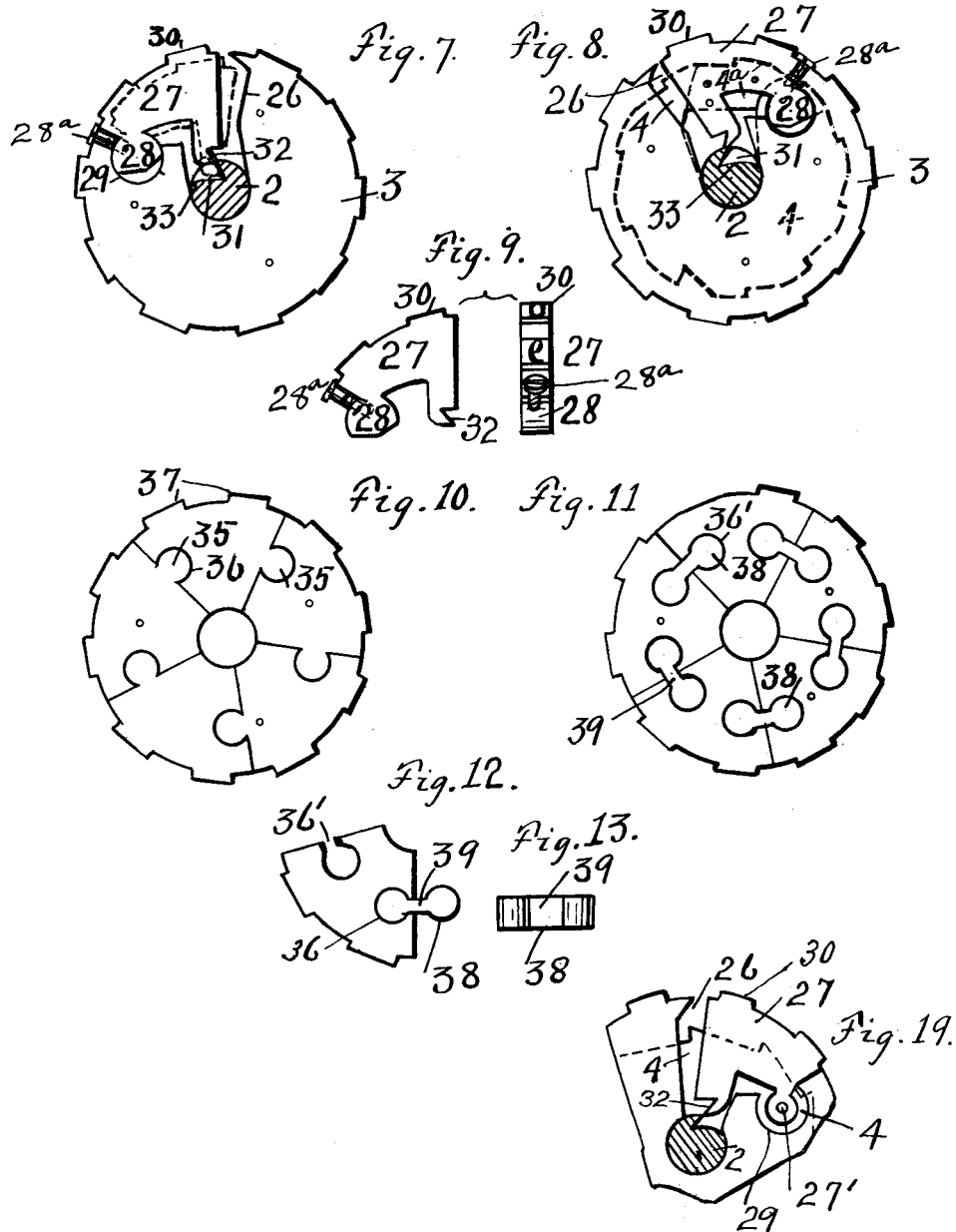
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3 Sheets—Sheet 2.



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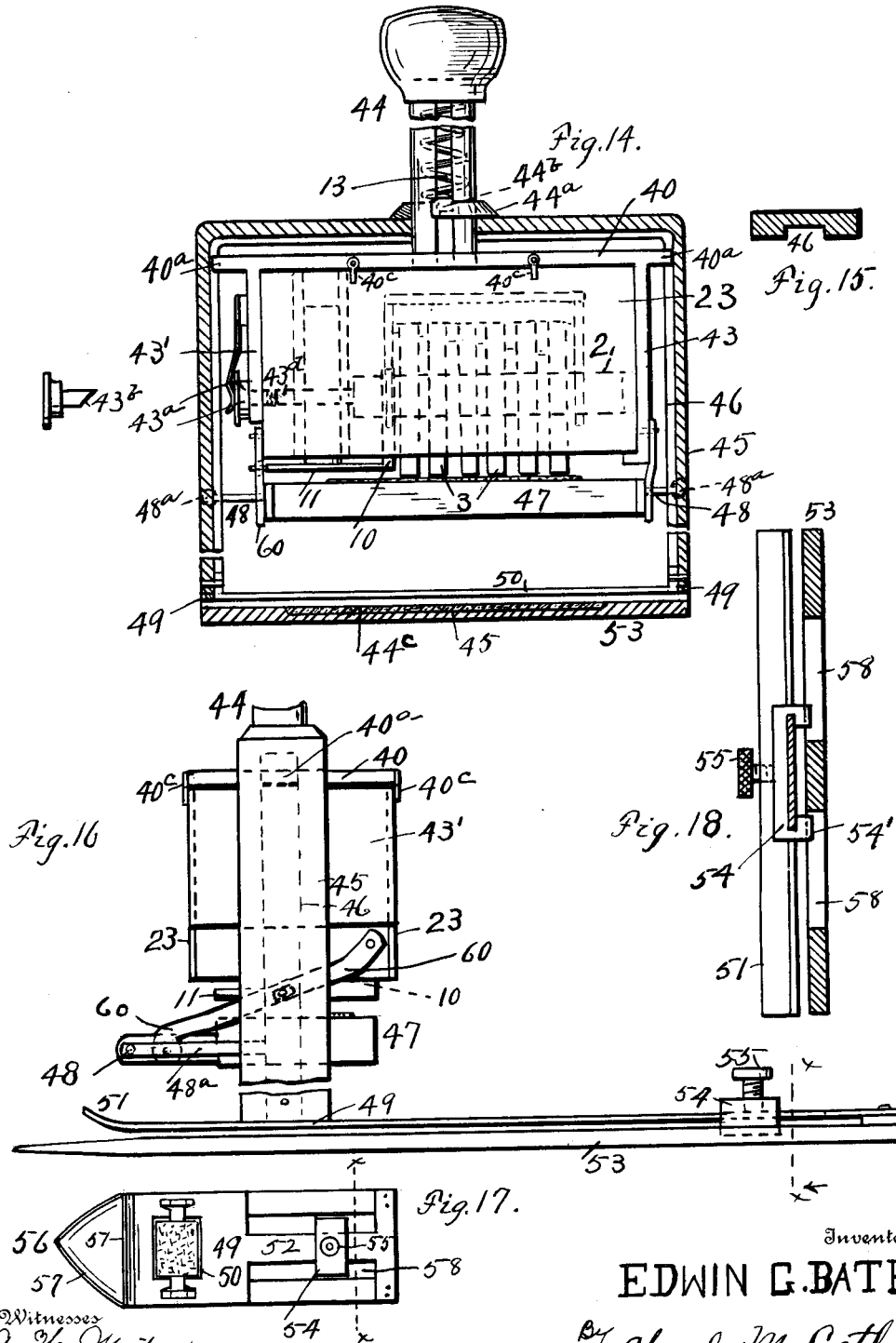
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

EDWIN G. BATES, OF NEW YORK, N. Y., ASSIGNOR TO THE BATES MACHINE COMPANY, OF SAME PLACE.

AUTOMATIC NUMBERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 676,084, dated June 11, 1901.

Application filed August 4, 1900. Serial No. 25,908. (No model.)


To all whom it may concern:

Be it known that I, EDWIN G. BATES, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Automatic Numbering-Machines, of which the following is a specification.

This invention relates mainly to type-high automatic numbering-machines, designed to be locked in a chase with the form, surrounded with type matter, or used separately when numbers only are to be printed, and to such machines combined for use with the frame of an automatic hand numbering-machine, to an improved gage, and other features hereinafter set forth.

In the drawings, Figure 1 is a side view of a typographic numbering-machine, the front side of the casing being broken away. Fig. 2 is an end view of the same. Fig. 2^a is a perspective view of two connected pins. Fig. 3 is a plan. Fig. 4 is a section on line 4 4 of Fig. 1. Fig. 5 is a perspective of the stepped pawls and plate or frame carrying said pawls. Fig. 6 is a rear side view of a side of the casing. Fig. 6^a is a sectional view on line 6^a 6^a of Fig. 6. Fig. 7 is a side view of a wheel with a drop-cipher, showing also a section of the axis. Fig. 8 is a similar view showing the opposite side of such wheel, its ratchet-wheel being shown in dotted lines. Fig. 9 is a side and an edge view of the drop-cipher section detached. Figs. 10 and 11 are side views of two slightly-different constructions of number-wheels. Fig. 12 is a side view of a segment of the wheel of Fig. 11 detached. Fig. 13 is a side view of a securing device. Fig. 14 is a vertical section of a hand numbering-machine frame with a gage and the typographic machine supported in the frame. Fig. 15 is a transverse cross-section of the frame. Fig. 16 is a side view of the machine. Fig. 17 is a plan view of the gage detached and on a smaller scale. Fig. 18 is a section on lines *xx* of Figs. 16 and 17. Fig. 19 shows a modification of the drop-cipher connection. Figs. 20 and 21 are views at right angles to each other of a modified plunger-plate and locking device therefor, and Fig. 22 shows

the periphery of a modified number-wheel developed.

1 is a metal frame of  shape, with the usual printing-opening in its bottom, which frame carries a non-rotary axis 2, on which are several number-wheels 3, each of which has secured to one of its sides a ratchet-wheel 4, with which the stepped pawls 5 engage in the usual way. Said pawls are carried on a plate 6, pivoted by arms 7 8 on the axis 2. Arm 8 has a segment of gear 9 engaged by a rack 10, projecting down from plate 11, which is transverse to the axis and is normally held above the end 12 of the frame and out of the printing-plane by a strong spring 13, held in a hole or socket 14 in said frame, the spring pressing against the plate between the pins at their upper or outer ends. Plate 11 is guided in its reciprocating movements by pins 15 in holes or sockets 16 in end 12 on opposite sides of the spring. Plate 11 is normally out of the printing-plane and is so mounted and guided that it moves straight up and down bodily as distinguished from swinging on a pivot, as does plate or lever J, for example, in my Patent No. 484,390, and the projecting arm is rigid with plate 11, being preferably integral therewith, and the teeth thereon forming a straight rack. Pins 15 have on their facing sides elongated notches 18, which come within holes 16, and the end 12 has holes 19 at right angles to said notches in lines intersecting the notches, as shown in Fig. 2. In said holes pins 20 are inserted to form limiting devices for pins 15 and plate 11 against the normal tension of spring 13. It is preferred to connect these pins by an integral cross-piece 21, Figs. 2 and 2^a, so that they may both be inserted or removed by a single operation and the number of separate pieces be reduced. End 12 of the frame has a notch or depression 22, just deep enough to admit part 21, so that it shall not project beyond the face of end 12. The notch at one side of part 21 is inclined, Figs. 1 and 2, so that a suitable tool can be inserted under part 21 to withdraw pins 20 when necessary to remove pins 15 and plate 11. This device locks or unlocks both pins 15 simultaneously and is a very cheap and efficient device. Plate 11 also has a pro-

jection 17, which extends above the top of the number-wheels and which is provided with the printing character or device "No." or other desired character and is so located as to print in the same line as the number-wheels, which at the printing-line are type-high. The part 11 is adapted to receive the impact of a printing-platen in the act of printing when the numbering-machine is fixed in the form and to be moved down to the level of the type-wheels, which movement operates the rack 10 and swings the plate 6 and stepped pawls carried thereby. When the platen ceases to press on the machine, spring 13 raises plate 11 and swings the pawl-carrying plate and stepped pawls back to the position in Fig. 4, which return movement advances one or more of the number-wheels. It is not broadly new to provide period-plates, "No." plates, and the like, which are depressed by the platen and have means for operating the pawl-plate. The present invention, however, comprises improved constructions, as shown and described.

The frame 1 is provided with side plates 23, each of which has two or any suitable number of pins 24, rigidly fixed to the plate, which fit removably into smooth holes 25 in frame 1 and form the only securing devices for the sides, the latter being therefore readily put in place and removable without the necessity of operating-screws, as is usually the case. When the machine is in a form, these plates are firmly clamped in place by the surrounding matter. In Fig. 1 the front plate 23 is partly broken away to show parts behind it.

Preferably the number-wheels 3, following the units-wheel, have drop-ciphers of improved construction and for the usual purpose of such devices. Referring to Figs. 7, 8, and 9, each of said wheels 3 has a segment removed at 26 and a section 27 pivoted in space 26 by an extension 28, hereinafter more fully described, which fits so as to turn in socket 29 in the body of wheel 3. While the socket moves with the wheel, it is fixed in relation to the removed segment. The drop-cipher section 27 is enough smaller than space 26 to allow the required movement. Preferably the section constitutes a fifth of the wheel, and has two printing characters, one of which, 30, is the zero. Axis 2 has an undercut longitudinal groove 31, into which the hooked ends 32 are engaged to normally hold the part 27 depressed. Fig. 7 shows the section 27 just about to drop as end 32 is carried over the edge of the groove by rotation of the wheel. The part 32 will then be caused to engage the undercut by a slight backward movement of the wheel, which may be effected by the hand, this position being shown in dotted lines, Fig. 7. When the wheel is turned, end 32 passes out of the undercut groove, is raised by contact of the lower side 33 of the groove, and is supported in printing position—that is, with its outer face in

the periphery of the wheel—by the periphery of shaft 2 for a full revolution of the wheel and not liable to get out of order.

In some machines or in some wheels of some machines I omit the drop-ciphers and use complete wheels, which may consist of segments fastened together to form such wheel. The last wheel in a machine is generally made without a drop-cipher, as shown in Fig. 3 the last wheel at the right. In Fig. 10 is shown a wheel designed for said last wheel or for such other location as requires no drop-cipher. Each segment is provided with a cylindrical extension 35 and similarly-shaped opening or socket 36. Each segment is preferably a fifth of the wheel and has two numerals 37 on it. The segments are forced together and form a permanent structure. By making the wheels of segments the numbers can be stamped thereon, while with wheels of a single piece the numbers must be engraved.

The wheel shown in Fig. 11 differs from that of Fig. 10 in that each segment has two openings or sockets 36' and the segments are secured together by fastening devices 38, the ends of which are driven into sockets 36' of adjoining segments. It is preferred to place the circular parts of the sockets back from the edge of the segment, with a narrow passage leading therefrom to the segment edge, as shown.


The cylindrical heads of the securing devices are connected by thin flat stems 39, which fit into said narrow passages. This makes a strong easily-assembled wheel. Evidently a drop-cipher such as shown in Figs. 7 and 9 could be substituted for the zero-segment in these wheels, Figs. 10 and 11, if desired. In making these wheels a device 38 may be inserted in one edge of each segment, (see Fig. 12,) the projecting end thereof then corresponding to projection 35 of Fig. 10 and the socket 36' at the opposite edge corresponding to socket 36.

Sometimes the user of numbering-machines, especially printers, desires a typographic machine and also desires an automatic hand numbering-machine. According to this invention it is possible to use the same printing-head in both situations.

In Fig. 14, 40 is a handle-plate adapted to be secured to the machine shown in Figs. 1, 2, &c. Fig. 14 shows plate 40 secured to said machine inverted and in a hand-machine frame. The handle 44 of a hand numbering-machine is suitably secured to plate 40, which is provided with lugs 40^a at the ends, adapted to travel in groove 46. The plate also has a vertical arm 43, with a ledge at its bottom to support one end of the typographic machine and an arm 43' at its opposite end, in which is an automatic spring-catch 43^a, the inner end 43^b of the catch being beveled on one side, so as to be retracted when the typographic machine is pushed in, but having its upper side straight, so as to form a support

for that end of the typographic machine when the catch snaps into a hole in the head. Preferably a hole 43^d in line with the axis 2, which is generally found in machines now in use, for use in removing the axis is utilized also for the catch. The vertical arm 43, with its ledge, and the opposite arm 43' and spring-catch 43^a form means for connecting the typographic machine to plate 40.

43^e represents buttons pivoted to plate 40 and adapted to swing down, as shown, to prevent the side plates 23 becoming detached from the head when used in the hand-machine.

45 is the frame of a hand numbering-machine, this frame preferably being formed from a uniform strip of steel, with a groove 46 on one side for its entire length, a piece being cut from said strip of suitable length and bent to  shape. The strip is of uniform cross-section throughout its length. This type of frame is not claimed herein.

47 is an ink-pad holder pivoted at 48 at one side of the frame.

49 is a thin printing-plate, of steel or other suitable metal, secured to the ends of the frame and having a printing-opening 50. One end of plate 49 is bent up at 51 a short distance from the frame. At the other end plate 49 has an integral extension 52, narrower than plate 49, which serves as a yielding or spring connection or support for a comparatively thick and heavy steel tongue 53, which in use is slipped under the card or sheet to be printed, providing the necessary solidity of surface to insure clear impressions.

44^c is a felt or other yielding pad in a depression 45 in plate 53.

54 is a cross-bar adapted to slide on the extension 52 and preferably engaging the edges thereof, as shown at 54'.

55 is a screw for securing bar 54 at any position to which it is adjusted.

The rear end 56 of plate 53 is tapering or rounded and also has a downward bevel 57, which, together with the upturned edge of the printing-plate, makes it easy to insert the cards to be printed. The plate may be cut away at 58 to decrease weight and to make room for the ends of bar 54.

In use this machine is held in the right hand, (extension 52 and plate 53 forming a handle,) the ticket, for example, being grasped by the thumb and fingers of the left hand, and is passed between plates 49 53 until it is stopped by the gage-block 54, thus bringing the palm of the left hand under plate 53, affording sufficient solidity beneath the card to insure a good impression when handle 44 is depressed by the right hand. The gage being properly set, the cards will be printed exactly on the correct line. The same machine can be used for cards or tickets of different sizes by adjusting the gage.

The ink-pad-holder pivot, Fig. 16, must, as usual, be supported at a distance to the rear of the frame 45; but owing to the form of the frame described there are no rearwardly-ex-

tending lugs to support the pivot, as in old machines having cast frames, nor, owing to the thinness and form of the printing-plate, is it advisable to support standards therein. Moreover, the curved end of said plate is usually in such position as to interfere with thus supporting the standards. These objections are overcome in this improvement by supporting such standards 48^a horizontally from edges of the vertical legs of frame 45 at the proper height for the pivot. Said standards are preferably supported by being forced into plain holes—*i. e.*, holes not having screw-threads—in the frame; but it is not essential that such plain or smooth holes be used. The ink-pad support is swung back by depressing the head in any well-known or suitable way, means therefor being indicated by arm 60, between the pad-support and the head, and moved by movement of the latter, as common in numbering-machines. Lever or arm 60 is provided with an elongated slot 60^a, into which a pin 60^b, projecting from plunger-plate 11, extends for moving the plate and the pawl-plate-moving rack 10 when the head is reciprocated.

With typographic numbering-machines it is sometimes desirable to change from consecutive numbering to printing numbers in progression with a difference or arithmetical ratio greater than one for special occasions, and it is desirable to be able to use a single machine in both cases by simply substituting one units-wheel for another, this being done without taking the machine apart. To make the units-wheel easily removable, I cut away the pivot 28 of the drop-cipher (on the lower side in Fig. 7) in such manner that when the drop-cipher is in its raised—that is, printing—position part 28 still has bearings in the cylindrical opening 29 on opposite sides, so that the cipher-section will readily turn on its pivot when unsupported. The opening in which the section 27 is mounted is made a little longer at the periphery of the wheel than the body of the segment. The extra length, however, is occupied by a suitable device, as a screw 28^a, set in the part 28, and limits the normal outward movement of part 27. By removing this screw, part 27 can be turned up a little farther until the inner edge of part 28 passes out of opening 29, when section 27 can be lifted out. Then the wheel can be turned and removed, the cut-away part of the wheel and of its ratchet being adapted to slip over axis 2. As shown in Fig. 8, a segment 4^a of ratchet-wheel 4 is separate from the rest of the ratchet-wheel, but is riveted to segment 27, and is of such form as not to interfere with movement of part 27. The ends of segment 4^a are shown curved, the center being the center of pivot 28. When the units-wheel is removed, another wheel is substituted by slipping it into place in manner the reverse of that above described. On the substitute wheel the ten printing numbers are arranged in order of

the units-columns of the progression—thus, for example, “1, 3, 5, 7, 9, 1, 3, 5, 7, 9,” or “1, 4, 7, 0, 3, 6, 9, 2, 5, 8.” It will be seen that the ratchet of this units-wheel must have a deep notch for each group of figures terminating at the last number of the progression below a number requiring a zero, (as “10,” “20,” &c.,) so that the following wheel or wheels will be suitably advanced with the units-wheel. In the first example above given the tens-wheel must be advanced twice for each revolution of the units-wheel and in the second example three times. The number of times which the tens-wheel is advanced is a fixed and definite number of times for each progression of numbers on the units-wheel, said number of times corresponding to the ratio of the progression. Evidently the drop-ciphers of the number-wheels following the units-wheel and said wheels themselves are not necessarily made removable, but may be.

When the typographic machine is to be used in a hand-machine frame, the strong spring is removed from its place behind the plate 11 and is utilized as the head-raising spring in the handle 44 of the hand-machine.

44^a is a ring from which finger 44^b extends into the handle and forms an abutment for the spring. A thinner plunger-plate 11 than the one removed is substituted, (Figs. 14 and 16,) so as to remain above the printing-plane when the head is depressed. The plunger is connected to the stepped-pawl-carrying plate, as described in connection with Figs. 4 and 5.

The plunger-plate in the typographic machine may have a removable “No.” or prefix printing block. The base of this block is outwardly beveled and is held between a fixed undercut block 11^a and a clamping-screw 11^b.

11^c is a block secured to frame 1 and having a notch 11^d.

11^e is a screw set on plate 11 and having an eccentric head which when properly turned (when the plunger-plate is depressed) engages the notch and locks the plunger down, so that the machine may print the same number indefinitely.

In Fig. 19 is shown a modification, the drop-cipher section being pivoted to the ratchet-wheel by pivot 27', which may or may not be within an opening 29. This may be used when the removable drop-cipher and wheel are not required.

I claim—

1. The combination in a numbering-machine of a frame, an axis, number-wheels with pivoted drop-cipher sections whose printing-faces are normally retracted out of the printing-plane but which reach said plane when the wheels are turned, ratchets for the number-wheels, stepped pawls, a pawl-carrying plate having arms with bearings on said axis, one of said arms having gear-teeth, a plate guided to move bodily straight up and down, means including a spring normally holding said plate out of the printing-plane, the spring being adapted to be compressed in the act of

printing, a projecting arm rigid with said plate and having a straight rack engaging said gear-teeth on the arm.

2. The combination, in a numbering-machine, of a frame, an axis, number-wheels, ratchets, a stepped pawl, a pawl-carrying plate having arms with bearings on said axis, one of the arms having gear-teeth, a plate, a spring normally holding the plate out of the printing-plane and adapted to be compressed by the act of printing, pins for guiding said plate, and a projecting arm on said plate with teeth engaging said gear-teeth, as set forth.

3. The combination, in a numbering-machine, of a frame, an axis, number-wheels, ratchets, a stepped pawl, a pawl-carrying plate having arms with bearings on said axis, one of the arms having gear-teeth, a plate, a spring normally holding the plate out of the printing-plane and adapted to be compressed by the act of printing, pins for guiding said plate, and a projecting arm with teeth engaging said gear-teeth, the pins having limiting-notches, and pins mounted in the frame and passing into said notches to serve as stops for the first-mentioned pins.

4. The combination with the axis, number-wheels, pawls, plates carrying the pawls and pivoted on said axis, of plate 11, pins 15 having notches 18, pins 20 engaging the notches to limit the movement, a spring normally holding said plate out of the printing-plane, and the rack-arm on said plate for swinging the pawl-plate.

5. A plate 11 having a printing projection, notched limiting guide-pins, and a rack parallel with said guide-pins, in combination with pins 20 passing through said notches and forming stops for the pins, number-wheels, and means for turning them operated by said rack.

6. The combination with plate 11, and a plurality of limiting and guide pins having notches, of a plurality of connected pins 20 engaging respectively the notches of the guide-pins, whereby the pins 20 can be simultaneously inserted or removed.

7. The combination of a frame, plate 11, pins 15 movable in holes in said frame and having notches, connected pins 20, said frame having holes for pins 20, and a depression in the outside of the frame adapted to receive the part connecting pins 20, one side of the notch being inclined as set forth.

8. A number-wheel having a segment removed therefrom, a section 27 having one or more numbers thereon, one being a cipher, section 27 having a pivot extension 28, and the body of the wheel having a fixed socket 29 in which the extension can turn to lower or to raise the cipher.

9. A number-wheel having a segment removed therefrom, a section 27 having one or more numbers thereon, one being a cipher, section 27 having a pivot extension 28, and the body of the wheel having a socket 29 in which the extension can turn to lower or to

raise the cipher, section 27 having a hooked end 32, in combination with an axis having an undercut longitudinal groove for controlling the drop-cipher.

5 10. A rigid permanent number-wheel having a plurality of parts, and a connection between them consisting of a projection from one part fitting a fixed socket in the adjoining part, said projection being sufficiently
10 large as to require great force to enter it in the socket, and the socket surrounding the larger part of the projection so as to maintain its hold thereon.

11. The combination with a typographic
15 numbering-machine adapted to be used in a form with type, of a hand-numbering-machine frame, means for detachably securing said typographic machine therein, and means for
20 operating the same manually, whereby the same head can be used either as a typographic machine or as a hand-machine.

12. In a number-wheel the combination of a wheel-body with a segment removed, a pivoted drop-cipher section having a plurality of
25 characters thereon, one of which is the cipher, the cipher-section being within the space left by said removed segment and having a pivot extension bearing in a fixed pivot-socket in the wheel-body.

30 13. The combination of a typographic numbering-machine having suitable number-wheels, a handle, a hand-machine frame supporting the handle, a plate attached to the handle, means for detachably securing the
35 typographic machine to said plate, and means for turning said number-wheels of the typographic machine operated by movement of said handle, whereby the same printing-head can be used as a typographic machine or as
40 a hand-machine.

14. The combination with the frame and head of a numbering-machine, of a printing-plate having a printing-opening therein, one end of the plate bent upward at 51, the other
45 end of said plate having a spring extension, an adjustable gage thereon, and a base-plate to one end of which the outer end of said extension is secured, there being space between the printing-plate and the base-plate to receive the card or ticket to be printed on.
50

15. The combination with the frame and head of a numbering-machine, of a printing-plate having a printing-opening therein, one end of the plate bent upward at 51, the other
55 end of the plate having a spring extension, an adjustable gage thereon, and a base-plate to one end of which the outer end of said extension is secured, there being space between the printing-plate and the base-plate, the base-plate having a yielding pad below the opening in the printing-plate.
60

16. The combination with the frame and head of a numbering-machine, of a printing-plate having a printing-opening therein, one
65 end of the plate being bent upward at 51, the other end of the plate having a spring extension, an adjustable gage thereon, and a base-

plate to one end of which the outer end of said extension is secured, the other end of the base-plate extending beyond the printing-plate and having a downward bevel and a tapering end to facilitate introduction of cards.
70

17. The combination with the frame and head of a numbering-machine, of a printing-plate with a spring extension narrower than the printing-plate, a base-plate below the printing-plate and having connection with the spring extension at the end remote from the printing-plate, and a gage on the spring extension.
75 80

18. The combination with the numbering-machine grooved frame, a printing-plate, a printing-head, an ink-pad and holder, levers operated by movement of the head for moving the ink-pad and holder, standards projecting from an edge of each vertical leg of said frame and forming a pivot-support for the ink-pad holder.
85

19. The combination of a numbering-machine U-shaped steel frame grooved throughout its length and of uniform transverse cross-section throughout its length, a printing-plate, a printing-head, and ink-pad and pad-holder, levers operated by movement of the head for moving the ink-pad and holder, standards projecting from an edge of each vertical leg of said frame and forming a pivot-support for the ink-pad holder.
90 95

20. The combination with the grooved frame of a numbering-machine, of a printing-plate extending a little beyond the frame and having an upwardly-bent edge, a numbering-head, an ink-pad holder, a pivot for said holder, levers for operating the holder, and horizontal standards projecting from the grooved frame and supporting the pivot above the projection of the printing-plate.
100 105

21. The combination with a numbering-machine frame, a printing-plate, an extension thereof, a base-plate near to the extension and connected thereto only at the end remote from the frame, the extension and the base being adapted to be grasped by the hand as a handle.
110 115

22. The combination of a numbering-machine frame, a plate 11 extending across the machine at right angles to its axis, said plate having an extending arm with rack-teeth, an arm with gear-teeth meshing with the rack, a plurality of guide-pins for plate 11 near opposite ends thereof, and a single spring serving to raise said plate.
120

23. A number-wheel having a cut-away segment from its periphery to the axis-opening, a cylindrical pivot-opening, a drop-cipher segment having a pivot extension with bearing in the pivot-opening, means for normally limiting the outward swing of the drop-cipher segment, said means being removable to allow a further swing, the pivot extension being cut away so as to be released from its bearing by such further swing.
125 130

24. A number-wheel having a cut-away seg-

ment extending to the shaft-opening, a removable drop-cipher section pivotally supported within the space left by the cut-away segment, in combination with a ratchet-wheel
 5 connected to the number-wheel, a segment of the ratchet-wheel being separate from the rest of the wheel and secured to the drop-cipher section so as to be removable therewith.

25. A number-wheel having a cut-away segment extending to the shaft-opening, a removable drop-cipher section pivotally supported within the space left by the cut-away segment, a stop limiting the normal movement of the drop-cipher section and when removed
 15 allowing further outward movement of the drop-cipher section, the pivot of the drop-cipher section being cut away within its bearing, whereby after said further movement the drop-cipher section can be raised out of its
 20 position within the cut-away segment.

26. A number-wheel having a cut-away segment extending to the shaft-opening, a removable drop-cipher section pivotally supported within the space left by the cut-away segment, a stop limiting the normal movement
 25 of the drop-cipher section, and when removed allowing further outward movement of the drop-cipher section, the pivot of the drop-ci-

pher section being cut away within its bearing, whereby after said further movement the
 30 drop-cipher section can be raised out of its position within the cut-away segment, in combination with a ratchet-wheel connected to the number-wheel, a segment of the ratchet-wheel being separate from the rest of the
 35 wheel, and secured to the drop-cipher section so as to be removable therewith.

27. In an automatic typographic numbering-machine adapted to be set up with type in a form, the combination of frame 1 with
 40 smooth holes 25 therein, a non-rotary axis supported by said frame, number-wheels on the axis, and loose wheel - protecting side plates 23 having projecting pins 24 fixed to
 45 said plates and adapted to easily enter and move from said holes while remaining fixed rigidly to the plates, whereby said plates when
 not surrounded by type matter are easily removed.

In testimony whereof I affix my signature
 50 in presence of two witnesses.

EDWIN G. BATES.

Witnesses:

CHARLES M. CATLIN,
 G. W. BALLOCH.