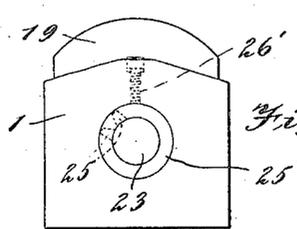
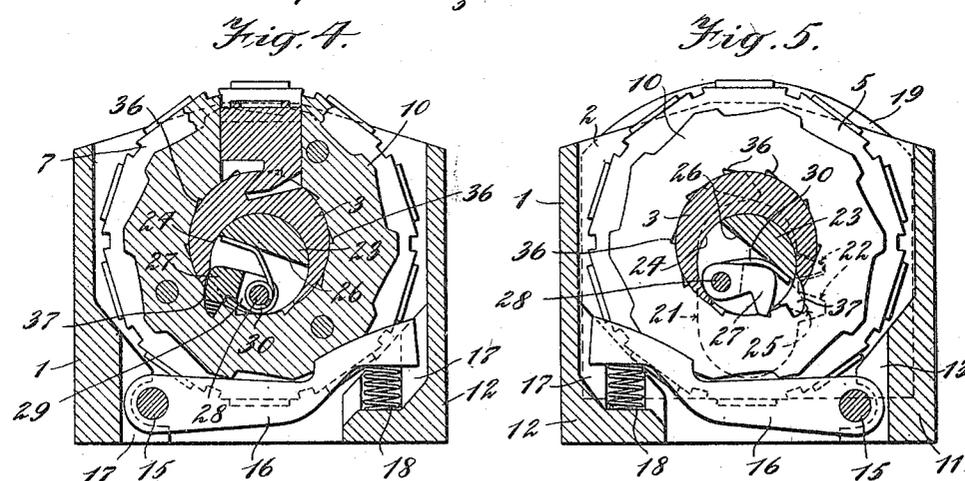
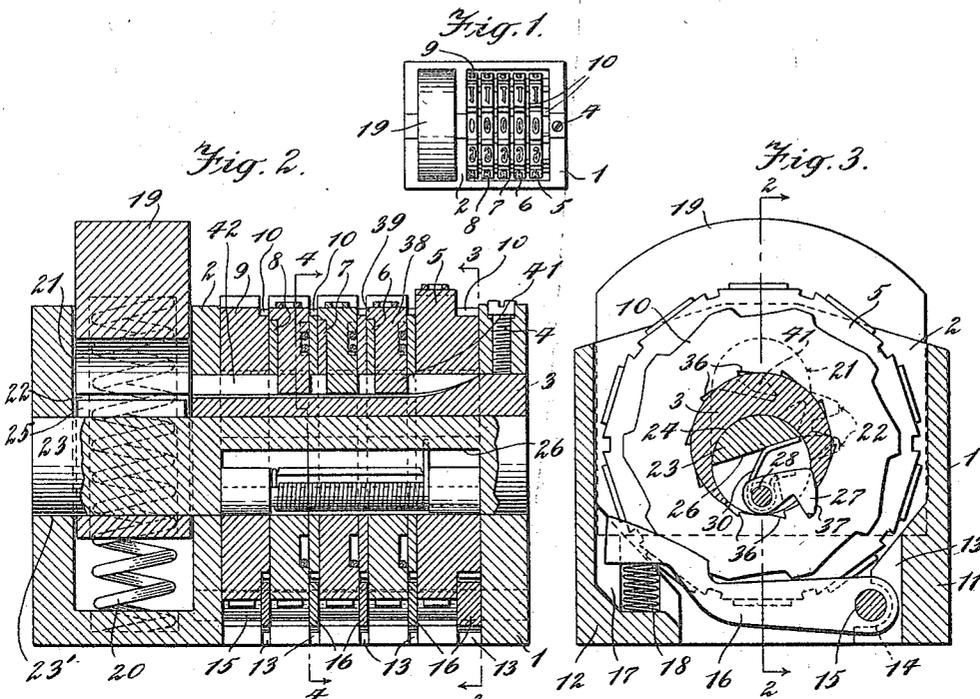


W. OLSON.
 NUMBERING HEAD.
 APPLICATION FILED SEPT. 1, 1914.

1,202,414.

Patented Oct. 24, 1916.

2 SHEETS—SHEET 1.



Witnesses:
Geol. Cheney
Henry Bradley

Fig. 12. Inventor
William Olson

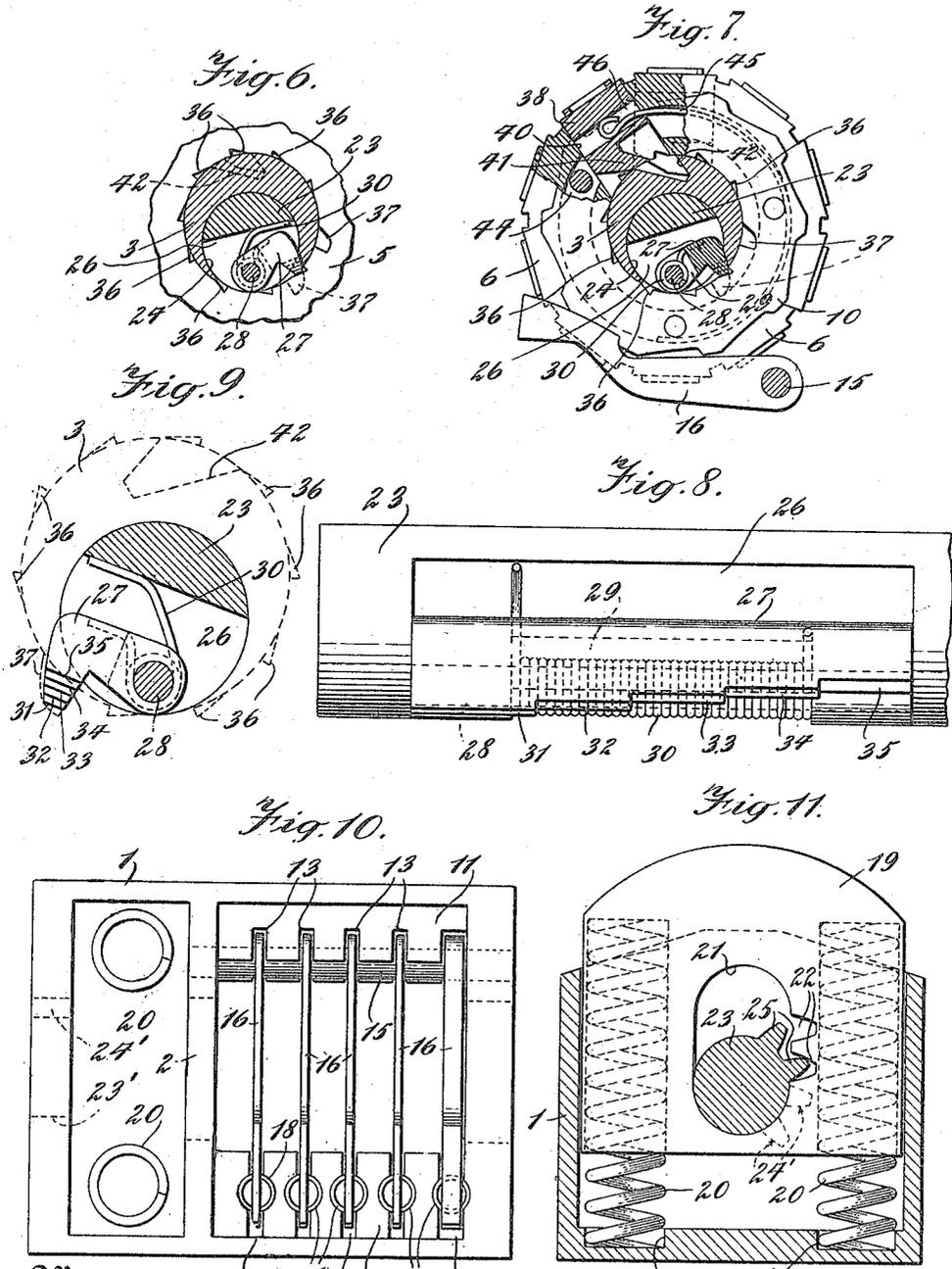
By his Attorneys
Rosenbaum, Stockbridge & Bond

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2 SHEETS—SHEET 2.



Witnesses:
John A. Johnson
Henry M. Moulton

Inventor
William Olson

By his Attorneys
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UNITED STATES PATENT OFFICE.

WILLIAM OLSON, OF NEW YORK, N. Y.

NUMBERING-HEAD.

1,202,414.

Specification of Letters Patent.

Patented Oct. 24, 1916.

Application filed September 1, 1914. Serial No. 859,611.

To all whom it may concern:

Be it known that I, WILLIAM OLSON, a citizen of the United States, residing at the city of New York, in the borough of Bronx and State of New York, have invented certain new and useful Improvements in Numbering-Heads, of which the following is a full, clear, and exact description.

This invention relates to a numbering head or machine and has special application to devices of this character which are adapted to be inset in a type form; the numbering disks carry printing characters on their peripheries and are actuated progressively each time the type form is brought into contact with the platen, to thereby successively number the sheets, tickets or other matter, as they are printed.

Devices operating on this general principle have heretofore been used, and it is the object of the present invention to improve the structural features to provide a device which is of an extremely simple and compact construction, positive in operation, and in which the actuating mechanism is entirely inclosed so that there is practically little, if any, danger of it becoming clogged or otherwise getting out of order.

With these objects in view, one of the important features of the invention resides in the provision of an internal pawl which is arranged within the supporting shaft upon which the numbering disks are freely mounted, which pawl is adapted to engage with notches in the inner peripheries of the disks to progressively actuate them when an oscillatory movement is imparted to the pawl.

Another important feature of the invention relates to the construction of the casing which is provided with two separate compartments in one of which the driving member is positioned, while the disks are accurately and snugly fitted into the other, so that any lateral movement of the disks is prevented.

Other important features of the invention reside in the specific construction of the radially movable type block which carries one of the printing characters; and the particular form of driving mechanism shown which is entirely positive in its operation, consisting of a reciprocatory block carrying a rack which is adapted to engage a mutilated pinion upon a shaft which carries the pawl for progressively moving the numbering disks.

Still other features of the invention will be apparent to those skilled in the art, from the detailed description hereinafter to follow, and will be particularly pointed out in the appended claims.

In the drawings: Figure 1 shows a plan of a numbering head embodying the features of the present invention; Fig. 2 is an enlarged sectional view of the head, taken on the line 2-2 of Fig. 3; Fig. 3 is a transverse section of Fig. 2, taken on the line 3-3 of Fig. 2; Fig. 4 is a transverse section taken on the line 4-4 of Fig. 2; Fig. 5 is a view similar to Fig. 3, showing the pawl in the position it assumes when the reciprocatory block or driving member is in contact with the platen; Fig. 6 is a detail view of Fig. 5, showing the pawl in the position it assumes when the driving member is released; Fig. 7 is a detail view of the second numbering disk from the right, as shown in Fig. 2; Fig. 8 is a detail view of the pawl; Fig. 9 is a transverse section of Fig. 8, showing the inner peripheries of the numbering disks in dotted lines; Fig. 10 is a plan of the casing with all of the parts removed, except the retaining pawls; Fig. 11 is a detail showing the driving mechanism for the shaft, which carries the actuating pawl; and Fig. 12 is a detail view of a modified means for holding the actuating shaft in place.

The numbering disks and driving mechanism are mounted in a substantially box-like casing 1, open at the top, which is of a suitable size to be inset in the type form, the casing being shown in substantially its actual size in Fig. 1. This casing is divided by a vertical transverse partition 2 into two separate rectangularly-shaped compartments. Circular apertures are provided in the end wall of the larger of these compartments and in the partition 2 constituting bearings for a stationary shaft 3, which extends the length of the larger compartment only. The stationary shaft is held in the exact position in which it is shown in Fig. 4, by means of a set screw 4, the shaft being preferably spotted or countersunk at the point on which the end of the set screw bears to prevent its inadvertent rotation.

Freely mounted upon the shaft 3 are a plurality of numbering disks, each carrying the raised characters from zero to 9 on its periphery. In the specific embodiment of the numbering head illustrated, five such

numbering disks have been shown, which are designated 5, 6, 7, 8 and 9, the numbering disk 5 being the digit wheel, disk 6 the tens, disk 7 the hundreds, and so on. Positioned adjacent one face of each of these disks is a ratchet wheel 10 which is preferably separate from the disk and is riveted or otherwise secured thereto, the disks and ratchet wheels being accurately machined so that when they are assembled in place in the larger compartment, they will entirely fill the space between the partition and the end wall of the casing which will prevent any inadvertent lateral movement of the disks along their supporting shaft. The middle or the bottom of the larger compartment is preferably cut away, while the interior lower corners of this compartment are filled with triangular shaped blocks 11 and 12 preferably integral with the casing. The block 11 has a plurality of vertically disposed slots 13 therein corresponding to the number of the numbering disks used, which slots are positioned directly beneath the respective ratchet wheels 10 carried by these disks. A longitudinal semi-circular recess 14 is provided in the block 11, into which is fitted a stationary shaft 15, supported at its ends in the end walls of the compartment. This shaft carries a plurality of pawls 16, the ends of which extend out beyond their pivotal point and are positioned in the slots 13. An equal number of slots 17 are arranged in the triangular block 12, which are arranged in transverse alinement to the slots 13 and are adapted to receive the free ends of the pawls 16, whereby the pawls are prevented from any lateral movement or from any tendency to tilt along their longitudinal axes and are always maintained in a position to engage the teeth of the corresponding ratchet wheels in a direction normal to their contacting surfaces. Cylindrical recesses are provided in the block 12, which recesses cut the slots 17 and form chambers into which are inserted coiled springs 18, the end of the pawls 16 resting upon these springs, which, by their tension hold the pawls in engagement with the ratchet wheels 10. As will be clear from Fig. 2, the ratchet wheel and pawl cooperating with the numbering disk 5 carrying the digits are preferably made heavier than the others, since this disk is actuated most frequently, and will occasion a greater wear upon these parts.

Positioned in the smaller of the two compartments in the casing is a reciprocatory block or driving member 19, which is substantially rectangular in shape, but has its upper surface curved, which surface is adapted to be engaged by the platen as the numbering head, together with the type form, is brought into contact therewith. If desired, printing characters may also be placed upon this surface, as for example, the

characters No. —. This block is normally maintained in extended position by two helically coiled springs 20 (see Fig. 10), which fit for the major portion of their length into cylindrical chambers in the block which prevents any lateral distortion of the spring. Cylindrical recesses 20' are also provided in the bottom of the compartment in which the ends of the springs rest for the same purpose.

Centrally disposed in the block 19 is an elongated slot 21, the ends of which are preferably semi-circular, as will be later referred to. In one side wall of this slot are formed a plurality of notches 22, forming a rack having a single tooth. An oscillatory shaft 23 extends the entire length of the casing and is mounted for a portion of its length in a cylindrically-formed recess 24 in the stationary shaft 3, while its other end is supported in a suitable bearing 23' formed in the end walls of the smaller compartment. The recess 24 is eccentric to the axis of the stationary shaft 3 and its periphery cuts the outer periphery of the stationary shaft to provide a longitudinal opening, through which the pawl carried by the shaft engages with the inner periphery of the numbering disks as will be later referred to.

The shaft 23 is provided with teeth 25 adjacent one end thereof forming a mutilated pinion, adapted to engage the notches 22 so that the reciprocatory movement of the block is changed into oscillatory movement of this shaft, the semi-circular wall at the lower end of the elongated slot 21 forming a stop to limit the movement of the block in its upward direction. The teeth 25 of the mutilated pinion are of a length sufficient to fit snugly against the side walls of the smaller compartment and will, for this reason, prevent any lateral movement of the shaft. The bearing 23' in the end of the casing adjacent the smaller compartment is provided with notches 24' of a shape and size to permit the teeth of the mutilated pinion to pass through the same, so that the shaft may be correctly positioned within the casing, these notches being so arranged that they will permit the teeth 25 to be passed laterally into the notches 22, when the block 19 is in the position it assumes when the driving member is in contact with the platen. Instead of forming notches 24' in the bearing or opening 23', this opening may be made of sufficient diameter to permit the teeth 25 to freely pass therethrough. A collar 25' is then fitted on the end of the shaft which is of the same thickness as the casing walls and it is held in place in the opening 23' by a set screw 26' passing down through the casing wall. This modified construction is shown in Fig. 12 and permits a more rapidly assembling of the parts as it is then not necessary to bring the notches

in the rack carried by the driving member into alinement with the notches in the casing.

A segmental-shaped recess 26 is cut in the shaft 23 opposite the numbering disks, which recess is of sufficient depth to receive an actuating pawl 27, which is suitably pivoted in the recess upon a pin 28. The pawl 27 is freely mounted upon this pin and has a portion of its surface intermediate its ends and surrounding the pin cut away as at 29, to provide a recess in which a coiled spring 30, which is mounted on the pin 28 is adapted to fit. One end of this spring engages the shaft, while the other end engages the pawl in such a manner as to rotate the pawl in a counter-clockwise direction, as shown in Fig. 3. The pawl 27 consists of an L-shaped bar of sufficient length to snugly fit between the side walls of the recess 26, so that the pawl will have no lateral movement relative to the shaft 23. The outstanding leg of the pawl has formed thereon stepped teeth which have been designated 31, 32, 33, 34 and 35, five teeth being provided of a width to correspond to the five numbering disks, the teeth being of varying lengths, with the tooth 31 which engages with the disk 5 the longest and the other teeth gradually decreasing in length as they approach the other end of the pawl.

Cut in the inner periphery of each of the numbering disks 5 to 9, inclusive, are a plurality of equally spaced notches or ratchet teeth, which are ten in number, corresponding to the characters from 0 to 9, which are formed on the periphery of each of the disks. Nine of the notches in each disk, which have been designated 36, are of uniform depth, while one deep notch 37 is provided on each of the disks with the exception of the disk 9 which need not have such a notch, but the same may be provided if it is desired to make all of the wheels uniform, since it will not prevent the progressive actuation of the disks. The notches 37 in each of the wheels are of uniform depth.

Inset in each of the disks 6, 7 and 8 is a radially movable type block which is adapted to be retracted to a non-printing position, the block in the disk 6 being designated 38, which will alone be described, the other being identical in construction. This block is substantially rectangular in shape and is set in a similarly shaped recess in the disk, the ratchet wheel 10 which is secured to one of the end faces of the disk holding it against lateral displacement. The head of the block is preferably enlarged providing a shoulder 39 which slides in a slot 40 on the face of the disk. This head carries the raised character zero. Depending from the inner end of the block is an angularly-disposed shoulder 41, which is adapted to abut against the side wall of an angularly-dis-

posed V-shaped recess or groove 42 cut in the top peripheral surface of the stationary shaft 3, as will be clear from Fig. 7, which will lock the movable type block in its retracted position while the numbering disk remains in its initial position. An arcuately shaped groove 44 is cut in the face of the numbering disk 6, in which recess is placed a similarly shaped spring 45, which is held in place in the groove by the ratchet wheel 10. One end of this is adapted to rest in a transverse groove 46 cut in the type block. This spring is so arranged, that it will tend to throw the movable type block into printing position, or to a position where its raised character is in circumferential alinement with the other characters on the numbering disk. The spring also serves as a stop to limit the outward movement of the type block when it reaches this position, since the walls of the groove in the disk and block will both abut against the spring. When the numbering disk is rotated in a counter-clockwise direction (see Fig. 7) the angularly-disposed shoulder will be carried out of locking engagement with the upper wall of the groove 42 and the shoulder 41 will then coast with the other wall of the groove, to aid the spring in throwing the type block to its outer position.

The operation of the numbering head is as follows: Referring first to Figs. 2, 3 and 4, in which the parts are shown in their initial position, the raised characters at the top of each of the wheels is zero, and it may be here stated that the zero space on the numbering disk 9 is left blank and cut away so to be below the plane of the other zero characters, since it is never necessary to print zero with this disk. The radially movable type blocks which carry the zeros for the intermediate wheels, are, when the parts are assembled, arranged so that they will be in their retracted position in which they are locked by the shoulder 41, as has been described. It will also be seen from Figs. 3 and 4, that in the initial position of the numbering head each of the deep notches in the wheels 5 to 8 inclusive, are in alinement and so arranged that the teeth 31 to 35 inclusive, of the pawl 27, lie in the same, the tooth 35 engaging a notch 36 in the periphery of the numbering disk 9. If the numbering head is then brought into engagement with the platen, the zero on the digit wheel will alone print. The block 19 is also caused to move downwardly from the position shown in Fig. 3, to the position shown in Fig. 5, and through the rack and pinion connection, the shaft 23 will be rotated a partial revolution in a clockwise direction, as viewed in Fig. 3, the teeth of the pawl slipping out of the deep notches 37 in each of the disks and being carried a sufficient distance to permit the tooth 31 to en-

gauge a notch 36 in the digit wheel 5. During this rotation of the shaft the numbering disks are prevented from being carried therewith, by the pawls 16 which are in engagement with the teeth in the ratchet wheels 10, each of the pawls being held in correct position by the springs 18 and the slots in the casing, as has been described. When the pawl has reached the position shown in Fig. 5, it will be seen that since the tooth 31 is in engagement with one of the notches 36 in the digit wheel 5, the teeth 32, 33, 34 and 35 which are of less length, are not in a position to engage the notches 36 in the other numbering disks. As the bed of the press moves away from the platen the block 19 is returned to its original position by the springs 20, which will again rotate the pawl in the opposite direction to its normal position, or to the position of the pawl shown in Fig. 6. The tooth 31 which is in engagement with the notch 36 in the digit wheel 5 will therefore carry this wheel one step forwardly to bring the raised character "1" at the top of the periphery of the digit wheel so that upon a second movement of the bed, the character 1 will be printed instead of zero. The actuation of the numbering head for the next eight oscillations of the pawl will be the same, the characters 2 to 9 inclusive, being brought to printing position by a step-by-step movement of the disk 5. Upon the next oscillation of the shaft and pawl the deep notch 37 in the digit wheel will be in a position to be engaged by the pawl when the block is moved downwardly, or in other words, the deep notch in the digit wheel will be in a position to be engaged by the pawl when in the position shown in Fig. 5. This will permit the second tooth 32 to engage one of the uniformly cut notches 36 in the numbering disk 6, which carries the tens characters, so that when the reciprocating block resumes its position under the influence under the springs 20, both wheels 5 and 6 will be rotated, bringing the character 1 on the tens wheel and the character zero on the digit wheel in a position to print. The rotation of the numbering disk 6 in a counter-clockwise direction, as viewed in Fig. 7, will, as has been described, throw the angularly-disposed shoulder 41 out of locking engagement with the walls on the groove 42 in the stationary shaft, and the spring 45 will then force this block radially outwardly until the character carried thereby is brought into a printing position. As has been described, the angularly-disposed shoulder coacting with the other wall of the groove will serve as a cam to throw this type block outwardly. On the eleventh oscillation of the pawl the digit disk will again alone be actuated, since the deep notch in the digit wheel has been moved one step from the position in which the deep notch can be engaged by the tooth 31. Operation will then be continued, the digit wheel completing a second revolution by a step-by-step movement until the deep notch 37 is again brought into a position to be engaged by the tooth 31, which will permit a second step-by-step movement of the disk 6 to bring the character 2 into printing position. The operation for the hundreds disk 7, thousands disk 8, and tens of thousands disk 9, is similar, the hundreds disk 7 being actuated after the numbering disk 6 has made a complete revolution, and the deep notch therein has been brought into alinement with the deep notch in the disk 5, which will permit the tooth 33 to engage a notch 36 on the periphery of the disk 7. The operation of the remaining wheels is similar and need not further be described.

While I have shown a numbering head which is especially adapted for use in printing presses, it is not my intention to limit the invention to this particular use, as it is obvious that the important features of the invention; the internal pawl and its associated parts, the construction of the casing and pawls mounted therein are capable of being used with any form of numbering head and machine which it is desired to progressively actuate a plurality of numbering disks.

I claim:—

1. In a numbering machine, a casing open at the top and divided into separate compartments, a plurality of numbering disks mounted for independent rotation in one of said compartments and completely filling the same, a driving block snugly fitted into the other of said compartments, a shaft passing through both said blocks and disks, means associated with said driving block and shaft for oscillating the latter and means including a part mounted on said shaft engaging the interior of said disks for progressively actuating them.
2. In a numbering machine, a box-like casing open at the top and divided into separate compartments, a plurality of numbering disks mounted for independent rotation in one of said compartments and completely filling the same, a reciprocating block in the other of said compartments having its upper end extending above said casing, when in extended position, means for normally urging said block to said position, a shaft passing through both said blocks and disks and means including parts mounted on said shaft cooperating with said block and the interior of said disks, respectively, to progressively actuate said disks, when said block is reciprocated.
3. In a numbering machine, a casing, a plurality of numbering disks therein, a stationary shaft upon which said disks are freely mounted, said shaft having an eccen-

trically disposed recess therein cutting its peripheral surface, a second shaft eccentric to the first named shaft and positioned in the recess in said first named shaft and a stepped pawl carried in a recess in said second named shaft engaging the inner peripheries of said disks to progressively actuate them.

4. In a numbering machine, a plurality of disks, a stationary shaft upon which said disks are freely mounted, ratchet wheels and pawls for preventing movement of said disks in one direction, said shaft having an eccentrically disposed recess therein cutting its peripheral surface, a second shaft eccentric to said first named shaft and positioned in the recess therein, said second named shaft having a recess therein, a stepped pawl mounted in said recess, a plurality of notches in the inner periphery of each of said disks,

said pawl engaging said notches to progressively actuate said disk upon an oscillatory movement imparted to said shaft and means for oscillating said shaft.

5. In a numbering machine, a casing, a plurality of numbering disks, a stationary shaft upon which said disks are freely mounted, said shaft having a recess therein cutting its peripheral surface, an oscillatory shaft in said recess, a stepped pawl in said recess connected to said second named shaft, said stepped pawl and connections to said second named shaft being positioned entirely within said recess.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

WILLIAM OLSON.

Witnesses:

GEO. C. CHENEY,
HENRY MOUPLEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."