

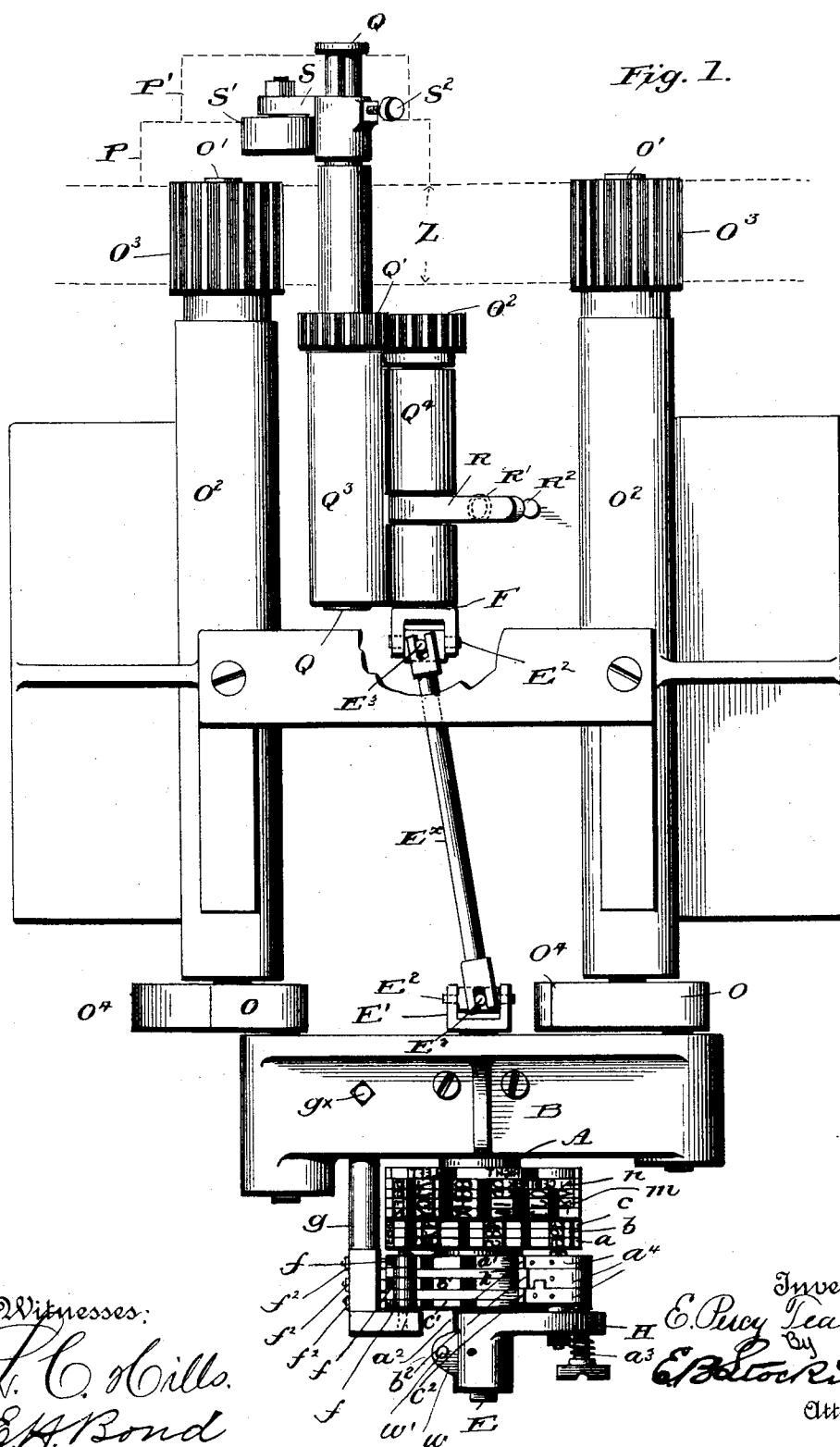
(No Model.)

4 Sheets—Sheet 1.

E. P. TEAL.
NUMBERING MACHINE.

No. 536,448.

Patented Mar. 26, 1895.



Witnesses:
L. C. Hills.
E. A. Bond

Inventor:
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By
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Attorney

(No Model.)

4 Sheets—Sheet 2.

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Fig. 1.^a

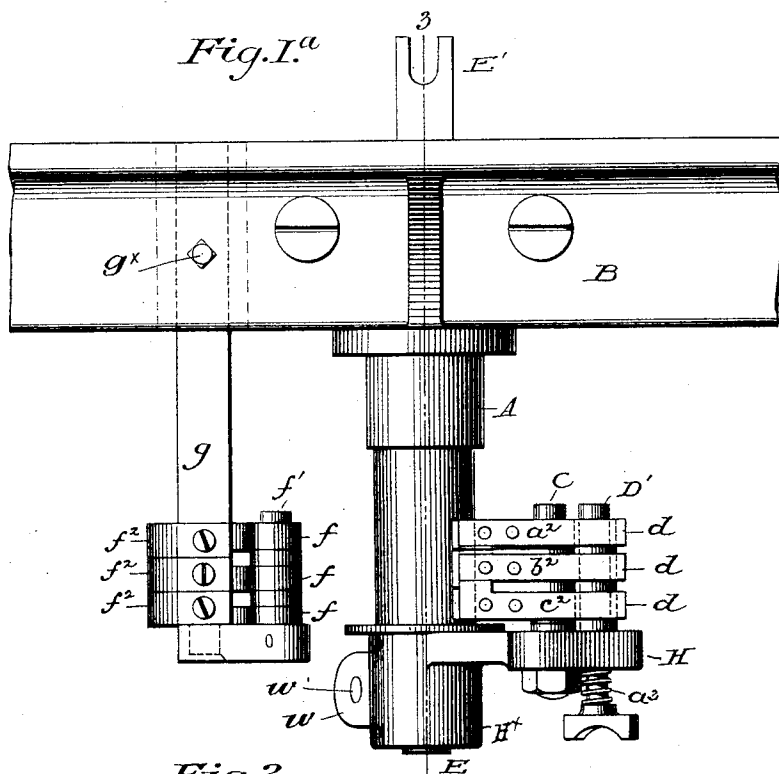
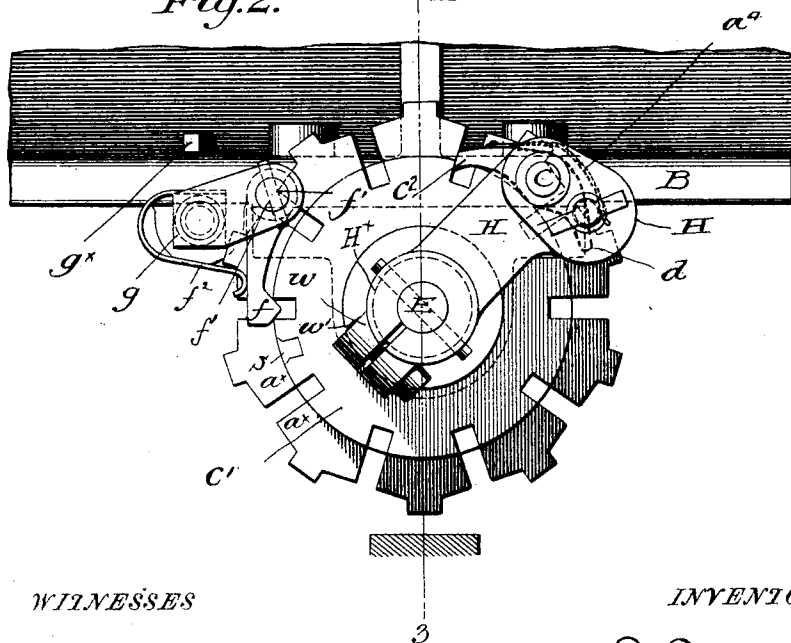


Fig. 2.



WITNESSES

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4 Sheets—Sheet 3.

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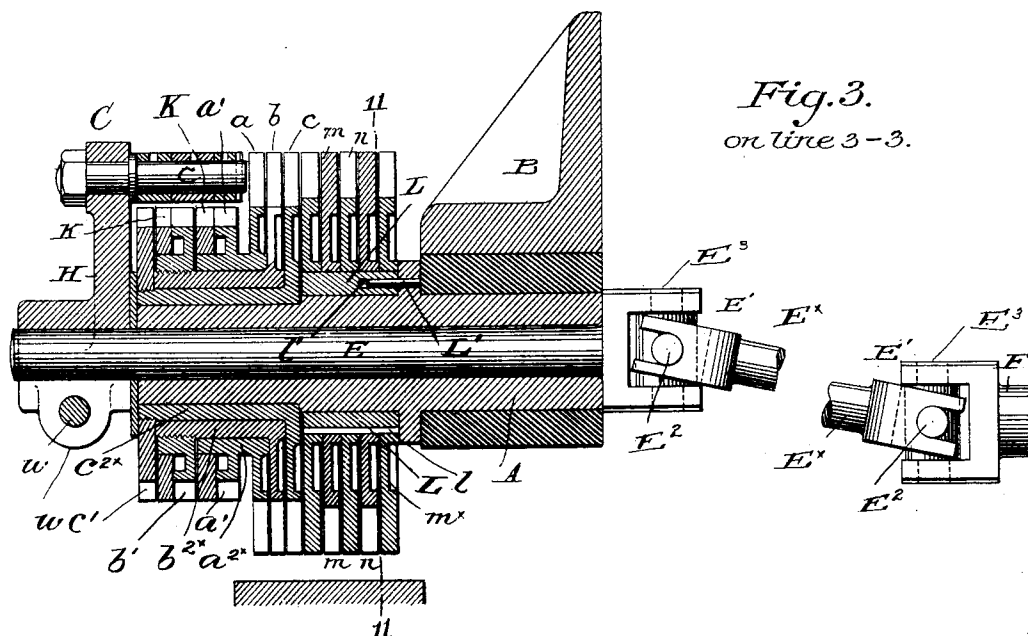


Fig. 4.

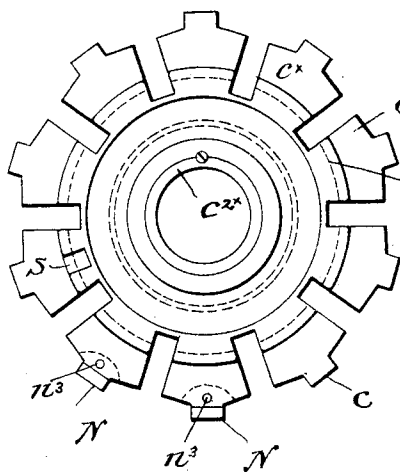


Fig. 5.

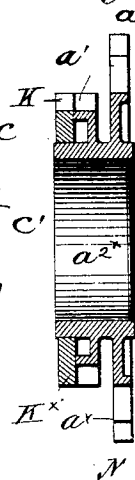


Fig. 6.

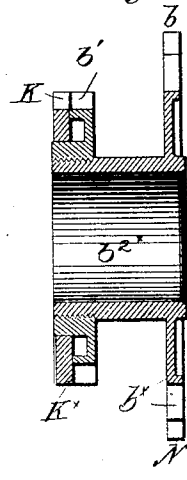
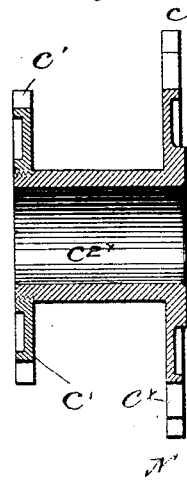


Fig. 7.



WITNESSES

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(No Model.)

4 Sheets—Sheet 4.

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Fig. 8.

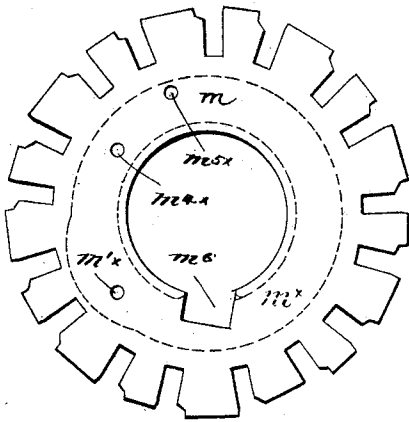


Fig. 9.

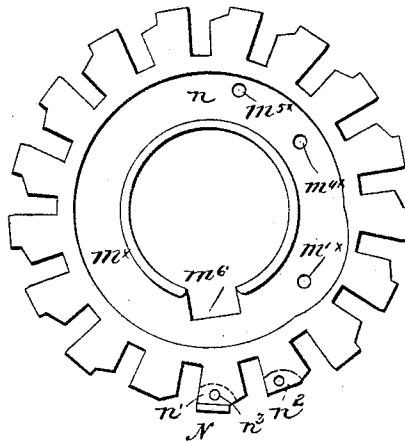


Fig. 10.

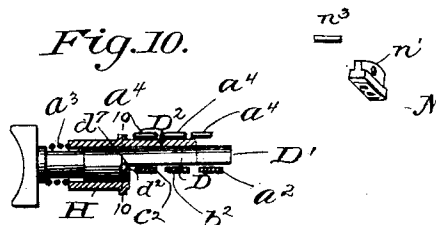


Fig 10.^a

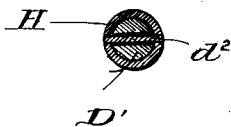
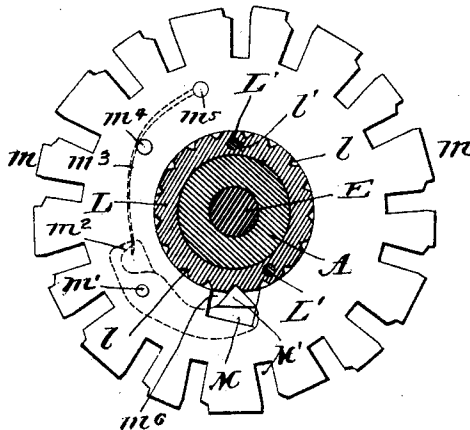


Fig. 11.

on line n-n.



WITNESSES

Raymond B. Bancroft.
V Coombe

INVENTOR

E. Percy Teal

UNITED STATES PATENT OFFICE.

EDWIN PERCY TEAL, OF UPPER DARBY, ASSIGNOR TO THE GLOBE TICKET COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

NUMBERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 536,448, dated March 26, 1895.

Application filed December 12, 1893. Serial No. 493,502. (No model.)

To all whom it may concern:

Be it known that I, EDWIN PERCY TEAL, a citizen of the United States, residing at Upper Darby township, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Numbering-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to numbering machines of that class in which a series of disks is operated to print upon material passed beneath, and is capable of producing consecutively printed or stamped impressions from 0 to 99 with two disks, to 999 with three disks, 9,999 with four and so on; or alternately, 0, 2, 4, 6, &c., or 1, 3, 5, 7, &c., as required, starting and stopping at any predetermined numbers. A previous practice in this class of machines has been, to utilize the movement which produces the impression to change from one number to another. This method of changing the disks limits the speed at which the machine may be operated. In order to overcome this objection and others arising from such form of construction, I have devised the mechanism shown in the accompanying drawings.

The invention consists in providing means for changing the numbers or characters to be impressed by the head which means operate independent of the motion of the head required to make an impression.

The invention also consists in providing means for releasing or throwing out of action the pawls controlling the motion of the type wheels.

It also consists in the combination of parts and details of construction illustrated in the accompanying drawings and set forth in the following description.

It will be understood that while I have shown and described what I deem to be the best method of carrying out my invention that many modifications of construction could be devised by any one skilled in the art which would be substantially similar to the construction shown, and therefore, could be broadly considered as coming within the scope of this invention.

Referring to the drawings: Figure 1 is a

plan of the head with the mechanism for giving it motion as a whole and of the independent mechanism for changing the disks of the head. Fig. 1^a, is a plan view of the head with the disks removed and showing the actuating and retaining pawls and the lifting device for throwing the actuating pawls out of operative contact with the disks. Fig. 2, is a front elevation with the disks in position. Fig. 3, is a sectional view on line 3, 3, of Figs. 1 and 2. Fig. 4, is an elevation of the hundreds disk. Figs. 5, 6 and 7 are respectively sections through the units, tens and hundreds disks. Figs. 8 and 9, are front and rear elevations of a usual form of disk in combination with which are shown inserted and detachable types. Fig. 10, is a detail of the device for lifting the changing pawls. Fig. 10^a is a cross section through the line 10 10 of Fig. 10. Fig. 11 is a section on the line 11—11 of Fig. 3.

In the drawings: A, represents a spindle fixed within a moving head B'. Upon the spindle A, are carried disks *a, b, c*, having the sleeved portions *a^{2x}, b^{2x} and c^{2x}* telescoped together and capable of frictional rotation independently of each other. Each of these disks carries upon projecting lugs, *a^x, b^x, and c^x*, Figs. 5, 6 and 7, ten type characters; one disk, as *a*, carrying figures representing units, disk *b*, representing tens, and disk *c* representing hundreds. Each of the disks carries on a sleeve projecting from the same, a ratchet disk *a' b' and c'* rigidly secured thereto, and adapted to be moved by a series of pawls *a², b², c²*, mounted upon a stud C, carried by an arm H, mounted upon an oscillating shaft E, carried within the spindle A, and having at one end a universal joint E', by means of which it is connected to a rotatable shaft F, mounted in fixed bearings and from which motion may be transmitted to the arm and ratchets. The pawls *a², b² and c²*, are held in contact with the ratchets by springs *a⁴*, and have rearwardly projecting ends *d*, by means of which they may be lifted from contact with the disks.

Mounted in the arm H, and projecting below the ends, is placed a key D', of cylindrical form, one half of which is cut away, and which is mounted to rotate in a tube D², within which it is locked by a pin *d²*, which engages

a notch d' in the said key as seen best in Fig. 10, the said key having a slight endwise movement and the key or locking pin being retained in its seat by the action of a spiral spring a^3 , surrounding the key between its head and the arm H. In order to lift the pawls and throw them out of contact, the key is given a half turn, which brings its cylindrical portion against the projecting ends of the pawls, and thereby lifts them from contact with the ratchets. The arm H is carried by the sleeve H^x which embraces the outer end of the shaft E and is provided with the ears w to receive the bolt w' by which it is clamped in position.

Projecting from the frame B, is a stud g , preferably square in cross section, and rounded at that portion which is held within the head B, so that it may be capable of revolution upon its axis in order to adjust the retaining pawls f , which are carried at its outer end upon a fixed pin f' , and held in contact with the ratchets a' , b' and c' of the disks a , b and c by means of curved springs f^2 . The stud is secured within the head B, by a pointed set screw, g^x by means of which the position of the retaining pawls in relation to the disks is maintained.

Referring to the units, tens and hundreds disks, it will be noted that as they rotate through the action of the pawls it will be necessary after the units disk has made ten steps to carry the motion from it to the tens, and similarly from the tens to the hundreds. For the purpose of effecting this movement, I provide a cylindrical surface K^x adjacent to each ratchet disk (except the last of the series) and having one notch K corresponding with zero. As the actuating mechanism moves the units disk step by step, this notch will be brought into line with the second pawl b^2 controlling the tens disk, which will thus be dropped into position to move the tens disk one step the pawl riding said cylindrical surface K^x until it reaches the notch K when it acts upon the adjacent ratchet. A similar action occurs when the tens disk has been rotated ten steps, thereby carrying the motion to the hundreds disk and so on.

Referring now to the disks carrying the independent characters indicated by m and n , it will be seen that these disks are carried upon the same sleeve, and adjacent to the numbering disks, said sleeve, being surrounded by a notched ring L having the notches l as seen best in Fig. 11 and upon which the disks rotate. The printing characters for these disks and for the numbering disks also, I prefer to make removable. The method of holding the types in position is clearly indicated in the drawings, N, N being removable sections consisting of a body upon which the characters are formed and tongues n' adapted to be inserted within grooves n^2 in the projections of the disk provided for the purpose, pins n^3 being passed through to secure the types in position. A notch S is provided in

each of the ratchet disks by means of which the respective number disks may be held in such a position that the numbers will have no contact with the working surface, thereby producing no impression.

For the purpose of repeating a given impression and facilitating the manual or initial adjustment of the disks, it is necessary only to turn the key which lifts the pawls out of contact with their respective ratchets. This will make the motion ineffective, thus repeating any given impression.

It now remains to describe a mechanism for giving the numbering head a motion to and from the printing or impression surface and the means for changing the disks of the numbering head so that it shall print numbers in succession or other desired series. The head B is in this instance mounted at each extremity on a rotating crank O mounted on a shaft O' carried in fixed bearings O^2 and provided with pinions O^3 which may be arranged to mesh with any suitable gearing of a printing press. This gear may be on the shaft of the impression cylinder of the press to which the numbering head is applied. This gear would be in the vertical plane embraced in the dotted lines z Fig. 1. Each of the crank arms O are in this instance provided with counterbalanced or weighted ends O^4 which serve to render the rotation of the head B smooth and even. As hereinafter suggested a motion of a different character may be given to the head B and the mechanism which it carries, the only essential being that the motion is employed to carry it to and from the impression cylinder in order to print thereon. When properly proportioned and timed the mechanism thus far described will cause the numbering and character heads to make impressions during the rotation of the impression cylinder in a continuous succession and with a frequency proportioned to the diameters of the pinions and the gear above mentioned. The shaft F is connected with the shaft E by a universal joint E' which consists in this instance of the well known gimbal joints E^2 , E^3 and one member of each is formed at each end of the connecting shaft E^x . The center of motion of this shaft where it connects with the shaft F is opposite the center of motion of the head B and its opposite end of that end connected with said head always travels on a circle which is the base of the cone described by the shaft E^x so that although shown as possible still it is not essential that there be a longitudinal movement of or along the line of the shaft E^x nor any provision for such a movement in the connection of said shaft with the shaft E or the shaft F.

On the side of the impression cylinder gear above mentioned there is provided a cam P, indicated by dotted lines in Fig. 1, for the purpose of operating a rock-shaft Q carrying a pinion Q' adapted to mesh with a pinion Q^2 fixed to the shaft F. The bearings for said shafts are shown at Q^3 and Q^4 respectively

and these are fixedly connected with the machine in any desired manner. The shaft F carries a rock arm R which is normally held by a spring R' in contact with the stud R² but which spring permits a partial rotation of the shaft F in a direction that will lift the rock-arm R away from the pin R², the functions of the spring being to retain the rock-arm and the parts operatively connected therewith to a normal position after being operated as about to be described.

On the shaft Q there is mounted a rock arm S carrying an anti-friction roller S'. This roller lies in the path of the cam P of which there may be any desired number on the cylinder gear, so that as each cam passes beneath the roller it is raised, the shaft Q is partially rotated and this motion is conveyed by the pinion Q' to the pinion Q² and by that to the shaft F to lift the rock-arm as described and to give motion to the ratchet operating pawls a^2 , b^2 and c^2 and thus change the disks of the numbering head to print numbers in successive series. When it is desired to print numbers in intermittent series, such as 1, 3, 5, &c., additional cams P' (see dotted lines Fig. 1) are provided which give twice the movement to the rock arm S as does the cam P therefore communicating through the parts described including the shaft E^x, twice the movement to the pawls a^2 , b^2 and c^2 . In this case the set screw S² in the head of the rock arm S is loosened and the said arm is moved outwardly on the shaft Q so as to bring the roller S' into the path of said cam P² where it is secured by the said set screw.

Referring now to Fig. 11 each of the character disks is provided with an annular space m^x (see Figs. 3 and 9 and dotted lines in Fig. 8) in which are arranged a detent and its spring. The detent M (Fig. 11) is offset so as to operate within opening m^6 and to come in contact with the grooves l of the ring or sleeve L which is held against rotation by the pins L' projecting through a relatively fixed part and into the ring as shown in Fig. 3. The detent is pivoted at m' on a pivot seated in the opening m'^x , Fig. 8. The detent has a recessed heel m^2 upon which bears a spring m^3 compressed against a pin m^4 seated in openings m^{4x} Fig. 8 and secured to a pin m^5 at its opposite end seated in the opening m^{5x} , Fig. 8. By this construction the character disks can be rotated upon the sleeve by hand and retained in an adjusted position by its detent.

It will be seen that by the construction adopted all of the operating parts are within reach of the attendant, that the disks are readily removable, that the working parts can be made larger than where the operating pawls are carried inside their disks and that the construction generally is simplified. The head, by which is meant the complete combination of the parts effecting the operation of number disks, (including the said disks) is usually

carried and has motion imparted to it, by a slide or arm having a reciprocating motion but the present invention is intended to be applied equally well to all other forms of motion. Again the motion from which the disks are operated or set automatically, is usually incidental to the primary motion producing the impression; but a peculiarity of the present invention consists in changing the number disks to print different numbers by a motion independent of, and it may be at a slower rate of speed than would be incidental to this primary action, it having been found by experience, that the latter connection limits the speed of accurate operation. By the use of universal joints or a flexible connection independent and intermittent motion will be imparted to the head from an independent shaft without distortion.

I have shown one form of mechanism for independently changing the number disks by a movement separate and independent from the printing movement of the head but I do not limit my invention to the particular mechanical connecting devices shown and described as it is apparent that other well known power conveying and motion giving mechanisms can be substituted therefor.

Having thus described my invention, what I claim is—

1. In a numbering machine, the combination of a spindle fixed within a moving head, disks telescopically arranged on said spindle, a shaft within said spindle, pawls supported upon said shaft and means connected with said shaft for actuating the pawls, substantially as specified.

2. In a numbering machine, the combination with the spindle and a shaft therein, of number and character disks on said spindle, pawls mounted to be operated by the movement of the shaft to engage the number disks, substantially as specified.

3. The combination with the spindle and shaft of the pawls, carried by said shaft and having rearwardly projecting ends, the springs acting upon said pawls and a locking pin mounted for rotation and having a portion thereof substantially semi-cylindrical in shape said locking pin being mounted for endwise movement and having a notch to engage a stop pin, substantially as specified.

4. In a numbering machine, the combination of a spindle fixed within a moving head, disks arranged on said spindle, a shaft within the spindle and pawls supported upon said shaft and constructed and arranged to be actuated by the movement thereof, substantially as specified.

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

EDWIN PERCY TEAL.

Witnesses:

EDW. E. FITLER,
GEORGE A. YUNGER.