(No Model.) 3 Sheets—Sheet 1.

J. PHILLIPS.

APPARATUS FOR THE CONSECUTIVE NUMBERING OF CHECKS, TICKETS, &c.

No. 410,673. **Patented Sept. 10, 1889.**

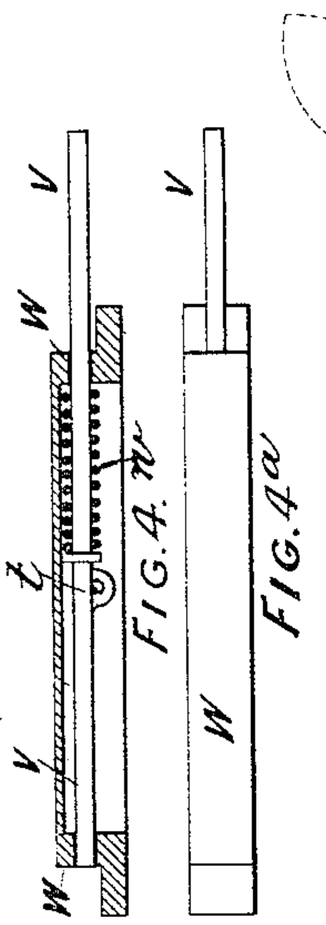


FIG. 4.

FIG. 4a

FIG. 1.

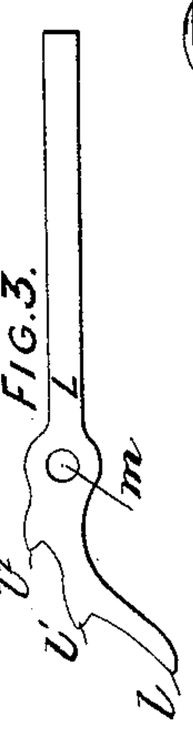


FIG. 3.

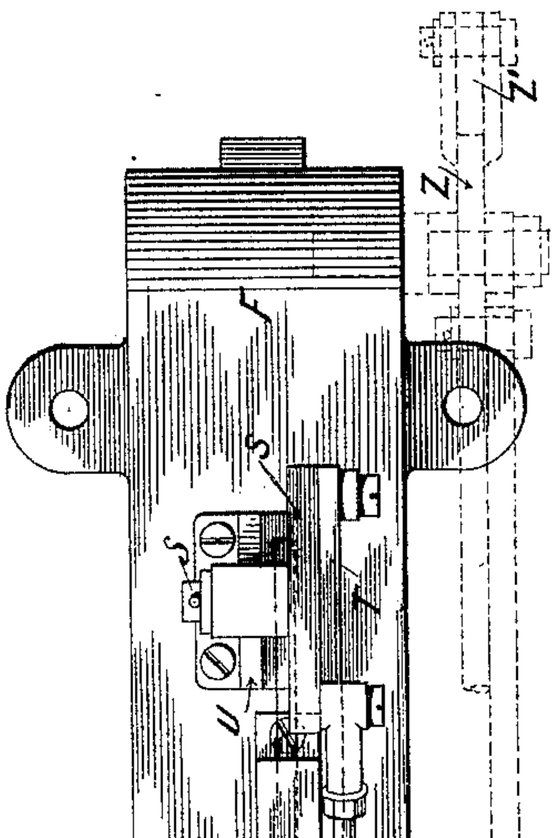
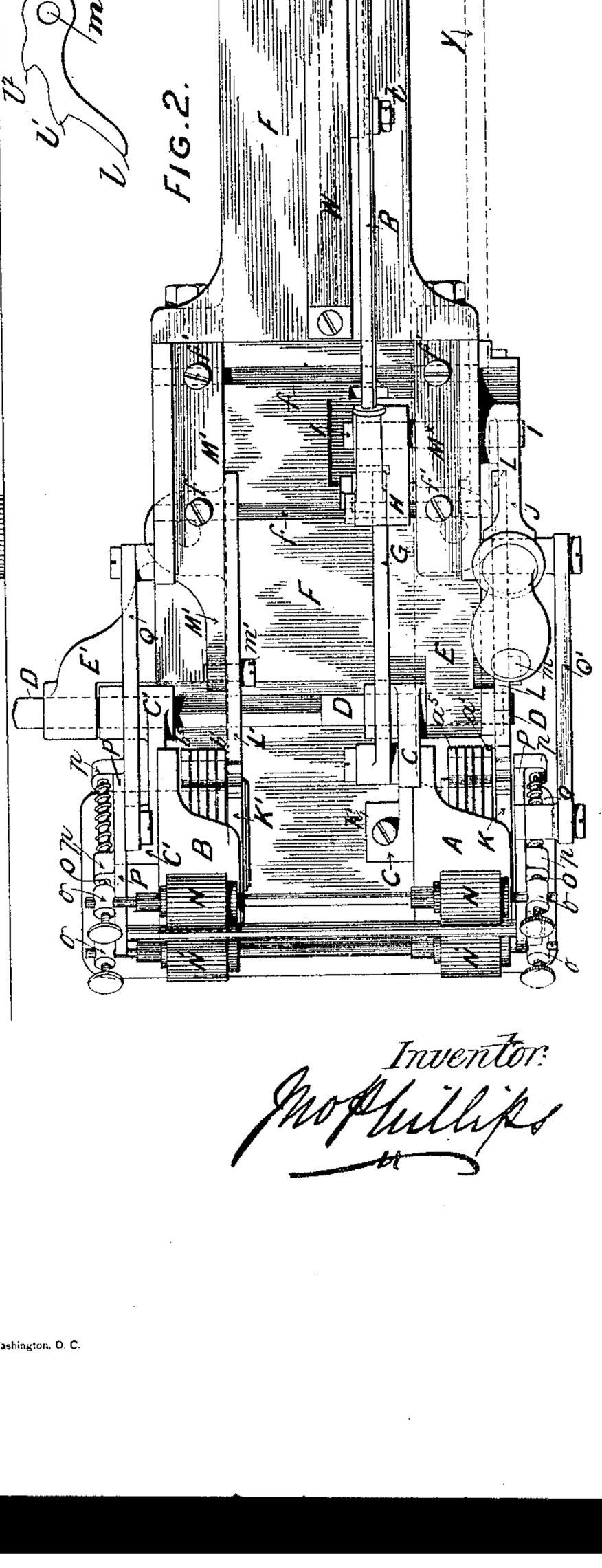


FIG. 2.



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(No Model.) 3 Sheets—Sheet 2.

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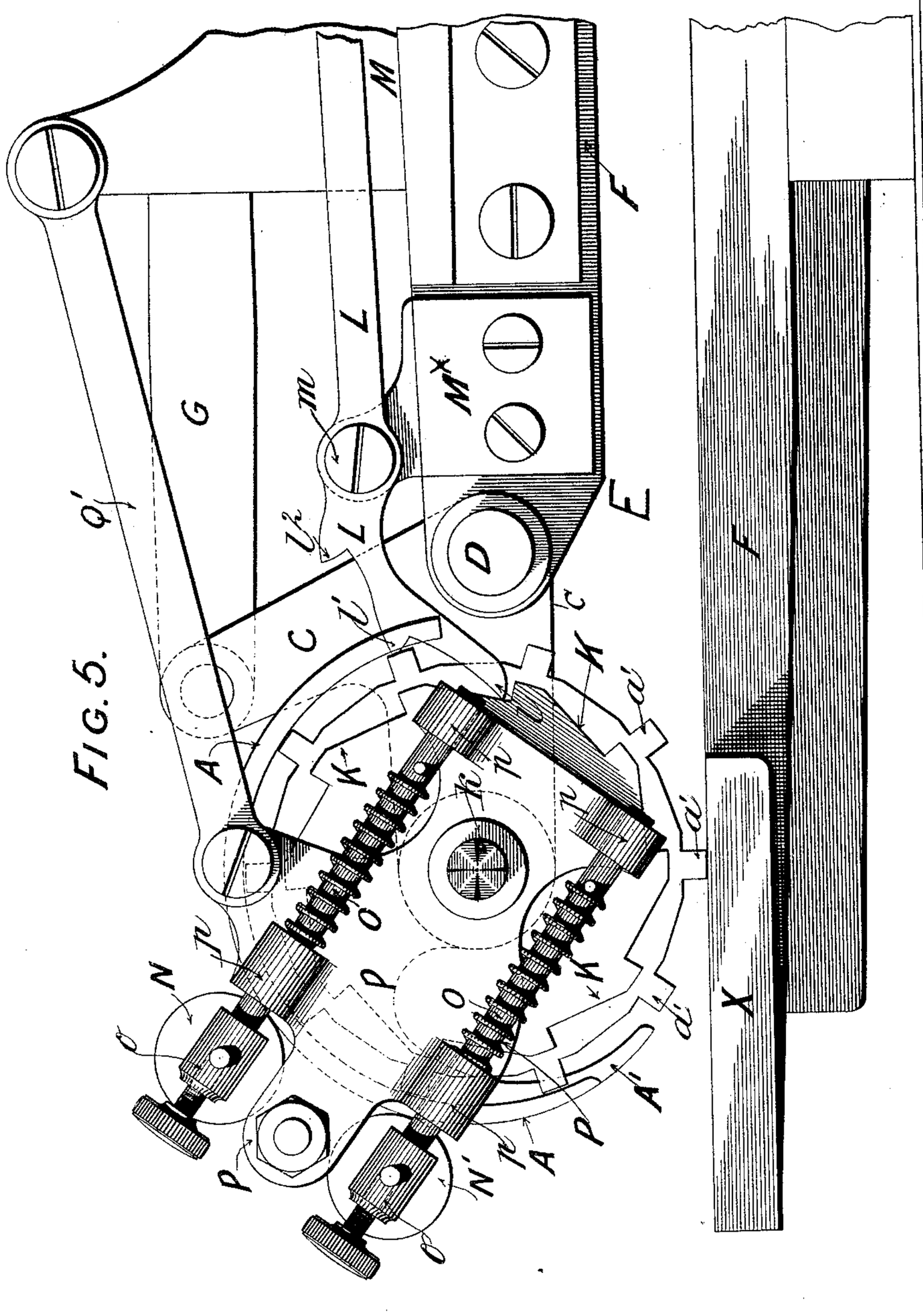
APPARATUS FOR THE CONSECUTIVE NUMBERING OF CHECKS, TICKETS, &c.

No. 410,673. Patented Sept. 10, 1889.

FIG. 5.



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(No Model.) 3 Sheets—Sheet 3.

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APPARATUS FOR THE CONSECUTIVE NUMBERING OF CHECKS, TICKETS, &c.

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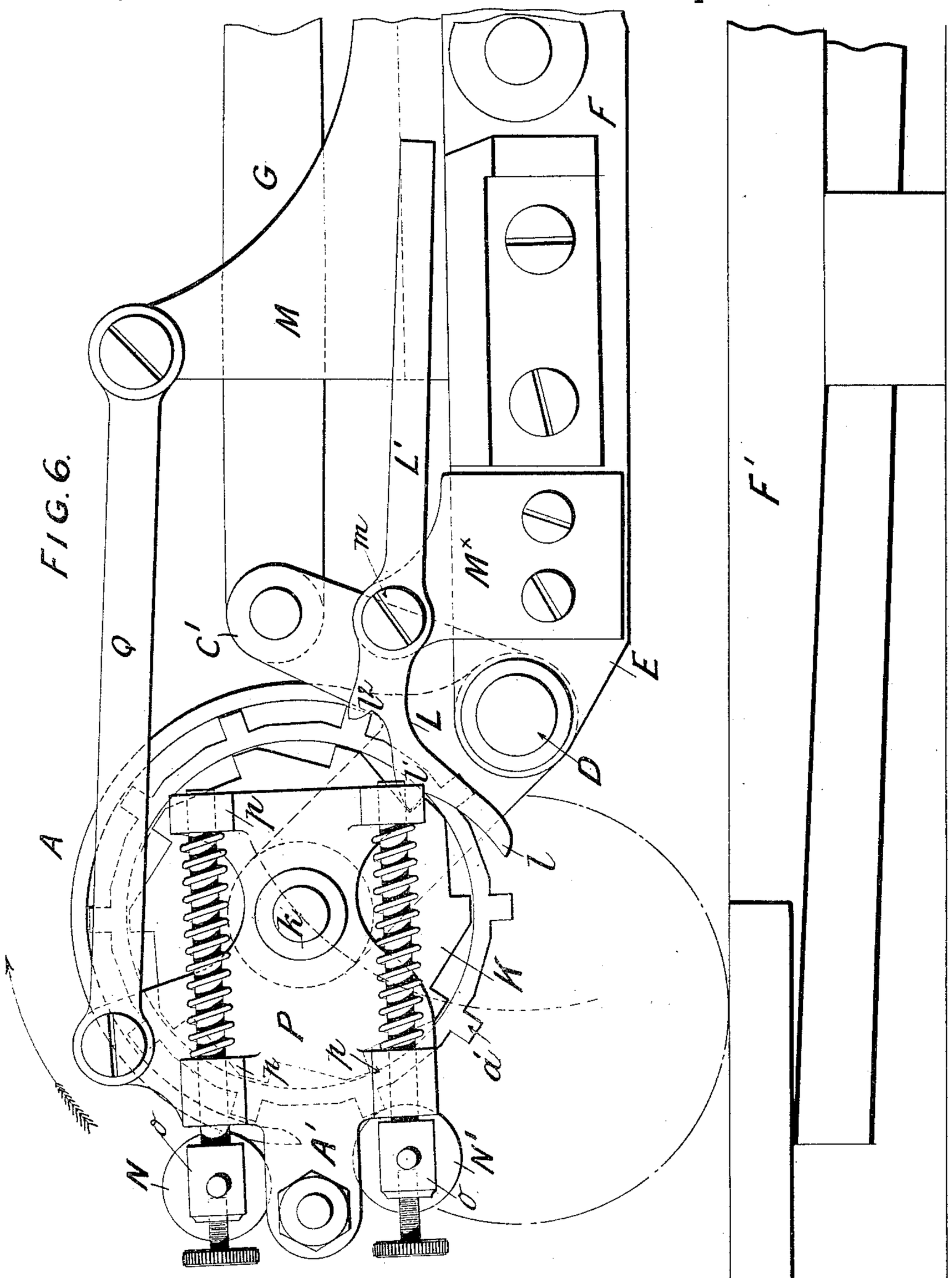
FIG. 6.



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UNITED STATES PATENT OFFICE.

JOHN PHILLIPS, OF LONDON, ENGLAND.

APPARATUS FOR THE CONSECUTIVE NUMBERING OF CHECKS, TICKETS, &c.

SPECIFICATION forming part of Letters Patent No. 410,673, dated September 10, 1889.

Application filed November 5, 1888. Serial No. 290,053. (No model.) Patented in Belgium October 1, 1888, No. 83,440.

To all whom it may concern:

Be it known that I, JOHN PHILLIPS, a subject of the Queen of Great Britain, residing at London, England, have invented a certain new and useful Improvement in Numerical Printing-Machines, (which invention has been patented to me in Belgium by Letters Patent No. 83,440, dated October 1, 1888,) of which the following is a full, clear, and exact specification.

My invention relates primarily to machines for providing checks or other documents with consecutive numbers by means of a set of parallel disks mounted on the same axle in close proximity to each other, each disk having ten projecting types from 0 to 9 equally distributed over its circumference, the first disk representing the units, the second the tens, the third the hundreds, and so on. For printing the numbers on the checks, the entire set of disks is alternately moved to and from the surface of the paper by means of a handle or treadle, imparting to the disk-holder an oscillating motion, and the feed motion of the paper at a right angle to the motion of the disk-holder is also produced by hand. After each impression the unit-disk is automatically caused to make one-tenth of a revolution on its axle by means of a ratchet mechanism. After each revolution of the unit disk the next disk makes one-tenth of a revolution, and so on.

The object of my improvement in such machines is to produce the necessary motion of the disk-holder by a shorter and easier motion of the handle or treadle than has hitherto been necessary to produce two or more impressions at the same time, to avoid shocks in the ratchet mechanism which turns the numbering-disks on their axes, and to render the inking more uniform.

In the following description reference will be made to the accompanying drawings, of which—

Figure 1 is an elevation, and Fig. 2 a plan, of a machine embodying my invention, while Figs. 3 to 5 represent certain details. Fig. 6 shows the numbering-head in its elevated position.

The machine comprises one or more disk-holders, (the drawings show two, A and B,) adapted to move simultaneously to and from the platform X, which supports the checks or other sheets to be numbered. Each disk-holder carries a row of type-disks $a'\ a^2\ a^3\ a^4\ a^5$ and $b'\ b^2\ b^3\ b^4\ b^5$ similar to those hitherto employed. Each disk-holder supporting the axle of a set of type-disks has the shape of a circular casing, and is fixed to a lever C, mounted on a horizontal shaft D. The latter has its bearings in a pair of brackets E E′, fixed to the bed-plate F of the machine. An oscillating motion is imparted to the shaft D by means of a lever C′, (preferably made of one piece with the lever C,) a link G, and a lever H, mounted on a horizontal shaft I, carrying a handle J. The drawings show the handle in its extreme left-hand position, corresponding to the lowest position of the type-holders when they are in the act of printing, while the extreme right-hand position of the handle is indicated by dotted lines. The motion of the handle J, and therefore of the type-holder, toward the right is limited by the inclined face of a short angle-iron screwed to the side of the bed-plate F, near the fulcrum of the handle J, as shown in Fig. 1. The handle J may, however, be mounted directly on the shaft D, in which case the lever C′, link G, lever H, and shaft I become unnecessary.

On the axle k of the type-disks $a'\ a^5$ is mounted a ratchet-wheel K, which is concentric with the type-disk and connected with the first of them in the usual manner, so that the latter is forced to share any rotary motion of the ratchet-wheel.

Into the ratchet-wheel K gears a peculiarly-shaped pawl L, pivoted on a pin m, which is fixed to a bracket $M^{\times}$, secured to the bed-plate F. As shown in detail by Fig. 3, the pawl L has three teeth $l\ l'\ l^2$, adapted to come in contact with three consecutive teeth of the ratchet-wheel, the distance between two teeth of the pawl being approximately equal to the pitch of the ratchet-wheel. The pawl L has a long rear extension L′ beyond its fulcrum, which extension serves as a counter-weight to hold the pawl against the ratchet-wheel and prevent it from dropping out of gear. During the return (and upward) motion of the disk-holder the point l meets first the nearest tooth of the ratchet-wheel, so as to

keep the contact-face stationary for a moment, while the disk-holder continues its upward oscillation, in consequence of which the ratchet-wheel will commence to turn on its axis. During the further up motion of the disk-holder the second tooth l' will come in contact with the next tooth of the ratchet-wheel, (see Fig. 6,) and cause it to continue its rotary motion after the point l has come out of action. Before the tooth l' ceases to act the third tooth l^2 comes into gear and continues the pivotal motion of the ratchet-wheel until it has made one-tenth of a revolution. The effect of the pawl L is therefore similar to that of a toothed segment.

If the ratchet-wheel has a larger number of teeth than ten, or if the motion of the ratchet-wheel is completed by the aid of pointed stop-pins projecting from the face of the first type-disk and falling into conical recesses formed in the face of the second type-disk, the third tooth of the ratchet-pawl may be omitted.

Fig. 6 shows the numbering-head in its elevated position at the moment when the inking-roller N′ touches the type-disks. A dotted circle indicates the outline of the type-disks in their lowest position.

The inking apparatus is constructed as follows: The cylindrical surface of the disk-holders A and B serves as inking-table, as in other machines. The ink is distributed to each inking-table by a roller N. The roller N′ receives the ink from the said table and distributes it to the type-disks a' a^5 b' b^5. The lower end of the inking-table (that which is next to the lower edge A′) is eccentric, so as to allow the rollers N′ to come gradually nearer to the axle k of the disks a' a^5 while approaching the edge A′, which is almost level with the face of the type. The axles of the inking-rollers have their bearing in the heads o o of the oblique rods O, adapted to slide in the bearings p p, forming part of the plate P, which is loose on the axle k of the type-disks.

In multiple apparatus the axles of the rollers N N′ belonging to different sets of type-disks are preferably joined together, and the two plates P are connected with each other by a rod, which may be situated between the roller-axles, as shown by the drawings. Each of the spindles O O is surrounded by a helical spring, abutting with its upper end against one of the bearings p, while its lower end rests on a pin fixed in the said spindle slightly above the lower bearing p of the spindle, so as to allow the projecting pin, together with the spindle, to move up and down, as may be required. The lower end of each spring is thus movable, and tends to draw the inking-rollers against the inking-table and the types by exerting an axial pressure on the spindles. The plate P is connected with the bracket M, fixed to the bed-plate F, by means of a link Q′, which prevents the inking-rollers from taking part in the oscillating motion of the disk-holder A B around the axle D, and thereby produces a relative rotary motion between the disk-holder and the plate P, which holds the inking-rollers.

I do not, however, claim any special arrangement of inking-rollers or the means for securing them to the roller-carrying plates P and for pressing them against the inking-table, nor do I claim any special shape of these plates.

To compensate for the unbalanced weight of the oscillating parts, I may employ a compensating spring W, (shown in detail by Fig. 4, which is a vertical section of the spring-casing, while Fig. 4ª is a plan of the same.)

To the lever H is attached a link R, connected with a balance-lever S, mounted on an axle s, having its bearings in the fixed bracket U. The other end of this lever is connected with a horizontally-movable rod V by means of a link T and pin t. The rod V is guided in the ends of a casing W, fixed to the bed-plate F, and is surrounded by a helical spring v. The spring v, inclosed in the casing W, is so arranged that it counteracts the weight of the disk-holders and other oscillating parts, storing up energy during their down motion and giving it out again during their up motion, thus rendering the resistance approximately uniform.

For changing the distance between the disk-holders A and B, and therefore between different sets of type-disks, the lever C′ is shifted along the axle D, and the bracket M′ is shifted on the bed-plate F as far as required and then fixed in its new position. To facilitate this change, the axle D is rectangular in cross-section, and the bracket M′ is attached to the bed-plate F by means of bolts f' passing through slots f f, formed in the bed-plate F, parallel to the axle D.

Instead of a handle J, or in conjunction with it, I may employ a treadle mechanism acting on the shaft I, or the latter may be set in motion by means of an oscillating lever, a connecting-rod, and a crank, to which continuous rotary motion is imparted by engine-power.

The drawings show in dotted lines part of the treadle mechanism Y Z Z′, adapted to act on the lever H. In this case the compensating spring is preferably replaced by a balance-lever Z^2, connected with the treadle mechanism, as shown in Fig. 1 by dotted lines.

Although the drawings show only two sets of type-disks adapted to oscillate simultaneously on the same horizontal shaft D, it is evident that the machine may be adapted for printing three or more numbers at the same time. In this case the bed-plate F would be made wider and the slots f f and shaft D made longer. The distance between adjoining sets of type-disks may be made equal or unequal. The ends of the shaft D where they pass through the bearings E and E′ are cylindrical, while the intermediate portion is square, and the oscillating levers, which sup-

port the adjustable disk-holders, are fixed at the required point of shaft D by means of set-screws.

The machine works as follows: The type-disks are first lifted from the printing table or platform X by turning the handle J into its extreme right-hand position, (shown by dotted lines,) the check or other document is fed forward by hand, and the lever J is turned into its left-hand position, (shown in the drawings,) thereby pressing the type-disks upon the printing-surface and producing the desired impression. As the plates P P are held by the link Q′ Q′, they will turn on the axle *k* while the latter oscillates on the shaft D, thereby causing the inking-rollers to distribute ink to the inking-table and thence to the type-disks during every oscillation. At every up motion of the shaft *k* the pawl L turns the ratchet-wheel K one division.

The connection between adjoining type-disks of each set and between the first type-disk and the ratchet-wheel or equivalent turning-gear, as well as the shape of the disks and disk-holders, may be similar to that employed in numbering apparatus hitherto employed, and will not, therefore, require special description.

What I claim is—

1. In numerical printing apparatus, the combination of a printing table or platform with a shaft held in bearings parallel to the said platform and provided with mechanism for imparting to it an oscillating motion around its axis, a numbering-head comprising a disk-holder and inking-table with a set of type-disks and inking apparatus held by a lever mounted on the said shaft and adapted to be fixed thereon at various points of its length, and ratchet mechanism adapted to turn the type-disks at each oscillation, substantially as described, and for the purpose specified.

2. In numerical printing apparatus, the combination of a printing table or platform, with a shaft held in bearings parallel to the said platform and provided with mechanism for imparting to it an oscillating motion around its axis, two or more levers mounted on the said shaft at a variable distance from each other, each lever carrying at its free end a disk-holder and inking-table with a set of type-disks and inking apparatus, and ratchet mechanism adapted to turn the type-disks at each oscillation, substantially as described, and for the purposes specified.

3. In numerical printing apparatus containing two or more sets of type-disks mounted on an axle adapted to oscillate to and from the printing table or platform, the combination of printing-platform X with horizontal shaft D, held in a pair of bearings and provided with means for imparting to it an oscillating motion to and from the platform, a pair of disk-carriers A B, and levers mounted on the axle D at a variable distance from each other, each disk-carrier being shaped as a cylindrically-curved casing over the upper part of the circumference of the type-disks and adapted to serve as inking-table, two sets of type-disks, together with ratchet-wheel and axle supported by the disk-holder, a pair of multiple ratchet-pawls L, adapted to come in contact with the ratchet-wheels and turn the same during the up motion of the disk-holders, and inking apparatus mounted on the axles of the type-disks and provided with means to prevent it from turning with the disks or disk-holders, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JNO. PHILLIPS.

Witnesses:
JASPER WETTER,
CHAS. ROCHE.