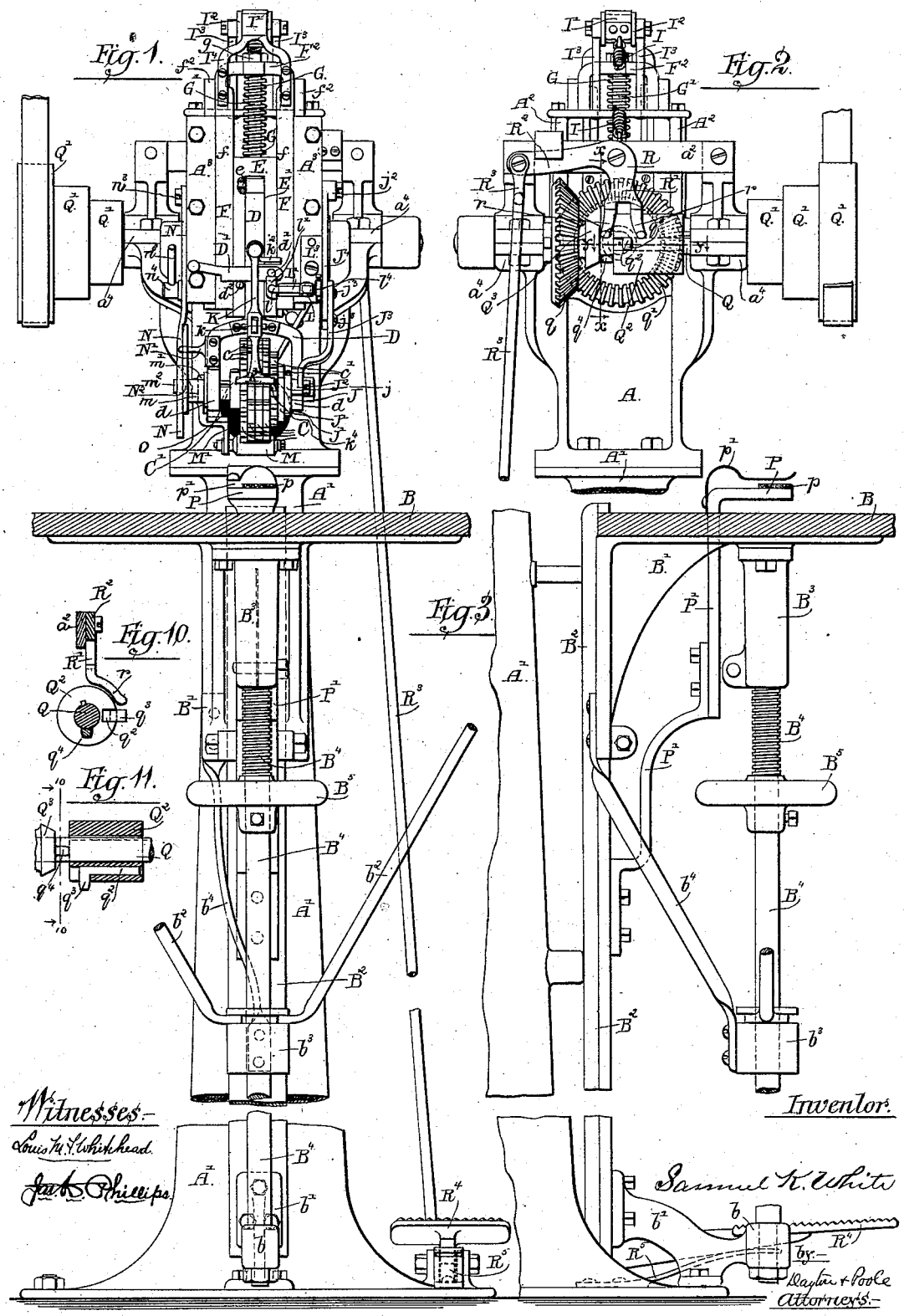
(No Model.) 3 Sheets—Sheet 1.

S. K. WHITE.

NUMBERING MACHINE.

No. 381,974. Patented May 1, 1888.



(No Model.) 3 Sheets—Sheet 2.

S. K. WHITE.

NUMBERING MACHINE.

No. 381,974. Patented May 1, 1888.

Fig. 4.

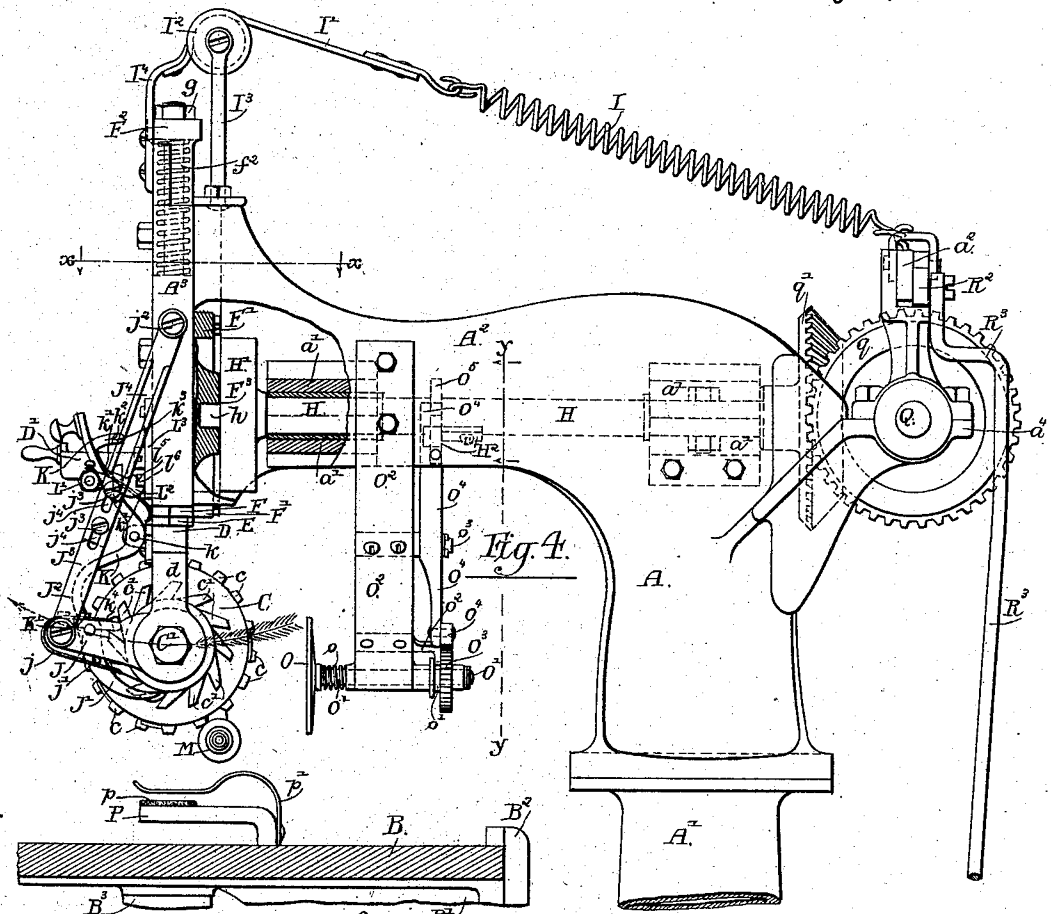


Fig. 8.

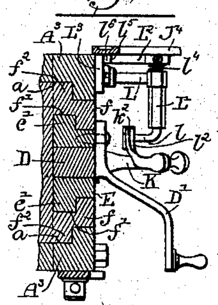


Fig. 5.

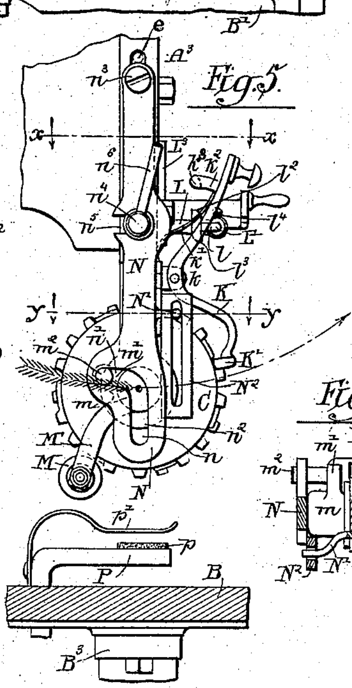


Fig. 6.

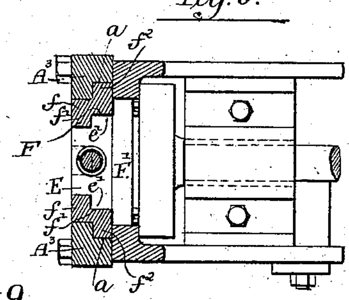
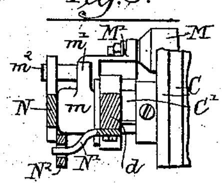


Fig. 9.



Witnesses:
Louis M. F. Whitehead
Jas. H. Phillips

Inventor:
Samuel K. White
by Dayton & Poole Attorneys.

(No Model.) 3 Sheets—Sheet 3.

S. K. WHITE.

NUMBERING MACHINE.

No. 381,974. Patented May 1, 1888.

Fig. 12.

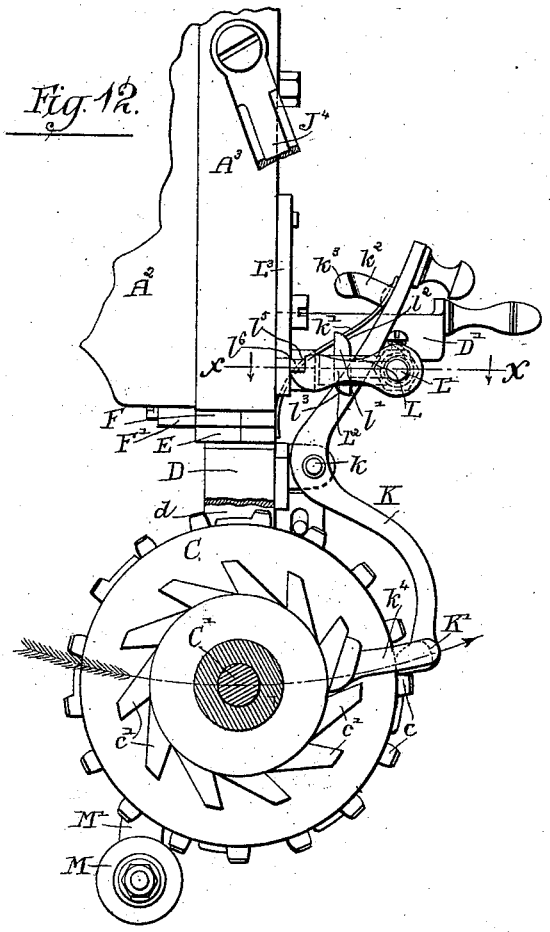


Fig. 7.

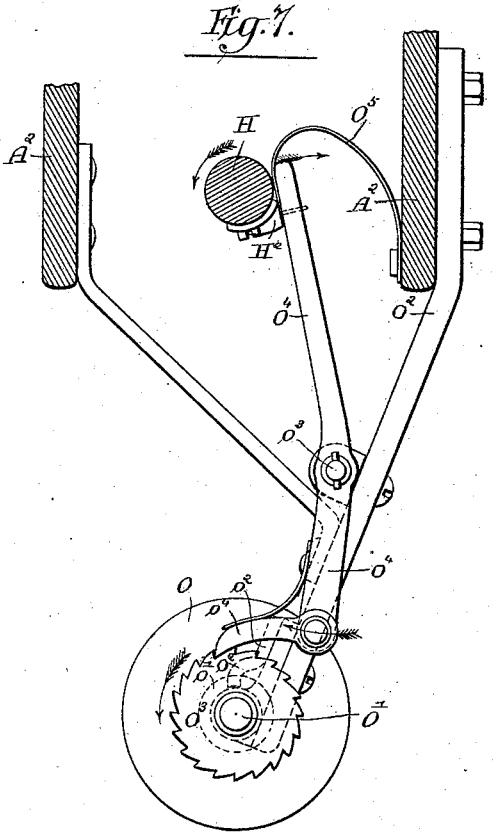
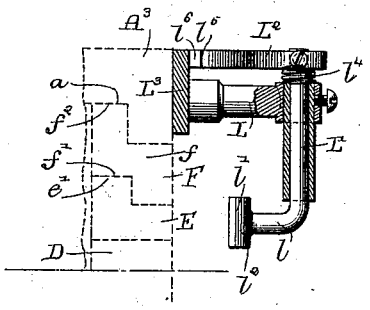


Fig. 13.



Witnesses:-
Louis W. Y. Whitehead.
Wm. F. Fleming.

Inventor:-
Samuel K. White.

by:- Dayton & Poole.
Attorneys:-

UNITED STATES PATENT OFFICE.

SAMUEL K. WHITE, OF CHICAGO, ILLINOIS, ASSIGNOR TO SHEA SMITH, OF SAME PLACE.

NUMBERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 381,974, dated May 1, 1888.

Application filed March 31, 1887. Serial No. 233,117. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL K. WHITE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Numbering-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improvement in numbering or paging machines, or machines employed for printing a series of consecutive numbers, and which comprise a series of movable type disks or wheels, which are arranged side by side, and are turned in the operation of the machine in such manner as to present the types for printing numbers in serial order.

The invention relates more particularly to paging or numbering machines of that class in which the book, paper, or other article upon which the printing is done is placed upon a stationary bed or support, and in which the type-disks are moved toward and from the surface to be printed in producing the impression.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a front view of a numbering-machine embodying the same. Fig. 2 is a rear view of the upper part of the machine. Fig. 3 is a side elevation of the lower part of the machine, showing devices for supporting a work-table. Fig. 4 is a side elevation, upon an enlarged scale, of the main or upper part of the machine. Fig. 5 is a view of the parts adjacent to the type-disks as viewed from the side of the machine opposite to that seen in Fig. 4. Fig. 6 is a detail plan section taken upon line *x x* of Fig. 4. Fig. 7 is a detail section taken upon line *y y* of Fig. 4, showing devices for actuating an inking-plate. Fig. 8 is a detail sectional plan view taken upon line *x x* of Fig. 5. Fig. 9 is a detail sectional plan view illustrating parts for actuating an inking-roller, taken upon line *y y* of Fig. 5. Fig. 10 is a detail section taken upon line *x x* of Fig. 2, illustrating a clutch device in the driving mechanism, whereby the machine may be stopped and started when desired. Fig. 11 is a longitudinal section of the same parts, taken upon line *y y* of Fig. 2, looking downwardly. Fig. 12 is an enlarged detail side elevation of the type-disks and devices for turning the same. Fig. 13 is a detail section taken upon line *x x* of Fig. 12.

As illustrated in the said drawings, A is a frame by which the principal operative parts of the machine are supported, or in which they have bearings, said frame being attached to the upper end of a supporting-standard, A′, and provided with an overhanging "goose-neck" or arm, A^2, which extends over the work-table B, and is provided at its forward or free end with vertical guides *a a*, in which a reciprocating plate or frame, E, supporting the numbering-disks, is arranged to slide.

C C C are the numbering disks or wheels provided with peripheral types *c c*, and mounted side by side upon a common shaft, C′. Said disks are provided with devices whereby one disk is moved one-tenth of a rotation after each complete revolution of the adjacent disk, and which may be of any well-known or preferred construction. In the particular machine shown these devices are located between the disks, and inasmuch as such devices are common and well known they are not made the subject of illustration in the drawings.

The type disks are immediately sustained by a forked bar, D, arranged vertically and provided at its lower end with two arms or forks, *d d*, which extend at the sides of the disk, and are provided at their ends with bearings for a horizontal shaft or pin, C′, upon which the disks are mounted, and about which they revolve. The bar D is attached to a plate, E, having sliding connection with the vertically-sliding frame or carriage F, which is engaged at its side margins with the guides *a a* of the frame. The bar D is located within a recess, E′, in the plate E, and is secured therein at its upper end by means of a horizontal pivot, *e*, and by a locking device at its lower end, this construction being used to enable the said bar D and the disks mounted in the lower end thereof to be swung upwardly and forwardly in the direction indicated by

the arrow in Fig. 5, so as to enable the types at the lower part of the disks, and which are in position for printing at any particular time, to be readily inspected by the operator. The mounting of the disks upon a swinging or movable support, as set forth, is also convenient when it is desired to change the position of the disks in starting the machine at a certain number, it having been necessary heretofore to use as a guide in this operation the numbers visible at the front side of the disks, and to make allowance for the number of numerals between those in position for printing and those which are in view at the front of the disks in shifting or turning the latter.

A simple and convenient form of locking device for holding the arm D vertical in the operation of the machine is herein shown, said device consisting of a swinging arm, D′, pivoted at d' to the front face of the plate E and constructed to extend across in front of the bar D, said arm D′ being adapted to engage a projection, d^2, upon the plate E, by which said bar is held in a horizontal position. The plate E is mounted to slide in the sliding frame F by means of lateral extensions or flanges e' e' upon the said plate E, engaging rabbets or recesses f' f' in the vertical side pieces, f f, of the frame F, the plate E being held in place by means of bars F′ F′, bolted to or over the rear surface of the said side pieces of the frame and extending across or over the rear surface of the said plate E, in the manner clearly shown in Figs. 4 and 6. A yielding connection between the plate E and the sliding frame F is formed by means of a spring, G, herein shown as of spiral form, and placed about a rod, G′, secured in the top of the plate E, and passing through a cross-piece, F^2, which is attached to the upper ends of the side pieces, f f, of the frame F, said spring G being held between the top of the said bar E and the said cross-bar F^2, as clearly shown in Fig. 1 of the drawings. A nut, G, is placed upon the upper end of the said rod G′, above the cross-bar F^2, for the purpose of limiting the downward movement of the plate E under the action of the spring.

The sliding frame F is shown in the drawings as provided with exterior lateral ribs or flanges f^2 f^2, which engage the guides a a of the frame, said guides being herein shown as formed by rabbeted vertical plates A^3, bolted to the front vertical face of the main frame-arm A^2 in the manner clearly indicated in Figs. 1, 6, and 8.

A vertical reciprocatory movement is given to the sliding frame F and parts connected therewith by means of a horizontal shaft, H, which is mounted in bearings a' a' of the frame-arm A^2, and is provided at its ends adjacent to the said sliding support with a crank-disk, H′, provided with a crank pin, h, which engages a horizontal transversely-arranged slot or groove, F^3, formed in one of the transverse bars F′ of the sliding frame F. The driving-shaft H is in the particular machine shown driven by gearing embracing a clutch device, as will be hereinafter described.

For counterbalancing the weight of the sliding frame F, the disks, and other parts carried thereby, I preferably arrange a spring between the stationary part of the frame and the said sliding support in such manner that the spring tends to lift the said support, and to thus take from the crank-pin all or a greater part of the weight of the several parts.

One convenient construction in a spring arranged for the purpose above stated is herein shown, in which a spirally-coiled spring, I, is attached at one end to a bar, a^2, at the rear end of the machine-frame, and at its opposite end to a strap, I′, which strap is attached to the frame F and passes over a roller, I^2, mounted upon vertical standards I^3 I^3, fixed in the top of the arm A^2, said strap being attached to the said frame F, preferably by means of a forked bar, I^4, attached at its upper end to the strap and at its lower forked ends to the side pieces, f f, of the said frame F. In the vertical reciprocatory movement of the frame the strap I′ in the downward movement of the frame will be drawn over the roller I^2, so as to stretch or expand the spring I, and in the upward motion of the frame the contraction of the spring will aid in lifting said frame in an obvious manner.

In numbering-machines of the character herein shown devices are commonly provided for automatically turning the first or end disk of the series containing the types indicating units one step at each reciprocation of the disks, the movement of the other disks being accomplished by automatically acting devices from the said first or units disk in a well-known manner, and motion is given to said first or units disk by means of operative connections between the movable part carrying the disks and a stationary part of the machine-frame. Devices for turning the said first or units disk, operating by the motion of the disks with relation to the frame, are herein shown and are constructed as follows:

c' c' c' are ratchet-teeth upon the outside face of the disk C, which is at the right-hand side of the series, and which contains the types by which the numerals expressing the units are printed. Rotative motion is given to this first disk only by the actuating devices, the other disks being turned in their order by suitable automatic actuating devices located between the disks and operating to turn each disk one-tenth of a rotation at the completion of each rotation of the next adjacent disk to the right of it in a manner heretofore common and well known.

J is an oscillating arm pivoted upon the shaft C′ between one of the forks d and the units-disk C, which latter is provided with ratchet-teeth c' c', and J′ is a spring-pawl pivoted to the said arm J and engaging said ratchet-teeth. In the particular construction illustrated the pawl J′ is actuated by a leaf-spring, j, secured to the arm J and pressing at its free end upon

a pin, j', fixed in the side of the pawl J'. The arm J is arranged generally in a horizontal position, and to its outer or free end is attached a connecting-bar, J^2, which connecting-bar is pivotally joined at its upper end with a stationary part of the frame-arm A^2. In the particular construction illustrated a pivot, j^2, for the upper end of the said connecting-bar J^2 is formed by a screw-stud inserted in the side of the plate A^3. The said connecting-bar J^3 is, furthermore, preferably made adjustable in length by being formed of two separate parts, J^3 J^4, which parts are overlapped at their meeting ends and secured together by screws j^3 j^3, which pass through slots j^4 j^4 in one of said parts, whereby the arm may be lengthened and shortened, as desired. When the type-disks and connecting parts are reciprocated vertically in the operation of the machine, the arm J will obviously be caused to swing about its pivotal axis by reason of the connection of the outer end of said arm with the frame, so that at each downward movement of the disks the pawl will be advanced over one of the ratchet-teeth c', and in the upward movement of the disks the disk C, to which the ratchet-teeth are attached, will be turned one-tenth of a rotation by the engagement of the pawl with the said ratchet-teeth.

When the disk-actuating devices are constructed in this manner and the machine is at the same time provided with a separate swinging bar, D, enabling the type to be drawn upwardly and forwardly for the purpose of inspection in the manner hereinbefore described, the pivot j^2, connecting the upper end of the connecting-bar with the machine-frame, will preferably be arranged axially in line with the horizontal pivot-pin, by which the said bar D is pivotally connected with the plate E. By this construction, when the type-disks are turned upwardly and forwardly by the rotation of said bar D about its pivot, the lower end of the connecting-bar J^2 will be maintained in the same position with regard to the axis of the disks as when the latter are in working position, so that the arm J will not be moved nor the disks shifted in such upward bodily movement of the disks.

It is obviously desirable in machines of the character described to provide some means for locking the several type-disks from possible movement during the time that the types are being pressed against the paper and the impression is being made. For this purpose the machine herein illustrated is provided with devices as follows:

K is a lever pivoted between its ends at k to suitable lugs or projections formed or cast upon the part immediately supporting the type-disks—in this case the bar D, at a point near the said disks. At its lower end the said lever K is provided with a cross-bar, K', adapted to engage suitable notches or spaces formed in the peripheries of the type-disks C C. A spring, k', is applied to the said lever K in such manner as to throw the cross-bar K' toward the type-disks, said spring k' being herein shown as made of leaf form and as attached to the upper end of the lever and arranged to bear against the bar D. At a point near its upper end the lever K is provided with an arm or projection, k^2, having at its end a horizontal laterally-projecting arm, k^3.

L is a horizontal arm rigidly fixed to the machine-frame and projecting horizontally from the front face thereof, and L' is a short horizontal shaft mounted in the outer end of said arm and provided with an arm, l, which extends inwardly toward the front face of the frame-arm, and is provided at its inner end with a vertically-arranged cam-plate, l', Figs. 12 and 13. This cam-plate is located in the vertical path through which passes the arm k^3 of the lever K as the part carrying said lever is reciprocated, and said plate is provided at its upper and outer edge with a beveled or inclined surface, l^2, and at its lower and inner edge with a similar beveled or inclined surface, l^3. The shaft L', by which the said cam-plate l' is supported, is furthermore mounted to rotate in the arm L, and is held in position with the arm l horizontal by means of a spring, l^4, placed about the said shaft L, as more clearly shown in Fig. 8. Upon the end of said shaft L', outside of the arm L, is placed an arm, L^2, which extends inwardly toward the front face of the frame-arm, and is provided at its end with a notch, l^5, adapted to engage a stud or projection, l^6, upon said frame. As herein shown, the arm L and stud l^6 are formed upon a plate, L^3, which is secured by screws to the front face of the plate A^3. The said arm L^2, by its engagement with said stop or stud l^6, holds the cam-plate l' from upward movement, while allowing said cam-plate to move freely downward by the yielding of the said spring l^4. In the operation of these parts the finger k^3 of the lever K, as the said lever descends with the type-disks, strikes upon the top surface of the cam-plate l', and thereby thrusts the said cam-plate downwardly until the latter has swung outward sufficiently to allow the said finger to pass the cam-plate and become disengaged therefrom. As soon as the cam plate is released from engagement with the downwardly-moving finger k^3, said cam-plate is immediately returned to its normal position by the action of the spring l^4. In the upward movement of the disk and the lever K the finger k^3 strikes the inclined surface l^3 at the lower end of the cam-plate l', and inasmuch as the cam-plate is held from upward movement by the engagement of the arm l^3 with the stud l^5, the said finger k^3 is thrown forwardly by the cam-plate, thus moving the lever K in a direction to release the cross-bar K' from the type-disks. This movement of the lever K takes place at the beginning of the upward movement of the type-disks and at the moment before the latter are turned or shifted by the actuating devices. In the downward movement of the type disks, however, the cross-bar remains constantly in engagement

with said disks, so that the disks are always held positively from movement, excepting during the time in the upward movement of the parts when the disks are being turned or shifted by the actuating devices.

The cam-plate *l* operates to throw the cross-bar K′ outwardly away from the disks; but it serves to retain the said cross-bar free from the disks during the short time only during which the finger k^3 is engaged with the cam-plate, and in order to retain the bar K′ free from the disks until the rotative movement thereof caused by the pawl J′ is completed the said bar K′ is provided with an arm, k^4, Fig. 12, which extends inwardly into position to engage the ratchet-teeth *c′ c′*, the said arm k^4 being so arranged that when it rests in the spaces between the teeth the cross-bar K′ is engaged with the notches of the disks, while at the same time it serves to hold said cross-bar free from the disks when held outwardly by contact with the ratchet-teeth. In the beginning of the upward movement of the disks the lever K is moved by the cam-plate *l′*, so as to release the cross-bar K′ from the disks and allow one or more of the latter to turn. After the end disk, C, has been turned a short distance, however, one of the ratchet teeth *c′* will be brought into position to engage the arm k^4, so that after the finger k^3 has passed clear of the cam-plate *l′* the arm k^4 by its contact with the said ratchet-tooth will retain the bar K′ at the outward limit of its movement until the tooth has passed from contact with said arm k^4, when the cross bar K′ will be allowed to swing inwardly into engagement with the disks.

In connection with a machine embracing the features above set forth any suitable inking device for applying ink to the type prior to each impression may be employed. A novel form of inking device embracing an oscillating inking-roller and an ink-distributing disk is herein shown, and is constructed as follows:

M is an inking-roller, which is mounted upon the end of an arm, M′, which arm is attached to a sleeve, *m*, having bearings upon the disk-shaft C′ exterior to the fork *d* at the end of the said shaft opposite to that at which the disk-actuating devices are located. Attached to the said sleeve *m* is another arm, *m′*, having upon it a pin, m^2, which engages a cam-slot, *n*, in the lower end of a rigid depending arm, N, attached to the frame-arm A^2. The cam-slot *n* is provided with an upper horizontal part, *n′*, and a lower vertical portion, n^2. When the disks are at the upper limit of their movement, the pin m^2 rests in the outer end of the horizontal part *n′* of the cam-slot, and at this time holds the inking-roller at a point slightly forward of the row of types which are in position for printing. As shown in the drawings, Figs. 1 and 5, the reciprocating parts are located about midway between the upper and lower limits of their movement, so that the roller M appears in said figures in a position somewhat to the rear of the lowermost row of types. As the type-disks descend, the central axis of the shaft C′ is carried downwardly with relation to the pin m^2, while at the same time said pin is moved inwardly through the part *n′* of the cam-slot, thus swinging the inking-roller upwardly and inwardly about the said shaft. When the inking-roller has been swung through approximately a quarter-revolution, the pin m^2 enters the vertical part n^2 of the cam-slot, and the roller is thus held in its elevated position and behind the type-disks during the continued downward movement of the disks and until the impression has been made, and the disks have again risen to bring the said pin m^2 into the horizontal part of the cam-slot.

During the time the inking-roller is held at the upward limit of its movement said roller is caused to pass over an inking surface or disk, O, which is located beneath the arm A^2 opposite the type-disks, and is supported and rotated in a manner hereinafter described.

To enable the type-disks and bar D, to which they are attached, to be swung upwardly and forwardly for the purposes of inspection and adjustment in the manner before described without disengaging the pins n^2 from the cam-slot *n* of the arm N, said part N is preferably pivoted at its upper end to the frame-arm, so that the lower end of said arm N may be swung upwardly and outwardly with the other moving parts at such time. In the particular construction illustrated the upper end of said arm N is connected by a screw-stud, n^3, with the side of the plate A^3, and the lower part of the arm is rigidly held in place for operation by means of a screw-stud, n^4, engaging a lateral opening or slot, n^5, in the said arm, said screw-stud N^4 being provided with an arm or lever, n^6, whereby the stud may be rotated for clamping the arm N firmly against the side of the frame when the arm is vertical and the said stud is engaged with the said slot n^5.

The inking-roller, as above set forth, is arranged to rest at a point beneath or slightly forward of the types which are in position for printing at the time the disks are at the upper limit of their movement, and if the pivotal axis of the stud n^3 were arranged in alignment with the pivotal axis of the bar D the said inking-roller would stand in front of the types which are in position for printing when the disks are swung upwardly for inspecting said types. To provide means whereby the inking-roller will be moved backwardly out of the way of the operator at such times, I preferably locate the pivot-stud n^3 of said arm N at a point below a horizontal line passing through the pivotal axis of the bar D, so that when the said bar D and the disks are swung bodily forward and upward the outer or free end of the arm N, containing the cam-slot, will be moved upwardly or inwardly with relation to the central axis of the disk-shaft C′, and will thereby turn the pin n^2 about said shaft, so as to swing the inking-roller backwardly away from the types which are in position for printing.

The bar D is desirably provided with a bent arm, N′, which engages a vertical slotted plate, N^2, attached to the arm N, so that in moving the said bar D the arm N will be held constantly in the same relation therewith by the engagement of said bent arm N′ with the slotted plate N^2, and the pin m^2, for actuating the inking-roller, will therefore be retained in proper operative position in the cam-slot to produce the backward movement of the inking-roller in the manner above stated.

The inking-disk O is mounted upon a shaft, O′, having bearings in the lower end of a depending rigid arm, O^2, attached to the frame A^2. The said shaft O′ is mounted to slide horizontally in the said arm O^2, and a spiral spring, *o*, is placed between the said arm and the rear surface of the distributing-disk O, so as to hold said disk forward and in position for contact with the inking-roller, while at the same time allowing the disk to move upon contact of said inking-roller therewith as the latter swings in its circular path.

Ink is applied to the front face of the distributing-disk O, and said disk is rotated for the purpose of effecting the even distribution of the said ink in the same manner as is common in ink-distributing disks for printing-presses. Devices for rotating said disk are shown in Figs. 4 and 7, and are made as follows:

O^3 is a ratchet-wheel mounted upon the shaft O′, the hub of said wheel being provided with a groove, *o′*, engaged by an arm, o^2, attached to the supporting-arm, whereby the said ratchet-wheel is held from endwise movement with the shaft when the latter is moved by the contact with the inking-roller therewith.

O^4 is a vertically-arranged lever pivoted near its middle at o^3 to the arm O^2, and having at its lower end a spring-pawl, o^4, engaging the ratchet-wheel O^3. The upper end of the lever O^4, as clearly shown in Fig. 7, is adapted to engage a cam projection, H^2, upon the driving-shaft H, the end of the lever being held in position for engagement with the said cam or projection by means of a spring, O^5, attached to the frame-arm and bearing against the said lever. As the shaft H is rotated, the cam projection engages and gives oscillatory movement to the said lever O^4, whereby the ratchet-wheel and shaft, and distributing-disk attached thereto, are given an intermittent rotative motion.

Devices shown for supporting the work-table B consist of a metal bracket, B′, arranged to slide vertically upon a guide-bar, B^2, attached to the standard A′ of the machine, to which bracket the work-table is secured. Said bracket is provided with a depending sleeve, B^3, which is engaged by a vertical screw-shaft, B^4, mounted at its lower end in a step or bearing, *b*, attached to a bracket, *b′*, at the lower part of the machine-frame.

B^5 is a hand-wheel attached to the shaft for turning the latter, so as to raise and lower the table, as desired. The book or other work to be printed is sustained upon the work-table B; but for supporting the paper sheets or pages while the impression is made a block or anvil, P, is attached to an arm or bracket, P′, sustaining said anvil above the table and beneath the type-disks secured to the guide-bar B^2 below the table, and arranged to extend upwardly through an aperture in the table, as clearly shown in Fig. 3.

The arm or standard P′ is arranged at the rear of the point at which the impression is made, and the anvil extends forward from its point of attachment to said arm, so as to overhang the table, the said anvil and arm being herein shown as made in a single bar bent at right angles in the manner shown.

p is a cushioned surface upon the anvil for receiving the pressure of the types, and *p′* a spring-arm extending over the anvil at one side of the cushion for the purpose of preventing the leaf or sheet from being lifted with the disks in case the paper sticks to the types.

The machine containing the adjustable table B and separate anvil P is more particularly intended for paging books, the table being placed at such a distance below the overhanging anvil-block that the top part of the book may be thrust beneath the said block and opposite sides of the same leaf, thereby conveniently placed upwardly upon the anvil-block for making the impressions thereon.

The work-table B is desirably made of considerable length, and to support its outer ends brace-rods b^2 b^2 are desirably employed, which brace-rods are connected with a block, b^3, attached to a downwardly-extending arm or brace, b^4, fixed at its upper end to the movable bracket B′, the said block b^3 being laterally sustained by means of the screw-shaft B^4, which passes through said block and upon which the block slides vertically when the table is moved.

The driving device for actuating the horizontal driving-shaft H embraces a clutch mechanism especially adapted for machines of this class, such device being made as follows:

Q is a horizontal shaft arranged at right angles with the shaft H, and connected with the latter by means of bevel-gears *q q′*. Said shaft Q is mounted in bearings a^4 at the rear end of the frame-arm A^2, and is provided at one end with suitable driving-pulleys, Q′ Q′. Upon said shaft Q is affixed a cylindric block, Q^2, and in said block, parallel with the shaft, is placed a sliding bar, q^2, said bar being constructed to slide in the block in a direction parallel with the shaft and having at one end a projection, q^3, extending beyond the external surface of said cylindric block. The gear-wheel *q* is mounted to turn upon the shaft Q, and is provided with a sleeve or extension, Q^3, upon the end of which, adjacent to the end of the block Q^2 and in position to engage the end of the sliding bar q^2, is a stud or projection, q^4.

R is a lever pivoted to a cross-bar, a^2, attached to the bearings a^4 above the latter, said lever being provided with a vertical part or

arm, R′, having prongs *r r*, which extend downwardly into a position adjacent to the projection q^3 of the sliding bar q^2. Said lever R also has a horizontal arm, R^2, to the outer end of which is connected a rod, R^3, attached to a foot-lever, R^4, located at the base of the machine-standard. The prongs *r r* of the lever R are bent in a curve approximately concentric with the axis of the shaft Q, said prongs being arranged to extend through a curve of about one-fourth of a circle, as clearly shown in Fig. 8. Said prongs *r r* are curved or spread outwardly at their free ends, and are arranged to afford a space sufficient for the passage of the projection q^3 at the narrowest part of the space between them, as clearly shown in Fig. 2. A spring is applied to the lever R, or a part connected and moving therewith, in such manner as to hold the horizontal arm of the said lever at the downward limit of its movement and the prongs *r r* in position to retain the projections q^3 at the rearward limit of its movement, or free from the stud q^4, as the shaft is revolved, together with the block Q^2 thereon. As herein shown, a leaf-spring, R^5, is applied to the foot-lever R^4 for this purpose, as clearly shown in Figs. 1 and 3. By pressing on the foot-lever R^4 the lever R will be moved so as to bring the prongs in position to engage and move the said projection Q^3 outwardly or toward the stud q^4, and thus cause the engagement of the end of the bar Q^2 with the said stud, when the motion of the shaft will be communicated to the bevel-wheel *q*.

The parts of the clutch will remain in engagement in the manner described as long as the foot is retained upon the lever R^4; but as soon as the said lever is released the prongs *r r* of the lever R will be swung into position to engage and throw inwardly the projection q^3, and thereby release the bar q^2 from the stud q^4 and allow the stoppage of the machine.

In numbering-machines of the character above described, as heretofore commonly made, the numbering or type disks have been attached to one end of a horizontally-arranged oscillating arm which is actuated by means attached to a part of the arm remote from the disks. In this prior construction the type-disks are thrown forcibly toward the printing-surface at each downward movement of the arm, the type-disks and other heavy parts connected therewith acting to give hammer-blows upon the paper being printed, liable to be of too great force or violence when the paper is thick or when several sheets of paper are placed beneath the disks to be withdrawn one by one as printed, this being commonly done to facilitate the rapid handling of the sheets. Machines have been made having a spring in the connections between the oscillating disk-supporting arm and the devices by which such arm is moved; but a device of this character has proved of little utility, for the reason that the weight of the parts upon the free end of the supporting-arm is so great that a violent blow is struck from the impetus acquired in moving toward the paper, notwithstanding the yielding connection in the driving devices.

In the machine above described the type-disks are mounted upon a support (the bar D) which has yielding connection with the vertically-oscillating frame F, so that the type-disks and said support may yield upwardly when necessary to prevent a too forcible pressure upon the printing-surface, while the said oscillating frame and other parts of the disks, supporting and actuating devices continue to be moved through the full extent of their throw.

I claim as my invention—

1. The combination, with the frame and type-disks of a numbering-machine, of a vertically-reciprocating frame carrying said disks, a bar, D, supporting the said disks and pivoted to the reciprocating frame, and means for locking said bar D in position for operation, substantially as described.

2. The combination, with the machine-frame and type-disks, of a vertically-reciprocating frame carrying said disks, a support for the disks pivoted to the said reciprocating frame, and devices for rotating the disks, comprising a connecting-bar pivoted to the machine-frame, the pivots of the said disk-support and the connecting bar being located in alignment with each other when the oscillating frame is at the upper limit of its vertical movement, whereby the disk-support may be swung about its pivot without turning the disks, substantially as described.

3. The combination, with the machine-frame and type-disks, one of which is provided with ratchet-teeth, of a vertically-reciprocating frame carrying said disks, a support, D, for the disks pivotally connected with said reciprocating frame, a swinging arm, J, pivoted concentrically with the disks, a spring-pawl upon said arm, engaging the ratchet-teeth of the said disk, and a connecting-bar pivoted to the outer end of said arm J and to the machine-frame, the pivots connecting the said disk-support and connecting-bar with the frame F and the machine-frame being located in alignment with each other when the frame is at the upper limit of its movement, substantially as described.

4. The combination, with the machine-frame, the type-disks, and the reciprocating frame carrying said disks, of a roller, I^2, mounted upon the machine-frame over the reciprocating frame, a strap attached to the reciprocating frame and passing over the said roller, and a spring, I, attached to the said strap and to the frame, substantially as described.

5. The combination, with the machine-frame, the type-disks, and a reciprocating part or frame carrying said disks, of an upwardly-yielding cam-plate, as *l′*, mounted upon the machine-frame, and a movable part, as lever K, mounted upon the part or frame which carries the disks, and engaging the latter to prevent them from turning, said movable part

being provided with a projection or finger located in the path of the said cam-plate, whereby the disks are released at each upward movement thereof, substantially as described.

6. The combination, with the machine-frame, the type-disks, and a vertically-reciprocating frame carrying said disks, of a lever pivotally connected with the frame and provided with a cross-bar engaging the disks, and an upwardly-yielding cam-plate mounted upon the machine-frame, said lever being provided with a projecting part or finger for engaging the cam-plate, whereby the lever is moved to release the disks at each upward movement of the latter, substantially as described.

7. The combination, with the machine-frame, the type-disks, and vertically-reciprocating frame carrying the disks, comprising a lever, K, pivotally connected with the reciprocating frame and provided with a cross-bar, K′, and a horizontal finger, k^3, of a rock-shaft, L′, mounted upon the machine-frame and provided with an arm supporting a cam-plate, l', located in the path of the finger k^3, said rock shaft being provided also with an arm, L^2, a stop upon the machine-frame in position to engage said arm L′, and a spring applied to hold said cam-plate in the path of the finger k^3, substantially as described.

8. The combination, with the machine-frame, the type-disks, one of which is provided with ratchet-teeth, and a reciprocating frame carrying said type-disks, of a lever, K, pivotally connected with the reciprocating frame and provided with a cross-bar, K′, a horizontal finger, k^3, and an arm, k^4, engaging the said ratchet-teeth, a rock-shaft, L′, mounted upon the machine-frame and provided with an arm supporting a cam-plate, l', located in the path of the finger k^3, said rock-shaft being provided also with an arm, L^2, a stop upon the machine-frame engaging said arm L^2, and a spring applied to retain the said cam-plate normally in the path of the finger k^3, substantially as described.

9. The combination, with the machine-frame, the type disks, and the vertically-reciprocating frame carrying said disks, of an inking device comprising an inking-roller, an arm pivoted concentrically with the disks and sustaining the inking-roller, a crank-arm attached to the said roller-supporting arm and provided with a crank-pin, and a stationary part or arm provided with a slot engaging said crank-pin, and constructed to swing the inking-roller about the axis of the disks as the latter are bodily moved, substantially as described.

10. The combination, with the machine-frame, the type-disks, a vertically-reciprocating frame carrying said disks, and a support for the disks, pivotally connected with the frame to allow said disks to be swung upwardly, of an inking device comprising an inking-roller, an arm pivoted concentrically with the disks and sustaining the inking-roller, a crank-arm attached to said arm and provided with a crank-pin, and a part or arm, N, provided with a cam-slot engaging said crank-pin, said arm N being pivoted to the machine-frame, so that it may be swung upwardly with the disks, and means for holding the said arm N in its operative position, substantially as described.

11. The combination, with the machine-frame, the reciprocating frame F, the type-disks, and the bar D, supporting said disks and pivotally connected with said frame, of the inking-roller, the arm M′, supporting said roller, the crank-arm m', provided with a crank-pin, and the arm N, pivoted at its upper end to the machine-frame, the pivotal axis of said arm N being located somewhat below the pivot of the bar D when the frame is at the upper limit of its movement, whereby the inking-roller will be moved when the disks are swung bodily upward and forward, substantially as described.

12. The combination, with the machine-frame, the type-disks, the vertically-reciprocating frame carrying said disks, and a bar, D, supporting the disks and pivotally connected with the frame, of an inking device comprising an inking-roller, a pivoted arm carrying said roller, a crank-arm attached to said roller-supporting arm and provided with a crank-pin, an arm, N, pivoted to the machine-frame and provided with a cam-slot engaging the said crank-pin, and means for holding the said arm N in operative position, the said arm N and the bar D being provided with an interlocking slot and pin, whereby the arm N will be moved with the bar D when said bar is swung about its pivotal axis, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

SAMUEL K. WHITE.

Witnesses:
C. CLARENCE POOLE,
CHARLES T. LORING.