(No Model.) 2 Sheets—Sheet 1.

J. H. REINHARDT.

CONSECUTIVE NUMBERING MACHINE.

No. 350,640. Patented Oct. 12, 1886.

Fig. 1.

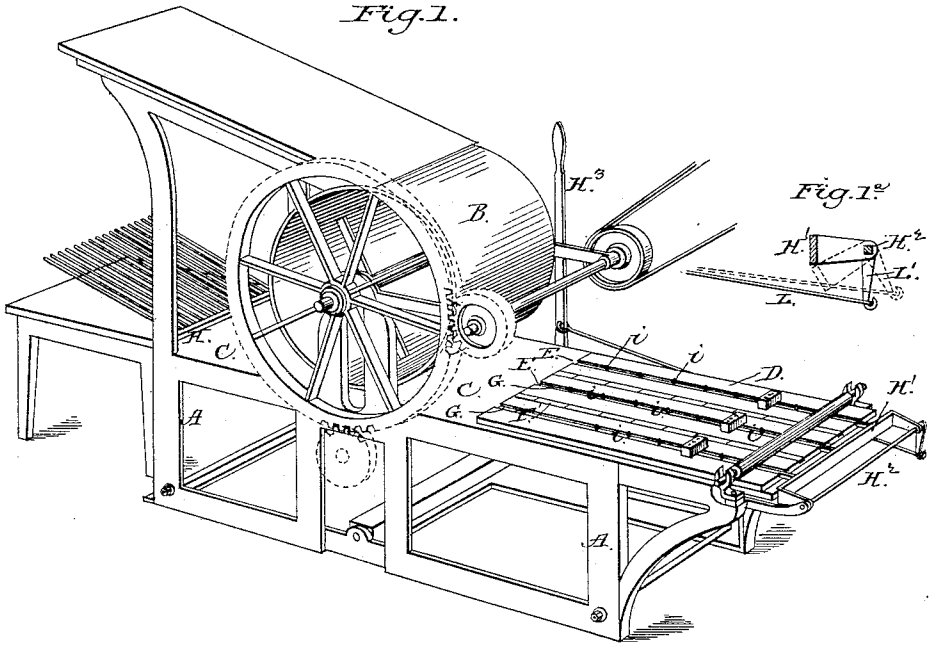


Fig. 1a.

Fig. 2.

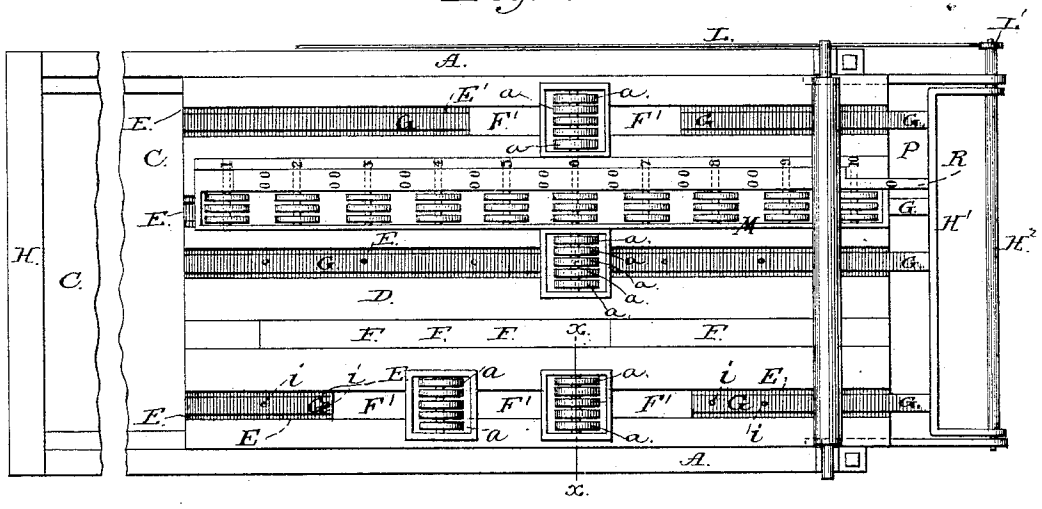


Fig. 3.

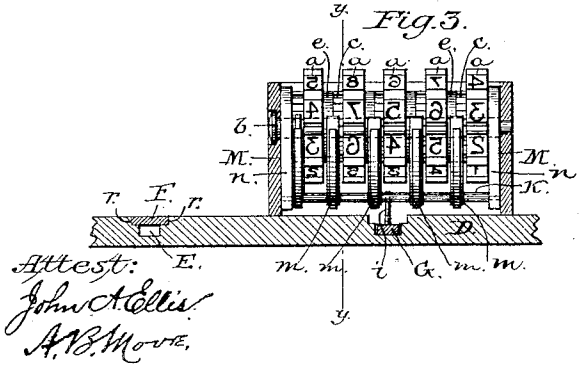
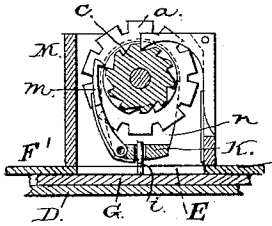


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

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CONSECUTIVE NUMBERING MACHINE.

No. 350,640. Patented Oct. 12, 1886.

Fig. 5.

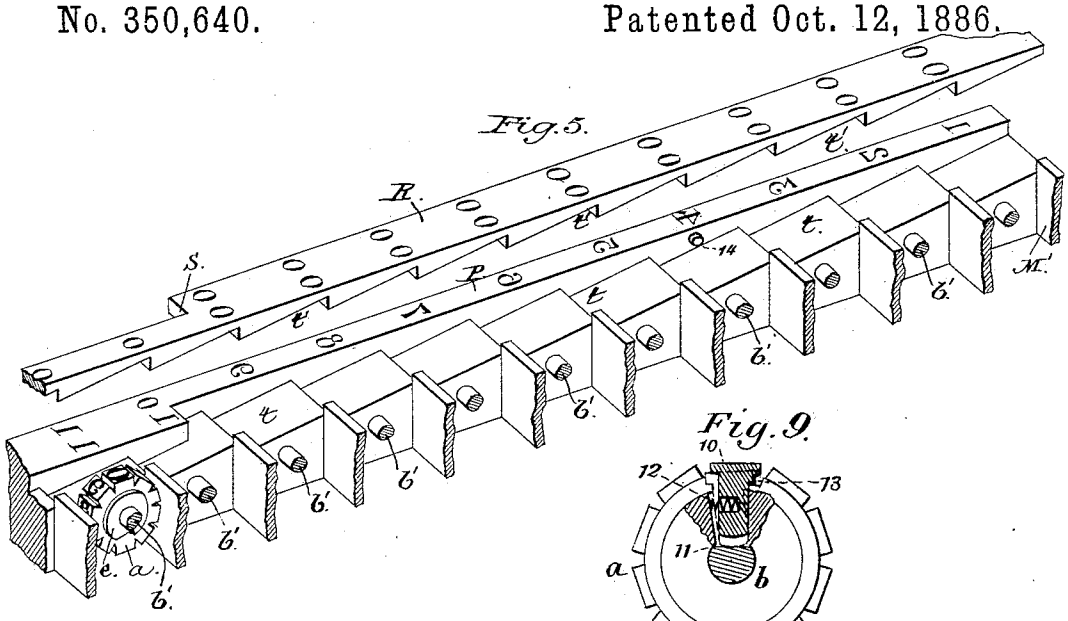


Fig. 9.

Fig. 6.

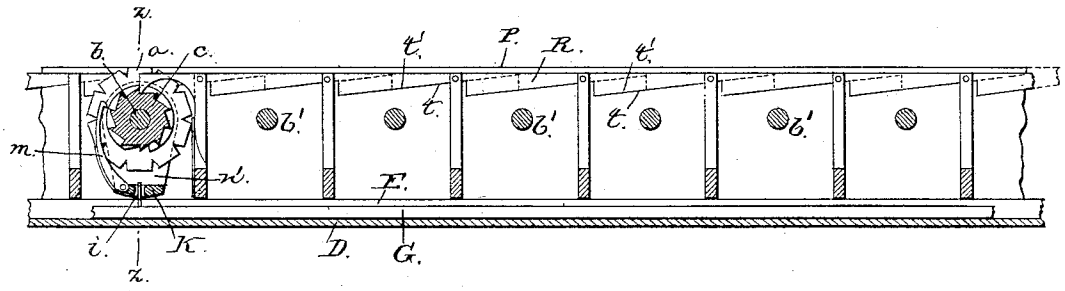


Fig. 7.

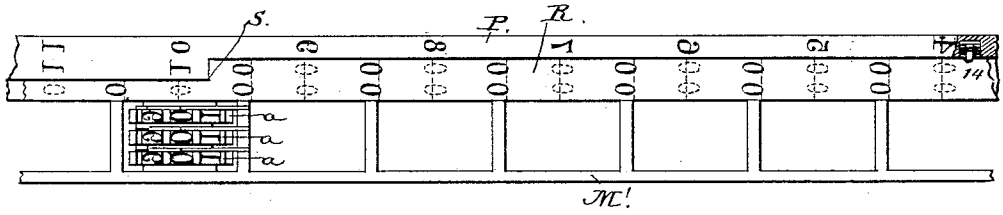
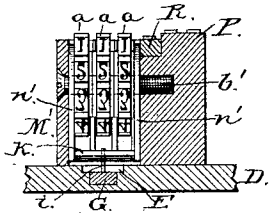


Fig. 8.



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UNITED STATES PATENT OFFICE.

JAMES H. REINHARDT, OF MEMPHIS, TENNESSEE, ASSIGNOR OF ONE-HALF TO JOSEPH WETTER, OF SAME PLACE.

CONSECUTIVE-NUMBERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 350,640, dated October 12, 1886.

Application filed October 17, 1885. Serial No. 180,154. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. REINHARDT, of Memphis, in the county of Shelby and State of Tennessee, have invented a new and useful Improvement in Consecutive-Numbering Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to that class of consecutive-numbering machines adapted to be set in a form of type and to be automatically actuated by the movements of the printing-press upon which the form is placed, and more particularly to the specific form of said machines described in Letters Patent of the United States No. 318,803, bearing date May 26, 1885.

The object of my invention is to adapt these machines for use in a cylinder press for the purpose of printing by the million consecutively-numbered tickets at the rate, if desired, of one thousand at each impression.

It consists in the combination, with stops at either end of the frame or stationary bed-plate of a cylinder printing-machine and with the traveling bed moving thereon, of actuating-strips inserted in longitudinal grooves in the traveling bed, provided with pins or lugs to engage the swinging pawl-frames of numbering heads or machines fixed upon said bed, and of cam-strips or movable type-plates fitted upon the numbering-machines, the movable strips in the traveling bed and upon the numbering-machines being made to move longitudinally by contact with the stops at the completion of the movement of the traveling bed in either direction.

In the accompanying drawings, Figure 1 is a view in perspective of a cylinder-press having my invention applied thereto, with but one of its inking-rollers shown, Fig. 1ª being a detached sectional detail, on an enlarged scale, of the pivotal stop at one end. Fig. 2 is a plan view of the traveling bed of the press and of the outer end of its fixed frame, with one only of the inking-rollers shown in position, and with consecutive-numbering machines of different forms fixed upon the bed. Fig. 3 is a section, on an enlarged scale, of one of the single-numbering machines or numbering heads in line *x x* of Fig. 2. Fig. 4 is a transverse section of the same in line *y y* of Fig. 3. Fig. 5 is a view in perspective and upon an enlarged scale of a portion of one side of a consecutive-numbering machine, with a movable type-plate adapted to be used with a cylinder-press in printing one thousand consecutively-numbered tickets at each movement of the bed, the numbering-wheels being omitted in said view. Fig. 6 is a longitudinal section, and Fig. 7 a plan view, of the same, with all but one set of wheels omitted. Fig. 8 is a transverse section of the machine mounted upon the traveling bed of the press, in line *z z* of Fig. 6, the numbering-wheels and their pawls being shown in elevation; and Fig. 9 a side view of one of the wheels in a numbering-head, partly in section, illustrating the combination therewith of a radially-adjustable type-section for the cipher.

A A represent the frame, B the cylinder, C the fixed bed-plate, and D the traveling bed, of a cylinder printing-press of any approved form. The traveling bed D, upon which the form of type to be printed is locked, is made to reciprocate back and forth from front to rear under the cylinder B, and the type thereon are inked by suitable rollers in the usual manner. The details of mechanism for accomplishing these ends need not herein be particularly described, and are not shown in the drawings.

In the upper face of the traveling bed D a series of parallel longitudinal grooves or recesses, E E, are cut to extend from end to end thereof. These grooves are reduced in width by reason of longitudinal offsets *r r* (see Fig. 3) on each side thereof, forming ledges upon which to support a longitudinal covering strip or plate, F. This plate F is made to fit closely in the groove E, and to fill the upper portion thereof flush with the face of the bed, so that when the strip is inserted therein the face of the bed may be used for the ordinary purposes of the press as if unbroken. (See Figs. 1 and 3.) Each covering-strip F may be made in one piece to extend the entire length of the groove, or be made in sections, as shown at F′ in Fig. 2, to cover the groove between the numbering-heads fitted thereon, to permit of

setting type and furniture over the groove between the heads as well as around them.

The central depression of the groove E is made rectangular in cross-section, as shown in Figs. 3 and 8, and by removing the covering-strip F out of the groove a second longitudinal strip, G, may be inserted therein to slide longitudinally in said central depression. This movable strip G is made of a length exceeding that of the bed D, so as to project out beyond the ends thereof. (See Fig. 2.)

A fixed stop-plate, H, (see Fig. 2,) is secured at one end of the press in line with the bed D, so that when the bed has completed its movement in that direction its end will touch the stop-plate, and the movable strips G G, projecting beyond the bed, will, by coming into contact with the stop-plate, be forced inward. At the opposite end of the press a second stop-plate, H′, is pivoted upon a rock-shaft, H^2, (see Figs. 1, 2, and 1^a,) so that it may be swung up into register with the plane of movement of the traveling bed D in position to touch the end of the bed at the moment its travel in that direction is completed. When thus swung up, it operates to force inward the projecting strips G G as the bed completes its movement. The movement of the rock-shaft H^2, carrying the stop-plate, is effected by means of a lever, H^3, placed within reach of the operator manipulating the press, and which is connected by a coupling-rod, L, to an arm, L′, projecting from one end of the shaft H, as shown in Fig. 1^a.

Each movable strip G is fitted with a series of pins, *i i*, to project upwardly therefrom above the level of the bed D. (See Figs. 1, 3, 4, and 8.) These pins may be made detachable to admit of insertion in holes in the strip, so as to adapt them to various positions of the numbering-heads upon the bed.

The numbering-heads for use with the cylinder-press may be constructed each of a set of numbering type-wheels, *a a a*, (see Figs. 3 and 4,) mounted to rotate freely upon a fixed axial shaft, *b*, in a frame or casing, M. Each type-wheel has a concentric ratchet-wheel, *c*, formed or secured upon one side thereof and a blank wheel, *e*, of the same diameter upon its opposite face, this blank-wheel being omitted, however, from the last type-wheel in the set.

The type-wheels *a a* are actuated by means of pawls *m m* upon arms projecting from the cross-bar K of a frame, *n n*, suspended from the axial shaft at each end to swing under the type-wheels. The pawls *m m* are fitted to rest one upon each of the ratchet-wheels *c*, to engage its teeth, and are made wide enough to rest also upon the periphery of the adjacent blank wheel *e*, so that said blank wheel shall prevent an engagement of the pawl *m* with the ratchet *c*, except as permitted by a notch cut in the periphery of the blank wheel *e* opposite the number 9 on the periphery of the type-wheel to which it is secured; hence each type-wheel on the left, beginning with the unit-wheel, is actuated by its pawl once only in the revolution of the type-wheel next to the right. To avoid, in numbering consecutively with the device, an imprint of the ciphers on the several wheels preceding the first in the numbering-head before they are required, I form the type for the cipher for each of said wheels upon a detachable movable section, 10, (see Fig. 9,) adapted to fit in a radial slot extending to the center of the wheel. The section is made of such a length as that when inserted in the slot with its inner end resting upon the periphery of the fixed shaft *b* the type shall be in line of print. A flat face, 11, is cut away upon the upper side of the shaft *b*, so that the section 10, when in register with said recess, may drop inward sufficiently to bring its type out of line for print. (See dotted lines, Fig. 9.) The section 10 is confined in its slot by means of a lateral spring, 12, which permits also a slight play of the section transversely to the axis of the wheel. When thrown out, the section is supported by an offset, 13, at its outer end, which, by the action of the spring 12, is carried over the edge of the slot into a rabbet cut therein. This construction of the numbering-heads is similar to that described in the Letters Patent No. 318,803, hereinbefore mentioned, but for use in connection with the traveling bed of a cylinder-press fitted with the movable strips G G the plunger for actuating the swinging pawl-frame found in said patented machines is omitted and the lower bar, K, of the frame in each is slotted or perforated to receive the end of one of the pins *i i*, projecting from the strips G G, (see Figs. 4, 6, and 8,) whereby, when the numbering-head is fitted upon the bed B of the printing-press over one of said strips G, the engagement of a pin, *i*, with the swinging frame of the numbering-head will, when the strip moves in one direction, oscillate the frame far enough to produce thereby a movement of the type-wheels, and in the opposite direction to carry back the pawls *m m* into position to engage each another ratchet-tooth. The reciprocating movement of each strip G, produced by the contact of its ends alternately with the stops H H′ in the movement of the traveling bed to and fro under the impression-cylinder, will thus operate to cause a single movement of the type-wheels in each numbering-head fixed upon the traveling bed over the strip after each imprint from the type.

When it is desired to repeat the impression of the numbers without change thereof, the movable stop H′ is dropped out of contact with the ends of the strips G G, so that no movement of said strips will be produced.

To facilitate printing upon the cylinder-press, a series of consecutively-numbered tickets numbering several thousands at the rate of one thousand at each impression, I construct the numbering-machines each with a case, M′, (see Fig. 7,) about equal in length to that of the traveling bed D of the press, and

with fifty sets of type-wheels mounted upon axial rods *b' b'*, transversely to the length of the case, each set of wheels being actuated by a swinging pawl-frame, *n'*, in manner as above described, to be engaged by one of the pins, *i*, upon one of the strips G on the traveling bed of the press. Along the left-hand margin of the case M', I provide an edge plate, P, wide enough to carry fixed type representing the figures from 1 to 50 in consecutive order, the type being brought into a common plane for print with the type on the type-wheels *a a*, and each in line with one set of said wheels, as shown in Figs. 5 and 6. To print the first one thousand tickets, I fit in a recess at the left of the edge plate P, and between it and the type-wheels, a longitudinally-movable strip, R, of the same length as the case M', and upon this movable strip R, I form or affix ciphers in type to fill out, in connection with the fixed type on the edge plate P, three places of figures at the left of each set of wheels—viz , with two ciphers opposite the first nine digits, and then, by means of an offset, *s*, in the strip, whereby it is narrowed at this point, with one cipher opposite the remaining forty double figures in the column.

The bottom of the recess in which the strip R moves longitudinally and the under side of the strip itself are each formed with a series of offsets, formed by transverse notches *t t' t t'*, (see Fig. 5,) having a bevel of a length corresponding to the interval longitudinally between the several figures on the edge plate P, and the type are so placed upon the strip as that when they are brought into register and line between the fixed type on the edge plate P and those on the wheels *a a* of each set the opposite-inclined surfaces shall so ride up one upon the other as to elevate the strip R high enough to bring the face of the type thereon into the same plane for print as are the type on the edge plate P and on the wheels, whereupon the strip is engaged and held fast by a spring-catch, 14, inserted in a recess in the inner side face of the strip P to project slightly therefrom into a socket in the opposite face of the strip R. While the pressure of the catch is sufficient to hold the strip in position against ordinary pressure, it may be disengaged and released by pushing the strip forcibly with the finger. By releasing the catch and moving the strip longitudinally the projections or offsets thereon sliding down into the notches in the recess will lower the face of the strip so as to carry the type thereon below the level for print. When in this position, the end of the strip projects beyond the case at that end of the edge plate bearing the highest number.

The strip R is of such length as that when the traveling bed D of the press reaches the end of its movement after the first impression the end of the strip will strike the stop H' and be thereby moved inward to carry the type thereon up into line of print with the fixed type and the wheels; hence while at the first impression the fixed type, from 1 to 999, with the last 000, will, with the first figure on the last set of wheels, alone be imprinted after this first impression has been taken, the bed moving out under the inking-rollers will at the end of its movement carry the end of the strip R into contact with the stop H', and thereby automatically bring into line of print the figures to complete the next two places to the left—thus, 005 or 015 or 099—and so fill out the figures of the first thousands, indicated by the first type-wheel in each set except the last, together with the second figure in said last set—thus, 1005 or 1015, &c. At the next movement of the press the first wheels in every set will be automatically changed by the movement of the underlying strip G to indicate the second thousand—thus, 2005, 2015, 2098, 3000.

In the numbering-machines by which the second, the third, fourth, and successive hundreds up to nine in the series of one thousand are printed the movable strip R is omitted, and the three places of figures to the right are represented by appropriate type fixed or formed directly upon the marginal plate P of the casing, at the right of the wheels—thus, 100, or 105, or 115, or 190, &c., in the first; 200, 205, 215, 290, &c., in the second; 500, 501, 505, 590, &c., in the fifth, and so on. By the change in the numbering-wheels after each imprint the figures for print become 1100, 1200, &c., then 2100, 2200, &c., then 3100, 3200, &c., up to a million or more.

In the operation of my improved numbering-machines having fifty sets of type-wheels in combination with the slotted traveling-bed of a cylinder-press provided with movable strips G G and with stops H H', as described, when it is desired to number one thousand tickets at each impression, the type-wheels are all first set to 0, excepting the first wheel in the last set, which is set to 1. The ciphers are depressed out of line of print, and the movable type-strip R on the first machine in the series is pushed outward so as to bring the type thereon also out of line of print. The first impression taken from the series will print a set of of tickets with consecutive numbers from 1 up to one 1000. As the bed moves back from the impression-cylinder to be inked and reaches the end of its travel the movable type-strip R on the first machine in the series striking against the stop-plate H' will be forced inward and carry its type into line of print with the fixed type and type-wheels, while simultaneously the strips G G, also striking the stop-plate H', will be forced inward, and in their movement will produce a movement of the swinging pawl-frame under each set of type-wheels, which will operate to move the first wheel in each set from 0 to 1, excepting the last, which is moved from 1 to 2; hence at the next impression taken by the press from the machines a set of tickets will be printed with consecutive numbers from 1001 to 2000. At the next move the type-wheels are all changed, one number to print 2001 up to 3000, and so on.

Where it is not required to print so large a number of tickets, a sufficient number of the consecutive-numbering machines, each including one or more sets of numbering-wheels, as shown in Fig. 5, are fitted in order upon the traveling bed D of the press, (see the small machine in Fig. 1,) so that their swinging pawl-frames shall engage each one of the pins *i* upon the movable strips G, whose operation, as described, will automatically produce a change in the type-wheels, as required, after each impression taken therefrom.

I claim as my invention—

1. The combination, with the frame and traveling bed of a cylinder printing-machine, a movable bar or strip fitted to play lengthwise in a groove in said bed and project from either end thereof, and a stop on the frame operating to force the bar inward as the bed completes its movement, of a numbering-machine comprising several sets of numbering-wheels actuated by a swinging pawl-frame and mounted upon the bed, a pin projecting from the movable bar to engage said swinging frame, an extended lateral type-plate fixed upon the edge of the numbering-machine carrying type in register with each set of numbering-wheels, an extended movable type-plate notched transversely upon its under side and riding upon counterpart notches in the bottom of a recess between the fixed type-plate and the numbering-wheels, and which projects parallel with the movable bar or strip to engage simultaneously therewith the stop on the frame, and a catch for confining the movable type-plate when forced inward by contact with the stop to bring its type into register and line of print with those on the fixed plate and numbering-wheels, substantially in the manner and for the purpose herein set forth.

2. The combination, with the traveling bed of a cylinder printing-machine, and with a movable bar and strip fitted to play longitudinally within and project at either end from a groove in said bed, a numbering-head fixed upon the bed over the groove, a swinging pawl-frame actuating the numbering-wheels in the head, and a pin projecting from the movable bar or strip to engage the pawl frame, of a movable stop mounted upon the frame of the machine at one end of the travel of the bed, and a lever actuating said stop to move it into and out of line of engagement with the movable bar or strip carried by the bed, substantially in the manner and for the purpose herein set forth.

3. The combination, with the traveling bed of a cylinder printing-machine, a movable actuating bar or strip fitted to play lengthwise in a groove in said bed and to project beyond the ends thereof, and one or more numbering-heads mounted upon the bed over the bar to be actuated by its movement, of sectional covering-plates F′ F′, fitting in the groove above the movable bar and flush with the face of the bed, to permit the placing of type and furniture around the numbering-head without interfering with the movement of said bar, substantially in the manner and for the purpose herein set forth.

4. The combination, in a numbering-head, of five or more parallel sets of numbering-wheels, a single swinging pawl-frame actuating each and every set of wheels, a type-plate fixed upon the lateral edge of the casing of the head and bearing numeral types to register in line of print with those upon each set of type-wheels, a second parallel movable type-plate fitted in a recess between said fixed type-plate and the wheel, bearing ciphers arranged to be brought by a longitudinal movement of the plate into and out of register and line of print with the numerals upon the fixed type-plate, and which is formed with a continuous series of transverse longitudinally-beveled notches on its under side to ride upon counterpart notches within the recess, and a catch automatically engaging and confining said movable type plate when brought into line of print with the fixed type-plate, substantially in the manner and for the purpose herein set forth.

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

JAMES H. REINHARDT.

Witnesses:
J. F. ACKER, Jr.,
A. B. MOORE.