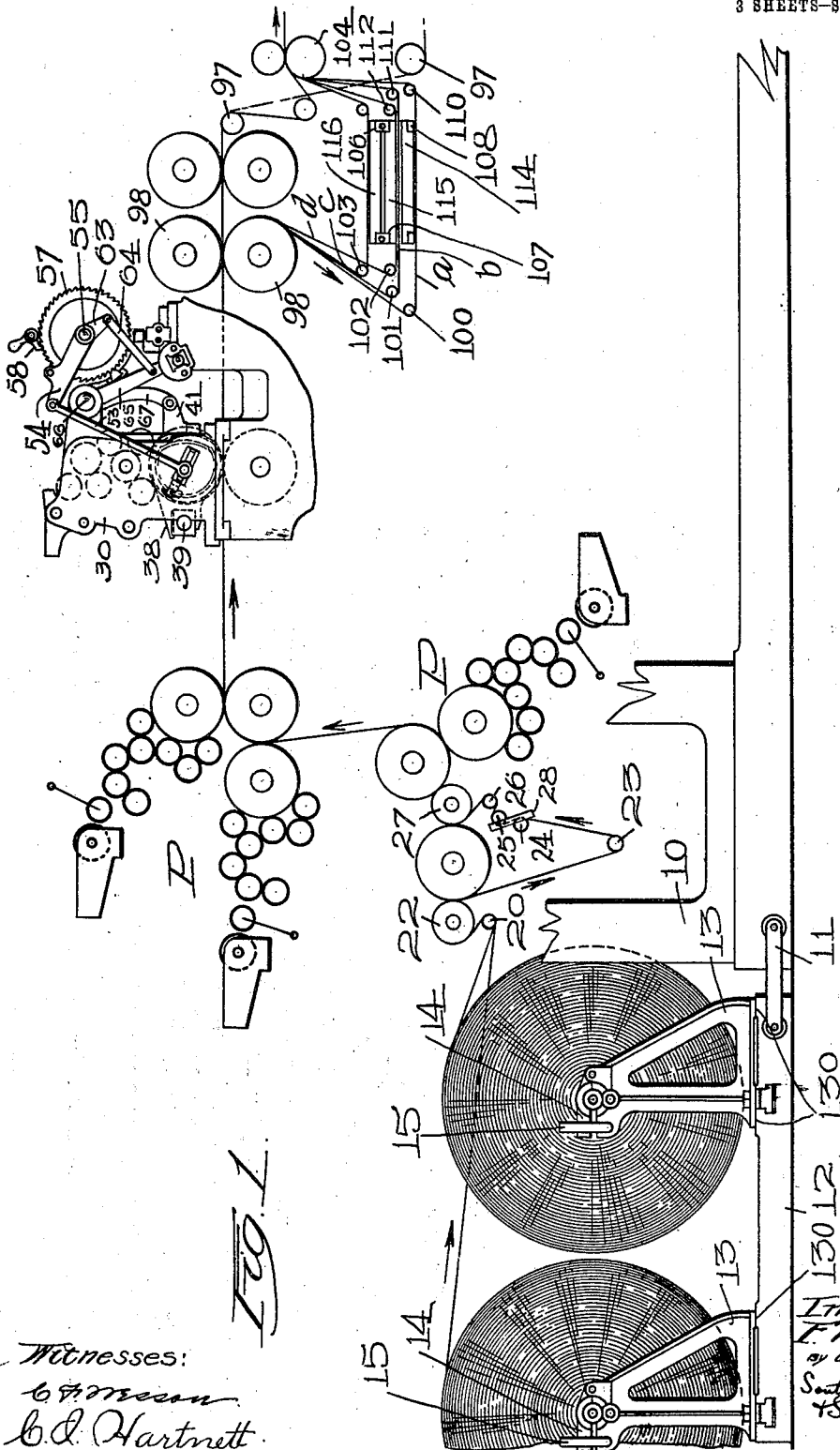


F. MEISEL.
 PRINTING AND NUMBERING MACHINE.
 APPLICATION FILED AUG. 17, 1910.

1,034,637.

Patented Aug. 6, 1912.

3 SHEETS-SHEET 1.



Witnesses:
 C. A. Mason
 C. L. Hartnett.

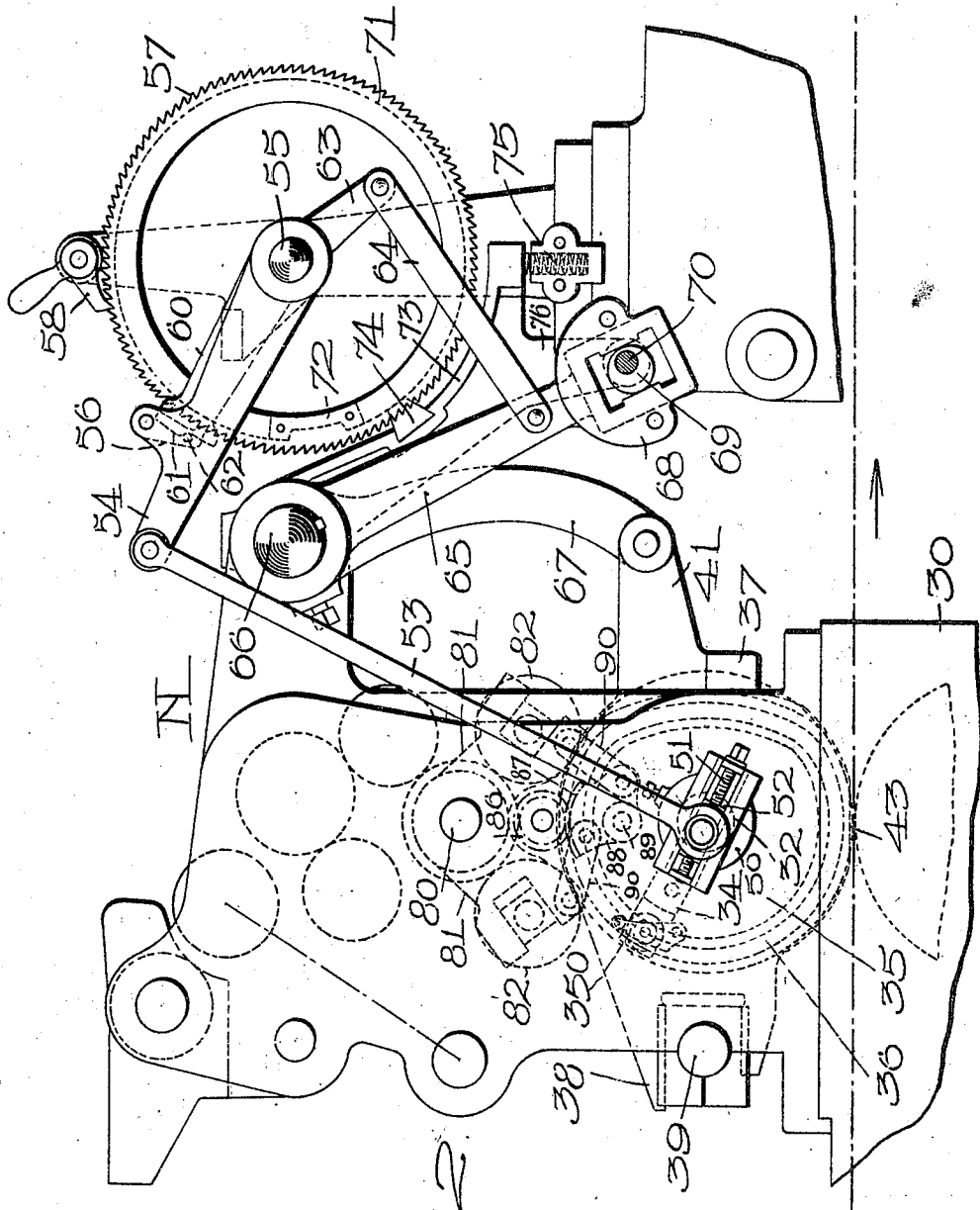
Inventor
 F. Meisel
 by attorneys
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 & Southgate

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3 SHEETS—SHEET 2.



Witnesses:
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FIG. 2

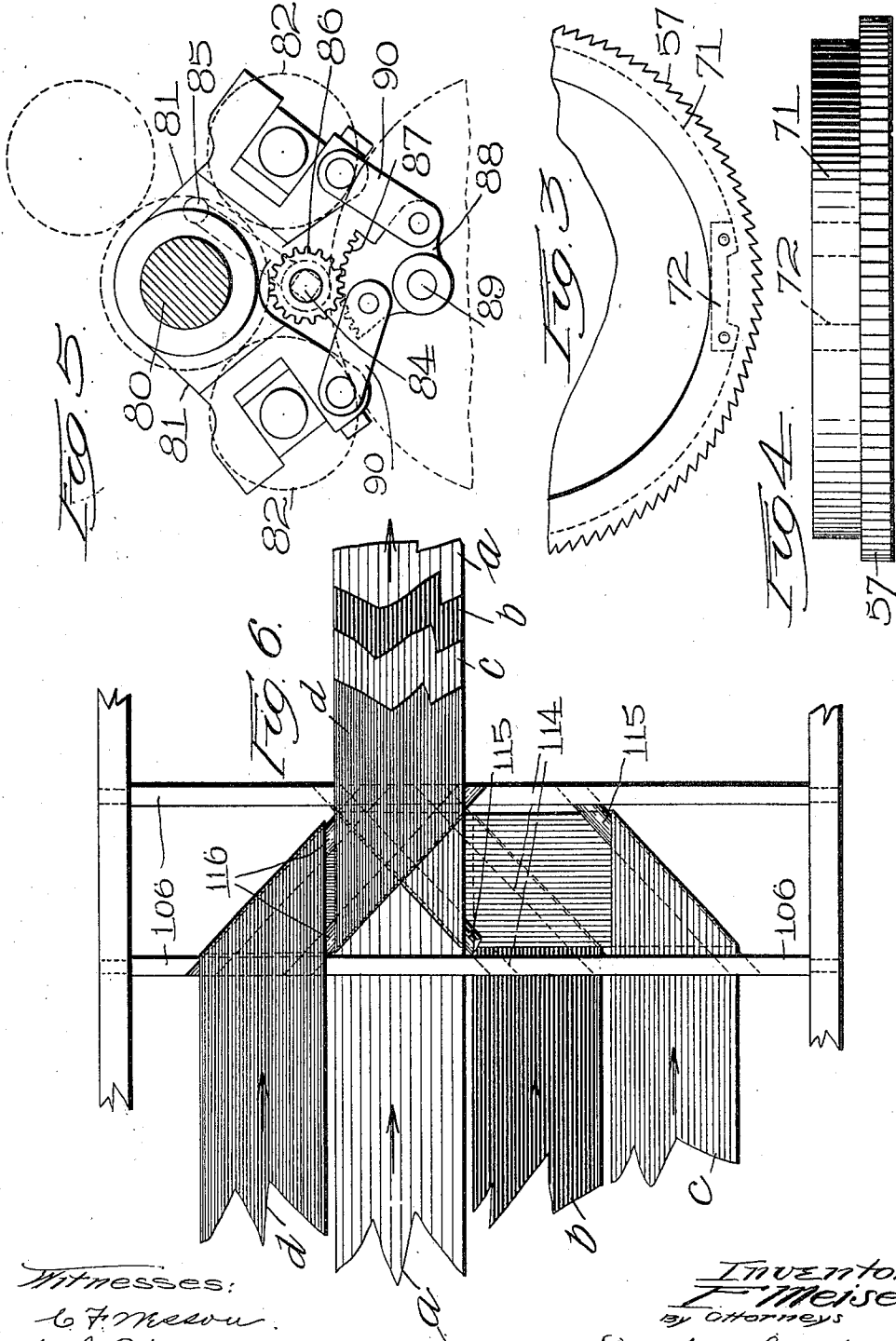
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

FRANCIS MEISEL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO MEISEL PRESS & MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

PRINTING AND NUMBERING MACHINE.

1,034,637.

Specification of Letters Patent.

Patented Aug. 6, 1912.

Application filed August 17, 1910. Serial No. 577,616.

To all whom it may concern:

Be it known that I, FRANCIS MEISEL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Printing and Numbering Machine, of which the following is a specification.

This invention relates to a printing and numbering machine.

The principal objects of the invention are to provide a machine of this character with improved means for numbering the sheets or pages and of such a character that when the end of a series is reached the numbering arrangement will be automatically disconnected from the feed so that the last number will continue to print indefinitely if the press continues in operation, and to provide hand operated means for throwing out the numbering device in the same way connected with the automatic arrangement in a very simple manner.

The invention also involves improvements in details of construction and combinations of parts as will appear hereinafter.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a diagrammatic side elevation of a printing machine constructed in accordance with this invention. Fig. 2 is a side view of a portion of the numbering mechanism on enlarged scale. Fig. 3 is a side view of a ratchet wheel thereof. Fig. 4 is a plan thereof. Fig. 5 is a side view on larger scale of the roller throw off of the numbering mechanism, and Fig. 6 is a plan of the collating device.

In the form of the invention shown in the drawings the main frame 10 of the machine is connected by links 11 or the like with a base or stand 12 for a plurality of sets of brackets 13 adapted to support the paper rolls. This machine being designed particularly for printing a plurality of webs at the same time, these rolls are arranged so that a number of them can be placed on the machine at once to feed the webs through simultaneously. In the present case each of the brackets 13 is of a general triangular shape and is supported on planing spots 130 on the frame and bolted to the frame at the rear so as to extend forwardly therefrom to have a bearing well forward of the bolts. The bolts are located

substantially under the centers of the bearings at the top of the brackets. In this way it will be seen that any force applied to the webs pulling toward the main frame 10 will serve to keep the brackets seated firmly on the base and held securely in position. Each of the brackets is provided with a swinging member 14 having a half bearing for the shaft of the roll and a swinging locking member 15 therefor. In the present instance four webs, *a*, *b*, *c*, and *d*, are shown but it will be understood that some other number of webs can be passed through the machine.

The webs all pass to a roll 20 under which they extend and then pass upwardly over a feed roll 22. From this roll the webs fall and each forms a loop in which is located a light roller 23. This prevents entanglement of the web during its rapid passage through the machine. Each web then passes under and over stationary bars 24, 25, and 26. On the bars 24 and 25 are laterally adjustable guides 28 between which the webs pass. Thus the webs are guided laterally and kept in proper relative position so that they can be cross associated as explained hereinafter with the printed matter in registration. The irregularity in the edges of the rolls renders this guiding necessary. It will be understood that the feed rolls 22 and 27 are similar and are positively driven by mechanism which it is not necessary to describe in detail as it is well understood in this art. The webs then pass through the printing mechanism which is designated in a general way by the letter P and the details of which will not be described, as any printing mechanism can be employed.

The numbering mechanism N comprises a frame 30 on which the impression roll 31 is driven in any desired way, the driving mechanism not being shown herein. Rotating in contact with the impression roll is a numbering head shaft 32 which is driven in the usual manner. On this shaft are a plurality of numbering heads 34, one for each web, each constructed in the usual or any desired way, and each having an arm 350 for operating the numbering disks so as to change the numbers in the usual way. The rolls on these arms are operated by an equal number of non-rotatable cams 35 having grooves 36 in which these rolls travel.

Each cam 35 is mounted on a frame 37 having a horizontal fork 38 which slides on a stud 39 mounted on the frame 30 on which the numbering mechanism is supported. It is also provided with an arm 41 extending in the opposite direction for sliding it back and forth. It will be understood readily from a consideration of the shape of the groove of this cam that when in the extreme left-hand position, as shown in Fig. 2, the eccentricity of the cam is at its maximum and each numbering head roller will be operated once during each rotation of the shaft on which the numbering heads are mounted. But when this cam is shifted to the right the eccentricity of the cam is reduced to such an extent that the arms of the numbering head will not be vibrated sufficiently to feed the numbering disk. In other words, the flat part of the groove will be substantially the same distance from the center of the shaft 32 as the normally concentric part. It will be understood that the number heads are so constructed as to permit a certain amount of play of the numbering head arms without operating the numbering disks. It will be seen that the sliding cam is provided with a flat spot 43 at the bottom. This is merely to provide a clearance for the impression cylinder.

The way in which the cams 35 are shifted back and forth both automatically and by hand will now be described. To the end of shaft 32 is fastened a T-slotted crank 50. In the T-slot or groove of this crank a stud 52 is held and made to slide in the slot. The head of the stud which fits the slot has a threaded orifice, through which a screw 51 passes. By means of the screw the stud 52 can be moved to one or the other side of the center. When set to either side of the center of the shaft 32 it will have a crank motion, varying in amplitude in proportion to its distance from the center. This stud is connected with a link 53 which is pivoted to an arm 54 which swings on a transverse shaft 55. On the arm 54 is a spring-pressed pawl 56 normally in engagement with the teeth of a ratchet wheel 57 rotatable on the shaft 55. A weighted pawl 58 is also shown for preventing reverse motion of the ratchet wheel. Also pivoted on the shaft 55 is an arm 60 having a cam surface 61 adapted to engage a pin 62 on the pawl 56. In the position shown in Fig. 2 these parts are in normal position so that at each rotation of the crank 52 the arm 54 will oscillate and carry the ratchet wheel around a space of one or more teeth, according to the setting of the screw 51. But if the arm 60 is moved downwardly, the cam surface 61 thereon will engage the pin 62 and throw the pawl 56 out of engagement with the teeth so that the feed of the ratchet wheel will be stopped. This is accomplished by providing the arm 60 with

an arm or projection 63 and connecting it by a link 64 with an arm 65 keyed on a rock shaft 66. Also keyed on this rock shaft are a plurality of arms 67 which are pivotally connected with the arms 41 on the several sliding cams. The arm 65 is provided with a head 68 having a slot therein in which fits an eccentric 69 on a stud 70 fastened to an extension 76 of an arm 73. Eccentric 69 is provided with a handle for operating it by hand. When this eccentric and cam are in the position shown in Fig. 2 the arm 65 is in its left-hand position and the parts will operate to number the sheets in regular order; but when the eccentric is turned opposite to the position shown in Fig. 2 the arm 65 is moved to the right, the arm 60 is moved downwardly so as to throw the pawl 56 out of engagement with the teeth on the ratchet wheel and the cams 35 are moved to the right so as to stop the operation of the feed of the numbering mechanism. But at this time the numbering mechanism will continue to print the last number as long as the press is operated. For the automatic operation of this mechanism the printing and numbering cylinders make a predetermined number of revolutions to one of the ratchet wheel. The numbering machines number consecutively, during the greater part of the one revolution of the ratchet wheel, but during the last part of a full revolution of the ratchet wheel the same number is printed. This process is repeated automatically as long as the eccentric 69 remains in the position shown in Fig. 2. For instance, if the ratchet wheel has 210 teeth and it is desired to number consecutively up to 200 the following 10 impressions of the numbering machines will be 200. To accomplish this result a wheel 71 is fixed to the ratchet wheel 57 and having a steel plate 72 set in having a depression in its periphery. The length of this depression corresponds to the distance the disk 71 moves during the number of impressions the numbering machines are desired to print having the same value plus the width of tooth 74. Pivotally mounted on the shaft 66 is an arm 73 having a hardened steel tooth 74 set therein and adapted to fit in the notch. Ordinarily this tooth rides on the circumference of the wheel 71 but when it comes to the notch a spring 75 moves the arm up and forces the tooth into the notch. The arm 73 is provided with an extension 76 in which the stud 70 is fastened. Consequently this motion of the arm 73 carries the arm 65 bodily to the right and accomplishes the same objects as are accomplished by the hand oscillation of the eccentric 69. The numbering mechanism also is provided with inking mechanism having in general the usual characteristics but in order to provide an improved roller throw-off mechanism the

following construction is provided. Mounted on a shaft 80 located on the side of the numbering head opposite the impression roll are a pair of arms 81 extending in opposite
 5 directions therefrom but both extending toward the numbering heads. On each of these arms is an inking roller 82 adapted to be inked from the ordinary mechanism. Located on the frame 30 between this shaft and
 10 the cam 35 is a shaft 84 which has a handle 85 for operating it by hand. It is provided with a gear or pinion 86 which meshes with a gear segment 87 on a member 88 oscillatable on a stud 89. This member is provided
 15 with two links 90 pivoted to it on opposite sides of the stud on which it swings and extending in opposite directions, each being pivoted to one of said arms 81. It will be seen that with this simple construction both
 20 of the inking rollers can be thrown off, thus stopping the printing operation. This is ordinarily done when the cam 36 is thrown to inoperative position, and prevents the further repetition of the last number, to
 25 which reference has been made.

After the plurality of webs have passed through the numbering mechanism they can be brought to a roll 97 and taken to a re-winder in the usual way, but I prefer to
 30 conduct them through a collating device to which they pass from between rolls 98. The drawings show four webs, each passing to a different roll 100, 101, 102 and 103 located at different points in order to register with
 35 the proper part of the collating or registering device. The purpose of the collating device as will be understood is to bring these four or other number of webs into registration with each other, one over the other, so
 40 that when they pass between rolls 104 to be taken to the cutter or other mechanism they will be in perfect registration. For this purpose the frame of the machine is provided with bearings in which are located the
 45 journals for the rolls 100, 101, 102 and 103 and on which also are located frames 106, 107 and 108. Under the bottom frame the under web *a* passes from the roll 100 to another roll 110 without deviation from its
 50 course. The other three webs are intended to be brought from their positions at the side of this web *a* and carried directly over it so that they issue from the collating device in registration with it.

55 The web *b* travels to an intermediate position under the roller 101 and is brought out from the machine under a roll 111. For this purpose the lower frame 108 is provided with two fixed turning bars 114 located at an
 60 angle of 45 degrees to the direction of motion of the web and parallel with each other. These bars are spaced far enough apart so that the web *b* enters the collating device over them and over the frame 108, then
 65 passes around the outer bar and down under

it so as to take up a direction transverse to the direction of motion of the web *a*, then passes around the other bar 114 and out of the collating device directly over the web *a* to the delivery roll 111. The web *c* which
 70 passes under the roll 102 on one end comes over a turning bar 115 on the frame 107, then under it and under another turning bar 115 on the same frame and out over the
 75 other two webs to the delivery roll 112. These turning bars 115 are located at an angle of 45 degrees to the direction of travel of the web, and one of them is directly over the inner turning bar 114 but they are farther apart than the bars 114. The web *d*
 80 comes in from the roll 103 over the upper frame 106 and its turning bars 116, around which it passes to the delivery roll 113. The turning bars 116 are at an angle of 90 degrees to the other turning bars.

It will be understood, of course, that with a greater number of webs pairs of turning bars of the same character parallel with those described will be provided, but if the other webs entering the collating device are
 90 at a greater distance from the top web their turning bars will simply be a greater distance apart. In all cases the delivery turning bars of all pairs are directly under or over the inner bars of the pairs described.
 95 In this way it will be seen that the several webs, of the same or different colors, are printed and numbered while being taken through the machine parallel with each other and all in the same plane, and that
 100 they are then collected and registered so that they issue one over the other.

While I have illustrated and described a preferred embodiment of the invention, I am aware that many modifications can be
 105 made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction herein shown and
 110 described, but

What I do claim is:—

1. In a machine of the character described, the combination of a shaft adapted to rotate, a numbering head mounted thereon to rotate therewith, having an operating
 115 arm, a non-rotatable cam adjacent to said shaft having a center and provided with a continuous cam groove, parts of which are drawn on a circle from said center, and other parts of which are eccentric with respect thereto, said groove being adapted to receive said arm for operating it as the shaft rotates, and means for sliding said cam to and fro into two positions in one of which
 120 the said center of the cam is concentric with the shaft, and the other of which the center of the shaft is between the centers of the two portions of the groove.

2. In a numbering machine, the combina- 130

tion of a rotary numbering head having an operating arm rotatable with it, a shaft on which said head is mounted, a cam having a continuous groove formed of two parts, each constituting a curve drawn from a center within the cam, and means for moving the cam in a direction parallel to the line connecting said centers into two positions, in one of which one of said centers is concentric with said shaft, and in the other of which the center of the shaft is between said centers.

3. In a numbering machine, the combination of a numbering head having an operating arm, a cam for operating the arm, means for causing a relative rotary motion between the cam and head to operate the numbering head, and means for causing a relative sliding motion between the cam and head in a direction perpendicular to the axis about which said rotary motion takes place to render the cam operative or inoperative without disconnecting the arm therefrom.

4. In a numbering machine, the combination of a numbering head having an operating arm, a cam for operating the arm, means for causing a relative rotary motion between the cam and head to operate the numbering head, and means for sliding the cam back and forth in its own plane into operative and inoperative positions.

5. In a numbering machine, the combination of a numbering head having an operating arm rotatable with it, a non-rotatable cam for operating the arm, means for rotating the numbering head, and means for causing a relative sliding motion between the cam and head in a direction parallel with the plane of the cam, to render the cam operative or inoperative.

6. In a numbering machine, the combination of a rotary numbering head having an operating arm, a cam having a groove for controlling the motions of said arm as the numbering head rotates, said cam having a fork, a stationary support on which said fork is located, and an arm on the cam for operating to slide the cam on said support.

7. In a numbering machine, the combination of a rotary numbering head having an operating arm, a cam having a groove for controlling the motions of said arm as the numbering head rotates, said cam having a fork, a stationary support on which said fork is located, an arm on the cam for sliding the cam on said support, a hand shaft, and means on said hand shaft for moving said arm back and forth.

8. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, of a non-rotatable cam for controlling the motions of said arm as the shaft rotates, a shaft having two arms keyed thereto, one being pivotally connected with the cam, hand operated means for mov-

ing the other arm to turn said shaft and reciprocate the cam, and power operated means for periodically moving said second arm bodily independently of the position of the hand-operated means.

9. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, of a non-rotatable cam having means for controlling the operation of said arm as the head rotates, a lever connected with said cam having a head provided with jaws, an eccentric located between said jaws, and a shaft on which said eccentric is mounted, whereby the turning of said shaft will move the lever and change the position of the cam.

10. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, of a non-rotatable cam having means for controlling the operation of said arm as the head rotates, a lever connected with said cam having a head provided with jaws, an eccentric located between said jaws, a shaft on which said eccentric is mounted, whereby the turning of said shaft will move the lever and change the position of the cam, and power operating means for bodily moving said shaft to turn the lever.

11. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, of a non-rotatable cam for controlling the operation of said arm as the head rotates, manually operated means for moving said cam bodily, and separate power operated means for bodily moving the hand operated means to move the cam independently of the position of the hand operated means.

12. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, of a non-rotatable cam having means for controlling the operation of said arm as the head rotates, a lever connected with said cam having a head provided with jaws, an eccentric located between said jaws, a shaft on which said eccentric is mounted, an arm adapted to swing freely and having a tooth, said arm being connected with said eccentric, whereby the eccentric will move bodily with the arm, a rotary wheel having a notch in its circumference, means for rotating said wheel once for a plurality of revolutions of the numbering head, and means for forcing said tooth into the notch when they register.

13. In a numbering machine, the combination with a numbering head having an arm for operating it, of a cam having means for controlling the operation of said arm, a lever connected with said cam, an arm adapted to swing freely and having a tooth, said arm being connected with said lever, means whereby the latter will move bodily with the arm, a rotary wheel having a notch

in its circumference, means for rotating said wheel once for a plurality of revolutions of the numbering head, and means for forcing said tooth into the notch when they register.

5 14. In a numbering machine, the combination with a numbering head having an arm for operating it, a cam having means for controlling the operation of said arm, a lever connected with said cam having a head provided with jaws, an eccentric located between said jaws, a shaft on which said eccentric is mounted, an arm adapted to swing freely and having a tooth, means for connecting said arm with said eccentric, 10 a wheel having a notch adapted to come into registration with said tooth as the wheel rotates, a ratchet wheel rotatable with said wheel, and means connected with said numbering head for rotating said ratchet wheel step by step as the head rotates.

15. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, a non-rotatable cam having means for controlling the operation of said arm as the head rotates, a lever connected with said cam having a head provided with jaws, an eccentric located between said jaws, a shaft on which said eccentric is mounted, an arm adapted to swing freely and having a tooth, means for connecting said arm with said eccentric, a wheel having a notch adapted to come into registration with said tooth as the wheel rotates, a spring for pressing said arm against the wheel, a ratchet wheel rotatable with said wheel, and means connected with said numbering head for rotating said ratchet wheel step by step as the head rotates.

16. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, a non-rotatable cam having means for controlling the operation of said arm as the head rotates, and a lever connected with said cam, of means whereby the lever can be moved to change the position of the cam, an arm having a tooth, means for connecting said arm with said means for moving the lever, a wheel having a notch adapted to come into registration with said tooth as the wheel rotates, a spring for pressing said arm against the wheel, a ratchet wheel rotatable with said wheel, means connected with said numbering head for rotating said ratchet wheel step by step as the head rotates, and means whereby when said lever is moved to move the cam in one direction the means for turning the ratchet wheel will be rendered inoperative.

17. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, and a non-rotatable cam for controlling the motions of said arm as the shaft rotates, of a shaft having two arms keyed thereto, one being pivotally connected with the cam, hand-

operated means for moving the other arm to turn said shaft and reciprocate the cam, and power operated means for periodically moving said second arm bodily independently of the position of the hand-operated means, the last named means comprising a wheel and a ratchet wheel rotatable together, said wheel having a notch, a freely swinging arm having a tooth in position to engage said notch, a spring for keeping the tooth against the wheel, and means on said arm for moving the cam into inoperative position when the tooth enters the notch.

18. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, and a non-rotatable cam for controlling the motions of said arm as the shaft rotates, of a shaft having two arms keyed thereto, one being pivotally connected with the cam, hand-operated means for moving the other arm to turn said shaft and reciprocate the cam, and power operated means for periodically moving said second arm bodily independently of the position of the hand-operated means, the last named means comprising a wheel and a ratchet wheel rotatable together, said wheel having a notch, a freely swinging arm having a tooth in position to engage said notch, a spring for keeping the tooth on the wheel, means on said arm for moving the cam into inoperative position when the tooth enters the notch, means connected with the numbering head for rotating the ratchet wheel step by step as the numbering head rotates, and means for rendering said last named means inoperative when the cam is moved into inoperative position.

19. In a numbering machine, the combination of a rotary numbering head having an operating arm, a bodily movable non-rotatable cam for operating said arm as the head rotates, an adjustable crank rotatable with the numbering head, a lever oscillatable about a center and connected with said crank, a wheel having a notch, a ratchet wheel rotatable about the center on which said wheel rotates, an oscillatable pawl connected with said lever for engaging the ratchet wheel and rotating it, a lever oscillatable on the same center and having a cam surface for engaging said pawl and moving it out of engagement with the tooth when in a certain position, and means for moving the first named cam and lever simultaneously to render the cam and pawl inoperative.

20. In a numbering machine, the combination with a numbering head having an arm for operating it, and a cam for controlling the motions of said arm as the head moves, of a shaft having two arms keyed thereto, one being pivotally connected with the cam, hand-operated means for moving

the other arm to turn said shaft and operate the cam, and power operated means for periodically moving said second arm bodily independently of the position of the hand-operated means.

21. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, and a non-rotatable cam for controlling the motions of said arm as the head rotates, of a shaft having two arms keyed thereto, one being pivotally connected with the cam, hand-operated means for moving the other arm to turn said shaft and reciprocate the cam, and power operated means for periodically moving said second arm bodily independently of the position of the hand-operated means.

22. In a numbering machine, the combination with a rotary numbering head having an arm for operating it, and a non-rotatable cam for controlling the motions of said arm as the shaft rotates, of a shaft having two arms keyed thereto, one being pivotally connected with the cam, hand-operated means for moving the other arm to turn said shaft and reciprocate the cam, power operated means for periodically moving said second arm bodily independently of the position of the hand-operated means, inking rollers and means for throwing the inking rollers out of contact with the numbering head.

23. In a machine of the character described, the combination with a numbering device, comprising number printing members, means for moving said device, means for periodically feeding the number printing members as the numbering device moves, of automatic means for permanently throwing out of operation said feeding means after a predetermined number of impressions have been made, whereby the numbering device will continue to perform the op-

eration of printing the last number at each subsequent movement thereof.

24. In a machine of the character described, the combination with a numbering device, comprising number printing members, means for moving said device, means for periodically feeding the number printing members as the numbering device moves, means for periodically inking the number printing members, of automatic means for permanently throwing out of operation said feeding means after a predetermined number of impressions have been made, whereby the numbering device will continue to perform the operation of printing the last number at each subsequent movement thereof, and means for throwing the inking means out of operation to prevent the collection of ink on the part of the number printing device that repeats.

25. In a numbering machine, the combination with a rotary numbering head, an impression roll, inking rolls for the numbering head, means for operating the numbering head during each revolution thereof, and means for permanently stopping the feed of the numbering head without stopping the machine, whereby the numbering head will continue to operate to print the last number repeatedly as long as the machine continues to operate, of means for throwing the inking roll out of position to engage the numbering head whereby the repeated action of the numbering head can be caused to take place without actually printing the repeated numbers.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

FRANCIS MEISEL.

Witnesses:

A. M. JOHNSON,
A. E. MEISEL.