No. 710,380. Patented Sept. 30, 1902.

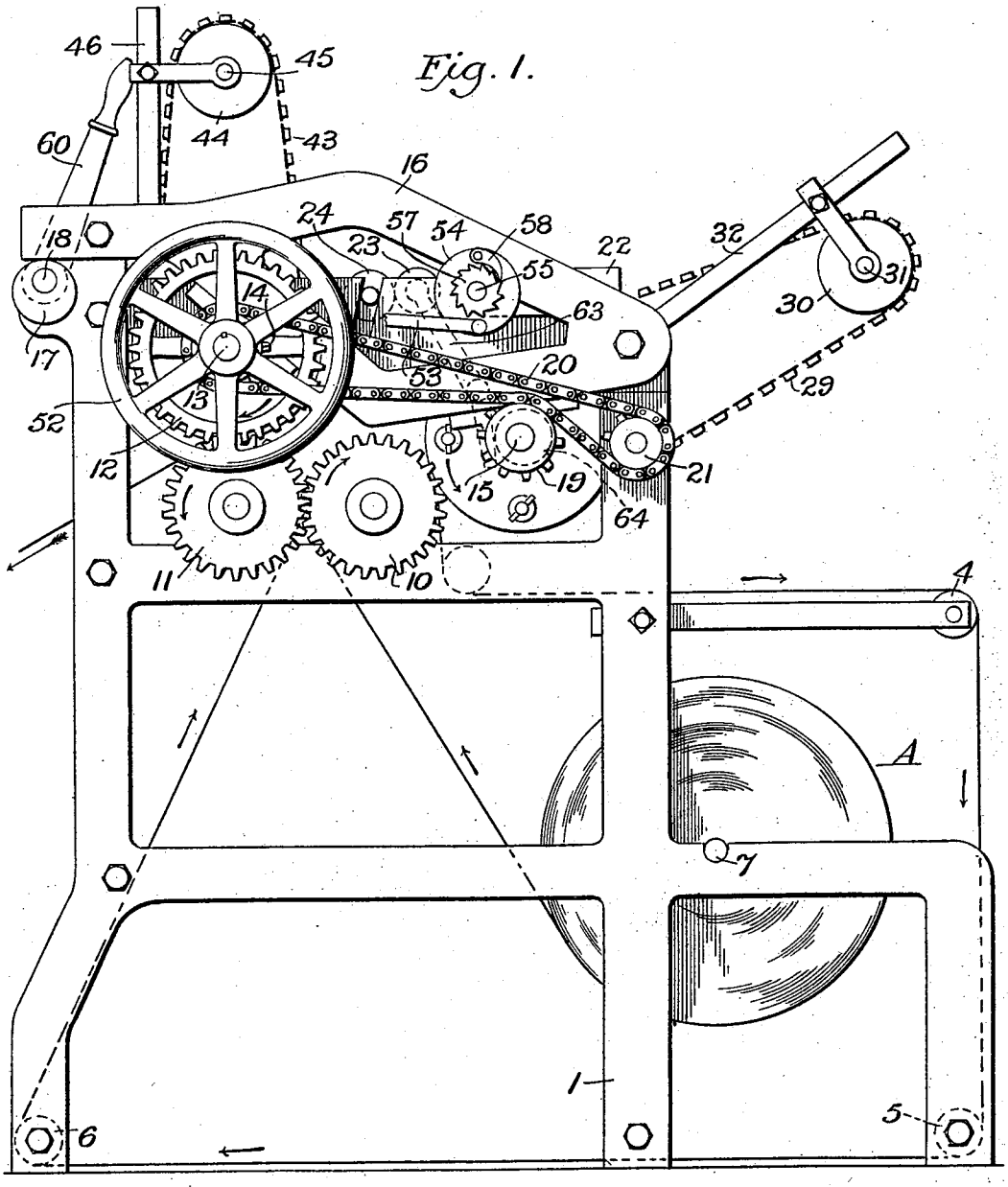
F. M. TURCK.

NUMBERING MACHINE.

(Application filed Aug. 31, 1901.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



WITNESSES:

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No. 710,380. Patented Sept. 30, 1902.

F. M. TURCK.

NUMBERING MACHINE.

(Application filed Aug. 31, 1901.)

(No Model.) 4 Sheets—Sheet 2.

Fig. 2.

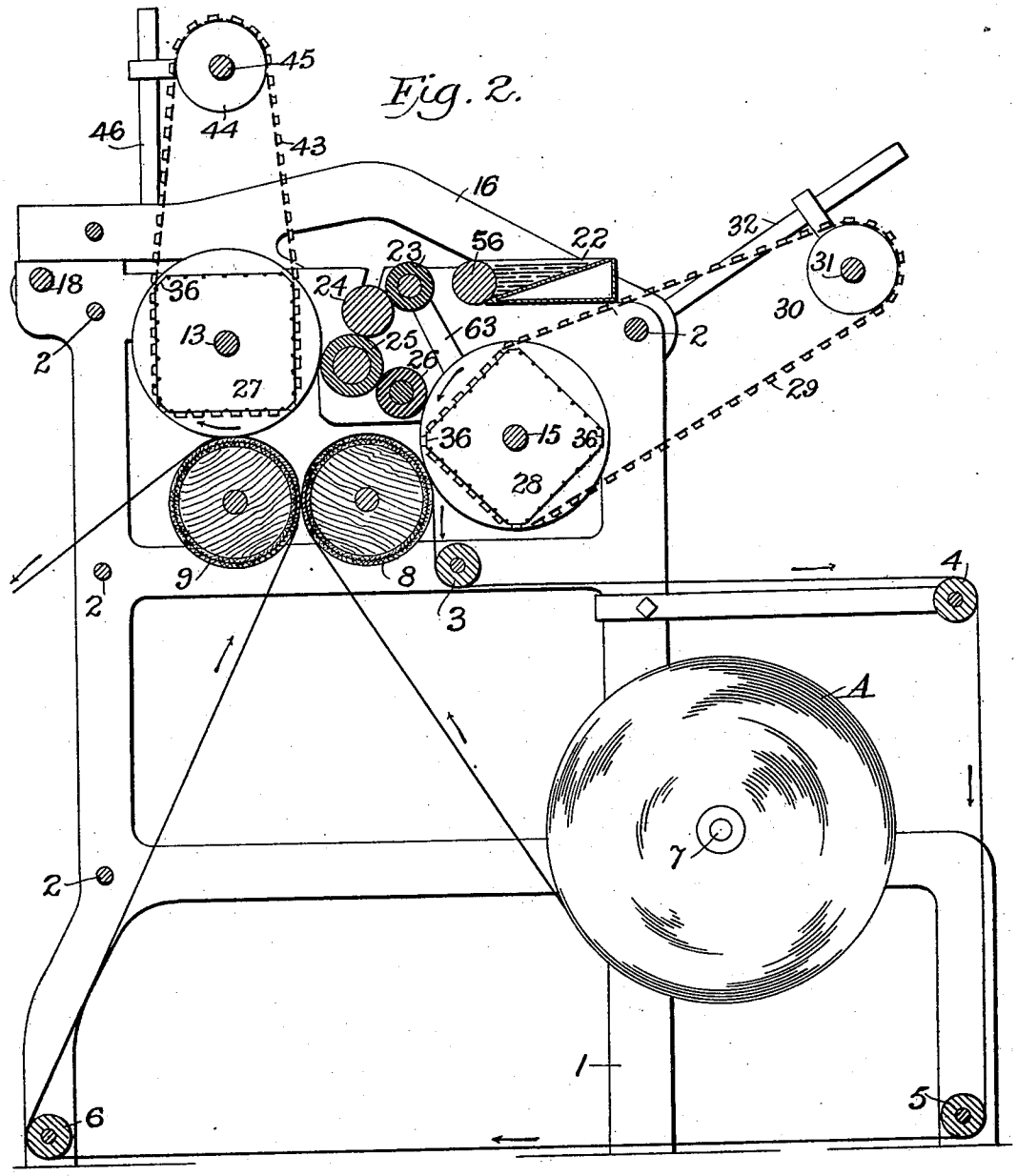
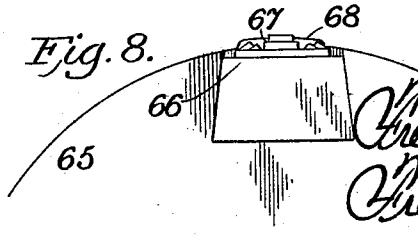


Fig. 8.



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No. 710,380. Patented Sept. 30, 1902.

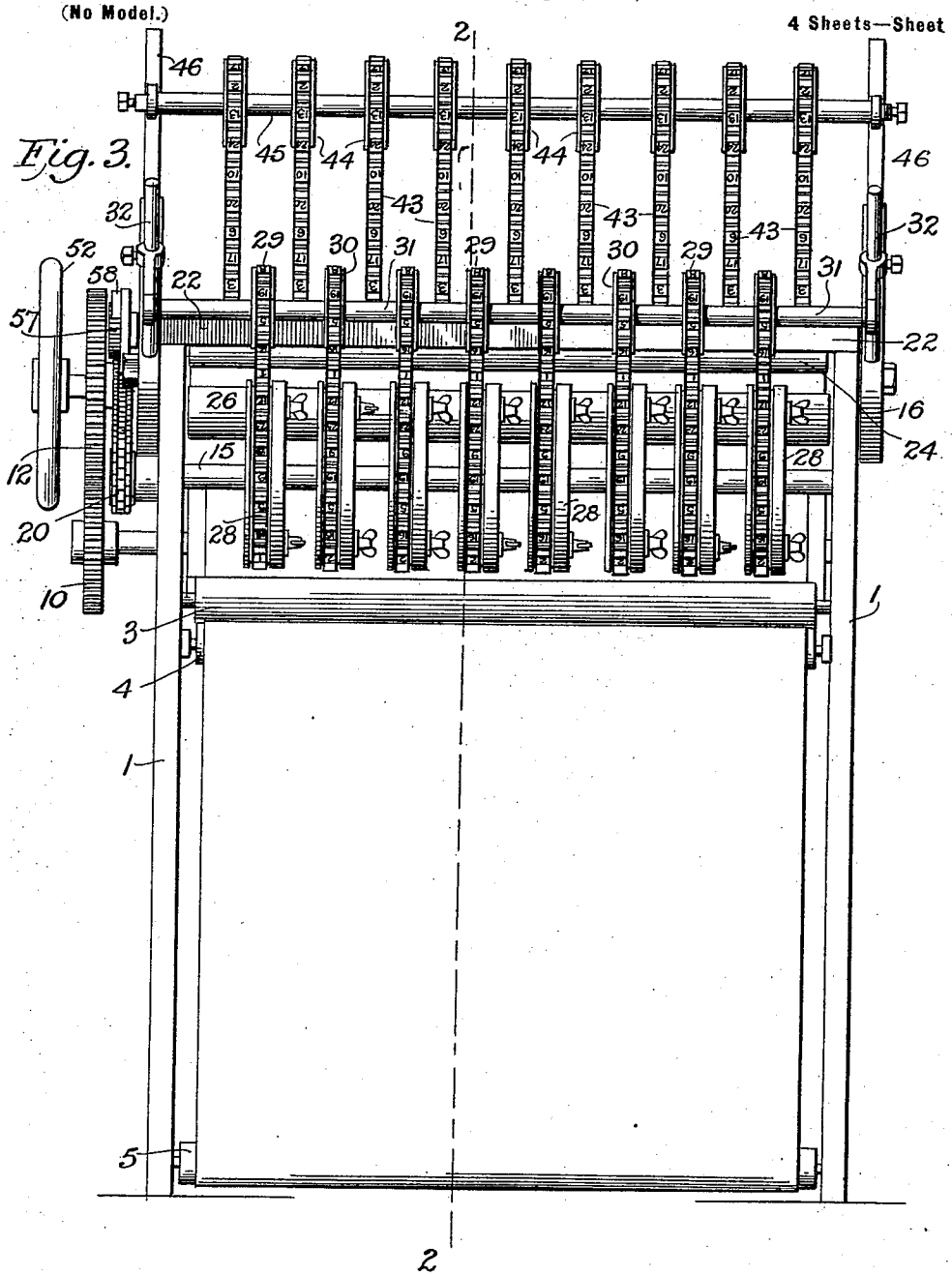
F. M. TURCK.

NUMBERING MACHINE.

(Application filed Aug. 31, 1901.)

(No Model.) 4 Sheets—Sheet 3.

Fig. 3.



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No. 710,380. Patented Sept. 30, 1902.

F. M. TURCK.

NUMBERING MACHINE.

(Application filed Aug. 31, 1901.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 4.

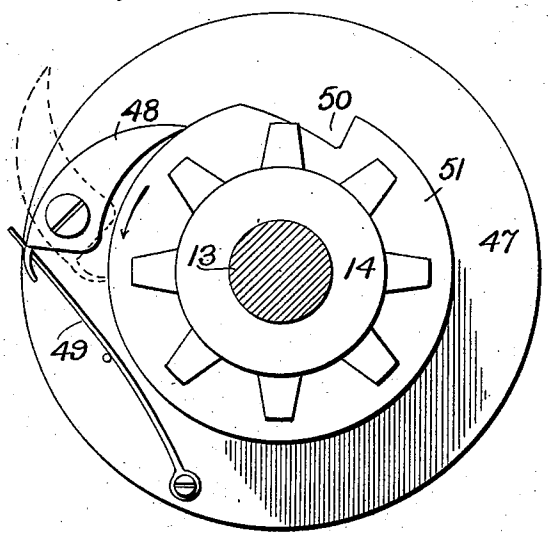


Fig. 5.

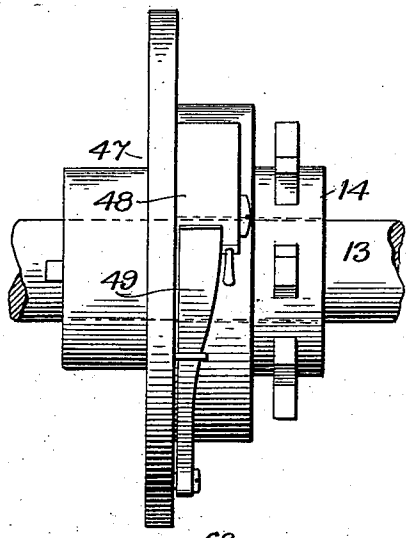


Fig. 6.

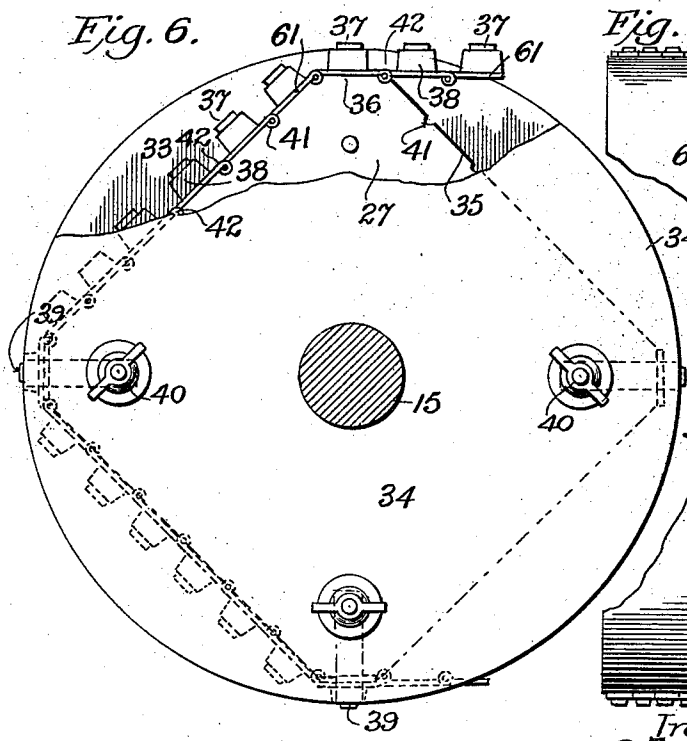
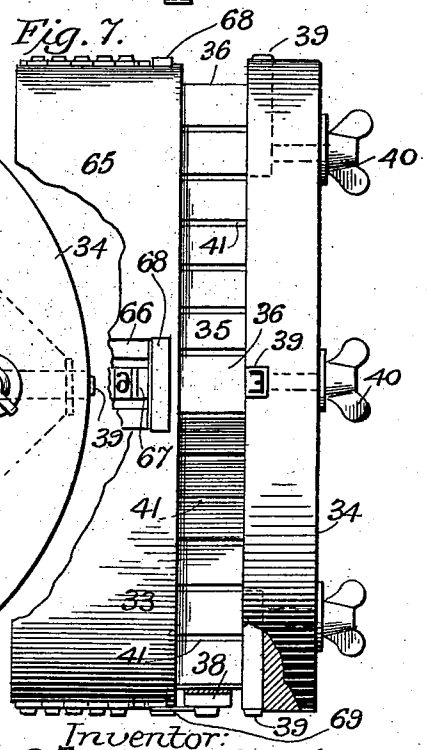


Fig. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

FREDERICK M. TURCK, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO TRACY MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

NUMBERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 710,380, dated September 30, 1902.

Application filed August 31, 1901. Serial No. 73,995. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK M. TURCK, a citizen of the United States of America, and a resident of New York city, county of New York, and State of New York, have invented certain new and useful Improvements in Numbering-Machines, of which the following is a specification.

This invention relates to a numbering-machine or numbering attachment for printing machinery, its object being to provide improved mechanism for consecutively or serially numbering or applying letters or symbols of any kind to a web of paper, sheets, sales-slips, or the like. The machine is primarily intended as an attachment to a regular printing-press, into which the paper after it has been numbered may be led to receive such additional printing as is desired. One of the important features among many that might be mentioned is a wheel or rotary device of novel construction in connection with which a printing belt or tape is arranged, so that I am enabled to apply numbers or other characters to a web or sheet in a simple and positive manner at regular intervals and in any desired position, so that when the sheets are subsequently folded or superimposed and made into book form the slips or leaves of the book will be numbered reliably in consecutive order, and in the practical construction of the machines embodying the present improvements two printing-couples are employed, one member of each being an impression-cylinder, while the other is a plural arrangement of said rotary wheels and printing-belts, one printing-couple being arranged to execute printing action on one side of the web and the other on the other side thereof, and the type, dies, or other printing devices on the belts are arranged so that the printing is not from adjacent types on the belt, but from non-adjacent ones, so that between two impressions a number of type equal in extent to the distance between successive impressions to be made on the web or sheet are passed or skipped without printing, the object of arranging type in this manner and printing from the non-adjacent types being to reduce to a minimum the length of the printing-belt.

The invention also includes means by which the numbering devices may be readily receded or advanced in position, as the case may require, when the web has been broken or exhausted or when for any reason the paper or printing is imperfect. Also it comprises a novel means for leading the web through the first printing-couple, thence around the paper-roll, and then through the second printing-couple to secure compactness of arrangement, as well as to enable efficient printing to be had on both sides of the paper, together with the employment of a single ink-fountain and inking means for both printing-couples.

The invention also consists in numerous details and peculiarities in the construction, combination, and arrangement of the various parts, substantially as will be hereinafter described and claimed, and it will be noted that although my present improvements have been designed more particularly with reference to the marking of sales-slips with the proper numbers I am not by any means confined to this particular use of the invention, and it will be understood that the invention is a broad one and is limited to no particular kind of printing-press or line of industry.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of my improved numbering-machine. Fig. 2 is a vertical section on the line 2 2 of Fig. 3. Fig. 3 is a front end elevation. Figs. 4 and 5 are side and edge views, respectively, of the pawl-and-disk arrangement that I employ for resetting the type-carrying belt to any desired point in case of displacement through any cause. Figs. 6 and 7 are side and edge views, respectively, of one of the non-circular rotary wheels that carry the type-belts and provide the platens at equidistant points, on which the type rest at the printing instant.

Similar characters of reference designate corresponding parts throughout all the different figures of the drawings.

The various mechanical parts constituting my present improvements are supported in a suitable framework, the form and construc-

tion of which may vary within wide limits, but having, essentially, the vertical side pieces 1, united together by horizontal cross-rods 2, which are placed at convenient points. Journaled in this main frame at convenient points are the guide-rollers 3, 4, 5, and 6 and also the shaft 7, that carries the roll A of paper, the location of this roll being such that the paper may readily be fed off and through the machine over the impression and guide rollers and eventually into the press with which the numbering attachment is connected.

The course of the paper-web A through the machine will be readily perceived by glancing at Figs. 1 and 2. After leaving the roll it passes up and over impression-cylinder 8, this being the point where one side of the paper is printed. Thence it passes downwardly and under guide-roller 3, thence horizontally and over guide-roller 4, thence downwardly vertically and under guide-roller 5, thence horizontally and over guide-roller 6, it being noted that in passing from the roller 4 to 6 it passes around the main web A. From guide-roller 6 it passes upwardly in an inclined position to the other impression-cylinder 9, which is located adjacent to the first-mentioned impression-cylinder 8, said impression-cylinder 9 belonging to the printing-couple which applies the printing to the other side of the paper, so that the paper receives its second and final impression at this point. From impression-cylinder 9 the paper passes to the printing-press for the final operations. By thus following the course of the paper through the numbering attachment it will readily be seen how the printing is effected on both sides, the whole operation being performed within a small space and in such a manner as not to interfere with any of the other mechanism. By leading the web around the paper-roll in the manner which I have stated after the one side has been printed and then through the second printing-couple I am enabled to use but a single fountain for inking the forms for both sides, as well as to secure other advantages that are self-evident in the operation.

The impression-cylinders 8 and 9 which I have just mentioned are suitably journaled in the main frame and are furnished with the customary blankets and other appurtenances. The shafts of cylinders 8 and 9 are provided, respectively, with gear-wheels 10 and 11, that are in mesh with each other. (See Fig. 1.)

Mounted upon the top of the main frame is a second horizontal frame of a general skeleton form, being made as simple as possible, having side pieces 16, which are connected and braced by means of suitable rods or cross-pieces. This swinging frame is pivotally supported at one end of the main frame, while at the other end of the main frame means are provided for oscillating or lifting as much as will be required the movable end of the swinging frame for the purpose of throwing the mechanism carried by said frame into or out of gear with the driving elements on the main frame, thus enabling the printing devices to operate or remain idle at the pleasure of the attendant. Said means for vibrating the swinging frame consists, essentially, of a shaft 18, which is journaled in the sides 1 of the main frame, which shaft carries cams 17 at each end, that operate beneath the contiguous side pieces 16 of the swinging frame. A lever 60 is rigidly secured to the shaft 18, and by means of it the cams are simultaneously rotated and the swinging frame thereby lifted or lowered, accordingly as the movement of the lever 60 is in one direction or the other. In this swinging frame are journaled two shafts 13 and 15, each of which carries a number of wheels, in connection with which are arranged the printing-belts, which I shall presently more fully describe. The wheels and printing-belts accompanying shaft 13 constitute, along with the impression-cylinder 9, one of the printing-couples of the machine, and the wheels and belts accompanying shaft 15 constitute, along with the impression-cylinder 8, the other printing-couple of the machine. The shaft 13 is provided with a gear-wheel 12, adapted to engage the gear-wheel 11 when the swinging frame is in the proper position and to permit it to be disengaged therefrom after the swinging frame has been lifted. Likewise on shaft 13 is a sprocket-wheel 14, around which passes a chain 20, that also engages a sprocket-wheel 19 on the shaft 15 and passes around a sprocket-wheel 21, carried by a stud on the side 1 of the main frame. The sprocket-wheel 19 is of the same size as sprocket-wheel 14. It will be noted that the chain 20 has its outside edge in engagement with the sprocket-wheel 19 and does not, therefore, surround said wheel, but imparts motion to it, and the motion is in a direction reverse to the direction of motion of the sprocket-wheel 14. Sprocket-wheel 21 is merely an idler.

The main frame of the machine is provided at its upper end, preferably at a point not far distant from the pivotal point of the swinging frame 16, with an ink-fountain 22, contiguous to which is the usual train of inking-rollers 23, 24, 25, and 26, said rollers being arranged in any desired manner and operating to deliver ink to the face of the type on the belts 43 and 29, which are carried by the wheels 27 and 28, to be presently described. This ink-fountain is operated through a rod 53, that is connected at one end to a crank-disk made fast on some shaft or other part of the printing-press, (not shown,) which gives said rod 53 a reciprocating motion. The other end of rod 53 is connected to a disk 54, that is mounted and turns loosely on the shaft 55 of an ink-feeding roller 56, arranged in the fountain 22. Disk 54 carries a pawl 58, that engages a ratchet-wheel 57, keyed to the shaft 55. Every forward-and-backward movement of the rod

advances the ratchet-wheel one or more teeth. The roller 23 has its ends journaled in reciprocating levers 63, that are pivoted to the main frame, (see Fig. 1,) said levers 63 having their lower ends acted on by cams 64, fast on the shaft 15, as shown in dotted lines in Fig. 1. As the shaft 15 revolves the cams 64 cause roller 23 to carry ink from roller 56 to roller 24.

The wheels that carry the type-provided chains or belts 29 and 43 are indicated at 27 and 28. There is a series of wheels 27, and they are carried on the shaft 13, and there is also a series of wheels 28, and they are on the shaft 15. Around each wheel 27 passes a type-provided chain or belt 43, which also passes over an idler-pulley 44, secured on a shaft 45, that is supported in a bracket 46. Around each one of the wheels 28 runs a type-provided wheel or chain 29, which likewise passes around an idler-pulley 30, supported on a shaft 31, which is carried by a bracket 32. The number of wheels 28, as also the number of wheels 27, may vary as desired.

The shape of wheels 27 and 28 may be square, as shown, or they may have any number of sides; but they are non-circular, and it is essential that each wheel should have a plurality of peripheral sections forming bases or platens, on which the type or dies of the printing-belt are seated at the printing instant. Preferably these peripheral platens are situated equidistant from each other. In case of a square wheel like that shown in the drawings the corners of the square do not reach a point, but are truncated, as shown, to form straight-edged platens or bases to receive the types, as stated, it being noted that these platens so formed are situated farther from the axis of the wheel than are the planes or edges connecting said peripheral platens, so that in one sense the platens may be denominated "elevated points," that carry the type in such a way during the printing operation as that it will touch the inking-roller and receive ink therefrom and then touch the paper and apply its character thereto when the latter is resting on the contiguous impression-cylinder. By referring to Figs. 6 and 7 the detailed construction of one of the wheels 27 and 28 will be clearly perceived. It has already been stated, of course, that the printing-belts operated by the wheels 27 print one side of the paper, while the printing-belts operated by the wheels 28 print the other side of the paper. Although this is so, yet as the construction and arrangement of the parts of both printing-couples are substantially the same except as to their location a description of one of the wheels will suffice for an understanding of the construction and operation of all of them, and this remark applies to a description of one of the printing-belts also. If the wheel is square, the form which I have intimated is a convenient one, we will see by referring to Fig. 6 that 35 represents the long edges of the square and 36 the flattened or truncated corners, which corners serve as platens to sustain the type at the time of printing. Secured to one side of the wheel is a circular disk 33, the edge of which projects beyond the edges of the wheel to serve as a guide on that side, and secured to the other edge of the wheel is a disk 34, similarly projecting beyond the edges of the wheel, so that when the printing-belt is in position on the wheel it will lie between the disks 33 and 34. The truncated corners 36 of the wheel provide a surface having a length exactly equal to the length of one of the links of the type-carrying belt 29 or 43, and when the link rests on surface 36 in printing position the face 37 of the type 38 is elevated a short distance above the peripheries of the disks 33 and 34, as shown in Fig. 6. By referring to Fig. 2 it will be seen that a link of the belt 29 on the wheel 28 has just assumed its position on one corner-platen 36, having just passed the inking-roller 26 and received therefrom a supply of ink, and is now about to print its character or symbol on that part of the paper sheet that is passing over the adjoining face of the impression-roller 8.

The disk 34 at points adjacent to the corner-platens 36 is mortised or channeled to receive certain type 39, having letters or characters thereon that are to be printed in conjunction with the numerals on the type carried by the printing-belt. These type 39 are held in place by means of set-screws 40 and may be readily taken out, adjusted, changed, or substituted, as desired. When it is desirable to have other characters or numbers printed on the paper in addition to the letters that are marked by the type in the disk and the numerals that are marked by the type on the printing-belt, I often find it convenient to substitute for the thin disk 33 a thicker disk 65, (see Fig. 7,) which is provided with dovetailed sockets 66 at points opposite to the letter-type 39, said sockets 66 receiving small typographic numbering-machines 67, the sides of which are dovetailed to correspond to the shape of the sockets in order that they may be the more easily inserted and retained therein. Each of these numbering-machines is provided with a lever 68. I do not enter into a detailed description of the construction of the typographic machine, as it is a common and well-known device, and a description in detail is therefore unnecessary. The belt 29 or 43, as the case may be, is provided at the proper point with a projection 69, adapted to engage the lever 68 of the typographic machine when it passes it, so as to depress it and cause a readjustment of the numerals on the face of said machine, so that a new number may be printed as required. The projection 69 on the belt may itself carry a type having thereon some suitable symbol or character to be printed to show a connection between the belt-numeral and the typographic numeral or the disk-letter. When a

typographic numbering-machine is thus attached, numbers can be printed continuously in conjunction with the numbers printed from the belt-type and the disk-type. Various ways may be devised for attaching and operating the typographic numbering devices, and I do not wish to be restricted to the particular mechanism herein described.

The belts 43 and 29, as I have stated, are of the same construction. Each has links 61, that are hinged together by means of the hinges 42, and on each link is a type 38, having the printing-face 37, which obviously may be a numeral, letter, character, or any symbol. The sockets 41, which are cut in the longer edges 35 of the wheels, are intended to receive the hinges 42, that fall thereinto during the revolution of the wheels, thereby securing a proper adjustment of the type during the movement of the chain. Obviously the wheels may be secured to their respective shafts in any desired manner. The number of links in the chains and the length of the edges 35 of the wheels may vary within wide limits in correspondence with the character of the work to be done. It will readily be seen that when sales-slips are to be printed, the length of the slip may be regulated by the length of the edge 35 of the wheel or the distance of the truncated corners 36 from each other. Further, the provision of the flat or truncated corners insures that the types adjacent to the one resting for the instant on said corner to print will not receive ink or touch the sheet of paper; but only the type which is on the truncated corner will be receiving ink and doing effective duty.

In the present example of my invention, which is offered here for explanatory purposes merely and to which of course I am not restricted, it is delineated in the drawings, and I now proceed to describe it herein as employing chains consisting of fifty links and using square wheels, the corners of which are flattened at 36, as shown, while the sides 35 between the corners 36 are of a length sufficient to accommodate six of the printing-links between the corners—that is to say, if the first link rests on one corner the eighth link will rest on the second corner and the fifteenth link on the third corner, and so on, so that every seventh link of that portion of the belt surrounding the wheel will rest on the corners.

Referring to Fig. 6, we may suppose that the link 61, resting on the lower corner of the wheel, carries the numeral "1." If such is the case, the link on the left-hand corner will carry the numeral "2" and will be the eighth link in the series. The link on the top or upper corner will carry the numeral "3" and will be the fifteenth link in the series. The seventh link in the chain, counting to the right from the upper corner where the fifteenth link is located, will carry the numeral "4," and the succeeding seventh link will carry the numeral "5," which latter will be the thirty-sixth link, so that in calculating the figures or numbers carried by the respective links we must reckon the links in a multiple of seven and add one. Thus if the complete belt contains fifty links it will be evident by taking this formula that the link following the forty-ninth which is a multiple of seven would carry the numeral "8." The chain will print a series of consecutive numbers from "1" up, or it may duplicate each number as many times as may be required by properly equipping the printing-belts with the necessary type-numbers; but from what I have already said it will be evident that the types when doing effective work will rest on the corners or planes having a greater radius than the edges between said planes and that while the corner-types are thus in printing position the intermediate ones will not be effective, so that the printing is always from non-adjacent types, and in each instance the number of intervening idle types will of course depend upon the character of the printing to be performed, the size of the wheel, and the number of links in the belt. When there are fifty links in the belt, the type-numbers thereon will be so arranged that the printing will occur with each seventh link in a consecutive series from "1" upward until the fiftieth figure has been reached, when the operation will be repeated, and so on.

There are times in the operation of the machine when the paper may break or some trouble may occur in the running of the mechanism, in consequence of which it will be needful for the numbering-machine to be turned back or advanced, so as to reset the numbers, for it is essential, of course, that they should always be located in proper position to fit the sheet to be printed. To meet this contingency, I provide the device illustrated in Figs. 4 and 5, wherein is represented a disk and collar 47, keyed to the shaft 13, adjoining the sprocket-wheel 14 and provided on the face adjacent to said sprocket-wheel with a pawl 48 and spring 49. Spring 49 is arranged to bear on either of two faces of the rear body of the pawl, so as to hold it either in or out of engagement with a notch or depression 50, cut in the hub 51 of the sprocket-wheel 14. Referring to Fig. 4, it will be seen that the pawl 48 is shown as about to engage the notch 50, for the sprocket and hub are assumed to be traveling toward the pawl, as shown by the arrow. The shaft 13, as will be seen in Fig. 1, is provided with a hand-wheel 52, by means of which the shaft may be turned backward with its pulleys to any predetermined point. In making this adjustment the pawl will of course be lifted out of the notch 50, the hand-wheel operated, and the non-circular wheels and belts turned back or reset to the proper position, and thus pawl 48 again thrown into engagement with the disk 51, for when the point at which it is desired to reset the types has been reached and the pawl thrown down the hub in its revolution will bring the notch 50 into engagement with

the pawl, and the work of the wheels and belts will be resumed in proper order, as before.

Many changes may be made in the exact construction and arrangement of the various parts of my invention without departing from the scope of the claims appended hereto.

I lay a broad claim to the non-circular wheel having portions of greater radius than the rest and operating in conjunction with the belt, which prints from non-adjacent type, and I also lay a broad claim to numerous other of the important features which have been hereinabove described. The precise embodiment of the invention delineated and described herein is of course offered simply by way of example and with no idea that I shall be restricted thereto, and I expressly state that in the practical construction and use of the invention I expect to make such needful variations as the exigencies of the case may require.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a numbering-machine, a rotary wheel having a plurality of peripheral sections forming bases or platens located farther from the axis of the wheel than are the intervening edges, in combination with a printing-belt whose type or dies are seated on the aforesaid platens during the printing operation to bring non-adjacent types into printing position.

2. In a numbering-machine, a non-circular wheel having equidistant tangential platens, between which are intervening peripheral sections of less radius than the platens, in combination with an endless printing-belt consisting of interhinged type-carrying links that are seated on the platens to bring the non-adjacent type into printing position, and guides on the sides of the wheel to keep the belt in place on the wheel periphery.

3. In a numbering-machine, a plural-sided wheel some of whose sides are of greater radius than the remainder, said sides of greater radius being equidistant from each other, in combination with an endless printing-belt consisting of type-carrying links that are seated on sides of greater radius to bring non-adjacent types into printing position.

4. In a numbering-machine, a non-circular wheel having equidistant tangential platens between which are sections of less radius than the platens, in combination with a printing-belt consisting of type-carrying links adapted to be seated on the platens when in printing position, guides on the sides of the wheel to keep the belt in place thereon, and printing devices carried on one of the said guides at points near the said platens to permit printing therefrom in line with the printing done by the belt.

5. In a numbering-machine, a non-circular wheel having equidistant tangential platens between which are sections of less radius than the platens, in combination with a printing-belt consisting of type-carrying links adapted to be seated on platens when in printing position, a type-carrying disk on one side of the wheel whose type are carried at points near the platens so as to permit printing therefrom in line with the printing done by the belt, and typographic numbering devices likewise carried by the wheel and actuated from the belt when the numbers on said devices are to be changed.

6. In a printing-machine for printing both sides of a web, means for leading the web through a printing-couple to print one side, then around the roll of paper and through a second printing-couple to receive an impression on the other side, in combination with a single inking device located so as to ink the printing members of both printing-couples, substantially as described.

7. In a printing-machine containing two printing-couples arranged to print the opposite sides of a web, means consisting of guide-rollers for leading the web through the first printing-couple to print one side, then around the roll of paper and through the second printing-couple to receive the impression on the other side, in combination with an inking device arranged to ink the printing members of both printing-couples.

8. In a printing-machine containing two printing-couples arranged to print both sides of a web, said printing-couples consisting each of an impression-cylinder and a plural arrangement of non-circular wheels and endless type-carrying belts that print from non-adjacent types, means consisting of suitable guide-rollers for leading the web through the first printing-couple to print one side, then around the roll of paper and through the second printing-couple to print the other side.

9. In a numbering-machine, the combination with two printing-couples, each comprising an impression-cylinder and a plural arrangement of non-circular wheels and endless type-carrying belts, of a single ink-fountain and its rollers serving both printing-couples, and means for conveying the web through the couples to cause printing on both sides.

10. In a numbering-machine containing two printing-couples arranged to print both sides of a web, the combination with the main frame and the impression members of the printing-couples journaled therein, of a swinging frame pivotally supported on the main frame and the printing members of the printing-couples suitably supported in said swinging frame, said printing members consisting each of a plurality of non-circular wheels and endless type-carrying belts running thereon and printing from non-adjacent types, together with means whereby the adjustment of the frame enables the printing members to receive motion from the impression members, substantially as set forth.

11. In a numbering-machine containing two printing-couples arranged to print upon the

opposite sides of a web, the combination with the main frame and the impression members of the printing-couples journaled therein, of a swinging frame pivotally supported on the main frame, and the printing members of the printing-couples supported in said swinging frame, said printing members consisting each of a series of non-circular wheels and endless belts that print from non-adjacent types, and means for adjusting the swinging frame consisting of cams or eccentrics.

12. In a numbering-machine, a printing-couple consisting of an impression member and a printing member having a series of one or more rotary non-circular wheels with an endless type-carrying belt running thereover that prints from non-adjacent types, together with a disk and spring-pawl devices on the shaft of the non-circular wheel, with means for rotating said shaft in order to reset the type in printing position.

13. In a numbering-machine the combination with a shaft, a series of non-circular wheels arranged thereon, a series of printing-belts that print from non-adjacent types and are carried on the aforesaid wheels, a disk to which is pivoted a pawl provided with a spring to hold it in an elevated or depressed position, said disk being arranged in connection with the shaft, and means for driving said shaft in the operation of the machine.

Signed at New York city this 29th day of August, 1901.

FREDERICK M. TURCK.

Witnesses:
FRED E. TASKER,
RITA BRADT.