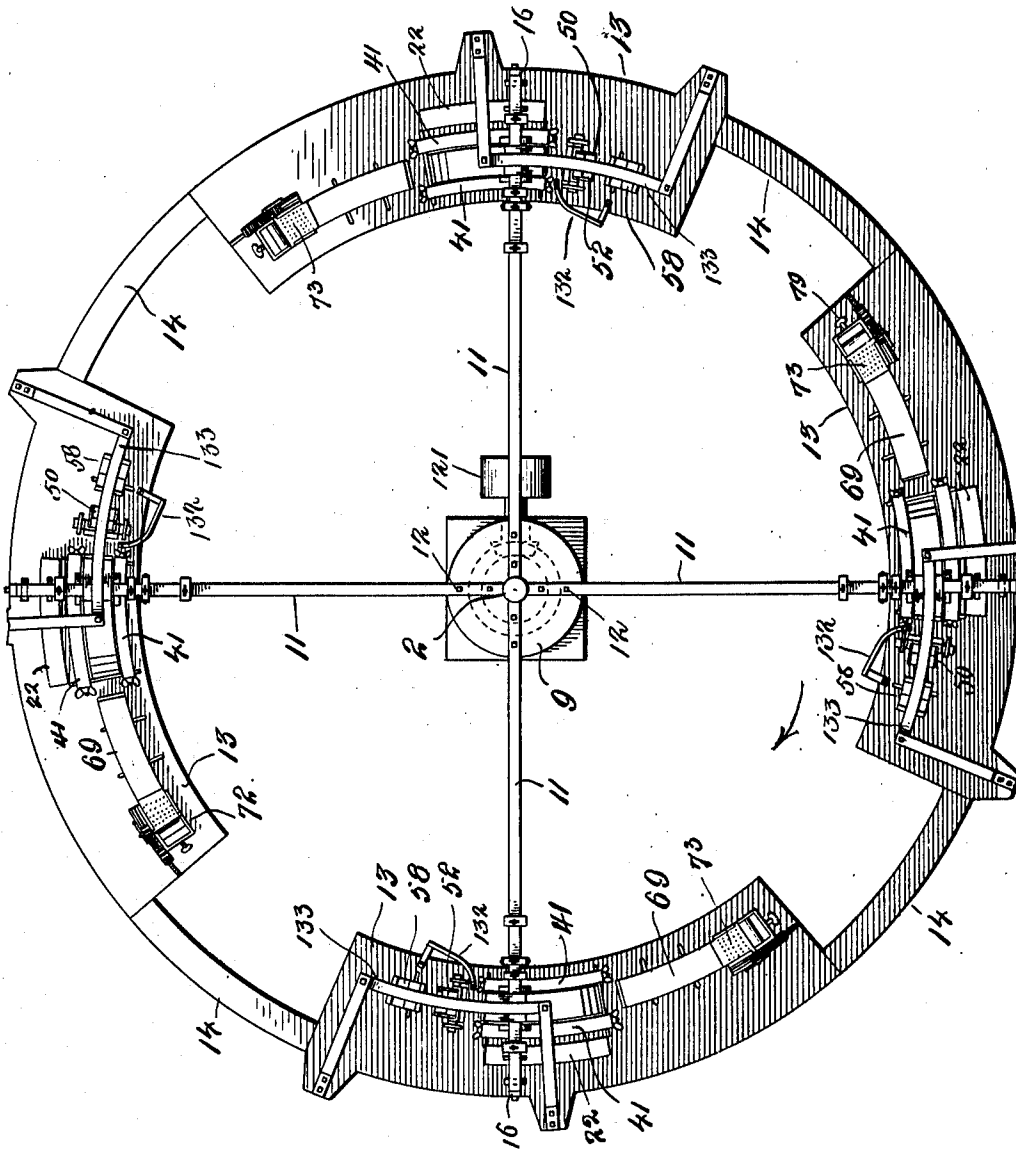


F. A. TREIBER.
 PRINTING MACHINE.
 APPLICATION FILED SEPT. 17, 1909.

988,603.

Patented Apr. 4, 1911.

7 SHEETS—SHEET 1.



WITNESSES:

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Fig. 1.

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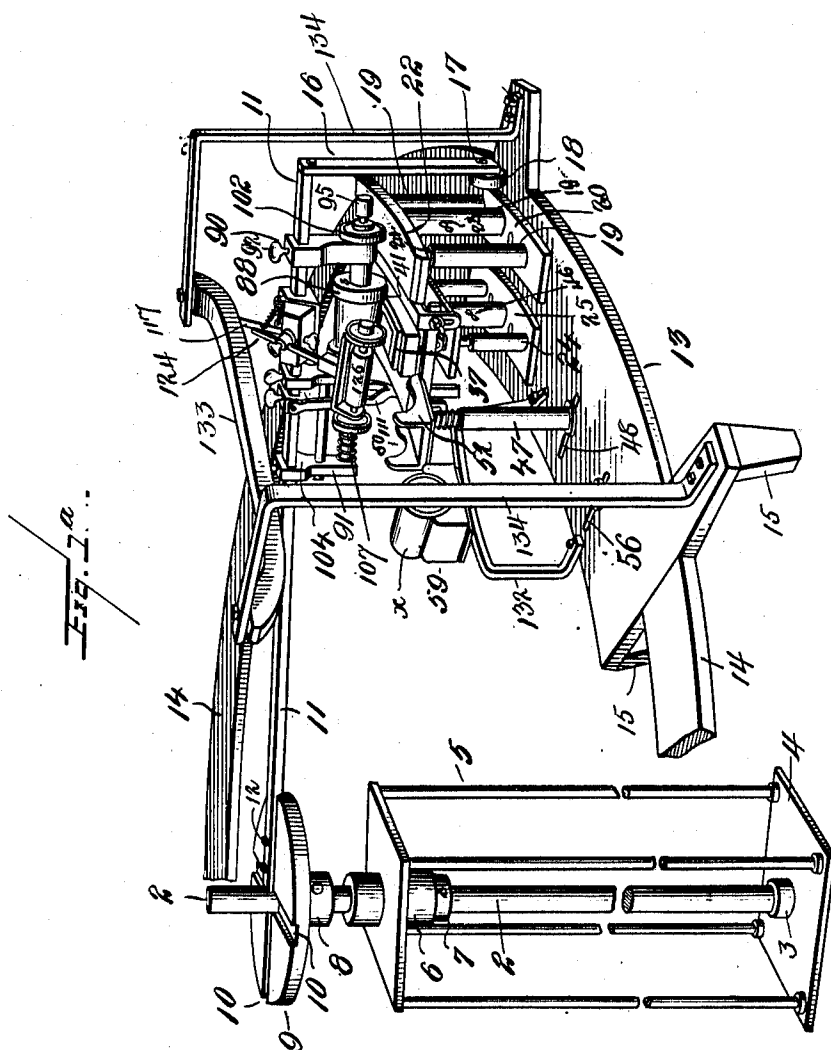
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7 SHEETS—SHEET 2.



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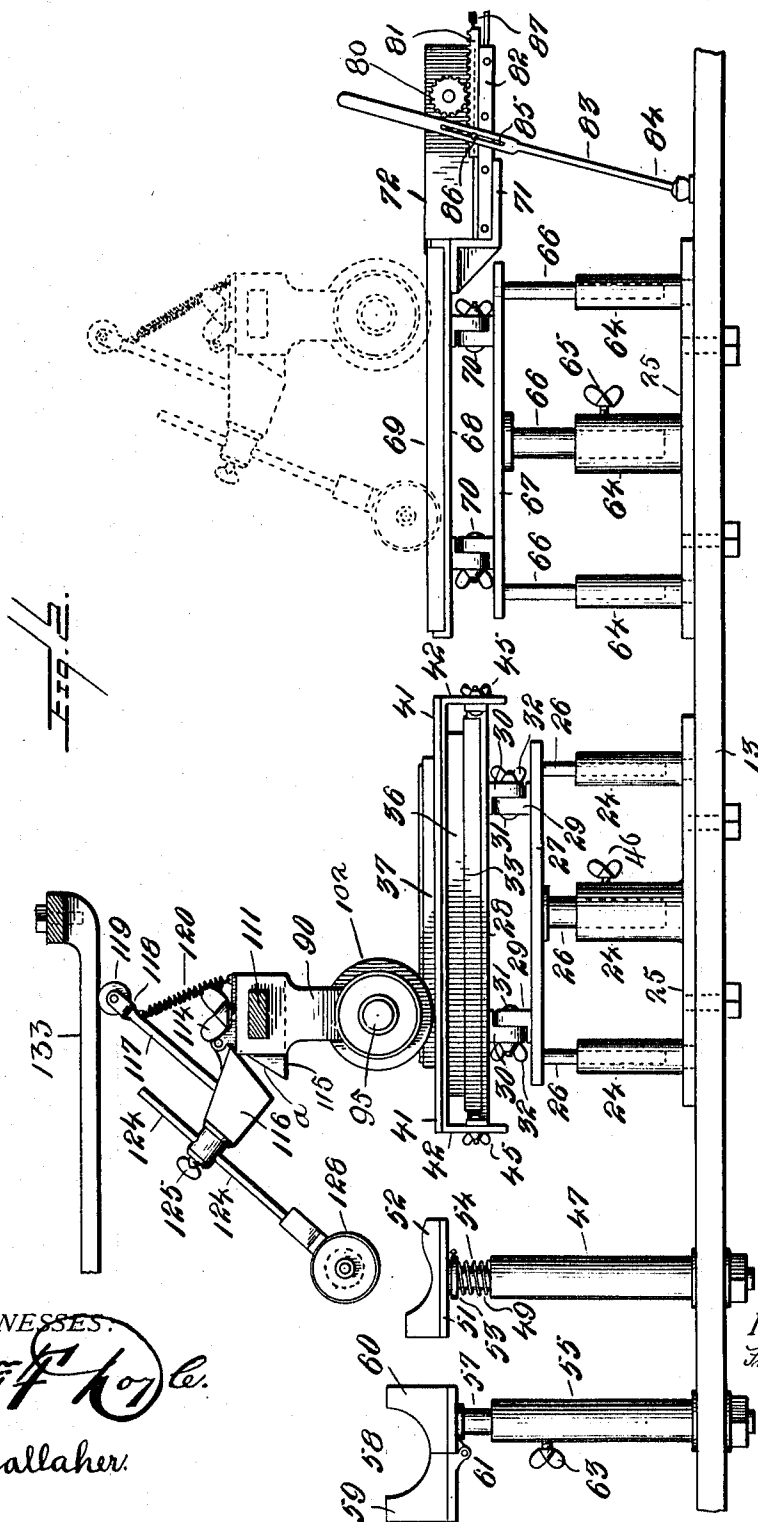
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7 SHEETS-SHEET 3.

988,603.



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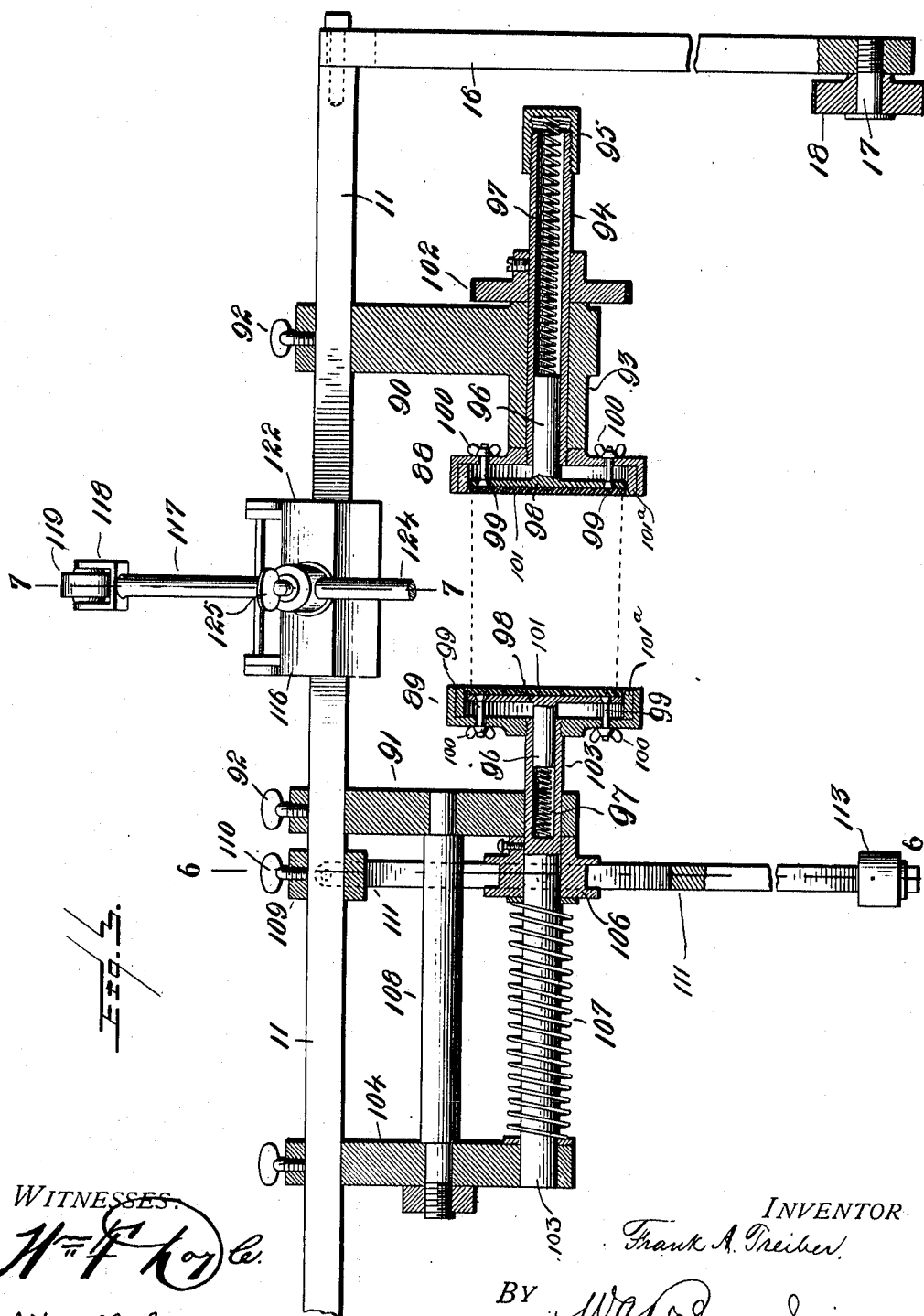
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7 SHEETS—SHEET 4.



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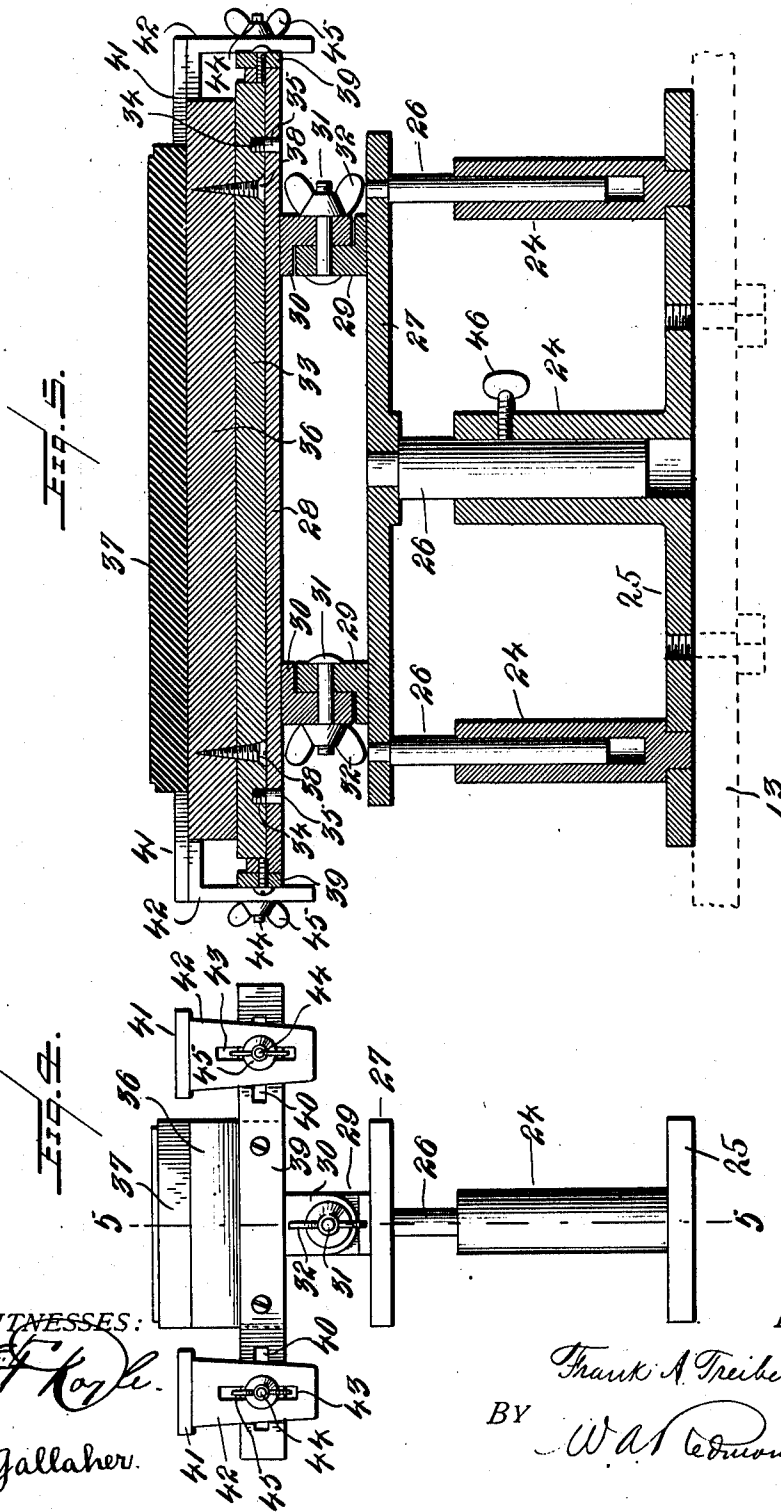
F. A. TREIBER.
PRINTING MACHINE.

APPLICATION FILED SEPT. 17, 1909.

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7 SHEETS—SHEET 5.

988,603.



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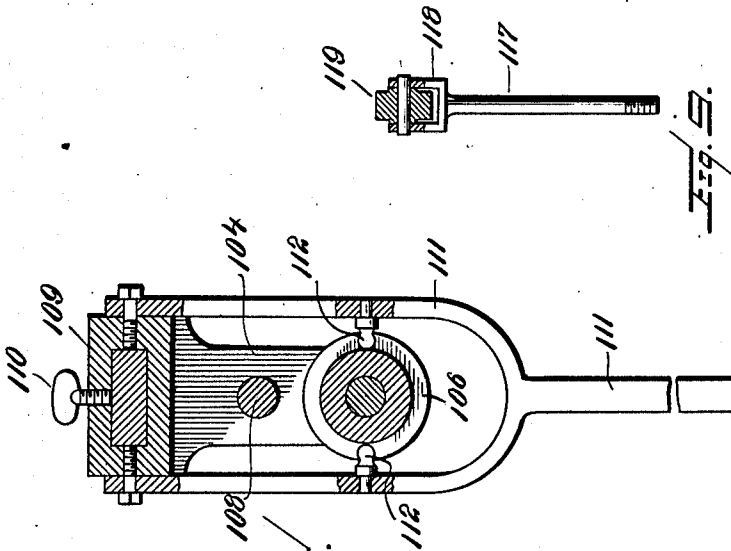
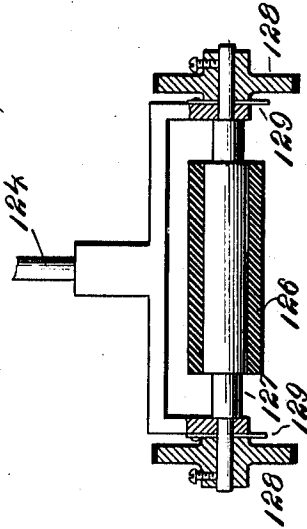
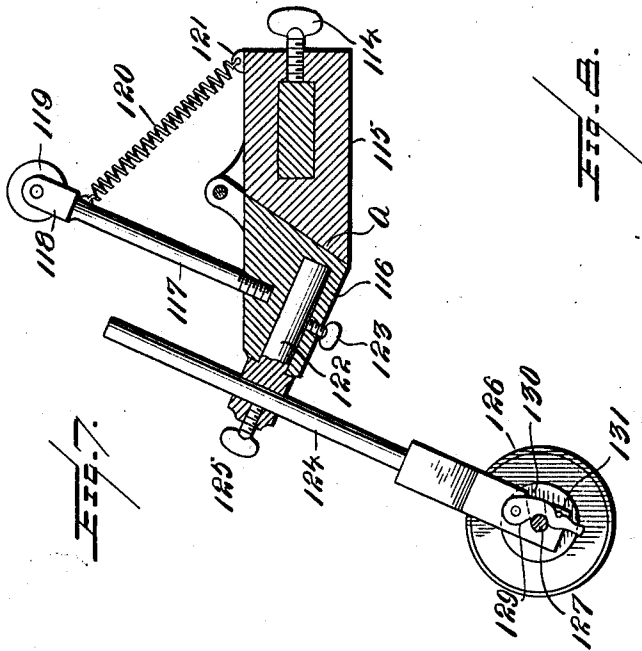
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988,603.

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7 SHEETS—SHEET 6.



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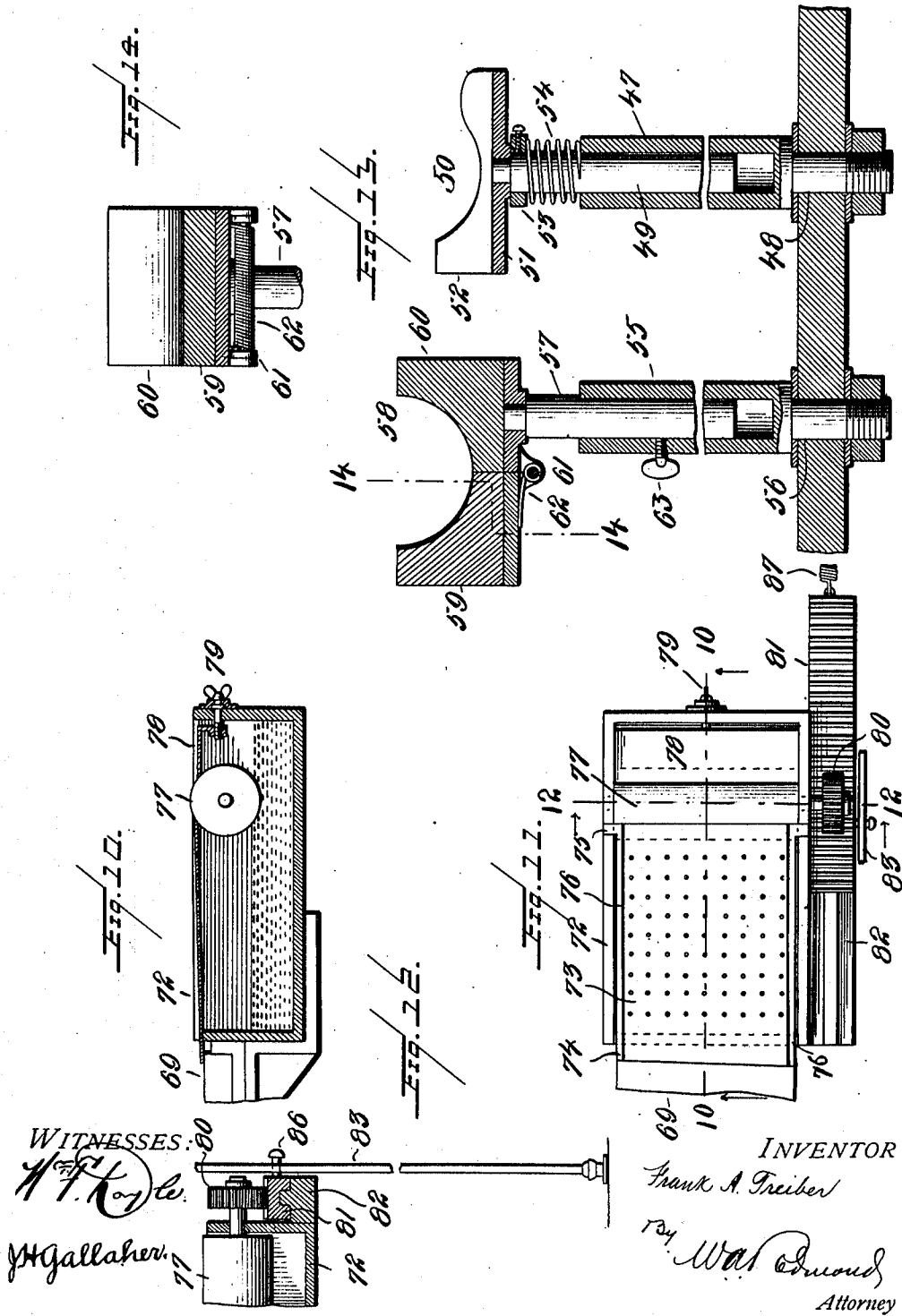
Attorney

F. A. TREIBER.
 PRINTING MACHINE.
 APPLICATION FILED SEPT. 17, 1909.

988,603.

Patented Apr. 4, 1911.

7 SHEETS—SHEET 7.



UNITED STATES PATENT OFFICE.

FRANK A. TREIBER, OF CUMBERLAND, MARYLAND.

PRINTING-MACHINE.

988,603.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed September 17, 1908. Serial No. 518,174.

To all whom it may concern:

Be it known that I, FRANK A. TREIBER, a citizen of the United States, residing at Cumberland, in the county of Allegany and State of Maryland, have invented a certain new and useful Improvement in Printing-Machines, of which the following is a specification.

This invention relates, generally, to printing or marking machines, and particularly to machines for imprinting patterns or designs on curved surfaces or tapered cylindrical bodies, such as tumblers, and it has for its object to provide a simple, durable, and inexpensive machine adapted to automatically pick up the article to be treated, subject it to the printing operation, and discharge it from the machine with the pattern or design accurately printed thereon in ink or paint and ready for the next step or process of fixing the pattern or design on the article, and it consists of the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan view of my improved machine. Fig. 1^a is an enlarged detail perspective view. Fig. 2 is an enlarged detail side elevation with parts removed. Fig. 3 is an enlarged detail view, partly in section, of the chucks and connected parts. Fig. 4 is a detail end view of the printing pad. Fig. 5 is a detail longitudinal vertical section on the line 5-5, Fig. 4. Fig. 6 is an enlarged detail view of the forked lever. Fig. 7 is an enlarged detail vertical section through the inking roller device. Fig. 8 is a detail sectional view of the inking roller. Fig. 9 is a detail view of the rod for tilting the inking roller. Fig. 10 is a detail sectional view on the line 10-10, Fig. 11. Fig. 11 is a plan view of the inking trough. Fig. 12 is a vertical sectional view on the line 12-12, Fig. 11. Fig. 13 is a detail vertical section of the delivery and feeding holders. Fig. 14 is a detail sectional view on the line 14-14, Fig. 13.

Similar numerals refer to similar parts throughout all the views.

Referring to the drawings 2 represents a vertically arranged shaft which is stepped in a bearing 3 in the base 4 (see Fig. 1^a) of the frame 5 which carries the bearing 6 for the upper end of the said shaft, and 7 an adjustable collar secured to the shaft and

abutting against the bearing 6 to secure the shaft in position and prevent it working upward during the operation of the machine.

An adjustable hub 8 is secured to the projecting upper end of the shaft 2 and carries a disk 9. In the upper face of the disk radially extending grooves 10 are formed which may be of dovetail form, as shown, or of any other preferred shape in cross-section, their purpose being to receive the ends of the arms 11, which ends are made to conform to the shape of the grooves, and are secured therein by bolts or screws 12, but it is preferred that the outer portion of the arms be made square or rectangular in section in order that the parts carried thereby may be more firmly secured against movement, as shown, although their shape may be the same throughout their length if so desired. Surrounding the shaft 2 and concentric therewith is arranged a circular table or bed consisting, preferably, of the arc-shaped platforms 13 which are connected together at their adjacent ends by the narrow sector-shaped strips 14, which, with the platforms 13, form a continuous circular track around the shaft 2; the whole being supported by suitable legs or frames 15 arranged at intervals around the same. To the extreme outer end of each of the arms 11 is adjustably secured a rod 16 which carries a stud shaft 17 at its lower end on which is journaled a rubber tired wheel 18 which supports the outer end of the said arms 11 and travels on the track formed by the table when the machine is in operation. The rods 16 may be made vertically adjustable in any desired or convenient manner, as for instance, by forming an elongated slot in the same, as indicated in dotted lines in Fig. 3, through which a bolt is inserted into the end of the arms 11.

On a line coinciding with the curve or arc of the table and within the path traveled by the wheels 18, is arranged a series, preferably three, of hollow posts 19 which are secured in a plate 20, which is bolted to the table so as to be adjustable, which posts receive the supporting standards 21 from a segmental track 22 on which the wheels or rollers which operate the tumbler holding chucks travel, as will be described. The outer or end posts of the series of posts 19 are steadying posts and the center post is provided with a set screw 23 to engage the standard telescoping therein, in order to

secure the track at the height to which it is adjusted. The track 22 is formed of wood or other suitable material adapted to have frictional engagement with the chuck wheels or rollers, and the standards 21 are secured to and project from the underside of the tracks and support them in proper position for engagement with the chuck wheels or rollers. Adjacent the posts 19 and on a parallel coinciding line therewith, a series, preferably three, of hollow posts 24 are arranged, said posts being secured to a plate 25 which is adjustably secured to the table. See Fig. 5. The posts 24 receive the standards 26 which are secured to and project from the underside of a platform 27. This platform supports, through a hinged connection, a flanged table 28 on which is superposed the printing pads on which the pattern or design to be printed on the article being decorated is formed. The hinged connection, as shown in this instance, is made by securing perforated lugs 29 to the platform 27 and similar lugs 30 to the underside of the table 28 and connecting the lugs by threaded pins or bolts 31 on which winged nuts 32 are run. Thus the table 28 may be tilted or adjusted to any desired angle to the horizontal by loosening the nuts 32 and then secured in its adjusted position by tightening said nuts. See Figs. 4 and 5.

Arranged on the table 28 is a plate 33 having recesses 34 in its under surface near each end to receive the guide pins 35 which are secured in the upper face of the table 28, said pins and recesses being employed in order to insure the proper location of the printing pad in assembling the parts. To the plate 33 the wooden base 36 of the rubber pad 37 is secured by screws 38 which enter the same through the plate 33 and serve, with the flange of table 28, to hold the printing pad firmly in position during the operation of the machine. To the flange at each end of the table 28 is secured a bar 39, which projects at each side of the table and is longitudinally slotted near each end, as at 40, which supports a segmental track or way 41, arranged at each side of the printing pad, through the bracket arms 42 which are longitudinally slotted at 43 and adjustably secured to the bars 39 by means of the bolts 44 extending through the slots 40, 43, and secured in their adjusted position by the winged nuts 45. See Figs. 4 and 5. The tracks or ways 41 are of wood or other suitable material adapted to provide frictional contact with the wheels or rollers which operate the inking device, as will be hereinafter described. The posts 24 are shorter than the posts 19, but in other respects are similar thereto, and the center post of the series is provided with a set screw 46 which is adapted to en-

gage the standard therein in order to secure the printing pad at the height to which it may be adjusted.

A hollow post 47, (see Fig. 13), is adjustably secured in a transverse slot 48 in the circular table or bed adjacent to and in line with what may be termed the delivery end of the printing pad, in which a standard 49 is inserted, said standard supporting a delivery or discharge holder 50 on which the article is deposited by the chucks after the pattern or design has been imprinted thereon. This holder consists of a horizontal plate 51 having the vertical parallel side pieces 52, the edges of which are formed on a reverse curve, as shown, in order to form a rest for the article deposited thereon. By means of this form of holder the article rests near its ends, or top and bottom, on the side-pieces 52 without its body portion, on which the pattern or design is printed coming in contact with the body of the holder, thus preventing the wet ink or paint of the pattern or design being smeared by contact with the holder.

The bottom plate 51 of the holder is formed with an opening to receive the reduced end of the standard 49, and an adjustable collar 53 is secured on said standard against which presses one end of a coiled spring 54 which surrounds the standard, the other end of said spring resting on the top of the post 47. See Figs. 2 and 13. The spring support just described enables the deposit of the article on the holder without liability of breaking the article, as, if the adjustment is not exactly correct, or if, for any reason, the article is delivered to the holder with unnecessary force the spring will permit the holder to yield to the pressure of the article before the latter reaches the breaking or crushing point.

Adjoining the post 47 and in line therewith a hollow post 55 is adjustably secured in a transverse slot 56 in the circular table or bed, which receives the stem 57 of a feeding holder 58, which consists of a block having a tapering curved recess or depression in its upper face to accommodate it to the shape of the tumbler or article to be marked or printed. The block is formed in two parts or halves 59—60, which are connected together by a hinged joint 61 on the pin of which a spring 62 is arranged so as to bear against and normally hold the forward half—59—of the block up to and in contact with the other half thereof. See Figs. 13 and 14. A thumb screw 63 serves to hold the standard or stem 57 in its adjusted position in the post 55.

The inking device is arranged in front of or in advance of the pattern or design holding device and, referring more particularly to Fig. 2, where it is shown to the right, it consists of the hollow posts 64 secured to a

plate and to the table in a manner similar to that of posts 19 and 24 and on the line of the circle in which posts 24 are arranged, and the center post being provided with a thumb screw 65 to fix the inking device in its vertically adjusted position. Telescoping in the posts 64 are the stems or standards 66 which carry the table 67 to which the frame 68 for the ink distributing plate 69, is connected by the hinges 70 in a manner similar to the connection between the pattern or design holder and its plate 27, as described above. As shown best in Fig. 2 a bracket 71 is secured to and projects from one end of the frame 68 and supports the trough which contains the ink or paint, and which, as shown in Fig. 11, consists of a box 72 the outer side wall of which is slightly less in length than the inner wall so that the connecting wall at one end extends at a slight angle to the opposite end wall. The purpose of this construction is to distribute the ink evenly from the box to the plate 69, the outline of the latter being on the arc of a circle, as shown. See Fig. 1. A perforated metal plate 73 forms a cover for the greater portion of the trough, said plate lying between the side walls thereof and resting on and projecting beyond one end wall, the projected end, 74, being imperforate. The other end of said plate 73 is supported from the box by bent lips 75 which engage the side walls. At each side of the plate 73 a longitudinally extending groove 76 is formed therein to confine the ink to the plate. An iron roller 77, for conveying the ink to the perforated plate, is journaled in the side walls of the trough, the surface of which projects slightly above the adjacent end of the plate 73 and is in contact therewith, while a short plate 78 is arranged at the opposite side of the roller and is adjustably held from the end wall of the trough by a screw operated by a thumb nut 79 and by which it may be adjusted to or from the roller, the purpose of which is to scrape off the surplus ink or paint taken up by the roller before it reaches the plate 73, the end of the latter being in slight contact with the roller scrapes the ink or paint therefrom onto the plate. The roller 77 carries a pinion wheel 80 at one end of its shaft which meshes with a rack 81 arranged to slide on a way 82 supported by the bracket 71, as best shown in Fig. 2, and which is moved longitudinally in one direction by a rock lever 83 supported from the main table 13 by a ball and socket joint 84, said lever being slotted at 85 to receive a pin 86 projecting from the side of the rack, while the return movement of the rack is made by a spring 87 connected to the rack and a stationary part of the machine. See Figs. 11 and 12.

Referring particularly to Fig. 3, where

the parts are shown enlarged, 88 and 89 represent the chucks for holding the article under treatment. These chucks are supported from the arms 11 by means of the hangers 90, 91, which are formed with openings 70 at their ends corresponding to the shape of the arms 11 so that they may be slid thereon and secured in proper position relative to each other by set or thumb screws 92. The hanger 90 is formed with a lateral extension 75 93 which is bored out to receive a tube 94 which screws into the hub of the chuck head 88 at one end and is threaded to receive a screw cap 95 at its other end. A plunger stem 96 is inserted in the end of the tube 94 80 and bears against one end of a coiled spring 97 which is located in the tube, the other end of said spring abutting against the screw cap 95. The head of the plunger stem 96 is secured to the back of a disk 98 which is held 85 in the chuck head by the screw bolts 99 which extend through the back of the head and are provided with the winged nuts 100 by which the disk may be adjusted in the chuck head and which also limit the outward 90 movement of said disk. To the disk is secured in any desired manner a facing 101 of wood or rubber. Within the chuck heads a lining ring 101^a, preferably of wood, or other material softer than metal, having a beveled edge, is secured in order to protect the edge of the article held by the chucks from injury.

The tube 94 is fitted in the extension 93 so as to be free to rotate therein and carries 100 an adjustable rubber tired roller 102 which serves to actuate the same and also acts, in conjunction with the hub of the chuck, to fix the tube against longitudinal movement. The opposite chuck head, 89, is provided with 105 a plunger stem 96, disk 98, facing 101, screw bolts 99, nuts 100, lining ring 101^a and spring 97, in all respects similar to chuck head 88, and is screwed onto the end of a shaft 103 loosely supported at one end by the hanger 110 91 and at the other end by a hanger 104 from the arm 11. The shaft 103 is hollowed out at one end to receive the plunger stem 96 and the coiled spring 97, which bears against the end of the plunger stem to normally hold 115 the disk extended to the limit permitted by the screw bolts 99. Secured on the shaft 103 is a grooved wheel 106 and a coiled spring 107 surrounds said shaft between said wheel and the hanger 104, the purpose of which is to normally hold the chuck head 89 extended to the limit fixed by the grooved wheel contacting with the side of hanger 91. A brace bar 108 connects the hangers 91 and 104 so as to hold the same steady and prevent the possibility of the same spreading by reason of the pressure exerted by the spring 107.

Adjacent the hanger 91 on arm 11 a block 109 is adjustably secured, by a set or thumb screw 110, to which is pivotally hung the 130

forked lever 111 having pins 112 which engage the grooved wheel 106 at opposite sides as best shown in Fig. 6. Said lever carries a friction roller 113 at its lower end, so that

5 when the lever is swung in one direction on its pivots it acts to draw the chuck head attached to shaft 103 away from its companion head. The means for positively moving the lever will be described hereinafter.

10 To the arm 11 at a point midway the hangers 90 and 91 is secured, by a set or thumb screw 114, a block 115 having an inclined face, as at *a*, and to which block is connected by a hinge joint a tapering block

15 116 having an inclined face corresponding to face *a*. As shown best in Figs. 2 and 7, a rod 117 is screwed into the block 116 and extends downwardly and forwardly therefrom and carries in a fork 118 at its upper end a

20 roller 119, and is connected by a coiled spring 120 to a lug 121 on the block 115. At the outer end of the block 116 a pin 122 is inserted in a recess therefor, and is held in place by a thumb nut 123 and, through a

25 perforation in the enlarged head of said pin, a rod 124 is inserted and held by a thumb nut 125. The end of the rod 124 is forked and carries a roller 126. See Fig. 8. The roller 126 is an inking roller and is made of

30 composition as is usual, and its shaft 127 extends through the arms of the fork at each side and carries the wheels 128. Latches 129 are pivoted to the outer sides of the fork arms over the slots 130 formed in the edges

35 thereof in which the shaft rests or is journaled, in order to engage the shaft, and a pin 131 is inserted in the arms so as to engage the latch and thus lock the shaft in place.

The lever 111 is operated by a cam track

40 132 (Figs. 1 and 1^a) which is adjustably bolted to the table. As best shown in Fig. 1, the track 132 curves away from the table so as to move or swing the end of lever 111 inwardly or toward the main shaft 2 during

45 its engagement with the track, and thereby move or slide the shaft 103, which carries chuck head 89, longitudinally in its bearings, so as to draw said chuck head 89 away from its mate. The track 132 is so located that the

50 initial movement given the lever 111 commences just as the forward side of the chucks approach the holder 50, and as the chucks continue on or forward the end of lever 111 is gradually moved away from the holder

55 until the chucks arrive at a point over the middle of the holder at which time the article carried by the chucks is released from the chuck heads and deposited on the holder. This is accomplished by adjusting the bolts

60 99 so as to limit the outward throw of the disks 98, caused by the action of the springs 97, so that, when the chuck heads reach a point about over the middle of the holder, the disk is extended its full limit, and the

65 further inward movement of the chuck head

89 carries the disk with it, thus releasing the article from pressure and permitting it to drop onto the holder 50.

A cam track 133 is arranged above and in line with the printing pad and extends over 70 the holder 50 and over and past the feeding holder 58, and is supported by the arms 134 from the table. See Figs. 1, 2 and 1^a. This track, 133, operates the inking roller 126 through the rod 117, the friction roller 119 75 of which engages the said track and is depressed thereby so as to tilt or lift the inking roller up and away from the printing pad after it has applied the ink thereto, and to hold it in its lifted position until it has 80 passed beyond the feeding holder 58, when the roller 119 passes off the track and the weight of the inking roller and attached parts causes it to drop to normal position. The spring 120 acts to retard the speed of the 85 inking roller when it drops so that it is lowered slowly and without force.

In the drawings is illustrated a machine having four groups of devices including printing pads, ink troughs, and devices for 90 delivering or feeding and receiving the article, arranged at equal distances apart around the table, and four arms each of which carries a group of devices, similar to each other, for inking the printing pads, rotating the 95 article on the pads, depositing the marked article, and picking up an unprinted article or blank, but it is evident that a greater or less number of groups may be employed without a departure from the scope or spirit of my invention and I do not desire, there- 100 fore, to be limited to any particular number of groups, nor to the particular arrangements of such on the frame shown in the drawings. 105

The operation of the machine is as follows: With the parts in the positions shown in Figs. 1 and 1^a, the articles to be marked with the pattern or design, in this instance 110 a tumbler, as shown in Fig. 1^a, at *a*, are placed on the feeding holders by the attendants. Power is then applied to rotate the arms 11 in the direction of the arrow, Fig. 1. As the arms move over the cam tracks 132 the rollers 113, carried at the end of the 115 forked levers 111, engage the sides of the tracks 132 and thereby gradually move or swing said levers inwardly, or out of a vertical plane, on their pivots, thus sliding or moving the shaft 103 longitudinally in its 120 bearings, against the pressure of spring 107, and thereby moving the chuck head 89 inwardly so as to withdraw it from its mate, 88. This movement continues until the chuck heads are moved to a point directly oppo- 125 site and in line with the article on the feeding holder at which point the roller 113 passes off the track and the spring 107 on shaft 103 acts to instantly move the said shaft to its normal position and thereby 130

cause the chuck heads 80 and 88 to grasp the article between them. The continued forward movement of the arm presses the article against the hinged half, 59, of the holder 58, and forces the same downward, against the pressure of the spring 62, to permit the tumbler to be carried forward by the chucks. In the meantime the inking roller 126 has been lifted or tilted up by the engagement of the roller 119, carried by rod 117, with the cam track 133, and carried in its elevated position over and past the holders, 50 and 58, and gravitates to its lowered or normal position when the roller 119 passes off the end of the track 133. The inking roller is then carried forward in its lowered or normal position onto the ink trough and gathers a supply of ink which is evenly spread thereon as it rotates or rolls over the inking plate 69. As the arm continues forward the wheels 128 on the shaft of the inking roller mount the tracks 41 at each side of the printing pad and by frictional engagement therewith rotate the inking roller as it travels over the pad. The parts are so arranged and timed that the roller 119 on rod 117 engages the cam track 133 at the moment the inking roller leaves the printing pad, and said roller is then tilted, as above described, to carry it over and above the holders 50 and 58. The chucks carrying the tumbler are then advanced to the printing pad and the wheel or roller 102 on the shaft 94, by frictional contact with the track 22, imparts rotation to the tumbler as it travels over and on the printing pad, thereby having printed thereon the design or pattern formed on the pad. The continued movement of the arm then brings the roller on the forked lever 111 against the cam track 132 and the chuck head 89 is withdrawn from its mate so as to release the printed or marked tumbler and permit it to be deposited on the holder 50, from which the attendant removes it, while the chucks move forward and pick up the tumbler which has been placed on the holder 58, and conveys the same to the printing pad of the next group and after it is marked or printed deposits the same on the delivery holder of such group.

The iron roller 77 which feeds the ink from the trough is intermittently rotated by the pinion wheel 80 thereon which is engaged by the toothed rack 81 which is reciprocated on the way 82 by the lever 83 connected through a slot to the pin on the rack. The rock lever 83 projects above the ink trough and is so placed that the projection 93 on the hanger 90 strikes and swings or depresses the same and thereby slides the rack 81 forward, thus rotating the roller 77 in one direction in the ink in the trough while a spring 87 acts to return the rack and lever to their normal position and rotate the iron roller in the opposite direc-

tion in the ink and thereby insure an even and uniform distribution of the ink on the roller.

Power is applied to the shaft 2 by a belt from any prime mover to the pulley 121 on a shaft 122 which carries a bevel pinion which meshes with a similar pinion on the shaft 2, as shown in Fig. 1.

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

1. A machine for marking cylindrical articles, comprising a printing pad, means for inking the pad, horizontally circumrotating mechanism for automatically grasping the article to be marked at each end, means for rotating the article in contact with the pad, and means for automatically releasing the article to deposit it on a support or holder.

2. A machine for printing or marking cylindrical articles, comprising a printing pad, means for inking said pad, a holder for supporting the unmarked article in a horizontal position, horizontally circumrotating mechanism for automatically removing the article from the holder, and means for rotating the article in contact with the pad.

3. A machine for printing or marking cylindrical articles, comprising a printing pad, a holder for supporting the article to be marked in a horizontal position, and a horizontally circumrotating device for automatically clamping the article and conveying the same from the holder to the printing pad and rotating it thereon.

4. A printing machine comprising a printing pad, a horizontally revolving device for inking said pad, and a horizontally revolving device for carrying to and rotating the blank article on the printing pad.

5. A printing machine comprising a stationary printing pad, a horizontally revolving inking device, a horizontally revolving device for grasping the blank article and rotating the same on the printing pad, and means for automatically releasing the article after it has been marked or printed.

6. A machine for printing on tapered cylindrical articles, comprising a rotating arm, devices for holding and rotating the article carried by said arm, an inking device supported by said arm, an ink reservoir, a printing pad, and means for automatically releasing the printed article from the holding device.

7. A machine for printing on tapered cylindrical articles, comprising an adjustable printing pad, an adjustable ink reservoir or trough, a traveling movable holder for the blank article, means for intermittently rotating said holder, a traveling inking roller, means for intermittently rotating said roller, and means for automatically releasing the article from the holder.

8. In a printing machine, a horizontally revolving arm carrying chucks to hold the article to be printed, and means for automatically separating the chucks to release the article.
9. In a printing machine, a horizontally revolving arm carrying chucks to hold the article to be printed, a stationary feeding holder arranged in the path of said chucks, means for separating the chucks, and means for closing the same on the article.
10. In a printing machine, a horizontally revolving arm carrying chucks to hold the article to be printed, a lever connected to one of said chucks, and means arranged in the path of said lever for engaging the same to move said chucks apart.
11. In a printing machine, a horizontally revolving arm, rotatably and slidably mounted chucks carried by said arm, a lever carried by said arm and connected to one of said chucks, means for engaging said lever to separate the chucks, and means for returning said chucks to their normal position.
12. In a printing machine, a feeding device, comprising a block formed in halves hinged together at their meeting faces, each of said halves having a portion thereof removed to form a semi-circular depression on the line of division between them to receive the article to be printed, and a spring for normally holding the halves together.
13. In a printing machine, a delivery or discharge holder comprising a plate having parallel vertical sides the edges of which are formed on a reverse curve to form a support for the printed article.
14. In a printing machine, a delivery or discharge holder for receiving the printed article, comprising a yielding supported plate having parallel vertical sides the edges of which are formed on a reverse curve to form a support for the article.
- In testimony whereof, I affix my signature, in the presence of two witnesses.
- FRANK A. TREIBER.
- Witnesses:
GERARD EVERSTINE,
W. E. WALSH.