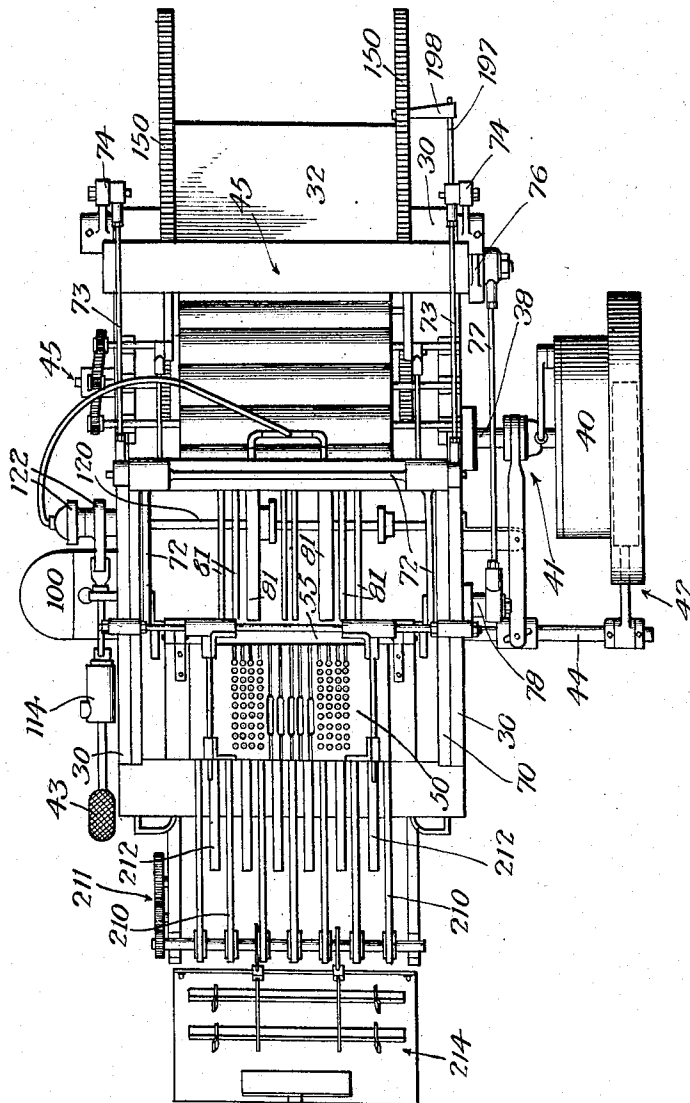


937,527.

Fig. 1.



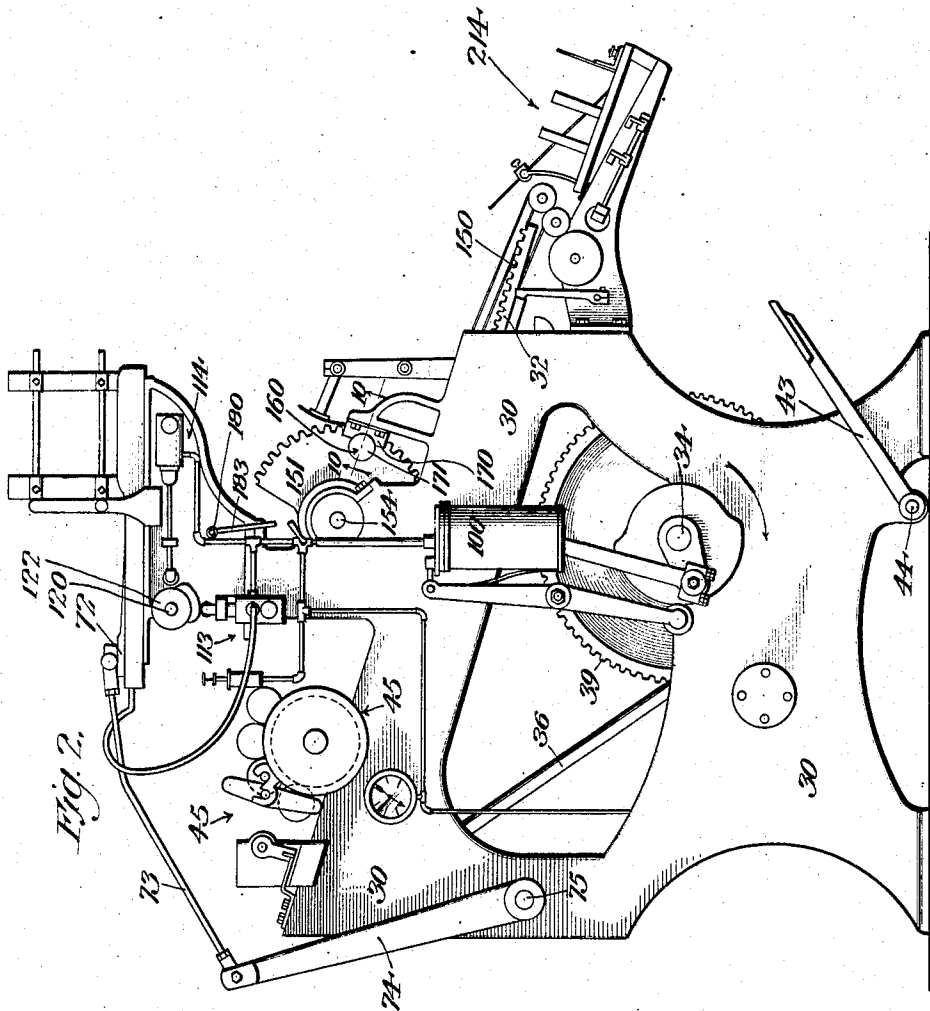
Witnesses:
 Lute S. Allen,
 Elwood H. Barkalan.

Inventor:
Arthur J. Hodge,
By James T. Buckelen
Attorney-in-Charge

A. J. HODGE.
PRINTING PRESS.
APPLICATION FILED MAR. 9, 1909.

937,527.

Patented Oct. 19, 1909.
7 SHEETS—SHEET 2.



Witnesses:
J. S. Allen
Elmer H. Barken

Inventor:
Arthur J. Hodge
By James T. Barken
Attorney

937,527.

Patented Oct. 19, 1909.
 7 SHEETS—SHEET 3.

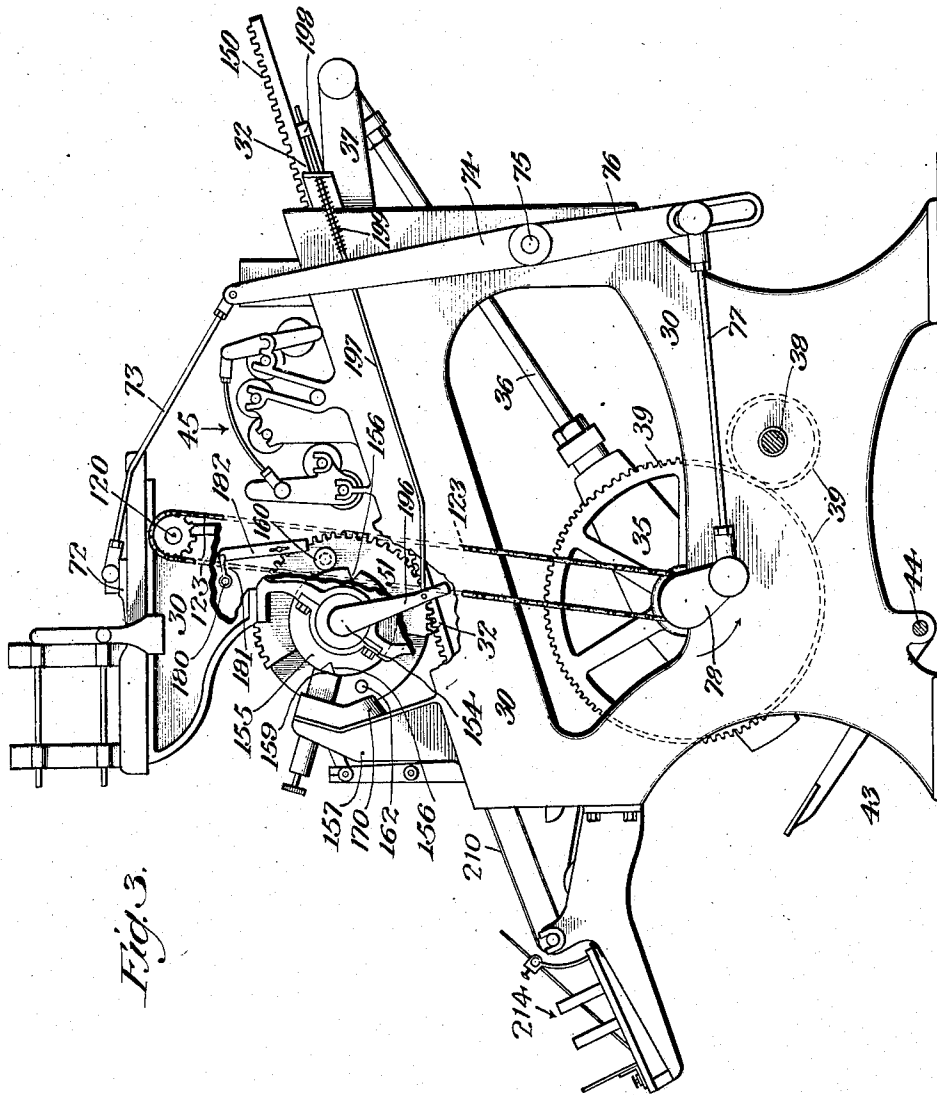


Fig. 3.

Witnesses:

Lute S. Allen,
Elwood H. Baskelen.

Inventor:
Arthur J. Hodge.

By *James T. Baskelen*
 Attorney

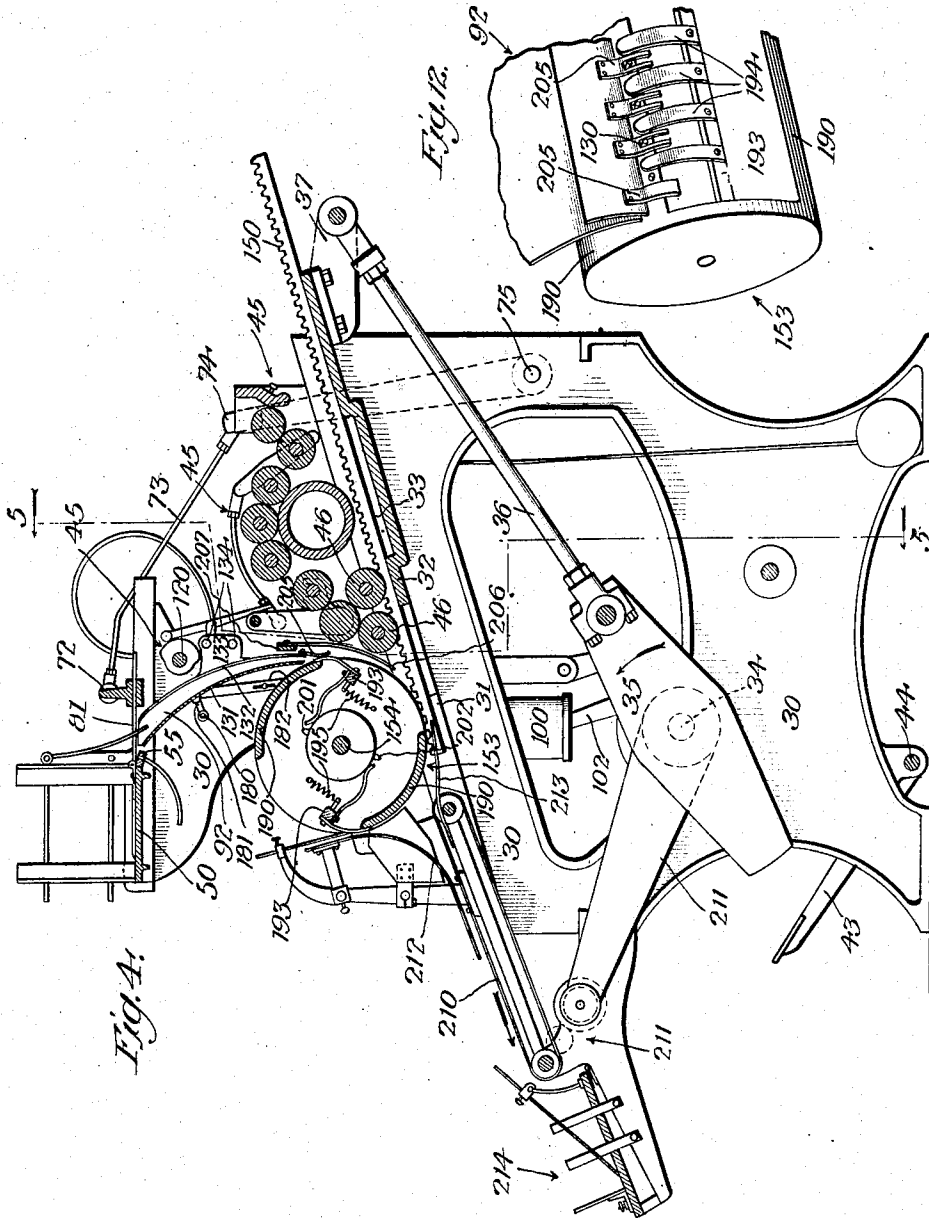
A. J. HODGE.
PRINTING PRESS.

APPLICATION FILED MAR. 9, 1909.

937,527.

Patented Oct. 19, 1909.

7 SHEETS—SHEET 4.



Witnesses:
Lute D. Allen
Elmer H. Baskin

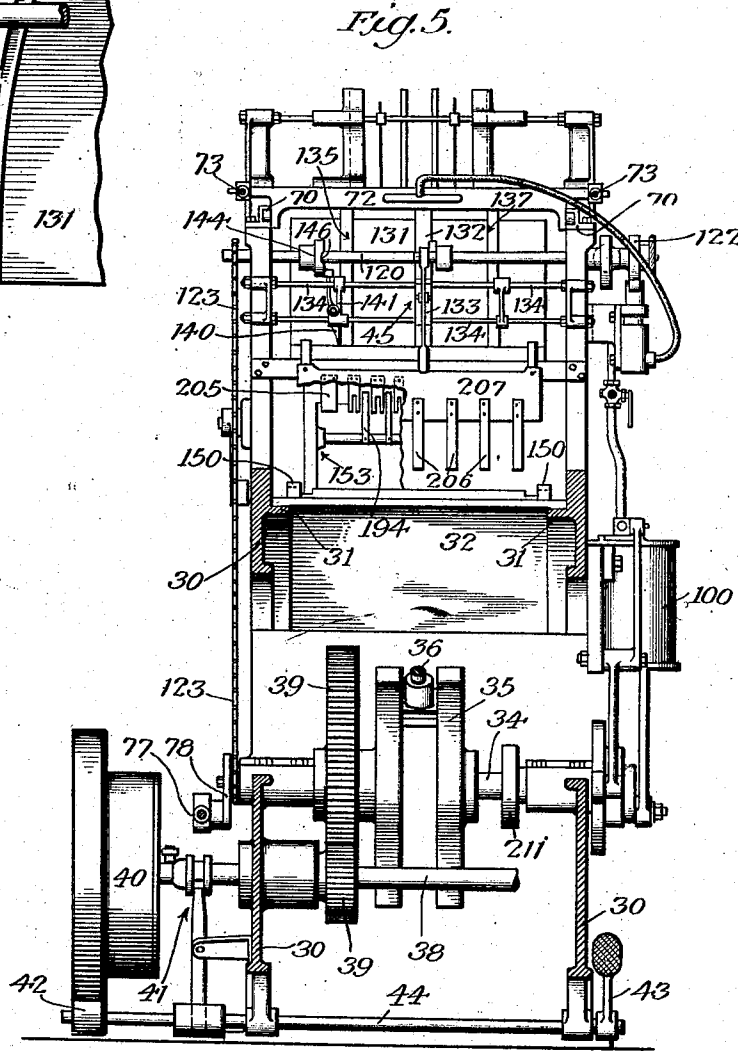
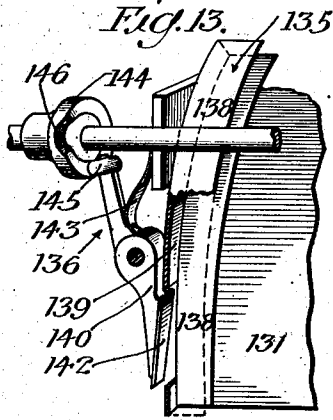
Inventor:
Arthur J. Hodge
By James T. Buckner
Attorney

A. J. HODGE.
PRINTING PRESS.
APPLICATION FILED MAR. 9, 1909.

937,527.

Patented Oct. 19, 1909.

7 SHEETS—SHEET 5.



Witnesses:
Lute S. Allen,
Elmer H. Banker

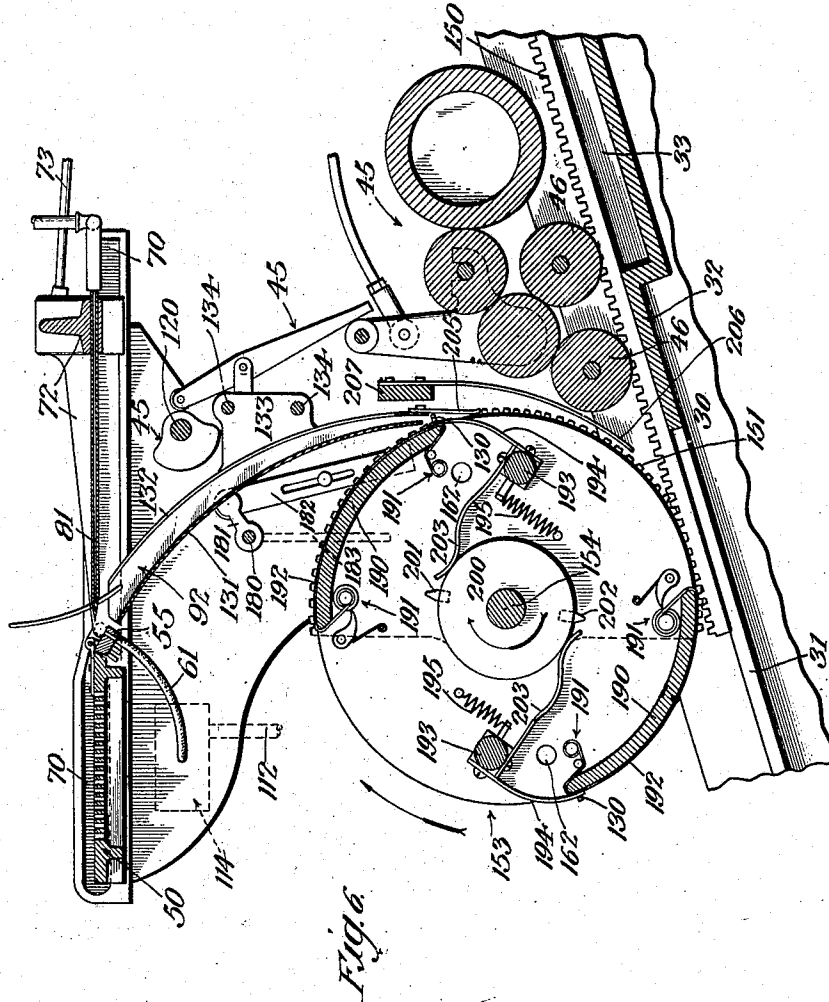
Inventor:
Arthur J. Hodge,
By James T. Banker
Attorney

A. J. HODGE.
PRINTING PRESS.
APPLICATION FILED MAR. 9, 1909.

937,527.

Patented Oct. 19, 1909.

7 SHEETS—SHEET 6.



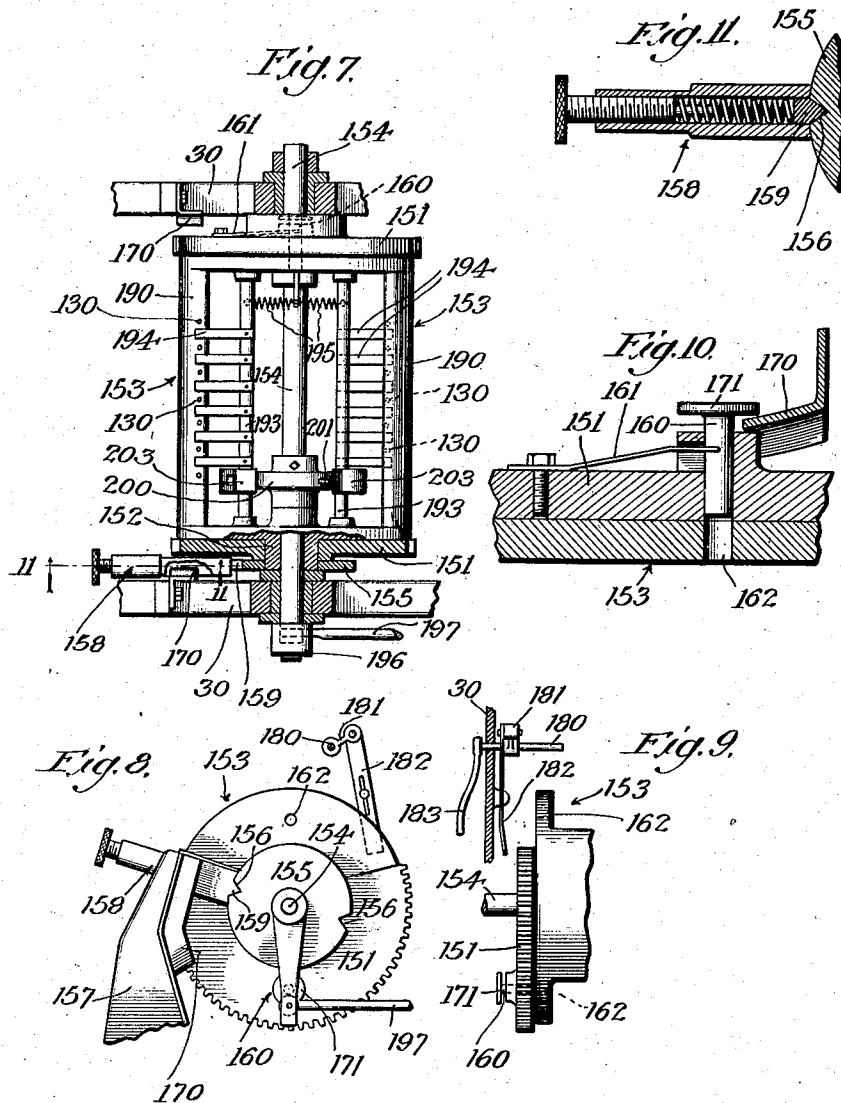
Witnesses:
Lute S. Allen,
Elmer H. Rankin

Inventor:
Arthur J. Hodge,
By James T. Buckelew
Attorney

A. J. HODGE.
PRINTING PRESS.
APPLICATION FILED MAR. 9, 1909.

937,527.

Patented Oct. 19, 1909.
7 SHEETS—SHEET 7.



Witnesses:
Lute J. Allen
Elwood H. Banker

Inventor:
Arthur J. Hodge
By James T. Banker
Attorney

UNITED STATES PATENT OFFICE.

ARTHUR J. HODGE, OF PASADENA, CALIFORNIA; ASSIGNOR TO MILLS AUTOMATIC PRESS CO., OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

PRINTING-PRESS.

937,527.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed March 9, 1909. Serial No. 482,214.

To all whom it may concern:

Be it known that I, ARTHUR J. HODGE, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented new and useful Improvements in Printing-Presses, of which the following is a specification.

This invention relates to a press of a general character and operation shown and described in Patents Nos. 867,634 and 872,108 issued to The Mills Automatic Press Company on Oct. 8th, 1907 and November 26th, 1907; and it consists in general improvements in the mode of operation of the different parts and in the construction of the same to make a more efficient press. In the latter mentioned patent, which is the basis of the former, a small printing cylinder is utilized, the paper being held on the cylinder by suction after being fed thereto by an appropriate feeding means. At the end of the printing operation the suction is released and the paper passes to a collection box over a delivery apron. The cylinder is solid in its peripheral portions and is of such a size that it will accommodate around its circumference the largest sized sheet to be printed. In order to keep the type in the form box from contacting with the cylinder except when it is desired to print upon the sheet of paper, a mechanism is employed to lower the box during all but a small portion of its movement, this portion being on the up stroke of the type when the type has reached a position adjacent the cylinder which at this time has a sheet of the clean paper around it. In this form of press the cylinder rotates during all the time that the form box on the bed is moving.

In the present invention it is arranged that the bed and the form box shall reciprocate in a single plane rather than move in one direction in one plane and in the other direction in another plane. After being once adjusted so that the type bears against the cylinder with the correct pressure the type moves in a simple motion of reciprocation. This motion is supplied by the same means as in the above mentioned patents but it will be obvious that it may be supplied in any approved manner. In the present machine the cylinder does not rotate all the time but remains at rest during the motion of the bed in one direction, which I may call the feeding and inking motion of the

press, and is rotated during the printing motion of the press. The cylinder is of such a size that it is only moved through a half revolution in each of the cycles of operation of the press, its periphery moving the same distance that is covered by the bed in its reciprocation. The form box on the bed is only approximately half as long as the motion of reciprocation of the bed and it therefore follows that only one quarter of the periphery of the cylinder is needed for the support of the sheet to be printed upon. Thus alternate quarters of the periphery of the cylinder are cut away and the operation of the whole mechanism is so arranged that when the bed travels back on its inking movement and the cylinder is stationary one or the other of these cut away portions is over the type in the form box. In this manner it is provided that the type does not come into contact with the cylinder or with any part thereof except when it is desired to print upon the sheet held upon and supported by the cylinder. Upon the back or inking movement of the bed and the type in the form box thereon, the feeding mechanism of the press is arranged and timed to deliver a sheet of paper to the stationary cylinder. This feeding mechanism may be of any preferred form, the construction illustrated being the one now in use on the press shown. Although it does not enter into the present invention in its particular form, it is included in the showing so that the same may be complete. In the present form suction means are employed to engage the edge of the sheet for its removal. When clear of the pile the sheet is dropped into the feed box of the machine where it is registered or alined accurately just before being placed on the cylinder.

In the accompanying drawings:—Figure 1 is a plan view of the press. Fig. 2 is a side elevation of the same taken on the valve side of the machine. Fig. 3 is a side elevation taken on the drive side of the machine. Fig. 4 is a longitudinal vertical section taken to correspond with Fig. 3. Fig. 5 is a vertical cross section taken on line 5—5 of Fig. 4. Fig. 6 is an enlarged section of the feeding and cylinder mechanism, this view being similar to the showing of the same portions in Fig. 4. Fig. 7 is a sectional plan view of the cylinder and its immediate mechanism. Fig. 8 is an end elevation of the same shown

without the frame of the machine. Fig. 9 is a side elevation of the portions shown in Fig. 8. Fig. 10 is a fragmentary section taken on line 10—10 of Fig. 2. Fig. 11 is a fragmentary section taken on line 11—11 of Fig. 7 and showing the mechanism for the stopping of the cylinder. Fig. 12 is a perspective view showing the position of the cylinder paper engaging mechanism in relation to the feeder box when a sheet is about to be placed on the cylinder. Fig. 13 is a perspective view of the registering mechanism on the feeder box.

In the drawings 30 designates the frame of the machine which is provided with ways 31 for the support of bed plate 32 having form box 33 therein. In the present form the bed plate is shown as being supported on an incline but this is not necessary to the efficient working of the press. In the lower part of the frame is journaled a main shaft 34 carrying a crank 35 which is connected through a connecting rod 36 to a bracket 37 secured to the under side of the bed plate. The throw of this crank is such that the travel of the bed plate and the type thereon is just sufficient for the operations to be hereinafter described. The main shaft is driven through the agency of a counter shaft 38 to which it is connected by gears 39. The counter shaft is provided with a driving pulley 40 and a clutch 41 for connecting it to the shaft, the clutch and also a brake 42 being operated by a foot lever 43 mounted on the opposite side of the machine and operating through a shaft 44. By this mechanism the operation of the press may be controlled. Located on the frame at the upper part thereof and in proper relation to the bed plate, is a set of inking feeders and rolls 45. As this arrangement is of ordinary construction and has no bearing on the present invention it will suffice to say that the face of the type in the form box is inked upon its passage under rolls 46 at the upper end of the stroke.

The feeding mechanism.—The sheets are placed in a pile on a tray 50 and the mechanism is arranged to feed the lowermost sheet from the pile into chute 92. The forward edge of the lowermost sheet is bent down by appropriate action of suction apron 55, a valve 114 controlling the suction supply. Fingers 81 then enter the pile above the lower sheet and remove that sheet upon their outward movement, the fingers being hollow with suction ports at their ends for engagement with the sheet. The fingers are mounted on a reciprocating frame 72 which moves in a cam groove 70 on the frame, movement being imparted through connecting rod 73, arms 74 and 76 pivoted at 75, and connecting rod 77 secured to crank 78 on the main shaft 34. Suction is supplied to the mechanism by a pump 100, operated

from shaft 34. Valves 114 and 113, controlling the suction supply to the apron and the fingers respectively, are operated from cam shaft 120 through the medium of cams 122.

The alining mechanism.—Upon passing into chute 92 the sheet falls to the lower end thereof and rests upon pins 130 which are set in the impression cylinder and which are at rest in the position shown in Fig. 6. Chute 92 is formed on one side by a solid sheet of metal 131 and on the other side by a number of strips 132 which are placed in a position shown and supported on brackets 133 from rods 134 extending across the frame. The members which form the lateral edges of the chute are illustrated in Fig. 13. The member 135 which is upon the left in Fig. 5 is provided with the alining mechanism 136 while the member 137 upon the right in that figure is not provided with the alining mechanism but consists mainly of curved walls 138 and a lateral wall 139. This lateral wall 139 of member 137 forms the gage against which the sheets are moved by mechanism 136. The alining mechanism consists of a pivoted arm 140 mounted on bracket 141 by which member 135 is secured on rods 134, the lower end of this arm carrying portion 142 of lateral wall 139. A spring 143 tends to hold portion 142 in its normal position but a cam 144 on cam shaft 120 engages a roller 145 to prevent the inward movement of the lower end of the arm except when cut away portion 146 of the cam reaches the roller. The mechanism is so arranged that this cut away portion reaches the roller at the time when the sheet of paper is standing in the lower end of the chute, and portion 142 of the lateral wall 139 of member 135 then contacts with the edge of the paper and forces the paper against member 137. By this means the sheet is perfectly registered in both directions and is then ready to be taken onto the cylinder.

The cylinder mechanism.—Along each side of bed plate 32 a rack 150 is placed, this rack being so designed that its pitch line comes in the same plane as the faces of the type on the bed plate. Each of these racks meshes with a sector 151 loosely mounted about hub 152 of impression cylinder 153. By the reciprocation of the bed plate the sectors are continually oscillated through a half revolution. Cylinder 153 is loosely mounted on a shaft 154 which extends across the frame. On one of its hubs 152 outside of the sector thereon a disk 155 is rigidly secured, this disk being provided with two V-shaped notches 156 arranged diametrically opposite each other. Mounted on an extension 157 of the main frame is a detent 158 whose spring pressed plunger 159 is adapted to enter the notches in the periphery of disk 155 and to thereby resiliently and yieldingly stop the disk and the cylin-

der at the exact position desired without undue shock. The disk is so set on the cylinder that the cylinder is stopped in the exact position shown in Figs. 4 and 6, while the spring is so set behind the plunger that it may be forced out of the notch at the beginning of the enforced movement of the disk. Each of sectors 151 is provided with a pin 160 which is shown in detail in Fig. 10. This pin is set in the sector and is pressed inwardly by a spring 161, the inner end of the pin normally pressing against the outer end of cylinder 153. The ends of the cylinder are each provided with two apertures 162 which are arranged diametrically opposite each other and in the path which is traversed by pins 160 so that the pins will normally be pressed into the apertures by springs 161. This action normally takes place each time the bed plate reaches the upper end of its travel with the sectors in the position shown in Fig. 6. Upon the downward movement of the bed plate the sectors and the cylinder are rotated in the direction indicated by the arrow until nearly a half revolution is completed. Just before the half revolution is completed the cylinder is released from the sectors and is then carried on by its own momentum until plunger 159 enters notch 156 and thus stops the cylinder at a position exactly half a revolution removed from its last position. The disengagement of pins 160 from the cylinder is accomplished by means of wedges 170 mounted on extension 157. In the course of their rotation heads 171 of the pins ride up over these wedges and the pins are thereby moved outwardly. This action takes place at the time above noted, the cylinder passing on by its own momentum to its position of rest so that when the sector moves back to its original position the pins will not engage with the apertures in the cylinder. The cylinder is thus left in its final position while the sector moves back to its initial position.

In the normal operation of the machine the cylinder is moved as above described upon each downward movement of the bed plate. Means are provided however for allowing the bed plate to reciprocate without the movement of the cylinder. This means is comprised in a small shaft 180 extending across the frame above the cylinder, this shaft having arms 181 thereon which are connected to depending fingers 182. These fingers are formed as is shown in Fig. 9 and their lower diagonal ends are so placed that by a rotation of shaft 180 they may be thrown into engagement with heads 171 of pins 160 when the pins are in the position shown in Fig. 3. Thus by rotating shaft 189 by handle 183 in the proper direction the fingers are thrown into such a position that the pins ride up on them and are thus pre-

vented from making connection with the apertures in the cylinder. Thus the sectors may be allowed to move without moving the cylinder.

Referring particularly to Fig. 6 it will be seen that portions of the cylinder surface are cut away, only about two opposite quarters 190 remaining. Over these portions provision 191 is made for stretching a stiff backing sheet 192 for the support of the sheets to be printed upon. At one edge of each of the cylindrical surfaces pins 130, before referred to, are located. Within the cylinder two longitudinal shafts 193 are placed and a series of spring fingers 194 on each of the shafts presses against one edge of each of the cylindrical faces of the cylinder between the pins 130. A spring 195 connected to each of the shafts provides means for holding the fingers tightly against the cylinder.

As before stated, the cylinder is loosely mounted on shaft 154. On one end of this shaft an arm 196 is mounted, a rod 197 being secured to the arm. This rod extends along the side of the press as is shown in Fig. 3 and is provided on its end with a block 198 which is adapted to engage with the upper end of bed plate 32 at the upper extremity of its motion, so that the shaft and the attached parts are held in the position shown in Fig. 6 while the bed is in its extreme upper position. A spring 199 holds rod 197 and shaft 154 normally in a position rotated in the direction indicated by the arrow in Fig. 6 from the position shown in that figure. Mounted on shaft 154 is a disk 200 carrying pins 201 and 202 on its periphery. At all times when the cylinder is stationary and except when the bed is at its upper position, as shown in Fig. 6, these pins stand under arms 203 which are secured on shafts 193. Shafts 193 are thereby held in such a position that fingers 194 are moved outwardly from engagement with the surface of the cylinder and are in a position to receive a sheet between them and the cylinder or to release a sheet from that position. The position for the fingers which are taking the sheet is shown in Fig. 12, the sheet dropping down chute 92 onto pins 130 inside of fingers 194. It will be seen that the pins 130 pass into slots in the ends of fingers 205, these fingers preventing the sheet from sliding off the ends of the pins. Fingers 194 are moved outwardly between fingers 205. Just as the bed plate reaches its upper position, shaft 154 is rotated from its normal position to the position shown in Fig. 6 and fingers 194 are thereby allowed to press against the edge of the sheet resting on the pins 130 and the sheet is thereby firmly held on the cylinder to be carried around with it. On the downward motion of the bed shaft 154 is carried again to its normal

position, but in the meantime the cylinder has started to rotate, so that arms 203 are carried away from pins 201 and 202 and are not engaged by them to again lift fingers 194. To keep the rear portion of the sheet up against the cylinder in the movement thereof, long fingers 206 are provided which hang from a stationary support 207. The half revolution of the cylinder carries the sheet, which has been printed by impression upon the type in the form box, to a position opposite that from which it started. When in this position arms 203 ride up over pins 202 and fingers 194 release the sheet to fall onto a set of belts 210 which are continuously driven in the direction indicated by the arrow through the medium of gear and belt connection 211 with the main shaft. Guides 212 and an apron 213 force the sheet to pass onto the belts whence it is conveyed to the collection box 214 at the lower end of the machine.

Having described my invention, I claim:—

1. In a printing press having a reciprocating bed plate and an intermittently revolving cylinder cooperating therewith, the cylinder having apertures in its end, a gear sector loosely mounted on the cylinder to revolve thereon, a rack on the bed plate for engagement with the sector, a spring pressed pin mounted on the sector and adapted to enter the apertures in the cylinder, a shoulder on the pin, and a stationary wedge over which the shoulder on the pin passes in its movement with the sector, the wedge lifting the pin out of the apertures in the cylinder.

2. In a printing press having a reciprocating bed plate and an intermittently revolving cylinder cooperating with the same, the cylinder having a pair of apertures in each end, the apertures being spaced diametrically opposite each other, a gear sector loosely mounted on each end of the cylinder to revolve thereon, racks on the bed plate for engagement with the sectors, a spring pressed pin on each of the sectors, stationary wedges, shoulders on the pins adapted to ride over the wedges and to thereby lift the pins out of the apertures in the cylinder, the wedges being so located that the pins are disengaged just before the completion of a half revolution of the cylinder.

3. In a printing press having a reciprocating bed plate and an intermittently rotating cylinder cooperating therewith, the cylinder having a pair of apertures in each end, the apertures being spaced diametrically opposite each other, a gear sector loosely mounted on each end of the cylinder to revolve thereon, racks on the bed plate for engagement with the sectors, a spring pressed pin on each of the sectors and adapted to enter the apertures in the cylinder, stationary wedges, shoulders on the pins adapted to ride over the wedges and to be thereby lifted out of

the apertures in the cylinder, the wedges being so located that the pins are disengaged just before the completion of a half revolution of the cylinder, and yielding stop means for the cylinder.

4. In a printing press having a reciprocating bed plate and an intermittently rotating cylinder cooperating therewith, the cylinder having a pair of apertures in each end, the apertures being spaced diametrically opposite each other, a gear sector loosely mounted on each end of the cylinder to revolve thereon, racks on the bed plate for engagement with the sectors, a spring pressed pin on each of the sectors and adapted to enter the apertures in the cylinder, stationary wedges, shoulders on the pins adapted to ride over the wedges and to be thereby lifted out of the apertures in the cylinder, the wedges being so located that the pins are disengaged just before the completion of a half revolution of the cylinder, a disk mounted on the cylinder to revolve therewith, the disk having V-shaped notches in its periphery, and a stop member with a V-shaped end adapted to enter the notches, the stop member being forced into the notches by a spring.

5. In a printing press having a reciprocating bed plate and an intermittently revolving cylinder cooperating therewith, means for revolving the cylinder when the bed plate moves in one direction, means for holding the cylinder at rest while the bed plate moves in the opposite direction, grippers on the cylinder for sheets of paper, means to normally hold the grippers open when the cylinder is in its position of rest, and connective means between the bed plate and the grippers whereby the grippers are allowed to close as the bed plate reaches the end of its non cylinder operating movement.

6. In a printing press having a reciprocating bed plate and an intermittently revolving cylinder cooperating therewith, means for revolving the cylinder when the bed plate moves in one direction, means for holding the cylinder at rest while the bed plate moves in the opposite direction, grippers on the cylinder for sheets of paper, a shaft mounted in the cylinder and having lugs thereon, arms on the grippers for engagement with the lugs when the cylinder is in its position of rest, and connective means to turn the shaft so that the lugs disengage the arms when the bed plate reaches the end of its non cylinder operating movement.

7. In a printing press having a reciprocating bed plate and an intermittently revolving cylinder cooperating therewith, the cylinder having apertures in its end, a gear loosely mounted on the cylinder to revolve thereon, a rack on the bed plate engaging with the gear, an engaging member on the gear adapted to move into the apertures in the cylinder, a shoulder on the engaging

member, and a stationary wedge over which the shoulder rides in its motion on the sector.

8. In a printing press having a reciprocating bed plate and an intermittently revolving cylinder cooperating therewith, the cylinder having apertures in its end, a gear loosely mounted on the cylinder to revolve thereon, a rack on the bed plate engaging with the gear, an engaging member on the gear adapted to move into the apertures in the cylinder, a shoulder on the engaging member, a stationary wedge over which the shoulder rides at one end of its travel with the gear, and a manually movable wedge adapted to be placed in the path of the shoulder at the other end of its travel.

9. In a printing press having a reciprocating bed plate and an intermittently revolving cylinder cooperating therewith, the cylinder having two apertures in its end spaced diametrically opposite each other, a gear loosely mounted on the cylinder to revolve thereon, a rack on the bed plate engaging with the gear, an engaging member on the gear adapted to move into the apertures in the cylinder, a shoulder on the engaging member, a stationary wedge over which the shoulder rides at one end of its travel with the gear, and a manually movable wedge adapted to be placed in the path of the shoulder at the other end of its travel.

10. In a printing press having a reciprocating bed plate and an intermittently revolving cylinder cooperating therewith, means for revolving the cylinder when the bed plate moves in one direction, means for holding the cylinder at rest while the bed plate moves in the opposite direction, grippers on the cylinder for sheets of paper, a shaft mounted in the cylinder and having lugs thereon, arms on the grippers for engagement with the lugs when the cylinder is in its position of rest, a movable contact member so placed that the bed plate engages with and moves it at the end of its non cyl-

inder rotating stroke, and connective means between the contact member and the shaft whereby the shaft is rotated to disengage the arms from the lugs.

11. In a printing press having a reciprocating bed plate and an intermittently revolving cylinder cooperating therewith, means for revolving the cylinder when the bed plate moves in one direction, means for holding the cylinder at rest while the bed plate moves in the opposite direction, grippers on the cylinder for sheets of paper, a shaft mounted in the cylinder and having lugs thereon, arms on the grippers for engagement with the lugs when the cylinder is in its position of rest, a radial arm mounted on the shaft, a contact member so placed that the bed plate engages with it and moves it at the end of its non cylinder rotating stroke, and a rod connecting the contact member with the end of the radial arm.

12. In a printing press having a reciprocating bed plate and an intermittently revolving cylinder cooperating therewith, means for revolving the cylinder during the movement of the bed plate in one direction, means for holding the cylinder at rest while the bed moves in the opposite direction, sheet grippers on the cylinder, cam means to normally hold the grippers open as the cylinder comes into its position of rest and during its period of rest, and connective mechanism between the cam means and the bed plate whereby the cam means is moved to close the grippers during the last portion of the non cylinder rotating movement of the bed plate and the first portion of the cylinder rotating movement thereof.

In witness that I claim the foregoing I have hereunto subscribed my name this 2 day of March 1909.

ARTHUR J. HODGE.

Witnesses:

JAMES T. BARKELEW,
LUTE S. ALTER.