

Feb. 2, 1937.

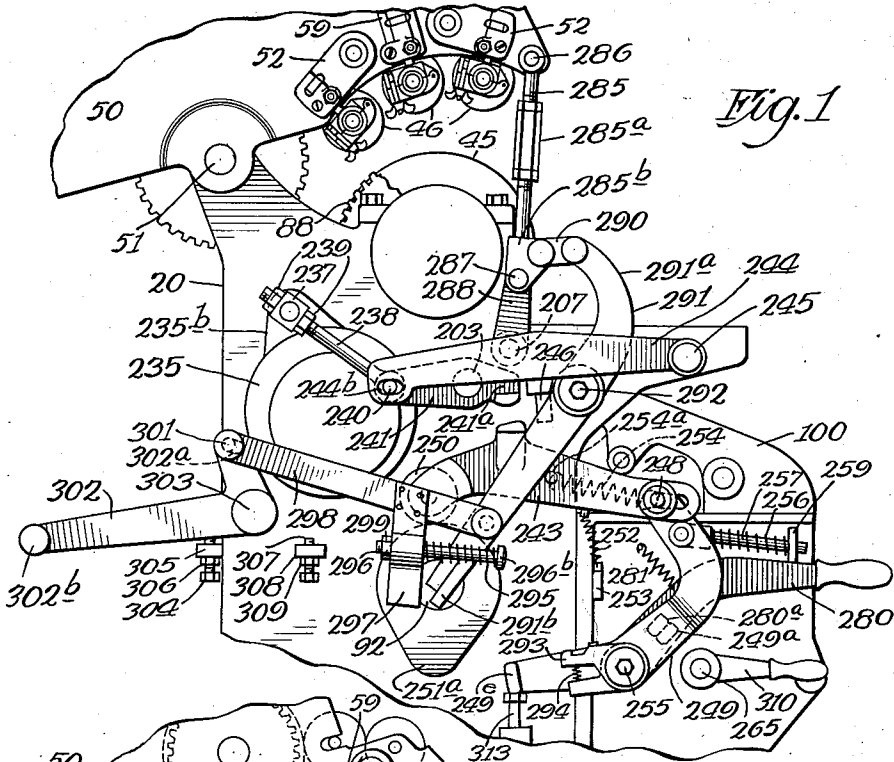
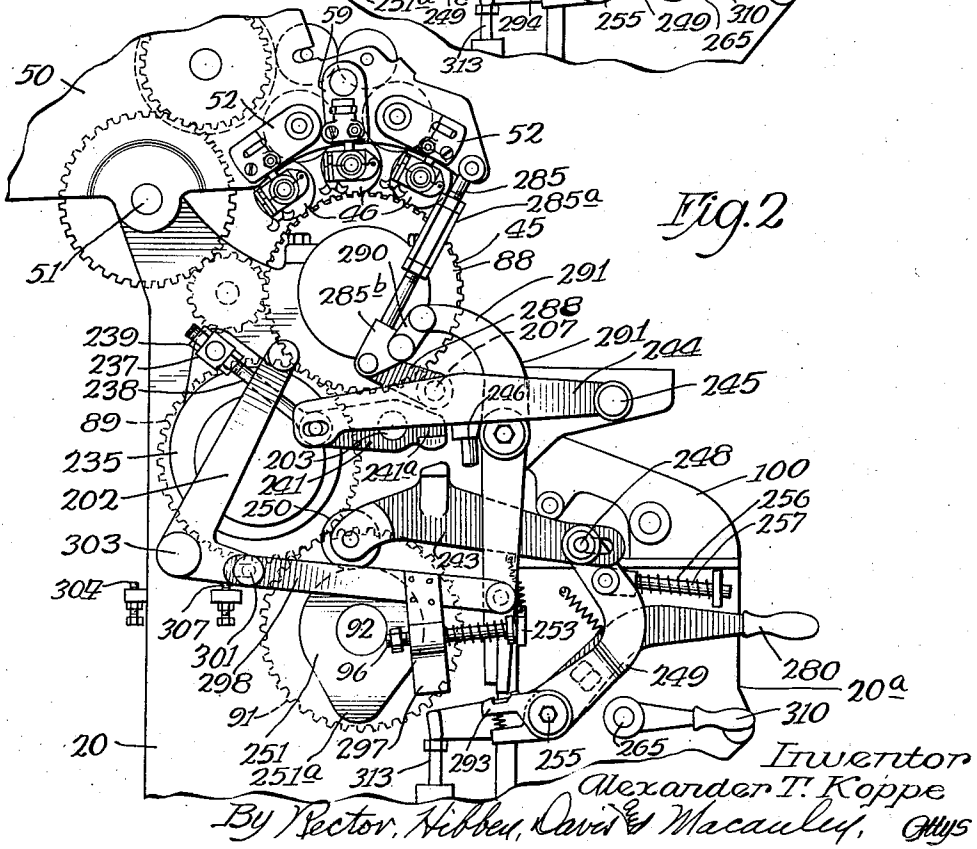
A. T. KOPPE

2,069,613

CYLINDER SEPARATING MECHANISM FOR PRINTING PRESSES

Filed Feb. 17, 1934

7 Sheets-Sheet 1



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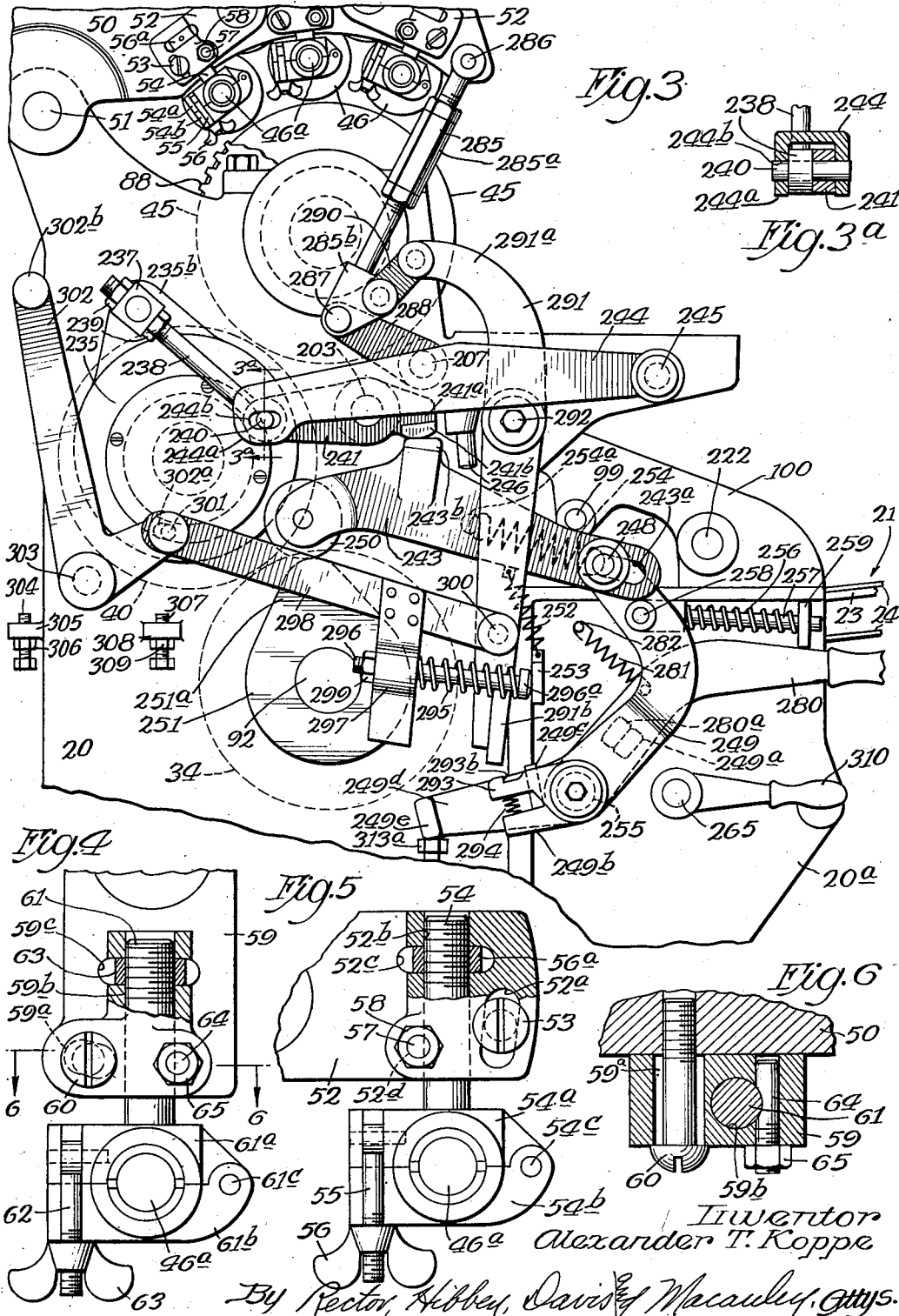
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CYLINDER SEPARATING MECHANISM FOR PRINTING PRESSES

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7 Sheets-Sheet 2



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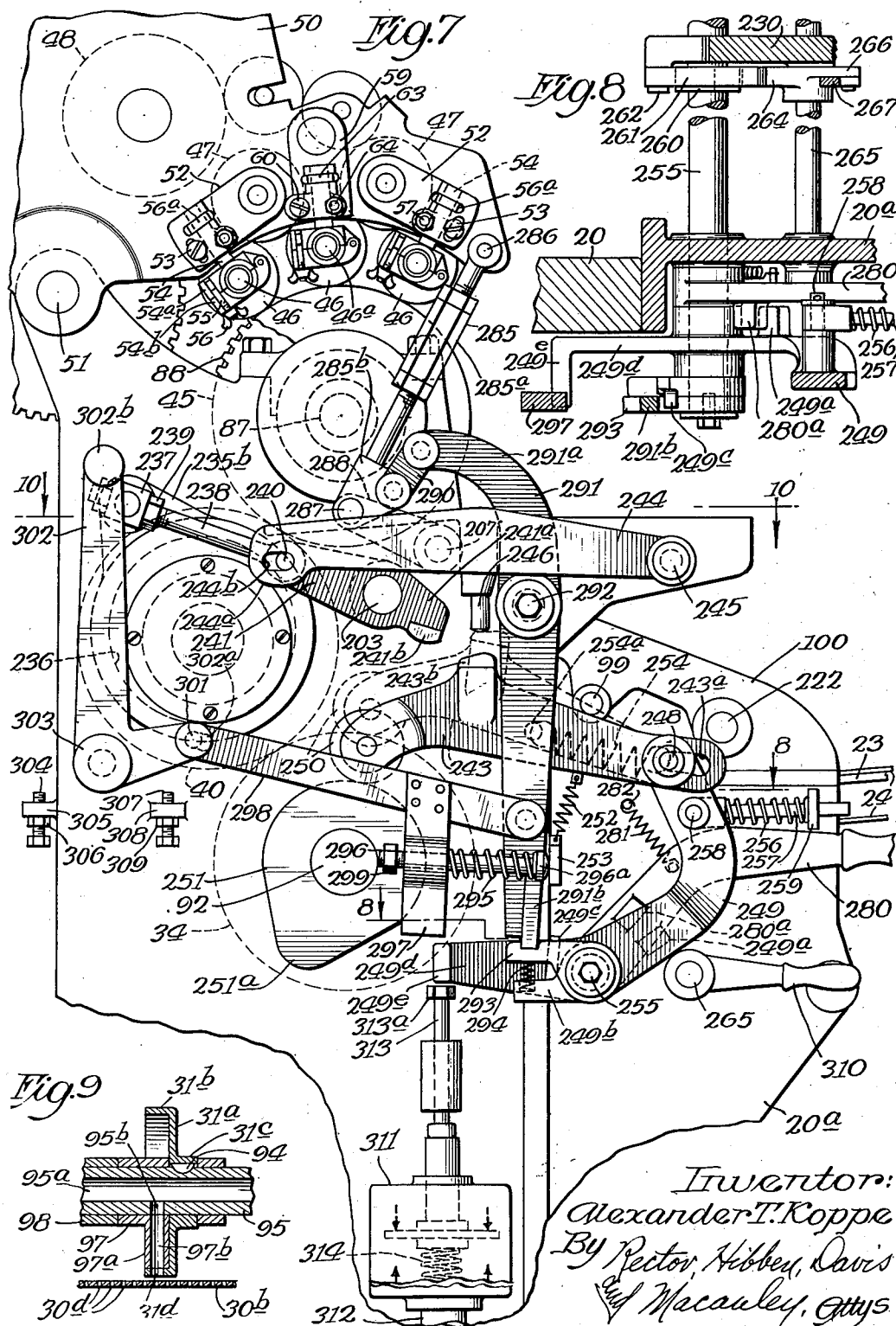
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CYLINDER SEPARATING MECHANISM FOR PRINTING PRESSES

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7 Sheets-Sheet 3



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7 Sheets-Sheet 5



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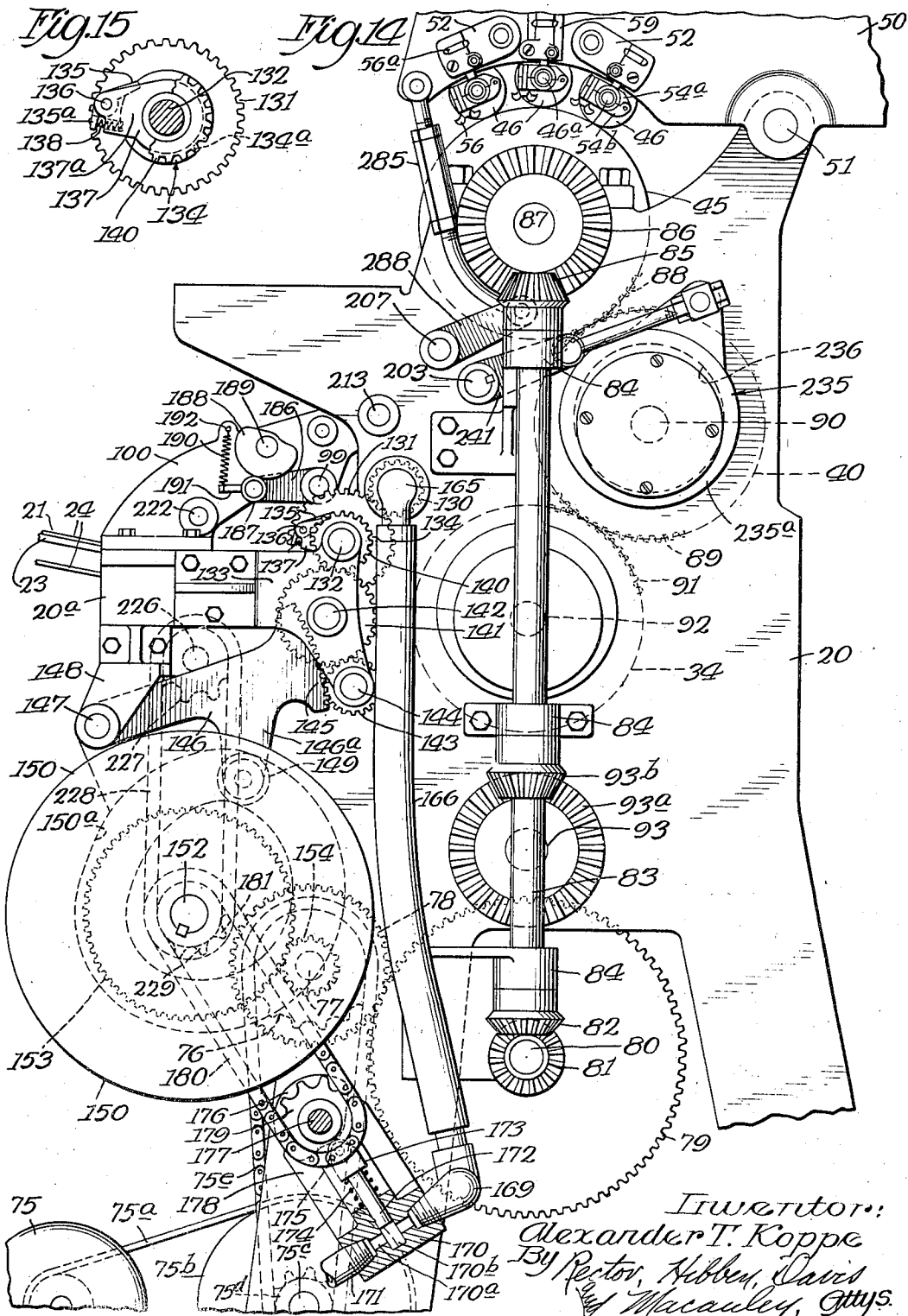
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CYLINDER SEPARATING MECHANISM FOR PRINTING PRESSES

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7 Sheets-Sheet 6



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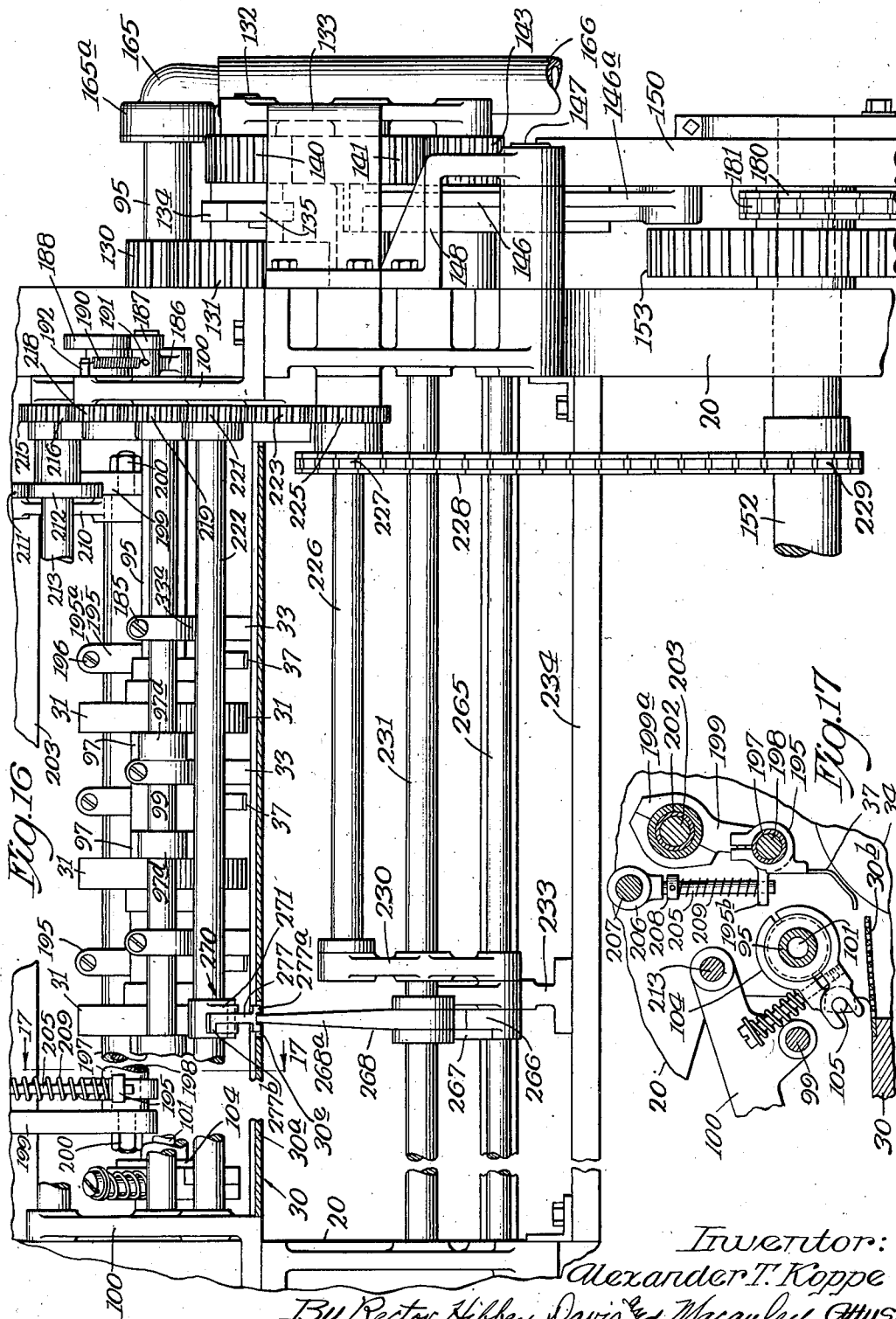
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CYLINDER SEPARATING MECHANISM FOR PRINTING PRESSES

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7 Sheets-Sheet, 7



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UNITED STATES PATENT OFFICE

2,069,613

CYLINDER SEPARATING MECHANISM FOR
PRINTING PRESSESAlexander T. Koppe, New York, N. Y., assignor to
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Application February 17, 1934, Serial No. 711,776

13 Claims. (Cl. 101—247)

This invention relates to improvements in printing presses and its purpose is to provide mechanism for automatically separating the cylinders of a press, such as the inked transfer cylinder and the paper-carrying cylinder, upon failure of the feeding mechanism to deliver a paper sheet to the paper-carrying cylinder, thus preventing the printing of the impression upon the surface of that cylinder. The invention is particularly adapted for use in connection with printing presses of the offset type in which the design carried by a press plate of zinc or the like, mounted upon one cylinder, is transferred to a rubber blanket forming the surface of a transfer cylinder, by which the inked design is in turn transferred to the paper sheet mounted upon another cylinder, and one of the objects of the invention is to effect the separation of the paper-carrying cylinder and the transfer cylinder and also to separate the transfer cylinder from the cylinder carrying the zinc plate, upon failure of the machine to feed a sheet of paper or other stock to the paper-carrying cylinder. Another object of the invention is to separate the inked form rollers from the cylinder carrying the zinc plate or the like upon failure of the machine to feed a sheet of paper or the like to the paper-carrying cylinder. Still another object of the invention is to provide a printing press comprising a movable member adapted to engage the surfaces of successive sheets of paper or other stock as these sheets are fed to the cylinders of the press and adapted, when there is a failure in the supply of paper sheets, to release certain latch mechanism which automatically effects the separation of the cylinders of the press and the movement of the inked form rollers to inoperative positions. A further object of the invention is to provide means for automatically separating the cylinders of a press upon failure of the supply of paper sheets thereto in combination with means for permitting the ready restoration of the cylinders to their normal positions after the failure in the supply of paper sheets has been corrected. Other objects relate to various features of construction and arrangement which will appear more fully hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings, in which one embodiment is illustrated. In the drawings,

Fig. 1 shows a side elevation of the upper portion of a printing press embodying the features of the present invention, illustrating the parts in the positions they occupy when the cylinders

of the press are separated and the ink supply means elevated from its normal position;

Fig. 2 is a side elevation similar to that of Fig. 1, showing the mechanism of the present invention in its normal position corresponding to the printing position of the cylinders of the press and the normal position of the ink supply means;

Fig. 3 is an enlarged side elevation similar to a portion of Fig. 2, illustrating the relative positions of the parts when the cylinders of the press are separated from each other while the ink supply means retains its normal position;

Fig. 3^a is an enlarged detail section taken on the line 3^a—3^a of Fig. 3;

Fig. 4 is an enlarged side elevation of one of the devices for supporting and adjusting one end of an ink supply roll;

Fig. 5 shows a side elevation of another form of device for supporting and adjusting an inked form roller;

Fig. 6 is a transverse section on the line 6—6 of Fig. 4;

Fig. 7 is a side elevation similar to that of Fig. 3, showing the relative positions of the parts when they have been restored to their normal positions;

Fig. 8 is a horizontal section taken on the irregular line 8—8 of Fig. 7;

Fig. 9 is a detail vertical section taken on the line 9—9 of Fig. 10;

Fig. 10 is a horizontal section taken on the line 10—10 of Fig. 7;

Fig. 11 is a vertical section taken on the line 11—11 of Fig. 10;

Fig. 12 is a vertical section similar to the lower right-hand portion of Fig. 11, showing the relative positions of the parts when there is a failure in the feed of paper sheets so that the latch mechanism is tripped by the rotary device which normally engages the upper surface of the paper sheets as they are fed to the cylinders;

Fig. 13 is a perspective view of the rotary paper-engaging device which controls the operation of the latch mechanism;

Fig. 14 is a partial side elevation of the printing press looking toward the side thereof opposite that illustrated in Figs. 1, 2, 3 and 7;

Fig. 15 is a detail vertical section taken on the line 15—15 of Fig. 10, showing the ratchet actuating device for imparting an intermittent rotary motion to the vacuum feeding drums;

Fig. 16 shows a partial vertical section transversely of the machine on the line 16—16 of Fig. 10; and

Fig. 17 shows a detail vertical section taken on the line 17—17 of Fig. 16.

As illustrated in the drawings, the invention is embodied in a printing press of the offset type comprising vertical side frames 20 which are adapted to rest upon a suitable foundation or support and which have rear extensions 20^a adapted to support parts of the operating mechanism. The paper sheets to be printed are supplied to the press by suitable feeding mechanism, such as that described and claimed in my co-pending application Serial No. 706,188 filed January 11, 1934, and these paper sheets 22 follow each other in succession over a paper conveyor 21 comprising a feed board 23 over which pass the endless power-driven feed tapes 24 supported at their lower ends by a roller 25 which has bearings in brackets 26, as illustrated particularly in Figs. 10 and 11. From the conveyor 21, each paper sheet 22 passes onto a table 30 which has a rearward extension 30^a terminating adjacent the conveyor 22 and a forwardly extending plate 30^b adapted to support the forward part of the sheet. The forward edge of each paper sheet is positioned on the table 30 against a series of paper stops 33 so that each sheet is definitely located in a precise position before it is fed to the cylinders of the press by the rotation of a series of vacuum drums 31 which are located above the supporting plate 30. After being positioned against the stops 33, the stop members are elevated and the vacuum drums rotate in the direction of the arrow 32 with the result that the forward portion of the paper sheet is positioned against the stops 35 of a paper-carrying cylinder 34 which rotates in the direction of the arrow 36. This mechanism, including the vacuum feeding drums 31, by which the paper sheets are positioned and then fed to the cylinder, is described and claimed in my co-pending application Serial No. 700,258, filed November 29, 1933.

The paper sheet 22 is guided to the cylinder 34 by guide fingers 37 and when the edge of the sheet engages the stop members 35, it is automatically gripped and held by a series of gripping fingers 38, whereupon the stop members 33 are elevated, as shown by dotted lines in Fig. 12, and the paper sheet is withdrawn from the table and carried around the cylinder as the cylinder rotates in the direction indicated by the arrow 36, shown in Fig. 11. The cylinder 34 may be provided with a draw sheet 39 which underlies the paper sheet on the cylinder. As the paper sheet rotates with the cylinder 34, an impression or design is printed thereon from the transverse cylinder 40 which rotates in the direction of the arrow 41 and which is provided with a rubber blanket 42 adapted to receive its impression from an offset press plate 44, of zinc or the like, which is mounted on the plate cylinder 45. The cylinders 34, 40 and 45 are power-driven and the upper cylinder 45 is adapted to drive, by frictional contact, a series of inked form rollers 46 which have their peripheral portions formed of felt and which are adapted to receive their ink supply from metal rolls 47. These rolls 47 are in turn supplied with ink from a metal cylinder 48 which is supplied with ink from a reservoir in the usual manner. The rolls 46, 47 and 48 are carried by a head 50 which is pivotally mounted at 51 on the side frame members 20 so that the entire series of ink supply rolls may be tilted upwardly to move the rolls 46 out of contact with the press plate 44 on the cylinder 45.

The inked form rollers 46 have their shafts 46^a mounted in brackets which are illustrated particularly in Figs. 3, 4, 5 and 6. The two outer

brackets at each end of the rollers comprise plates 52 which are pivotally mounted upon the ends of the shafts of two of the rolls 47 and which are provided adjacent their opposite ends with slots 52^a engaged by screws 53 which enter threaded apertures in the head 50 to hold the plates 52 in adjusted position. Each plate 52 is enlarged at one end and is provided with a transverse threaded aperture 52^b engaged by a threaded stud 54. This stud is provided with an enlarged head comprising two parts 54^a and 54^b which are pivoted together at 54^c and which form between them a cylindrical bearing for the end of one of the shafts 46^a. A member 55 is secured in an aperture in the member 54^a and passes through an aperture in the other member 54^b to be engaged on its threaded end by a wing nut 56^a which may be removed when it is desired to detach the ink roller 46 supported thereby. Each plate 52 is provided with a slot 52^c intersecting the threaded aperture which is engaged by the stud 54 and an adjusting nut 56 is mounted in this slot on the threaded portion of the stud so that by rotation thereof the axis of the connected ink roller 46 may be raised or lowered to contact properly with the zinc plate 44. A further adjustment may be effected by loosening the screws 53 and swinging the plates 52 about the shafts on which they are pivotally mounted. The plate 52 is provided with a cylindrical aperture 52^d which partially intersects the bore 52^b in which the member 54 is mounted and this aperture is engaged by a pin 57, recessed on one side to receive the member 54, and threaded at its outer end for engagement by a nut 58, as shown in Fig. 6, which illustrates a like construction for the intermediate roller 46, as hereinafter described. The pin 57 holds the stud 54 against rotation and maintains the bearings of the inked roller shaft in proper adjustment. The intermediate inked roller 46 is carried at its end by plates 59, shown in Figs. 3 and 4, which are similar to the plates 52 except that they have a more limited swinging motion about the axes of the shafts of the rollers 47 on which they are supported. These plates 59 are clamped in place on the head by screws 60 which engage threaded apertures in the head and elongated slots 59^a in the plates, as illustrated in Fig. 4. Each plate 59 is provided with a bore 59^b in which is mounted a stud 61 having at its lower end an enlarged head made up of parts 61^a and 61^b which are similar to the parts 54^a and 54^b previously described and which are similarly pivotally connected at 61^c and secured together by a threaded pin 62 and a wing nut 63 for clamping in the bearing thereof the shaft of the middle inked roller 46. The stud 61 is adjustable vertically by a nut 63 located in a slot 59^c formed in the plate and the stud is held against rotation by a transverse pin 64 and a nut 65 similar to the parts 60 previously described in connection with Fig. 5.

The cylinder 45 is provided with clamps 60 for securing the zinc plate 44 in place and the cylinder 40 is provided with a pair of clamps 67 for engaging one edge of the rubber blanket 42 and with another pair of clamps 68 mounted on a roller 69 for engaging the other edge of the rubber blanket and drawing it taut around the cylinder. The cylinder 34, which carries the paper sheet during the printing operation, is preferably provided with the perforated draw sheet 39 which is secured along one edge between a pair of clamps 70 mounted in the longitudinal recess of the cylinder and at the other end by being turned inwardly and clamped against one edge of the

recess by means of the blocks 71 which carry the stop members 35. These blocks are mounted on a rod 72 which may be turned to release a sheet. Adjacent this rod, there is mounted the shaft 73 upon which the paper-gripping fingers 38 are secured. This shaft is provided at its ends, in the usual manner, with crank arms having rollers adapted to engage stationary cams mounted on the side frames 20 of the machine so that the grippers 38 are automatically actuated at the proper periods of time to grip the paper sheet and to release it. When the paper sheet is released from the cylinder 34, it is taken by a delivery cylinder 74 which is somewhat similar to the cylinder 34 except that it rotates in the opposite direction so that its gripping fingers may receive the paper sheet as it is released from the cylinder 34. The cylinder 74 delivers the paper to stacking apparatus of any suitable form.

The cylinders 34, 40, 45 and 74 are driven by mechanism which is located adjacent one of the side frames 20, as shown particularly in Fig. 14. This mechanism is driven from an electric motor 75 mounted on the lower part of the frame and connected by a belt 75^a to actuate a pulley 75^b fixed on the shaft 75^c which is connected through a sprocket gear 75^d with a sprocket chain 75^e which extends upwardly and around a sprocket gear 76 secured upon a shaft 77 which also has bearings in the side frame members 20. The shaft 77 has secured thereon a pinion 78 which meshes with a large gear 79 secured upon a shaft 80 having bearings in the lower parts of the side frames 20. This shaft 80 has fixed thereon a bevel pinion 81 which meshes with a bevel gear 82 secured upon the lower end of a vertical shaft 83 having bearings in the brackets 84 which are secured to the adjacent side frame. At its upper end, this shaft 83 has a bevel pinion 85 secured thereon to mesh with a bevel gear 86 which is secured upon the shaft 87 of the plate cylinder 45. The shaft 87, like the shafts of the other cylinders, is journaled in bearings carried by the side frames 20 and through the connections just described it is driven to revolve in contact with the transfer cylinder 40 and the inked form rollers 46. On the inner side of one of the side frames 20, the shaft 87 of the plate cylinder has a gear 88 secured thereon to mesh with a gear 89 which is secured to the shaft 90 of the transfer cylinder 40. This gear 89 also meshes with a gear 91 which is secured upon the shaft 92 of the paper-carrying cylinder 34 so that the paper carrying-cylinder is driven from the transfer cylinder. The delivery cylinder 74 is fixed upon a shaft 93 which is journaled in bearings carried by the side frames and one end of this shaft has fixed thereon a bevel gear 93^a which is driven by a bevel pinion 93^b secured upon the lower part of the vertical shaft 83. In this way, all of the cylinders are positively driven in timed relation to each other and the mechanism of the present invention is adapted to separate the cylinder 40 from both the cylinder 34 and the cylinder 45 upon the failure of the machine to feed a paper sheet to the cylinder 34. This is accomplished, as hereinafter described, without completely disengaging the gears 88 and 89 and 89 and 91 so that these cylinders are continuously driven even when they are separated from each other to prevent printing by the cylinder 40 upon the surface of the cylinder 34. Before describing the mechanism by which the automatic separation of the cylinders is effected, the means for feeding the paper sheets to the cylinder 34 will be more particularly described.

The mechanism by which the paper sheets are transferred from the conveyor 21 to the cylinder 34 is illustrated particularly to Figs. 9, 10, 11 and 12 and is described and claimed in my co-pending application Serial No. 700,258, filed November 29, 1933. This mechanism comprises the feeding drums 31, heretofore mentioned, which are in the form of radial disks 31^a having transversely extending annular flanges 31^b at their outer edges. These disks have hubs 31^c which are secured by keys 94 upon a hollow shaft 95 which extends transversely of the machine, above the paper supporting plate 30^b, with the end portions thereof journaled in bearings which are formed in the side frames 20, as shown particularly in Fig. 10. The shaft 95 also has mounted thereon a series of suction blocks 97 each of which is associated with one of the drums 31. Each block 97 comprises an arm 97^a which extends vertically downward from the shaft 95 with a passage 97^b formed therein to communicate with the internal passage 95^a of the hollow shaft 95 through one of the ports 95^b which are formed in the shaft. The flange 31^b of each vacuum drum 31 is provided throughout a portion of its circumference with a series of spaced suction openings 31^d which are adapted to register successively with the suction passage 97^b as the drum is revolved about the associated block 97. The ports 95^b which are formed in the hollow shaft 95 are extended through a substantial arc, as shown in Fig. 11, corresponding to the arc through which the openings 31^d are distributed around the periphery of the drum so that as the drum revolves, a communication is established between the interior of the hollow shaft and each of the passages 97^b throughout the time that the openings 31^d are passing beneath the lower end of the suction block. The shaft 95 also carries a series of sleeves 98 which are mounted between adjacent members 31 and 97 on the shaft in order to space them apart. In addition to the downwardly extending arms 97^a, each suction block comprises a horizontally extending arm 97^c terminating in a hub portion 97^d which is engaged by a shaft 99 extending transversely of the press and having its ends journaled in brackets 100 carried by the side frames 20, thus holding the suction blocks 97 against rotation while the drums 31 revolve about them. One end of the shaft 95 is closed by a plug 101 and the other end is connected to a source of suction, as hereinafter described, so that a partial vacuum is maintained within the hollow shaft 95 and as the shaft is rotated by the mechanism hereinafter referred to, the suction acting through the passages 97^b and the openings 31^d operates to pick up the paper sheet 22 from the supporting plate 30^b and move it in the direction of the cylinder 34 as the drums rotate. The distribution of the openings 31^d about a portion of the periphery of each drum 31 is such that while the last opening is passing beneath a passage 97^b, as the drums rotate in the direction of the arrow 32, in Figs. 11 and 12, the forward edge of the sheet will have engaged the stops 35 carried by the cylinder 34, and the paper sheet is then gripped by the fingers 38, as shown by dotted lines in Fig. 12, just before the sheet is released by the suction applied through the last openings in the drums 31.

The mechanism for rotating the shaft 95 is adapted to produce a complete rotation of the shaft during the movement of each paper sheet 22 over the table 30 and at the end of each rotation, the shaft and the drums 31 come to a complete stop and remain stationary until the next

paper sheet is moved into engagement with the stop members 33. In order to insure the stopping of the shaft 95 and the connected drums 31 at the end of each revolution, without any 5 overrunning due to momentum, the shaft 95 is provided with a friction brake 104 having its brake strap connected to a stationary rod or pin 105 projecting outwardly from the adjacent side frame 20 so that the brake is held against 10 rotation during the rotation of the shaft 95.

In order to prevent the close contact of the paper sheet with the supporting plate 30^b from creating a suction effect which might interfere with the ready picking up of the paper sheet by 15 the vacuum drums, the plate 30^b is preferably provided with perforations 30^d distributed throughout the area beneath the drums. These perforations are of varying cross-section, diverging 20 downwardly, to prevent the clogging of the openings with dust or the like, and they permit the atmospheric pressure to act freely on the under side of each paper sheet when the sheet is beneath the suction drums so that the sheet is readily picked up by the suction established 25 through the passages 97^b and the openings 31^d. The plate 30^b may be made adjustable for the purpose of varying its spaced relation to the lower peripheral portions of the drums 31.

For the purpose of imparting to the shaft 95 30 an intermittent rotary motion, each increment consisting of a complete revolution, this shaft is provided at one end with a gear 130 which meshes with a gear 131 mounted to revolve on a short shaft 132 which has one end fixed in one side 35 frame 20 and the other end secured in a bracket 133 which is secured to the side frame, as shown in Figs. 10, 14 and 15. The gear 131 is provided with a relatively fixed ratchet disk 134 provided with a pair of diametrically opposed notches 40 134^a adapted to be engaged by a pawl 135. This pawl is pivoted on a pin 136 carried by an actuating member 137 which is in the form of a hub mounted on the shaft 132 with an outwardly projecting arm 137^a in which the pin 136 is fixed. 45 The pawl 135 is provided with a tail portion 135^a and a coil spring 138, seated in a recess in the arm 137^a, bears against this tail portion to force the pawl 135 against the periphery of the ratchet member 134. The actuating member 137 is 50 adapted to have an intermittent rotary motion, during each period of which the pawl 135 moves through an angle of 180 degrees, so that, upon each forward movement of the actuating member and the pawl, the ratchet member 134 is 55 rotated a half revolution of the gear 131. The gear ratio between the gear 131 and the gear 130 is such that upon each half revolution of the gear 131, the gear 130 is rotated a complete revolution, at the end of which the shaft 95 and the vacuum drums 131 are arrested and remain 60 stationary while the actuating member 137 reverses its movement to bring the pawl 135 into engagement with the next notch of the ratchet member 134.

The reciprocatory angular motion of the actuating member 137 is effected through a gear 65 140 keyed upon a hub of the actuating member and meshing with a gear 141 fixed upon a shaft 142 which is journaled in the side frame and in the bracket 133, as shown in Figs. 10, 14 and 15. 70 The gear 141 is driven by a pinion 143 which is fixed upon another shaft 144 having bearings in the bracket 133 and in the adjacent side frame. The pinion 143 is driven by a gear sector 145 75 carried at the end of an actuating lever 146

which is pivotally mounted at 147 upon a bracket 148. The lever 146 has a depending arm 146^a provided with a roller 149 adapted to travel in the groove 150^a of a cam 150 which rotates continuously and, through the roller 149, imparts a 5 reciprocatory motion to the lever 146, thus giving corresponding reciprocatory angular movements to each of the gears in the chain of gearing leading up to the actuating member 137. 10 There is thus imparted to the vacuum drums 31 an intermittent rotary motion whereby these drums rotate continuously in the same direction and come to a stop at the end of each revolution with the forward aperture of the series of aper- 15 tures 31^d in each drum located beneath one of the suction passages 97^b, as shown in Fig. 11, in readiness to pick up a paper sheet positioned against the removable stops 33. The cam 150 is adjustably secured upon a shaft 152 extending 20 transversely of the press and having bearings in the side frames 20, as shown in Fig. 14. The shaft 152 has a large gear 153 secured thereon to mesh with a driving pinion 154 which is fixed upon the previously described shaft 77 so that 25 the shaft 152 is rotated continuously during the operation of the driving motor. By adjusting the cam 150 on the shaft 152, the stationary positions of the drums 31 may be regulated in order to cause the initial opening 31^d in each vacuum 30 drum to be positioned beneath the associated suction passage 97^b in one of the suction blocks, and to regulate the speed with which the paper sheets engage the stops 35 on the cylinder 34.

The hollow shaft 95 is connected at the end thereof adjacent the gear 130 with an elbow 165 35 which communicates with a vacuum tube 166. The elbow 165 is provided with an enlargement 165^a containing means for forming a fluid-tight connection with the end of the rotating shaft 95. The vacuum tube 166 extends downwardly adja- 40 cent the vertical shaft 77, as shown in Fig. 14, and the lower end thereof communicates with an elbow 169 which is secured in a valve block 170 carried by the lower part of the side frame. This 45 valve block has a transverse passage 170^a communicating with the elbow 169 and also with a vacuum pipe 171 which leads to the suction pump adapted to be continuously driven by an electric motor or the like during the operation of the 50 press. The valve block 170 is provided with an upwardly extending bore 170^b which intersects the bore 170^a and which has slidably mounted therein a valve plug 172. At the upper end of 55 this valve plug there is mounted a bracket 173 and a coil spring 174 is interposed between this bracket and the upper face of the block 170 so that the spring acts normally to elevate the plug and permit a free communication between the 60 pipe 171 and the elbow 169. The bracket 173 carries a roller 175 arranged to bear upon the surface of a cam 176 which is secured on a shaft 177 rotatably mounted in a bracket 178 carried 65 by the valve block 170. A sprocket gear 179 is secured on the shaft 177 adjacent to the cam 176 and this sprocket gear meshes with a sprocket chain 180 which passes around a sprocket gear 181 fixed upon the previously described shaft 152 70 so that during the operation of the press, the cam 176 is continuously driven and effects an intermittent downward movement of the valve plug 172 with the result that the connection of the suction pipe 171 with the elbow 169 and the vacuum tube 166 is intermittently closed. The 75 cam 176 is so positioned on the shaft 177 that the suction connection is closed by the valve plug 172

during those portions of the revolutions of the vacuum drums 31 in which the unperforated portions of the drums pass beneath the suction passages 97^b in the blocks 97.

5 The stop members 33 which engage the forward edge of each paper sheet 22 on the supporting plate 30^b, as shown in Fig. 12, preliminary to the picking up of the paper sheet by the vacuum drums 31, are carried by the arms 33^a which are
10 positioned between the drums, as shown in Figs. 10, 11 and 12, and which are provided with split hubs 33^b adapted to be clamped on the previously described shaft 99 by means of clamping bolts or studs 185. With this arrangement, the rocking
15 of the shaft 99 in its bearings will elevate the stop members 33 from the paper-engaging positions shown in Fig. 12 to the elevated position shown in Fig. 11, thus permitting the paper sheet to pass over the supporting plate 30^b until it en-
20 gages the stops 35 on the cylinder 34, as shown in Fig. 11. This rocking movement is effected by means of a crank arm 186, shown in Fig. 14, which is fixed on the end of the shaft 99 and which carries a roller 187 arranged to bear upon the
25 peripheral surface of a cam 188 fixed upon the end of a shaft 189 which is journaled in the brackets 100. A coil spring 190 is connected to a pin 191 projecting from the end of the lever 186 and also to a stationary pin 192 fixed on the
30 adjacent bracket 100, thus maintaining the roller 187 in engagement with the cam. This cam has a substantial portion of its peripheral surface arranged concentrically with the axis of the shaft 189 and spaced some distance from said axis so that when this portion of the cam is in contact
35 with the roller 187, as shown in Fig. 14, the crank arm 186 is depressed, thereby causing the arms 33^a to be elevated, as shown in Fig. 11, to permit the movement of the paper sheet over the table
40 under the influence of the vacuum drums 31. At the end of this stage of the operation, and after the rear edge of the sheet has passed onto the cylinder 34 from the supporting plate 30^b, the stops 33 are quickly depressed into the notches
45 30^c of the supporting plate as the roller 187 passes into engagement with the sharply inclined portion of the cam 188, the stops 33 remain in the positions shown in Fig. 12, while another sheet of paper travels over the table 30 and engages those
50 stops, whereupon the sharply inclined portion of the cam 188 at the other side of the axis of the cam causes the arms 33^a to be quickly elevated until they reach the position where they are retained in their elevated positions while the roller
55 187 is in engagement with the portion of the cam which is concentric with the cam axis. In this way, the continuously rotating shaft 189, which is actuated as hereinafter described, causes a periodic elevation of the stops 33 in the proper
60 timed relation to the rotation of the vacuum drums 31 and the positioning of the stops 35 on the cylinder 34 in the proper location to receive the paper sheet.

As each paper sheet moves over the supporting
65 plate 30^b, it is guided into engagement with the stops 35 on the cylinder by the guide fingers 37, previously referred to. These guide fingers are carried by brackets 195 which have projecting
70 ears 195^a engaged by screws 196 which may be adjusted to clamp these brackets upon a tubular shaft or sleeve 197 which is mounted to rock about a shaft or axle 198 having its ends secured in the hangers 199, the ends of the shaft 198 being threaded for engagement by nuts 200, as shown
5 in Fig. 16. The hangers 199 are provided with

split hubs 199^a which are secured together and clamped upon a sleeve or hollow shaft 202 which is mounted upon a shaft or axle 203 extending between and secured in the side frames 20. A
5 bracket 195^b is clamped on the sleeve 197 adjacent one end thereof and is provided with an aperture which is engaged by a rod 205. The rod 205 is suspended from a member 206 which is mounted upon the rod or shaft 207 extending
10 between the side frames. The rod 205 carries a fixed collar 208 and a coil spring 209 which is positioned on the rod between the collar and the co-acting arm 195^b, as illustrated in Fig. 17, so that when the brackets 195 are rocked about the shaft
15 198, the spring 209 is compressed by the upward movement of the arm of the bracket 195^b. For the purpose of elevating the guide fingers 37, the hollow sleeve or shaft 197 has fixed thereon a crank arm 210, shown in Fig. 11, which carries at its upper and outer end a roller 211 adapted to coact
20 with the peripheral surface of a cam 212 fixed upon a shaft 213 which has bearings in the brackets 100. The cam 212 is so formed that after the forward edge of the paper sheet has been gripped by the gripping fingers 38 on the cylinder 34, the lever 210 is actuated by the cam to rock the hollow
25 shaft or sleeve 197, thereby elevating the stop fingers 37 to the position shown in Fig. 12 and compressing the spring 209. This elevation of the stop fingers 37 is maintained while the roller 211
30 contacts with that portion of the cam 212 which is concentric with the axis of the shaft 213 and then the fingers 37 are again moved to the position shown in Fig. 11 as the roller 211 rides inwardly on the sharply inclined portion of the cam
35 under the influence of the springs 209.

The shaft 213 is provided at one end with a relatively fixed gear 215 which meshes with an idler gear 216 mounted to revolve about a stub shaft 217 fixed in the adjacent bracket 100, as shown
40 in Fig. 11. The gear 217 meshes with a gear 218 fixed upon the previously described shaft 189 which carries the cam 188 for actuating the stops 33. The gear 218 is driven through an idler gear 219 which is mounted to rotate on a stub shaft 220 carried by the adjacent bracket 100. The
45 gear 219 is driven by a gear 221 fixed upon a shaft 222 which extends transversely of the machine with its ends journaled in the brackets 100. The gear 221 is driven by a gear 223 mounted upon a stub shaft 224 carried by one of the side frames, as shown in Fig. 11. The gear 223 is in turn driven
50 by a gear 225 fixed upon a horizontal shaft 226 which has one end journaled in one of the side frames 20 and the other end journaled in a frame member 230 which is supported by rods 231 and 265 extending between the side frames, as shown
55 in Fig. 16. The shaft 265 is also supported adjacent the frame member 231 by a member 233 which is supported upon a transverse frame member 234 secured to the side frames. This shaft 226 also has fixed thereon a sprocket gear 227, shown particularly in Figs. 11 and 16, which is driven by a sprocket chain 228. This sprocket
60 chain passes around a sprocket gear 229 on the shaft 152 which has previously been described as the shaft upon which the cam 150 is located. As heretofore explained, the shaft 152 is driven continuously when the driving motor of the press is in operation and it will be apparent that, through
65 the connections which have just been described, all of the shafts 213, 189, 222 and 226 are also continuously driven for actuating the various parts of the mechanism which are connected thereto. In addition to the sheet transfer mechanism just

described, the press may be provided with means, not a part of the present invention, for positioning the sheets laterally on the table 30.

When the conveyor 21 or the vacuum feeding drums 31 and their associated mechanism fail to feed a paper sheet 22 to the cylinder 34, the impression or transfer cylinder 40 is automatically separated from the paper-carrying cylinder 34 and from the plate cylinder 45 through the operation of mechanism which then automatically turns the eccentric bearing members 235 in which the ends of the shaft 90 of the cylinder 40 are journaled, as shown in Figs. 1, 2, 3 and 14. These bearing members are themselves journaled in apertures 236 which are formed in the side frame members 20 and they are provided on their outer sides with disks 235^a which overlap the side frames and which have crank arms 235^b extending therefrom and pivotally connected with blocks 237. Each of these blocks is engaged by a connecting rod 238 which is threaded at its extremity and engaged at the opposite sides of the block 237 by nuts 239 so that the effective length thereof may be varied. The other end of each rod 238 is pivotally connected by a pin 240 with a lever 241 mounted to revolve about the shaft 203 projecting transversely through the machine and having bearings in the side frame members 20, as shown in Fig. 3. At one side of the machine, one of these levers 241 is provided with a rearwardly projecting arm 241^a having a hardened lug 241^b adapted to be engaged by another lug 243^b, carried by an actuating member 243, when this actuating member is in the position shown in Fig. 3. Upon upward movement of the actuating member 243, the lug 243^b pushes upwardly on the arm 241^a of the adjacent lever 241, thereby turning the shaft 203 and moving both crank arms 241 to rotate the eccentric bearing members 235 to the position shown in Fig. 3, thereby separating the cylinder 40 from each of the cylinders 34 and 45. The upward movement of the levers 241 is effected by an arm 244 which is pivoted at 245 on one of the side frame members and which embraces the adjacent ends of one lever 241 and its connecting rod 238. The opposite flanges 244^a of this arm 244 are provided with elongated slots 244^b which are slidably engaged by the pivot pin 240. This arm 244 carries a downwardly projecting pin 246 which is adapted to be engaged by the lug 243^b of the actuating member 243, when the actuating member is in the position shown in Fig. 7, for the purpose of turning the adjacent lever 241 through the connected pin 240 and thereby turning the eccentric bearing members 235 so that the cylinder 40 is returned to printing position with respect to the cylinders 34 and 45. In Fig. 7, the actuating member 243 is shown by dotted lines in an upper position which it occupies after it has turned the eccentric bearing members 235 to bring about this normal printing relationship of the cylinders. The actuating member 243 is provided at its rear end with a slot 243^a engaged by a pin 248 which is secured upon the end of an actuating crank arm 249. At its other end, the actuating member 243 carries a roller 250 which rides upon the peripheral surface of a cam 251 secured upon the shaft 92 of the cylinder 34. This cam rotates continuously with the cylinder and upon each rotation thereof, the projection 251^a of the cam is adapted to elevate the actuating member 243 about the pin 248. If the cylinders have been in relative printing positions and the actuating member 243 is in a position with

the lug 243^b thereof beneath the lug 241^b on the adjacent lever 241, at the time that the actuating member is elevated by the cam 251, the lever 241 is turned by the elevation of the actuating member, as shown in Fig. 3, thereby separating the transfer cylinder 40 from each of the cylinders 34 and 45. If the actuating member occupies its rear position with the lug 243^b thereof beneath the pin 246, at the time that the actuating member 243 is elevated by the cam 251, and if the cylinder 40 is then separated from the cylinders 34 and 45, the elevation of the actuating member 243 causes the arm 244 to be raised by the engagement of the lug 243^b with the pin 246, as shown in Fig. 7, thereby turning the eccentric bearing members 235 and restoring the cylinder 40 to printing position with respect to the cylinders 34 and 45. The actuating member 243 is normally pulled in a downward direction by a coil spring 252 which is attached to the under side of this member and to a stationary member 253 carried by the adjacent frame member, thus maintaining the roller 250 in contact with the periphery of the cam 251. The actuating member 243 is moved to occupy a position beneath the lug 241^b or beneath the pin 246, by the actuating crank 249 which is fixed upon a shaft 255 journaled in bearings carried by the frame extensions 20^a. This crank member 249 may be actuated by the turning of the shaft 255 or by the action of a coil spring 256 which is mounted on a rod 257 pivotally attached at 258 to the crank member and having a sliding engagement with a flange 259 which projects outwardly from the frame member 20^a. The coil spring 256 engages the flange 259 at one end and the head of the pin 257 at the other so that when the shaft 255 is free to turn, the spring 256 moves the crank arm 249 toward the left, as viewed in Fig. 7, thereby positioning the lug 243^b beneath the lug 241^b of the crank 241 by which the eccentric bearing members 235 are turned in a direction to separate the cylinders. The pin 248 is connected by a coil spring 254 with a pin 254^a mounted on the actuating member 243, thus maintaining the pin 248 normally at the left hand end of the slot 243^a, as viewed in Fig. 7, but permitting relative movement of the actuating member 243 and the crank 249 in case the latch is tripped while the parts are in the relative positions shown in Fig. 3 with the lug 243^b at one side of the pin 246.

The shaft 255 is normally held against rotation under the influence of the spring 256 by certain latch mechanism illustrated particularly in Figs. 11 and 12 and including a disk 260 which is secured on the shaft 255 and which is provided at one point around its periphery with a notch 260^a having a radial shoulder 260^b at one end thereof. This notch is normally engaged by a latch member 261 which is pivoted at 262 on the frame member 231 carried by the transverse frame member 234 and by the various shafts which extend through it. The latch member 261 is notched to form a shoulder 261^a which is adapted to engage the shoulder 260^b of the disk 260 and it may be elevated to disengage these shoulders by a crank arm 264 which is secured upon a shaft 265 journaled in the frame member 231 and in the side frame members 20. This shaft 265 has another crank arm 266 fixed thereon and the outer end of this crank arm is pivotally connected by a link 267 with a bell-crank lever 268 which has an upwardly extended pointed arm 268^a terminating at a point beneath the table 30 adjacent a slot 30^a which is formed longitudinally in the

table at this point. Located above this slot is a rotary paper-engaging device 270, shown in Figs. 11, 12 and 13, comprising a crank arm 271 fixed upon the shaft 222 which is journaled in the brackets 100, and actuated in the manner heretofore described, to revolve in the direction of the arrow 273. This paper-engaging member comprises, in addition to the crank arm 271, a paper-contacting member 277 having a forked extremity 277^a at one end and a laterally projecting lug 277^b at the other. This paper-contacting member is pivotally connected at an intermediate point to the crank arm 271 by means of a pin 279 and, as the crank arm 271 rotates, the forked extremity 277^a of this member 277 is adapted to descend by gravity and ride upon the surface of the paper sheet 22 in the lower part of its path of travel, as shown in Figs. 11 and 12. The extent of the downward swinging of the forked end of this member is limited by the engagement of the member 277^b with the side of the crank arm 271. If there is no paper sheet on the table 30 over the slot 30^e therein, the forked extremity 277^a of this member 277 drops through the slot and the tip 268^a of the lever 268 is engaged by the slot 277^c of the fork, thereby causing the lever 268 to be turned toward the left, as viewed in Fig. 11, by the action of the device 270, so that the crank arm 264 is operated to elevate the latch member 261 as shown in Fig. 12. The shaft 255 is then free to turn under the influence of the spring 256 with the result that the actuating member 243 is moved by the crank 249 from the position shown by full lines in Fig. 7 to the position shown in Fig. 2, so that upon the next revolution of the cam 156, this actuating member is elevated to the position shown in Fig. 3, thereby causing the crank arms 241 to turn the eccentric bearing members 235 and separate the cylinders. On the other hand, if the paper sheets follow each other in proper succession on the table 30, the paper-engaging member 277 never drops through the slot 30^e and the latch member 261 continues to hold the shaft 255 against rotation. After the latch member 261 has been elevated to release the shaft 255 and permit the separation of the rolls by the action of the spring 256, the apparatus may be reset, after it has been determined that the paper sheets are again being delivered in normal sequence, by manually turning a crank handle 280 which is pivoted on the shaft 255 and which is normally held in elevated position by a coil spring 281 connected to the handle and to a pin 282 on one of the side frame members 20. Upon pressing this handle downwardly, a lug 280^a, formed on the side thereof, engages a lug 249^a formed on the side of the actuating crank 249, thereby turning the shaft 255 to a position where the latch member 261 again falls by gravity into the notch 260^a in the disk 260.

In addition to effecting separation of the cylinders when there is a failure in the feed of paper sheets to the cylinder 34, the dropping of the forked member 277 through the slot 30^e of the table 30 also brings about the elevation of the inking head 50 about its pivot 51 for the purpose of preventing further inking of the plate 44 on the cylinder 45 by the inked form rollers 46. This is accomplished through a pair of connecting rods 285 which are connected to the forward edges of the head 50 by pivot pins 286, as shown in Figs. 1, 2, 3, 7 and 14. These rods are formed in sections which are relatively adjustable by turn buckles 285^a and they include

brackets 285^b at their lower ends which are pivotally connected by pins 287 with crank arms 288 fixed on a transverse shaft 207 which is journaled in bearings carried by the side frames of the machine. At the side of the machine on which the actuating member 243 is located, the bracket 285^b is pivotally connected by a link 290 with the upper rearwardly curved extremity 291^a of a lever 291. This lever is pivoted at 292 on the adjacent side frame and extends downwardly to a point adjacent the actuating crank 249 where it terminates in a transversely extending flange 291^b adapted to engage a notch 293^b formed in a latch member 293 which is pivotally mounted on the shaft 255. The crank 249 is provided with an arm 249^b which projects downwardly and rearwardly beneath the latch member 293. This arm has a socket in its upper side which is engaged by a coil spring 294 arranged to bear at its upper end against the lower side of the latch member so that this latch member is normally forced in an upward direction to the extent permitted by a lug 249^c which projects laterally from another arm 249^d formed integrally with the crank 249 and projecting rearwardly therefrom beyond the latch member 293 and the arm 249^b. When the cylinders are in their normal printing positions and the inking head 50 is lowered to effect the inking of the plate 44 on the cylinder 45, the lever 291 by which the inking head is swung about its pivot, occupies the position shown in Fig. 7, wherein the flange 291^b at the lower end of this lever is engaged and held by the latch member 293, thus maintaining the inked form rollers 46 in their lower plate-engaging positions at the same time that the cylinder 40 is held in engagement with the cylinders 34 and 45 by the latch member 261.

When the actuating crank 249 is turned by the spring 256, upon the release of the shaft 255 by the latch member 261, the lug 249^c causes the latch member 293 to turn downwardly with the shaft 255 so that it assumes the position shown in Fig. 3. The lever 291, which operates the inking head 50, is then released and the lower end thereof is then permitted to swing toward the left, as viewed in Fig. 3, under the influence of a coil spring 295 which is mounted on a plunger 296 having a head 296^a engaged on one side by one end of the spring and contacting on its end with the fixed lug 253 carried by the side frame. This plunger 296 is slidably mounted in an arm 297 which is secured to and extends downwardly from a link 298 and the end of the plunger is engaged by a nut 299 which may be adjusted to vary the compression of the spring 295. The link 298 is pivotally connected to the lower part of the lever 291 by a pin 300 and at its other end it is engaged by a pin 301 which passes through an elongated slot 302^a formed in one arm of a bell crank lever 302. This bell crank lever is pivoted at 303 on the adjacent side frame 20 and the upwardly extending arm thereof is provided with a handle 302^b which may be engaged by the hand of the operator for manually controlling the operation of the lever 291. When the arm 297 is moved toward the left, as viewed in Fig. 3, by the expansion of the spring 295, the arm 297 carries with it the link 298 which is attached to the lever 291, so that the crank arms 288 on the shaft 289 are swung toward the right, as viewed in Fig. 3, thereby elevating the inked form rollers 46 out of contact with the plate 44 on the cylinder 45.

This brings about a comparatively slight separation of the cylinders 34 and 45.

ration of the inking rollers 46 and the plate on the cylinder 45, as shown in Fig. 3, but, if at any time during the operation of the machine a greater separation is desired in order to permit the removal of the rollers 46 from the brackets in which they are mounted, this may be accomplished by swinging the bell crank lever 302 manually about its pivot to the position shown in Fig. 1, whereupon the long arm of this bell crank lever rests upon an adjustable stop member 304 which threadedly engages a lug 305 carried by the adjacent side frame member 20 and which may be held in adjusted position by a lock nut 306. If the operator of the machine desires to prevent the separation of the inking rollers 46 from the plate 44 on the cylinder 45 at the time that the impression or transfer cylinder 40 is separated from the cylinders 34 and 45, this may be done by swinging the bell crank lever 302 toward the right, as viewed in Fig. 3, until it occupies the position shown in Fig. 2, where the short arm thereof rests upon a stop member 307 threadedly engaging a lug 308 carried by the side frame and held in adjusted position by a lock nut 309. When the short arm of the bell crank lever 302 engages the stop member 307, the pivot pin 301 lies below a line connecting the axes of the pivots 300 and 303 so that the short arm of the bell crank lever 302 and the link 298 then act as a continuous member opposing any movement of the lever 291 under the influence of the spring 295. If the bell crank lever 302 is in the position shown in Fig. 2, when the operator moves the handle 280 downwardly to reset the latch member 261, the transverse flange 249^e on the end of the previously described arm 249^d, movable with the actuating crank 249, engages the lower end of the arm 297 and thus swings the link 298 upwardly about its pivot 300 to restore the link 298 and the bell crank lever 302 to their normal positions, shown in Fig. 7, at the same time that the actuating crank arm 249 is restored to a position where the latch member 261 engages the disk 260 and the latch member 293 engages the flange 291^b on the lever 291. In addition to these means for manually controlling the operation of the lever 291 which controls the movement of the inking head 50, there is provided a manually operated handle 310 fixed on one end of the shaft 265 which carries the crank arm 264 by which the latch member 261 is elevated. This handle 310 may be manually operated when desired in order to release the latch member 261 from engagement with the disk 260 and thereby cause the spring 256 to effect the separation of the cylinders at any stage during the operation of the machine, even when the paper sheets are being fed in proper succession.

When the ink rollers are separated from the cylinder 45 and the cylinder 40 is separated from both of the cylinders 34 and 45, it is desirable that the cylinders be operated at a reduced speed while various changes and adjustments are being made in the set-up of the press and means are therefore provided for automatically altering the circuit connections of the driving motor 75 when the cylinder separating mechanism and ink roller moving mechanism are actuated. For this purpose, a trip switch 311, shown in Fig. 7, is provided for controlling the circuit connections of the motor 75, the arrangement being such that when the switch is closed, the resistance is cut into series with the motor or the field excitation of the motor is increased so that it then operates at a reduced speed, for example, half of the speed

at which it runs in the normal operation of the press. The conductors for controlling these circuit connections are led to the casing of the switch 311 through a conduit 312 and the contacts of the switch are controlled by a plunger 313 which has a head 313^a located beneath the arm 249^d. When the contacts of the switch are open, this plunger is maintained in its upper position by a spring or the like 314 and the position of the head 313^a is such that when the lever 291 is released by the latch 293 and the arm 249 moves downwardly to the position shown in Fig. 3 the plunger 313 is pushed downwardly to actuate the switch and thereby alter the circuit connections of the motor in order to cause the motor to operate at half speed.

Although one form of the invention has been shown and described by way of illustration, it will be understood that it may be constructed in various other embodiments coming within the scope of the appended claims.

I claim:

1. The combination in a printing press having a plurality of cylinders, of means for feeding paper sheets to one of said cylinders, means for supplying ink to another of said cylinders, means including an actuating crank for effecting relative movement of two of said cylinders transversely to their axes, means comprising a biased operating lever for effecting relative movement of said ink supply means with respect to its cylinder, means normally connecting said operating lever with said actuating crank for holding said ink supply means in operating position, and means actuated by the failure of said paper-feeding means to deliver paper sheets in regular sequence for causing the operation of said actuating crank to separate two of said cylinders and thereby releasing said operating lever to permit movement of said ink supply means from its operating position.

2. The combination in a printing press having a plurality of cylinders, of means for feeding paper sheets to one of said cylinders, means for supplying ink to another of said cylinders, means including an actuating crank for effecting relative movement of two of said cylinders transversely to their axes, means comprising an operating lever for effecting relative movement of said ink supply means with respect to its cylinder, means normally connecting said operating lever with said actuating crank for holding said ink supply means in operating position, means comprising a part movable into the path of travel of said paper sheets for causing the operation of said actuating crank upon the failure of said feeding means to deliver a paper sheet, said operating lever being released by the movement of said actuating crank, and spring means for moving said operating lever when it is released to effect the separation of said ink supply means from its cylinder.

3. The combination in a printing press having a plurality of cylinders, of means for feeding paper sheets to one of said cylinders, means for supplying ink to another of said cylinders, means including an actuating crank for effecting relative movement of two of said cylinders transversely to their axes, means comprising a biased operating lever for effecting relative movement of said ink supply means with respect to its cylinder, means normally connecting said operating lever with said actuating crank for holding said ink supply means in operating position, means including a latch for normally holding said actu-

ating crank against movement, and means comprising a part movable into the path of travel of said paper sheets for releasing said latch and permitting movement of said actuating crank upon failure of said paper-feeding means to deliver a paper sheet, said operating lever being released by the movement of said actuating crank.

4. The combination in a printing press, of a plurality of cylinders, means comprising an electric motor for rotating said cylinders, means for feeding paper sheets to said cylinders, inking rollers for supplying ink to one of said cylinders, means including a latch for normally holding said inking rollers in ink-supplying position, means actuated by the failure of said feeding means to supply a paper sheet to said cylinders for releasing said latch and effecting relative separation of said inking rollers and said cylinders supplied thereby, and means including an electric switch automatically operated by said last named means for changing the circuit connections of said motor and causing said cylinders to rotate at reduced speed.

5. The combination in a printing press, of a plurality of cylinders, means comprising an electric motor for rotating said cylinders, an inking head adapted to supply ink to one of said cylinders, means including an operating lever for effecting movement of said inking head with respect to the cylinder supplied thereby, a latch for engaging said lever for normally holding said head in ink-supplying position, means tending to actuate said lever to move said inking head from ink-supplying position when said lever is released by said latch, means for actuating said latch to release said lever, and means actuated by said last named means for controlling the speed of said motor.

6. The combination in a printing press, of a plurality of cylinders means comprising an electric motor for rotating said cylinders, an inking head adapted to supply ink to one of said cylinders, means including an operating lever for effecting movement of said inking head with respect to the cylinder supplied thereby, a latch for engaging said lever for normally holding said head in ink-supplying position, means tending to actuate said lever to move said inking head from ink-supplying position when said lever is released by said latch, means for actuating said latch to release said lever, an arm movable with said latch, and a trip switch connected in the circuit of said motor and having an operating part located in the path of movement of said arm.

7. The combination in a printing press, of a plate cylinder, means for supplying ink to said cylinder, means comprising an operating lever for effecting relative movement of said ink-supply means and said cylinder, means tending normally to actuate said lever to effect a limited separation of said cylinder and said ink-supply means, releasable means for normally holding said lever to maintain said ink-supply means in operative relation to said cylinder, and manually controlled means connected with said lever for effecting a greater separation of said ink-supply means and said cylinder when said lever is released by said releasable means.

8. The combination in a printing press, of a plate cylinder, means for supplying ink to said cylinder, means comprising an operating lever for effecting relative movement of said ink-supply means and said cylinder, means tending normally to actuate said lever to effect a limited separation of said cylinder and said ink-supply means,

releasable means for normally holding said lever to maintain said ink-supply means in operative relation to said cylinder, a manually operated crank, and a link connecting said crank with said lever whereby said lever may be manually actuated to control the separation of said ink-supply means and said cylinder when said lever is released by said releasable means.

9. The combination in a printing press, of a cylinder, ink-supply means for supplying ink to said cylinder, means comprising an operating lever for effecting relative movement of said ink-supply means and said cylinder, a bell crank lever having one arm adapted to be manually operated, a link connecting the other arm of said bell crank lever with said first named lever, and a stop for engaging said last named arm of said bell crank lever to position it in substantial alignment with said link and thereby prevent movement of said first named lever.

10. The combination in a printing press, of a cylinder, ink-supply means for supplying ink to said cylinder, means comprising an operating lever for effecting relative movement of said ink-supply means and said cylinder, a bell crank lever having one arm adapted to be manually operated, a link connecting the other arm of said bell crank lever with said first named lever, a stop for engaging said last named arm of said bell crank lever to position it in substantial alignment with said link and thereby prevent movement of said first named lever, the actuation of said bell crank lever to move said second named arm away from said stop being adapted to actuate said first named lever to separate said ink-supply means and said cylinder, and a second stop adapted to engage said bell crank lever to limit said last named movement thereof.

11. The combination in a printing press, of a plurality of cylinders, means for feeding paper sheets to one of said cylinders, inking means for supplying ink to another of said cylinders, means comprising a lever for effecting relative movement of said inking means and the cylinder supplied thereby, a latch for normally holding said inking means in operative position with respect to its cylinder, means for automatically actuating said lever to separate said inking means and the cylinder supplied thereby when said lever is released by said latch, means actuated by the failure of said feeding means to feed a paper sheet to said first named cylinder for separating said cylinders and releasing said latch, a manually operated bell crank lever, a link connecting one arm of said bell crank lever with said first named lever, and a stop for positioning said arm of said bell crank lever in substantial alignment with said link to prevent actuation of said first named lever when it is released by said latch.

12. The combination in a printing press, of a paper cylinder, a transfer cylinder, a plate cylinder, an inking head having inking rollers for applying ink to the plate cylinder, means for feeding paper sheets to the paper cylinder, tripping mechanism operative upon the failure of said feeding means to deliver a paper sheet, and independent mechanisms operable to separate the inking rollers from the plate cylinder and the transfer cylinder from the plate and paper cylinders, respectively, said independent mechanisms being released for operation when the tripping means is actuated.

13. The combination in a printing press, of a paper cylinder, a transfer cylinder, a plate cyl-

inder, an inking head having inking rollers for applying ink to the plate cylinder, means for feeding paper sheets to the paper cylinder, tripping mechanism operative upon the failure of the
5 feeding means to deliver a paper sheet to the paper cylinder, independent mechanisms operable to respectively separate the inking rollers from the plate cylinder and the transfer cylinder from the plate and paper cylinders, said

independent mechanisms being released for operation when the tripping mechanism is actuated and the inking rollers being moved to a limited separated position due to the actuation of its particular independent mechanism, and manually operated means for effecting a greater separation of the inking rollers and the plate cylinder.

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