

No. 867,634.

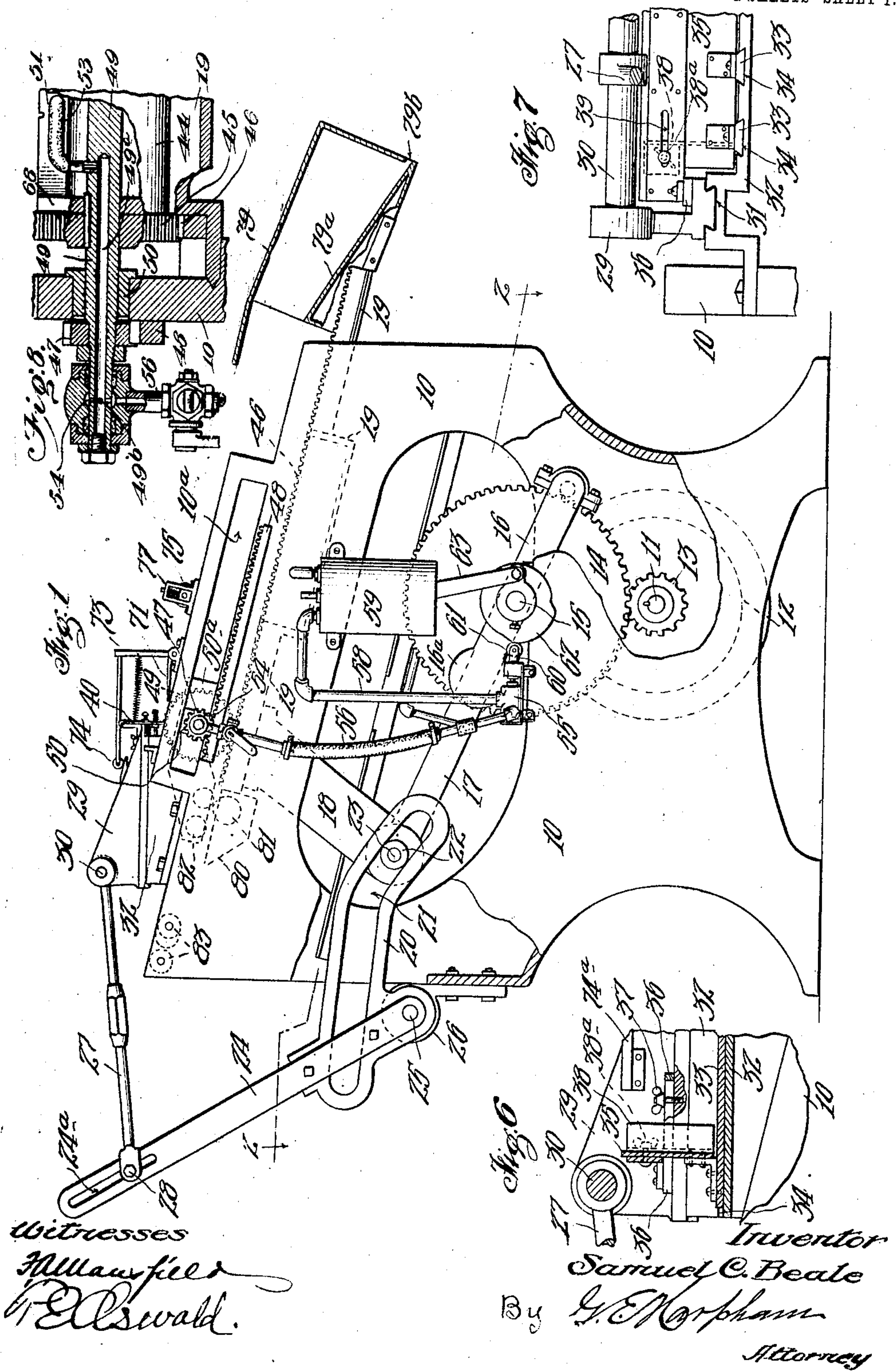
PATENTED OCT. 8, 1907.

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APPLICATION FILED JAN. 25, 1907.

2 SHEETS—SHEET 1.



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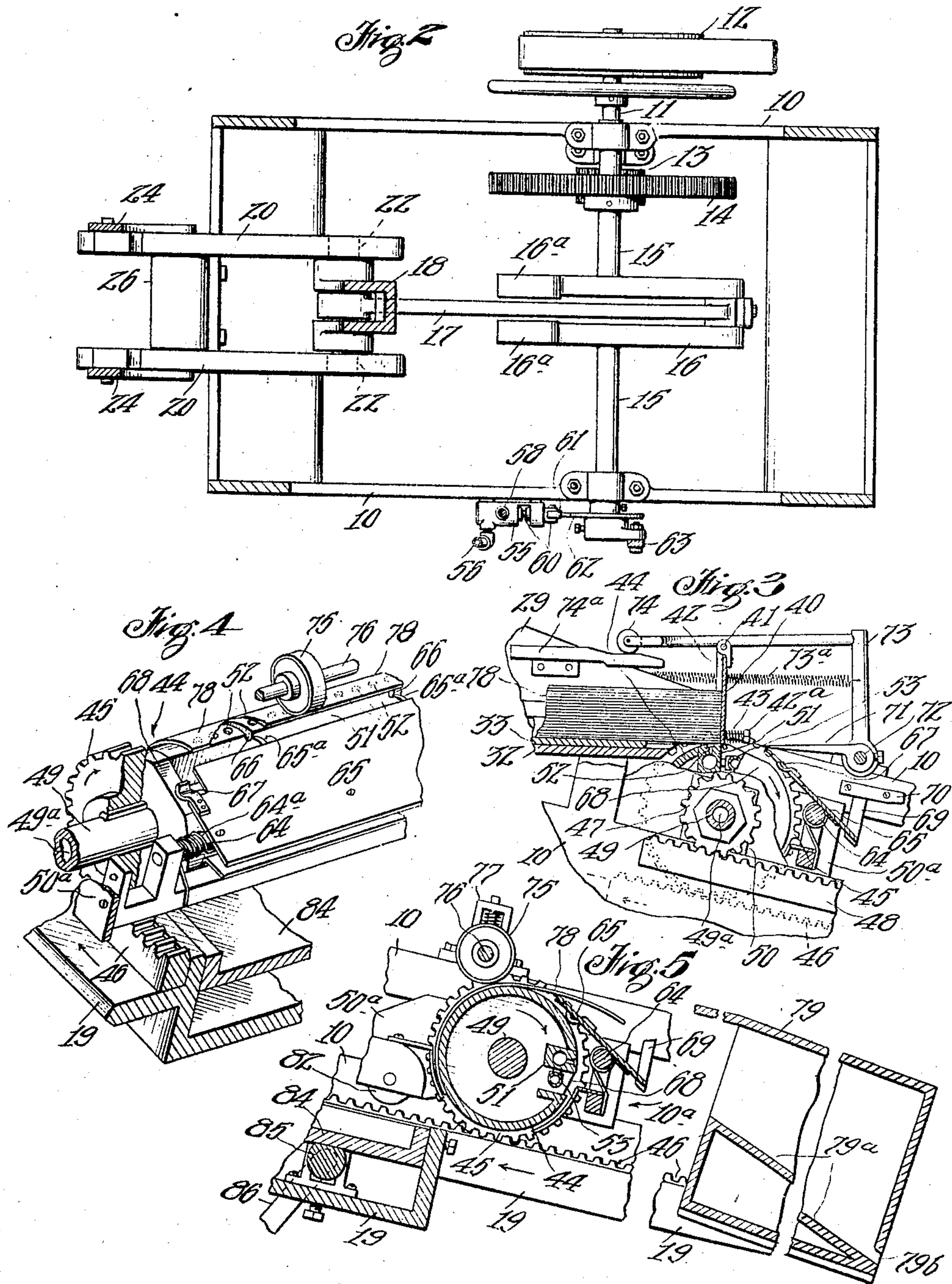
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC FEED AND DELIVERY MECHANISM FOR PRINTING-PRESSES.

No. 867,634.

Specification of Letters Patent.

Patented Oct. 8, 1907.

Application filed January 25, 1907. Serial No. 353,950.

To all whom it may concern:

Be it known that I, SAMUEL C. BEALE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Automatic Feed and Delivery Mechanism for Printing-Presses, of which the following is a specification.

My invention relates to an automatic feed and delivery mechanism for a printing press, in which the paper is automatically fed to a rotary cylinder to be printed and the sheet will then be automatically delivered out of the machine. Heretofore in printing presses with traveling paper carrying mechanism, the movement has been effected by means of racks and gears, and in starting the carrying mechanism in either direction there was always a jar and shock, which soon wears out the gears, racks the machine and renders high speed impracticable. With my improved machine these defects are avoided as the paper carrier is brought to rest and started from rest quietly and gradually, thereby rendering it susceptible of very high speed with infinitesimal wear.

The object of my invention is to provide an efficient, automatic and rapid acting feed and delivery mechanism for a printing press. I accomplish this object by the mechanism described herein and illustrated in the accompanying drawings, in which:—

Figure 1—is a side elevation of a printing press, partly in section, with my improved automatic feed and delivery mechanism. Fig. 2—is a sectional plan of same on line 2—2 of Fig. 1. Fig. 3—is an enlarged fragmental view, partly in section, of the paper feed mechanism. Fig. 4—is a perspective view of the cylinder and delivery apron. Fig. 5—is a sectional view of the cylinder, the type carrying frame and delivery apron in the act of delivering a printed sheet off the cylinder to the collection box. Fig. 6:—is a fragmentary sectional view of the paper carrier feed and the adjustable back. Fig. 7:— is a rear view of the paper carrier, showing the reciprocating mechanism. Fig. 8 is a sectional detail of air connections.

In one side of the frame 10 of the machine is mounted the driving shaft 11, on the outer end of which is the power pulley 12, driven in any suitable manner. Shaft 11 has rigidly mounted thereon a pinion 13 which meshes with gear 14. Gear 14 is mounted on crank shaft 15 which is provided with a crank 16; the arms of said crank project on both sides of shaft 15, as shown in Fig. 2, and the unconnected ends are provided with counter-balancing weights 16^a. A pitman rod 17 is pivotally connected at one end to crank 16 and at the other end to an arm 18, which arm is rigidly secured to the lower side of the inking bed of the type carrying frame 19, and as said crank is rotated said pitman causes a reciprocation of the frame 19 in inclined guide-ways, situated on the inner sides of the machine frame 10.

An arm 20 has a cam slot 21 therein, the end of which projects downwardly as shown in Fig. 1. Within this slot is a roller 22, which is mounted upon bolt 23, which bolt is the pivot that unites pitman 17 and arm 18. The arm 20 has a lever 24 pivoted at 25 to a bearing 26, secured to the frame of the machine at the center of the rear end thereof. An adjustable pitman 27 is secured by bolt 28 to lever 24, said bolt passing through a slot 24^a in the lever to adjust the travel of paper carrier 29. A rod 30 is secured to the sides of the carrier 29 and the forward end of the pitman 27 is mounted thereon.

The sides of the paper carrier 29 are slidably mounted in ways 31 of the supporting frame 32 and reciprocates therein, which frame is rigidly secured to the top of said frames 10. The bottom of the paper carrier is composed of fingers 33 which are slidably mounted in ways 34 in the bottom of frame 32, upon which the fingers reciprocate; these fingers are rigidly fastened to a back plate 35 of the paper carrier and are adjustable to paper of different widths. This back plate is transversely mounted to an adjustable slide 36, which slide is secured to a ledge of the sides of the paper carrier 29 by means of wing nut 37. A guide plate 38 is adjustably mounted to the back plate 35 by means of wing bolt 38^a, projecting through slot 39, and prevents lateral displacement of the paper. A like guide plate is at the other side of the carrier. The front plate 40 of the paper carrier is hinged at 41 to an adjustable arm 42, which is secured to a ledge on the sides of the carrier 29. A bolt 42^a passes through the front plate 40 and screws into the side of the carrier; a spring 43 on the bolt holds the front plate yieldingly in a vertical position against the front of the paper carrier 29. It will be observed that the lower end of the front plate 40 is engaged by the casing of air chamber 51 of the cylinder 44, which as said cylinder rotates will cause the lower portion of the plate to swing outwardly until it passes below the end of the plate, when the same will spring back against the front end of the carrier, thereby packing the paper.

At each end of cylinder 44 are cog gears 45 which mesh with inclined racks 46, situated at the sides of the type carrying frame 19, whereby as said frame is moved on its guideways, said cylinder is caused to rotate in a reverse direction to which the type carrying frame 19 is traveling, by means of pinion 47 which meshes with an inclined rack 48, rigidly secured to the outer sides of the frame 10. Pinion 47 is keyed to shaft 49 which rotates in a slide block 50 in guideway 10^a of the machine frame, and said shaft is keyed to the cog gears 45 and the cylinder 44. A similar pinion and cog gear is provided at the other end of the shaft. Within cylinder 44 is an air chamber 51 which is provided with a plurality of ports 52, which open through the top of casing of the chamber, which casing forms a portion of

the cylinder, the same being cutaway at this point. A pipe 53 connects chamber 51 with a bored portion 49^a of shaft 49, upon which the cylinder is mounted. This bored portion of the shaft passes through cog gear 45, the slide block 50 in the guideway 10^a and through the pinion 47 and an air chamber 54. Within air chamber 54 the shaft is perforated by perforations 49^b. The air chamber is connected to the air controlling valve 55; a portion 56 of this connection is flexible. A pipe 58 connects valve 55 to the air pump cylinder 59. A spring pressed stem 60 works in valve 55 and on its outer end is a bearing wheel 61, which has a rolling contact with cam 62, which cam is mounted upon shaft 15. Pivotaly connected with cam 62 is a pitman 63, the other end of said pitman is connected to a piston which has a working fit in air pump cylinder 59. The details of the suction mechanism are fully illustrated and described in the application of H. E. Brett, filed Jan. 4-07, No. 350,833, whose invention they are and for that reason is not more fully described herein.

Secured to shaft 64 is the delivery apron 65, (see Fig. 4) which apron is provided with projecting fingers 65^a that pass into grooves 66, situated on the top of the air chamber 51 of the cylinder 44. Curved arms 67 are secured to the delivery apron at each end and project downwardly therefrom, and said arms ride upon cams 68 and are held spring pressed against the same by spring 64^a secured to the shaft 64 and to its bearings and when the arms reach the cutaway portion of the cams, the fingers 65^a drop down into the grooves 66 and are raised up out of the grooves when the circular portion of the cam is reached. The delivery apron is provided with an upwardly extending arm 69, (see Fig. 3) which engages a lug 70 on the side of the frame 10. When the air chamber 51 is being exhausted; the lug 70 prevents the arms of the delivery apron from coming in contact with the cutaway portion of the cam 68, thereby keeping them from engaging the paper on the cylinder. The shaft 64 of the delivery apron is mounted to the side plates 50^a, which plates are integral with the slide block 50 and consequently said shaft moves with the cylinder 44.

A plurality of fingers 71 are secured to bar 72, by means of set screws so that they can be adjusted. Bar 72 is moved by the L-shaped lever 73, at the outer end of which is a roller 74, which roller engages and rides upon track 74^a and is held in contact by spring 73^a with said track. This track is secured to the paper carrier.

Friction rollers 75 are mounted on shaft 76. This shaft rotates in a spring pressed bearing 77, which keep said rollers in contact with the paper 78 on cylinder 44, as it is released from the suction ports 52 of the air chamber 51 mounted in the cylinder.

A collection box 79 is mounted at the lowest ends of the carrying frame 19, said box having an inclined floor 79^a which terminates at a transverse aperture 79^b in the lower end of the box.

The type form box 84 rests upon and is supported by shafts 85, (only one is shown) which are flattened as shown in Fig. 5. These shafts are mounted in bearings secured to the bottom of the pocket of the frame 19. Levers 86 (only one is shown) oscillate shafts 85 at a predetermined time, by mechanism not shown, lifting the form box 84 and the printing type to the paper 78

on the cylinder 44 as it rotates over the form box and printing said paper. Said mechanism being fully described and illustrated in the application of said Brett.

The ink font 80 is secured to the type carrying frame 19 and has roller 81 therein, which engages the inking rollers 82, mounted in the rear of side plates 50^a, which said plates are integral with slide block 50 which is mounted on shaft 49. Spreading rollers 83 are provided to take off the surplus ink.

The operation of various mechanisms are as follows: A quantity of paper 78 is placed in the carrier. The driving shaft 11 is rotated, which motion is transmitted to shaft 15. The revolution of shaft 15 through connecting mechanism causes the reciprocation of the type carrying frame and the paper carrier. It will be observed that during the greater portion of the time the paper carrier is not moving and that it moves only while the roller 22 is traveling in the downwardly inclined portion of slot 21, and that the motion is gradually and gently imparted to the carrier as it is made when the pitman has its least motion, thereby avoiding any shock or jar on the machine. Meanwhile the cam 62 on shaft 15 is so timed that just before the extreme limit of the forward movement of the paper carrier has been reached, the lower sheet of paper in the carrier is brought into contact with and rests upon ports 52 of the casing of air chamber 51, at which time said chamber is thrown to suction by means of pump 59. The racks 46 on the carrying frame 19 rotate the cylinder with paper upon it, and the stationary racks 48 meshing the pinion 47 on said cylinder shaft 49, cause the cylinder to travel in a reverse direction to that of the carrying frame, and as the cylinder rotates it moves downwardly. At this time the paper carrier 29 is also moving to the right which causes the fingers 71 to turn in a horizontal position above the end of the bottom sheet by means of the roller 74, on L-shaped piece 73, coming in contact with the higher portion of the track 74^a to support the front end of the paper, except the bottom one, while the cylinder 44 is withdrawing the undersheet. The cylinder 44 with a sheet of paper encircling it and held by the exhaust, proceeds down the inclined racks 46 and 48. Meanwhile the lever 86 has turned shafts 85, lifting the form box 84 and the type matter in contact with the sheet on the cylinder, printing said sheet as it rotates. The cylinder 44 still further rotates down the racks until the friction roller 75 comes in contact with the end of the sheet held at the air chamber ports 52, when the printed sheet is released from suction by the action of roller 61 of the air controlling valve 55, reaching the low side of the cam 62, releasing the suction in air chamber 51. Meanwhile the cam portion on cam 68 having come in contact with curved arms 67 of the delivery apron 65, making the apron drop and the projecting fingers 65^a enter the slots 66 in the casing of the air chamber 51, as shown in Fig. 4, and said fingers lift the end of the printed sheet off the cylinder, the friction rollers keeping said sheet in engagement with the casing of the cylinder 44 until the sheet is entirely free and delivered into box 79, from which it passes to a drying table not shown.

Having described my invention what I claim is:—

1. In a printing press, an intermittently traveling paper carrier having adjustable ends and sides and having the

front portion of the bottom open; cam operated mechanism secured to said carrier to intermittently operate the same; and mechanism operable by the carrier but not longitudinally movable to support the front end of the paper during a portion of the travel of the carrier.

5 2. In a printing press an intermittently traveling paper carrier; a pivoted lever operatively connected thereto; an arm secured to said lever intermediate its ends and adjacent the pivot of the lever, said arm having a cam slot therein; and mechanism engaging said arm within said slot to intermittently move the free end of the lever.

10 3. In a printing press, the combination of a reciprocating paper carrier having the front end of the bottom open; a plurality of supporting fingers secured to a shaft; and mechanism secured to said carrier and other mechanism secured to said finger shaft and co-acting to move the front end of the fingers up to and hold the same on a level with the bottom of said carrier during the latter part

of the forward movement of the carrier and during the first part of the backward movement of the carrier, and then to move the front end of the fingers below the level of the bottom of the carrier. 20

4. In a printing press an intermittently traveling paper carrier; an adjustable pitman secured thereto; a pivoted lever adjustably connected to said pitman; an arm secured to said lever intermediate its ends; and adjacent to the pivot of the lever, said arm having a cam slot therein; and mechanism engaging said arm within said slot to intermittently move the end of the lever connected to the pitman. 25

In witness that I claim the foregoing I have hereunto subscribed my name this 16th day of January, 1907. 30

SAMUEL C. BEALE.

Witnesses:

G. E. HARTHAM,
F. A. MANSFIELD.