

No. 675,499.

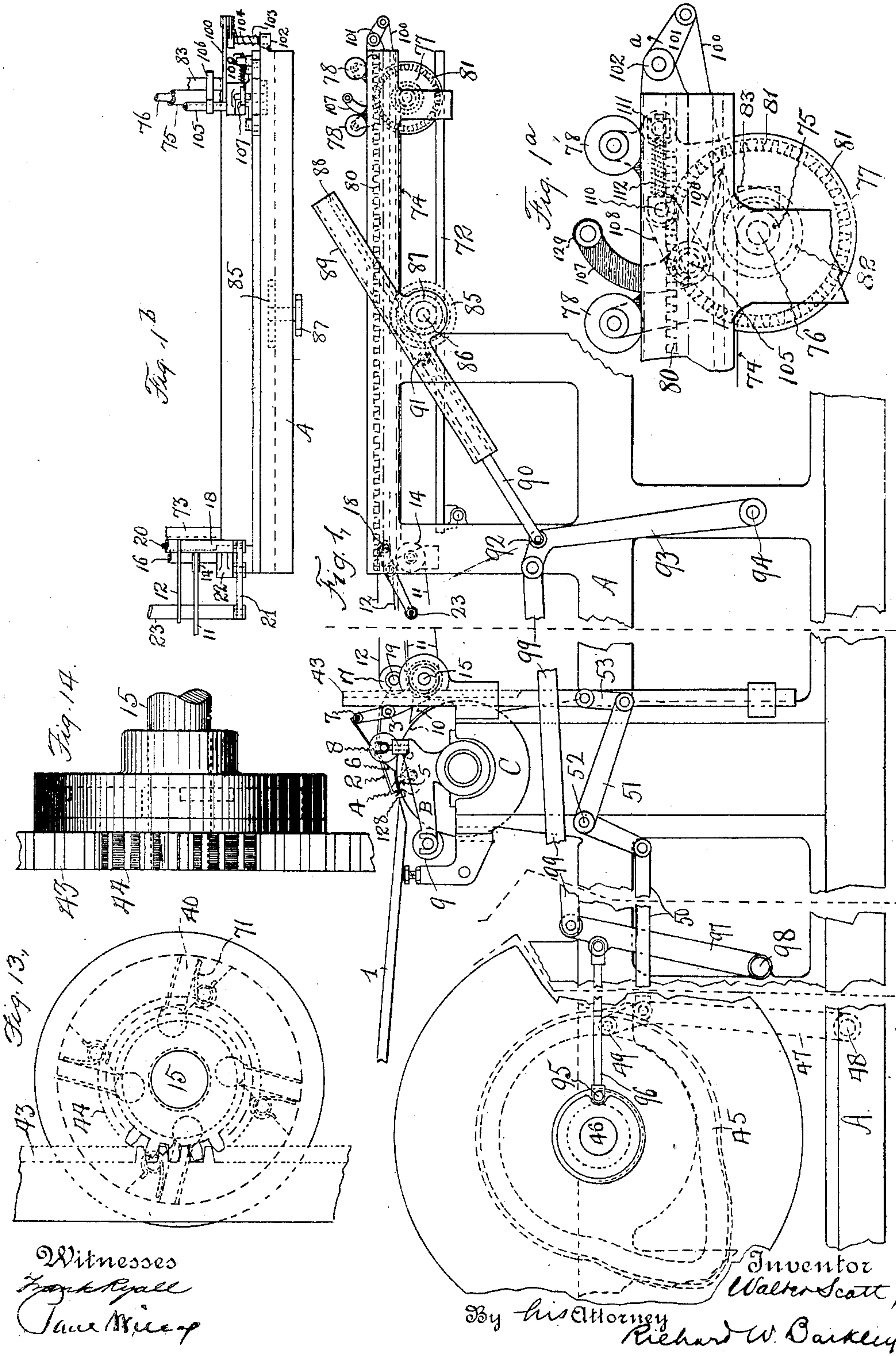
Patented June 4, 1901.

W. SCOTT.
PRINTING PRESS.

(Application filed June 15, 1898.)

(No Model.)

5 Sheets—Sheet 1.



No. 675,499.

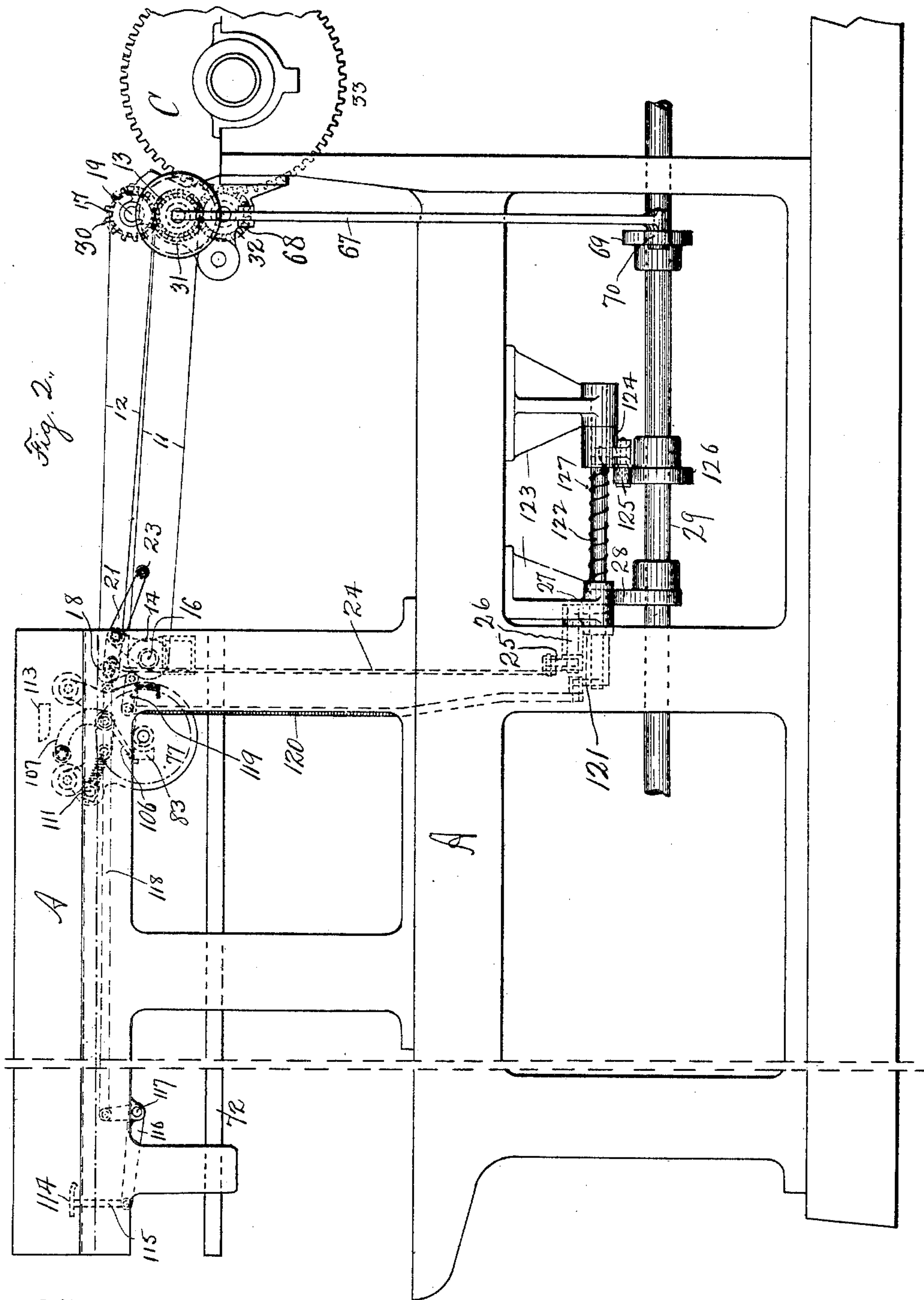
Patented June 4, 1901.

W. SCOTT.
PRINTING PRESS.

(Application filed June 15, 1898.)

(No Model.)

5 Sheets—Sheet 2.



Witnesses
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PRINTING PRESS.

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(No Model.)

5 Sheets—Sheet 3.

Fig. 3.

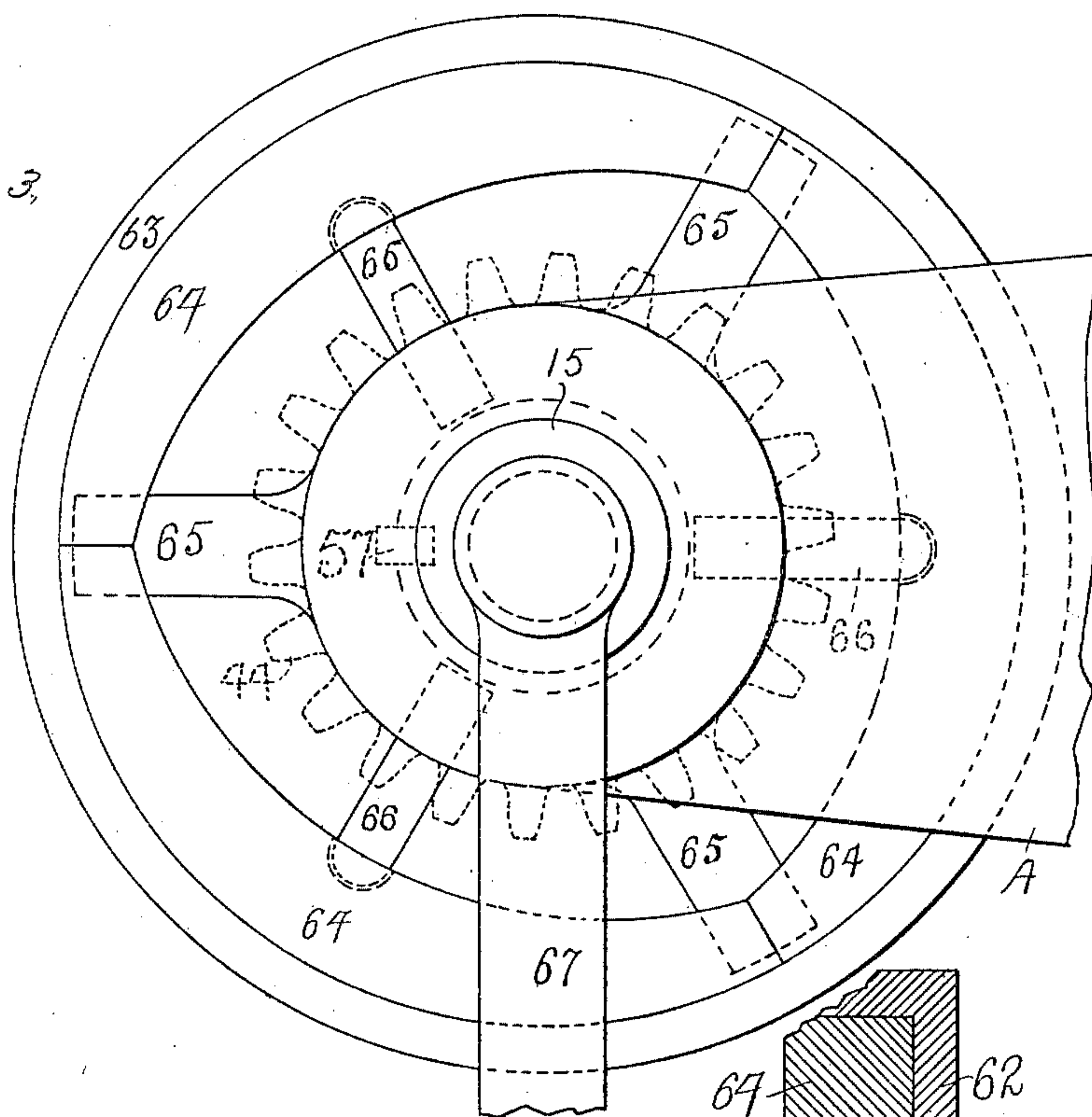
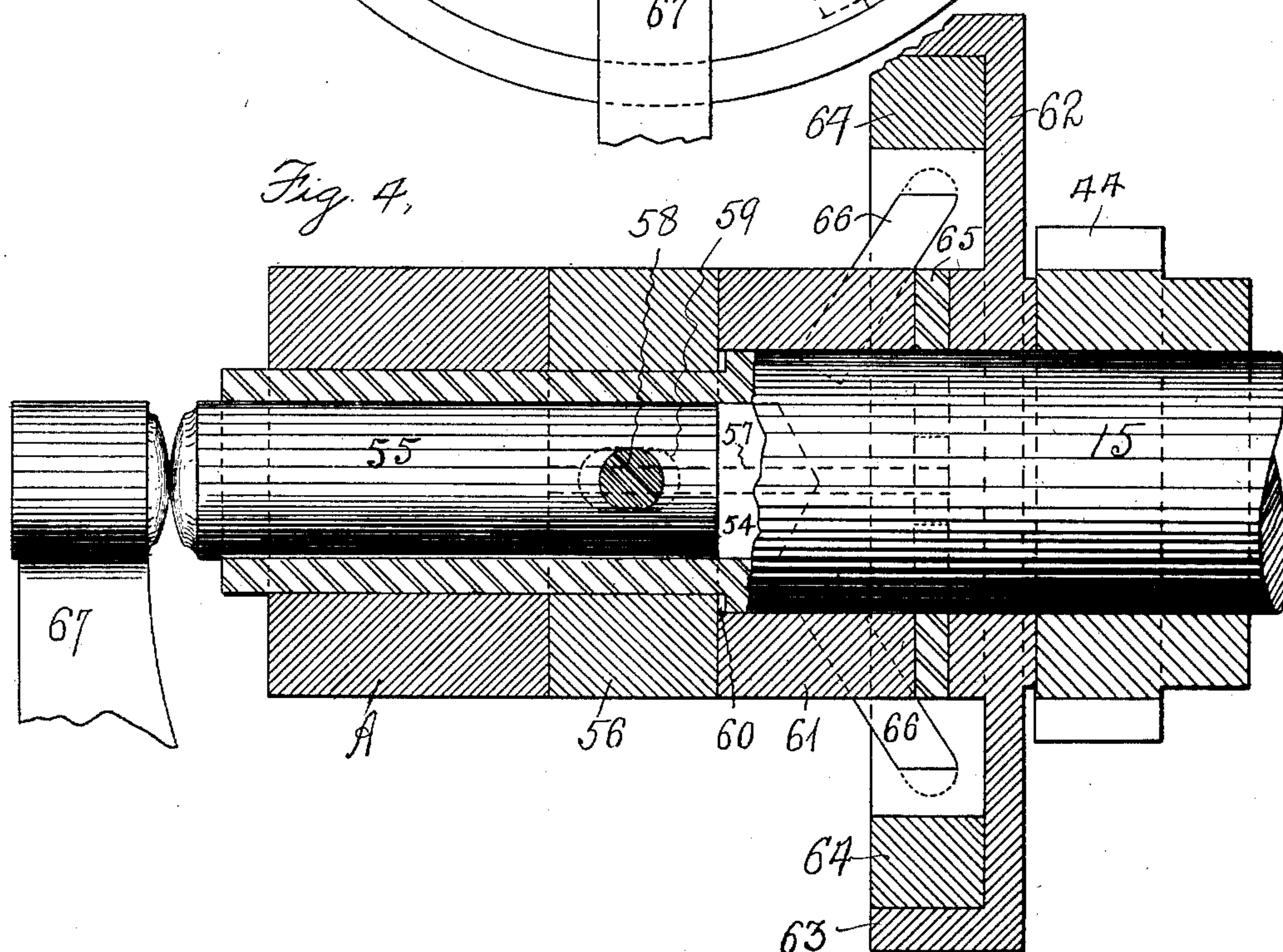


Fig. 4.



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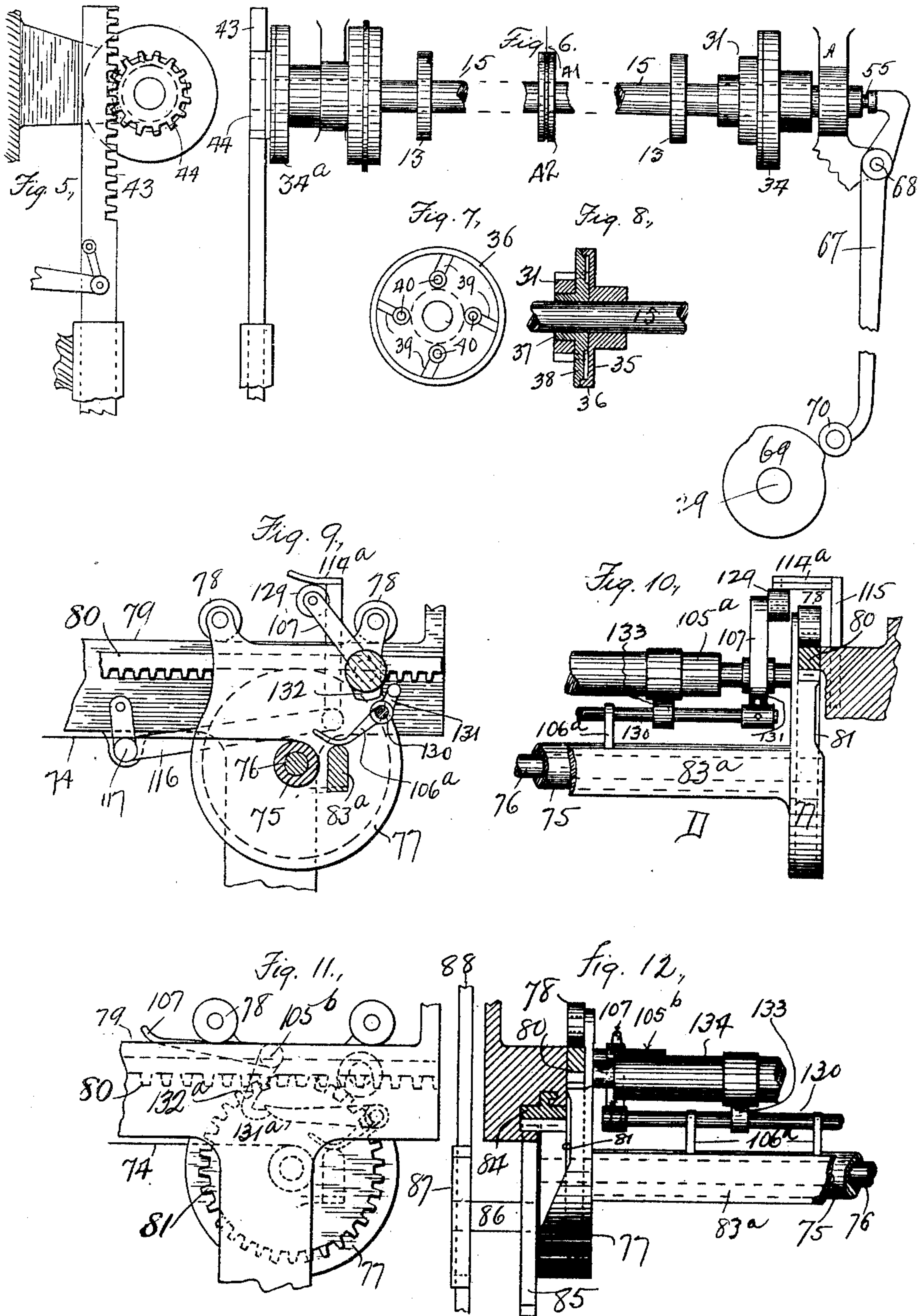
Patented June 4, 1901.

W. SCOTT.
PRINTING PRESS.

(Application filed June 15, 1898.)

(No Model.)

5 Sheets—Sheet 4.



Witnesses
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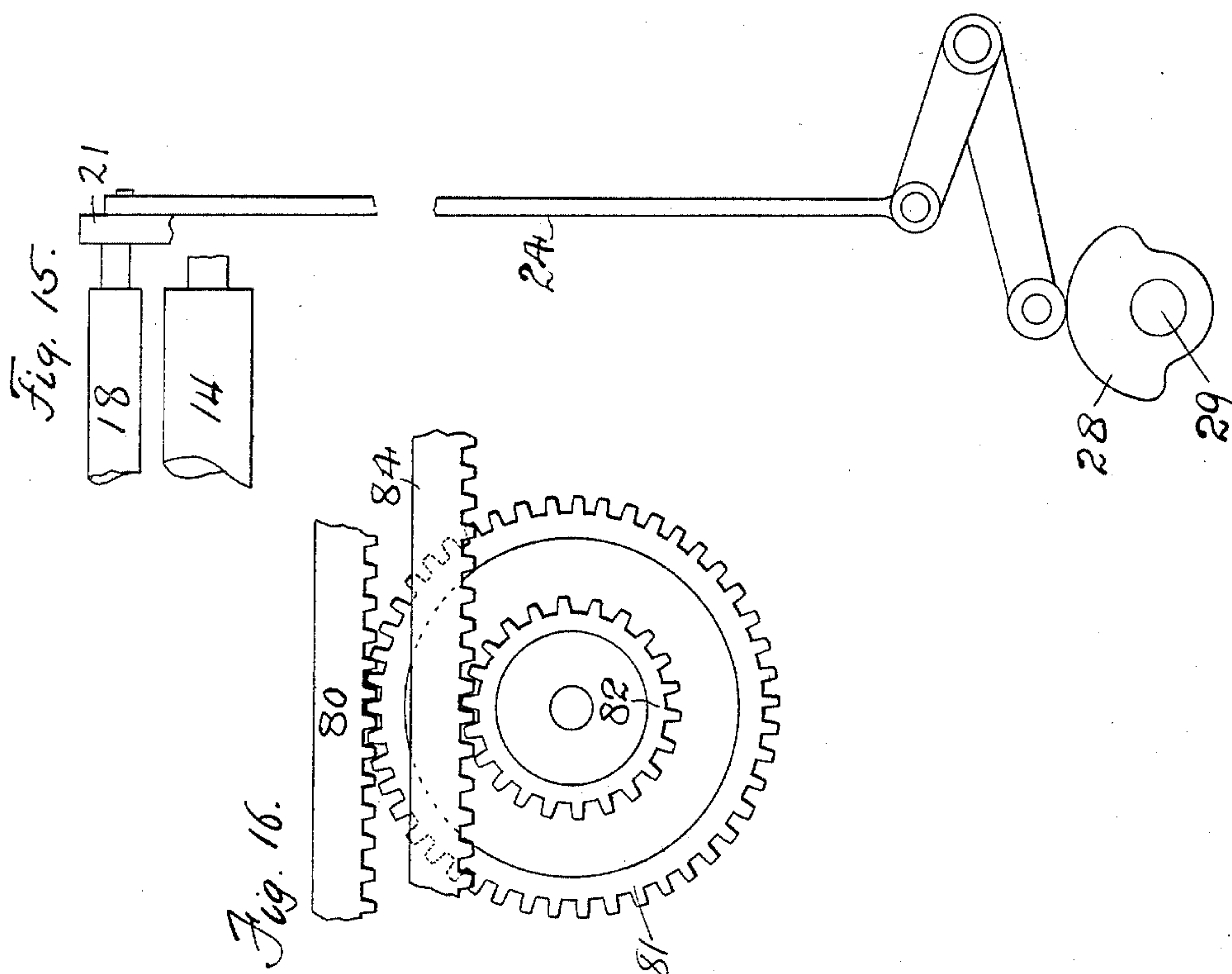
Patented June 4, 1901.

W. SCOTT.
PRINTING PRESS.

(Application filed June 15, 1898.)

(No Model.)

5 Sheets—Sheet 5.



Witnesses
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UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 675,499, dated June 4, 1901.

Application filed June 15, 1898. Serial No. 683,520. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, a citizen of the United States, and a resident of Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification.

The present invention relates to that class of machines commonly called "bed-and-cylinder" printing-presses, and has the general improvement of the devices for manipulating the sheets for its primary object.

The invention in some of its features relates more particularly to two-revolution and stop-cylinder presses, while other features are applicable in the case of oscillatory and continuously-revolving cylinder-presses.

One object of the invention is to secure an even and accurate feed of the sheets to the grippers or sheet-retainers of a stop impression-cylinder, while another object is to avoid smearing of or injury to the sheets while delivering them from the cylinder to the receiving-board.

To these and other ends the invention includes features, devices, and combinations of devices hereinafter described, and more particularly pointed out in the claims concluding this specification.

The preferred form of the invention is illustrated in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, parts being broken away, showing the feed and delivery mechanism and operating mechanism. Fig. 1^a is an enlarged detail of part of the mechanisms shown in Fig. 1 and showing parts omitted in that figure. Fig. 1^b is a plan view of certain parts shown in Fig. 1. Fig. 2 is a side elevation of the delivery end of the machine, but from the side opposite that shown in Fig. 1 and on a different scale and also shortened up to get the working parts on the drawings. Fig. 3 is a side elevation of the preferred form of clutch for connecting a supplementary driving mechanism with a sheet-carrier, as tapes. Fig. 4 is a vertical longitudinal sectional view of the said clutch mechanism. Fig. 5 is an end view, and Fig. 6 is a side view, of supplementary driving mechanism for actuating a sheet-carrier after its main driving mechanism has ceased to

act. Fig. 7 is a side elevation of part of a modified form of clutch, and Fig. 8 is a longitudinal sectional view of the same. Fig. 9 is a view, partly in section, of a modification of a gripper mechanism of the delivery and showing also the roller of the extensible collapsible sheet support or carrier. Fig. 10 is a view from the right, Fig. 9, of the mechanism shown in that figure. Fig. 11 is a view from the side of the machine of another modification of the gripper mechanism; and Fig. 12 is a view, partly in section, of the modification shown in Fig. 11, but from the right of the devices shown therein. Figs. 13 and 14 are two views of a modified form of clutch suitable for use in place of the clutch shown in Figs. 3 and 4. Fig. 15 is a detail view of roller lifting and lowering mechanism. Fig. 16 is a detail view of gearing.

In all the views the same part will be found marked with the same letter or numeral of reference.

The reference-letter A indicates a suitable framework comprising side frames, cross or tie bars, and other parts for supporting the working parts of the machine.

C indicates an impression-cylinder, which is preferably arranged to have a rising-and-falling motion to bring it into and to take it out of position for coaction with a to-and-fro-moving bed (not shown) and which also is by preference a stop-cylinder. Usual or known means may be employed for raising and lowering the cylinder C, and so also of the mechanism for starting and stopping it and for bringing it into coaction with and driving it from the bed. Such mechanisms may be of the types shown and described in Letters Patent of the United States granted October 3, 1893, and numbered 505,961. Also the cylinder C makes two revolutions, preferably, to each forward or printing stroke of the bed and is at rest during the return or non-printing stroke of the bed. In so far as certain features of my invention are concerned the sheets may be fed to the cylinder in the manner shown in said Letters Patent; but I prefer to feed them directly thereto from a feed-board 1, preferably arranged in juxtaposition to and at one side of the top of the cylinder C, and to do this while the cylinder is at rest.

2 marks suitable gages borne by a shaft 3, journaled in the framework of the machine and operated at suitable times by any usual or suitable means. (Not shown.)

5 The cylinder C is provided with a set of grippers 4 and a set of lifting-fingers 5, each of which is operated at the proper times by usual or known means. (Not shown.)

6 represents a set of guide-fingers carried
10 by the shaft 7, fast or journaled in the framework, the said fingers being curved where they lie over the cylinder C and their extreme ends being bent upwardly and away from the cylinder. The fingers 6 may be secured to
15 their shaft by set-screws, or they may be loose thereon and be held down against suitable stops by their own weight or by springs, or by both, or the shaft may be journaled and the fingers be fast thereto and the shaft be held
20 against a stop to maintain the guides at the proper distance from the cylinder, as by a weight or spring.

8 and 9 mark smoothing or feeding rollers coacting with the cylinder C, the said rollers
25 being journaled in boxes or the like borne by the frame B, bolted or otherwise secured to the journal-boxes of the cylinder C, and hence rising and falling with the cylinder.

The bed (not shown) may carry a litho-
30 graphic or other form or forms and be driven by any suitable or known means, and the cylinder C may be driven from the bed, as in the Letters Patent aforesaid, or it may be driven in other ways. Suitable inking devices (and water devices when required) are
35 used, but are not shown.

The sheets are preferably fed by hand from the feed-board 1 against the gages 2 and over the lifting-fingers 5 and under the up-
40 raised ends of the guides 6 and under the open grippers 4, after which the grippers are closed and the gages are lifted out of the way. During the forward or printing stroke of the bed the cylinder is first started up by the
45 starting mechanism, after which it is preferably driven from the bed. During this stroke of the bed the grippers 4 retain their hold on the sheet until they approach the guides 10 the second time, when they open and the fin-
50 gers 5 lift the head of the sheet onto the said guides 10, by which the sheet is guided to and between the carrying or delivery tapes 11 and 12. The guides 10 are borne by the main frame A. The set of tapes 11 run on pulleys or
55 rollers 13 14, the pulleys 13 being on a shaft 15 and the pulleys 14 on a shaft 16. The shaft 15 is journaled in the frame A near the cylinder C, and the shaft 16 is journaled in the frame A nearer the delivery end of the
60 machine. The set of tapes 12 run on pulleys or rollers 17 18, the former being borne by a shaft 19, journaled in the frame A above and near the shaft 15, and the latter being journaled on a shaft or rod 20, which connects
65 arms or levers 21 at opposite sides of the machine, or the pulleys 18 may be fast on the shaft 20, which in that case must be journaled

in the arms 21. The arms 21 are pivoted to brackets 22, secured to the frame A. The levers 21 are pivoted at points intermediate
70 their ends and are inclined or oblique with respect to the direction of motion of the tapes 11 12. The pulleys or rollers 18 are at that end of the levers farthest removed from the impression-cylinder and above the plane in
75 which the sheets are fed forward. The other ends of levers 21 are below the said plane and are joined by a rod or shaft on which the roller 23 is journaled, the said roller 23 being
80 within the set of tapes 11.

It is obvious that by rocking the frame formed by the arms 21, shaft or rod forming the pivot or journal therefor, and the rods or shafts on which the rollers 18 and 23 are journaled the sets of tapes 11 12 may be separated
85 and brought together at that end of their paths. In this way these tapes may be caused to coact to feed forward the sheets and be opened to release them, as desired, and this is done automatically in practice by means
90 of the pitman-rod 24, which is pivotally connected at its ends with one of the levers 21 and an arm 25 of the rock-shaft 26, journaled in the framework or in the bracket thereon. The shaft 26 is provided with a second arm
95 27, which is operatively connected with a cam 28 on a side shaft 29 of the machine, as by an antifriction-roller. (Not shown.) A spring (not shown) may keep the arm 27 or its roller in contact with the cam 28, or the cam may
100 be a grooved or face cam and the arm 27 or its roller engage therewith. Both constructions are well known and either may be used. The shaft 29 preferably makes one complete turn to one complete to-and-fro movement of the
105 bed.

The shafts of the pulleys carrying the tapes 11 12 are provided with pinions 30 and 31, which mesh with each other, and the latter pinion meshes with a pinion 32, journaled in
110 the frame A, and this last pinion meshes with a pinion 33 on the cylinder C. The pinion 30 is fast on its shaft, while pinion 31 is loose on its shaft and is connected thereto to drive the shaft in one direction only by any suitable
115 form of clutch, as 34, all for a reason presently to appear. A convenient form of one-way clutch for this purpose is shown in Figs. 7, 8, 13, and 14, wherein a disk 35 is fast to the shaft 15 and is provided with a rim or
120 flange 36, and the pinion 31 is fast to the hub 37 of a disk 38, which is loose on shaft 15 in so far as rotational motion is concerned. One or more friction-pawls 39 are pivoted to the disk 38 at 40 and have their ends bearing
125 against the inner surface of rim 36 and are held to their work by springs 71. The two-revolution stop impression-cylinder C does not drive the tapes 11 12 sufficiently far before it stops to run full-sized sheets beyond
130 the rollers or pulleys 13 and 17 or so far that the nip of the tapes 11 12 on the sheets will be freed when the rollers 14 and 18 are separated, as hereinbefore stated. There is thus

a liability that the sheets may be torn as they are drawn from between these rollers 13 and 17 or tapes 11 12 during the delivery. This chance becomes the more probable in case the sheets are to be split or severed as they are run out between tapes 11 12, as by the rotary knife or splitter 41 on the shaft 19 and the coacting grooved roller 42 on the shaft 15. This difficulty is met by means of a supplemental driving mechanism for continuing the forward or delivery rotation of shafts 15 and 19 and the motion of tapes 11 12 until the sheets are moved so far that the danger of tearing them as they are drawn from between the tapes 11 12 is entirely obviated. The mechanism herein shown for this purpose includes a reciprocating rack-bar 43, suitably guided on the frame A; a pinion 44, loose on the shaft 15; a clutch, as 34^a, for connecting the pinion 44 with the shaft 15 to drive it in the direction in which the same is driven from the cylinder C, and means for operating the rack-bar 43 from a cam 45 on the main driving or other shaft 46 of the machine, such as a lever 47, pivoted at 48 to framing A; an antifriction roller or stud 49 on said lever and engaging the cam 45; a link or pitman 50, pivotally connected to the lever 47 and to a bell-lever 51, pivoted to the frame A at 52, and a link or pitman 53, pivotally connected with the lever 51 and the bar 43.

The preferred form of the clutch 34^a, above referred to, is illustrated in Figs. 3 and 4, in which the shaft 15 is reduced in diameter at one end and is there bored out longitudinally at 54 to receive the round slide or shaft 55. A sleeve 56 is fixed to the reduced end of shaft 15 to turn therewith and to slide thereon, as by a feather or spline 57, and is connected to slide 55 by a bolt or pin 58, which passes through the longitudinal slots 59 in the hollow end of shaft 15, whereby slide 55 and collar 56 may slide lengthwise of shaft 15, but are compelled to turn with that shaft. In the normal positions of the parts the sleeve 56 is separated from the shoulder on the shaft 15 by a small space or interval 60 to allow of the said lengthwise motion. This is because of the relative positions of the pinion 44 and the sleeve 56 on the shaft 15. If their positions were inverted, such space 60 would be between these two parts or parts connected with them. A second sleeve 61 is splined to shaft 15 to have motion endwise thereof, while being incapable of independent rotational motion, and said second sleeve abuts against the sleeve 56. The loose pinion 44 is fast to a disk 62, which is also loose on shaft 15 and is provided with a rim or flange 63. Within the rim 63 are a number (say three) of segments 64, whose exterior surfaces are formed on arcs having radii equal to the radius of the internal surface of the rim 63 and are adapted to bear frictionally against such internal surface. These segments are held in place by a spider 65, which is splined to the shaft 15 to be ca-

pable of motion endwise thereof and to rotate therewith, as by the spline 57, and is or may be made of resilient metal somewhat dished or concaved on that side next the disk 62. The ends of the legs of the spider 65 rest in suitable slots at the ends of the segments 64 and allow said segments to move in and out radially of the clutch to connect and disconnect the shaft 15 and the pinion 44. The parts are so arranged that the elastic spider normally forces the sleeves 56 and 61 away from the disk 62 and toward the frame A. The sleeve 61 is provided with suitable slots and seats for the ends of three pushers 66, whose other ends rest in slots in the segments 64. The pushers 66 are arranged obliquely as regards the shaft 15, so that the endwise movements of the sleeve 61 will cause them to push the segments 64 out against the rim 63 and permit them to fall away therefrom. The pinion 44 and disk 62 are prevented from moving endwise of the shaft 15 by any suitable means, as by a collar or the like on the shaft. (Not shown.) For the purpose of operating the clutch at the proper times to cause it to connect the pinion 44 to the shaft 15 to the latter I provide a lever 67, pivoted at 68 to frame A, and operate it by means of a cam 69 on the said shaft 29, an antifriction-roller 70 being interposed between the lever and the cam. The force exerted by the spider 65, acting through the sleeves 61 and 56, pin 58, shaft 55, and lever 67 serves to keep the stud or roller 70 against the cam 69. It is noted that in Figs. 3 and 4 the pinion 44 and lever 67 are at opposite ends of the shaft 15, while in Fig. 6 these parts are at opposite ends of the said shaft 15, and that the shaft 15 is hollow from end to end in the latter case and the shaft 55 practically extends from end to end of the shaft 15. The operation in each case is substantially the same.

In lieu of the clutch just described the form of clutch shown in Figs. 7 and 8 may be employed for connecting and disconnecting the pinion 44 and the shaft 15, and in this case the lever 67, slide 55, and sleeves 56 and 61 are dispensed with.

The mechanism for receiving the sheets from the tapes 11 12 and delivering the same will next be described.

A bar 73 is secured to the framework A, adjacent and parallel to the roller 14, and one end of a web or tapes or broad bands 74 is secured to this bar. The other end of the web 74 is secured to the tubular roller 75, loosely mounted upon a shaft 76, which is journaled in the side plates 77. The plates 77 are provided with rollers 78, which are adapted to run upon the tracks or ways 79 on the top framing of the machine. By preference these tracks or ways are on the backs of two racks 80, which are fast to or are integral with the said framing of the machine. The shaft 76 is provided with pinions 81, which mesh with the racks 80, and is also provided with another pinion 82 of less diameter than the equal

pinions 81. As shown, the pinion 82 is half the size of pinions 81. The plates 77 are secured together rigidly, as by a bar 83, the ends of which are bolted or otherwise secured to the plates 77, thus forming a carriage for the roller 75. The pinion 82 is in mesh with a to-and-fro-movable rack-bar 84, which is suitably held to and guided by the fixed framework A, as by a hook and L-slot, as shown in Fig. 12. The rack-bar 84 is driven by an oscillatory gear 85, fast on the shaft 86, journaled in the framing of the machine. The shaft 86 is provided with a second pinion 87, which is in mesh with a to-and-fro-movable rack-bar 88, which is held and guided in the slanting way 89, secured to the top framing of the machine. A pitman 90 is pivotally connected to one end 91 of the bar 88, and the other end of the pitman is similarly connected at 92 to a lever 93, pivoted to the frame A, as at 94. The lever 93 is connected to and operated by a crank-pin 95 on the shaft 46 through the pitman 96, lever 97, pivoted to the frame A, as at 98, and a pitman 99, pivotally connected at its ends with the levers 93 and 97. As proportioned in the drawings, the pinion 87 is half the size of the pinion 85; but the proportions of the various gears may be varied at will. For the purpose of turning the roller 75 to wind up the support 74 there is a tape 100 provided, which is fast at one end to the roller 75 and at its other end to an arm 101 on the framework of the machine. By preference the arm 101 is pivoted to the framework, as at 102, by means of a shaft 103, and a spring 104, surrounding the shaft and secured at its ends to the framework and under the arm 101, lifts the arm 101 in the direction of the arrow *a*. The function of the pivoted spring-pressed arm 101 and tape 100 is to wind up the support 74 and to compensate for the increasing and decreasing diameter of rolled-up support as it winds on and unwinds from the roller 75.

The bar 83 forms part of a sheet-gripping mechanism, as will now be described. The carriage D (formed by the plates 77 and tie-bar 83 and parts connected thereto) has a shaft 105 journaled therein, and this shaft is provided with gripper-fingers 106, fast thereto, and with an arm 107, by means of which the shaft is rocked or moved. The shaft is also provided with a second arm 108, to which a rod 109 is pivotally connected at 110. The rod 109 passes loosely through a block 111, which is or may be pivoted to a side plate 77 of the carriage D. A spring 112 surrounds the rod 109 and bears against the block 111 and an enlarged head on the rod 109, the tension of the spring tending to push the arm 108 away from the block 111. The bar 83, the shaft 105, the block 111, the grippers 106, and the arm 108 are so placed relatively to each other that when the grippers rest on bar 83 the center 110 is below the line joining the block 111 and the shaft 105, and when the grippers are raised the said center 110 is

above such line. (See Figs. 2 and 1^a.) For the purpose of closing the grippers 106 down upon the bar 83 the framework A is provided with a fixed cam-block 113 near the point where the tapes 11 and 12 deliver the sheets to the support 74, said cam moving the arm 107 and shaft 105 far enough to cause the center 110 to pass below the line joining the centers of block 111 and shaft 105, whereupon the spring 112 completes the movement of the grippers, as will be understood. For the purpose of lifting the grippers from the bar 83 any suitable cam may be used; but I prefer to have a lifting toe or cam 114 for that purpose. The cam 114 is carried by a slide which has an up-and-down movement in a guideway in the frame A near the end thereof and is pivotally connected with a bell-lever 116, journaled at 117 to the frame A. The lever 116 is pivotally connected with a pitman-rod 118, which in turn is similarly connected with a second bell-lever 119. A pitman-rod 120 connects lever 119 with arm 121 of a shaft 122, journaled in brackets 123, fast to frame A. An arm 124 of the shaft 122 is provided with a roller 125, which bears against a cam 126 on the shaft 29. A spring 127 loosely surrounds the shaft 122 and has its ends secured to bracket 123 and over arm 124 and presses the roller 125 against the cam 126.

In many of the figures of the drawings certain of the gears or pinions and racks are indicated by their pitch circles and lines merely. In some of the figures showing modifications parts are omitted altogether, either because they are not employed or are fully shown elsewhere.

The operation of the foregoing devices is as follows: With the parts in the positions shown in Fig. 1 the bed (not shown) is at the extreme right-hand end of its movement and moves to the left in said figure. As the bed begins its printing movement the grippers 4 have been closed and the gages 2 have been lifted and the cylinder-starting mechanism begins to move the cylinder C simultaneously with the bed movement. The parts are so timed that the sheet held by the grippers 4 is brought in proper register with the form on the bed and the impression is given. As the grippers again approach the guides 10 they are opened and the fingers 5 are lifted to cause the head of the sheet to pass upon the guides 10 and to the tapes 11 and 12. As or before the sheet reaches the tapes 11 12 the cam 28 causes or permits the levers or arms 21, through the described mechanism, to raise the roller 23 and lower the roller 18, thus bringing the tapes 11 12 into such relation to each other that they will grip the sheet firmly between them and feed it forward to the bar 83 and grippers 106. The carriage D is moved to the left in Fig. 1 during the printing stroke of the bed, reaching the extreme of its motion in time to receive the sheet on the bar 83 as the sheet passes from between the rollers 14 and 18, whereupon the grippers 106 are closed,

as described, to hold the sheet on the bar 83. As the cylinder C completes its second turn the stopping mechanism comes into action and brings it to rest, with the impression-surface 128 in the position shown in Fig. 1. During the rotation of the cylinder C the shaft 15 is driven therefrom through the medium of the gears 33 32 31 and clutch 34. The gears 31 and 30 cause the tapes 11 12 to be driven in the proper manner and direction to feed the sheet forward to the carriage D. The shaft 15 is caused to continue its forward motion by means of the rack 43, gear 44, and clutch above referred to in time to prevent any pull upon the sheets by the carriage D moving away from the position shown in Fig. 2 other than that necessary to cause them to move with that carriage—that is to say, the sheets are fed forward by the pulleys 13 and 17 or the tapes 11 12 until their tails have cleared the said pulleys. At the same time the levers 21 are rocked to lift roller 18 and to lower roller 23 to cause a separation of the tapes at that end to free the sheet wholly from the tapes 11 12 and permit the grippers 106 and bar 83 to draw the sheets from off the tapes 11 as the carriage D moves away from the impression-cylinder C. It is understood, of course, that the lever 67 is operated at the proper time to close the clutch shown in Figs. 3 and 4 in case that form of clutch is used. During the time the rack 43 and gear 44 are driving the shaft 15 the clutch 34 slips freely and does not impede the action. As the carriage D moves away from the cylinder C the sheet-support 74 unrolls from the roller 75 and the tape 100 winds thereon. As the carriage D approaches the limit of its motion away from the cylinder C the roller 129 on arm 107 runs over the cam 114, which rises quickly, and so throws the arm 107 and shaft 105 as to move the center 110 beyond the line joining the centers 111 and 105, whereupon the spring 112 finishes the action of moving the grippers 106 off the bar 83, as described above. On the return of the carriage D toward the cylinder C the support 74 winds up from under the sheet, which drops, head first, upon the delivery-board 72. The bar 83 (shown in Fig. 1^a) may be concave on that side next the roller 75 and is so placed relatively to that roller that when the support 74 is fully wound thereon there is little space between the roller-up support and the curved surface of the bar for the head of the sheet to fall thereinto, but the head will go on top of the bar 83 in position for the angled ends of the grippers 106 to press the same over the square corner of the bar 83.

In the modification shown in Figs. 9 and 10, the grippers 106^a are curved and coact with the curved top of the bar 83^a to grip the sheets. The grippers 106^a are borne by a shaft 130 and the grippers are held down by their own weight or by a spring (not shown) or both. The shaft 130 is provided with an arm 131, by means of which it is rocked by the cam 132,

rigid with the arm 107. The shaft 105^a is or may be fast in the plates 77 and the arm 107 be loose thereon. The shaft 130 is journaled in arms 133, carried by the bar 105^a. The cam 114^a is arranged to coact with the top of roller 129, and the cam 126 is arranged to cause the lever 116 to move down instead of up to operate the cam 114^a and arm 107. The cam 132 and arm 107 remain in the position in which they are moved until positively moved therefrom by the roller 129, running on top of a cam, such as inverted cam 113, at the other end of the stroke of the carriage D. In consequence the grippers 106^a are held open during the return of the carriage D toward the impression-cylinder C. This modification is shown in the position of the parts just previous to the opening of the grippers.

In the modification shown in Figs. 11 and 12 the grippers 106^a are borne as in the modification last described, and the shaft 130 is carried by arms 133 from the bar 134, secured to the plates 77. The shaft 130 is provided with an arm 131^a, which has a curved end, under which the end of the hook-like arm 132^a bears, said arm 132^a being borne by shaft or stud 105^b. An arm 107 is rigid with the arm 132^a and is adapted to be depressed as in the case last described. As the arm 107 is depressed the arm 131^a is cammed up and the grippers raised from the bar 83^a and are held in such position until the arm 107 is lifted at the other end of the stroke of the carriage D, whereupon they are returned either by their own weight or by a spring, (not shown,) or both, to the position shown, which is that just before the cam 114^a acts to lower the arm 107.

Many modifications of parts and substitution of equivalents may be made without departing from the spirit of my invention. I therefore do not limit myself to the precise form thereof shown in the drawings and hereinbefore described.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a printing-press, the combination of an impression-cylinder making two revolutions while the bed is run in one direction and standing still while the bed returns, grippers and lifting-fingers on said cylinder, a feed-board arranged in juxtaposition to the upper side of said cylinder at one side thereof and from which the sheets are fed to the said grippers, and strippers and guides at the other side of the top of said cylinder to which the sheets are delivered by said lifting-fingers during the second revolution of the said impression-cylinder, substantially as described.

2. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of delivery-tapes driven from the said cylinder, a supplemental mechanism for continuing the motion of said tapes after the said cylinder stops, substantially as described.

3. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of

a movable sheet-carrier driven from the said cylinder, and supplemental mechanism for continuing the motion of said carrier after the cylinder stops, substantially as described.

5 4. In a stop-cylinder printing-press, the combination with a cylinder thereof, of a movable sheet-carrier driven from said cylinder, supplemental mechanism for continuing the motion of said carrier after the cylinder stops, 10 an extensible collapsible sheet-support to which said carrier delivers the sheets, and a delivery-board on which the support drops the sheets, substantially as described.

15 5. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of delivery-tapes driven from said cylinder, supplemental mechanism for continuing the motion of said tapes after the cylinder stops, an extensible collapsible sheet-support to which 20 said tapes deliver the sheets, and a delivery-board, substantially as described.

25 6. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of a movable sheet-carrier driven from said cylinder, supplemental mechanism for continuing the motion of said carrier after the cylinder has stopped, and delivery devices to which said carrier delivers the sheets, substantially as described.

30 7. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of tapes driven from said cylinder, supplemental mechanism for continuing the motion of said tapes after the cylinder stops, and delivery mechanism to which the tapes run the sheets, substantially as described.

35 8. In a printing-press, the combination of an impression-cylinder making two revolutions while the bed moves in one direction and at rest while the bed moves in the other direction, grippers and lifting-fingers on said cylinder, a feed-board arranged in juxtaposition to the upper side of the impression-cylinder at one side thereof and from which the 45 sheets are fed to said grippers, strippers and guides at the other side of said impression-cylinder, and an upper and lower set of tapes between which said strippers and guides direct the sheets, substantially as described, 50 during the second revolution of the cylinder.

55 9. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of two sets of tapes driven from said cylinder and between which the sheets are run from said cylinder, supplemental mechanism for continuing the motion of the tapes after the cylinder stops, means for bringing together and separating said tapes to cause them to grip and to release the sheets and delivery 60 mechanism to which said tapes run the sheets, substantially as described.

65 10. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of two sets of tapes driven from said cylinder and between which the sheets are run from said cylinder, supplemental mechanism for continuing the motion of said tapes after the

cylinder stops, means for bringing together and separating said tapes to cause them to grip and to release the sheets, and a to-and-fro-moving delivery mechanism having grippers to which the said tapes run the sheets, substantially as described. 70

11. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of 75 two sets of tapes driven from said cylinder and between which the sheets are run from the said cylinder, means for bringing together and for separating said sets of tapes to cause them to grip and to release the sheets, supplemental mechanism for continuing the motion of said tapes after the cylinder stops, and an extensible collapsible delivery mechanism having grippers to which said tapes 80 run the sheets, substantially as described. 85

12. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of delivery-tapes, toothed gearing and a clutch connecting said tapes and said cylinder for driving the tapes from the cylinder, and supplemental mechanism provided with a clutch 90 for driving said tapes after the cylinder stops, substantially as described.

13. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of 95 delivery-tapes, a shaft for carrying and driving said tapes, a clutch and gears for connecting said shaft to and driving it from said cylinder, a second gear loose on said shaft, a clutch for connecting it with the shaft, and 100 a reciprocating rack for driving said second gear, whereby the said tapes are driven after said cylinder stops, substantially as described.

14. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of 105 delivery-tapes, a shaft for driving said tapes, a clutch and gears for connecting said shaft with and driving it from said cylinder, a second gear loose on said shaft, a normally inoperative clutch for connecting said gear and said shaft, means for driving said gear, and means for throwing said clutch into operation to continue the motion of the tapes after the said cylinder stops, substantially as described. 110 115

15. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of a movable sheet-carrier driven from said cylinder through a clutch and gearing, and supplemental gearing and clutch for continuing 120 the motion of said carrier after the cylinder stops, substantially as described.

16. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of tapes, gearing including a clutch for driving 125 said tapes from said cylinder, and supplemental gearing including a clutch for driving said tapes after the cylinder stops, substantially as described.

17. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of 130 a movable sheet-carrier, gearing provided with a clutch for driving said carrier from said cylinder, supplemental mechanism in-

cluding a clutch for driving said carrier after the cylinder stops, and an extensible collapsible sheet-delivery to which the carrier delivers the sheets, substantially as described.

18. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of tapes, gearing provided with a clutch for driving said tapes from said cylinder, supplemental mechanism having a clutch for continuing the motion of the tapes after the cylinder stops, and an extensible collapsible sheet-delivery to which the tapes deliver the sheets, substantially as described.

19. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of two sets of tapes between which the sheets are run, gearing including a clutch for driving said tapes from said cylinder, means for closing and opening said sets of tapes to cause them to grip and release the sheets, supplemental mechanism including a clutch for driving said tapes after the cylinder stops, and an extensible collapsible delivery mechanism having grippers to which said tapes run the sheets, substantially as described.

20. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of two sets of tapes between which the sheets are run, gearing including a clutch for driving said tapes from said cylinder, means for closing and opening said sets of tapes to cause them to grip and release the sheets, supplemental mechanism including a clutch for continuing the motion of the tapes after the cylinder stops, and to-and-fro-moving delivery mechanism having grippers to which the tapes run the sheets, substantially as described.

21. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of a movable sheet-carrier driven from said cylinder, supplemental mechanism including a normally inoperative clutch for driving said carrier after the cylinder stops, and means for throwing said clutch into operation, whereby the said carrier is driven, substantially as described.

22. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of tapes driven from said cylinder, supplemental mechanism including a normally inactive clutch and means for throwing said clutch into operation to connect the supplemental mechanism to drive the tapes after the cylinder stops, substantially as described.

23. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of two sets of tapes driven from said cylinder and between which the sheets are run, means for closing and opening said sets of tapes to cause them to grip and to release the sheets, supplemental mechanism including a normally inactive clutch, means for throwing said clutch into operation to cause the supplemental mechanism to drive the tapes after the cylinder stops, and a to-and-fro-moving delivery mechanism having grippers to which the tapes run the sheets, substantially as described.

24. In a sheet-delivery, the combination of an extensible collapsible sheet-support, a bar in front thereof onto which the heads of the sheets are run, grippers coacting with said bar to hold the heads of the sheets, a carriage for said bar and grippers, and means for closing and opening the said grippers, substantially as described.

25. In a sheet-delivery, the combination of an extensible collapsible sheet-support, a bar in front thereof onto which the head of the sheet is run, grippers coacting with said bar to hold the head of the sheet, a spring for retaining said grippers open or closed, an arm connected to and moving to and fro with said grippers, and means for operating said arm to close and open said grippers, substantially as described.

26. In a printing-press, the combination of a reciprocating printing-bed, an impression-cylinder which is rotated twice during the forward stroke of the bed and is at rest during the return stroke of the bed, a feed-board at one side of the top of the cylinder from which sheets are fed to the cylinder while it is at rest, an extensible collapsible sheet-delivery apparatus, a receiving-board, and a sheet-carrying mechanism between said cylinder and said apparatus, said mechanism being driven from the cylinder, with means for driving said sheet-carrying mechanism as and after said cylinder comes to rest, substantially as described.

27. The combination of an impression-cylinder which revolves twice while the bed moves forward and is at rest while the bed returns, a feed-board at one side of the cylinder, a sheet-carrier at the other side of the cylinder, and an independently-driven delivery mechanism which seizes the head of the sheet as the cylinder comes to rest, substantially as described.

28. The combination of an impression-cylinder which revolves twice while the bed moves forward and is at rest as the bed returns, a feed-board at one side of the cylinder, a sheet-carrier at the other side of the cylinder, and an independently-driven reciprocating delivery mechanism having gripping devices which seize the sheet at its head when the head is at a distance from the impression-cylinder equal to the circumference thereof, substantially as described.

29. In a stop-cylinder printing-press, the combination with the stop-impression cylinder thereof, of a sheet-carrier driven from said cylinder, supplemental means for driving said carrier as and after said cylinder comes to rest, and an independently-driven extensible collapsible sheet-delivery to which said carrier runs the sheet, substantially as described.

30. In a stop-cylinder printing-press, the combination of the stop-cylinder thereof, with a sheet-carrier driven from the cylinder, supplemental means for driving said carrier as and after the cylinder comes to rest, and an

independently-driven extensible collapsible sheet-delivery provided with gripping devices to which said carrier runs the sheet, substantially as described.

5 31. In a stop-cylinder printing-press, the combination with a stop-cylinder thereof, of tapes driven from said cylinder, said tapes receiving the sheets from the impression-cylinder, supplemental means for driving said
10 tapes as and after said cylinder stops, and an extensible collapsible delivery mechanism to which said tapes run the sheet, substantially as described.

32. In a printing-press, the combination of
15 sheet carrying or supporting tapes, a tape-driving shaft, a clutch member and a gear fast to said member, a second clutch member, one of said members being fast to said shaft to rotate therewith and the other member being
20 loose to rotate independently of said shaft, means for driving said gear, and means for closing and opening said clutch, substantially as described.

33. In a printing-press, the combination of
25 sheet carrying or supporting tapes, a tape-driving shaft and gearing provided with a clutch for driving said shaft, whereby when the driver stops or reverses the tapes may remain stationary, substantially as described.

30 34. In a printing-press, the combination of sheet carrying or supporting tapes, a tape-driving shaft, a pinion a normally disengaged clutch for connecting said pinion and shaft, means for operating said clutch, and a recip-
35 rocating rack for operating said pinion, substantially as described.

35. In a printing-press, the combination of sheet carrying or supporting tapes, a hollow
40 tape-driving shaft, a slide in the shaft, a sleeve movable endwise of but not circumferentially of said shaft and connected with the slide to move therewith, a friction-rim and a pinion fast thereto both being loose on the shaft, radially-movable segments to coact
45 with said rim, and connections between said segments and said sleeve for moving the segments out against said rim and causing the

pinion to rotate the shaft with a spring for returning the parts to open the clutch, substantially as described. 50

36. In a printing-press, the combination of sheet carrying or supporting tapes, hollow shaft, a slide in the shaft, a sleeve movable endwise of but not circumferentially of said shaft and connected with the slide to be
55 moved therewith, a friction-rim and a pinion fast thereto both being loose on the shaft, radially-movable segments to coact with said rim, and connections between said segments and said sleeve for moving the segments out
60 against said rim and causing the pinion to rotate the shaft, substantially as described.

37. In a printing-press, the combination of sheet carrying or supporting tapes, the shaft
15 bored out as at 54, a slide 55 in said bore, 65 a sleeve on said shaft, a pin 58 connecting said slide and sleeve through slots 59 in the shaft, a rimmed disk 62 loose on the shaft, a pinion fast to the disk and loose on the shaft, segments as 64 within the rim of the disk, in-
70 clined pushers as 66 connecting the sleeve and segments, and an elastic dished spider as 65 for holding the segments in place and for holding the clutch normally open, with a set of tapes driven by the shaft, and means
75 for moving the slide 55 and sleeve against the force of the said spider, and closing the clutch, substantially as described.

38. The combination of a stop or oscillatory cylinder in a printing-press, with a tape-driv-
80 ing shaft, and gearing provided with a one-way clutch between said cylinder and said shaft whereby the shaft is driven intermittently in but one direction while the cylinder may stop or oscillate, substantially as de-
85 scribed.

Signed at New York, in the county of New York and State of New York, this 8th day of June, A. D. 1898.

WALTER SCOTT.

Witnesses:

E. D. O'BRIEN,
R. W. BARKLEY.