

No. 698,745.

Patented Apr. 29, 1902.

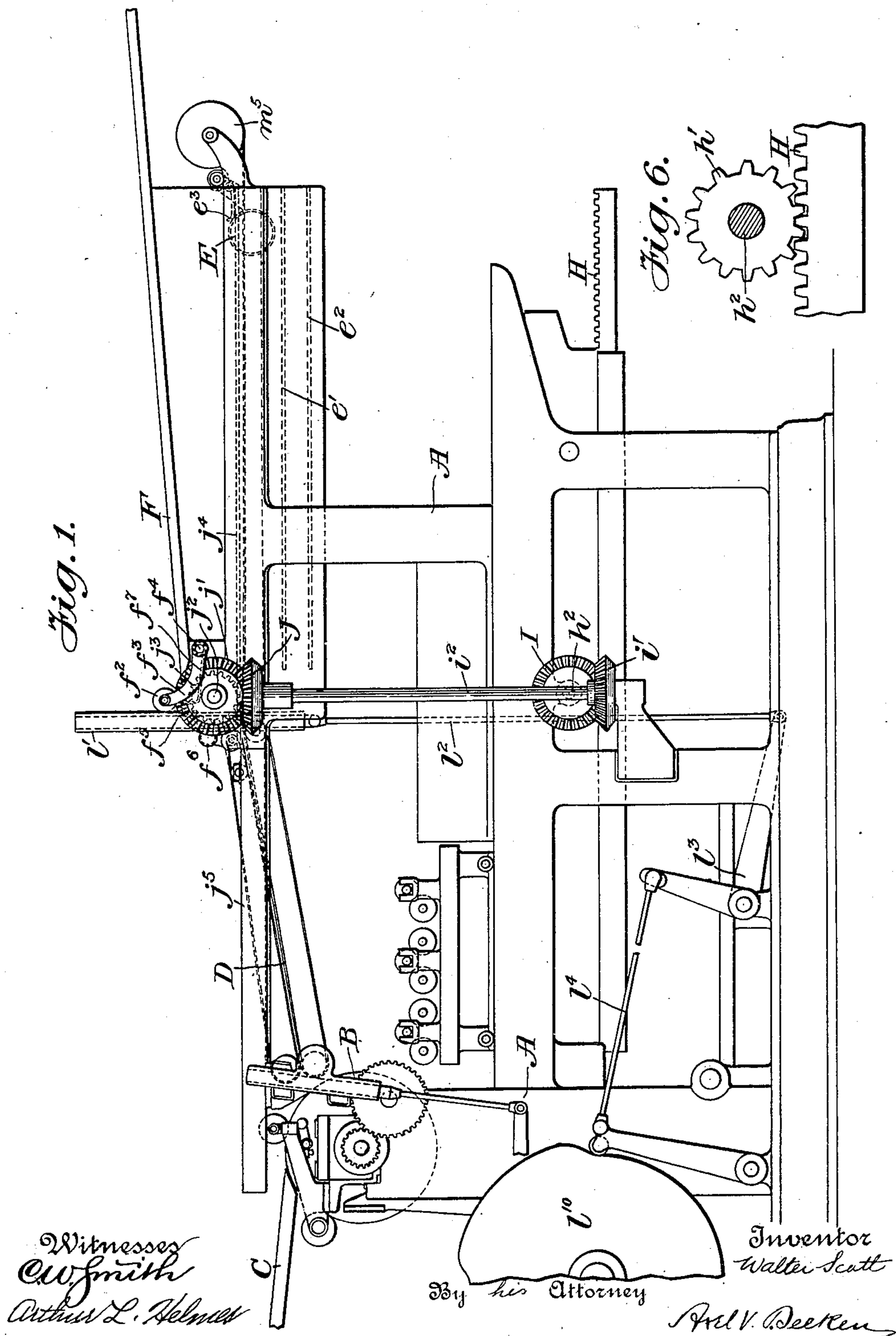
W. SCOTT.

SLIP SHEET INTRODUCING MECHANISM.

(Application filed July 3, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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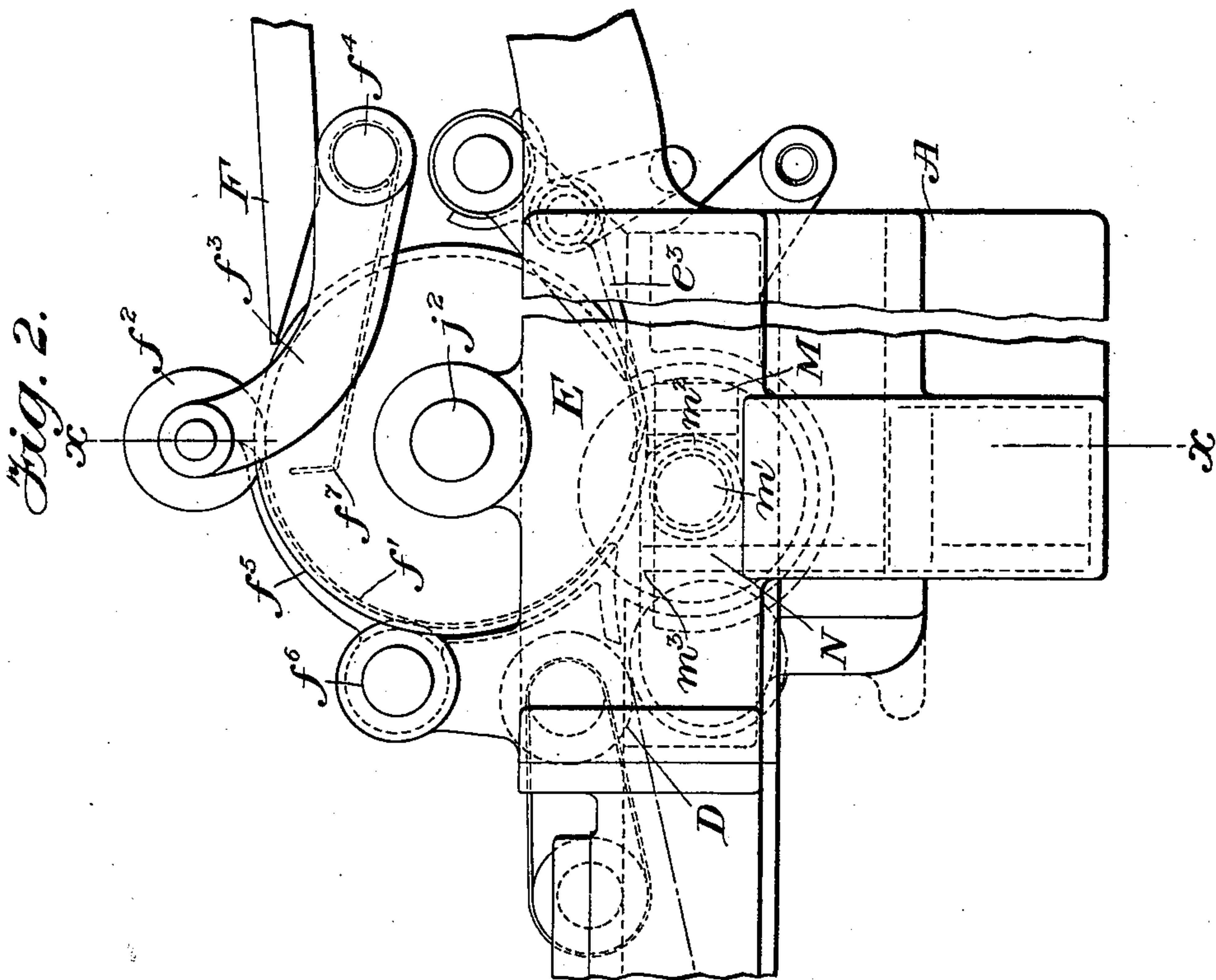
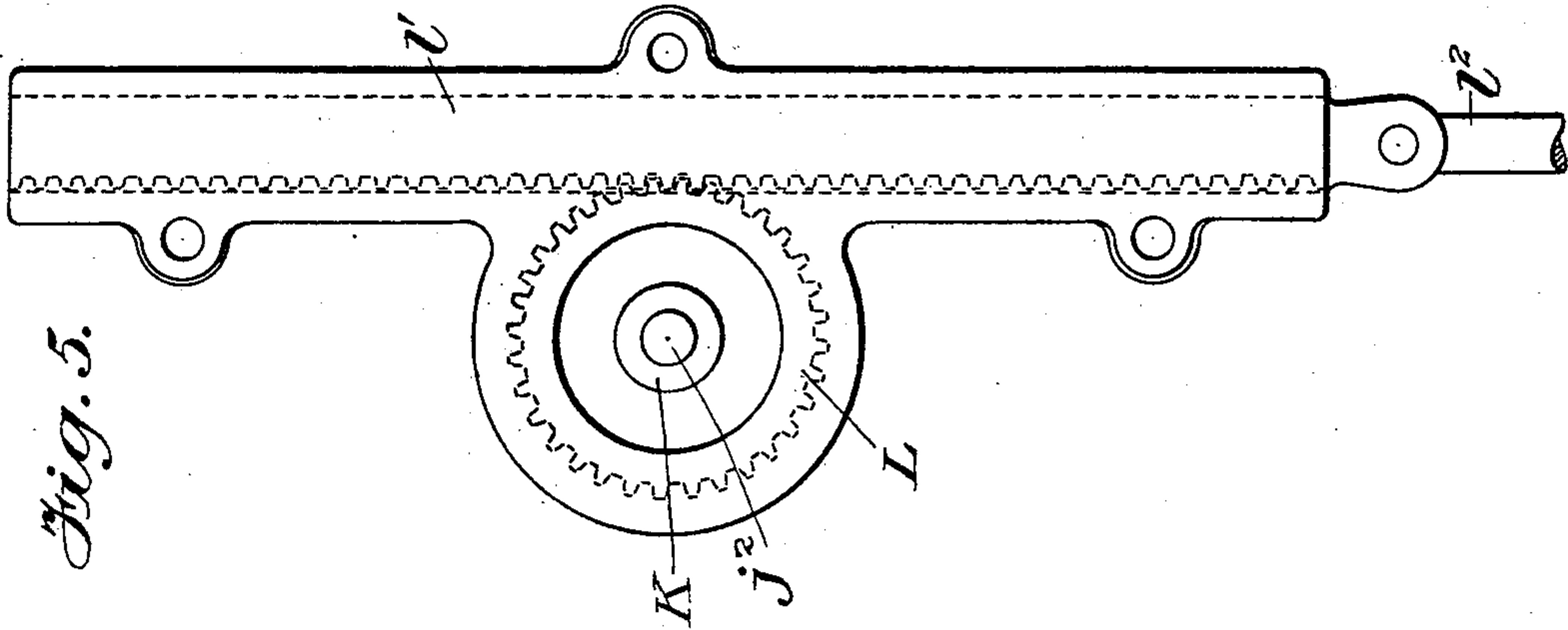
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(Application filed July 3, 1901.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses
C. W. Smith
Arthur L. Holmes

By his Attorney

Inventor
Walter Scott
Paul V. Deeken

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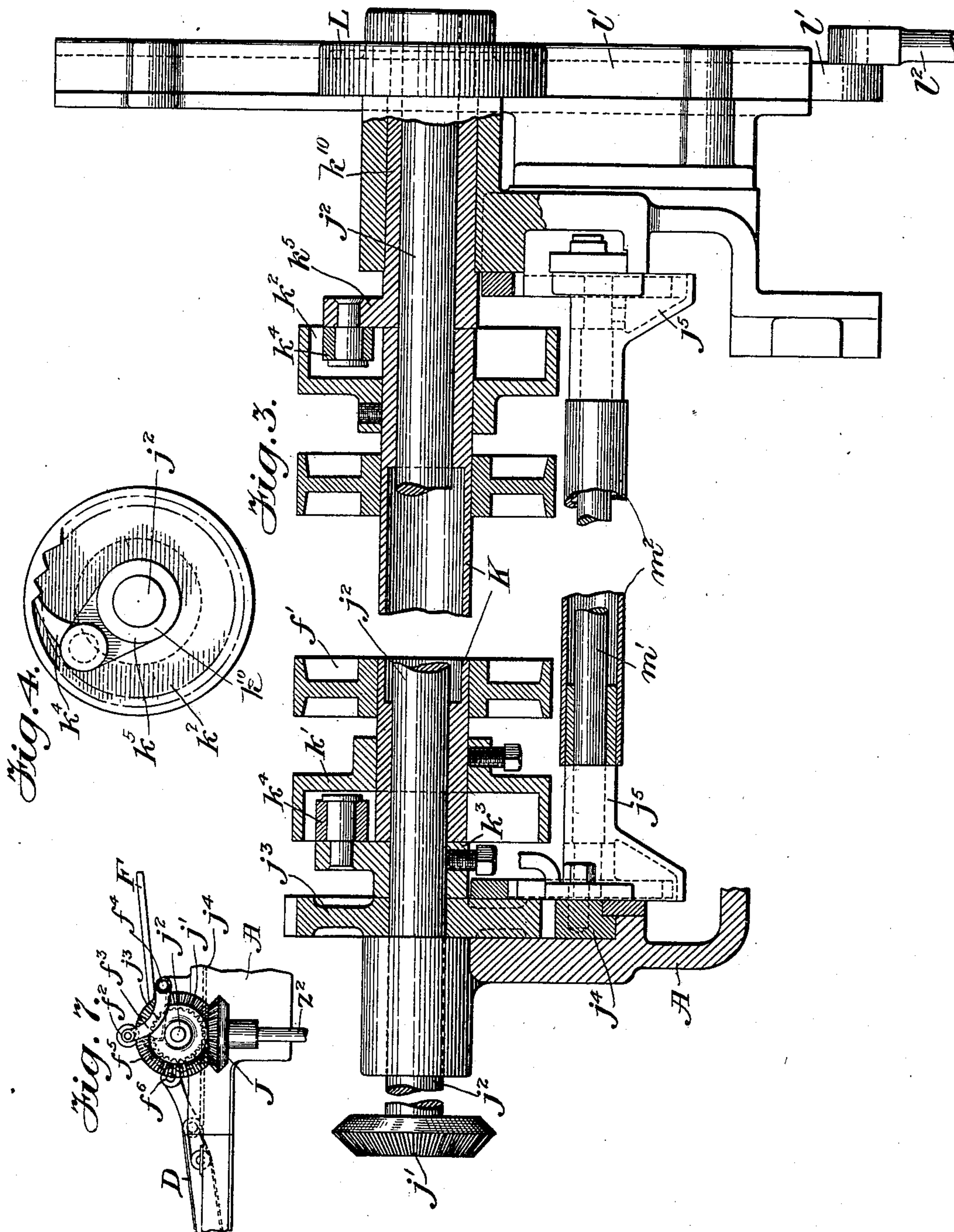
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SLIP SHEET INTRODUCING MECHANISM.

(Application filed July 3, 1901.)

(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

SLIP-SHEET-INTRODUCING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 698,745, dated April 29, 1902.

Application filed July 3, 1901. Serial No. 66,976. (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 Slip-Sheet-Introducing Mechanism, of which the following is a specification.

When printing of a fine quality is being done, and especially where sheets are being printed in many colors, it is often desirable to introduce sheets of paper, called "slip-sheets," between the printed sheets as they are delivered from the printing-press. This work has heretofore usually been done by operators laying on the slip-sheet after the printed sheet is delivered and before the next one is laid thereon. My invention is for the purpose of facilitating the introduction of these slip-sheets between the printed sheets, the slip-sheets being fed from a feed-table, caused to coincide with the printed sheets, and delivered with them.

I shall describe a slip-sheet-introducing mechanism and the adjacent elements of a printing-press in connection therewith and afterward point out the novel features in the claims.

My device can be applied to printing-machines of the bed-and-cylinder pattern known as "two-revolution," "three-revolution," "oscillating," or "stop-cylinder" printing-machines, also "rotary" printing-machines; but in the drawings I have illustrated my invention in connection with a machine of the stop-cylinder type.

In this instance the sheet-delivery mechanism is shown operated by means of a reciprocating rack operated by the device which operates the bed underneath the impression-cylinder in a well-known manner. By suitable means this rack drives a reciprocating carriage having racks and mounting the sheet-delivery mechanism of a suitable construction. Above the reciprocating carriage is mounted a feed-cylinder for the slip-sheets, which is given an intermittent and progressive motion—that is, a motion in one direction only—by suitable mechanism operated by the rack on the reciprocating carriage when the latter is on the return stroke to deliver the sheets. The printed sheets are carried to

the slip-sheet feeding-cylinder, where the printed sheet and the slip-sheet meet and from whence they are delivered together by suitable means. As the slip-sheet feed-cylinder is only operated when the rack is on the return movement, it becomes necessary to start the motion of the said cylinder a short time prior to the commencement of the return stroke of the rack on the reciprocating carriage, so that the slip-sheet will meet the printed sheet when the latter arrives at the slip-sheet feed-cylinder, where it is taken up by the sheet-delivery mechanism. This primary movement of the feed-cylinder is accomplished by a special device suitably operated, as will be hereinafter more fully described. Under certain conditions it may be advantageous to dispense with this special device and to impart the preliminary feeding motion of the slip-sheet feed-cylinder direct from the rack on the reciprocating carriage. This is accomplished by locating the feed-cylinder a distance back equal to the distance the slip-sheet has to travel over the said cylinder before it meets the printed sheet. By this means the feeding motion of the feed-cylinder commences simultaneously with the beginning of the return stroke of the reciprocating carriage; but the said cylinder, being placed a distance back equal to the distance the slip-sheet travels before it meets the printed sheet, will have fed the said slip-sheet to the proper point by the time the printed sheet has traversed the additional distance which it must cover to reach the point where the cylinder is located.

Other improvements will appear farther on in the specification.

Figure 1 shows a part of a printing-machine of the stop-cylinder type with a sheet-delivery apparatus and my improved slip-sheet-introducing mechanism. Fig. 2 shows an enlarged side elevation of the slip-sheet device and showing also the sheet-delivery mechanism in the position ready to grasp the two sheets. Fig. 3 is a sectional view on line *xx* of Fig. 2. Fig. 4 is a side view of the means for driving the feed-cylinder. Fig. 5 is a side elevation of the rack and gear of the special device for imparting the preliminary feeding motion to the feed-cylinder. Fig. 6 is a sectional view showing the gear

and the rack which through suitable means impart motion to the reciprocating carriage. Fig. 7 shows a modification wherein the feed-cylinder is moved back a distance, so as to dispense with the device particularly illustrated in Fig. 3.

In my application of April 27, 1901, Serial No. 57,738, I show a printing-machine with the sheet-delivery having a slip-sheet feed-board located above the path leading from the impression-cylinder and in front of the latter, so that the slip-sheets can be fed into the printed sheet's path and caused to coincide therewith and be delivered with the same sheet-delivery apparatus. This arrangement is somewhat objectionable, owing to the feed-board extending back toward and above the impression-cylinder and the feed-gages to which the sheets to be printed are fed, thereby casting a shadow on or obscuring the light from the feed-gages. In this application I place the feed-board in the opposite direction above the sheet-delivery apparatus and the receiving-board with its front end adjacent to a small feed-cylinder, which is located above the path of the printed sheet leading from the impression-cylinder and somewhere near the point where the printed sheet and the slip-sheet meet and run together in the delivery apparatus.

B is the impression-cylinder, suitably mounted in the framework A, driven and operated in connection with the type-bed in any well-known manner.

C is the feed-board, leading to the upper side of the impression-cylinder and from which sheets are fed to be printed.

D is a sheet-path leading from the cylinder B to the sheet-delivery, formed either with rods and tapes or with tapes only.

E represents a sheet-delivery which delivers the sheets onto receiving-boards, as e' and e'' . This sheet-delivery may be of any kind which draws or carries out the sheets and drops them on the receiving-boards—such, for instance, as in Patents No. 324,245, August 11, 1885; No. 351,471, October 26, 1886; No. 400,875, April 2, 1889; No. 563,967, July 14, 1896; No. 642,805, February 6, 1900; No. 642,806, February 6, 1900; No. 648,423, May 1, 1900. The sheet-delivery may or may not be provided with grippers, as e^3 , for seizing and drawing out the sheet. This delivery apparatus may be driven in any suitable manner. It is here shown as being driven by a reciprocating rack H, which is operated by the device which operates the bed underneath the impression-cylinder. In connection with this rack is placed a gear-wheel h' underneath the bed, which is mounted on the shaft h^2 , leading to the outside of the frame. On the end of this shaft is placed the bevel-gear I, which engages with a similar bevel-gear i' on the upright shaft i^2 . On the upper end of this shaft is placed another bevel-gear J, which engages with the bevel-gear j' on the shaft j^2 . Fastened to this shaft j^2 is a gear-

wheel j^3 , which engages with the rack j^4 , which is fast to the reciprocating delivery-carriage j^5 and drives the same back and forth.

F is a feed-board for slip-sheets, with its feeding end pointing in the direction of the impression-cylinder B.

f' is the slip-sheet feed-cylinder, which is mounted loosely on the shaft j^2 and constructed of pulleys on the hollow shaft K. Attached to each end of the shaft K are placed ratchet-drums k' and k^2 . On the shaft j^2 and adjacent to the ratchet-drum k' is secured, by means of screws, a lever k^3 , on which is mounted a pawl k^4 for engaging with the ratchet-drum k' . On the opposite end of the shaft j^2 is a sleeve k^{10} , mounted loosely and having a projection k^5 , which carries a pawl similar to k^4 , which engages with the ratchet-drum k^2 . On the end of this sleeve k^{10} is placed a gear L, which engages with the upright rack l' . The end of the rack l' is connected with a connecting-rod l^2 , which reaches down and engages with the bell-crank l^3 , which latter receives motion from a connecting-rod l^4 , which engages with a suitable cam, as l^{10} , and reciprocates the rack l' at the proper speed and at the proper time to impart the preliminary feeding motion to the cylinder f' . It will be observed that the cylinder f' is driven in a forward direction from the shaft j^2 by the ratchet-drum k' during the time the printed sheet is being drawn out over the delivery and that the cylinder f' will remain stationary on the forward stroke of the reciprocating delivery, except during the period when it is rotated by means of the ratchet-drum k^2 , operated by the rack l' .

f^2 is a drop-roller mounted in arms f^3 , fastened to the rock-shaft f^4 , operated in any usual and well-known manner. f^5 represents guides carried by the shaft f^6 in front of the cylinder f' .

The sheet to be printed is fed from the table C to the impression-cylinder B in the usual manner, where it receives an impression by passing between the said cylinder B and the reciprocating form, (not shown,) and is delivered in front of the cylinder into the sheet-path D or other sheet-transmitting device and passes along until its front end or edge is in a position to be received by the sheet-delivery apparatus. Before the sheet reaches this point a slip-sheet is fed from the board F to the guides f^7 . The drop-roller f^2 descends on the cylinder f' , and the guides f^7 , being mounted on the same rock-shaft, are lowered out of the path of the sheet to allow the sheet to start. The rack l' then starts the cylinder f' , and the sheet is fed around the cylinder until its front edge coincides with the printed sheet. The reciprocating delivery apparatus will then carry out the two sheets together, the cylinder f' starting with the delivery apparatus, and consequently running the slip-sheet out at the same speed as the printed sheet. In this case I have

shown a delivery apparatus similar to that described in Patent No. 642,805, having grippers e^3 .

In Figs. 2 and 3 I have shown an enlarged view of the slip-sheet-feeding device located at the end of the sheet-path, also a sheet-delivery apparatus consisting of a reciprocating carriage j^3 , on which is mounted the cross-bar M, the shaft m' , on which is mounted a roller m^2 , on which is mounted a sheet of canvas m^3 , the other end of the canvas sheet being fastened to the cross-bar N on the frame of the machine. As this reciprocating carriage approaches the end of its reciprocation underneath the feed-cylinder f' the grippers e^3 , which are in a raised position, drop on the sheets and seize them between the bar M and themselves, whereby the sheets are drawn out over the canvas m^3 and supported by it. When the carriage reaches the outward end of its reciprocation, the grippers e^3 are raised, and on the forward stroke of the carriage the canvas m^3 is rolled up on the roller m^2 , and the printed sheet and the slip-sheet are dropped on the delivery-board e' . m^5 is a compensating device which compensates for the difference in speed occasioned by the varying diameter of the roll m^2 in a well-known manner. When a sufficient number of sheets are delivered on the board e' , this delivery-board is drawn out and placed in a pile or rack. The sheets then fall on the board e^2 until another receiving-board is placed in the position of e' . It will be seen that by using two delivery-boards it is not necessary to stop the machine while the sheets are being taken out.

In Fig. 7 the feed-cylinder f' is shown as being moved back a distance equal to the distance which the slip-sheet travels over the feed-cylinder before it meets the printed sheet. By this means the printed sheet has to travel the extra distance occasioned by the position of the feed-cylinder before meeting the slip-sheet, whereby it becomes necessary to drive the feed-cylinder only during the return stroke of the reciprocating carriage, thereby dispensing with the rack l' and its connections, the feed-cylinder being driven from the rack of the reciprocating carriage only. In this case there may be a second gripper like e^3 to seize the slip-sheet, the printed sheet being seized by the first gripper.

The ratchet-drums k' and k^2 may be constructed with one or more cam-surfaces or as continuous ratchets, and instead of the ratchets there may be a frictional device used—such, for instance, as that shown in British Patent No. 27,148 of 1898, Figs. 29, 30, 31, and 32.

Instead of the drop feed-roller for feeding the slip-sheet a gripper on the cylinder may be used, the diameter and speed of the cylinder being such as to bring the gripper into the right position to receive the slip-sheet.

Having thus described my invention, what I claim is—

1. In a printing-machine, the combination of an impression-cylinder from which printed sheets are delivered into a sheet-path, a reciprocating sheet-delivery, a feed-board with its feeding end pointing in the direction of the impression-cylinder and a cylinder located above the sheet-delivery and rotating in one direction at about the same speed as the delivery and adapted to deliver slip-sheets on top of the printed sheets as they are being delivered.

2. The combination in a printing-machine of a sheet-delivery adapted to receive and deliver sheets, a sheet-feeding cylinder having an intermittent progressive movement located above the delivery, and adapted to feed sheets onto the printed sheets at about the same surface speed as the delivery.

3. The combination of a reciprocating sheet-delivery adapted to receive and deliver sheets from a printing-press, a feed-cylinder driven in unison therewith intermittently and in one direction and adapted to feed sheets over the printed sheets, whereby two sheets are delivered together on the receiving-board.

4. The combination of a reciprocating sheet-delivery adapted to deliver printed sheets, a feed-cylinder located above same and driven by it in one direction, whereby sheets are delivered onto the printed sheets and delivered with them.

5. The combination of a reciprocating sheet-delivery adapted to deliver printed sheets, a feed-cylinder driven by it in one direction to deliver sheets thereto, and remaining stationary while the delivery is on the forward stroke.

6. The combination of a reciprocating sheet-delivery adapted to deliver printed sheets, a feed-cylinder driven by it in one direction by a ratchet to deliver sheets thereto, and remaining stationary while the delivery is on the forward stroke.

7. The combination of a reciprocating sheet-delivery adapted to receive sheets from a printing-machine and deliver them onto a receiving-board, a slip-sheet feed-board, a feed-cylinder driven in one direction at about the same surface speed and coinciding with the delivery, and having a primary motion so as to feed the slip-sheet in register with the printed sheet as they meet at the delivery.

8. The combination of a reciprocating sheet-delivery, a feed-cylinder driven in unison therewith during its return stroke, and having a primary motion in the same direction during the outward stroke of the delivery, whereby sheets are fed in register to the delivery.

9. The combination of a reciprocating sheet-delivery, a feed-cylinder driven by a ratchet in unison with the delivery during its return stroke, and having another ratchet for a primary motion in the same direction during the outward stroke of the delivery, whereby sheets are fed in register to the delivery.

10. The combination of a reciprocating sheet-delivery, a feed-cylinder located near

the receiving end of the delivery and driven by a ratchet in unison with the delivery during its return motion, and having another ratchet for a primary motion in the same direction during the outward stroke of the delivery, whereby slip-sheets are fed in register to the delivery.

11. The combination with a reciprocating sheet-delivery, of a rack by which said delivery is driven, a slip-sheet feed-board, a feed-cylinder driven in one direction by means of a ratchet and a gear connected with said rack.

12. The combination with a reciprocating sheet-delivery, of a rack by which said delivery is driven, a slip-sheet feed-board, a feed-cylinder driven in one direction by means of a ratchet and a gear connected with said rack, and also receiving a primary motion by means of a second gear and ratchet connected with a rack driven by a cam-motion.

13. The combination of a reciprocating sheet-delivery adapted to deliver printed sheets, a feed-cylinder driven by it in one direction to deliver sheets thereto and remaining stationary during a portion of the forward stroke of the delivery.

14. The combination of a reciprocating sheet-delivery adapted to deliver printed sheets, a feed-cylinder driven by it in one direction by a ratchet to deliver sheets thereto and remaining stationary during a portion of the forward stroke of the delivery.

15. The combination of a reciprocating sheet-delivery adapted to receive and deliver printed sheets, of a slip-sheet feed-cylinder, and means whereby the feed-cylinder is given a progressive motion while the delivery is traveling in one direction, thereby supplying sheets to the printed sheets, and remains stationary when the delivery is traveling in the opposite direction.

16. The combination of a reciprocating sheet-delivery adapted to receive and deliver printed sheets, of a slip-sheet feed-cylinder, and means whereby the feed-cylinder is given a progressive motion while the delivery is traveling in one direction, and is given a primary motion in the same direction during a portion of the period the delivery is traveling in the opposite direction.

17. The combination with a reciprocating delivery, of a feed-cylinder, and means for imparting an intermittent, progressive motion to the cylinder so as to deliver slip-sheets to the reciprocating delivery at predetermined intervals.

18. The combination with a reciprocating delivery, adapted to receive and deliver printed sheets, of a feed-cylinder, and means for imparting an intermittent, progressive motion to the feed-cylinder so as to deliver slip-sheets on the printed sheets on the reciprocating delivery at predetermined intervals.

19. The combination with an impression-cylinder, a reciprocating sheet-delivery, and a slip-sheet cylinder, of a feed-board located above the sheet-delivery and extending backward and in a direction opposite to that in which the impression-cylinder is located.

20. The combination of a feed-cylinder, a reciprocating delivery, means whereby the feed-cylinder is given a progressive motion, and means whereby the feed-cylinder remains stationary during a portion of one of the strokes of the reciprocating delivery.

21. The combination of an impression-cylinder, a reciprocating delivery adapted to receive and deliver printed sheets from same, a slip-sheet feed-board with its feeding end pointing in the direction of the impression-cylinder, a slip-sheet feed-cylinder, and means for imparting a progressive motion to the feed-cylinder while the delivery is drawing out the printed sheets to deliver slip-sheets thereto.

22. The combination of a reciprocating delivery adapted to receive and deliver printed sheets, a slip-sheet feed-cylinder, means for imparting a progressive motion to the feed-cylinder while the delivery is drawing out the printed sheets to deliver slip-sheets thereto, and means whereby the slip-sheets are made to register with the printed sheets on the reciprocating delivery.

23. The combination of a reciprocating delivery adapted to receive and deliver printed sheets, a slip-sheet feed-cylinder, means for imparting a progressive motion to the feed-cylinder while the delivery is drawing out the printed sheets to deliver slip-sheets thereto, and means for imparting a primary motion to the feed-cylinder in the same direction prior to the drawing out of the printed sheets by the delivery, so as to make the printed sheets and slip-sheets register.

Signed at New York, in the county of New York and State of New York, this 14th day of May, A. D. 1901.

WALTER SCOTT.

Witnesses:

STANSBURY HAGAR,
AXEL V. BEEKEN.