

(No Model.)

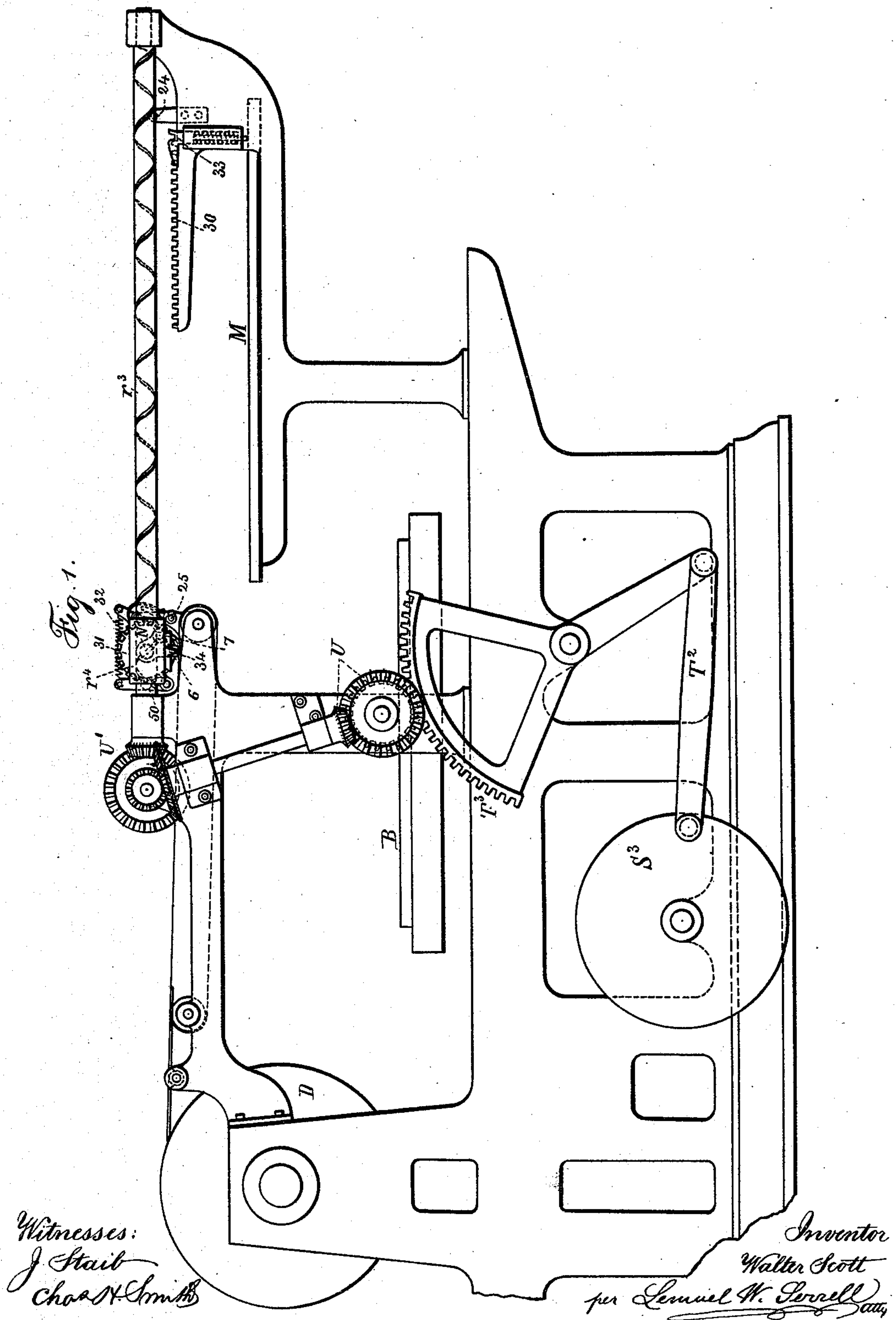
4 Sheets—Sheet 1.

W. SCOTT.

SHEET DELIVERY APPARATUS FOR PRINTING PRESSES.

No. 413,814.

Patented Oct. 29, 1889.



(No Model.)

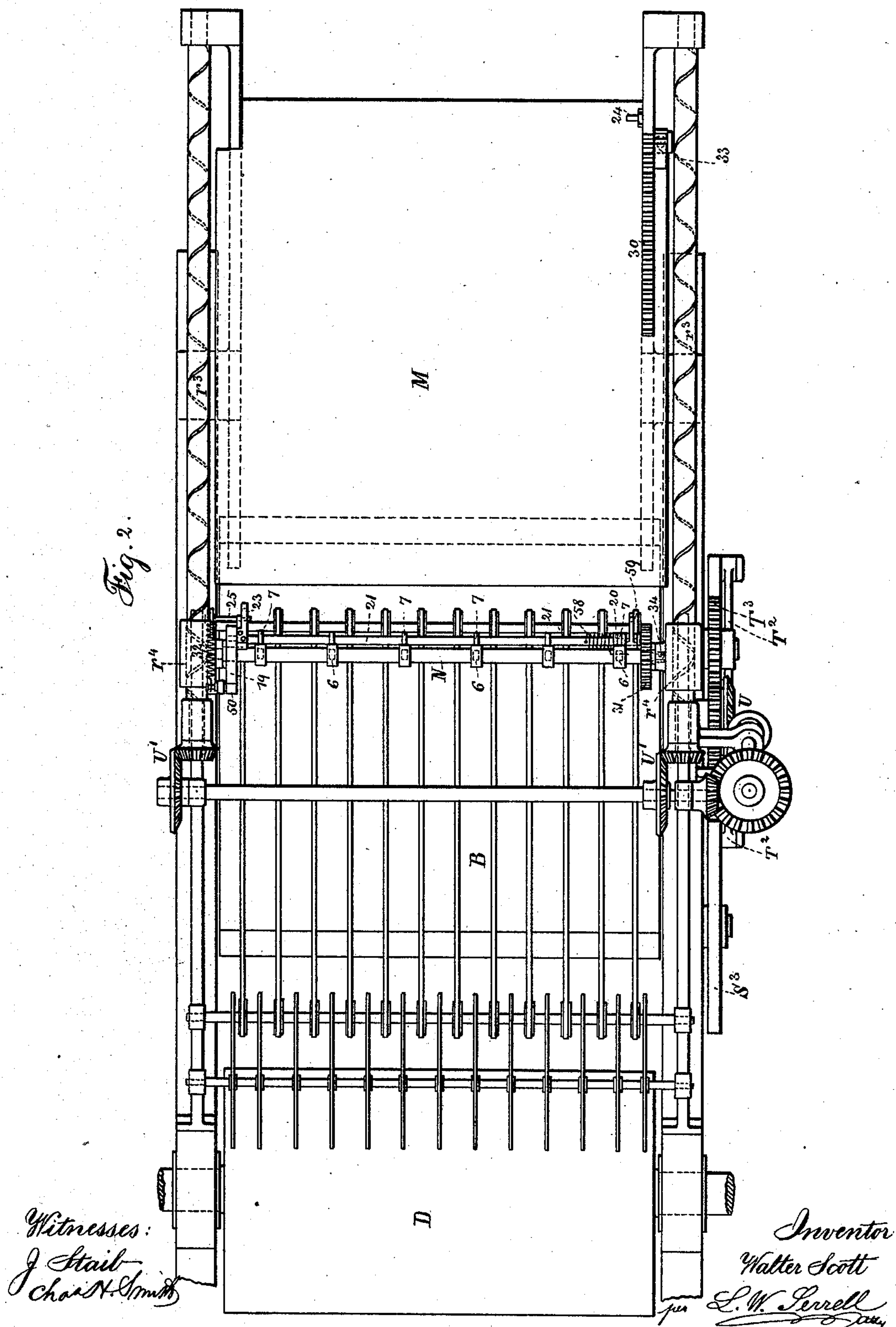
4 Sheets—Sheet 2.

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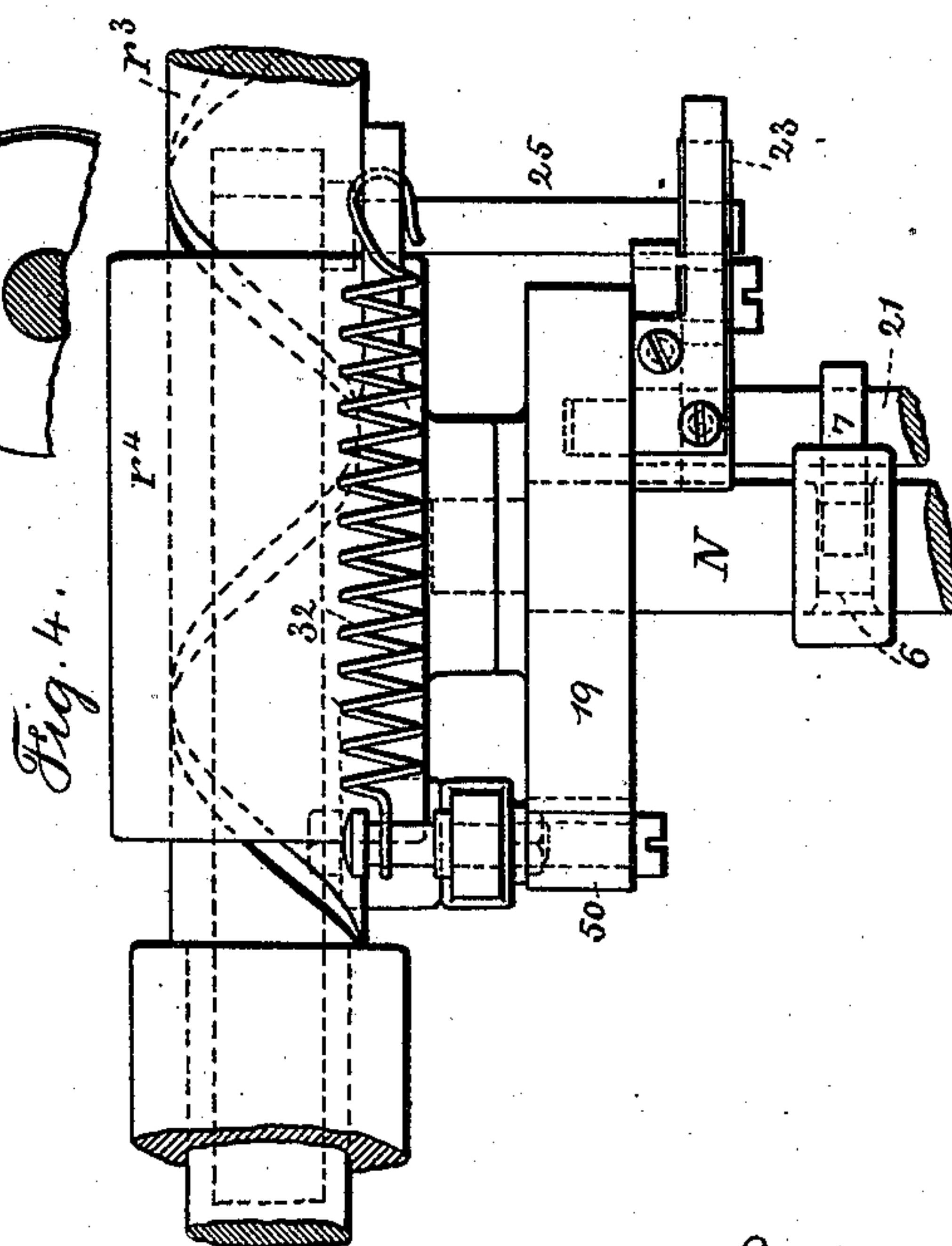
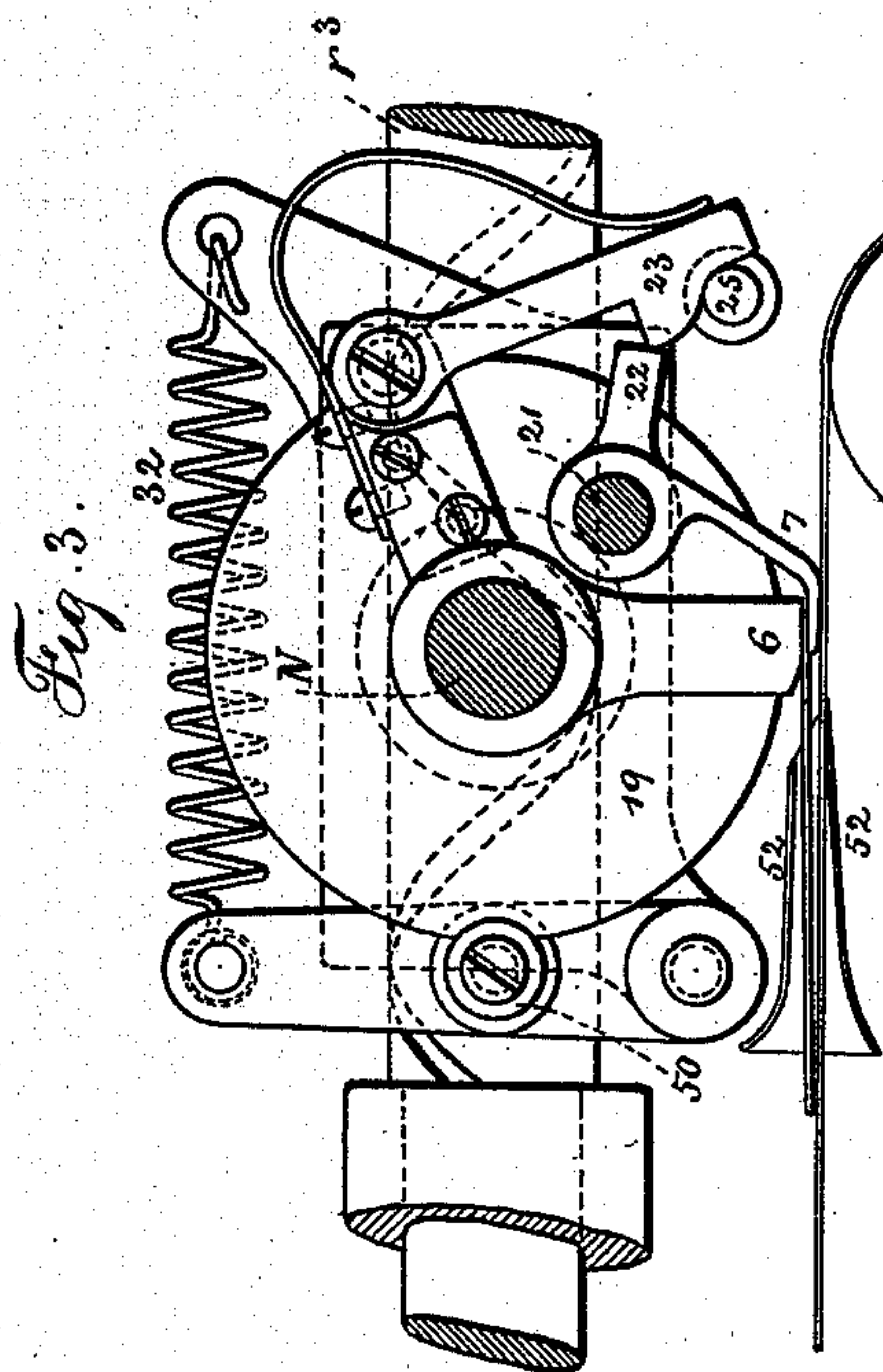
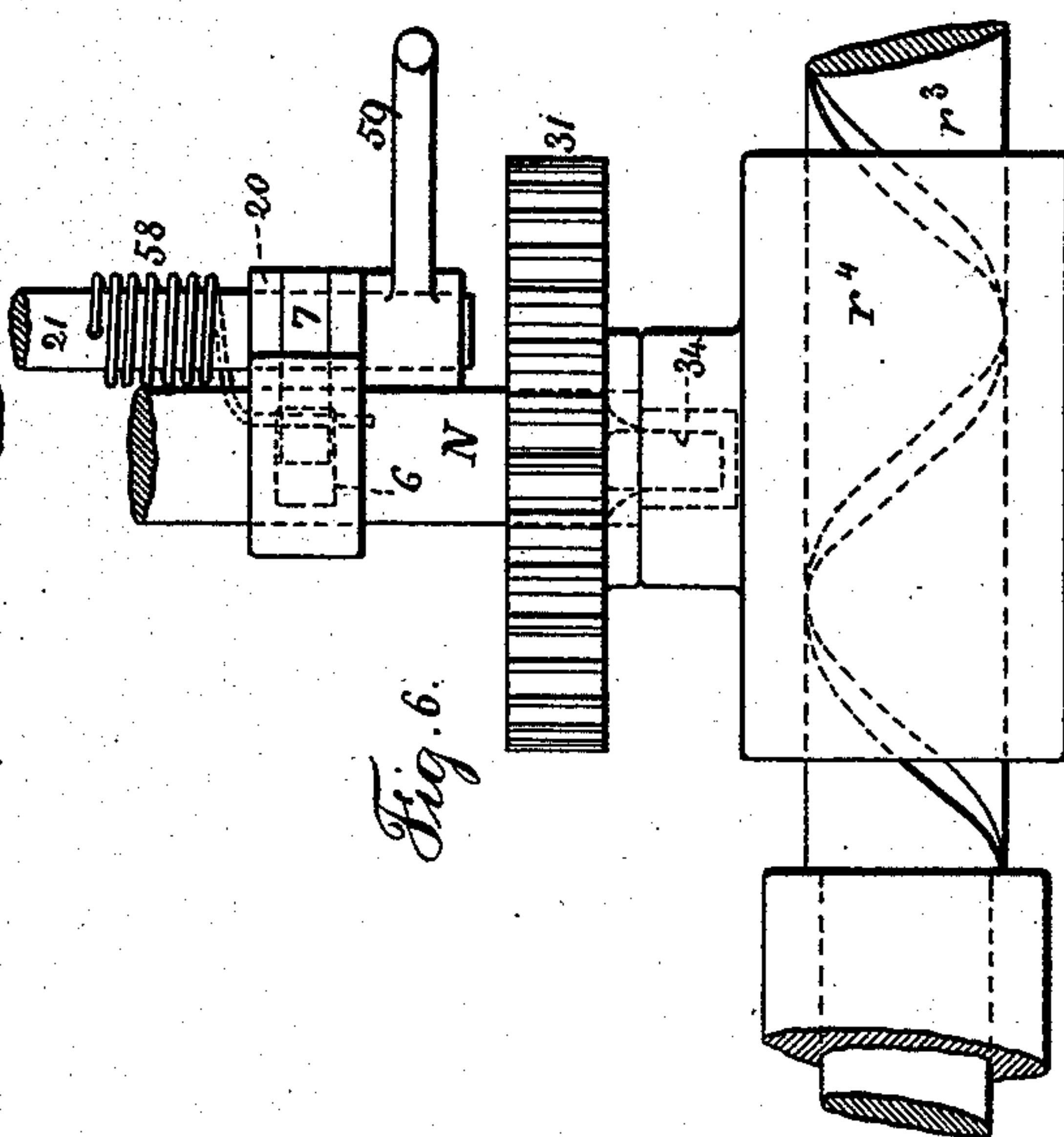
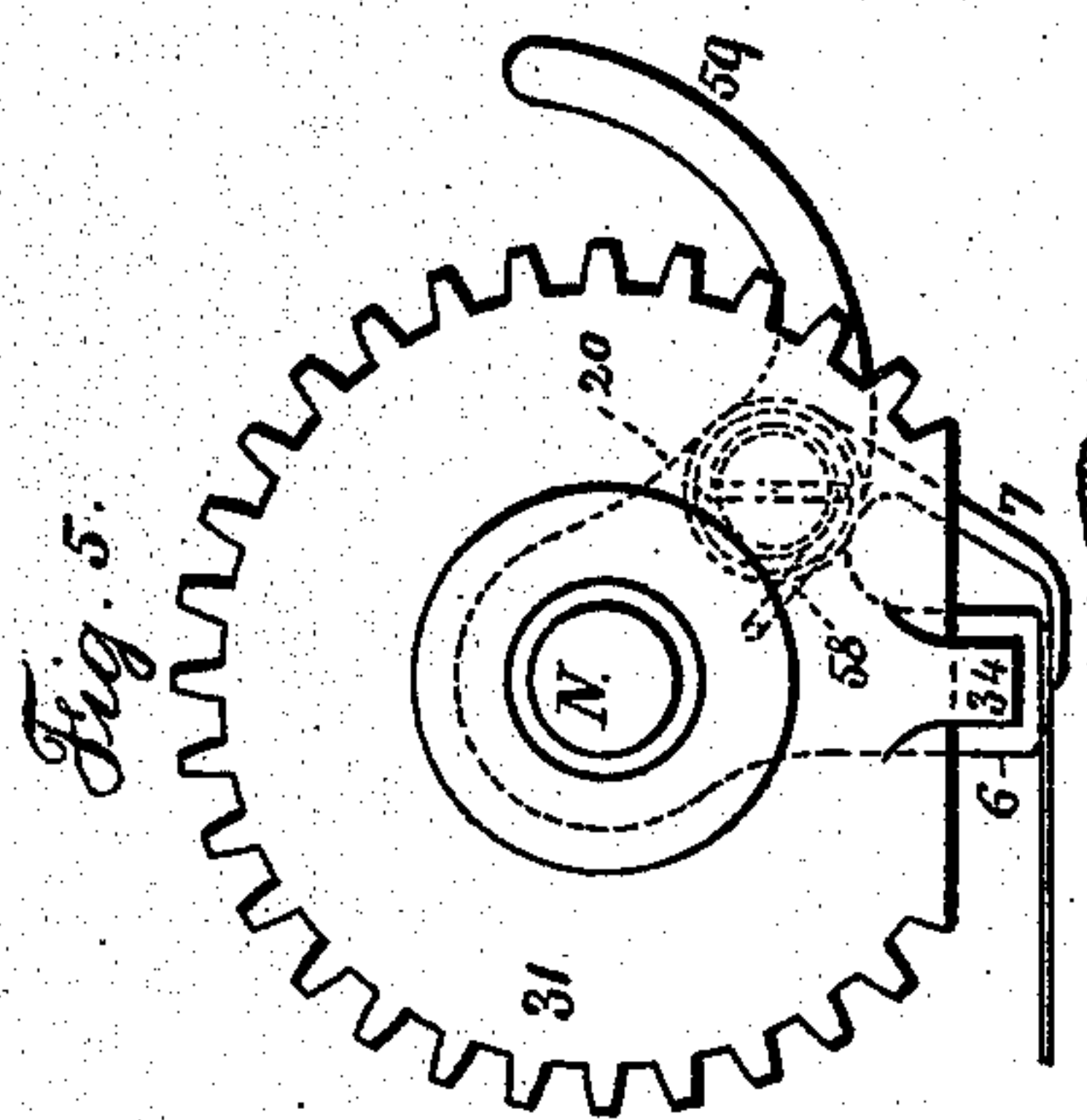
4 Sheets—Sheet 3.

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Witnesses:
J. Stait
Chas. H. Smith

Inventor:
Walter Scott
per Lemuel W. Perrell
att'y.

(No Model.)

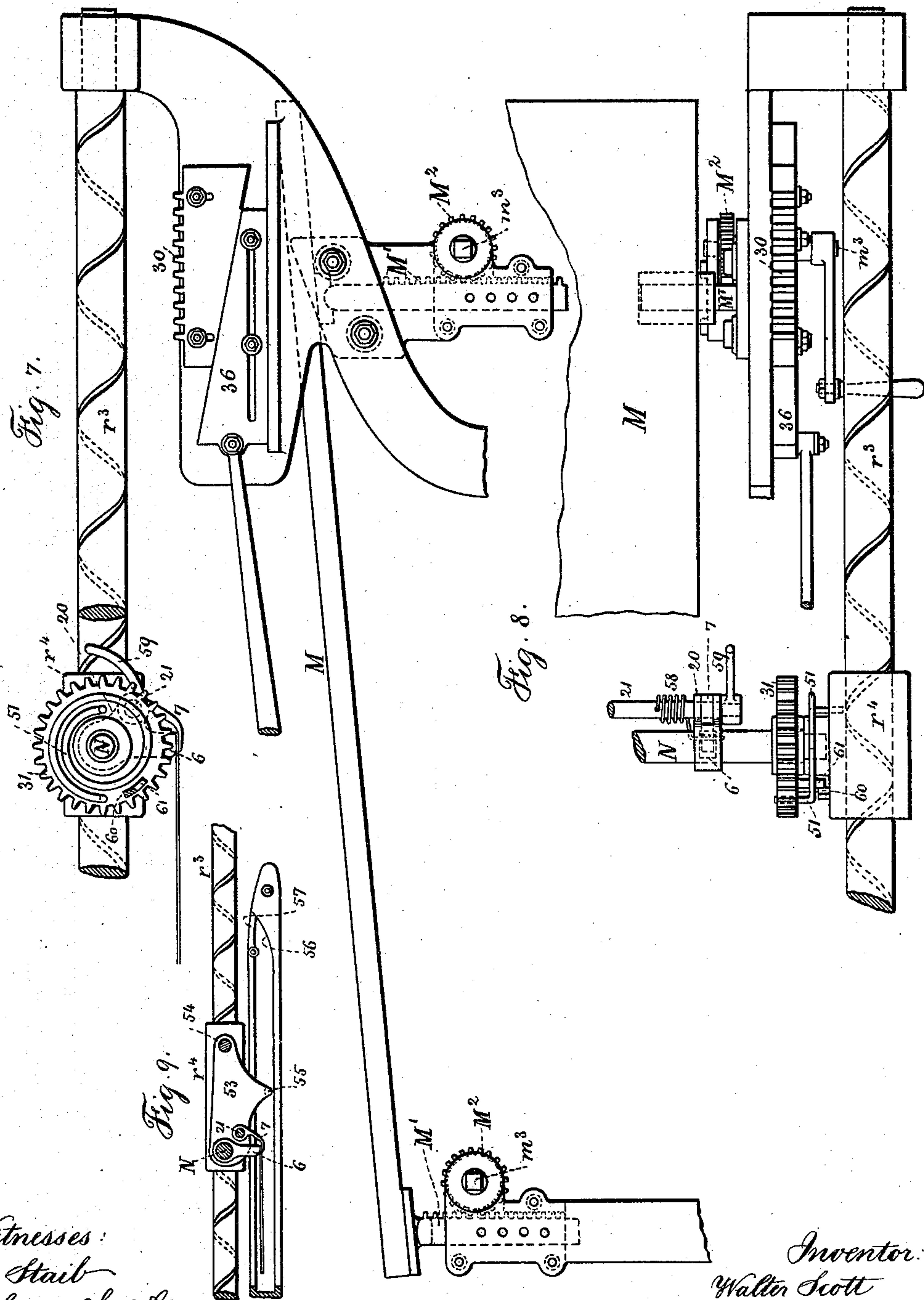
4 Sheets—Sheet 4.

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Inventor:
Walter Scott
per Lemuel W. Ferrell
Att.

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

SHEET-DELIVERY APPARATUS FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 413,814, dated October 29, 1889.

Application filed March 7, 1889. Serial No. 302,239. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, of Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Sheet-Delivery Apparatus for Printing-Presses, of which the following is a specification.

In my patent, No. 351,471, granted October 26, 1886, and in my patent, No. 400,875, granted April 2, 1889, I have represented a gripper-bar that carries grippers for seizing the sheet as it is passed away from the printing mechanism, and this gripper-bar and grippers are moved along horizontally over a table upon which the printed sheets are laid, and the grippers are opened at the proper time for dropping the sheet; but in this instance the grippers are sometimes liable to catch the end of the sheet upon the return movement, because the air beneath the sheet partially holds up the same.

The object of the present invention is to raise the points of the grippers after they have been opened to drop the sheet, so that such grippers do not return in the same path in which they move in conveying away the sheet, but above such path, and the advancing end of the sheet as it is dropped by the grippers may be partially pressed down by such grippers during the movement given to such grippers, and I provide for guiding the advancing end of the sheet into the grippers, so that such grippers do not have to be opened as wide as usual. The table upon which the sheets are delivered is adjustable and movable, so that the same may be adapted to the sheets as they are carried off horizontally by the grippers, for in cases when the sheet is heavy it is apt to hang down too far, and when light it does not rest down upon the pile of sheets evenly if it has too far to fall.

In the drawings, Figure 1 is an elevation representing a portion of the printing mechanism and showing the sheet-delivery device. Fig. 2 is a plan view of the same, representing the position of the respective parts. Fig. 3 is a section, in larger size, of the gripper-bar and its holding devices. Fig. 4 is a plan of the same at one side of the press. Fig. 5 is an elevation of the gear at the end of the gripper-shaft. Fig. 6 is a plan view of the

same. Fig. 7 is a detached elevation. Fig. 8 is a plan of a modification, and Fig. 9 illustrates a modification in the devices for raising the grippers.

This invention is available where the impression-cylinder makes one or two revolutions for each impression, or where the impression-cylinder is stopped during one movement of the press; but it is not limited to the same, and I have represented the impression-cylinder D as above the type-bed B, which latter reciprocates beneath the impression-cylinder as the printing is performed. The cross-bar N is parallel with the axis of the impression-cylinder D, and it is reciprocated horizontally by any suitable means—such, for instance, as by rack-bars, as in said Patent No. 351,471, or by screws that are revolved as in my aforesaid application. I have represented the screws r^3 as supported in stationary bearings and revolved first in one direction and then the other by the toothed segment T^3 , and bevel-gearing U and U' , and to this toothed segment T^3 a swinging movement is given by the connection T^2 to a crank-pin on the wheel S^3 , which wheel is revolved once for each sheet that is printed. Thereby the screws r^3 are revolved first in one direction and then in the other and give to the nuts r^4 a movement from end to end of the screws, or nearly so, the movement being greater than the length of the sheet, so as to draw the sheet along over the table M and leave such sheet thereon by opening the grippers at the proper time.

The cross-bar N is provided with grippers 6 and 7, and instead of said grippers simply being opened at the proper time the cross-bar N is moved to cause the grippers to return in a different plane and out of the way of the paper. With this object in view I either raise and lower the grippers or give to the cross-bar N a rotation in the nuts r^4 , which nuts form bearings or journal-boxes. It is preferable to employ a disk 19 or crank-arms 20, keyed on the cross-bar N, so as to revolve with the said bar N, and the movable grippers 7 are upon the cross-shaft 21, which cross-shaft 21 is supported at its ends in the disk 19 or crank-arms 20, and there is a suitable spring (shown as a helix) 58 around the shaft

21 for closing the grippers 7 against the grippers 6, and at one end of such cross-shaft 21 there is a device for holding the grippers open—such as the catch 22, that is received 5 by the spring-latch 23, so that the grippers are held open thereby during their return movement. The grippers and catch are acted upon by the cam-arm 59 coming against the stationary stud 24 at the extreme distant end 10 of the movement given to the cross-bar N, so as to open the grippers for dropping the sheet, and the latch 23 prevents such grippers closing until the latch 23 comes in contact with the stationary stud 25 to unlatch the arm 22 15 and allow the grippers to close in seizing the sheet.

The cross-bar N, disks 19, and crank-arms 20, the arm 22, and the spring-latch 23 all being supported by the cross-bar N, such cross-bar N can be raised and lowered or rotated 20 or partially rotated and carry with it the parts named without changing the condition of the grippers when they are either open or closed, and it is now to be understood that when the 25 grippers have seized the sheet and moved the same along over the bed M the grippers are opened as the cross-bar N is stopped at this end of the movement and the sheet can fall away from such grippers; but in order to prevent the grippers from catching the end of 30 the sheet during their return for another sheet I raise such grippers or give them a partial or complete rotary movement to carry the points of the grippers away from the sheet 35 to clear the end of such sheet as they are raised up above the position that the sheet has occupied.

I remark that any suitable mechanism may be made use of for giving to the cross-bar N 40 the proper movement for the purpose aforesaid. I have shown a stationary rack 30 at one side of the press and an interrupted gear 31 upon the cross-bar N. This interrupted gear, or the disk 19, is held by a spring 32 and 45 lever having a roller 50 upon it entering a slight recess in either the periphery or the side of such gear or the disk, so as to apply the friction necessary to prevent the cross-bar N revolving except when the gear 31 receives a positive movement from the rack 30. 50

In order to bring the rack 30 into action upon the gear 31, the rack itself might be lifted by any suitable movement to cause its teeth to come into contact with the gear 31; 55 but I prefer to make use of a spring starting-latch 33 upon the frame of the machine and a projection 34 upon the gear 31 or upon the disk 19, and as the cross-bar N and parts connected therewith are drawn along by the action of the screws r^3 or their equivalents the 60 projection 34 slides over and depresses the starting-latch 33, and such latch then springs up and holds the projection 34. During this movement the portion of the gear 31 where 65 there are no teeth has been adjacent to the rack 30, and as the nuts r^4 and cross-bar N are moved in the opposite direction and to-

ward the impression-cylinder D, the projection 34 being detained by the latch 33, the 70 gear 31 is partially turned, so as to bring its teeth into gear with the rack 30; hence there is a complete or partial rotation of the cross-bar N at the commencement of the return movement of the nuts r^4 , and in this move- 75 ment the points of the grippers 6 and 7 are carried backwardly and raised to clear the end of the sheet that has been dropped by the opening of such grippers, so that such sheet cannot be injured by the grippers on 80 their return motion. The latch 33 may be on the gear 31 and the projection 34 on the bed of the press, the parts being simply transposed.

If the rack 30 is of sufficient length to give the cross-bar N a complete revolution, the 85 points of the grippers will describe a cycloidal curve and come back to their normal position ready for the sheet to be received between the open grippers and the grippers to close upon the sheet at the end of the movement 90 toward the impression-cylinder and the spring-roller 50 will fall into the notch or recess to steady and hold the parts in their proper position as the next sheet is drawn along over the table M. If, however, the rack 95 30 is not sufficiently long to give a complete rotation to the gear 31 and cross-bar N, the parts may be returned to their normal position by the action of the spring 51, coiled around the cross-bar N, between the same and 100 one of the nuts r^4 . This latter arrangement is indicated in Figs. 7 and 8, wherein the rack 30 is represented as shorter and is adapted to receive a rising-and-falling movement at the proper time by any suitable means—such, for 105 instance, as the wedge 36 beneath such rack-bar, to which a motion is given at the proper time by a connection to any suitable portion of the bars. A stop 60 and a projection 61 110 serve to prevent the bar N and grippers turning back too far.

In order to lessen the distance that the grippers have to be opened, and hence provide for as small a rising-and-falling movement as possible to the cross-bar and grippers, I provide 115 guide-plates 52, Fig. 3, forming a mouth through which the sheet passes to the place where such grippers are closed upon it. These guide-plates are at the ends of the bars or lines of tapes that convey the sheet from the 120 printing device to the grippers.

I have shown in Fig. 9 the cross-bar N and grippers as held by arms 53, pivoted at 54 to the nuts r^4 , and having pins 55, that run upon cams 56, that lift the grippers as they are 125 opened and drop the sheet, and then the spring-switch 57, dropping, causes the grippers to return at a higher elevation, thus clearing the sheet that has been dropped.

The delivery-table M is supported near its 130 ends by the adjustable racks M' , set to slide vertically in supports on the frame of the machine, and these racks are moved by pinions M^2 upon cross-shafts m^3 , so as to raise

and lower the table M and hold it either horizontal or at an inclination, according to the character of paper that is being printed upon and delivered. On the under side of the delivery-table, near one end, there are recesses or forks to connect the same with the upper ends of the racks M', but to allow the table to be lifted off with facility. At the other end the table is preferably provided with flat plates resting upon the racks, so as to slide thereon when the other end of the table is raised or lowered.

I claim as my invention—

1. The combination, with the grippers 6 and 7 and the cross-bar N and its end bearings, of screws or their equivalents for reciprocating the bearings, the cross-bar and parts carried by the same, the table M, upon which the sheets are delivered, a stop for opening the grippers, and mechanism, substantially as specified, for raising the grippers to clear them from the sheet laid upon the table, substantially as set forth.

2. The combination, with the cross-bar N and screws ⁷³ or their equivalents for reciprocating such cross-bar N, of the grippers 6 and 7, the cross-shaft 21 for the grippers 7, a spring for closing the grippers, an arm and catch for holding the grippers when open, and a gear and rack for giving to the cross-bar N and parts connected therewith a rotary or partial rotary movement after the grippers have been opened for dropping the sheet, substantially as set forth.

3. The combination, with the cross-bar N, of bearings at the ends of such cross-bar and screws or their equivalents for reciprocating the bearings and cross-bar, grippers carried by the cross-bar, a gear and rack for revolving or partially revolving the cross-bar N and grippers, and a roller and spring acting in a recess to steady the cross-bar and grippers and prevent them revolving during the time that the sheet is carried by the grippers, substantially as set forth.

4. The combination, with the cross-bar N and the bearings ⁷⁴ and mechanism for reciprocating such bearings and carrying the cross-bar laterally above the sheet-delivery table, of the grippers 6, the shaft 21, and grippers 7, the arm and catch 22, the spring-latch 23, for holding the grippers open, the interrupted gear 31, the rack 30, the starting-latch 33, and the projection 34, against which the starting-latch operates to give to the interrupted gear a partial revolution at the commencement of the return movement of the grippers, substantially as and for the purposes set forth.

5. The combination, with the grippers for conveying the sheet along above the delivery-table, of the stationary guide-plates between which the sheet is passed to the grippers, substantially as set forth.

6. The combination, with the reciprocating gripping mechanism for seizing and delivering sheets, of the delivery-table and an adjustable support near each end of the table for raising or lowering one or both ends and inclining the table, substantially as specified.

7. The combination, with the sheet-delivery table, of a support near one end of the table, and a rack and pinion near the other end of the table to raise or lower the same, substantially as set forth.

8. The combination, with the grippers and their cross-bar, of nuts for receiving the ends of the cross-bar, screws for actuating such nuts, and gearing for revolving the screws first in one direction and then the other and reciprocating the gripper-bar and parts connected therewith, substantially as set forth.

9. The combination, with the sheet-delivery table, the grippers, and cross-bar carrying the same, of supports for the ends of the cross-bar, screws or their equivalents occupying a fixed position for supporting and reciprocating the cross-bar laterally above the table, and means for varying the position of the grippers in relation to their supports and raising the grippers above the path of the sheet on the return movement of such grippers, substantially as set forth.

10. The combination, with the grippers and the cross-bar carrying the same, of a gear-wheel and rack for rotating or partially rotating the cross-bar and moving the grippers away from the sheet after the grippers have been opened, substantially as set forth.

11. The combination, with the cross-bar and its end bearings, of the screws or their equivalents for reciprocating the same laterally, grippers connected with and carried by the said cross-bar, and mechanism, substantially as set forth, for giving to the cross-bar a rotary or partially rotary movement in its bearings during the return movement and between the dropping of one sheet and the grasping of the next by the grippers, substantially as set forth.

Signed by me this 5th day of March, 1889.

WALTER SCOTT.

Witnesses:

GEO. T. PINCKNEY,
HAROLD SERRELL.