

(No Model.)

6 Sheets—Sheet 1.

C. REISING.

SHEET SEPARATING AND PRINTING MACHINE.

No. 525,999.

Patented Sept. 11, 1894.

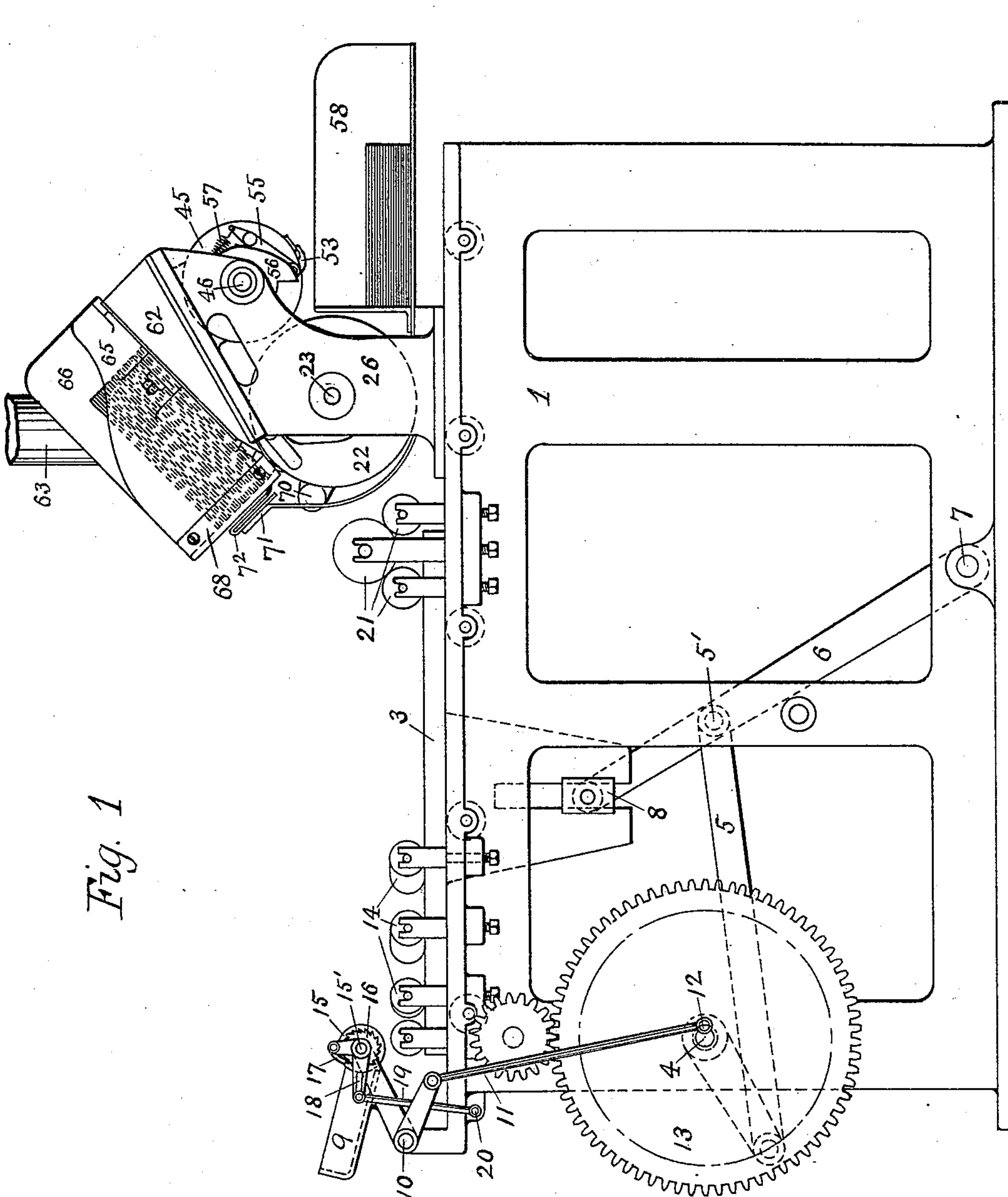


Fig. 1

Witnesses:

W. H. Honiss.
Geo. E. Smart.

Inventor:

Casper Reising.

(No Model.)

6 Sheets—Sheet 2.

C. REISING.

SHEET SEPARATING AND PRINTING MACHINE.

No. 525,999.

Patented Sept. 11, 1894.

Fig. 7

Fig. 8

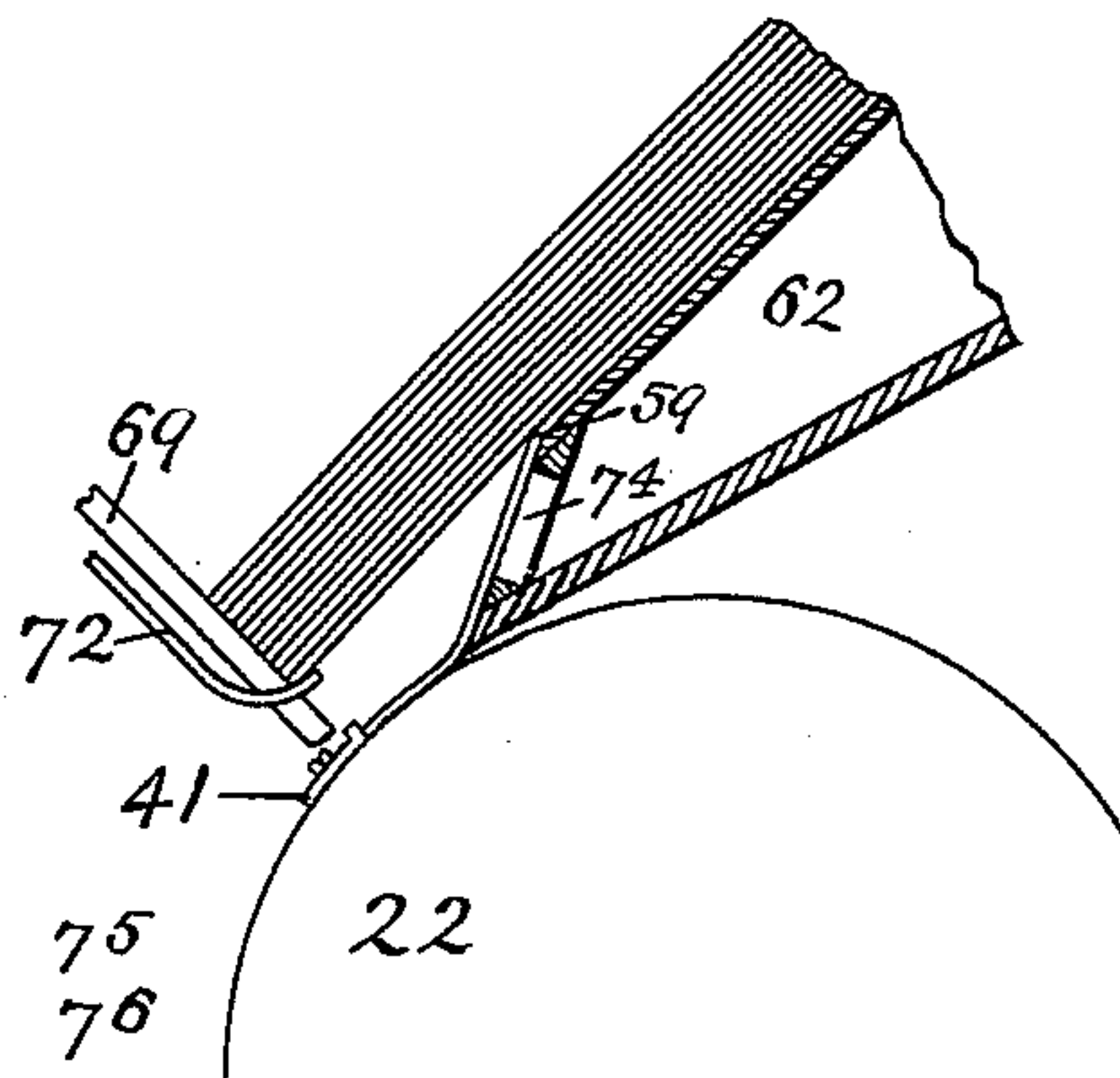
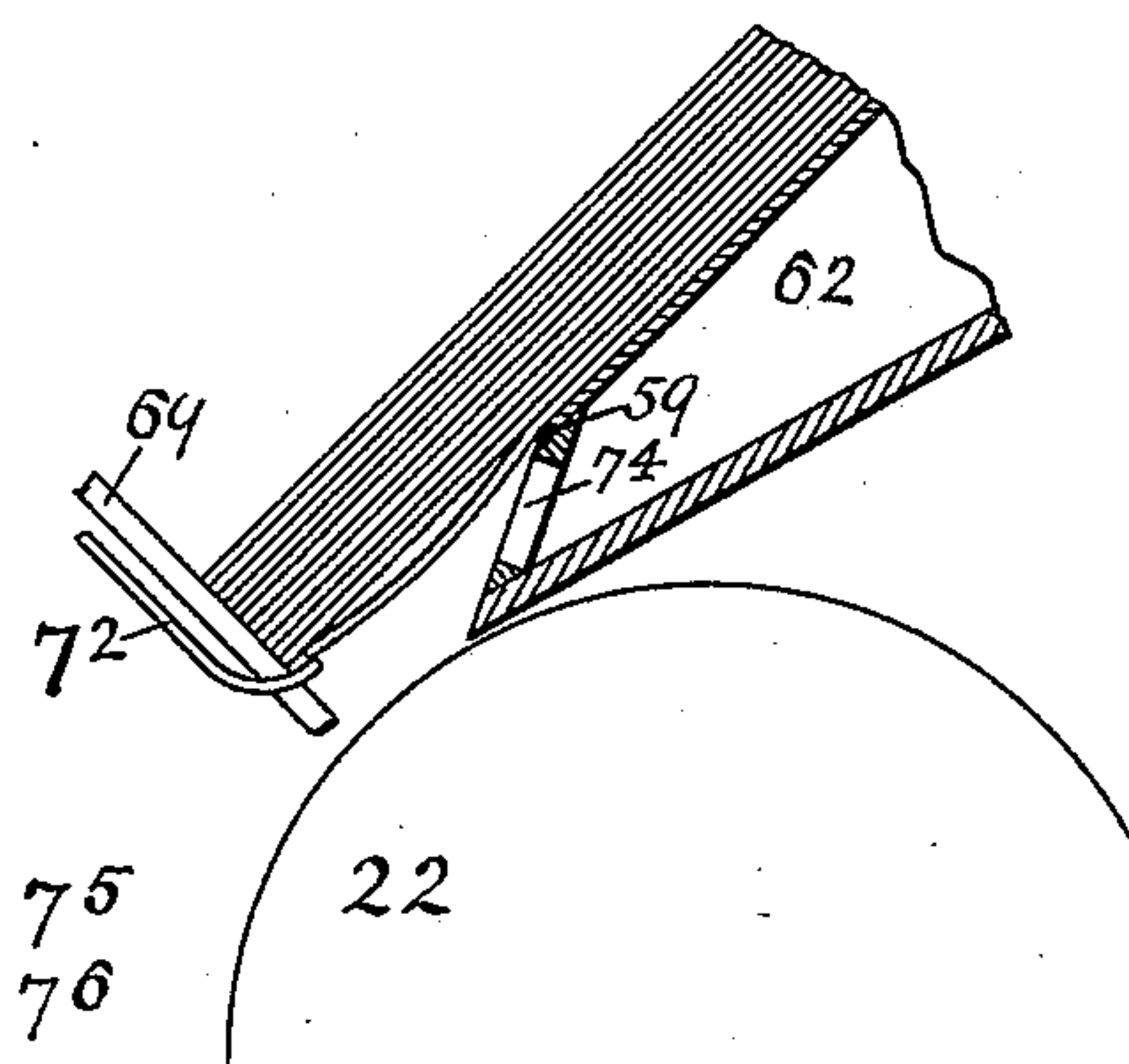
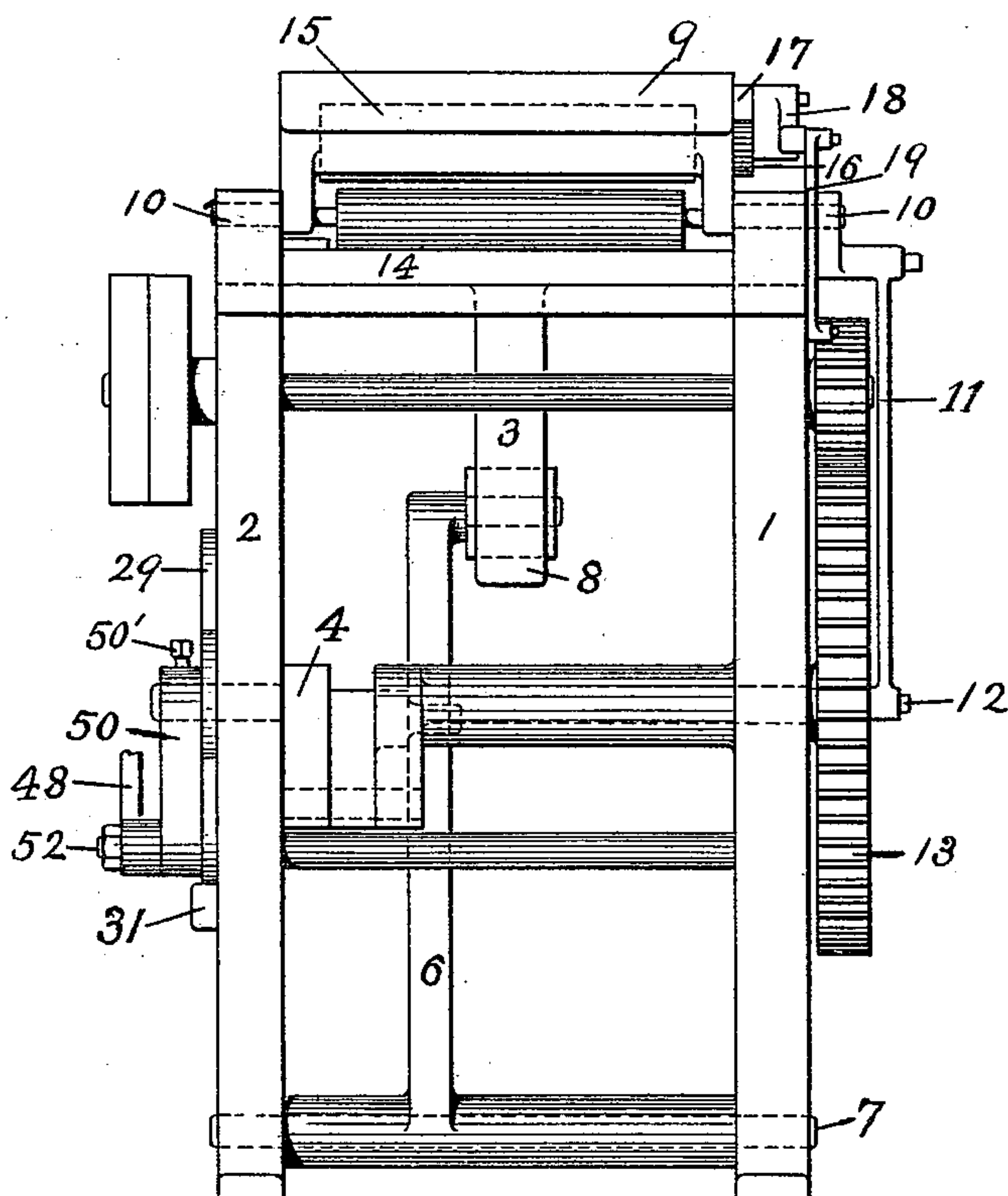


Fig. 2



Witnesses:

W. H. Boniss.

W. Maltner

Inventor:

Casper Reising

(No Model.)

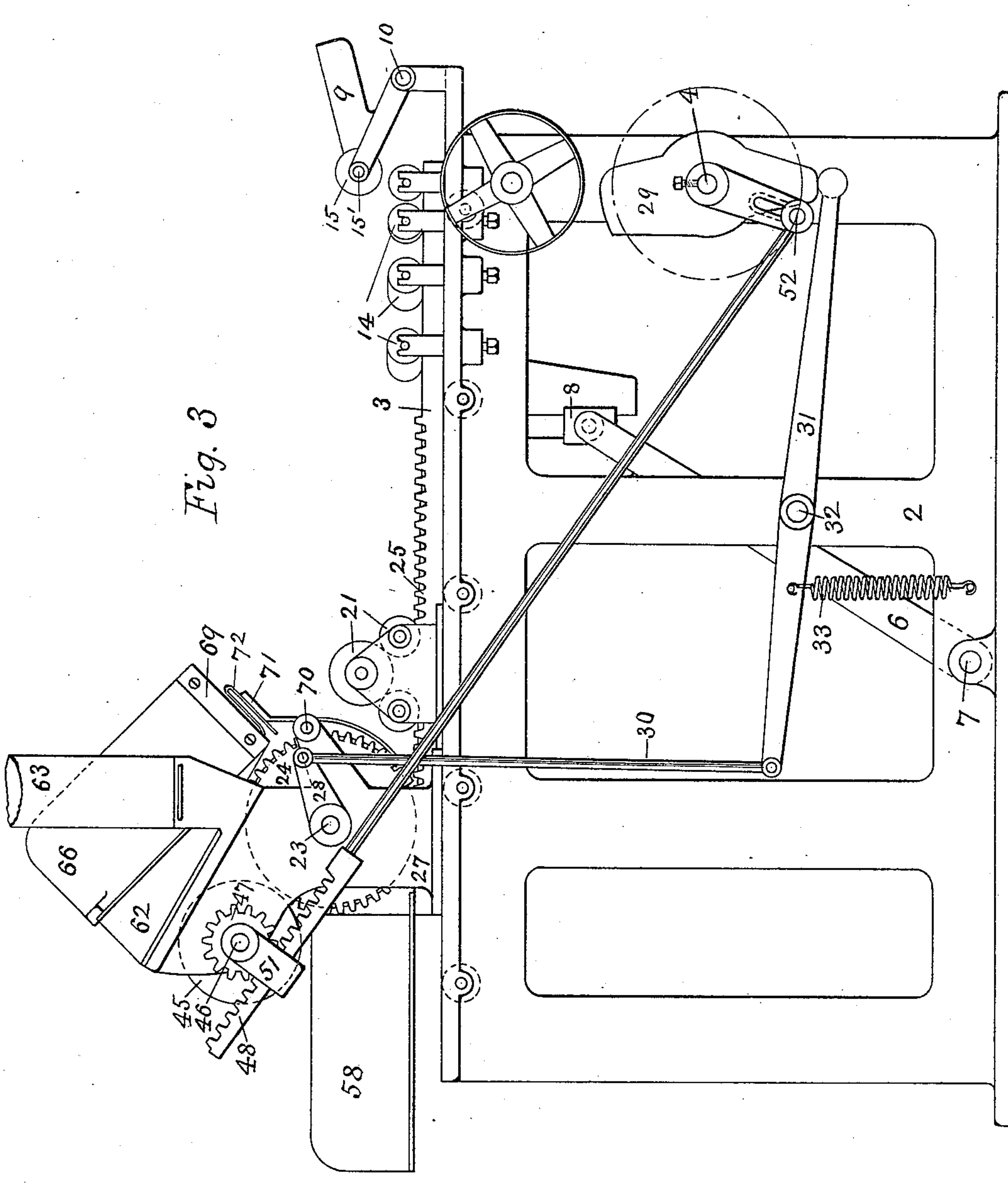
6 Sheets—Sheet 3.

C. REISING.

8 SHEET SEPARATING AND PRINTING MACHINE.

No. 525,999.

Patented Sept. 11, 1894.



Witnesses:

W. H. Honiss.
Geo. E. Smart

Inventor:

Casper. Reising.

(No Model.)

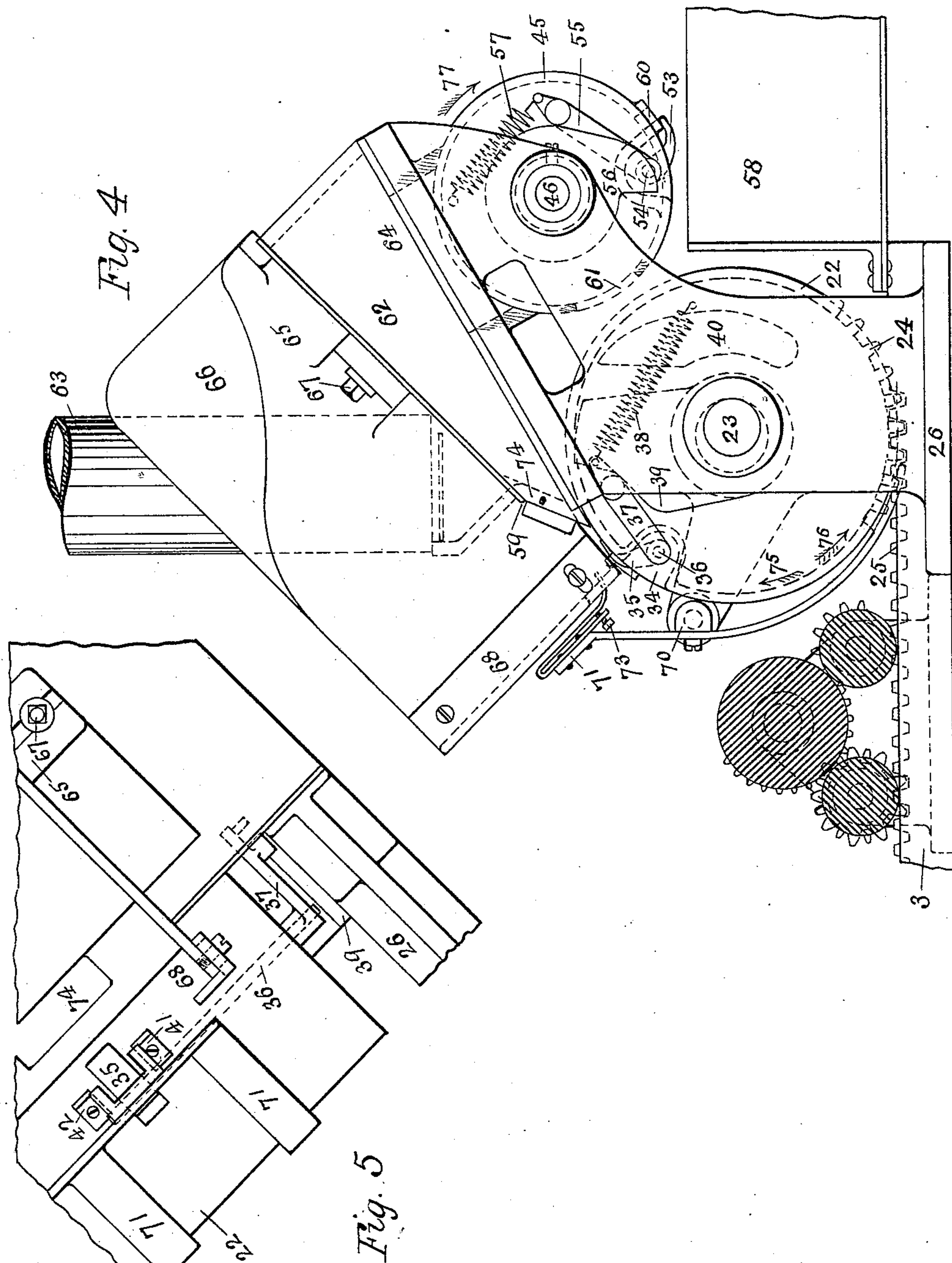
6 Sheets—Sheet 4.

C. REISING.

SHEET SEPARATING AND PRINTING MACHINE.

No. 525,999.

Patented Sept. 11, 1894.



Witnesses:

W. H. Honiss.
Geo. C. Smart.

Inventor:

Casper. Reising.

(No Model.)

6 Sheets—Sheet 5.

C. REISING.

SHEET SEPARATING AND PRINTING MACHINE.

No. 525,999.

Patented Sept. 11, 1894.

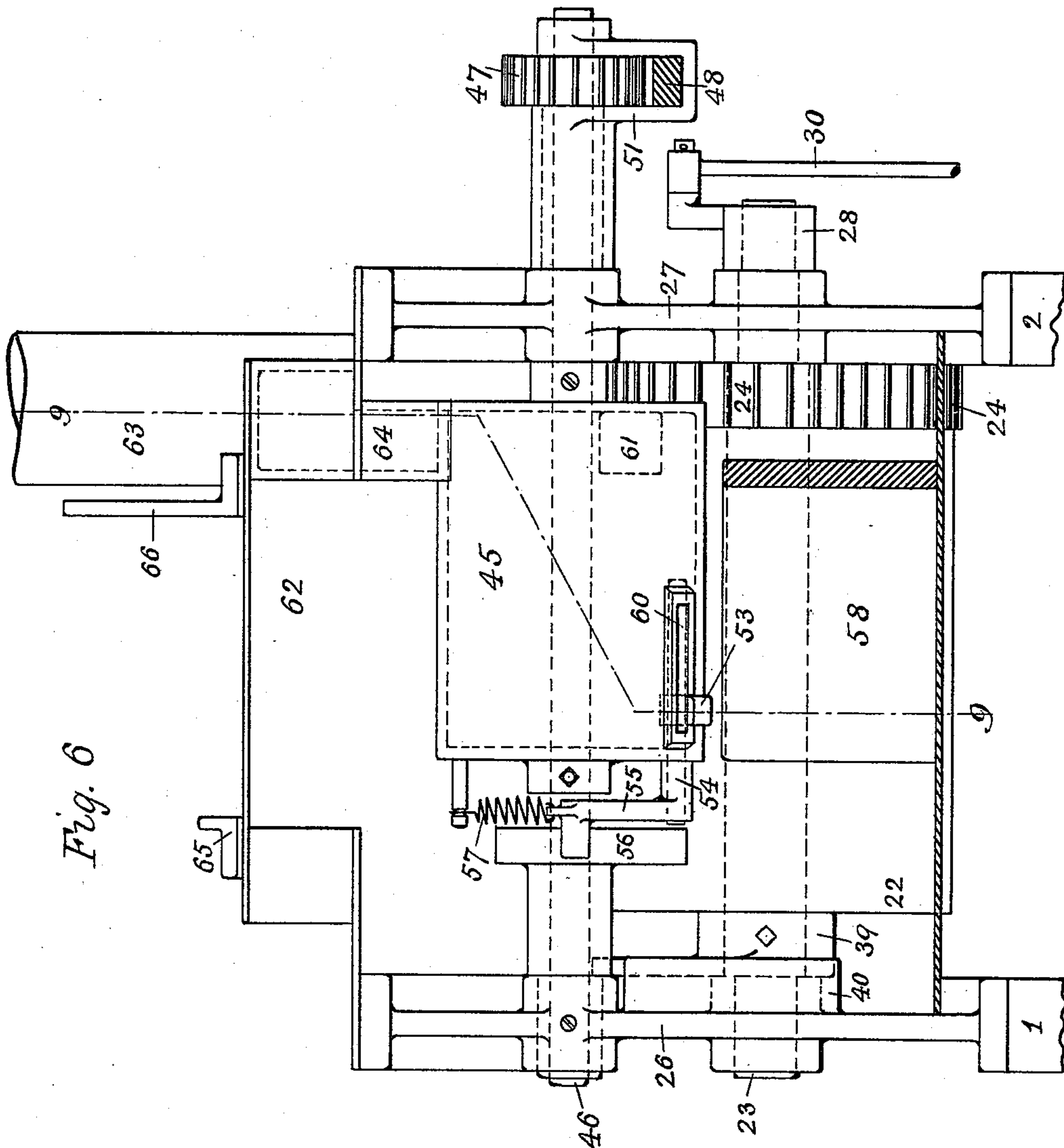


Fig. 6

Witnesses:

W. H. Honiss,
Geo. E. Smart

Inventor:

Casper. Reising.

(No Model.)

6 Sheets—Sheet 6.

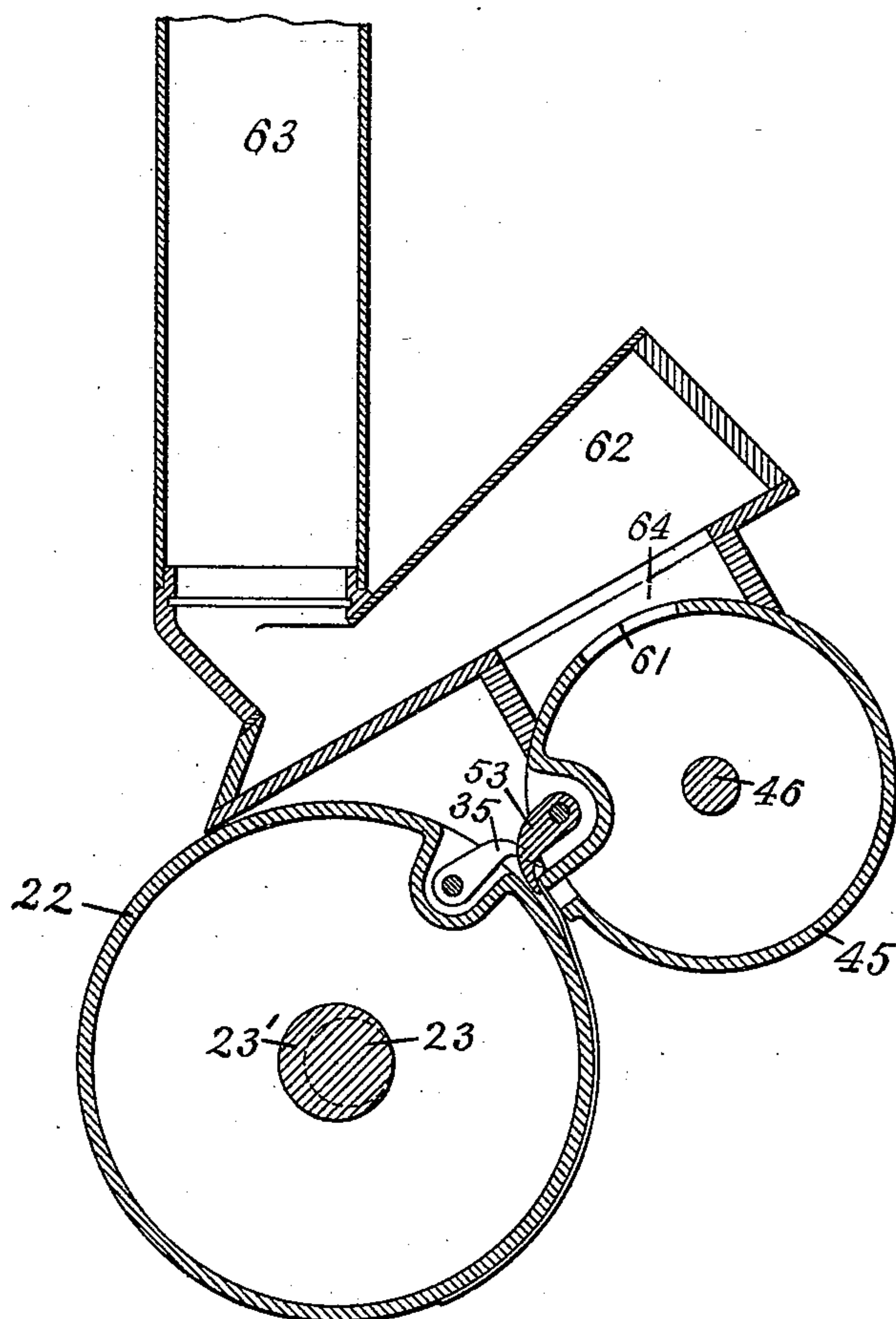
C. REISING.

SHEET SEPARATING AND PRINTING MACHINE.

No. 525,999.

Patented Sept. 11, 1894.

Fig. 9



Witnesses:

W. H. Honiss.

H. Mallner

Inventor:

Casper Reising.

UNITED STATES PATENT OFFICE.

CASPER REISING, OF SOUTHTON, CONNECTICUT, ASSIGNOR OF ONE-HALF TO LUCIUS V. WALKLEY, OF SAME PLACE.

SHEET SEPARATING AND PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 525,999, dated September 11, 1894.

Application filed December 26, 1893. Serial No. 494,813. (No model.)

To all whom it may concern:

Be it known that I, CASPER REISING, a citizen of the United States, residing at Southington, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Sheet Separating and Printing Machines, of which the following is a full, clear, and exact specification.

This invention relates to mechanism for automatically separating and feeding paper bags, envelopes, or sheets of paper from a pile to the cylinder or platen of a printing press, and to mechanism for removing them from that cylinder and delivering them in a pile after being printed.

Figures 1, 2, and 3 of the drawings are general views of a machine embodying my invention, showing also enough of the necessary and usual mechanism of an ordinary printing press to enable its connection and co-operation therewith to be understood; and are respectively a front, an end and a rear view thereof. Those figures also show the ink feeding mechanism fully. Fig. 4 is an enlarged front view of the upper portion of the mechanism, showing the details more fully. Fig. 5 is a projection at an angle of forty-five degrees, of a portion of what is shown in Fig. 4. Fig. 6 is a view looking from the right hand side of Fig. 4. Figs. 7 and 8 are diagrammatic views, partly in section, showing the operation of registering and delivering a sheet from the box to the cylinder. Fig. 9 is a side view in section taken on the line 9—9 of Fig. 6. In this figure the parts are shown in the position in which the port 61 of the take off roll registers with the port 64 in the vacuum box 62, and in which the sheet is taken off from the cylinder 22.

The numerals 1 and 2 represent the principal frames of a printing machine, upon which the bed 3 is adapted to move back and forth, carrying the type form from which the sheets are to be printed. The bed is reciprocated by a crank shaft 4 by means of the connecting rod 5, which is connected by the pin 5' to the lever 6. That lever is pivoted upon the shaft 7 and has journaled on its upper end the box 8 which is fitted to slide in a slot in the platen 3. The form is inked by the

distributing rollers 14, which receive the ink from the ink reservoir 9. That reservoir is pivoted at 10 upon the frames 1 and 2 and is caused to oscillate upon its pivots by means of the connecting rod 11 from the crank pin 12 in the side of the gear 13, as shown in Fig. 1. The fountain is provided with the ink roll 15, by means of which ink is fed to the nearest of the distributing rollers 14, when they are brought into contact by the oscillation of the fountain. That oscillation of the fountain also causes the ink roller to be slowly rotated by means of its ratchet wheel 16 fixed to the roll shaft 15', and the pawl 17 pivoted on the arm 18, which is connected by the rod 19 to the main frame at 20. As the fountain is oscillated forward toward the distributor rollers the pawl arm is also pushed forward, by the rod, the pawl passes over one or more teeth on the ratchet, and on the backward stroke the ratchet and its ink roll are advanced a corresponding amount. The amount of angular rotation of the roll at each stroke may be varied by altering the position of the connecting pin in the pawl arm 18. The rollers 21 are also employed to insure a more thorough distribution of the ink upon the form.

The impression cylinder 22 is journaled upon the eccentric part 23' of the cylinder shaft 23, and is provided with the gear 24 which engages with a rack 25 on the bed 3, by which the gear and its attached cylinder are caused to oscillate as the bed is moved back and forth. The relation of the rack and gear is such that the surfaces of the cylinder and the bed move at the same speed. The shaft 23 is journaled in the brackets 26 and 27 and has fixed upon its rear end the arm 28 which is connected with the cam 29 on the crank shaft 4 by means of the rod 30 and the lever 31, the latter being pivoted at 32 to the main frame 2. The lever 31 is held in contact with the cam 29 by the spring 33, and that cam operates through its connection with the shaft 23 to cause that shaft to oscillate at suitable times for the purpose of lowering the cylinder into suitable contact with the type when a sheet is being printed, and also for the purpose of oscillating the cam 39 as hereinafter specified.

The cylinder is provided with a recess 34 in which is located a gripper 35 having its outer end adapted to hold the bags or sheets upon the periphery of the cylinder. That gripper is fixed upon the end of a shaft 36, which is journaled in the cylinder and has fixed on its other end the cam arm 37. The spring 38 is attached to the cylinder and to the cam arm and operates to press the gripper down upon the cylinder. The adjustable registering stops 41 and 42 are attached to the cylinder, to regulate the register of the bags thereon. The cam 39 is fixed on the shaft 23 and operates to open the gripper 35 at a suitable time to receive the sheet, and a cam surface 40 on the bracket 26 is adapted to open the gripper at a suitable time for releasing the sheet from the cylinder as it is transferred to the take-off roll 45.

The take-off roll 45 is fixed on the shaft 46, which is journaled in the brackets 26 and 27. The gear 47 is fixed on the shaft 46 and meshes with the rack 48 which is connected by its stem to the crank pin 52 on the slotted crank 50, which is fixed on the shaft 4 by a set screw 50'. The rack 48 is fitted to slide through the guide 51, which, by being journaled on an extension of the bracket 27 concentric with the shaft 46 is adapted to keep the rack in engagement with its gear 47 as the rack is moved by the crank 50. The take-off roll is provided with a recess in its periphery in which is located the gripper 53 fixed on the shaft 54, the outer end of that shaft having fixed upon it the cam arm 55, which is held in engagement with the cam 56 by the action of the spring 57 attached to the arm and to a stud on the take-off roll. The cam 56 is attached to the bracket 26, concentrically with the shaft 46, for convenience in adjusting to position, and its function is to operate the gripper 53 at suitable times to grip the sheet to the roll 45, and to release it therefrom in order that it may fall into the box 58. The roll 45 is provided with an internal chamber having two external openings, 60 and 61, the former being close by the gripper 53, and the latter so located as to communicate with the adjacent port 64 in the vacuum box 62, when the roll 45 is in position to receive the sheet from the cylinder 22, as shown in Fig. 9.

The vacuum box 62, is supported on the brackets 26 and 27 and is connected by a tube 63 with any of the various known means for exhausting the air therefrom. A portion of the box 62 is fitted to the roll 45, and has a port 64 which communicates with the opening 61 in the roll 45, when the latter is oscillated to its position therefor. Thus that roll operates as a valve to allow of the alternate admission and exhaustion of air to and from its interior chamber. One end of the vacuum box also extends over the cylinder 22, and has an opening adjacent thereto for the purpose hereinafter specified. The top of the vacuum box is used as a table or support for the sheets to be fed to the machine, and is

preferably somewhat steeply inclined in order that the weight of the sheets may keep them well against the lower or gaging end. Upon the vacuum box are also fitted the side pieces 65 and 66, forming a sort of box in which the sheets are placed. These sides are adjustable toward and from each other to suit the various widths of sheets, and are fastened in their places by bolts as at 67. Upon the lower ends of these box sides are fastened the L-shaped gaging pieces 68 and 69, against which the lower ends of the sheets rest, as shown in Figs. 7 and 8. To the cross brace 70 is fastened the guard plate 71, the lower members of which partly encircle the cylinder, to keep the sheets from the inking rollers. Upon the upper end of the guard plate, or to any convenient support, is attached the adjustable stop finger 72, one end of which projects within the plane of the gage pieces 68 and 69 to an extent which may be regulated by the stop screw 73 as shown in Fig. 4. The position of this finger and its use in the operation of feeding the sheet, are best shown in Figs. 7 and 8, wherein is also shown in cross section the vacuum box with a pile of sheets in position to be fed to the cylinder. The lower left hand end of that box, as seen in the last mentioned figures is made at an angle with its upper surface on which the sheets rest, so as to allow the lower end of the bottom sheet to bend downward into contact with the cylinder, the sheet being therefore unsupported beyond the edge 59 of the box, excepting by the stop finger 72. An opening 74 into the vacuum box is so located in this lower inclined end as to allow the "suction" to operate upon the unsupported part of the sheet to bend it down as shown in Fig. 8.

The operation of the machine is as follows: A form, carrying type for the matter to be printed on the sheets, is secured to the bed, and the usual steps of "making ready" are taken. The sheets are placed upon the vacuum box, and the sides 65 and 66 and gage pieces 68 and 69 are adjusted for the proper registration of the sheets upon the cylinder, so that one end of the pile is supported by the vacuum box while the edge of the overhanging end is supported by the stop finger 72. Communication between the vacuum box and the means for exhausting the air therefrom, is opened by means of a slide in the pipe 63, and power is applied to the mechanism in the usual way, causing the bed to reciprocate, and oscillating the cylinder and the take-off roll. The air rushing toward the opening 74 operates to draw down the lower end of the undermost sheet toward that opening, curving and thus drawing back the lower end as shown in Fig. 7 until its edge is drawn clear of the stop finger 72, and falls upon the cylinder 22, as shown in Fig. 8. At this time that cylinder has nearly completed its backward oscillation in the direction of the arrow 75, and its gripper 35 is raised by the action of its arm 37 against the cam 39, which is

brought forward to meet that arm by a slight oscillation of the shaft 23. Just before the cylinder reaches the limit of its oscillation in the direction of the arrow 75 the registering stops 41 and 42 are brought against the front edge of the sheet, thus insuring more perfect registration. Then the shaft 23 is oscillated slightly, so as to carry the cam 39 away from the gripper arm, allowing the gripper 35 to drop upon the sheet, and hold it to the cylinder, which then oscillates in the direction of the arrow 76, drawing the sheet out of the box and carrying it around into contact with the type, the shaft 23 being oscillated to allow of a suitable impression. The cylinder continues to oscillate in this direction until the leading end of the sheet reaches the point nearest in contact with the take-off roll 45 when the gripper 35 is raised by the cam 40, the sheet is released from the cylinder, and is transferred to the take-off roll, as shown in Fig. 9. The oscillations of the take-off roll are so timed as to bring the opening 60 and the gripper 53 into a position relative to the cylinder which best allows of receiving the front end of the sheet therefrom. In that position the gripper 53 is raised by the cam 56, and the opening 61 communicates with the port 64 in the vacuum box, so that the resulting flow of air toward the opening 60 operates to carry the leading end of the sheet against the roll as it is released from the cylinder by the gripper 35. The take-off roll is then oscillated in the direction of the arrow 77, allowing the gripper 53 to drop upon the sheet, which is then carried by the continued oscillation of the roll to a suitable point for delivering it to the box 58. During this oscillation the opening 61 is carried out of communication with the port 64 in the vacuum box, and the normal atmospheric pressure is restored within the roll, so that the sheet is free to drop from the roll when the gripper 53 is raised by its cam 56. Having delivered the sheet to the take-off roll, the cylinder returns in the direction of the arrow 75 to its position for receiving the next sheet, being raised to clear the bed during that return by the action of the cam 29 and the eccentric shaft 23. The take off roll, having delivered the sheet to the box, returns to its first position in time to receive the next sheet from the cylinder. Thus it will be seen that the cylinder and the take-off roll are caused to oscillate in the same direction substantially at the same time, and it is obvious that the latter might receive its motion from the former by means of suitably proportioned intermediate gears meshing with the gear 24 and the gear 47, without departing from the substance and effect of this invention; but I prefer the mode herein shown for operating the take-off roll, as I am thereby better enabled to regulate the angular extent and time of the oscillations thereof by adjustment of the pin 52 in the slotted

crank, and by the adjustment of that crank upon its shaft 4.

It is not an essential feature of this invention that the communication between the vacuum box and the take-off roll shall be at the periphery of that roll, as it may with equal advantage be located on the side or end thereof. Nor is it my intention to limit myself to the precise means of communication herein shown between the arm 28 and its cam 29, as it is obvious that any of the well known connections may be employed, or that the cam may be so located with reference to the arm as to allow the latter to work directly upon the cam without the intervention of any connection whatever; but I have preferred to avoid the addition of a revolving shaft and its connections, as would be required by such a method and have located my cam upon the principal main shaft of the machine, believing this arrangement to be more direct and simple.

It is not essential that the take-off roll shall be cylindrical in form, as its function is in no way dependent upon that form. It is herein shown as a cylinder for ease of construction, and because that form is easily balanced. In many similar ways the various elements of this invention may be modified, or equivalent elements substituted, without departing from the spirit and substance thereof.

I claim as my invention—

1. A sheet separating table, provided with an interior chamber in which a partial vacuum is maintained, having a wall adapted to support a portion of the surface of a pile of sheets, with a wall adjacent to the unsupported portion of the pile, and inclined at a substantial angle to the sheet supporting wall, the inclined wall being provided with an opening leading to the interior chamber, all arranged and operating to draw toward that opening the unsupported portion of the adjacent sheet, substantially as described.

2. A sheet separating device, consisting of a table adapted to support a portion of the surface of a pile of sheets, and a stop finger adapted to support an edge of the overhanging portion of the pile, the table being provided with an air passage adjacent to that overhanging portion which communicates with a vacuum or exhaust chamber, whereby the unsupported portion of the lower sheet is drawn away from the other sheets and from the stop finger, substantially as described.

3. A sheet separating and feeding device, consisting of a table provided with an interior chamber in which a partial vacuum is maintained, having a wall adapted to support a portion of the surface of a pile of sheets, a wall adjacent to, and inclined at a substantial angle with the sheet supporting wall, provided with an opening leading to the interior chamber, and a reciprocating carrier provided with a gripper and located adjacent to

the inclined wall, all arranged and operating to automatically separate the lowest sheet from the others by drawing it down upon the inclined wall and pulling it away by the carrier, substantially as described.

4. A sheet separating and feeding device, consisting of a table adapted to support a portion of the surface of a pile of sheets, provided with a vacuum chamber having an opening adjacent to the unsupported portion of the pile, a traveling carrier or bed provided with a gripper, and a stop finger adapted to support the edge of the remaining sheets as the lower sheet is drawn away, all substantially as described.

5. A table or rack adapted to hold a pile of sheets to be separated and fed, consisting of an inclined base adapted to support a portion of the pile, adjustable sides adapted to gage the sidewise position of the pile, adjustable L-shaped pieces adapted to engage the lower leading corners of the pile of sheets and keep their front ends in even register, and an adjustable stop finger located substantially central with the opening between the L-shaped pieces and adapted to allow the lower sheet to be drawn away while constantly supporting those above it, substantially as described.

6. A table or rack adapted to separate and feed sheets from a pile, consisting of a vacuum box 62, having a surface adapted to support a portion of the under side of the pile, and having another surface adjacent to the unsupported portion provided with a port leading to the interior of the vacuum box, the adjustable sides 65, 66, the L-shaped pieces 68 and 69 adapted to constantly engage the leading corners of the pile of sheets and keep them in even register, and the adjustable stop finger 72 adapted to constantly support the edge of that side of the pile which is unsupported by the base, all substantially as described.

7. The herein described combination of a sheet separating and take off device, consisting of a vacuum box provided with a surface

adapted to support a portion of a pile of sheets, and having another surface adjacent to the unsupported portion of the pile provided with an opening therein leading to the interior of the vacuum box, an impression cylinder mounted adjacent thereto, provided with a gripper, and adapted to draw the separated sheet from the vacuum box, a take off roll mounted adjacent to the cylinder, provided with a gripper and provided with a port adapted to communicate with the vacuum chamber when the roll is in a relation to the cylinder suitable for receiving the sheet therefrom, all arranged and operating to feed a separated sheet to the cylinder, and from thence to the take off roll, substantially as described.

8. A sheet separating and take off device, consisting of a vacuum box having a surface adapted to support a portion of the under side of a pile of sheets, and having a surface adjacent to the unsupported portion of the pile, provided with an opening leading to the interior of the vacuum box, a stop finger adapted to support an edge of the otherwise unsupported portion of the pile, an oscillating cylinder journaled adjacent to the vacuum box and provided with a gripper adapted to seize the separated sheets and draw them from beneath the pile, an oscillating suction take off roll journaled adjacent to the cylinder, provided with a gripper, and provided with a port adapted to communicate at suitable intervals with the vacuum box by means of ports in their adjacent surfaces, substantially as described.

9. The combination of the vacuum box 62 provided with the port 64, the stop finger 72, the cylinder 22, its gripper 35, and the hollow take off roll 45 provided with the port 61 adapted to register with the port 64 in the vacuum box, substantially as described.

CASPER REISING.

Witnesses:

W. H. HONISS,
GEO. E. SMART.

It is hereby certified that Letters Patent No. 525,999, granted September 11, 1894, upon the application of Casper Reising, of Southington, Connecticut, for an improvement in "Sheet Separating and Printing Machines," were erroneously issued to said Reising and Lucius V. Walkley as owners of the entire interest in said invention; that said Letters Patent should have been issued to *The Consolidated S. O. S. Bag Company, of New York, N. Y.*, said The Consolidated S. O. S. Bag Company being assignee of the entire interest in said invention as shown by assignments of record in this office; and that said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 25th day of September, A. D. 1894.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

S. T. FISHER.

Acting Commissioner of Patents.