

No. 740,724.

PATENTED OCT. 6, 1903.

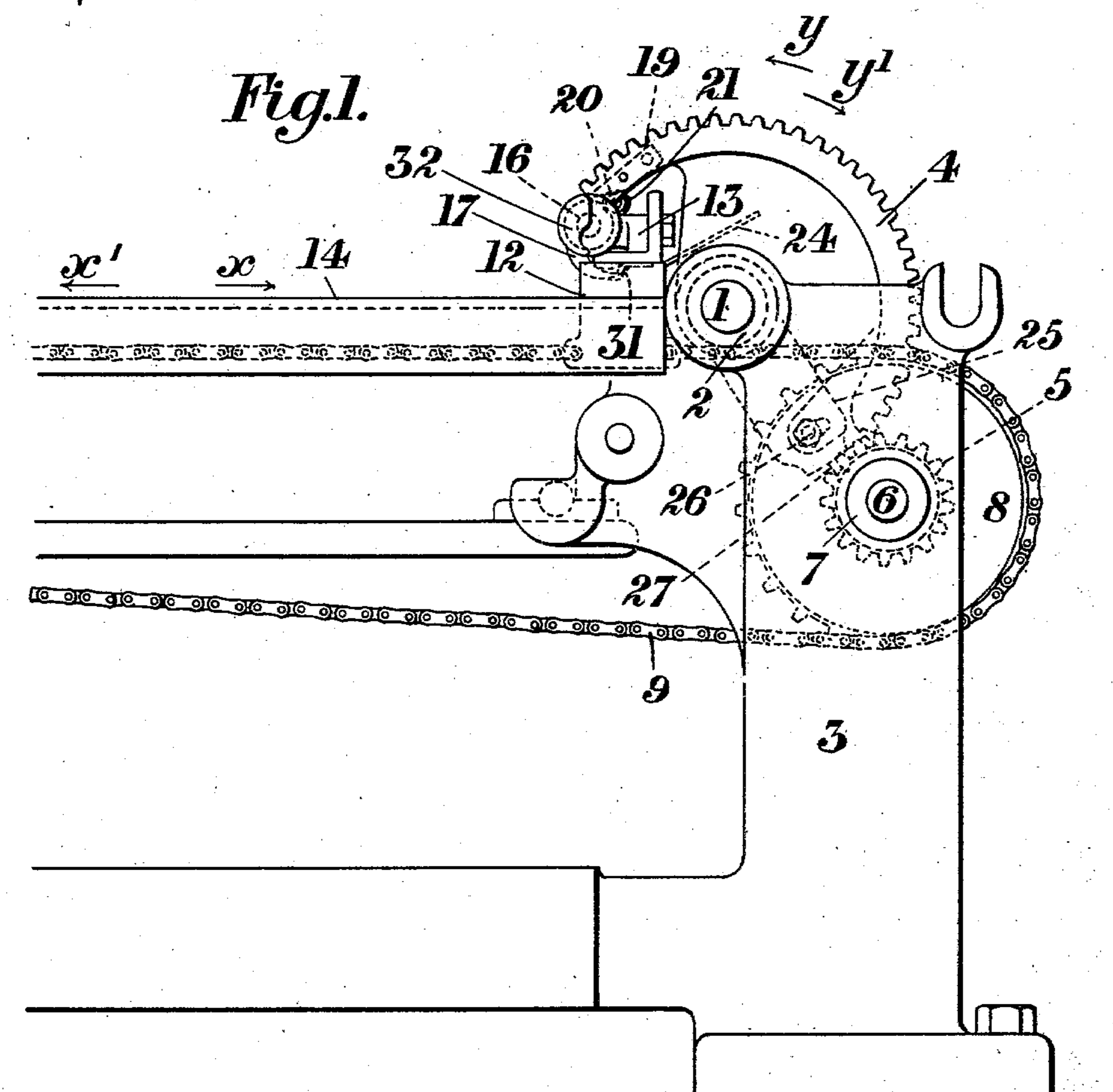
F. J. WICH & G. L. HOYT.

SHEET DELIVERY MECHANISM FOR PRINTING OR SIMILAR MACHINES.

APPLICATION FILED SEPT. 15, 1902.

NO MODEL.

6 SHEETS—SHEET 1.



Witnesses
Horace Grellier.
Rodolphe J. Henry

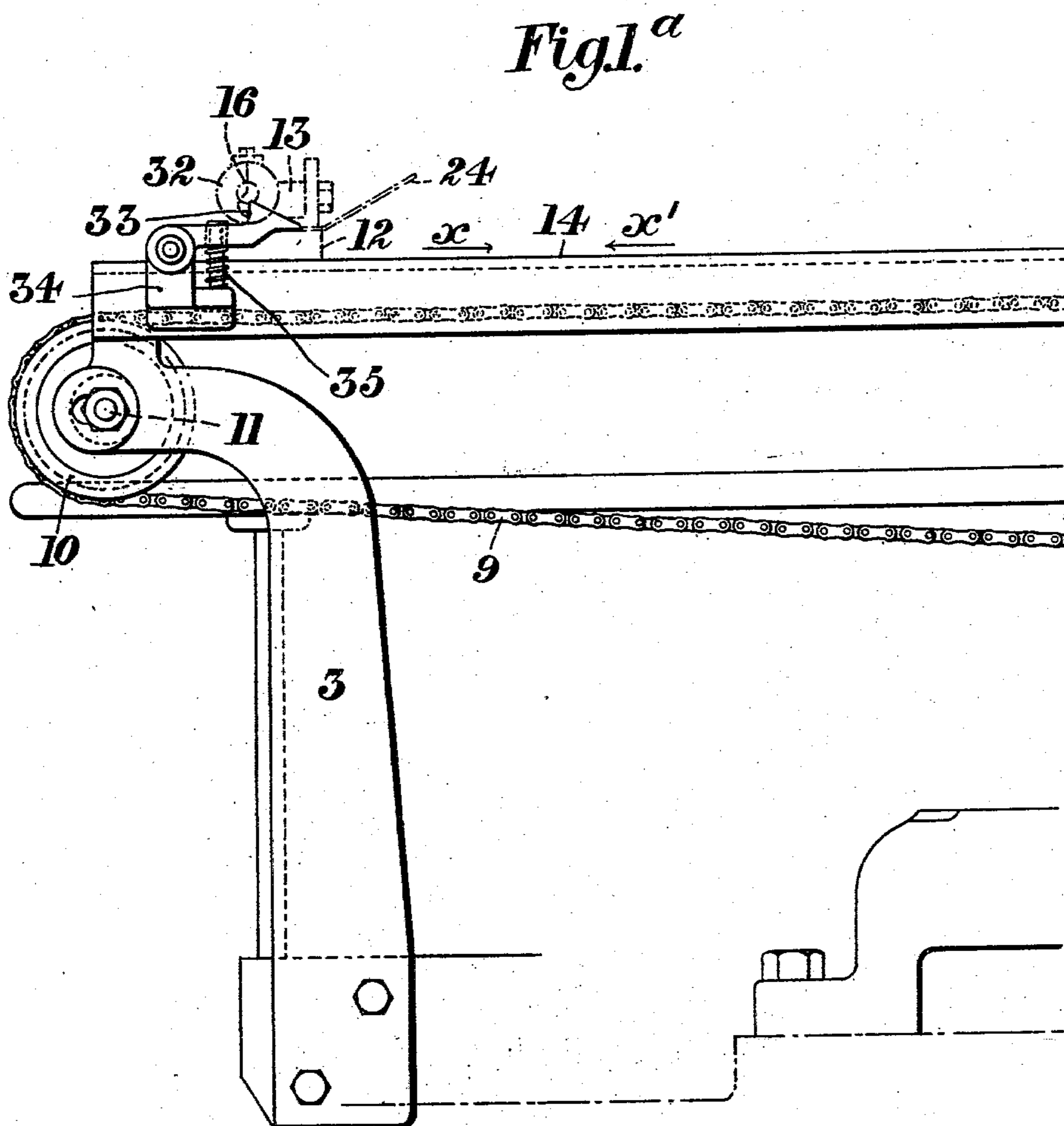
Inventors
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SHEET DELIVERY MECHANISM FOR PRINTING OR SIMILAR MACHINES.

6 SHEETS—SHEET 2.

NO MODEL.



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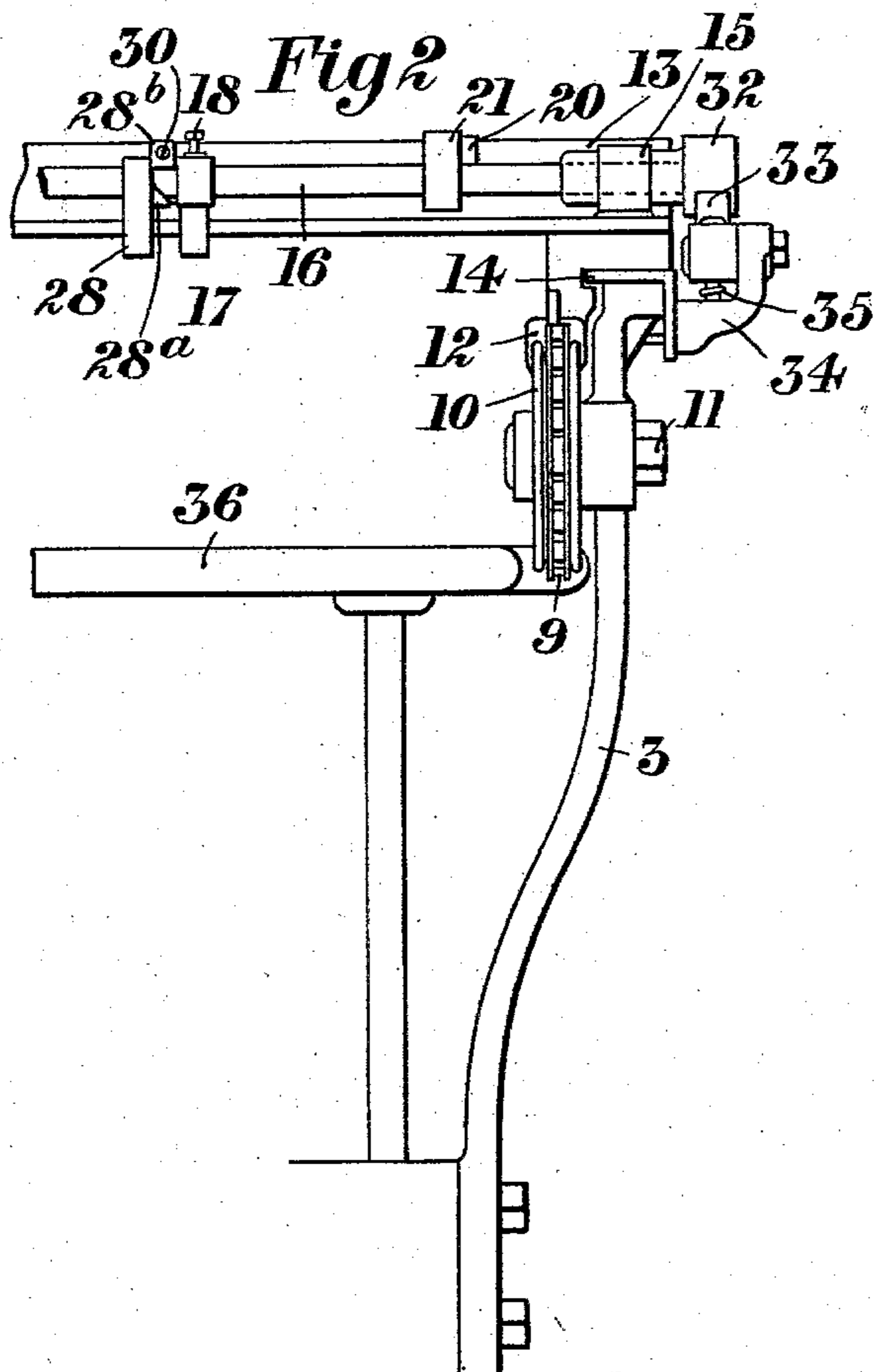
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6 SHEETS—SHEET 3.



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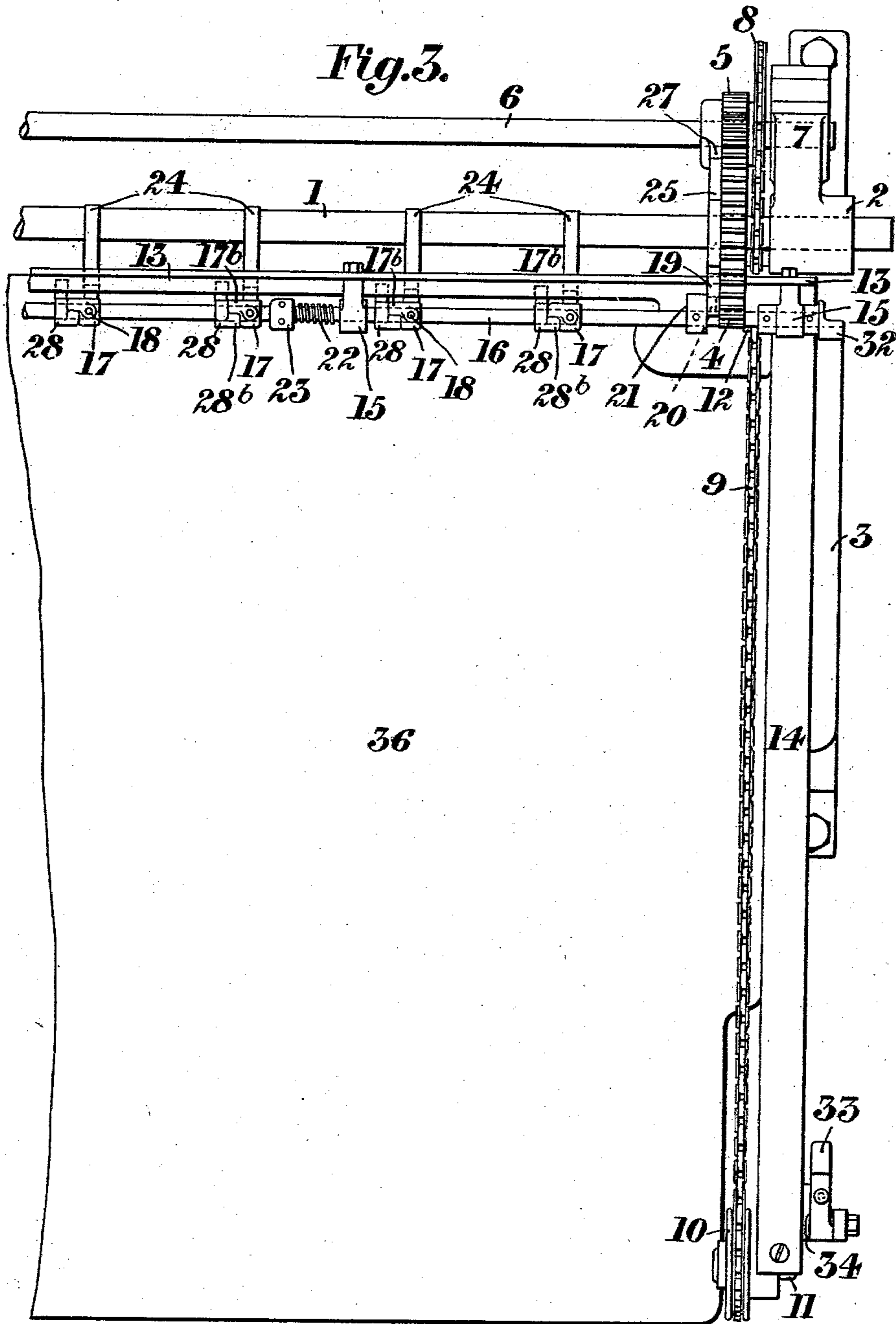
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6 SHEETS—SHEET 4.



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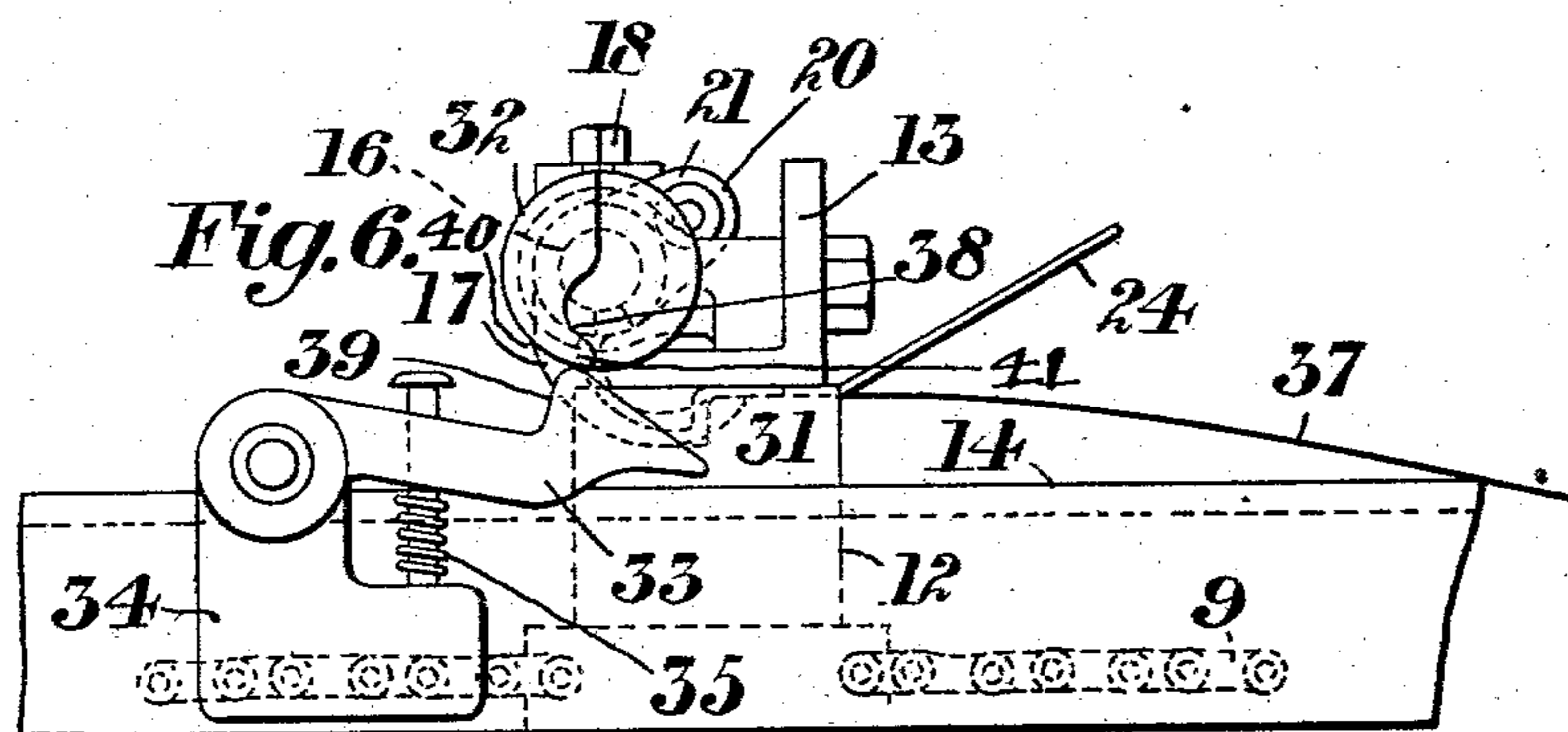
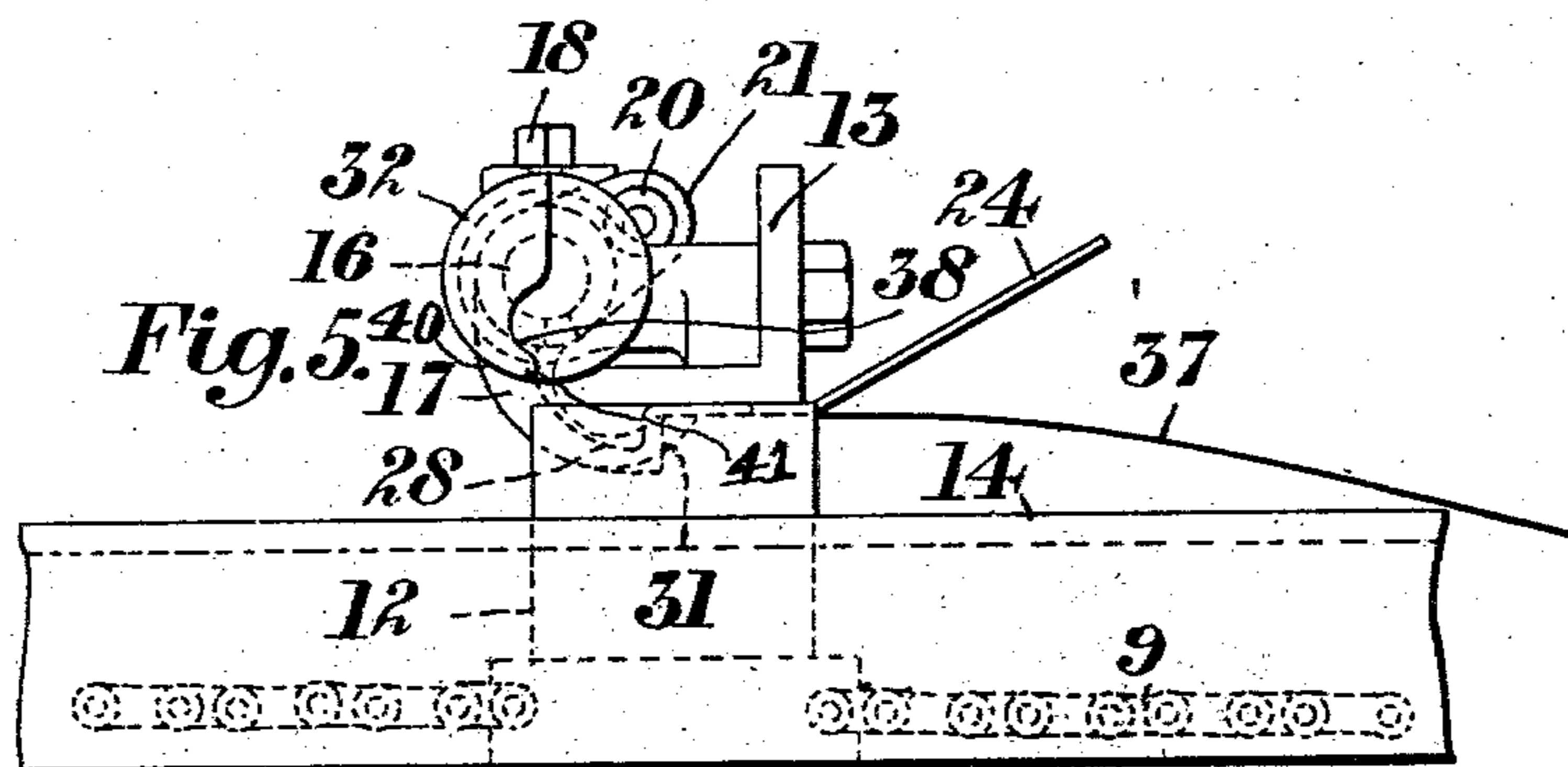
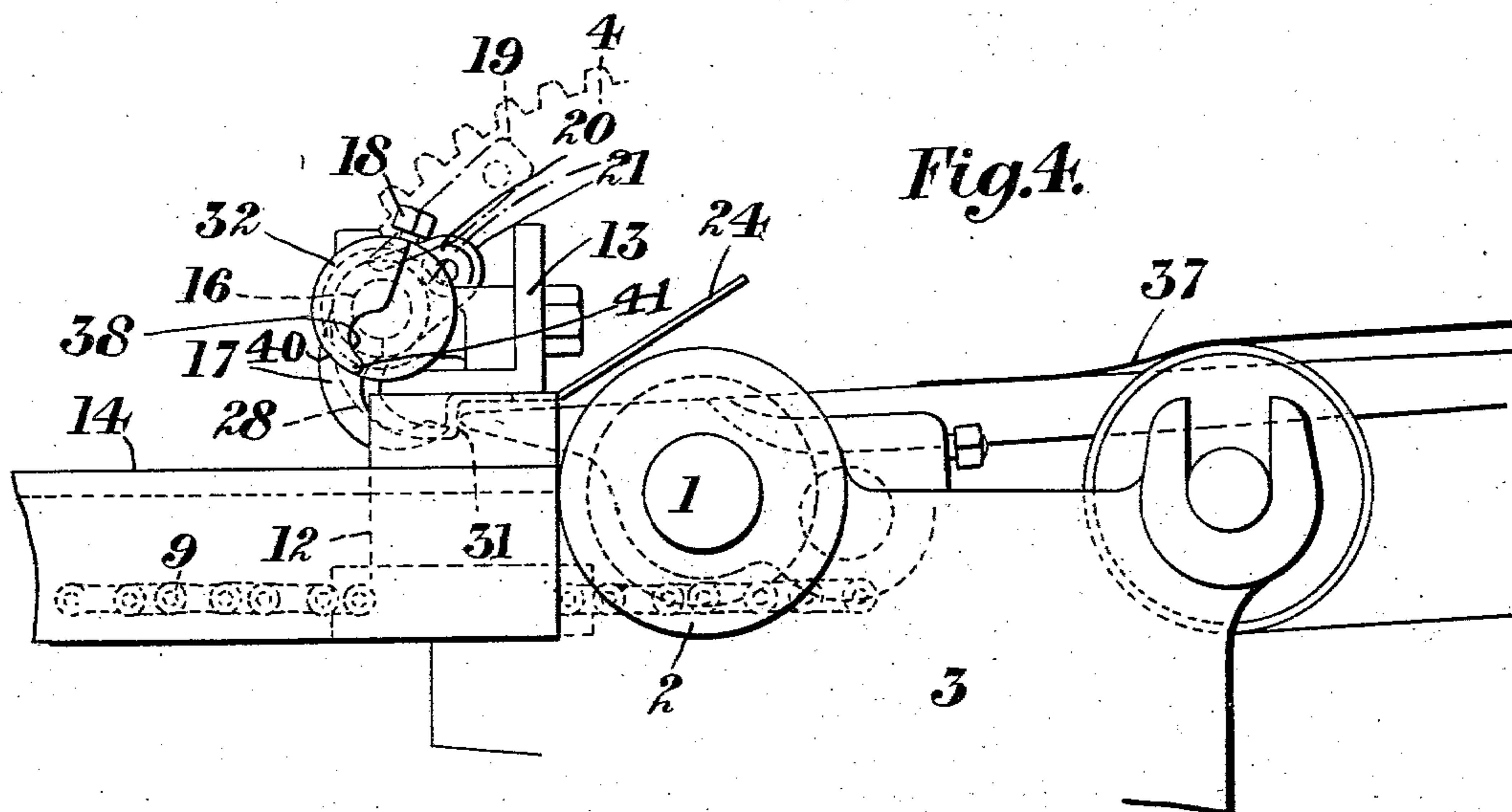
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NO MODEL.

6 SHEETS—SHEET 5.



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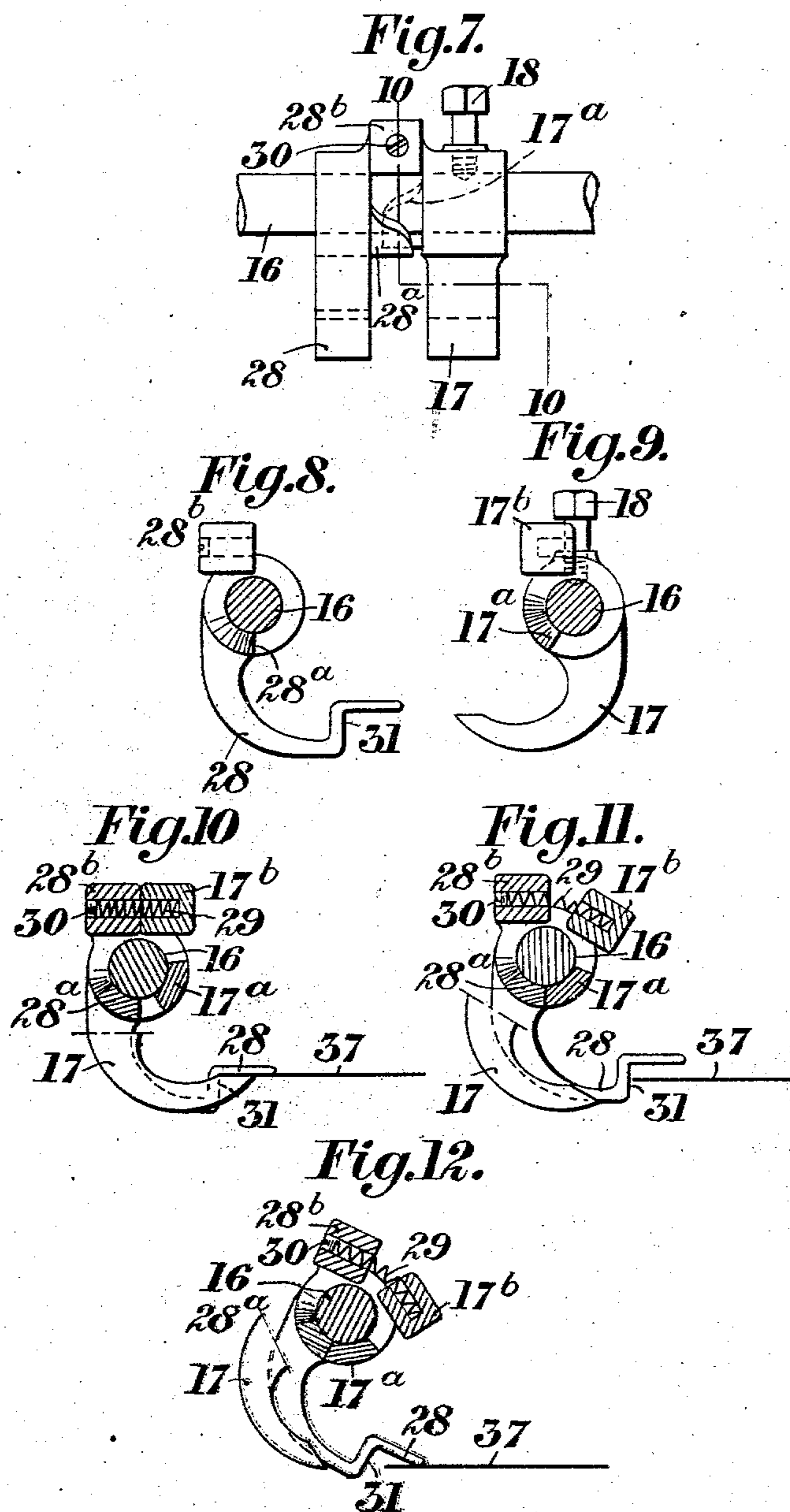
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APPLICATION FILED SEPT. 15, 1902.

NO MODEL.

6 SHEETS—SHEET 6.



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UNITED STATES PATENT OFFICE.

FERDINAND JOHN WICH AND GUY LIVINGSTONE HOYT, OF BROADHEATH, ENGLAND, ASSIGNORS TO THE LINOTYPE COMPANY, LIMITED, OF LONDON, ENGLAND.

SHEET-DELIVERY MECHANISM FOR PRINTING OR SIMILAR MACHINES.

SPECIFICATION forming part of Letters Patent No. 740,724, dated October 6, 1903.

Application filed September 15, 1902. Serial No. 123,499. (No model.)

To all whom it may concern:

Be it known that we, FERDINAND JOHN WICH and GUY LIVINGSTONE HOYT, of the Linotype Works, Broadheath, in the county of Chester, England, have invented certain new and useful Improvements in Sheet-Delivery Mechanism for Printing or Similar Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in sheet-delivery mechanism for printing and similar machines; and it consists in certain features of novelty in the construction, combination, and arrangement hereinafter fully described in the specification and more particularly pointed out in the claims.

Referring to the accompanying drawings, which are to be taken as part of this specification and read therewith, Figure 1 is the right-hand part, and Fig. 1^a the left-hand part, of a side elevation of a machine constructed according to our invention; Fig. 2, an elevation of the left-hand end of part of Fig. 1^a; Fig. 3, a plan of substantially one-half of the mechanism shown in Figs. 1 and 1^a; Fig. 4, a side elevation showing part of the mechanism with the grippers open for the reception of a sheet; Fig. 5, a side elevation showing the sheet engaged and being moved by the sheet-carrier; Fig. 6, a side elevation showing part of the mechanism as when the sheet is about to be disengaged by the grippers; Fig. 7, a rear elevation of one of the grippers and push-downs and a portion of the gripper-shaft; Fig. 8, a side elevation of one of the push-downs, and Fig. 9 a side elevation of one of the grippers as seen from the side opposite that from which Fig. 8 is taken; and Figs. 10, 11, and 12, vertical sections on the crooked line 10 10 of Fig. 7, showing one of the grippers and push-downs in different operative positions.

In constructing the apparatus, as shown in the drawings, we provide a rocking shaft 1, mounted at each end in a bearing 2 in the front end of the respective side frame 3, of

which only one is shown in the drawings, the said shaft being rocked in these bearings by any suitable devices. (Not represented in the drawings.) On the rocking shaft 1 just at the inside of the frame 3 is secured a toothed segment or mutilated gear 4, which acts as a driver to a spur-gear 5, secured on a shaft 6, journaled at each end in a bearing 7 in the respective side frame 3. There are also secured on the shaft 6 two sprocket-wheels 8, of which only one is shown, each engaging with a sheet-delivery chain 9, which passes over a roller 10, pivoted on a short stud 11, secured in the rear end of each of the frames 3. To each of the chains 9 is secured a block 12 of the sheet-carrier 13, the said block being free to slide along a guide-bar 14, secured one to each of the frames 3.

The sheet-carrier 13 is provided with bearings 15 for supporting the gripper-shaft 16, which is free to rock in the said bearings and on which the grippers 17 17 are rigidly secured each by means of a pinching-screw 18.

The before-described toothed segment 4 has secured thereon a cam 19, adapted to engage an antifriction-roller 20, pivoted on the free end of a lever-arm 21, fast on the gripper-shaft 16, and thereby rock the said shaft so as to lower the grippers 17 17 to effect the release of the sheet.

The grippers 17 17 are returned to their normal or gripping position by a spring or springs 22, encircling the gripper-shaft 16 and each secured at one end to an adjacent bearing 15 and at the other end to a collar 23, fast on the gripper-shaft. Each of the grippers 17 17 is adapted to grip the paper between itself and a sheet-guide 24, secured to the sheet-carrier 13. The toothed segment 4 and spur-gear 5 are provided with stop mechanism, consisting of a projection or arm 25, pivoted on the shaft 1 and adjustably secured to the toothed segment 4 by a slotted connection 26, Fig. 1, and a projection 27, extending from the boss of the spur-wheel 5, the convex end of the arm 25 engaging the concave end of the projection 27 (after the manner of a Geneva stop mechanism) to prevent any rotation of the wheel 5 and consequent movement of the chains 9 and

sheet-carrier 13 when the latter is in the receiving position, in which it is shown in Figs. 1, 3, and 4.

The boss of each of the grippers 17 is provided with two laterally-extending abutments 17^a 17^b, adapted to engage with respectively corresponding abutments 28^a 28^b, projecting laterally from the boss of a push-down 28, pivotally mounted on the gripper-shaft 16. The two abutments 17^b and 28^b are recessed to receive a helical spring 29, held in position at one end by a screw 30, inserted in the abutment 28^b, the said spring serving to hold the push-down in its elevated or inoperative position until it is positively moved therefrom by the engagement of the abutment 17^a with the abutment 28^a.

The push-downs 28 28 are of the bent form, (shown most clearly in Figs. 8, 10, 11, and 12,) so as to provide faces 31 31, which act as stops to the sheets fed to the gripper 17 17.

On one end of the gripper-shaft 16 a projection or cam device 32 is provided, which at the termination of the forward motion of the sheet-carrier by a cam-surface 40 depresses a catch or hook 33, pivoted to a bracket 34, secured to the side frame 3. This depression is effected against the pressure of a helical spring 35, which as soon as the nose 41 of the cam device 32 has passed over the hooked end 39 of the catch 33 raises the said end in front of device 32.

In Figs. 1, 3, and 4 the before-described apparatus is represented at the stage at which the sheet-carrier has just completed its forward or inoperative motion in the direction indicated by the arrow x in Figs. 1 and 1^a and at which the toothed segment 4 is still moving in the direction indicated by the arrow y , Fig. 1, the sprocket-wheels 8 and chains 9 at this juncture being locked by the engagement of the stop mechanism 25 and 27. By the continuation of the same movement of the segment 4 the cam 19 is caused to engage the antifriction-roller 20 on the lever-arm 21 with the result that in opposition to the spring or springs 22 the gripper-shaft 16 is rocked in its bearings and the grippers 17 17 are thereby moved downward away from the paper-guides 24 24 into the position in which they are shown in Figs. 4 and 11. The edge of the sheet is then inserted between the grippers 17 17 and guides 24 24 and immediately thereafter the segment 4 commences its movement in the direction of the arrow y' , the first part of this movement serving only to disengage the cam 19 from the antifriction-roller 20, and thereby to allow the grippers 17 17, under the influence of the spring or springs 22, to move upward to grip the sheet 37, the sheet-carrier 13 meanwhile remaining stationary by reason of the stop mechanism 25 27 being still in its engaging position. By the continued movement of the segment 4 in the direction of the arrow y' the stop mechanism 25 27 becomes disengaged and the segment is brought into gear with the wheel 5, so that

through the sprocket-wheels 8 and chains 9 the sheet-carrier 13 is moved in the direction indicated by the arrow x' in Figs. 1 and 1^a, this movement continuing until the cam device 32 first depresses the catch 33 by the cam-surface 40, as shown in Fig. 6, and then allows it to ascend in front of the nose 41 of the said cam device, as indicated partly in dotted lines in Fig. 1^a. At this juncture the toothed segment 4 and sheet-carrier 13 commence their movement in the direction respectively indicated by the arrows y and x , and the cam device 32, (by the nose 41 thereof engaging with the catch 33,) and consequently the gripper-shaft 16, become rocked in the manner indicated in Fig. 11. The first part of this rocking motion serves to lower the grippers 17 17, and thereby release the sheet 37, which is then free to fall onto the piling-board 36; but to prevent the sheet from sticking to the sheet-carrier 13 or from otherwise failing to drop onto the piling-board 36 the push-downs 28 28 are caused to descend in the following manner: Before the gripper-shaft 16 is rocked, as above described, the abutments 17^b are in contact with the abutments 28^b, the abutments 17^a and 28^a at that time being out of contact, all as shown in Fig. 10. During the above-named first part of the rocking motion of the gripper-shaft 16 the abutments 17^b and 28^b become separated, the abutments 17^a and 28^a are brought into operative contact, and the push-downs 28 28 (which then are otherwise unsupported) are supported in their elevated position by the springs 29 29, all as shown in Fig. 11. By the further rocking of the gripper-shaft 16 the said shaft, grippers 17 17, and push-downs 28 28 are rocked as if in one piece with each other, with the result that the sheet 37 is positively pushed toward the piling-board 36 by the push-downs 28 28, as indicated in Fig. 12. At this stage the cam-surface 38 of the cam device 32 by engaging with the hook 39 depresses the catch 33 and disengages it from the said device, so that under the combined influence of the springs 22 and 29 the gripper-shaft 16, grippers 17 17, and push-downs 28 28 are immediately returned to their respective normal positions, in which they are shown in Fig. 10. The sheet-carrier 13 then continues its forward motion until it reaches the position in which it is shown in full lines in Figs. 1 and 3, when the cam 19 on the segment 4 again engages the roller 20, and thereby opens the grippers 17 17 to enable the next sheet 37 to be gripped, after which the before-described operation is repeated.

We claim—

1. In sheet-delivery mechanism of printing and similar machines the combination with the fixed framing and guide-bars thereon, of a sheet-carrier movable along the guide-bars, flexible connectors attached to the sheet-carrier, wheels in operative connection with the connectors, a shaft journaled in the framing carrying the wheels, a spur-wheel and locking-

arm on the shaft, a rocking shaft parallel with the above-named shaft, a mutilated gear meshing with the spur-wheel, a locking projection on the rocking shaft to engage the above-named locking-arm, a gripper-shaft journaled in the sheet-carrier, a spring operatively connecting the gripper-shaft with the sheet-carrier, a gripper fast on the gripper-shaft and a push-down loose thereon, coöperating abutments on the gripper and push-down, a spring engaging the gripper and push-down to move one relatively to the other around the gripper-shaft, a lever-arm fast on the gripper-shaft, a cam adapted to engage said lever-arm, in rigid connection with the rocking shaft, a cam device on the gripper-shaft, a yielding catch in the path of the cam and a spring to normally hold the catch in said path, substantially as set forth.

2. In sheet-delivery mechanism of printing and similar machines the combination with a reciprocating sheet-carrier, a gripper-shaft journaled therein, and a rocking shaft in operative connection with the sheet-carrier, of a lever-arm fast on the gripper-shaft, a cam on the rocking shaft adapted to engage the said arm to rock the gripper-shaft, a gripper fast on the gripper-shaft and a push-down loose thereon, coöperating abutments on the gripper and push-down and a spring engaging the gripper and push-down to move one relatively to the other around the gripper-shaft, substantially as set forth.

3. In sheet-delivery mechanism of printing and similar machines the combination of a reciprocating sheet-carrier, a chain attached to the sheet-carrier, a sprocket-wheel gearing with the chain, a shaft carrying the sprocket-wheel, a spur-wheel and locking-arm on the shaft, a rocking shaft parallel with the above-named shaft, a mutilated gear meshing with the spur-wheel, a locking projection on the rocking shaft to engage the above-named locking-arm, a gripper-shaft journaled in the sheet-carrier, a lever-arm fast on the gripper-shaft, a cam on the rocking shaft adapted to engage the said lever-arm, in rigid connection with the rocking shaft and a gripper fast on the gripper-shaft, substantially as set forth.

4. In sheet-delivery mechanism of printing and similar machines the combination with a reciprocating sheet-carrier and a gripper-

shaft journaled therein, of a gripper fast on the gripper-shaft and a push-down loose thereon, coöperating abutments on the gripper and push-down, a spring engaging the gripper and push-down to move one relatively on the other around the gripper-shaft, a cam device on the gripper-shaft, a yielding catch in the path of the cam device and a spring to normally hold the catch in said path substantially as set forth.

5. In sheet-delivery mechanism of printing and similar machines, the combination with a reciprocating sheet-carrier and a gripper-shaft journaled therein of a gripper and cam device fast on the gripper-shaft, a yielding catch in the path of the cam device, a spring to normally hold the catch in said path, a cam-surface on the cam device to depress the catch during the operative stroke of the sheet-carrier and a nose and cam-surface on the cam device to, respectively, during the return stroke of the sheet-carrier, engage the catch to effect turning of the gripper-shaft and depress the said catch out of engagement, substantially as set forth.

6. In sheet-delivery mechanism of printing and similar machines the combination with a reciprocating sheet-carrier and a gripper-shaft journaled therein, of a gripper and cam device fast on the gripper-shaft and a push-down loose thereon, coöperating abutments on the gripper and push-down, a spring engaging the gripper and push-down to move one relatively to the other around the gripper-shaft, a yielding catch in the path of the cam device, a spring to normally hold the catch in said path, a cam-surface on the cam device to depress the catch during the operative stroke of the sheet-carrier and a nose and cam-surface on the cam device to, respectively, during the return stroke of the sheet-carrier, engage the catch, to effect turning of the gripper-shaft and depress the said catch out of engagement, substantially as set forth.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

FERDINAND JOHN WICH.
GUY LIVINGSTONE HOYT.

Witnesses:

SAM HAMNETT,
FRANCIS WILLIAM GUARD.