

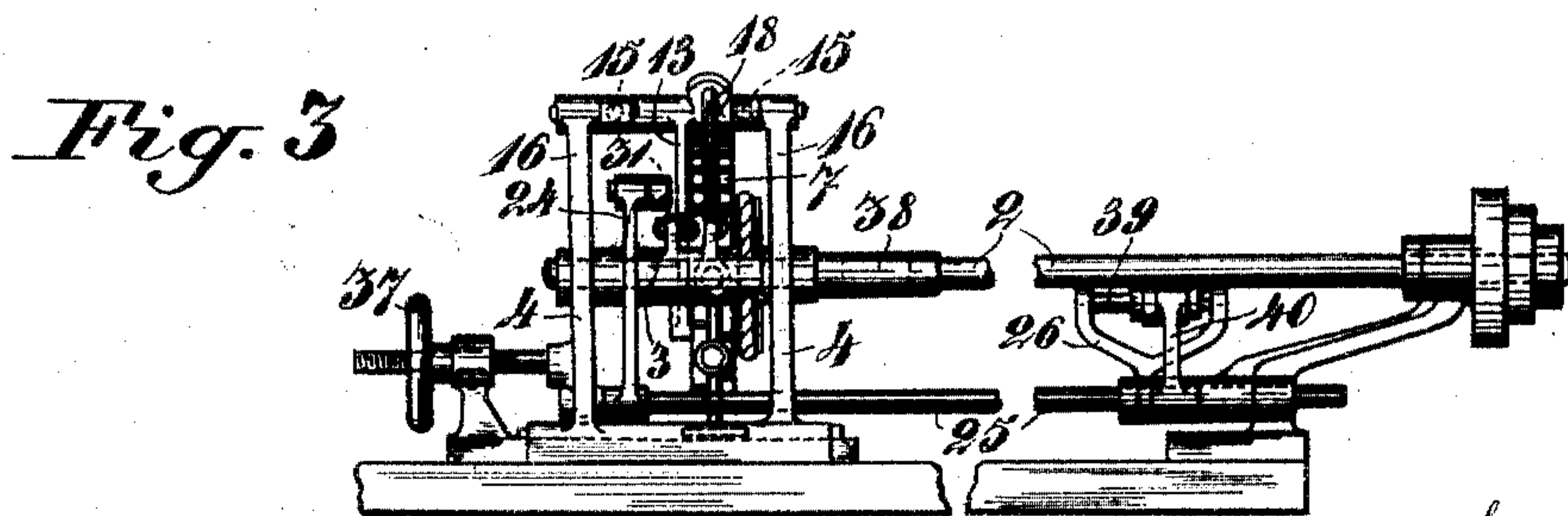
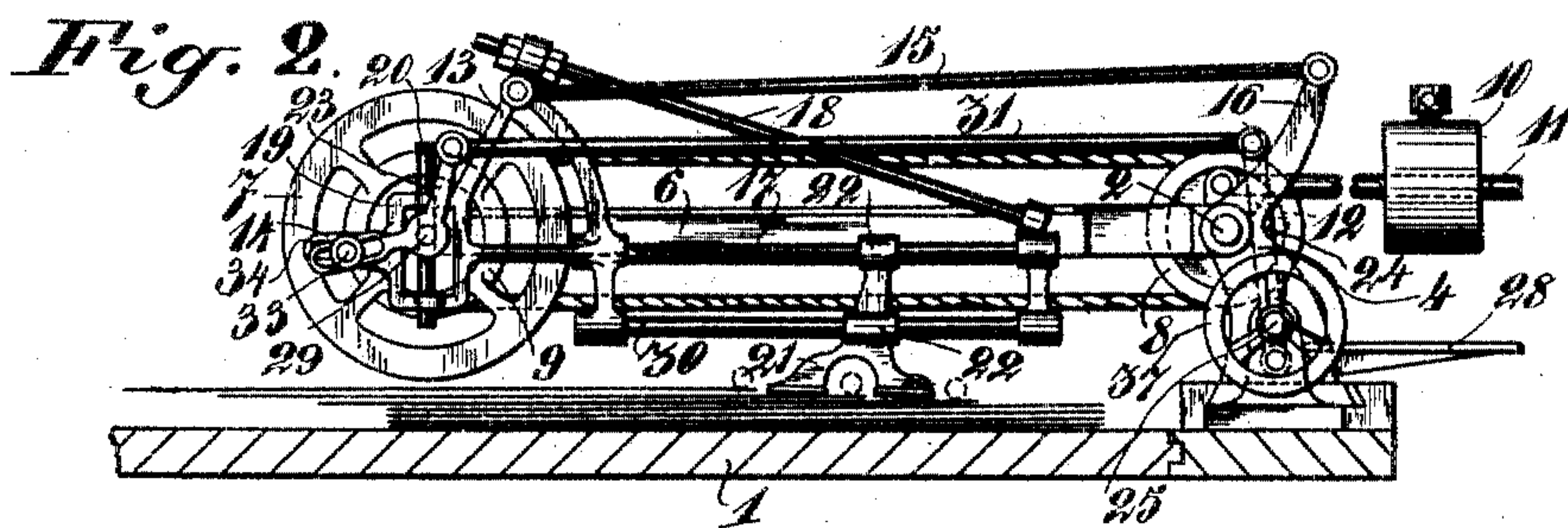
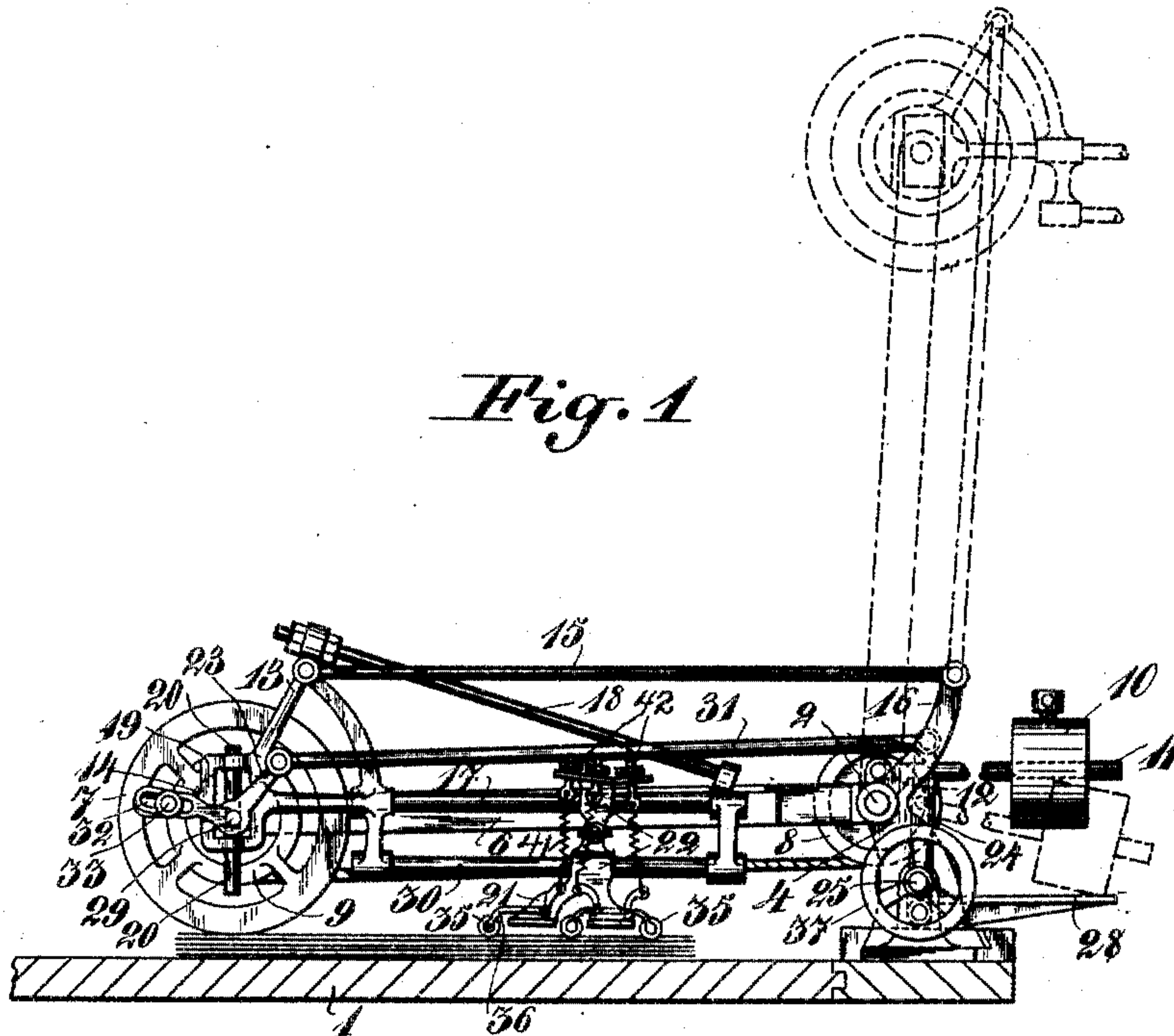
No. 776,837.

PATENTED DEC. 6, 1904.

E. J. HALLBERG.
PAPER FEEDING MACHINE.
APPLICATION FILED APR. 2, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

William J. Firth
Bryan H. Stott

Inventor:

Emil Julius Hallberg
By Henry G. Gamm
att.

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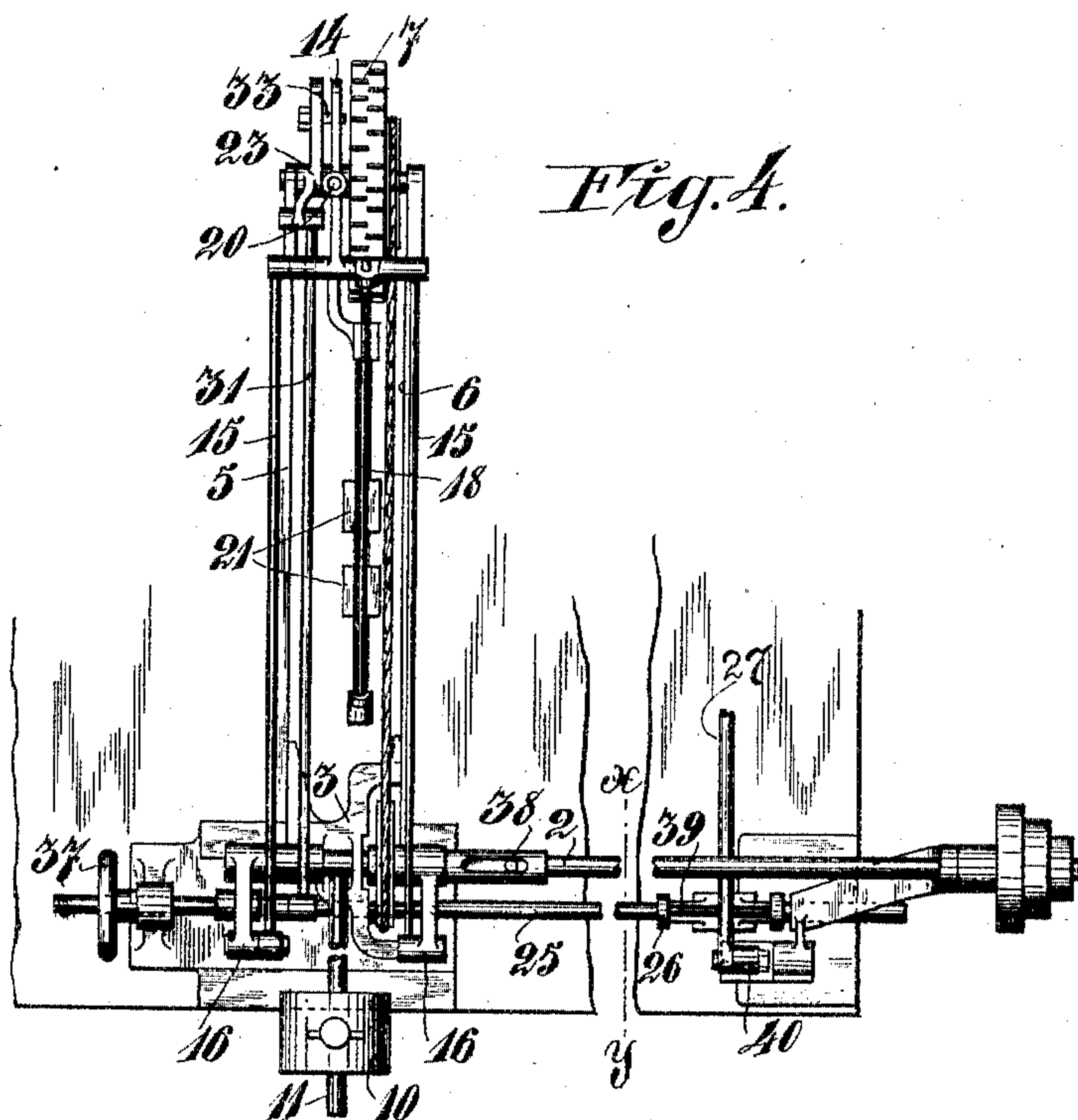
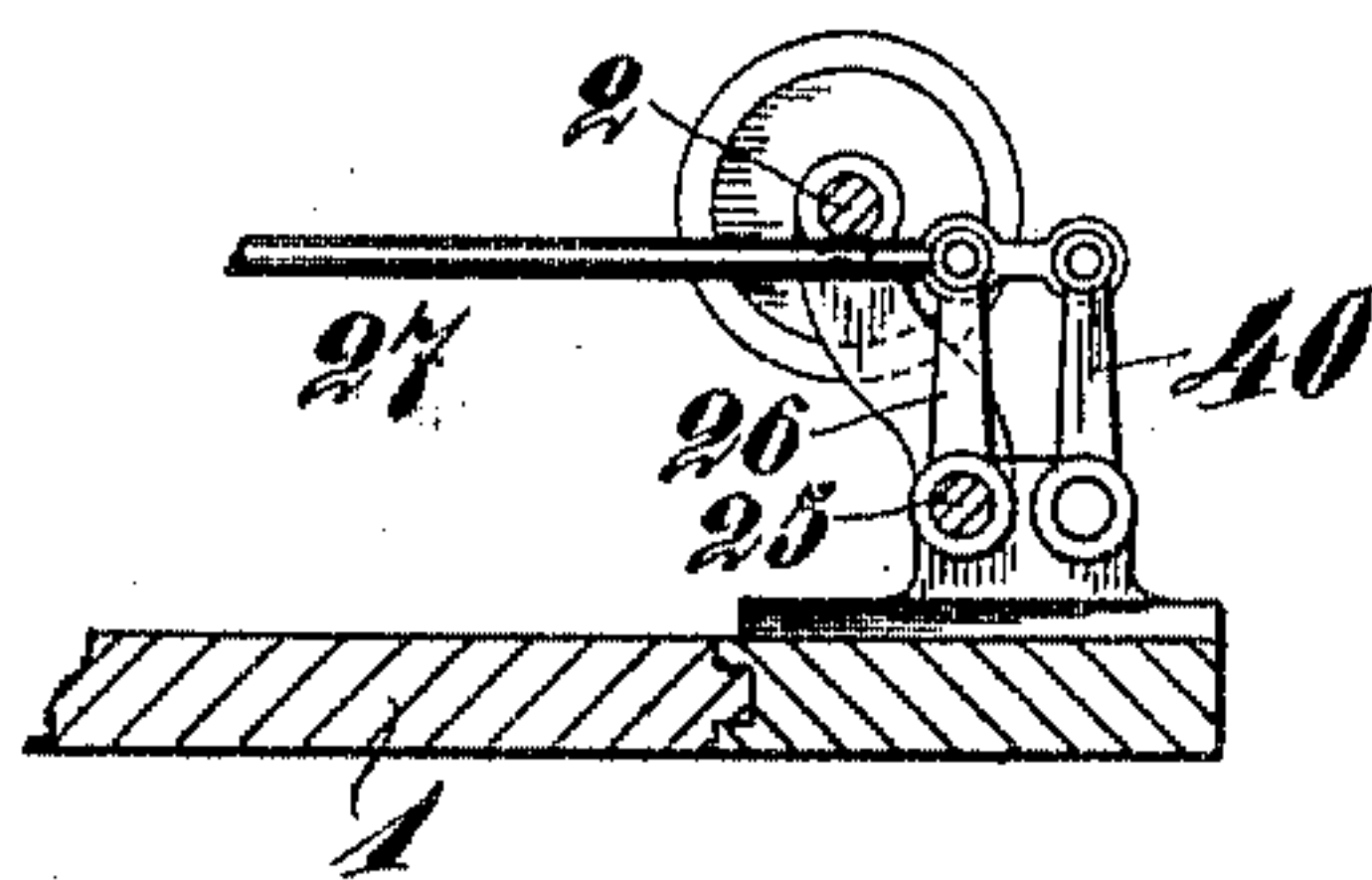


Fig. 5.



Witnesses:

William J. Smith
Benjamin H. Holt

Inventor:

Emil Julius Hallberg
By Henry Bennett
Atty.

UNITED STATES PATENT OFFICE.

ERNST JULIUS HALLBERG, OF STOCKHOLM, SWEDEN.

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 776,837, dated December 6, 1904.

Application filed April 2, 1904. Serial No. 201,299. (No model.)

To all whom it may concern:

Be it known that I, ERNST JULIUS HALLBERG, a subject of the King of Sweden and Norway, and a resident of Stockholm, in the Kingdom of Sweden, have invented certain new and useful Improvements in Paper-Feeding Machines, of which the following is a specification, reference being made to the accompanying drawings.

The present invention refers to improvements in that kind of paper-feeding machines described in my United States Letters Patent No. 750,453, which improvements after numerous trials have proved to form a machine having advantages over that shown in said patent.

This invention is illustrated in the accompanying drawings.

Figures 1 and 2 are side elevations of the feeding apparatus in two different positions. Fig. 3 shows the apparatus as seen from behind. Fig. 4 is a plan view of the apparatus; and Fig. 5 is a section on line *x y*, Fig. 4.

The parts in this device which fully resemble corresponding parts in the device described in Patent No. 750,453 will be mentioned first.

1 is the machine-table, bearing the driving-shaft 2, which is journaled at one end in the frame-piece 3, said frame-piece being pivotally mounted in the supporting-frame 4. From the frame-piece the two bars 5 and 6 extend forward, between the forward ends of which the combing-wheel 7, intended for combing off the sheets of paper, is journaled. In the frame-piece the rope or belt pulley 8 is secured on the end of the shaft 2, and the corresponding pulley 9 is mounted on the shaft of the combing-wheel 7. The pressure of the combing-wheel 7 against the paper lying underneath is regulated by means of the counterweight 10, which is mounted on the rod 11 at the desired place. The rod 11 is pivotally attached to the frame-piece and rests against the projection 12. Further, 24 is the arm at the rear of the machine, which is mounted on the shaft 25, journaled in the supporting-frame 4, which shaft is connected, by means of the arm 26 and the rod 27, Figs. 4 and 5, with a device for the further feeding forward of the paper, said device being so

constituted that a certain part is released or readjusted when the front ends of the sheet fed forward have reached a certain position.

28 is a support for the counterweight 10 when the apparatus is thrown back out of operative position.

A feature of novelty in this device consists in the bell-crank lever 23, which before was pivotally connected with the frame in which the presser-foot was slidably mounted, now being pivoted on the shaft 29 of the wheel 7 and having one arm loosely connected to the arm 14, extending from a frame 19, which surrounds the shaft 29, which frame is movably mounted on pins or rods 20, extending from a ring or a bushing which is loosely mounted on the shaft 29.

At the end of the arm 13, which extends upwardly from the frame 19, is a cross-piece which is at each end pivotally attached to one end of a bar 15. Each of these bars 15 has its other end pivotally connected with a stationary arm 16, projecting upwardly from the supporting-frame 4 and is of the same length as the bar 6, while the length of the arms 16 is equal to the distance from the point of union between the arms 13 and the bars 15 to the shaft 29 of the wheel 7 when the shaft 29 keeps its central position in the frame 19, so that these arms and bars thus form a parallelogram.

From the frame 19 extends rearward a bar 17 in a direction substantially parallel to the machine-table, and its rear end is supported by the rod 18, connected with the arm 13.

Parallel to the bar 17 and supported by the same there is another bar 30, which bars carry and guide the presser-foot 21, by means of sleeves 22, which are connected with the same and movably mounted on the bars to adjust the presser-foot to the desired distance from the combing-wheel.

One of the sleeves 22 is provided with a set-screw or the like, serving to hold the presser-foot in the adjusted position.

The bell-crank lever 23, pivotally mounted on the shaft 29, is connected with the arm 24 by a rod 31, which is pivoted at one end to the bell-crank lever and at the other end to the end of the upward-extending arm 24. The

rod 31 is of the same length as the rod 15, and its pivots are so situated that when the parts occupy their central position—*i. e.*, when the shaft 29 is in the middle of the frame 19—the pivotal connection of the rod 31 to the arm 24 is on a straight line drawn from the center of the shaft 29 and the pivotal connection of the rod 15 and arm 16, while the pivot at the other end of the rod 31 is on a straight line drawn through the center of the shaft 29 and the pivotal connection of the rod 15 and the arm 13. In consequence of this arrangement it is obvious that the entire apparatus can be swung to its raised position about shaft 2, as shown in Fig. 1.

The forward arm of the bell-crank lever is provided with an aperture 32, in which is placed a pin 33, which can be fixed at any desired place in the aperture by means of a clamping-screw or the like. The free end of the pin enters an aperture 34 in the arm 14 and can suitably be provided with a roller in order that when the mechanism is readjusted it may glide easily in said aperture.

The device operates in the following manner: If the apparatus when in action occupies the position shown in Fig. 1—*i. e.*, the wheel 7 is in contact with the paper (with a pressure regulated by the counterweight 10) and the presser-foot 21 is raised—the feeding forward proceeds until the forward edge of the uppermost sheet arrives at and readjusts a mechanism in the machine whereby a spring is released which acts on the rod 27, Figs. 4 and 5, in such a manner that the upper end of the arm 24, Fig. 1, is carried forward, whereupon the bell-crank lever 23 is rocked by the rod 31. In thus rocking the bell-crank lever it first fulcrums on the shaft 29, carrying the arm 14, and consequently the entire presser-foot-supporting frame, downwardly. During this movement the frame 19 slides on the pins 20, and the bars 17 and 30 and the presser-foot 21 descend, maintaining a position parallel to the table in consequence of the arrangement of the parallelogram until the presser-foot comes against the paper. As soon as the presser-foot receives support against the paper the descending movement of the same, as well as of the bars, the frame 19, and the pin 33, is stopped, in consequence of which the bell-crank lever during the subsequent part of its rocking movement has instead of the shaft 29 the pin 33 as its fulcrum, during which the shaft 29, and thus also the wheel 7, are raised. Thereupon the parts occupy the position shown in Fig. 2—*i. e.*, the wheel 7 is raised and the apparatus rests with the presser-foot against the paper. When the parts are to be returned to the position shown in Fig. 1, the upper end of the arm 24 is (with the aid of the bar 27 and the other mechanism not necessary to describe herein) moved backward, whereupon the bell-crank lever 23 during the first portion of its movement ful-

crums on the pin 33, thus lowering the wheel 7 against the paper, and then after the wheel has received support against the paper fulcrums on the shaft 29, whereupon the pin 33, and thus also the frame, the bars, and the presser-foot are raised. The height to which the presser-foot or the wheel is raised from the paper can be adjusted by shoving the pin 33 backward or forward in the aperture 32. The advantage of this arrangement is that the parts of which it consists have been, so to say, divided into two sections, which during the readjustment move in opposite directions in two succeeding periods of time, in consequence of which difficulties of construction in the machine are obviated, the masses to be raised each time are reduced, and the machine receives a more quiet, even, and silent action and works with greater precision.

The presser-foot 21 is provided with a number of rollers 35, each one being mounted on one end of a double-arm lever 36, connected with the presser-foot, the other end of which is actuated by a spring 41, with an adjusting-screw 42 for regulating the tension of the spring. These rollers, which for the sake of clearness are not drawn in full in Fig. 2, serve when the presser-foot is raised and feeding proceeds to effect a suitable pressure on those sheets underneath which, together with the uppermost one, are being conveyed forward by the combing-wheel 7 in order to reduce the speed of their movement forward, as required.

In order that the combing-wheel 7 may even when the machine is in action be readily set above the middle of the paper and thus prevent one side edge being fed forward quicker than the other, (to prevent the paper being fed forward obliquely,) the supporting-frame 4 is mounted on a guide and provided at one side with a projecting screw, the nut of which is in the form of a hand-wheel 37 and acts against a fixed support, so that when the hand-wheel is turned in any one direction the bearing can be moved on the guide to one side or the other. In consequence of this lateral adjustment of the supporting-frame the shaft 2 is divided and at the place of the division provided with a sleeve 38, fixed to one of the parts, in which sleeve the other part is movable in its longitudinal direction without being able to rotate therein. On the shaft 25, which is only a rocking shaft, the arm 26 is mounted near the rod 27, which arm is in the form of a fork, the shanks of which are connected by means of a pin 39 passing through an eye in the rod 27.

The shaft 25 and the fork accompany the bearing 4 in its movement, the pin 39 then gliding in the eye of the rod 27. In order that the rod 27 may not accompany the pin 39 in its movement, the rod is lengthened and at the end connected with a rocking arm 40 of the same length as the arm 26 and mounted on a fixed pivot.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a paper-feeding machine, a driving-shaft, a combing-wheel-supporting frame pivotally mounted on said shaft and extending forwardly thereof, a combing-wheel journaled in the forward end of said frame, connections between the combing-wheel and the driving-shaft for rotating the combing-wheel, a presser-foot-supporting frame mounted to slide vertically on said combing-wheel-supporting frame, a presser-foot mounted on said presser-foot-supporting frame, a bell-crank lever pivoted on the combing-wheel shaft and having one arm pivotally connected to a projection from said presser-foot-supporting frame, a lever at the rear of the machine, connections between said lever and the other arm of said bell-crank lever whereby upon the movement of the lever at the rear of the machine the bell-crank lever will be rocked to alternately raise and lower the combing-wheel and presser-foot.

2. In a paper-feeding machine, a driving-shaft, a combing-wheel-supporting frame pivotally mounted on said shaft and extending forwardly thereof, a combing-wheel journaled in the forward end of said frame, connections between the combing-wheel and the driving-shaft for rotating the combing-wheel, a presser-foot-supporting frame mounted to slide vertically on said combing-wheel-supporting frame, a presser-foot mounted on said presser-foot-supporting frame, a bell-crank lever pivoted on the combing-wheel shaft and having one arm provided with a slot, a pin adjustable in said slot and in a slotted projection from said presser-foot-supporting frame, a lever at the rear of the machine, connections between said lever and the other arm of said bell-crank lever whereby upon the movement of the lever at the rear of the machine the bell-crank lever will be rocked to alternately raise and lower the combing-wheel and presser-foot.

3. In a paper-feeding machine, a driving-shaft, a combing-wheel-supporting frame pivotally mounted on said shaft and extending forwardly thereof, a combing-wheel journaled in the forward end of said frame, connections between the combing-wheel and the driving-shaft for rotating the combing-wheel, a presser-foot-supporting frame, a presser-foot mounted on said presser-foot-supporting frame, a vertical sliding connection between the forward end of said presser-foot-support-

ing frame and the combing-wheel shaft, an arm extending obliquely upward from the forward end of said presser-foot-supporting frame, a fixed arm extending above the driving-shaft, a rod pivotally connecting the upper ends of said arms, the length of said rod being equal to the distance between the driving-shaft and the combing-wheel shaft, and the distance from the driving-shaft to the rear pivot of said rod being equal to the distance from the combing-wheel shaft to the forward pivot of said rod when the presser-foot frame is in its intermediate position with respect to the combing-wheel-supporting frame, a bell-crank lever pivoted on the shaft of the combing-wheel and having one arm pivotally connected to a projection from the presser-foot-supporting frame, a lever at the rear of the machine, a rod pivotally connected at one end to the other end of said bell-crank lever and to the upper end of the lever at the rear of the machine, the distance between the pivots of said rod being equal to the distance between the combing-wheel shaft and the driving-shaft, and the angle of the bell-crank lever being such that when it is in its intermediate position its pivotal connection with the operating-rod will be in line with the driving-shaft of the combing-wheel and the pivotal point of the arm extending rearwardly upward from the presser-foot-supporting frame, whereby the entire device may be swung upwardly about the driving-shaft as a pivot, and whereby when the bell-crank lever is rocked the presser-foot in its movement will maintain a relation parallel to the plane of the feed.

4. In a paper-feeding machine, a combing-wheel-supporting frame, a combing-wheel journaled therein, a presser-foot-supporting frame, a presser-foot mounted thereon, connections between the said frames whereby when the one is raised the other will be lowered to bring the combing-wheel and presser-foot alternately into contact with the paper, a series of presser-rollers mounted in bell-crank levers fulcrumed on the presser-foot, springs connecting said bell-crank levers with the presser-foot-supporting frame, means for adjusting the tension of said springs.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ERNST JULIUS HALLBERG.

Witnesses:

C. TH. SUNDHOLM,
H. P. OHLSSON.