

No. 623,089.

Patented Apr. 11, 1899.

E. M. LOCKWOOD.  
PAPER CUTTING MACHINE.

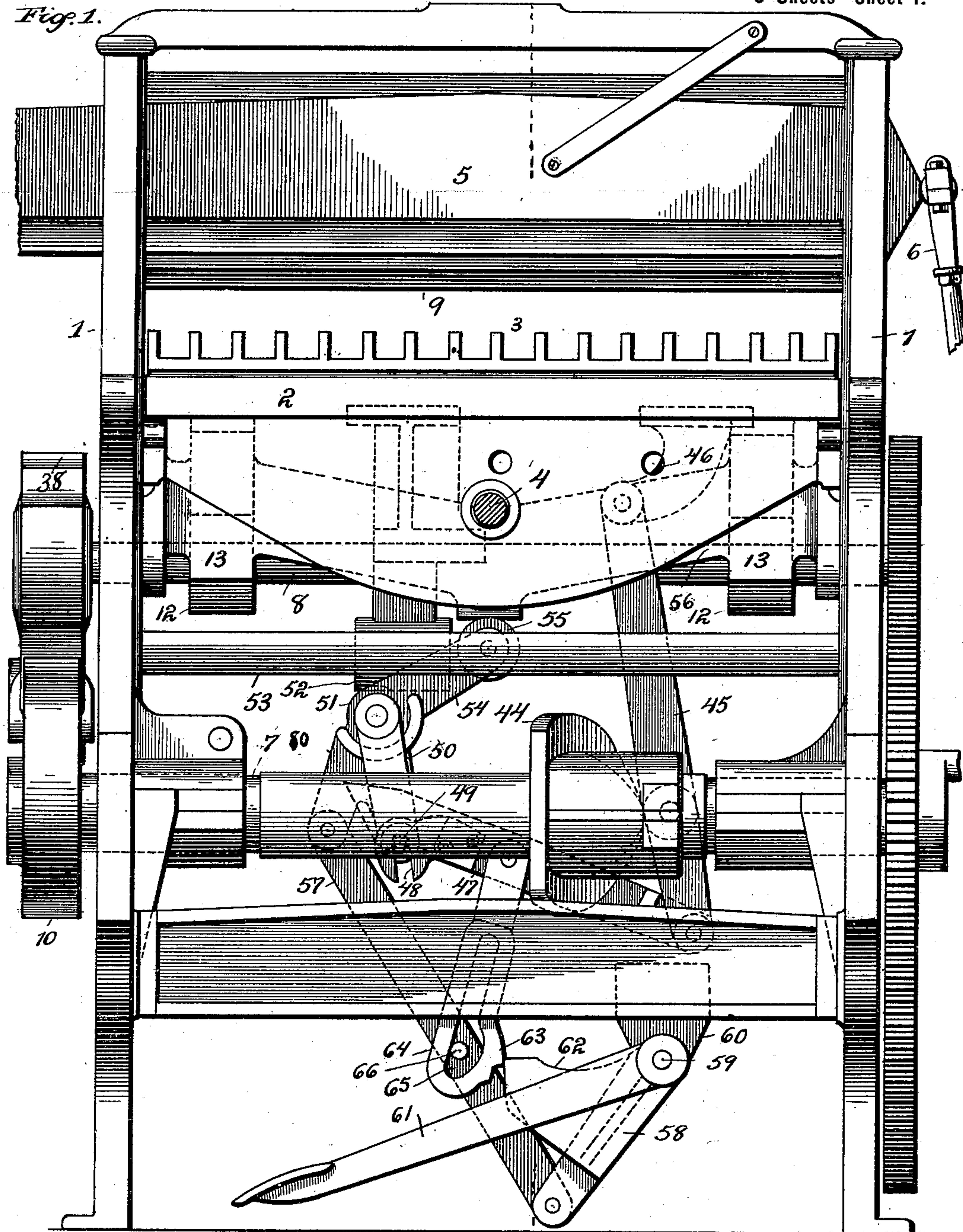
(Application filed May 18, 1898.)

(No Model.)

30

5 Sheets—Sheet 1.

Fig. 1.



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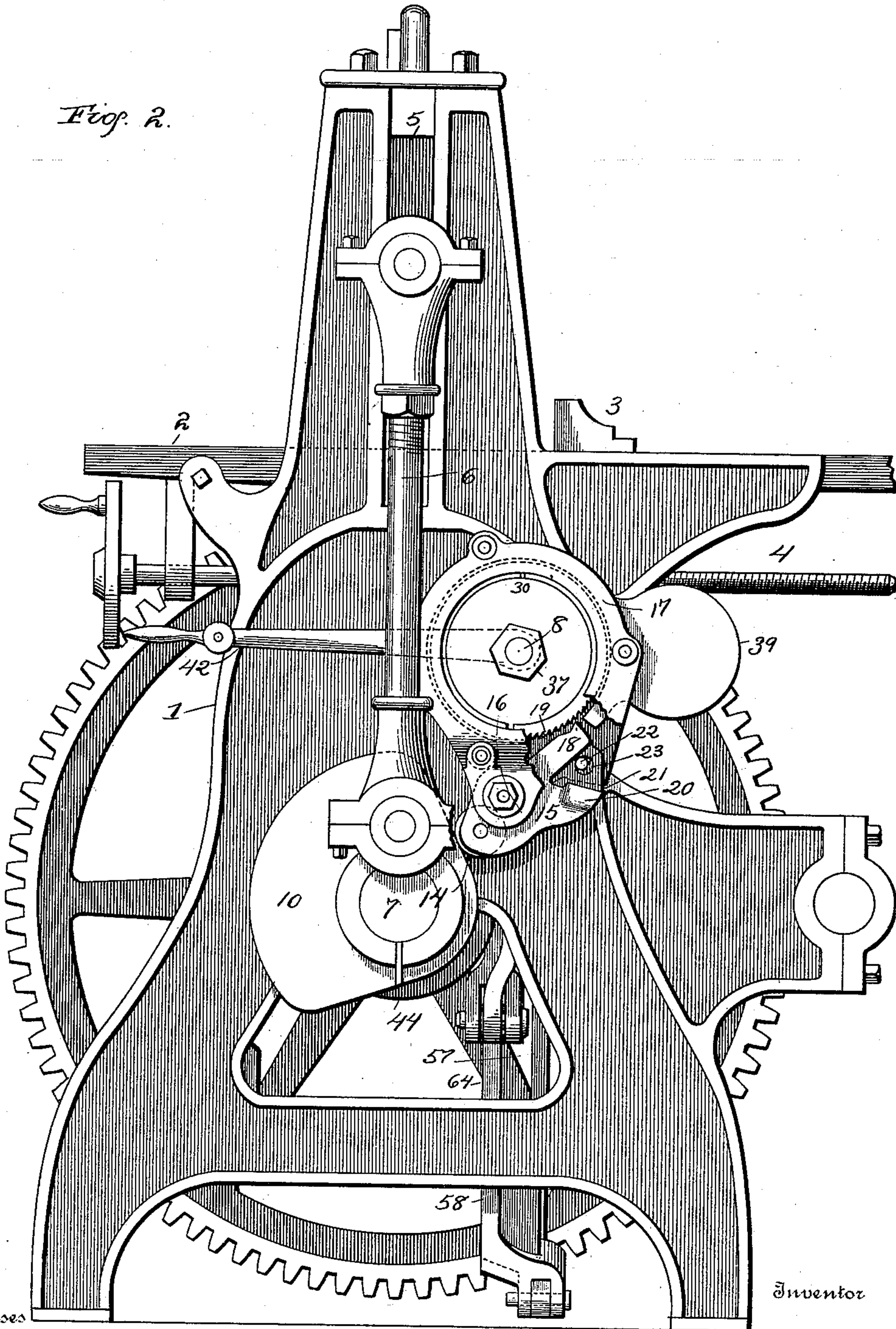
E. M. LOCKWOOD.  
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(No Model.)

5 Sheets—Sheet 2.

Fig. 2.



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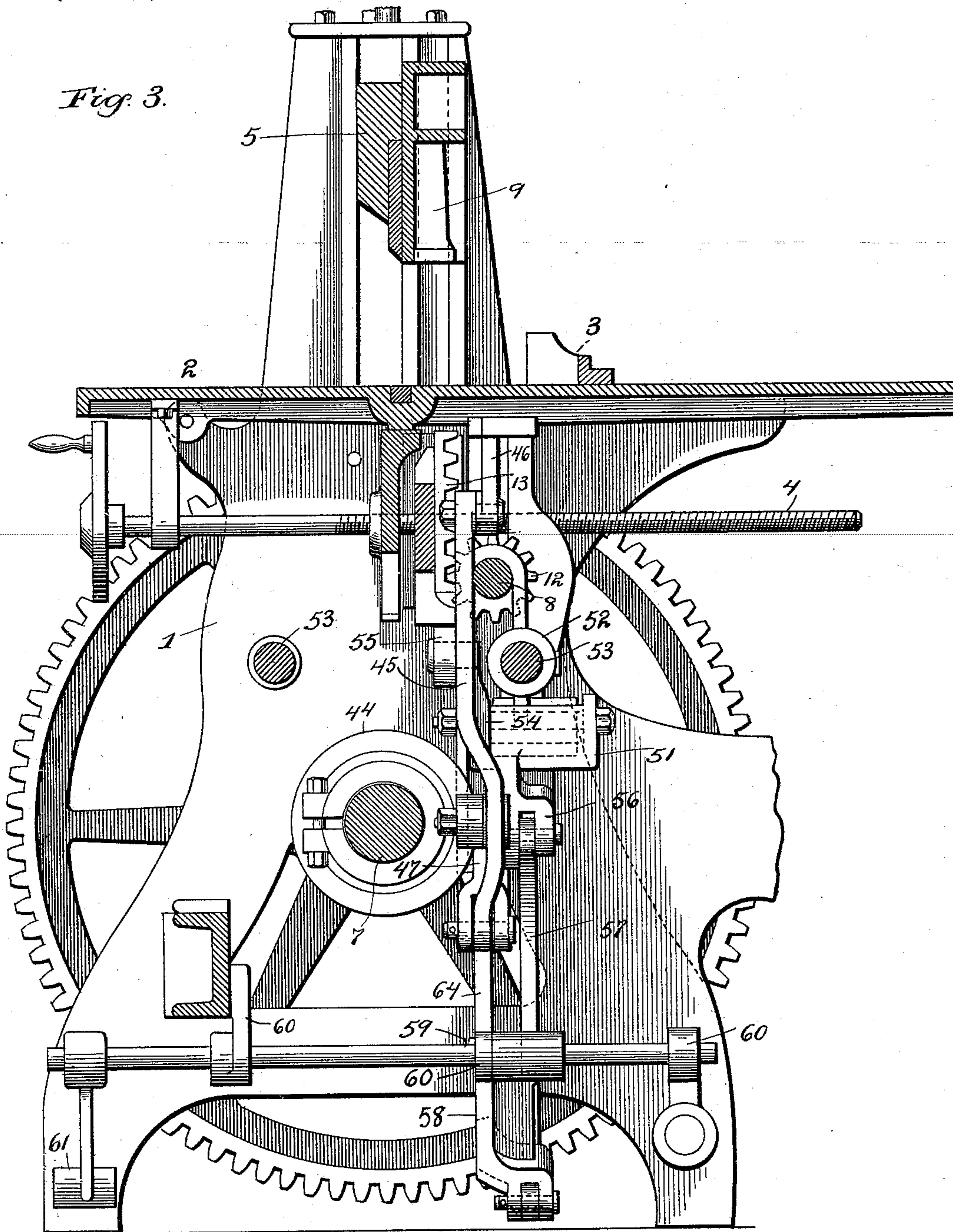
**E. M. LOCKWOOD.**  
**PAPER CUTTING MACHINE.**

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(No Model.)

**5 Sheets—Sheet 3.**

*Fig. 3.*



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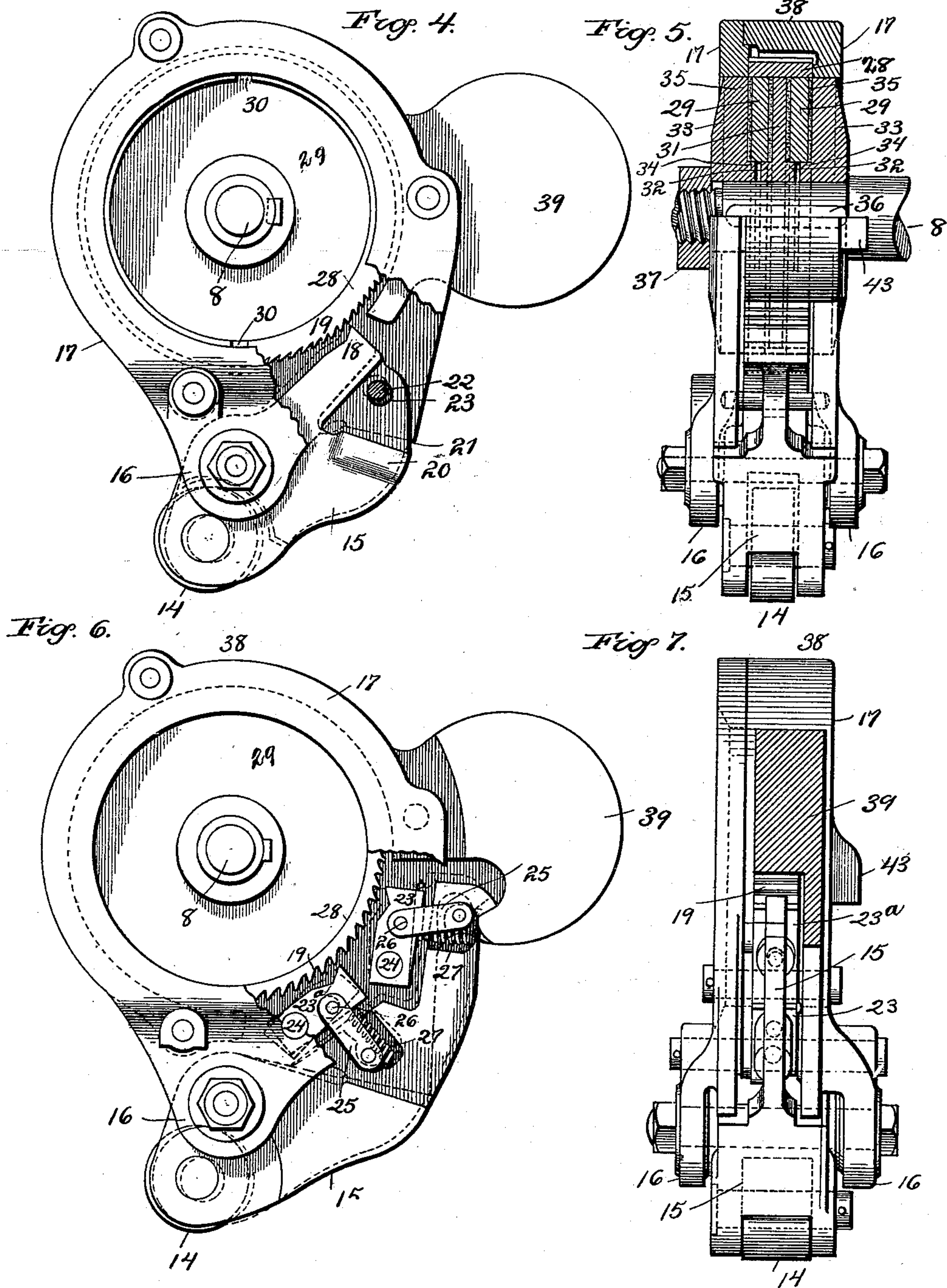
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(No Model.)

5 Sheets—Sheet 4.



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(No Model.)

5 Sheets—Sheet 5.

Fig. 8.

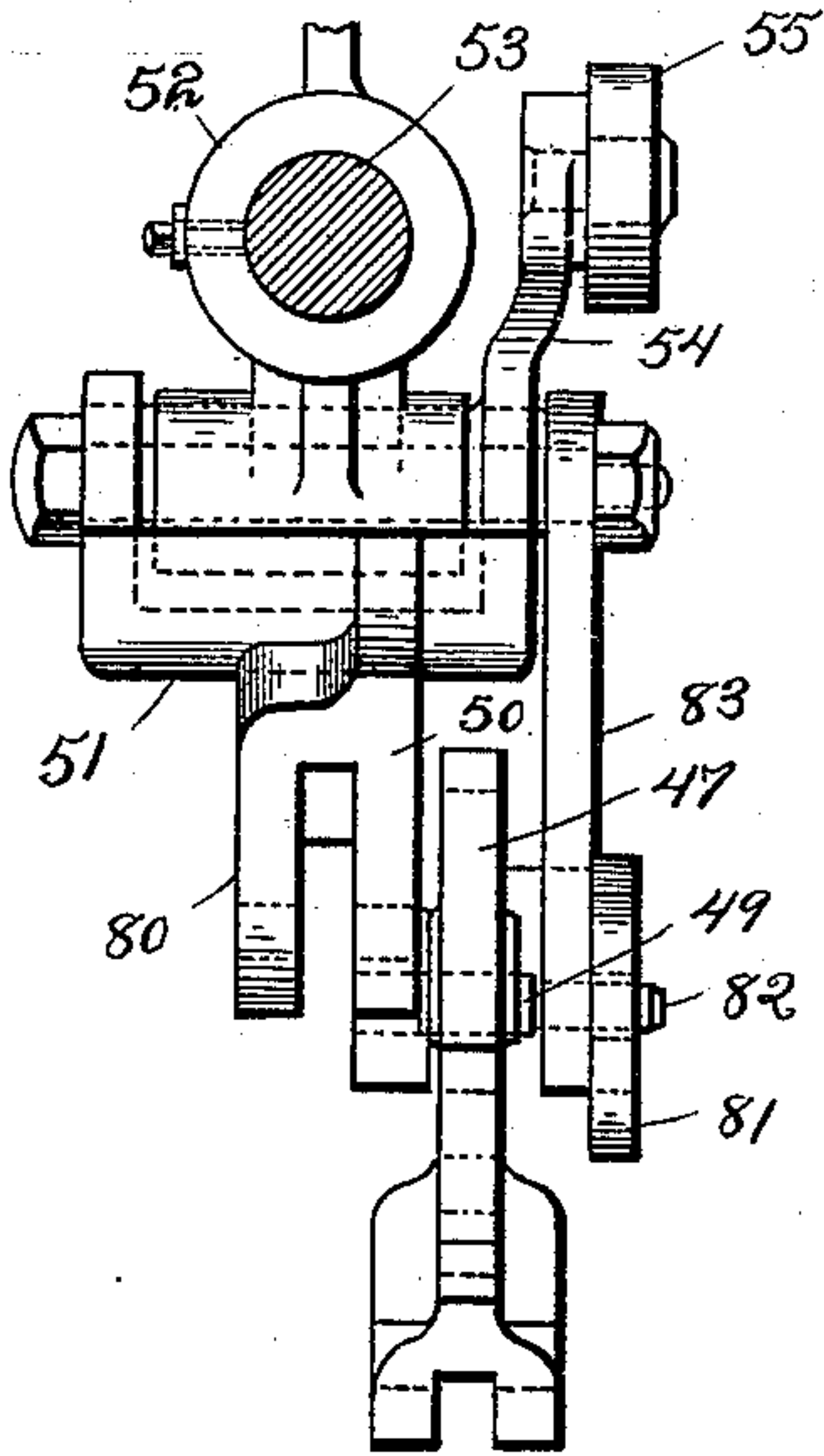


Fig. 9.

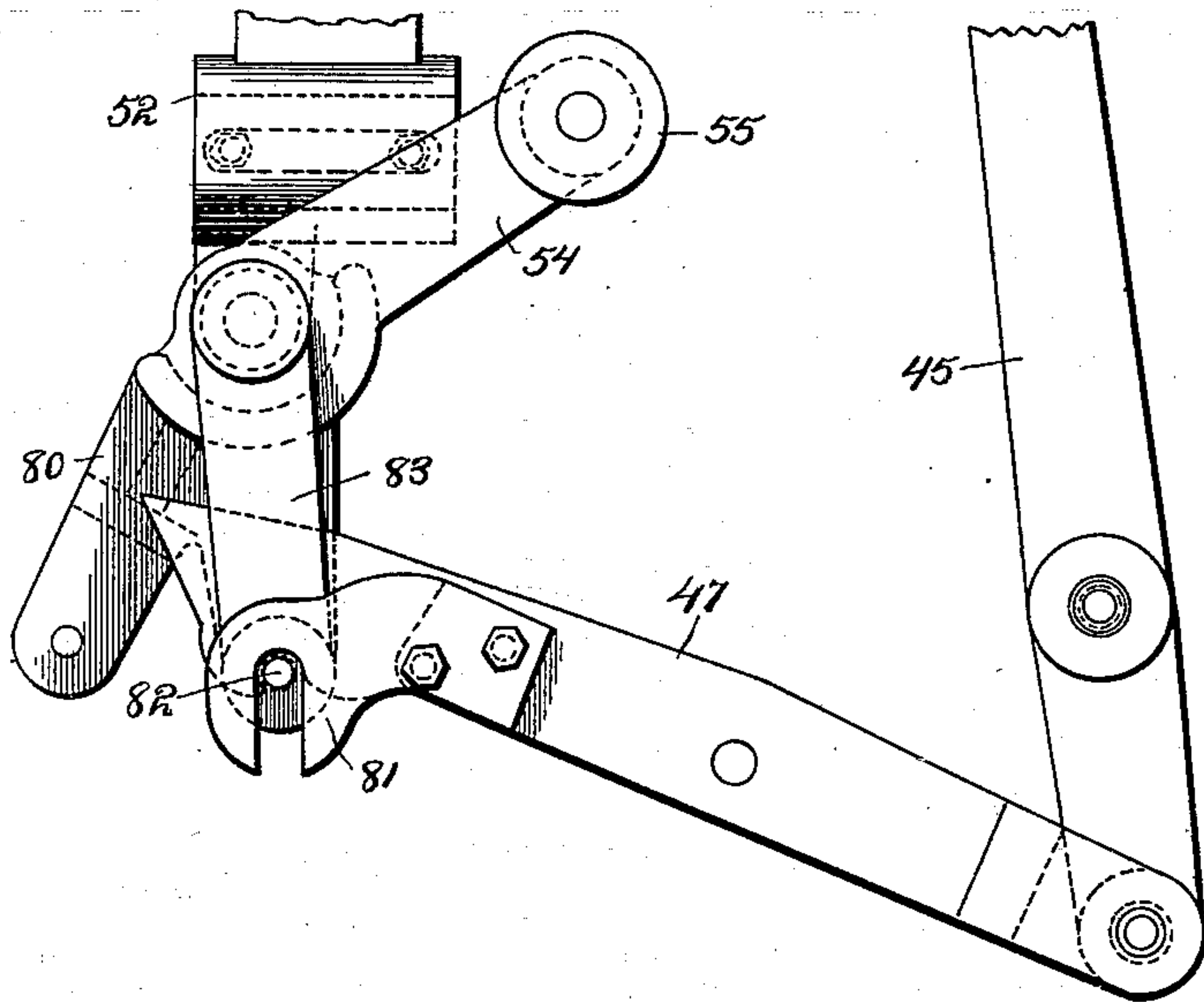


Fig. 10.

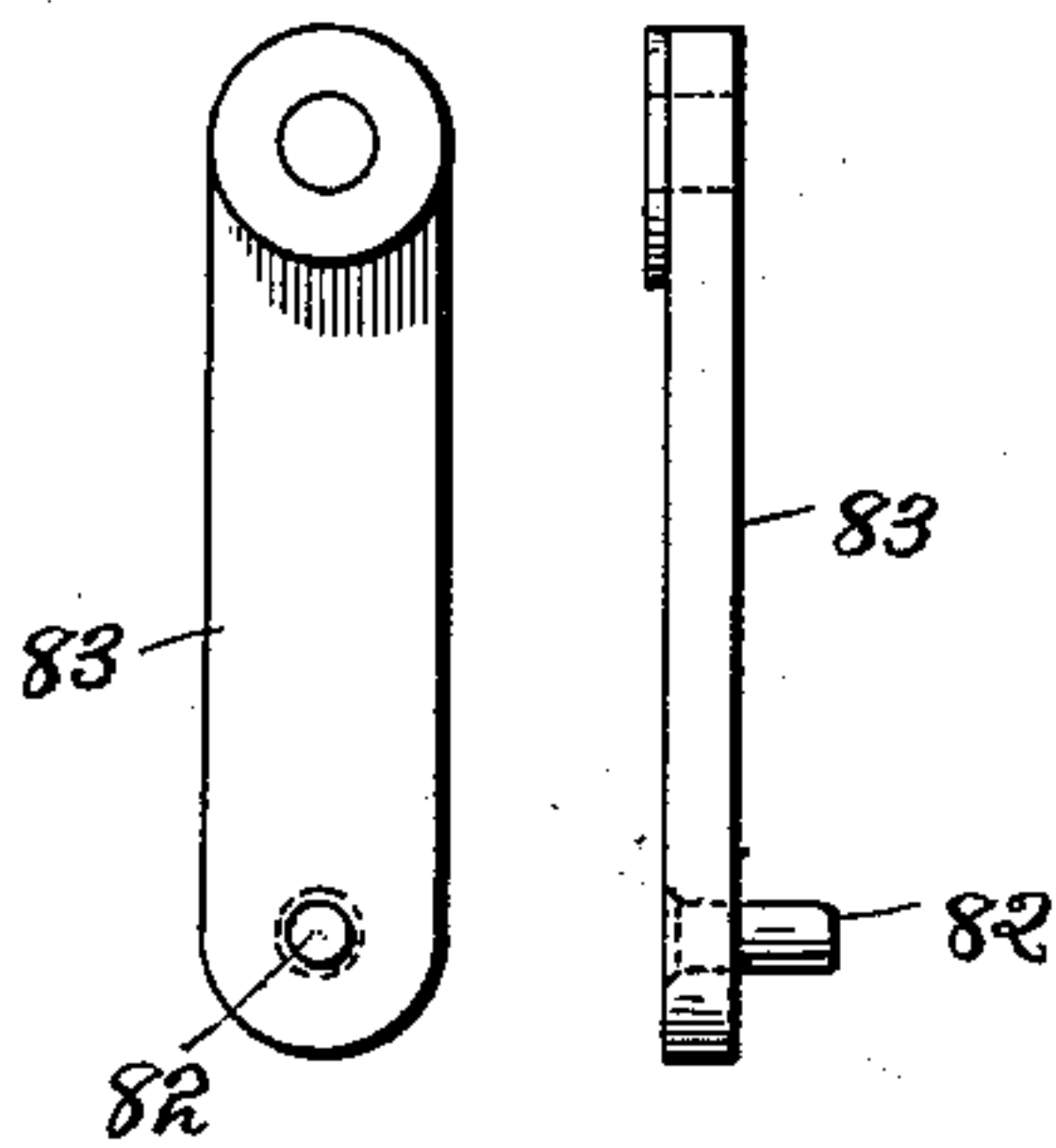
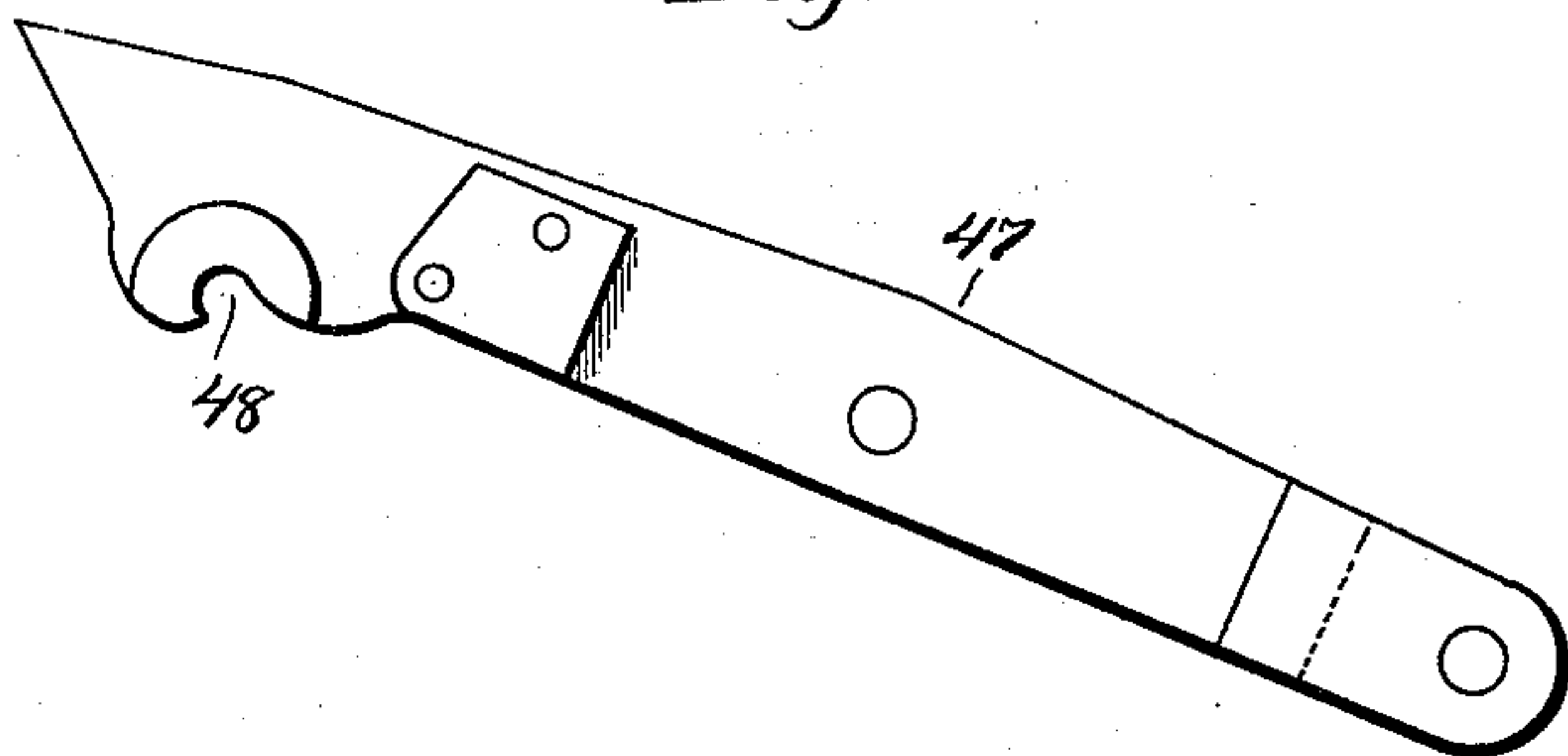


Fig. 11.



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# UNITED STATES PATENT OFFICE.

EDWARD M. LOCKWOOD, OF OSWEGO, NEW YORK.

## PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 623,089, dated April 11, 1899.

Application filed May 16, 1898. Serial No. 680,825. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD M. LOCKWOOD, a citizen of the United States, residing at Oswego, in the county of Oswego and State of New York, have invented certain new and useful Improvements in Paper-Cutting Machines; and I do 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.

This invention relates generally to paper-cutting machines, and particularly to the clamping devices of such machines; and it has for its object to provide improved means for operating the clamp automatically and also manually; and it consists in the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation of my improved machine; Fig. 2, a side elevation of the same; Fig. 3, a transverse vertical section on the line *xx*, Fig. 1; Fig. 4, a detail view, in side elevation, of the friction device partly broken away and one of the outside disks 33 removed; Fig. 5, a detail view, in end or front elevation, partly broken away, of the friction device; Fig. 6, a detail side view of a modification; Fig. 7, a detail end view of the same; Fig. 8, a detail end or edge view of the elbow-lever; Fig. 9, a side elevation of the same; Fig. 10, detail side and edge views of the link 50, and Fig. 11 a detail view of the link 47.

Similar numerals refer to similar parts throughout all the views.

Since the invention relates only to the clamping mechanism of paper-cutting machines and may be applied to all such machines in which the clamp is brought vertically down on the paper and the knife is operated so as to have an oblique or draw cutting action, particularly such as the machine shown and described in the patent to Armstrong, paper-cutting machine, No. 575,291, dated January 12, 1897, only so much of such machines will be described herein as will render clear the construction and operation of the present invention.

Referring to the drawings, the numeral 1 represents the frame of the machine; 2, the

horizontal bed on which the paper is cut; 3, a gage; 4, a screw-rod for operating the gage; 5, the knife-stock; 6, the pitman-rods for operating the knife-stock; 7, the main driving-shaft; 8, the shaft for the friction device; 9, the clamp or presser-bar; 10, the cam, mounted on shaft 7, for operating the friction device; 12, pinions mounted on shaft 8; and 13, rack-bars engaging pinions 12 and connected to the clamp or presser-bar 9 in order to move the same vertically, all of which may be constructed and arranged as shown and described in the patent to Armstrong above named or in the usual or desired manner.

In practice it has been found that the dog carried by the case of the friction device for operating the ratchet-wheel thereof in the Armstrong patent referred to was liable to engage the points of the teeth of the ratchet-wheel before the opposite end of the dog had cleared the pin which it engaged to release it from the ratchet-teeth on the return movement of the case, thus frequently causing the breaking off of a portion of the tooth thus engaged. With my improved construction and arrangement of parts the liability or danger of breaking the teeth of the wheel from the cause named is entirely obviated and the positive engagement and disengagement of the parts effected at each movement of the same.

In carrying out my invention I journal the roller 14 in the forked end of a jaw or lever 15, which is pivotally secured between the ears 16 of the casing 17 of the friction device. The jaw or lever 15 extends obliquely upward, and its end 18 serves the purpose of a pawl to engage the teeth of a ratchet-wheel 19. As indicated by dotted lines, Fig. 4, the swinging movement of the jaw or lever 15 is limited by the lateral projections or stops 20 formed thereon, which engage the offsets or edges 21 of the casing, and thereby arrests the upward throw of the lever or jaw at the instant the end of the lever or jaw has fully engaged a tooth of the ratchet-wheel.

The return movement of the jaw or lever is limited by a pin 22, rigidly secured to the casing and passing through an opening 23 of greater diameter than the pin, which also serves to fix the amount or degree of tooth clearance when the jaw or lever is disengaged from the ratchet-wheel. Thus it will be ob-



served that the first result of the cam 10 acting on the roller 14 is to bring the projection 20 into contact with the edges or offsets 21 of the casing and causing the pawl end of the jaw or lever to fully engage a tooth of the ratchet-wheel, this being accomplished before any movement is imparted to the casing, and that therefore there is no liability of the pawl or lever acting on the ratchet-wheel until it is in full-depth engagement with one of the teeth thereof.

In Figs. 6 and 7 I show a modified form of the device just described, from which good results may be obtained and which consists in providing two pawls 23<sup>a</sup>, fulcrumed on pins 24 in the casing and connected to the jaw or lever by links 25, pivotally secured to the jaw or lever and provided with pins 26, which enter openings or perforations formed in the pawls. The pawls 23<sup>a</sup> are so located and arranged in the casing that when one pawl is fully engaged with a ratchet-tooth the other pawl will be half-way between two teeth, thus avoiding undue loss of motion between casing and ratchet-wheel. The use of two pawls arranged as described permits of the use of very strong ratchet-teeth.

The openings in the pawls for the link-pins are larger than the latter to allow for the varying positions of the pawls when engaged with the ratchet-wheel. In order to keep the pawls properly extended from the jaw and yet allow the same to assume their varying positions when in engagement with the ratchet-wheel, I provide the springs 27, which are located in recesses in the jaw or lever and bear against the pawls, as shown. The friction device proper consists of a steel ring 28, having ratchet-teeth formed on its periphery and hereinbefore termed a "ratchet-wheel," fitting inside of which are two plain disks 29 and so connected to said ring 28 as to rotate with it and yet be free to move laterally therein. The connection between the disks and ring may be made in any desired manner, and I have shown one manner of connection, which consists in forming keys 30 on the disks, which enter grooves formed in the ring 18; but I may reverse this and place the key on the ring, or a spline or feather may be used.

The disks 29 are arranged between a central or middle disk 31, having hub-like offsets 32, and disks 33, having offsets 34, said disks 29 surrounding the offsets, as shown.

Between the disks 29 and the adjacent faces of the disks 31 and 32 are interposed fiber washers 35. The disks 31 and 33 are fitted on the shaft 8 and slidingly secured in place by a feather or key 36. The required frictional driving pressure is obtained by means of a nut 37 on the threaded end of said shaft 8, which binds the several disks, with their interposed fiber washers, together with such degree of pressure as the work requires.

The casing for the friction device is formed in two parts, one of which is provided with a peripheral flange 38, which forms a cover

for the disks at all points excepting where the jaw or lever 15 is hung. A weight 39 is formed or attached to the casing in any desired manner for a purpose to be described. My improved means for automatically lowering the clamp to the paper and raising it after the paper has been severed and also for manually lowering the clamp to the paper when desired, is shown in Figs. 1 and 2, and in which an arm 42 is adjustably secured to the edge of one of the pieces of the frame of the machine.

The inner end of the arm is loosely mounted on a hub surrounding the shaft 8 between the friction device and the end piece of the frame and in position to be engaged by a projection or stop 43, cast with or otherwise secured to the casing of the friction device, thereby limiting the return movement of the casing, and thus controlling the position of roller 14 with reference to the cam 10, which engages said roller to operate the friction device.

At a suitable point below the shaft 8, but not in the same vertical plane therewith, is located the shaft 7, and on this shaft is securely mounted a cam 44, which is adapted to engage and swing an arm or lever 45, which is pivoted at one end to a bracket 46, and to the opposite end of the lever 45 is pivoted one end of a link 47, the opposite end of said link being enlarged and formed with a hook 48 to engage a pin 49, projecting laterally from an arm 50 of a bell-crank lever 51, which is fulcrumed on a bracket 52, secured to a cross-bar 53 of the frame. Another arm 54 of the bell-crank lever carries at its free end a roller 55, the position of which is nearly central between the end pieces of the frame.

The bar 56, to which is secured the rack-bars 13, rests on the roller 55, and it will be readily seen that the motion given by the cam 44 to the lever 45 is transmitted through the link 47 and bell-crank lever 51 to the clamp and that the latter will be held at the top of its stroke when the machine is stopped automatically, as is common in all machines of this type, after each cut made by the knife through the bell-crank lever and its connections.

The axis of the bell-crank lever is transverse to the axis of the shaft 7 and also transverse to the plane of motion of the presser-bar, so that the movements of all the parts which operate to impart motion to the presser-bar are in the same plane as that of the presser-bar and restricted to a space immediately in line with and below said bar, and are arranged so that there is no lost space between the frame of the machine.

In order to provide for lowering the clamp to the paper while the machine is at rest, the link 47 is raised off the pin 49 of the arm 50 of the bell-crank lever, so as to disengage said bell-crank lever from the lever 45. To accomplish this, I provide the bell-crank lever with a third arm 80, to which is connected



one end of a rod 57, the other end of said rod being pivoted to a lever 58, secured to a shaft 59, mounted in brackets 60, secured to the frame of a machine. To the shaft 59 a foot-lever 61 is secured, and the lever 58 is formed or provided with an upwardly-extending arm 62. The end of arm 62 is adapted to engage a shoulder 63, formed on a swinging link 64 from a link 47, which link 64 is formed with a slot 65 to engage a pin 66, projecting laterally from the rod 57. The normal position of arm 62 is such that its end is slightly above the shoulder 63 of the link 64 and is in engagement or contact with said link, so that when it is desired to lower the clamp to the paper it is only necessary to depress the foot-lever 61 till the end of said arm passes clear of the shoulder 63, when the link 64 will swing backward, bringing its shoulder in position to be engaged by the end of arm 62 when the foot-lever is released, thus causing the link 64 to be lifted thereby, and through it the link 47 is lifted off the pin 49. This action leaves the bell-crank lever free to swing on its pivot as the foot-lever rises and permits the clamp to descend to the paper, while the lever 45 and link 47 are held in position by the cam 44. The free end of link 47 is provided with a projecting hook 81, which engages a pin 82 on a link 83, which is loosely suspended from the fulcrum-pin of the bell-crank lever 51, which holds said link 47 in the proper position to automatically reengage pin 49 when the revolution of cam 44 has moved the lever 45 and link into position so to do.

It is obvious that the movement just described necessitates that the shoulder 63 of link 64 be released from the arm 62 after it has performed its duty of disconnecting the link 47 from pin 49, and this is accomplished by means of the pin 66, carried by the rod 57, which is so located that the upward movement of the said rod 57 presses the pin 66 against the wall of the slot 65, and thus forces the shoulder off the end of the arm 62.

If desired, the clamp may be reset at the top of the stroke by simply depressing the foot-lever until the link 47 partly engages the pin 49, care being taken not to depress it sufficiently to cause the shoulder of link 64 to hook over the point of lever.

With the parts in the position shown the revolution of the cam 10 will swing or move the lever or jaw to become fully engaged with the ratchet-wheel at the moment the stops 20 thereon engage the edges 21 of the casing, and the further action of said cam on the jaw or lever causes the casing to move with the jaw or lever, and thus rotate the ratchet-wheel, which through its connection with the disks 29 causes the latter to rotate and to thus through the friction-disks 31 and 33, slidingly secured to the shaft 8, rotate the latter. The pinions 12 on said shaft 8 operate through the rack-bars 13 to press the clamp down on the paper till the pressure

thereon is sufficiently great to overcome the frictional contact between the disks 29 and 31 and 33, when the first-named disk will slip between the disks 31 and 33 and continue to turn with the ratchet-wheel during the further rearward swing of the casing and hold the clamp down on the paper with the greatest pressure obtainable—that is, with that degree of pressure which was sufficient to overcome the frictional contact between the disks. The continued movement of the ratchet-wheel and the disks 29 after the friction between the disks has been overcome holds the clamp down on the paper until the knife has severed the paper, the parts being so timed that when this occurs the cam 10 has presented its flat or straight edge to the roll 14 and the casing is gradually swung back to its starting position by the weight 39.

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

1. The combination, with the presser-bar or clamp of a paper-cutting machine, of a shaft for applying pressure to said bar or clamp, a friction device, comprising disks and a ratchet wheel or ring, carried by said shaft, a casing surrounding said friction device, a lever pivoted to said casing and means, operating said lever to cause it to engage said ratchet wheel or ring to impart movement to said shaft.

2. The combination, with the presser-bar or clamp of a paper-cutting machine, of a shaft for applying pressure to said clamp or bar, a friction device carried by said shaft comprising disks and a ratchet wheel or ring, a casing surrounding said friction device, a lever pivotally connected with said casing, a roller carried by said lever, and pawls pivoted to said casing and adapted to be operated by said lever to engage the ratchet wheel or ring.

3. The combination, with the presser-bar or clamp of a paper-cutting machine, of a shaft for applying pressure to said clamp or bar, disks slidingly keyed to said shaft, disks interposed between said shaft-disks, fiber washers arranged between said disks, a ring or ratchet-wheel surrounding the middle disks and keyed to the interposed disks, a casing surrounding said disks and a wheel or ring, a lever pivoted to the casing, a roller carried by said lever, and means for imparting motion to said lever.

4. The combination, in a paper-cutting machine, of a presser-bar or clamp, a bell-crank lever having its axis transverse the plane of motion of the presser-bar and having one of its arms provided with a roller engaging said bar or clamp, a lever having one end pivoted to the frame, a link connecting the free end of said lever and the other arm of the bell-crank lever, a shaft having its axis transverse to the axis of said bell-crank lever, and a cam mounted on said shaft and adapted to engage and swing said pivoted lever in a plane parallel to said shaft, whereby the bell-crank le-



ver is oscillated and the presser-bar automatically raised and lowered.

5 The combination with the presser-bar or clamp, of a pivoted arm engaging said bar or  
5 clamp, a swinging lever, a link connecting said swinging lever and arm, a cam for operating said swinging lever, a shaft, a lever rigidly secured to said shaft, a rod connecting  
10 said last-named lever and the pivoted arm, means, connecting the link and rod, for disconnecting the link and pivoted arm, and a foot-lever for operating said pivoted arm.

6 The combination with the presser-bar or clamp, of a bell-crank lever having one arm  
15 engaging said bar or clamp, a lever pivoted

at one end to the frame, a link connecting said lever and the bell-crank lever, a shaft, a lever having an upward extension secured to said shaft, a rod connecting said last-named lever and the bell-crank lever, a slotted link 20 carried by the first-named link, and engaging said rod, and a foot-lever secured to the shaft.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD M. LOCKWOOD.

Witnesses:

R. S. MARVIS,

J. A. SCHICKLING.



It is hereby certified that Letters Patent No. 623,089, granted April 11, 1899, upon the application of Edward M. Lockwood, of Oswego, New York, for an improvement in "Paper-Cutting Machines," were erroneously issued to said Lockwood, as sole owner of the invention; whereas said Letters Patent should have been issued to *the Oswego Machine Works, of same place*, said Oswego Machine Works being assignee of the entire interest in said invention as shown by the assignment of record in this Office; and that the 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 18th day of April, A. D., 1899.

[SEAL.]

WEBSTER DAVIS,  
*Assistant Secretary of the Interior.*

Countersigned:

C. H. DUELL,  
*Commissioner of Patents.*