

No. 706,237.

Patented Aug. 5, 1902.

H. HÖLSCHER.

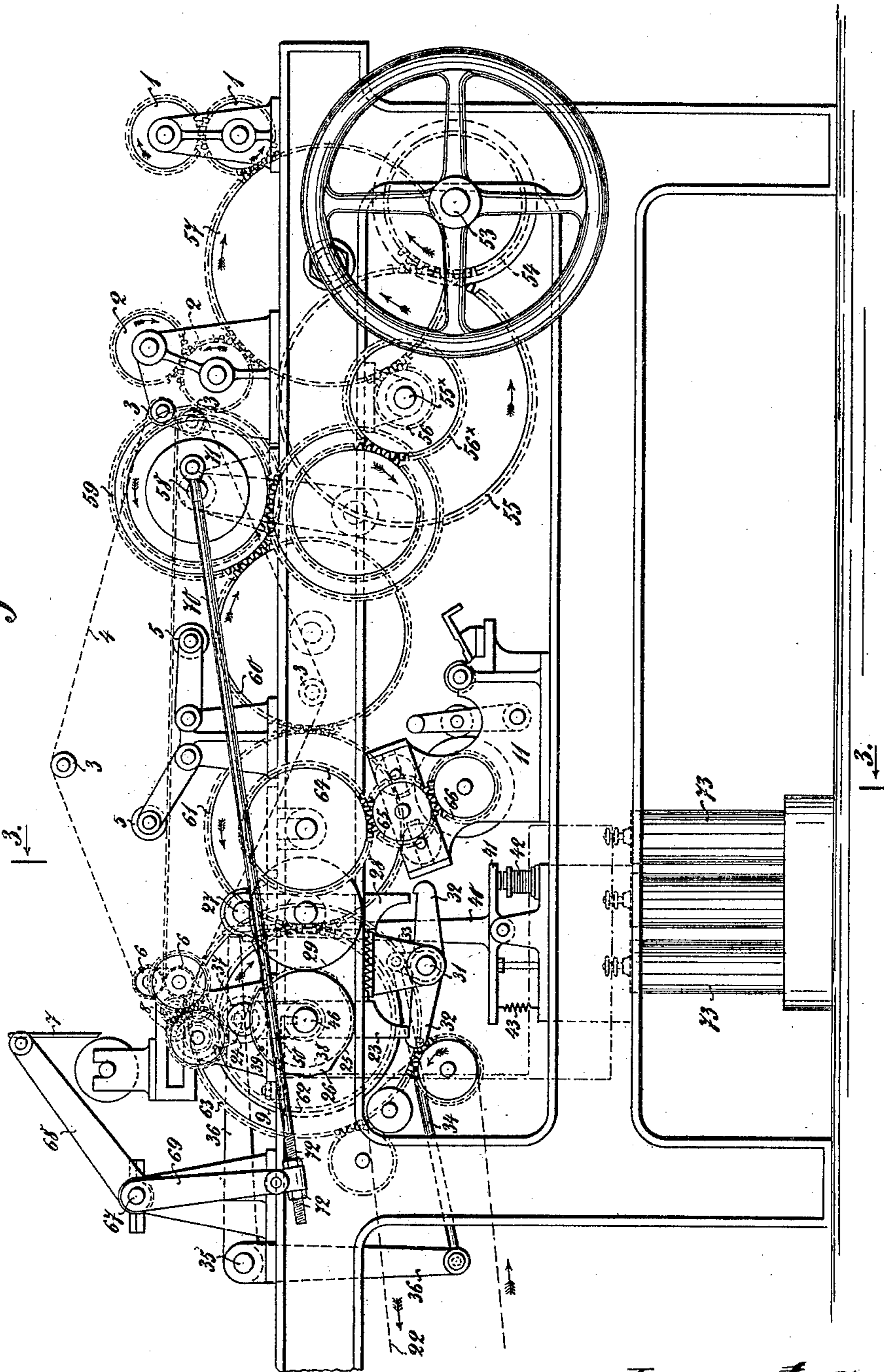
PRINTING APPARATUS FOR USE WITH MACHINES FOR MAKING PAPER BAGS.

(Application filed Mar. 19, 1900.)

(No Model.)

6 Sheets—Sheet 1.

Fig. 1.



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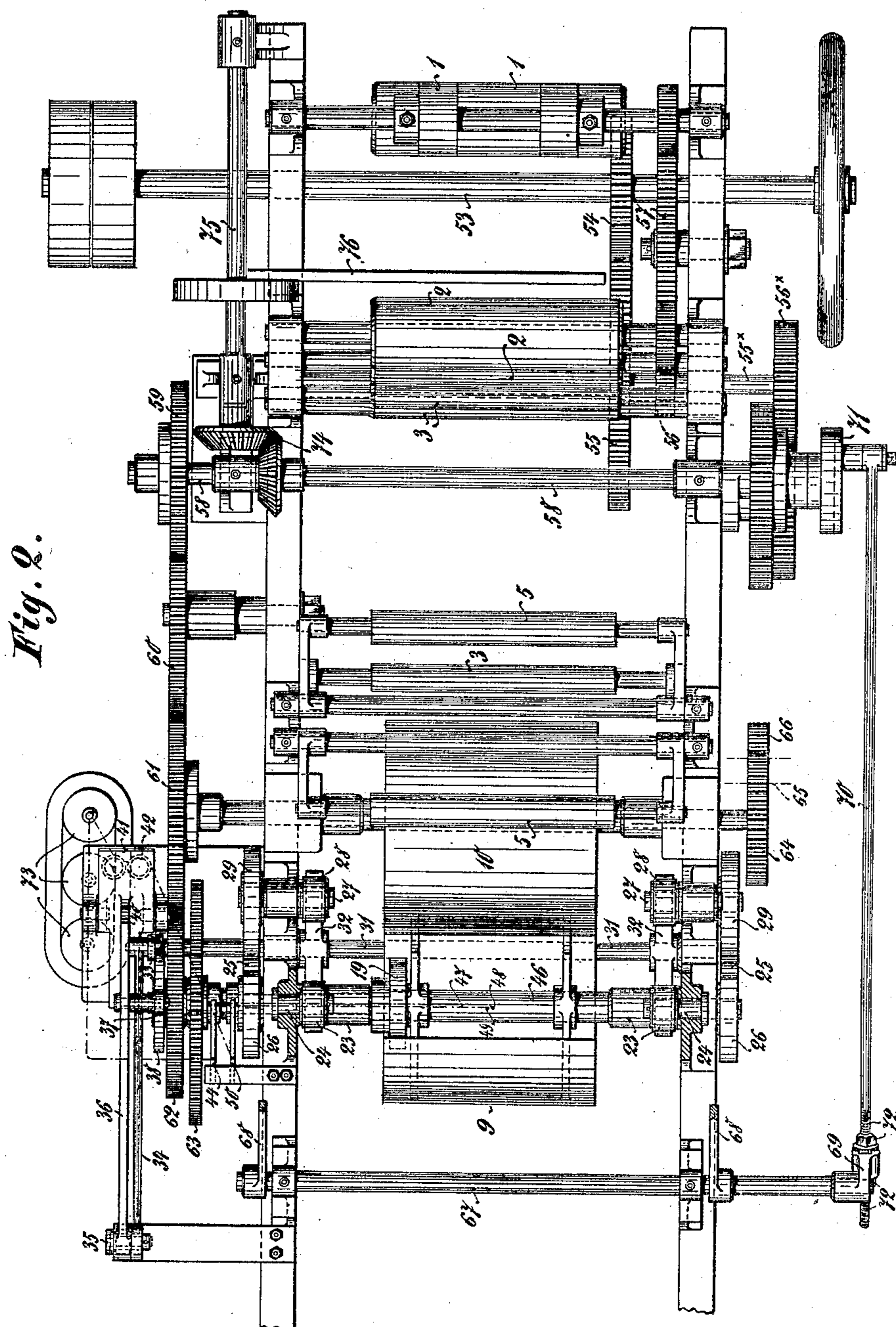
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6 Sheets—Sheet 2.



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Fig. 3.

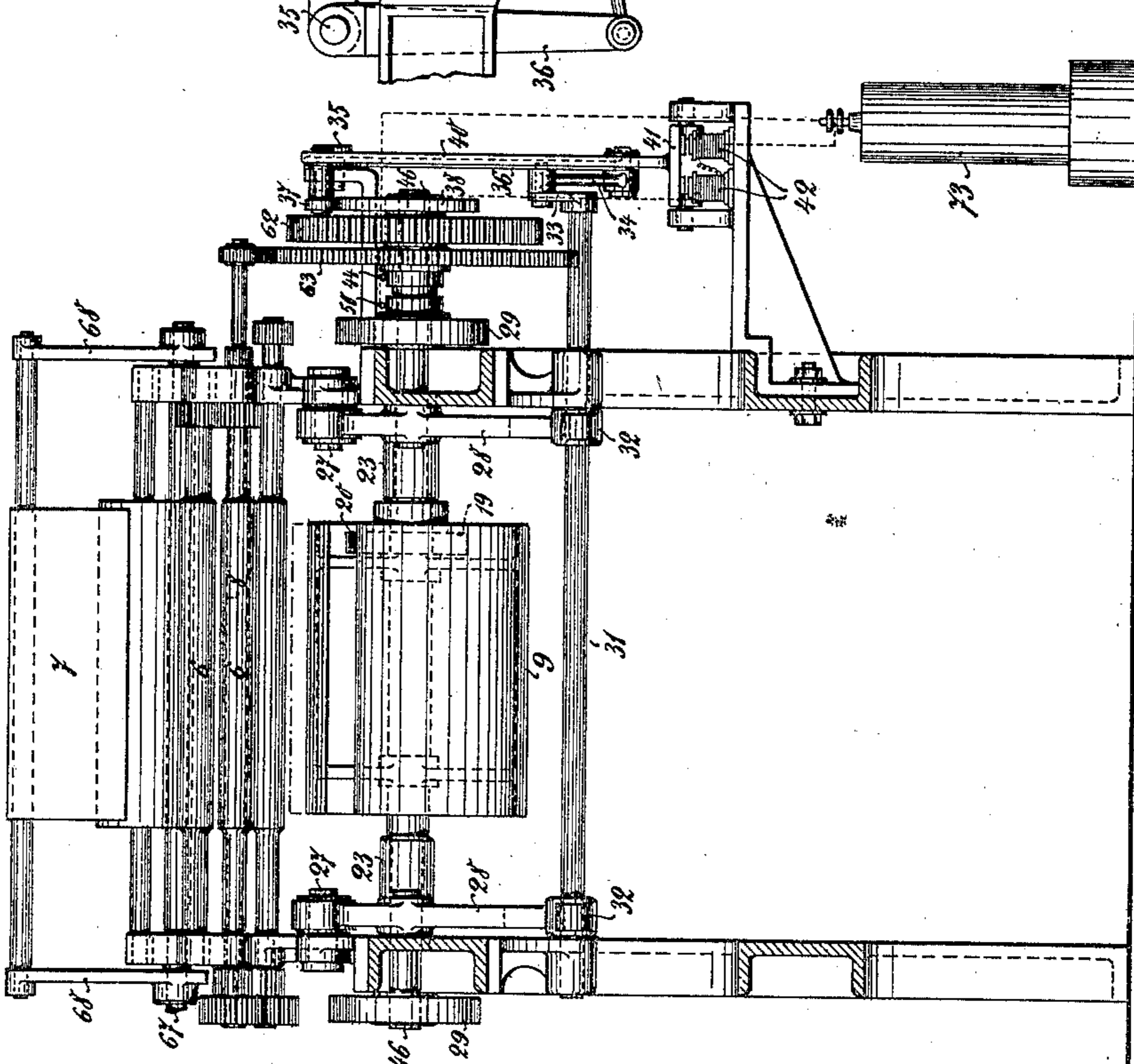
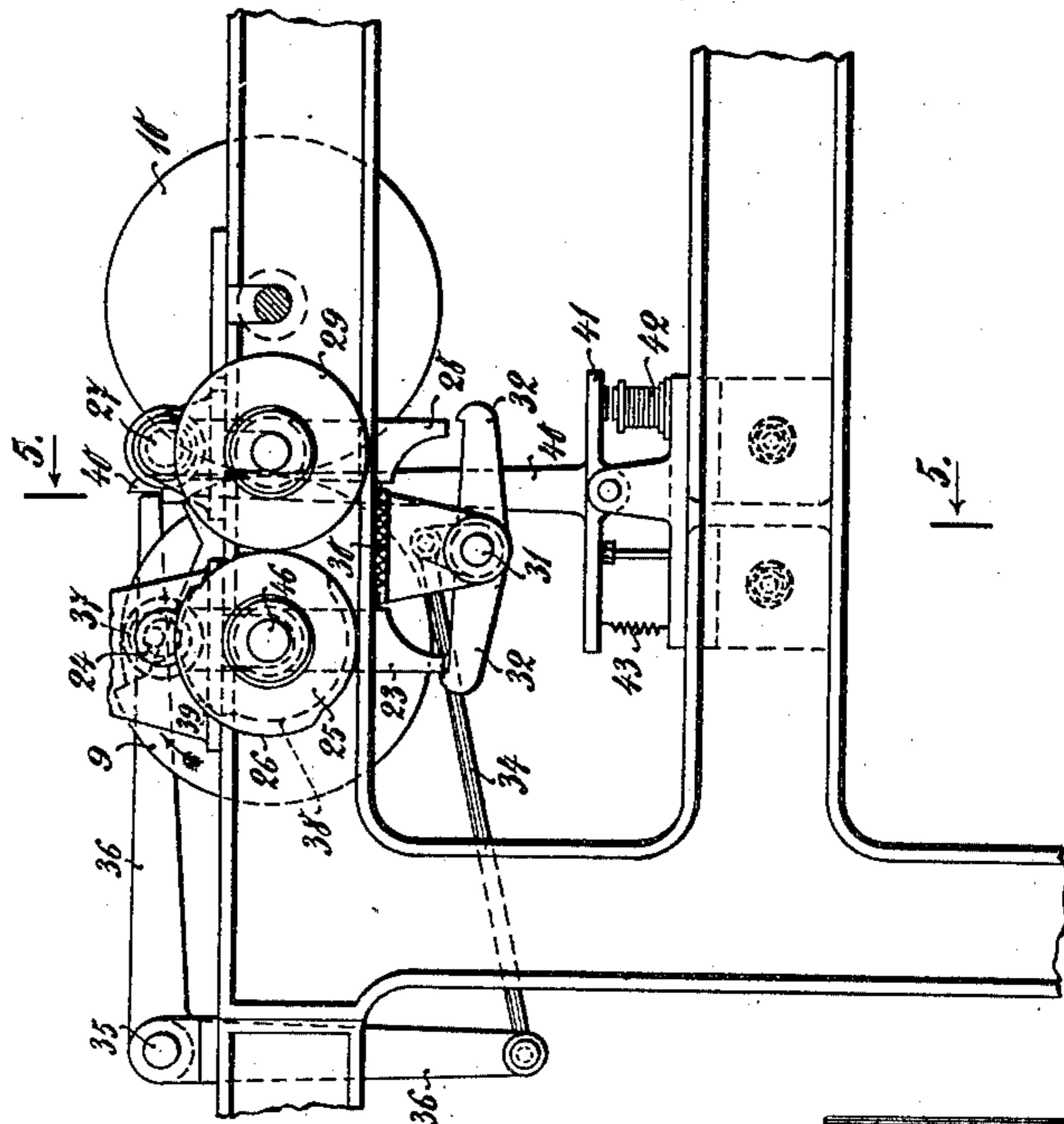


Fig. 4.



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Fig. 6.

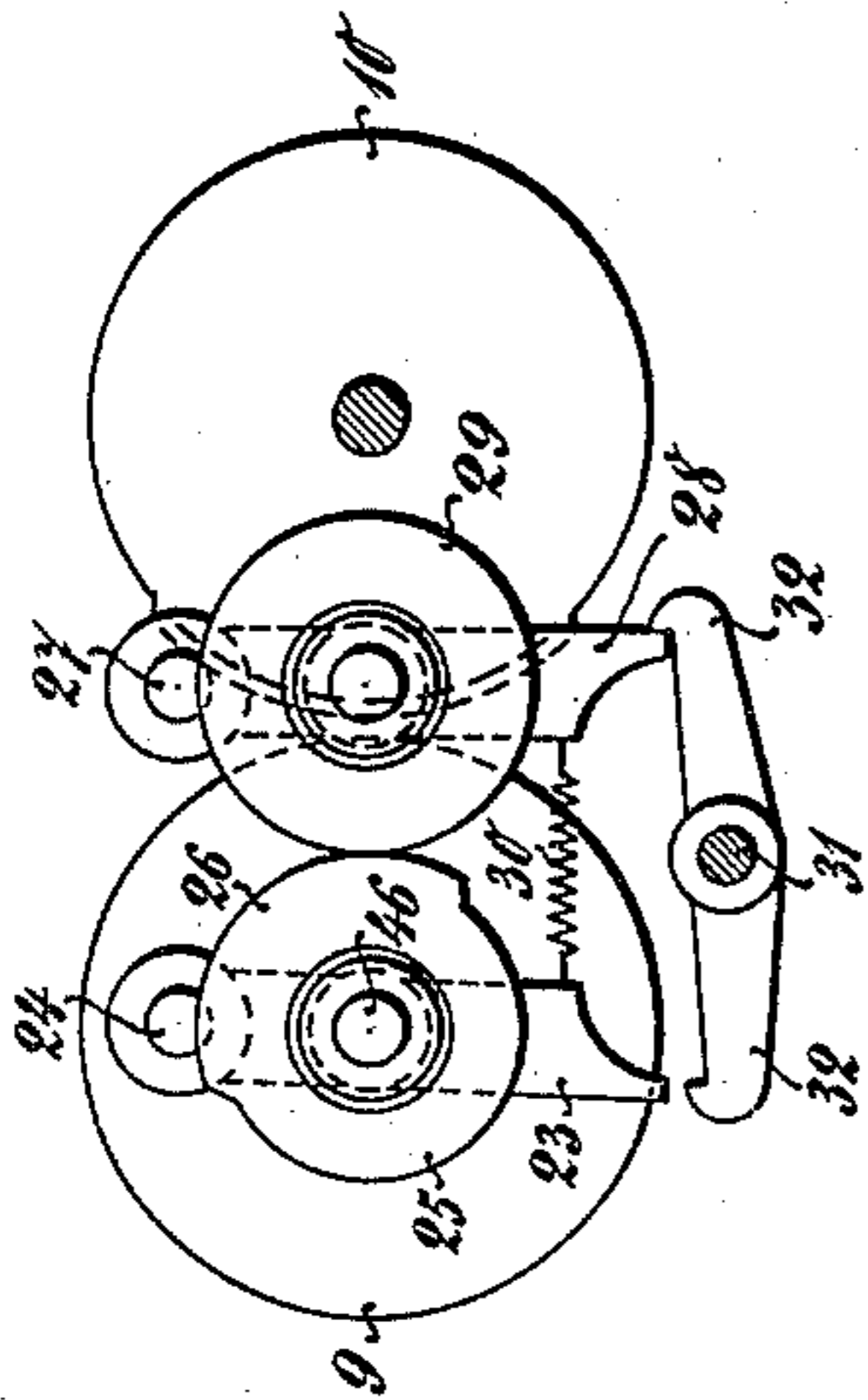


Fig. 7.

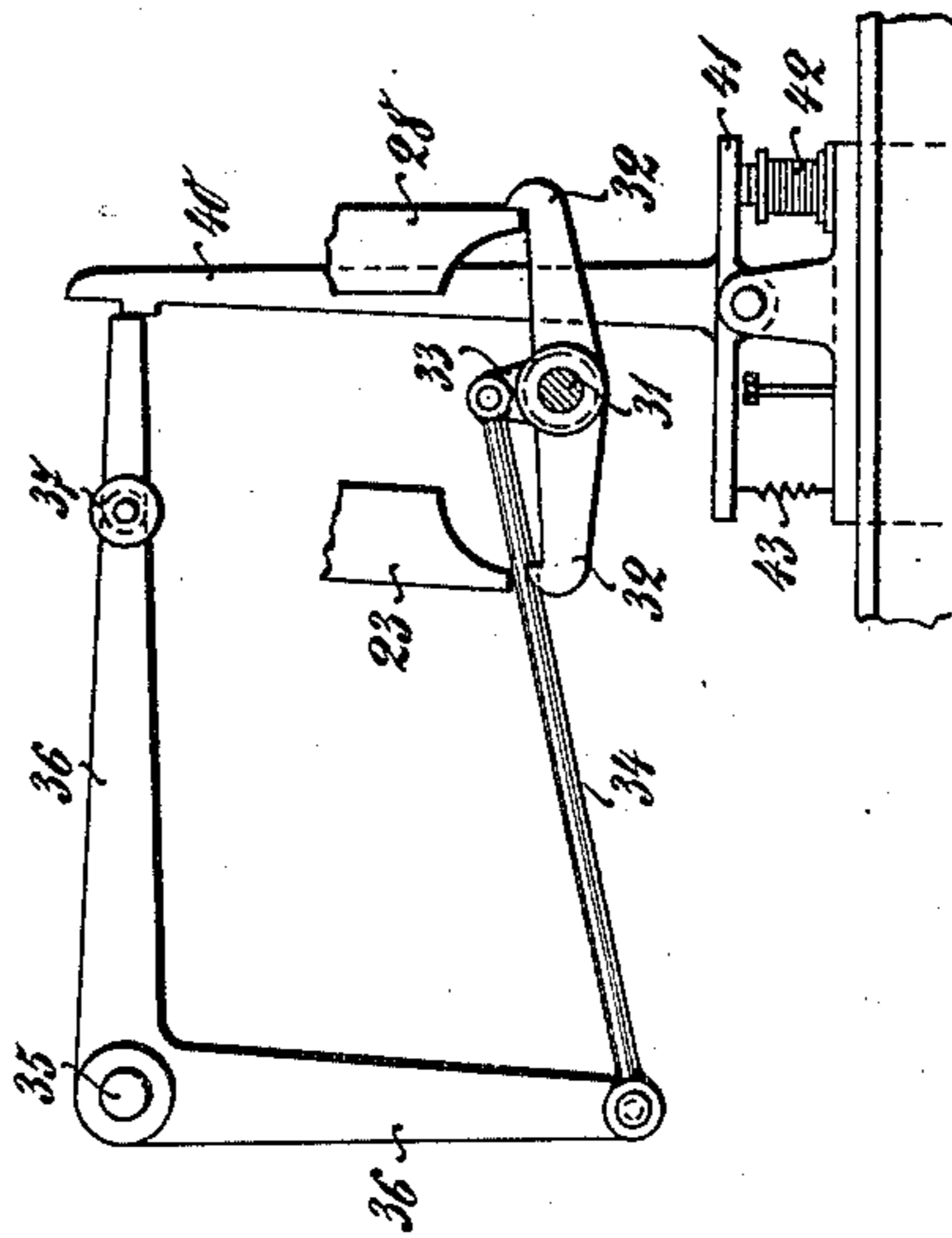


Fig. 5a.

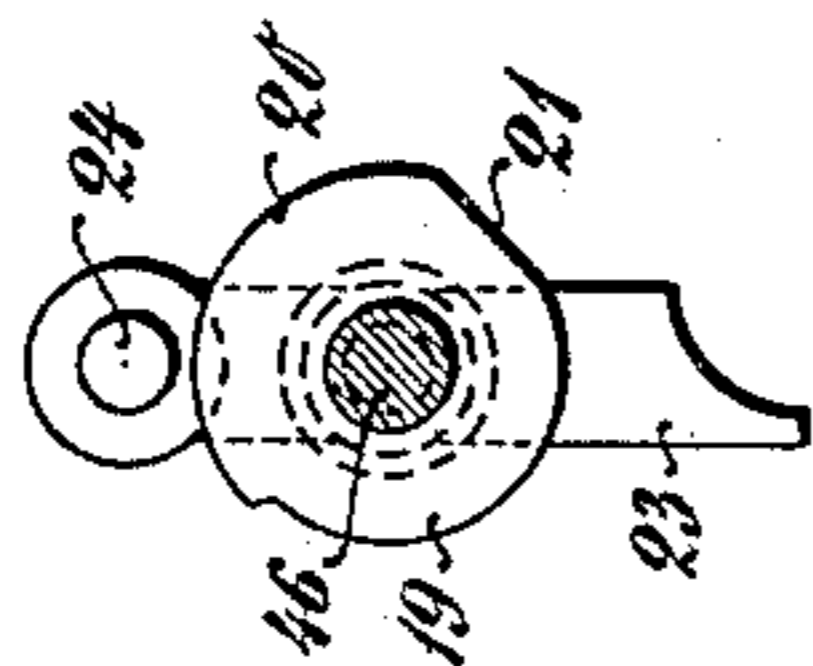


Fig. 5b.

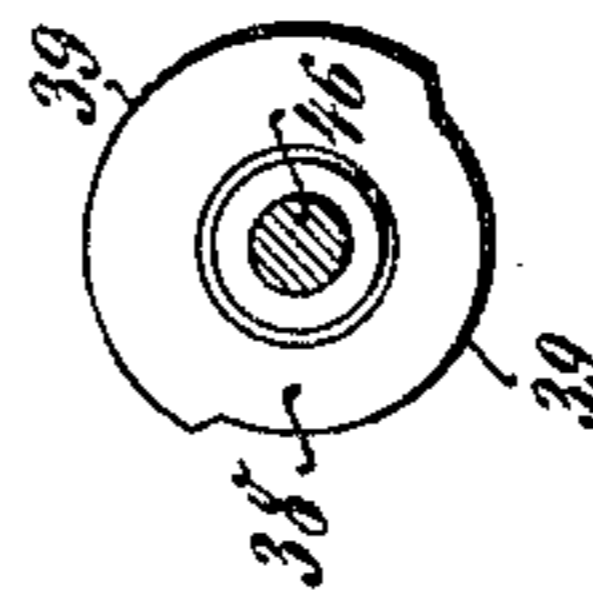
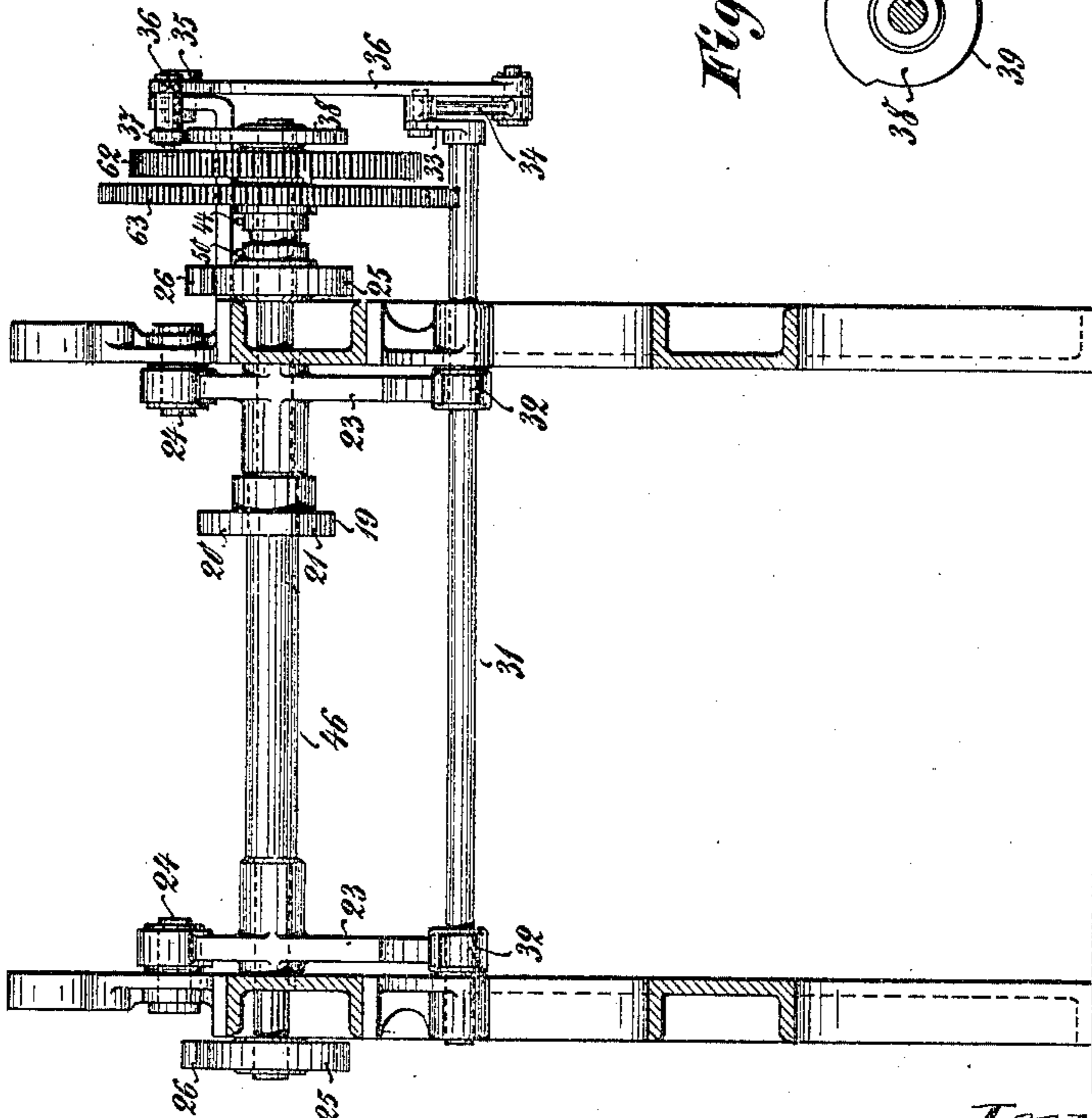


Fig. 5.



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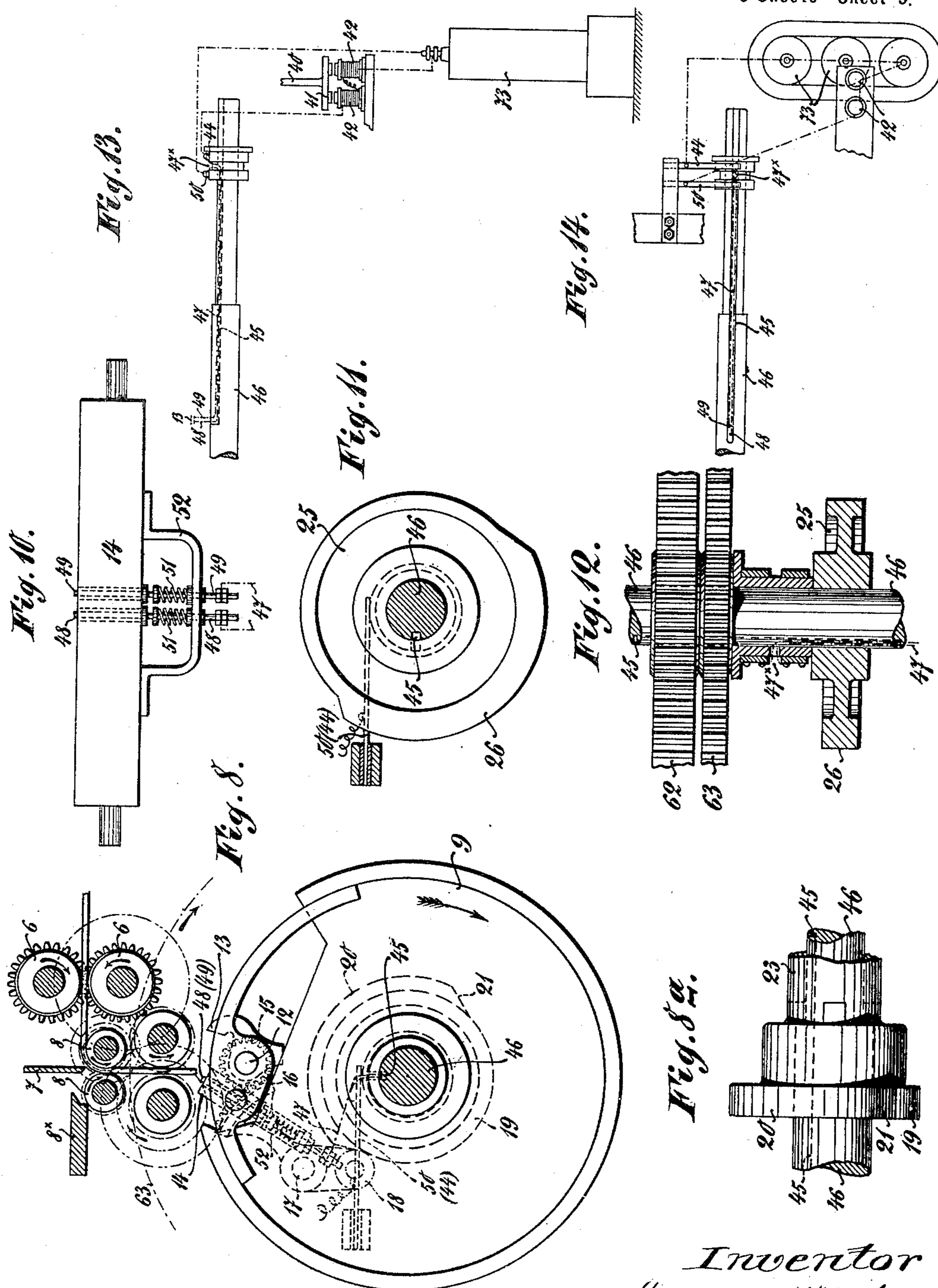
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(No Model.)

6 Sheets—Sheet 5.



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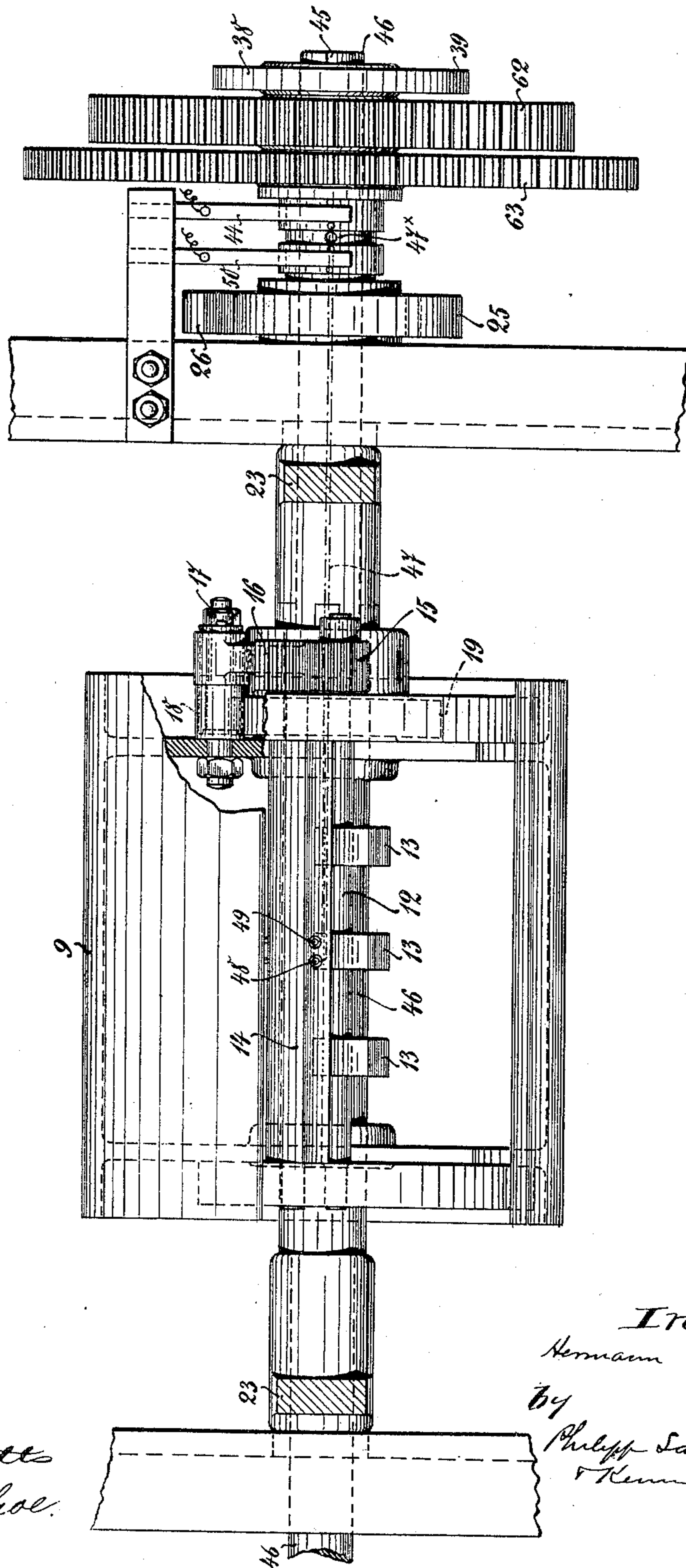
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(Application filed Mar. 19, 1900.)

(No Model.)

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Fig. 9.



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UNITED STATES PATENT OFFICE.

HERMANN HÖLSCHER, OF LENGERICH, GERMANY.

PRINTING APPARATUS FOR USE WITH MACHINES FOR MAKING PAPER BAGS.

SPECIFICATION forming part of Letters Patent No. 706,237, dated August 5, 1902.

Application filed March 19, 1900. Serial No. 9,167. (No model.)

To all whom it may concern:

Be it known that I, HERMANN HÖLSCHER, a subject of the King of Prussia, German Emperor, residing at Lengerich, in the Kingdom of Prussia, German Empire, have invented a new and useful Improvement in Bag-Printing Machines, of which the following is a specification.

The printing upon bags, cornets, and the like of paper of the names of firms or other particulars has hitherto been carried out after the completion of the article in a special press by special workmen, and thus the cost of the printing was comparatively high. Now according to this invention the printing upon the paper bags, cornets, and the like is effected during their manufacture by the aid of a rotary printing apparatus interposed in the bag-making machine, and thus not only cheaper but quicker work is obtained. With this improved arrangement, however, it may happen that the feeding of the paper bags into the rotary printing-press becomes interrupted accidentally through the tearing of the paper web or through any other cause in the working of the machine, and in such a case the ink will be transmitted to the printing-cylinder and will then smear the bags or the like afterward supplied thereto until the ink has been completely removed. This smearing of the bags may of course be prevented by stopping the machine and cleaning the cylinder; but this would entail a great loss of time, which is specially important when such interruptions are of frequent occurrence.

In order to absolutely obviate the before-mentioned defects, the improved printing-press is provided with an arrangement by which the printing is automatically stopped directly the paper bag fails to reach the printing device and is again automatically started as soon as the feed takes place.

The improved printing-press interposed in the paper-bag-making machine consists, for example, of an impression-cylinder, a type or plate cylinder, and suitable inking mechanism of known construction. In order to prevent printing when no bags are being fed, a cross-bar or bridge arranged opposite the grippers is fitted with two spring contact-pins in connection with an electric circuit. If the grippers close without holding a paper bag

between them and the bridge forming a counter-bearing, one of these grippers will be brought into metallic contact with both the said contact-pins, and thereby close an electric circuit, which then prevents the impression-cylinder from coming into contact with the type-cylinder, so that no printing can take place. The arrangement adopted for separating the two cylinders through the closing of the circuit is as follows: The impression-cylinder is mounted in oscillating bearings and its shaft is furnished at each end with a cam-disk. Opposite these cams are disposed two circular disks, mounted also in swinging bearings. The bearings which project downwardly are drawn toward each other by springs, so that the rotation of the impression-cylinder causes all the disks to revolve. Below the projecting ends of the bearings are keyed upon a common shaft double locking-levers adapted to retain either the cam-disks and the impression-cylinder or the circular disks. When the cylinder of the printing-press rotates and according as to whether the double locking-lever engages the one or the other of the projecting ends of the swinging bearings, either the impression-cylinder is separated from the type-cylinder or the circular disks move back, so that in the first case printing is interrupted and in the second case printing takes place. The operation of the double locking-lever is effected by the aid of a lever system in connection with the oscillating armature-lever of two electromagnets, which acts in the following manner: When a paper bag is fed between the grippers and the contact-pins of the bridge form the counter-bearing therefor, the electromagnets interposed in the electric circuit are not affected and the armature remains at rest and by its projection retains the lever system and causes the double locking-lever to lock the swinging bearings and keep the impression-cylinder in position for printing. If no paper bag is fed into the printing apparatus, the grippers on coming against the contact close the circuit, thereby causing the electromagnets to be magnetized and attract the armature-lever, which thereupon releases the lever system and enables the double locking-lever to engage the bearing of the circular disk. So soon as the projecting cam-surfaces during

their further rotation are brought in contact with the circular disks the shaft and the impression-cylinder are moved away from the type-cylinder and the printing ceases.

5 Obviously the automatic device before described may also be used in connection with other rotary printing-machines.

In the accompanying drawings I have shown a practical method of applying the invention.

Figure 1 is a side elevation of a paper-bag-making machine to which this invention has been applied. Fig. 2 is a plan view of the same. Fig. 3 is a cross-section taken upon the line 3 3, Fig. 1, looking from right to left. Fig. 4 shows a side elevation of the impression-cylinder and also the type-cylinder with the automatic stopping and starting device, the double locking-lever being engaged with the bearings of the impression-cylinder and printing takes place. Fig. 5 is a vertical section on the line 5 5 of Fig. 4, looking from right to left. Figs. 5^a and 5^b are detail views. Fig. 6 is a side elevation showing the two cylinders with their swinging bearings, the cam-disk, and the double locking-levers. Fig. 7 shows a side elevation of the lever system in connection with the double locking-lever and the electromagnets for operating them. Fig. 8 is an end view of the impression-cylinder with its grippers and with the feed-rollers. Fig. 8^a is a separate view of the cam-disk for operating the grippers. Fig. 9 is a plan view of Fig. 8. Fig. 10 shows the arrangement of the contact-pins disposed upon the bridge-piece forming counter-bearings. Figs. 11 and 12 show the friction-springs with the conducting-wires buried in a groove in the shaft of the grippers. Fig. 13 is a diagrammatic front view showing the contact-fingers, the wires which form the electric circuit, and the electromagnets. Fig. 14 is a diagrammatic plan view of the parts shown in Fig. 13.

A piece of paper sufficient to form a bag after having been cut from the continuous web and folded or lapped into the form of a tube is fed along by feed-drums 1 1 2 2, Figs. 1 and 2, to the conveyer-bands 4, which pass over suitable rollers 3 3, Fig. 1. These conveyer-bands, which are held close together by rollers 5, conduct the paper tube as far as the rollers 6 at the ends of the bands, where it is retained by a cross-bar 8^x, Fig. 8, until its front edge has been pushed downward between the feed-rollers 8 by a slide 7. The manner of actuating the said slide and other parts will be hereinafter explained. The rollers 8 conduct the paper tube, after first closing the folded bottom thereof to finish the paper bag, to the rotary printing apparatus arranged in the machine, such apparatus consisting mainly of an impression-cylinder 9, the type-cylinder 10, and inking mechanism 11, mounted beneath the cylinders. The impression-cylinder 9 rotates in the direction indicated by the arrow, Fig. 1, and is located vertically below the feed-rollers 8 and is

formed with a peripheral recess for the reception of the gripper mechanism. (See Figs. 8 and 9.) This mechanism consists of a rotary shaft 12, carrying, say, three grippers 13 and a stationary cross-bar or bridge 14, which is the fixed jaw of the grippers. (See Fig. 10.) The rotary or gripper shaft at one end carries a toothed pinion 15, gearing with a toothed segment 16. This segment is mounted loose upon a stud or pivot 17, screwed in the end wall of the impression-cylinder 9, and has a roller 18, carried by its tailpiece, which runs upon a cam-disk 19, secured to the nave of the bearing 23, Fig. 5, and having a peripheral extension or cam-surface 20. During the rotation of the press-cylinder 9 the roller 18 of the segment 16 runs upon the projecting edge or cam-surface 20 of the cam-disk 19, and thereby moves the grippers 13 toward the bridge 14 and closes the same. When the roller 18 again leaves the cam-surface 20 and runs upon the plain portion of the cam-disk 19, which is firmly keyed upon the nave of the swinging bearing 23, Figs. 5 and 5^a, the grippers are caused to return to their initial position by springs, (not shown in the drawings,) and this causes the segment also to be moved back. When the grippers thus opened arrive underneath the feed-rollers 8, the paper bag pushed downward by the slide 7 has been sufficiently lowered by the said rollers to bring the edge of the paper between the open grippers and the cross-bar or bridge 14. At this moment the roller 18 of the segment 16 runs upon the projecting portion or cam-surface 20 of the cam-disk 19 and closes the grippers 13, which latter then retain the paper bag until it has been printed on by the type-cylinder 10. By this time the roller 18 has arrived at the portion 21 and escapes from the projection 20, Fig. 8, when the grippers 13 again open and release the paper bag, which is conveyed away by a delivery-band 22, Fig. 1, and is deposited upon a delivery-table. (Not shown in the drawings.)

To stop the printing if at any time and for any reason the machine fails to deliver a paper bag between the cylinders 9 and 10, these latter are separated from each other. To this end the impression-cylinder 9 is mounted in swinging bearings 23, pivoted at 24, Figs. 1, 3, 6, and upon the ends of the cylinder-shaft are provided, outside the machine-frame, disks 25, Figs. 5, 6, provided with a projection 26. In line with the cam-disk and also mounted in a second set of swinging bearings 28, pivoted at 27, are two circular disks 29. The swinging bearings 23 and 28 are drawn toward each other by springs 30 in such a manner that the rotation of the impression-cylinder causes the rotation of the circular disks 29 through the intervention of the cams 25, and upon the projection 26 coming against the circular disks they are caused to recede. When, however, the bearings 28 are held stationary, it is the impression-cylinder which is forced rearward, and thus separate from

the type-cylinder 10. According, therefore, as one or other action takes place printing proceeds or is interrupted.

To enable either the impression-cylinder 9, with the cams 25, or the circular disks 29 to be held stationary, as may be required, the bearings 23 and 28 are formed with downwardly-projecting portions adapted to be engaged by double locking-levers 32, Figs. 4 and 6, keyed to a common shaft 31 and arranged below the bearings. These double locking-levers are formed with hook-shaped noses at each end, which engage the projecting ends of the swinging bearings 23 or 28 with the object stated, so that in fact it depends upon the position of the double locking-lever whether printing takes place or not.

I will now describe the manner and means by which the double locking-lever is operated so that printing takes place only when a paper bag is supplied, while the printing ceases directly the feed is interrupted.

At one end of the shaft 31 of the double locking-lever 32 there is arranged a short upwardly-directed arm 33, Figs. 1, 3, 4, 5, and 7, pivoted to a connecting-rod 34, secured to a pivoted bell-crank lever 36, pivoted at 35. The horizontal arm of the bell-crank lever is furnished with a roller 37, which rests upon a disk 38, Fig. 1, secured to the end of the shaft of the impression-cylinder 9 and having a peripheral recess 39 or a corresponding projection. (See Fig. 5.) By this contrivance the bell-crank lever 36 is caused to swing upon its pivot 35, and thus govern the position of the double locking-lever 32. When the horizontal arm of the bell-crank lever 36 is raised, the bearings 23 of the impression-cylinder 9, together with the cams 25 upon its shaft, are locked firmly in position by the double locking-lever 32, while the circular disks 29 are free to yield at the required moment, and thus allow printing to take place. (See Fig. 4.)

In order to keep the bell-crank lever 36 in its raised position during the whole time that bags are being fed forward for printing, the free end of the horizontal arm of the said lever is held by a supporting-arm 40, Figs. 4 and 7. This supporting-arm is connected to the horizontally-arranged movable armature 41, which is arranged above the electromagnets 42 and normally kept out of contact with same by a spring 43. On the failure to feed a paper bag into the grippers 13 these latter by their contact with the contact-pins 48 49, Fig. 10, on the cross-bar or bridge-piece 14 close the circuit, so that the electromagnets 42 become excited, and in attracting the armature 41 against the tension of the spring 43 they cause the support or arm 40 to move and disengage the horizontal arm of the bell-crank lever 36. The arm then drops until its roller 37 rests in the recess 39 of the cam-disk 38, and thereby causes the double locking-lever 32 to alter its position, so as to engage the bearings 28 of the circular disks 29 while re-

leasing the impression-cylinder 9, which is then forced sidewise by the cam-surface 26 of the disk 25 coming into contact with the circular disk 29. In this case, as has already been stated, the printing is interrupted. (See Figs. 6 and 7.)

The electric circuit, in which are included the electromagnets 42, starts at the one pole of the battery 73, Figs. 1, 2, and 3, leads to the contact-spring 44, Fig. 2, through the wire arranged in a groove 45 of the shaft 46 of the impression-cylinders, Figs. 1, 11, 12, and the wire 47 being insulated at 47^x, Fig. 11, and then to the contact-pin 48 in the bridge-piece 14, Fig. 10. From the other contact-pin 49 a second wire, also arranged in the groove 45 of the cylinder 46, leads to the contact-spring 50, Fig. 2, and thence to the other pole of the battery 73, Fig. 1. As will be seen from Fig. 10, the contact-pins 48 49, in addition to being mounted in the bridge-piece 14, are guided in the strap or stirrup 52, and by their springs 51 they are caused to slightly protrude from the bridge-piece 14. If a paper bag has not been fed into the printing apparatus, the middle gripper comes against both contact-pins 48 49, and thereby closes the circuit actuating the electromagnet 42; but directly the gripper 43 opens again the circuit is interrupted. The circuit also remains open when a non-conducting body is placed between the grippers 13 and the contact-pins 48 49. As paper constitutes a bad conductor, the last-mentioned case must happen each time a bag is fed forward and engaged in the grippers 13. Thus during the continuous uninterrupted working of the machine the electromagnets 42 are not actuated and the bell-crank lever 36 remains engaged, so that the double locking-levers 38 retain the swinging bearings 23 of the impression-cylinder 9 and enable the printing to proceed. Directly, however, from any cause the paper bag fails to be delivered between the grippers 13 these latter come into contact with the contact-pins 48 49 and close the circuit. The electromagnets then become excited, attract the armature 41, the support 40, connected with it, is moved toward the right, and the lever system 36 34 reverses the double locking-lever 32, which latter then locks the swing-bearings 28 of the circular disk 29. In consequence the impression-cylinder 9 is therefore enabled at the required moment to separate from the type-cylinder 10 and printing ceases.

The machine is driven from the shaft 53. The toothed wheel 54 transmits the rotation to a larger toothed wheel 55. Upon the shaft 55^x of this latter wheel are arranged two other toothed wheels 56 and 56^x, Fig. 1, the wheel 56 gearing with the wheel 57, which communicates motion to the pairs of feed-rollers 1 and 2. The press and the type cylinders 9 and 10 are driven from the shaft 58 through the intervention of wheels 59, 60, 61, and 62, Figs. 1 and 2, the shaft 58 being driven by a wheel 56^x and intermediary gear arranged

on the outer side of the frame. The toothed wheel 63 drives the pairs of rollers 6 and 8 and the wheel 64 drives the inking-rollers through the intervention of the wheels 65 and 66. A longitudinal shaft 75, driven from the shaft 58 through the intervention of bevel-wheels 74, operates the knife-like beater 76, which between the two pairs of feed-rollers 1 and 2 cuts the bag material off the paper tube.

The slide 7, by which the front edge of the paper bag is inserted between the rollers 8, is articulated to a lever 68 on a cross-shaft 67. At the other end of the cross-shaft 67 there is provided an arm 69, connected by a rod 70 to the eccentric-pin of a disk 71 upon the end of the shaft 58. The motion of the slide 7 can be regulated by adjusting the nuts 72 on the screwed portion of the connecting-rod 70.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a bag-printing machine, the combination with the impression-cylinder mounted in swinging bearings, of cam-disks on the ends of the shaft of the cylinder bearing against circular disks mounted also in swinging bearings and double locking-lever, essentially as and for the purpose described.

2. In a bag-printing machine, the combination with the impression-cylinder mounted in swinging bearings, of cam-disks bearing

against circular disks also mounted in swinging bearings, double locking-lever, and means for keeping the swinging bearings of the press-cylinder locked as long as the bags are regularly fed to the printing apparatus and for releasing them when the feed is interrupted.

3. In a bag-printing machine, the combination with the impression-cylinder mounted in swinging bearings, cam-disks on shaft of press-cylinder, circular disks, swinging bearings for same, and double locking-lever connected by lever system with the armature of an electromagnet, essentially as and for the purpose described.

4. In a bag-printing machine, the combination with the impression-cylinder mounted in swinging bearings, cam-disks on shaft of press-cylinder, circular disks, swinging bearings for same, double locking-lever connected by link connection with a bell-crank lever, armature of electromagnet, and swinging support controlled by said armature, essentially as and for the purpose described.

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

HERMANN HÖLSCHER.

Witnesses:

J. A. RITTERSHAUS,
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