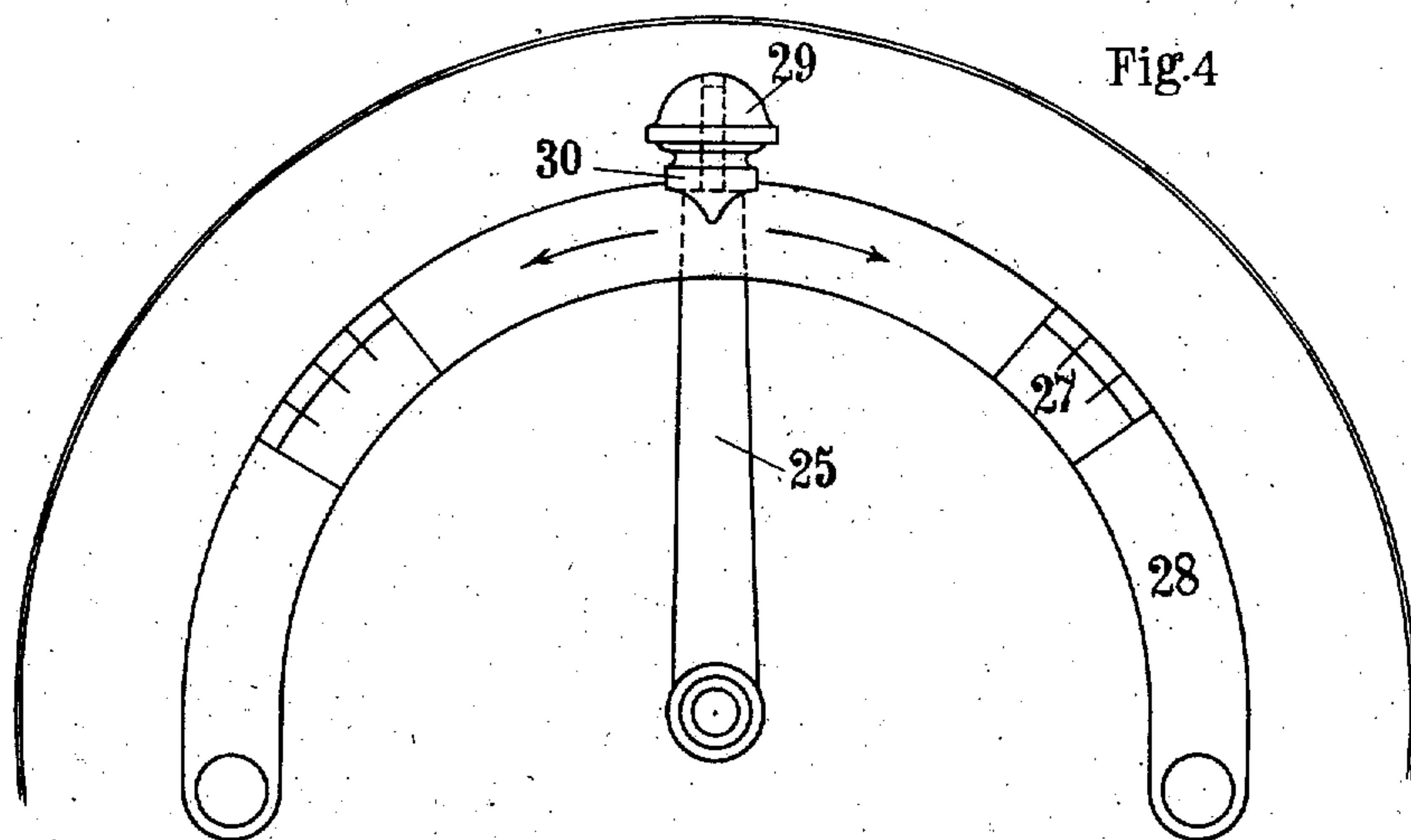
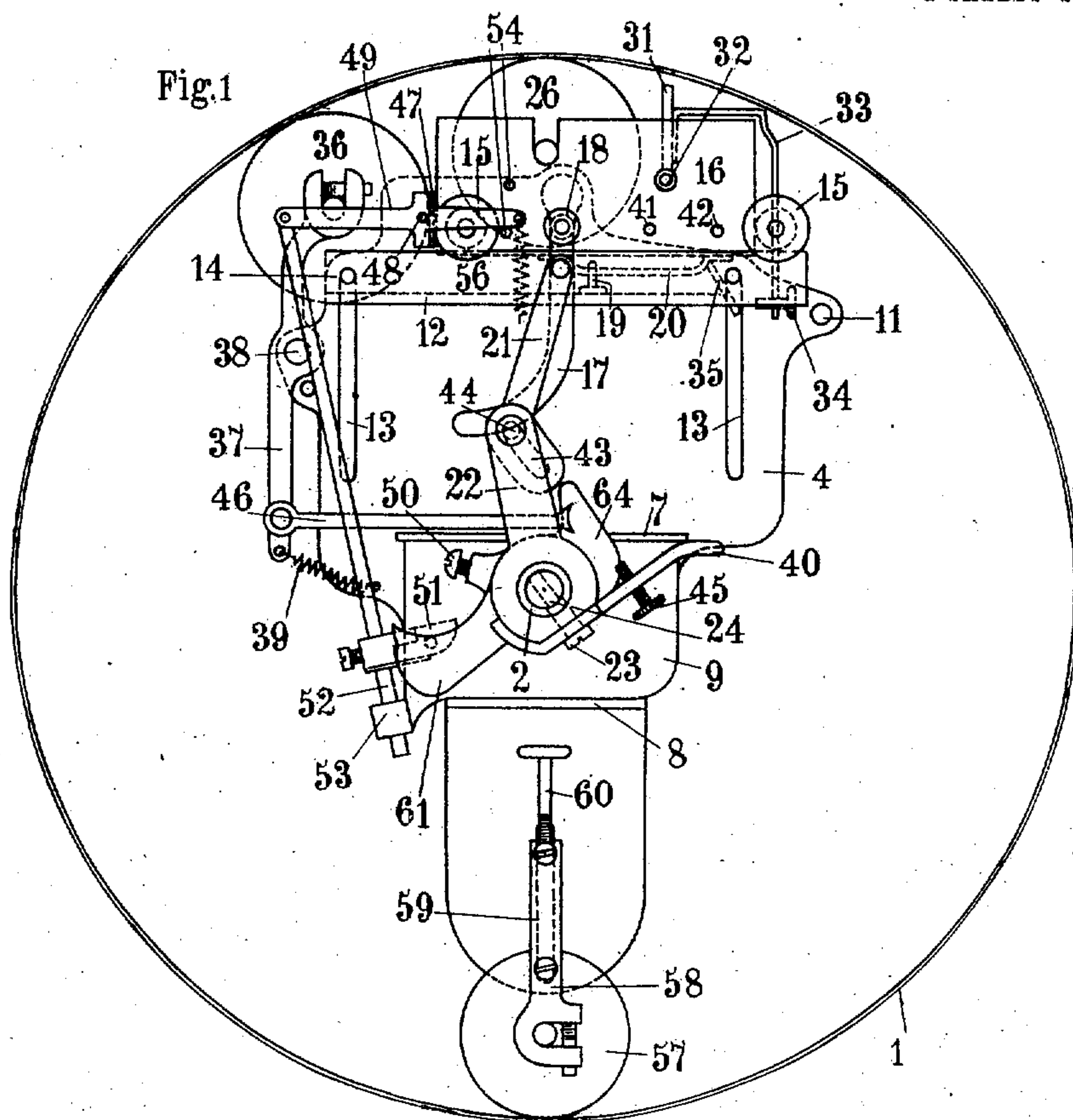


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 APPLICATION FILED JAN. 18, 1909.

973,520.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.



Witnesses,

1. L. E. Barkley.  
 2. E. J. Gibbs.

Inventor.

per.

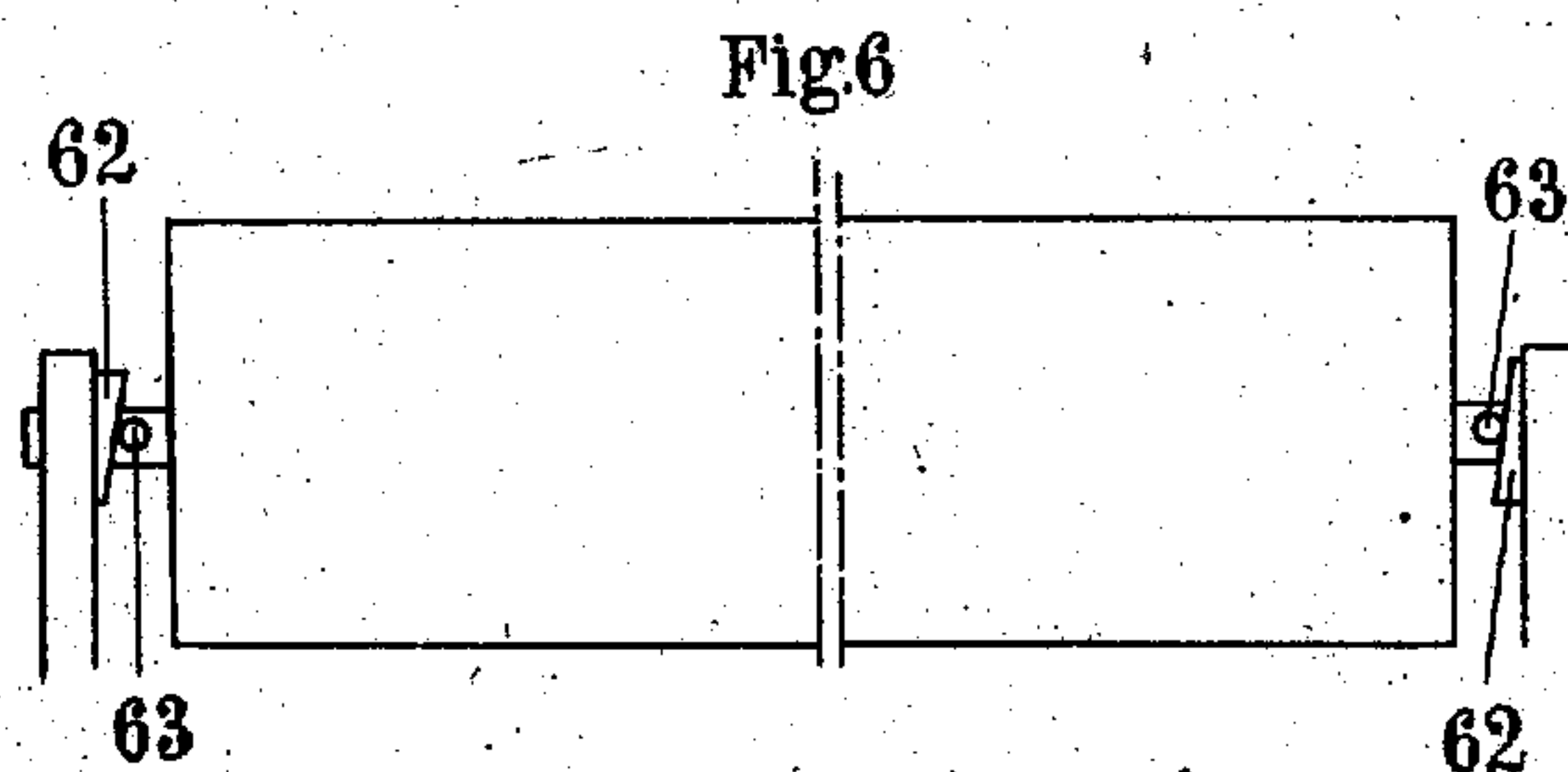
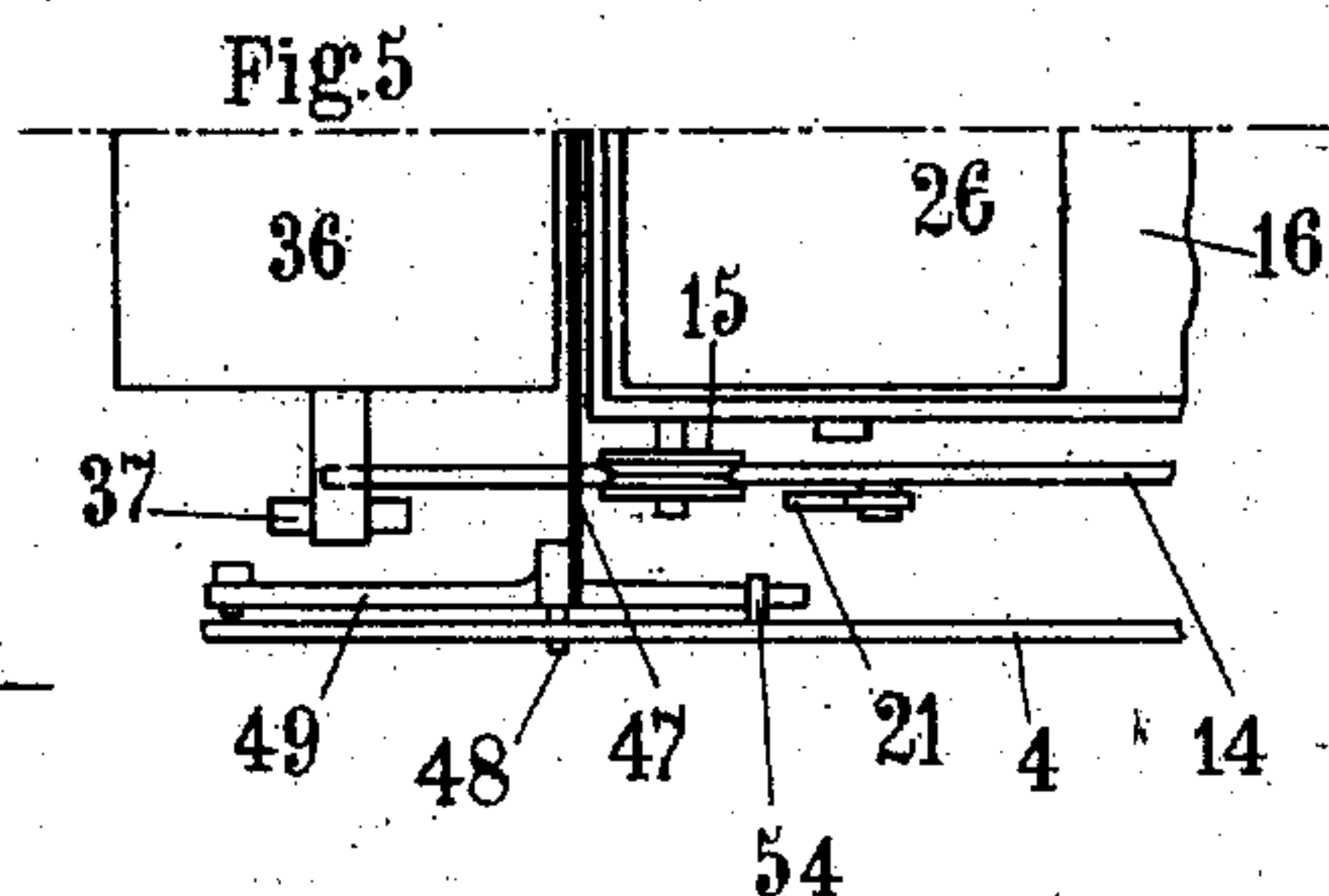
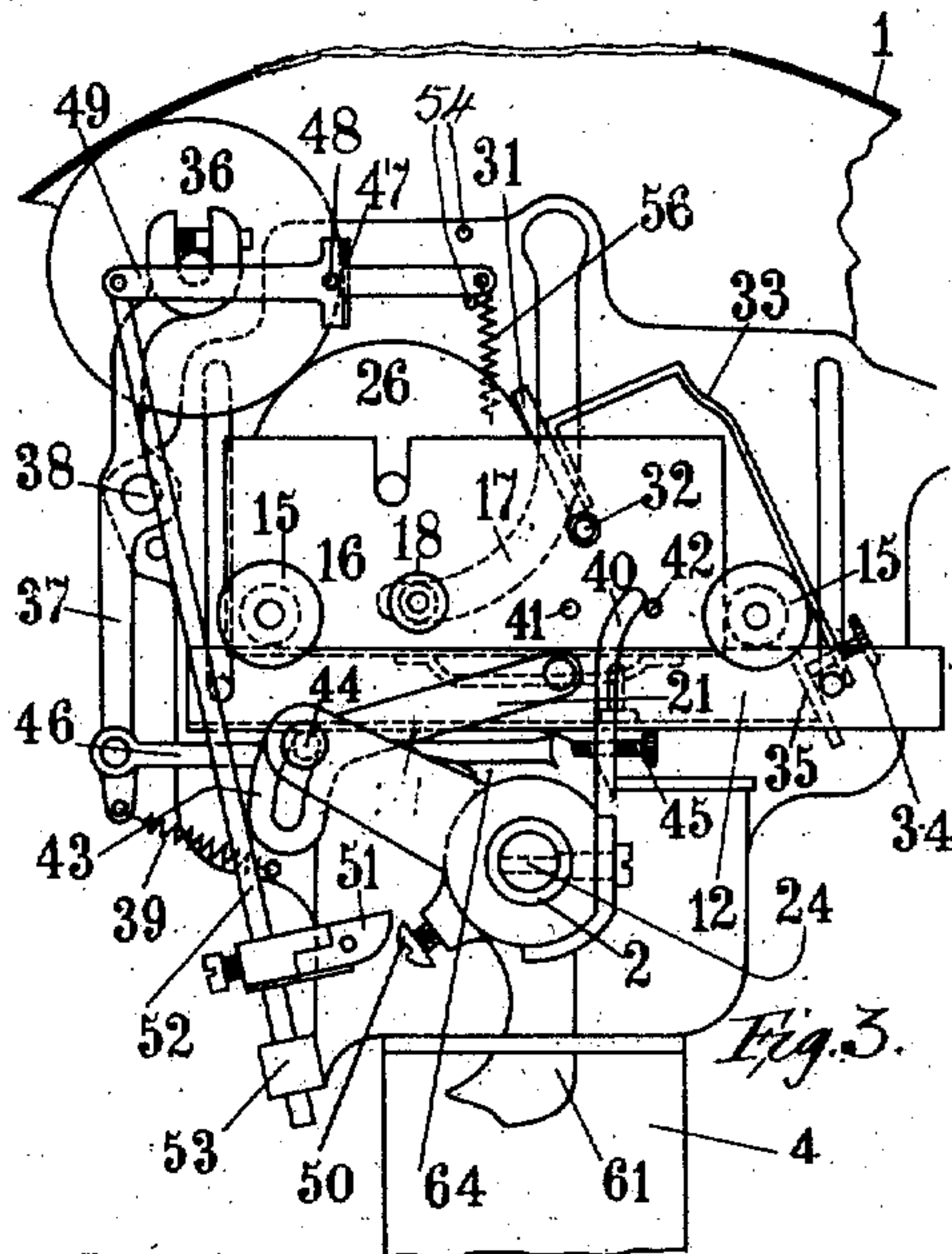
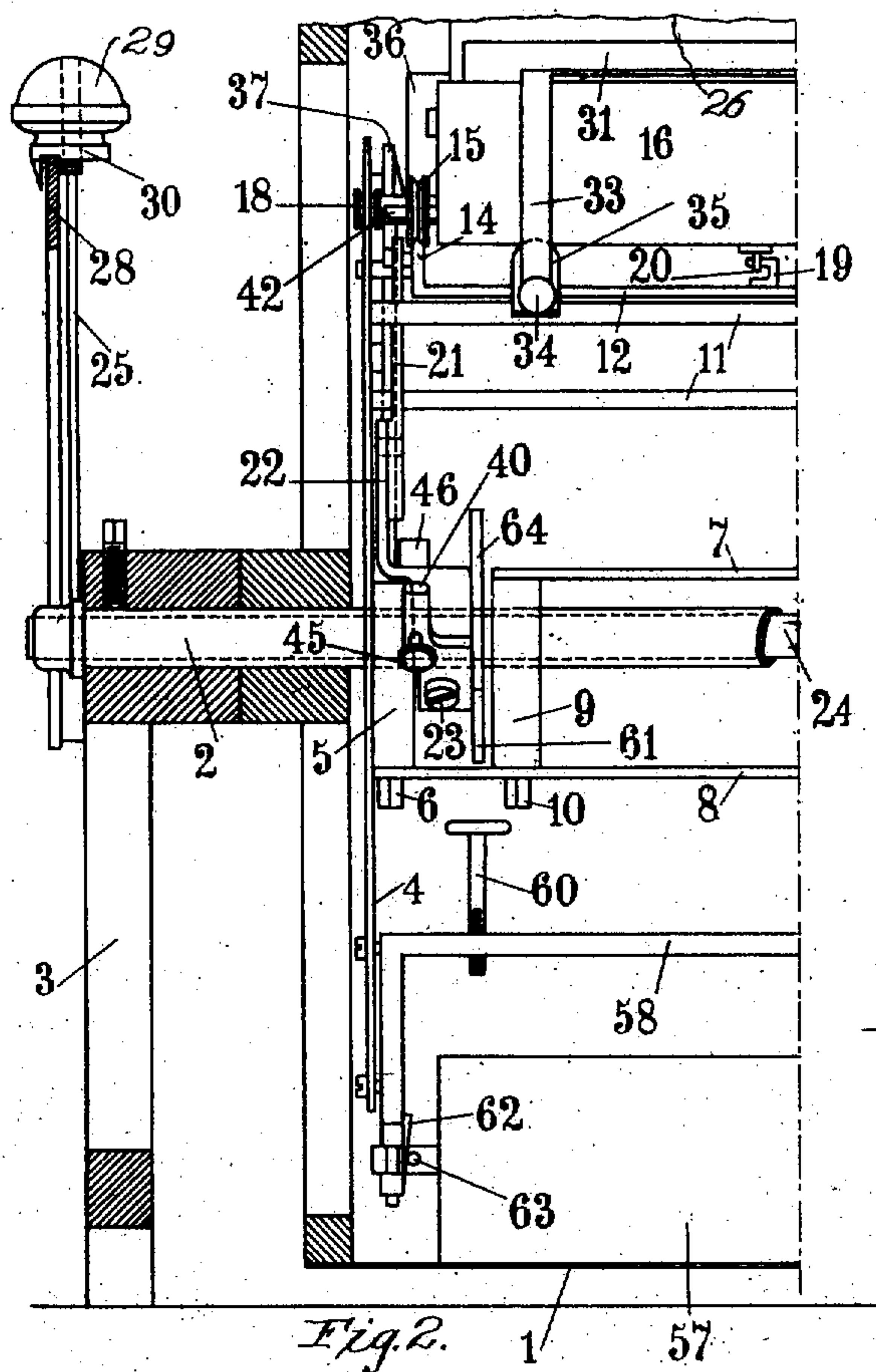
Paul Odon Laffitte.  
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2 SHEETS—SHEET 2.



Witnesses.

1. L. E. Backus.  
 2. E. J. Gibbs.

Inventor.  
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 Attorney.



# UNITED STATES PATENT OFFICE.

PAUL ODON LAFFITTE, OF PARIS, FRANCE.

INKING AND INKING-OFF MECHANISM FOR ROTARY PRINTING-MACHINES.

973,520.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed January 18, 1909. Serial No. 472,859.

*To all whom it may concern:*

Be it known that I, PAUL ODON LAFFITTE, a citizen of the French Republic, residing at 7 Rue de la Michodière, Paris, in the Department of Seine, France, have invented a new and useful Improvement in Inking and Inking-Off Mechanism for Rotary Printing-Machines, of which the following is a specification.

This invention relates to a mechanism for inking and inking-off for rotary duplicators. By this mechanism there can be obtained—

(1) The possibility of regulating and of controlling at will and at any moment either the direct inking of the cylinder when it is needful to make ready the apparatus, or for the indirect inking when it is needful to take the actual impressions, continuously and without stoppage in any number required.

(2) The possibility of inking-off the cylinder, that is to say of removing from it all the surplus ink which may have been applied to it, and returning the same directly to the ink holder without loss. This inking-off may be carried out in two ways, either by means of the same organs which serve to effect the direct and indirect inking of the cylinder, and in this case the inking-off is indirect; or by means of a supplementary scraper attached to these organs; and in this case the inking-off is direct, much more vigorous and rapid.

(3) The possibility of obtaining all the requisite checks and controlling arrangements both of the inking and of the inking-off whether direct or indirect while the apparatus is in operation and consequently without stopping its production, by the control of a single lever placed at and actuated from the outside.

A construction of the invention is illustrated in the accompanying drawing.

Figure 1 shows a side elevation with the organs in the position for direct inking and for direct inking-off. Fig. 2 shows a partial front elevation. Fig. 3 shows a partial side elevation showing the organs in the position requisite for the indirect inking and the indirect inking-off. Fig. 4 shows a controlling lever with a graduated sector. Fig. 5 shows a partial plan view corresponding to Fig. 1 and to Fig. 3 for the direct inking-off. Fig. 6 shows diagrammatically

a means for producing a to and fro longitudinal motion in a roller.

In these drawings, 1 indicates the rotary cylinder of the duplicator, revolving upon the hollow axle 2 fixed in the external frame 3. In the interior of the cylinder is fixed a frame upon the axle 2 for holding the ink vessel and the controlling mechanism. This frame comprises at each end a vertical plate 4, a hub 5 of which surrounds the axle 2 and is clamped upon it by the screw 6. The two plates 4 are connected together by flat cross pieces 7 and 8 fixed upon the top and the bottom of the hubs 5. These cross pieces are moreover fixed upon the transverse pieces 9 also fastened upon the axle 2 by means of screws 10. Two other cross pieces 11 further connect the upper parts of the plates 4 together. In the frame thus constructed a plate 12 can move vertically, guided at its ends by the guides 13 arranged in the plates 4. The ends of this plate 12 are raised in the form of rails 14 and support rollers 15 mounted upon the ends of an inker 16 so that this latter can move horizontally upon the rails 14 and vertically together with the plate 12. It is guided in this double motion by means of the curved guides 17 formed in the plates 4 and in which the pivots 18 slide, the said pivots being fixed to the ends of the inker. It therefore suffices to raise or to lower the plate 12 in order to obtain a similar vertical displacement of the inker and a transverse motion corresponding thereto. Any raising of the inker with regard to the plate is prevented by means of the clips 19 fixed upon the plate and engaging in recesses 20 beneath the inker. In order to raise or lower the plate 12, this plate is connected by the parts 21 to two arms 22 which are bound together by screws 23 with an oscillating shaft 24 mounted in the interior of the hollow axle 2, which axle is conveniently slotted for the passage of the screws 23. It suffices to cause the shaft 24 to oscillate by means of a lever 25 fixed upon the end of the shaft projecting beyond the frame 3, in order to raise or lower the two ends of the plate simultaneously.

In the interior of the inker is placed the inking roller 26 which comes in contact with the cylinder 1 when the plate 12 is raised. This contact commences before the termination of the vertical motion of the plate and becomes more and more strong in



proportion as the arm 22 and the rod 21 approach the vertical position. The corresponding positions of the controlling lever 25 are indicated by the divisions 27 upon the right end of a sector 28 attached to the frame 3. A screw 29 screwed upon the end of the lever 25 enables the operator to clamp upon the sector 28 the piece 30 which serves thus as a stop and at the same time as a pointer. In the position indicated in Figs. 1 and 2, the inking is direct. The more the lever is pushed to the right, the greater becomes the pressure of the roller 26 upon the cylinder and the more abundant will be the inking. In the inker there is moreover located a scraper 31 which can oscillate about the pivots 32 and which possesses an elbow-arm 33. This arm projects beyond the inker and is provided with a stop screw 34 arranged to impinge upon a sloping plane 35 in one piece with the plate 12 whenever the inker is moved to the left as shown in Fig. 3. In this position the scraper is inclined and presses more or less firmly against the roller 26 so as to reduce more or less the layer of ink upon this roller. In the position for direct inking (Figs. 1 and 2), the screw 34 is removed from the inclined plane 35 and the weight of the arm 33 compels the scraper 31 to move away from the roller 26, which permits this latter to take and supply the maximum quantity of ink.

A contact inking roller 36 is mounted upon two levers 37 oscillating upon an axle 38 and impelled by springs 39 which tend to press this roller 36 against the cylinder 1. When the plate 12 is lowered together with its inker, the transverse motion of this latter which results, has for effect to bring the inking roller 26 in contact with the roller 36 as shown in Fig. 3 for the purpose of effecting the indirect inking of the cylinder. The lever 25 is then in front of the divisions placed on the left upon the sector 28. The more the lever 25 is turned to the left, the more it pushes the inker in the same direction whereby the roller 26 is more firmly pressed against the roller 36, which pressure reduces proportionately the quantity of ink transmitted from the roller 26 to the roller 36 and from this latter to the cylinder, until finally the roller 26 transmits no more ink at all, and on the contrary removes it from the roller 36 and this in turn from the cylinder. This is the commencement of the indirect inking-off. It commences at the very moment when the indirect inking stops and vice versa. These two operations succeed one another and reverse one another according to the pressure exercised by the lever 25 upon the rollers 26 and 36 and according as there is more ink on the cylinder than on the rollers, or on the contrary on the rollers than on the

cylinder, and consequently according also to whether the scraper 31 has by means of its contact screws 34 regulated for this purpose, cleaned off the roller 26 as much as possible, thus permitting it to restore to the inker all the ink taken away by the rollers and thus cleaning the cylinder. In order to obtain an efficacious grip between these rollers in spite of the unfavorable slope of the parts 21 and 17, recourse is had to a bent piece 40 fixed upon the hub of each arm 22 and arranged to act upon pieces 41 and 42 fixed to the inker. On the other hand there is constructed in the parts 21 oblique slides 43 in which the pivots 44 fixed to the arms 22 can move freely. When the lever 25 is turned to the left, the plate being at the bottom of its course, the pivots 44 can move down in the slides 43. At this moment the part 40 strikes the part 41 and pushes directly the inker to the left in order to produce the requisite pressure between the rollers 26 and 36. Each part 40 has a stop screw 45 arranged to encounter a horizontal bar 46 articulated to the corresponding lever 37. This screw is adjusted so as to cause the oscillation of the lever 37, that is to say, to separate and to remove the roller 36 from the cylinder 1, at the same time as the part 40 presses still more the roller 26 against the roller 36; furthermore the screw 34 is arranged so as to produce at the same moment the maximum effect of the scraper 31.

The reduction of the indirect inking of the cylinder 1 and its indirect inking-off result thus successively and at the time of the most energetic scraping of the roller 26 by the plate 31, and of the stronger pressure of this roller against the roller 36, and of the relative release of this latter with regard to the cylinder 1. The divisions of the sector 28 indicate firstly the various degrees of the indirect inking, and then the indirect inking off of the cylinder, which can be logically calculated therefrom inversely. The direct inking-off of the cylinder in a manner much more immediate and rapid is obtained by aid of the scraper blade 47 placed close to the inking roller 36. This blade can oscillate upon pivots 48 which engage in holes of the plates 4, which is actuated by means of the levers 49 fixed to its ends. These levers are actuated for the purpose of pressing the blade against the roller, by means of the screw studs 50 mounted upon the hubs of the arms 22 and acting upon spring jacks 51 which are fixed upon the rods 52 pivoted to the levers 49 and guided by the guides 53. The studs 50 are constructed of screws with rounded heads so that they can be adjusted. The position of the jacks 51 upon the bars 52 is also adjustable. Striking studs 54 are fixed upon the plates 4 and limit the oscillations of



the levers 49 in both directions. The scraper 47 is normally held a little distance from the roller 36 by means of the springs 56. When the lever 25 is turned to the left (Figs. 1 and 3) away from the position of direct inking, the inker sinks down and places itself beneath the roller 36 as has been above described; before the roller 26 reaches into contact with the roller 36 the studs 50 strike the jambs 51 and oblige them to move down; the blade 47 is thus applied against the roller 36 with a pressure which can be regulated at will, and this obliges the ink from this roller, which ink has been taken directly from the cylinder, to fall back into the ink holder. The rapidity and the efficiency of this direct inking-off are greatest when the studs 50 act upon the points of the jambs. If the lever 25 is turned farther, the jambs escape the studs 50 and the springs 56 cause the scraper 47 to move away from the roller 36. When the lever 25 is brought back, the spring jambs yield and allow the studs 50 to pass without causing the blade 47 to oscillate.

In the construction shown in the drawing, another roller 57 rests by its own weight against the cylinder 1 above the printing cylinder (not shown on the drawing) and serves to facilitate the passage of the ink across the cylinder 1 to the place where the pressure is exercised on the said printing cylinder. This roller is mounted in a frame 58 guided by vertical guides 59 on the plates 4. Stop screws 60 are fixed upon this frame and receive the pressure of cams 61 in one piece with the arms 22 so that the roller 57 will be more firmly pressed against the cylinder at the moment when the indirect inking commences, and then less and less strongly according as this inking is diminished. When the lever 25 is pushed to the left to the utmost, the inking is entirely stopped and the cams 61 cease to act upon the stop screws 60. If the lever 25 be gradually brought back from the left to the right, the same effects are produced as above described but in inverse order; indirect inking-off, then the re-establishment of the indirect inking, then the progressive increase of this inking; then the suppression of all inking, then the direct inking off by a slight return of the lever, then the re-establishment of the direct inking and the progressive increase of this latter. The very simple control of the lever 25 therefore permits of regulating the inking and the inking-off of the cylinder at any moment without stopping the cylinder 1 or interrupting the action of the duplicator in any way, and this in such a way as to satisfy all requirements of the printing, so that the operator can thus control the results of the operation by sight and modify or correct them accordingly.

In order to regularize the inking over the entire length of the cylinder there may be given a to and fro motion to the rollers 36 and 57. A very simple means for producing this to and fro motion consists in fixing the cams 62 upon the supports of the rollers (Fig. 6) and the projections 63 upon the shafts of the said rollers, so that the sloping faces of these cams will push alternately to the right and to the left the projections 63 which come in contact with them. The accompanying drawing shows moreover a cam 64 in one piece with the arm 22 and arranged to raise the plate 12 when the lever 25 is turned to the right and thus assisting the little rod 21 at the commencement of the raising. This motion is facilitated also by the pressure of the part 40 upon the stud 42.

In the machine above described the mechanism arranged symmetrically at the two ends of the cylinder for moving the ink holder and the rollers is actuated simultaneously and equally by means of a common shaft 24 and a single outside lever 25. It is, however, possible to divide the shaft 24 into two parts independent one of another and each provided with a controlling lever.

Without departing from the invention, one may of course vary the forms and constructional arrangements of the inking device, of its support, and of the various organs for regulation and control, the essential feature being so to combine these organs or other equivalent organs so as to (1) produce the effects hereinbefore described; (2) obtain them by the simple motion of a controlling lever placed outside the duplicator; (3) and to effect this operation while the apparatus is in full working.

What I claim is:

1. Improved inking and inking-off mechanism for printing machinery, comprising in combination an ink holder, means for moving the said ink holder vertically and transversely in a single curvilinear motion, an adjustable inking roller, an auxiliary roller adapted to press with graduated pressure against the inking roller, an adjustable scraper adapted to press against the surface of the inking roller, mechanism for actuating the inking and inking-off apparatus by transmitted power, and a controlling lever adapted to effect at will either the direct inking of the inking roller, or the indirect inking thereof by the auxiliary roller, or the removal of ink by the said auxiliary roller, or finally the removal of ink by means of the adjustable scraper.

2. An improved inking and inking-off mechanism for printing machinery adapted to be located inside the printing cylinder, comprising in combination a vertically and transversely movable ink holder, lever mechanism for moving the said ink holder, a vertically and transversely in a single cur-



vilinear motion movable inking roller, an adjustable auxiliary roller adapted to press with graduated pressure against the inking roller, an inclinable and adjustable scraper adapted to be pressed against or removed from the surface of the inking roller, and a control lever placed outside the printing cylinder and adapted to control the action of the mechanism and produce either the distribution of ink to the printing roller or the removal of ink from the distributing roller, substantially as set forth.

3. An improved inking and inking-off mechanism comprising in combination with the rotary cylinder of a duplicator, an ink holder, a frame adapted to support the said holder and its controlling mechanism, guide pieces on the said frame adapted to direct the motion vertically and transversely in a single curvilinear motion of the said inking holder, an inking roller adapted to come simultaneously into contact with the contents of the ink holder and the inside of the duplicator cylinder when the said ink holder is raised, means for controlling the action of the said ink roller, auxiliary mechanism for supplying or removing ink from the said roller and mechanism for effecting at will either the direct inking of the inking roller

or the indirect inking thereof by the auxiliary roller or the removal of ink by the auxiliary roller or finally the removal of ink by means of an adjustable scraper.

4. An improved inking and inking-off mechanism for printing machinery, comprising in combination, an adjustable ink container, an inking roller cooperating therewith, auxiliary mechanism adapted to apply ink to or remove ink from the said inking roller, the scraper 47, lever mechanism adapted to press the scraper against the roller or remove it therefrom, screw studs 50 on said lever mechanism, spring jamps 51 adapted to cooperate with said screw studs for the purpose of limiting the motion of the scraper mechanism and an outside controlling lever so inter-connected with the mechanism that by means of it the inking or inking-off of the printing roller can be effected, varied, or reversed at will.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PAUL ODON LAFFITTE.

Witnesses:

HANSON C. COXE,  
JACK H. BAKER.