

J. J. PINK & J. FLETCHER.
KINETOSCOPE.

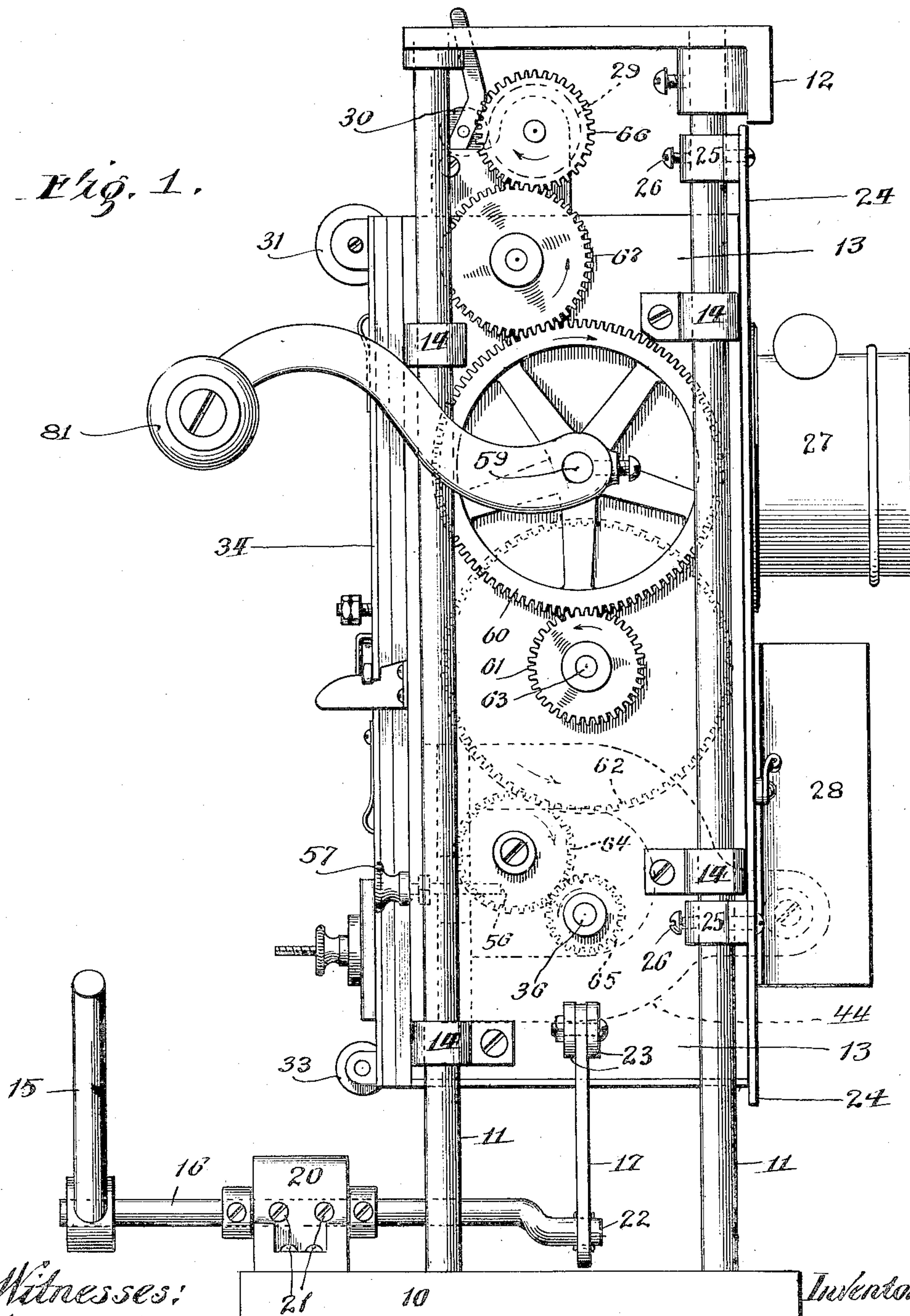
APPLICATION FILED MAR. 30, 1908.

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4 SHEETS—SHEET 1.

940,275.

Fig. 1.



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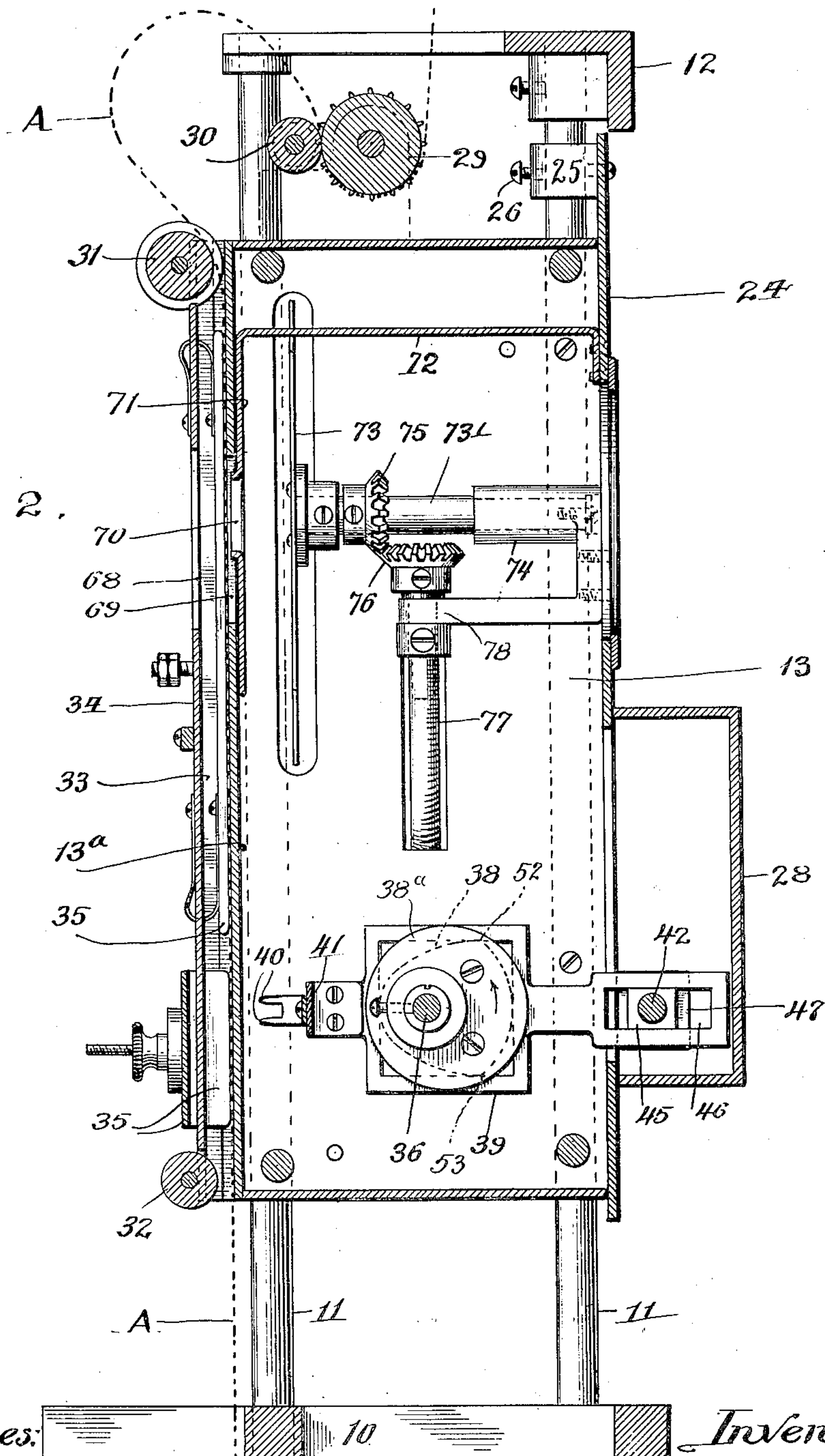
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Fig. 2.



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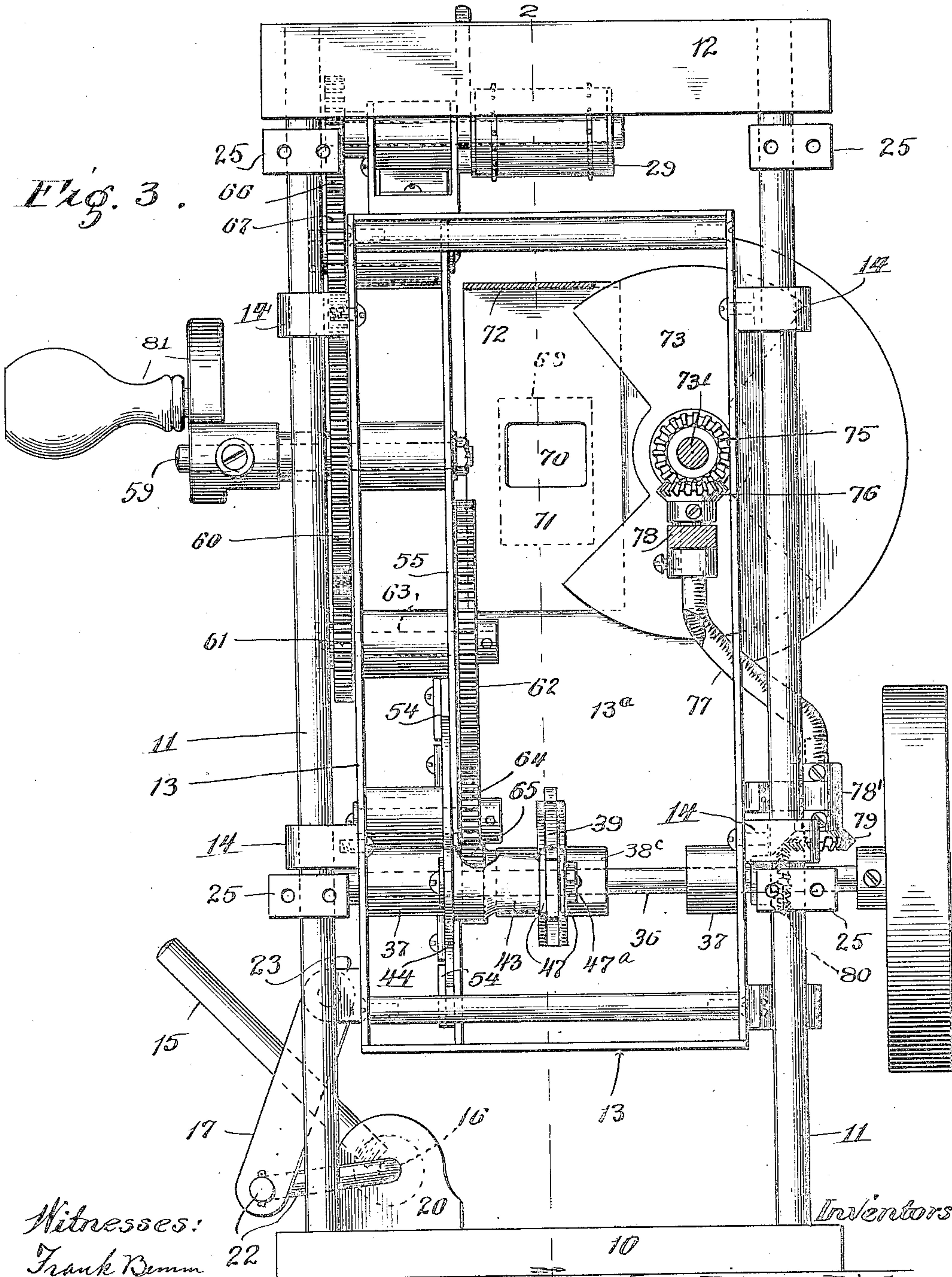
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4 SHEETS—SHEET 3.

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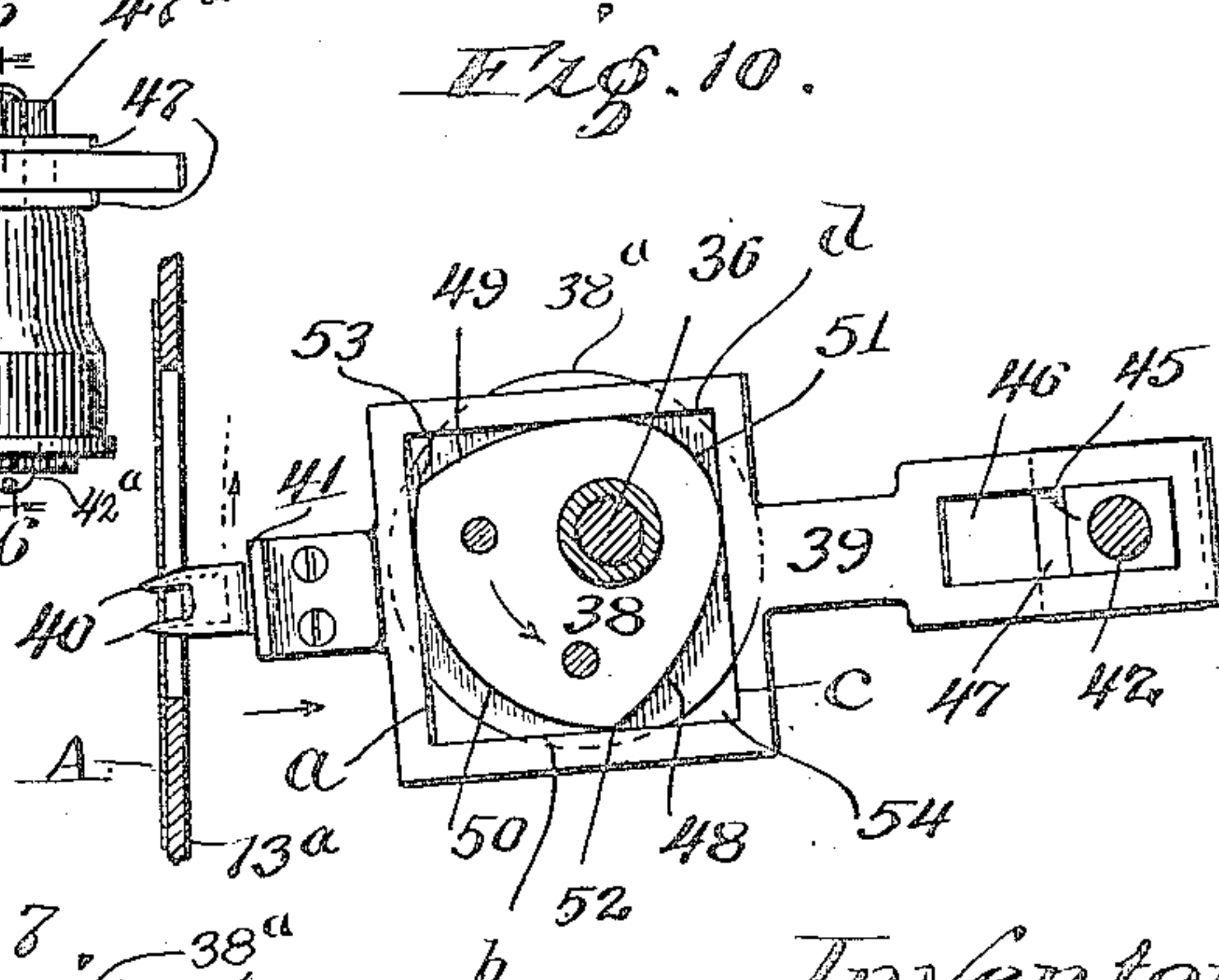
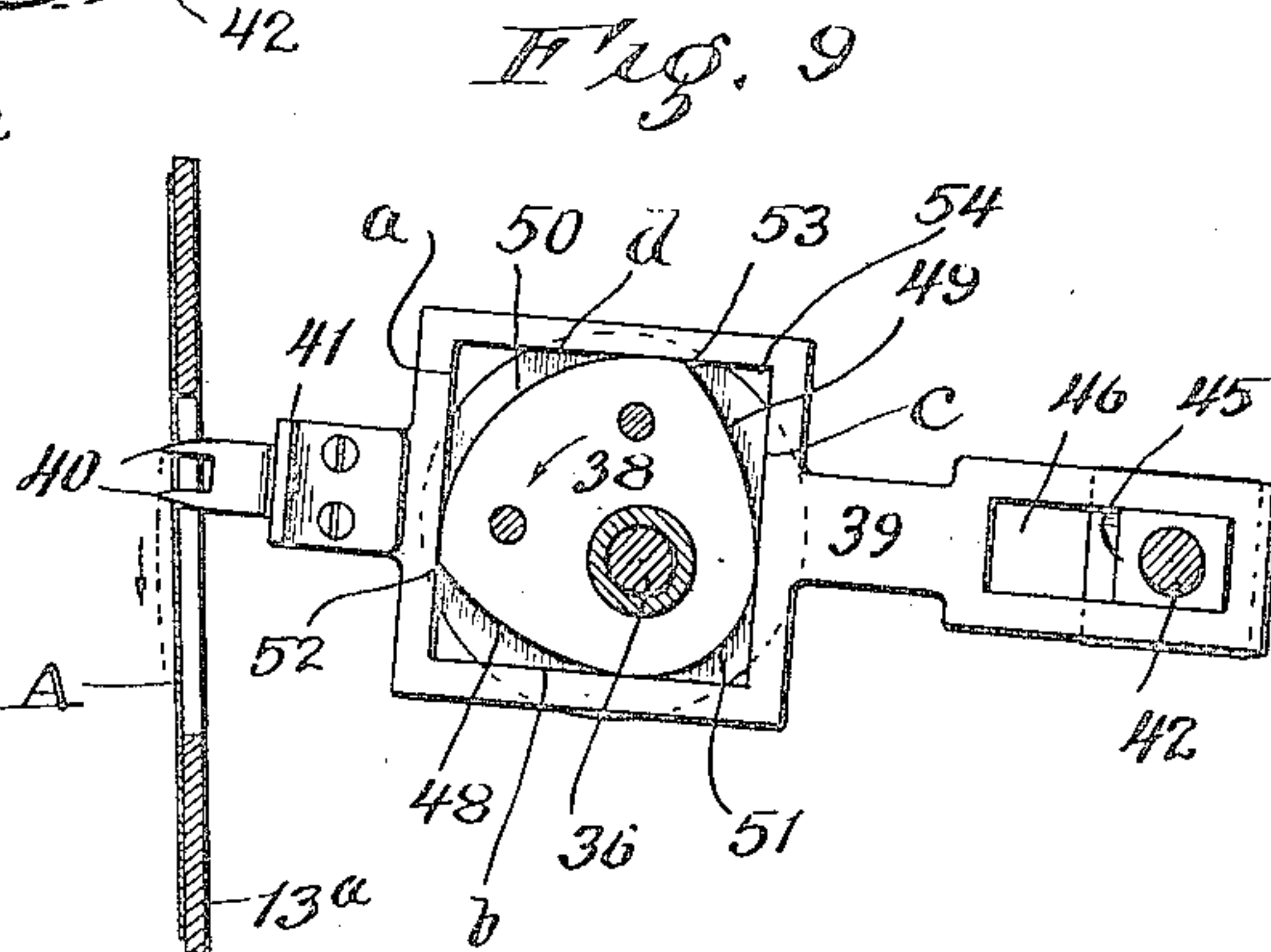
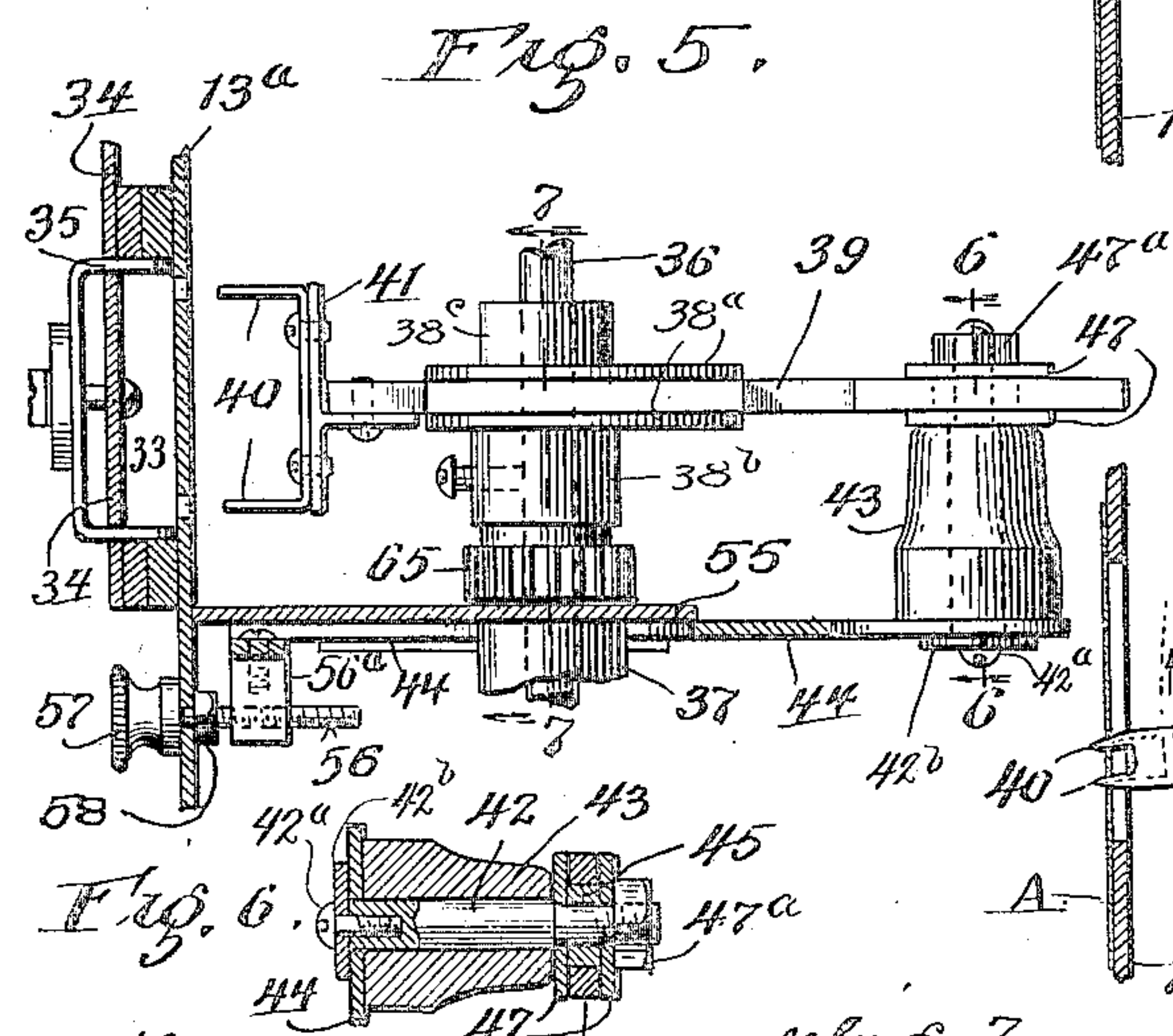
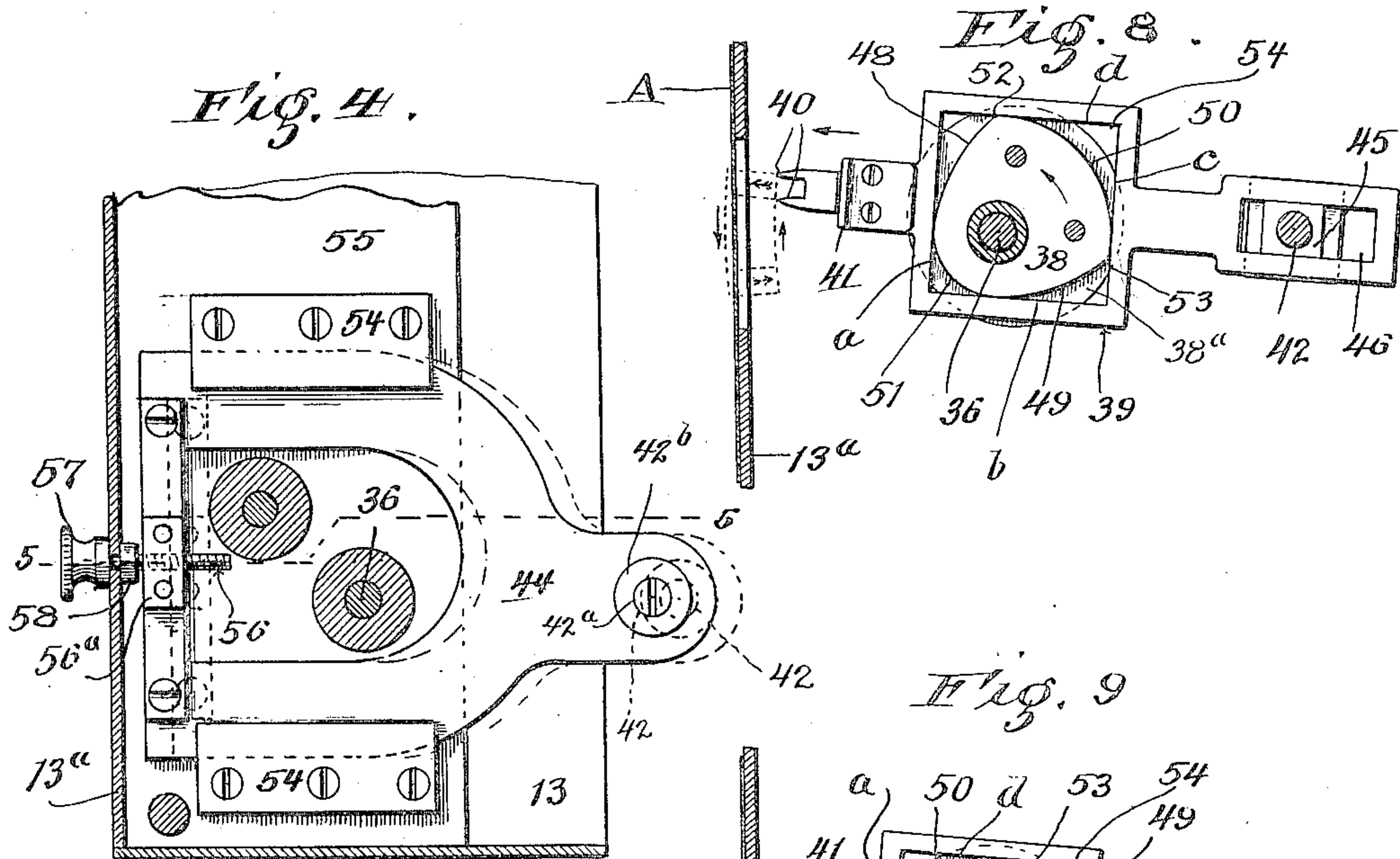
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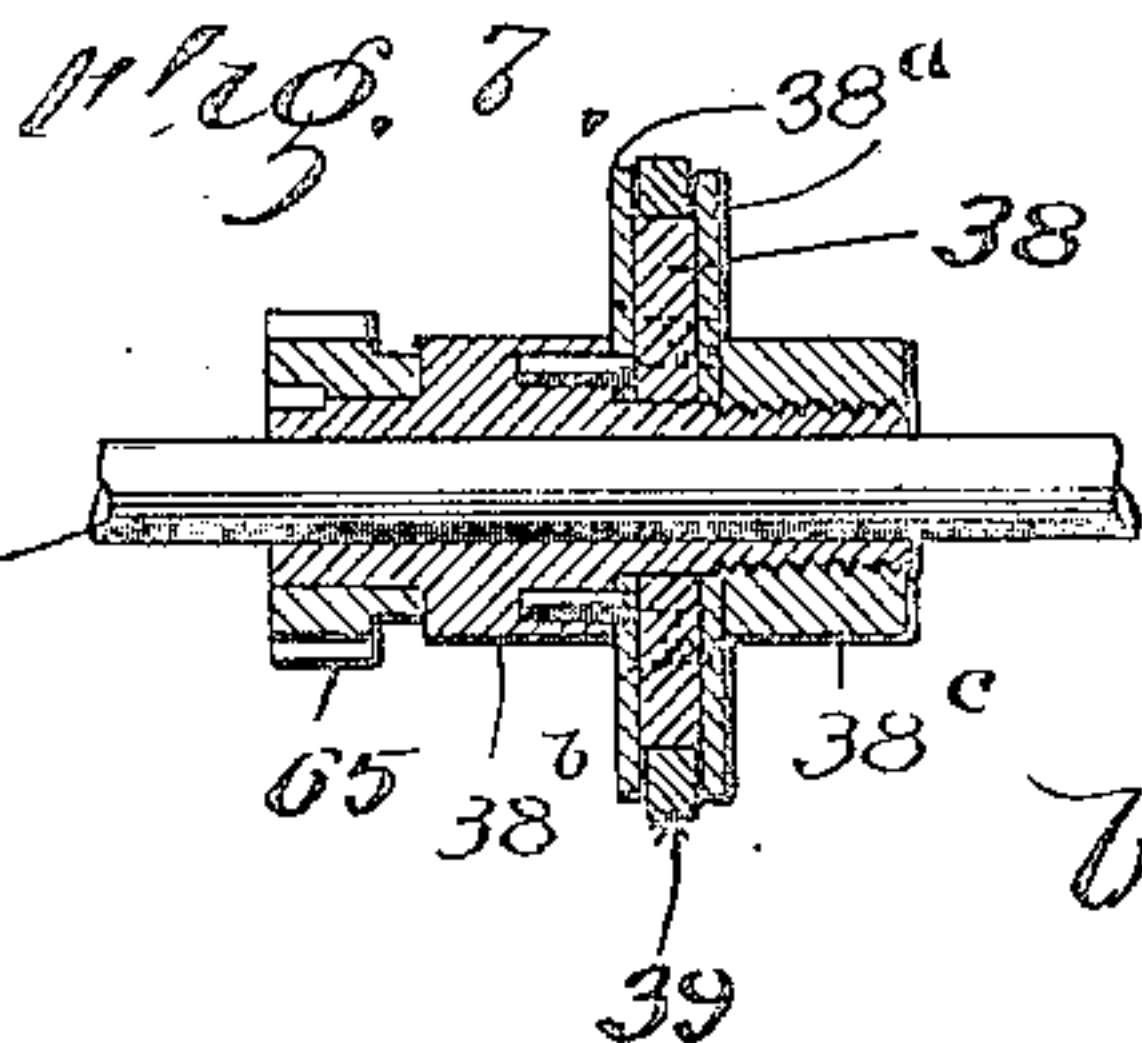
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4 SHEETS—SHEET 4.

940,275.



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UNITED STATES PATENT OFFICE

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KINETOSCOPE.

940,275.

Specification of Letters Patent.

Patented Nov. 16, 1909.

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To all whom it may concern:

Be it known that we, JOHN J. PINK, a citizen of the United States, and JOSEPH FLETCHER, a subject of the Kingdom of Great Britain, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Kinetoscopes, of which the following is a specification.

Our invention relates to machines for exhibiting pictures, and designs to provide a machine of improved construction.

One of the objects of this invention is to reduce to a minimum, the friction, vibration and noise usually attendant in machines of this class.

Another object is to provide means for regulating the stroke of the film actuating mechanism, thereby accommodating the advancing mechanism to films of different makes, or films which have shrunk from age, the perforations of which are consequently closer together than in new films.

Another object is to simplify and otherwise improve machines of this class, and to such ends this invention consists in certain novel features of construction, combinations and arrangements a description of which will be found in the following specification, and the essential features of which will be more definitely pointed out in the claims.

The invention is clearly illustrated in the drawings furnished herewith in which—

Figure 1 is a side view of a machine containing our improvements. Fig. 2 is a vertical, longitudinal section, taken on line 2—2 Fig. 3. Fig. 3 is a front view with the front plate removed. Fig. 4 is a detail side view of the mechanism for furnishing the shiftable fulcrum for the film actuating mechanism. Fig. 5 is a detail horizontal section taken on line 5—5 Fig. 4. Fig. 6 is a detail cross section taken on line 6—6 Fig. 5. Fig. 7 is a detail cross section taken on line 7—7 Fig. 5, and Figs. 8, 9 and 10 are detail views of the film shifting mechanism showing the carrier in three different positions.

In these views 10, is a base, upon which are mounted four framing rods 11, which are connected at their upper ends to a bracket 12, thus providing a frame of substantial construction. The film actuating mechanism is contained in a box 13, which is slidably connected to the framing rods 11, by ears 14, and said box may be raised or lowered to

“frame” the picture by means of a lever 15, shaft 16, and link 17. The shaft 16 is journaled in a bearing 20, and friction is applied to said shaft by two screws 21 threaded in said bearing. The shaft is provided with a crank 22 on one end which connects with the link 17. The other end of the link is connected to the box by means of ears 23. By swinging the lever 15 in the proper direction, the box may be raised or lowered to “frame” the picture.

A stationary front plate 24 is secured to the front rods 11 by ears 25 that extend out from the plate and set screws 26 are threaded in the ears and bear upon the rods, to clamp the plate in place thereon. Said plate 24 furnishes means for supporting the lens 27, and shutter mechanism and said plate contains an opening for access to the interior of the box. A cover 28 is provided to close said opening.

The film guiding mechanism comprises the ordinary sprocket 29, guide rollers 30, 31, 32 and a long flat guideway 33. This guideway 33 lies between the wall 13^a of the box and a door 34, and spring pressed shoes 35 are mounted upon said door and bear upon the film and hold it in a flat condition as it passes through the guideway 33. The exact form and arrangement of guiding mechanism are not material to our invention broadly considered and will not therefore be described in detail.

A cam shaft 36 is journaled in bearings 37, which are secured to the side walls of the box, and said shaft bears a cam 38 (see Figs. 2, 8, 9 and 10) which actuates a film carrier 39. The film carrier bears means for engagement with the film, which as shown comprises two pins 40, that project out from a plate 41, which is secured upon one end of the carrier 39. The carrier is fulcrumed upon a stud shaft 42, which is shiftable toward or away from the cam shaft, to provide a variable up and down stroke for the pins. As shown the stud shaft 42 is rotatably mounted in a boss 43, which is carried by a horizontally slidable support 44, and a slidable connection is afforded between the carrier and stud shaft by means of a slot 46 in the carrier, and a block 45 upon the stud shaft and two retaining plates 47 are placed on either side of the carrier and hold the latter in position upon the block 45. A nut 47^a is threaded upon the end of the stud

shaft to secure the plates 47 on said shaft. A screw 42^a threaded in the end of the stud shaft and a washer 42^b prevent endwise movement of said shaft.

5 The cam is secured between two washers 38^a which embrace the carrier 39 and said cam and washers are mounted upon the shaft 36 by means of a sleeve 38^b and nut 38^c threaded on said sleeve and bearing against
 10 one of the washers. The cam contains two working faces 48, 49 and two concentric faces 50, 51, the concentric faces lying diametrically opposite each other. The work-
 15 ing faces 48, 49, are arcs of circles, each having a radius equal to the distance between the concentric faces 50, 51, taken on a line running diametrically through the axis of the cam shaft. The distance in a straight
 20 line between the points 52, 53, on the cam, is also equal to the radius of the arcs 48 or 49 and said arcs are described from the points 52, 53 as centers. The geometric figure thus formed lies within a square
 25 opening 54 formed in the carrier, the four sides of the square being tangential to the faces 48, 49, 50, 51 of the cam. In Fig. 2 the carrier is alined with the cam shaft and stud shaft. Movement of the cam in the
 30 direction indicated by the arrows will cause the point 52 of the cam to rise, thereby swinging the carrier upward on its fulcrum, in an arc of a circle. As soon as the point 52 reaches the vertical center of the cam
 35 shaft, the working face 48 of the cam engages the edge or bearing face *a* of the opening 54 and moves the carrier forward toward the film until the point 52 passes by the horizontal center of the cam shaft and
 40 the point 53 reaches the vertical center of the shaft. The working face 48 will then engage the edge or bearing face *b* and swing the carrier down upon its fulcrum until the point 52 has passed the vertical center of
 45 the cam shaft, whereupon the working face 48 will engage the face *c* and move the carrier back until the point 52 reaches the horizontal center of the shaft, when the face 48 will engage the face *d* and raise the carrier. This gives to the carrier an oscillatory recip-
 50 roating movement in which the extent of the vertical throw of the pins is governed by the position of the fulcrum of the carrier. By moving the fulcrum toward the right from the position shown in Fig. 4 and there-
 55 by increasing the distance between the cam shaft and the fulcrum, the extent of the stroke of the pins is lessened, and by shifting the fulcrum toward the cam shaft the throw of the pins will be increased. It will be
 60 noticed that four points on the cam are always in contact with the carrier.

The support 44 is movably supported in guides 54 which are mounted upon a partition 55 that forms part of the box 13. A
 65 regulating screw 56 connects the support 44

with the rear wall 13^a of the box, said screw being threaded in a nut 56^a that extends out from the support 44. The screw is provided with a head 57, by means of which it may be
 70 turned and said screw is held against longitudinal movement by said head 57 and a shoulder 58 which are arranged on opposite sides of the plate 13^a. By turning the screw in the proper direction the support 44 may
 75 be moved back and forth thus shifting the fulcrum of the carrier toward or away from the cam shaft.

In the drawings the support 44 is shown in the form of a plate lying in the plane of
 80 certain shafts, and for this reason it is forked so as to straddle said shafts. It is obvious that this particular construction is not material to our invention broadly con-
 85 sidered inasmuch as any suitable connection between the regulating screw and stud shaft may be had which will operate to move said stud shaft toward or away from the cam shaft.

The cam shaft is driven from a crank shaft 59 by suitable gearing and as shown
 90 the train of gears between the crank shaft and cam shaft consists in a gear wheel 60 upon the crank shaft, a pinion 61, and gear wheel 62 on a stud shaft 63, an intermediate pinion 64 and a pinion 65 on the cam shaft.
 95 The sprocket 29 is geared to the crank shaft 59 by a train of gears comprising a pinion 66 upon the sprocket shaft, and an intermediate gear 67 between the pinion 66 and gear wheel 60. The gears are so proportioned
 100 that the cam shaft will be given a high rate of speed as compared with that of the crank shaft, and, the sprocket will be driven at such speed as to feed the film to the guide-
 105 way at the same rate of speed that the pins advance the film through the machine.

The light from the lamp (not shown) passes through apertures 68, 69 in the door
 34 and rear wall 13^a of the box, and through a framing aperture 70 in a stationary plate
 110 71, which is secured upon the front plate 24 by a bracket 72. The aperture 70 in the plate 71 is of the same size as the pictures on the film and the apertures 68, 69 are
 115 somewhat elongated so that the pictures on the film may be brought into register with the framing aperture in "framing" the picture. We have found that when the
 120 light from the lamp is not too strong a light shutter may be dispensed with, but as this machine is intended for commercial pur-
 125 poses as well as for home use we have provided a light shutter which is geared to the cam shaft and acts to cut off the light from the lamp during the intervals that the film
 130 is advanced to bring the succeeding pictures consecutively into view. As shown the shutter 73 is carried by a shaft 73', journaled in a bracket 74 secured to the stationary front wall, and said shaft bears a miter gear 75,

which meshes with a miter gear 76 upon a flexible shaft 77. Said flexible shaft is journaled in bearings 78, 78' and bears a miter gear 79 upon its lower end which meshes with a miter gear 80 upon the cam shaft. The gearing is so proportioned that the shutter will be caused to cover the light apertures during the periods of advancement of the film and expose the film while it is in a position of rest. By reason of the fact that the shutter, framing aperture and lens are stationarily supported in the machine, the shutter will properly intercept the rays of light and expose the pictures regardless of the position of the film advancing mechanism.

The film A is carried by a magazine (not shown) and is threaded through the machine as shown. The operating crank 81 being turned in the proper direction, the sprocket, cam shaft and shutter shaft, are driven at their relative speeds, the carrier being oscillated and shifted back and forth to advance the film one step in each revolution of the cam shaft. The light from the lamp is intercepted by the shutter during the interval that the film is drawn down by the carrier, and the cam is so proportioned that the picture is exposed during each 270° of revolution of the cam shaft and shifted during each 90° of revolution.

The advantages of this device are readily apparent. A single cam is employed which oscillates the carrier and shifts it into or out of engagement with the film. This does away with a great deal of friction and vibration, and gives the carrier a free, even and steady motion. When a comparatively new film is run through the machine, it is necessary that the pins be given a long stroke, and to effect this the regulating screw is turned in the proper direction to shift the fulcrum of the carrier nearer to the cam shaft. When an old film is used, and which because of its age has shrunk considerably, the fulcrum is shifted farther away from the cam shaft, thereby causing a shorter stroke and thus accommodating the stroke to the closer spaced perforation in the film.

We are aware that various alterations and modifications of this device are possible without departing from the spirit of our invention, and we do not, therefore, desire to limit ourselves to the exact form shown and described except as may be necessary from the prior state of the art.

We claim as new and desire to secure by Letters Patent:

1. In a machine of the class described, the combination with a fulcrumed, vertically oscillatable and longitudinally reciprocable carrier having suitable film engaging means rigidly secured thereto, of a stationary fulcrum member upon which said carrier is

slidably fulcrumed, a suitably operated cam shaft arranged in a plane which passes through the carrier fulcrum and extends approximately at right angles to the film and means on said shaft for oscillating said carrier longitudinally of the film and bodily shifting it in a straight line into and out of engagement therewith.

2. In a machine of the class described, the combination with a fulcrumed, vertically oscillatable carrier having suitable film engaging means rigid therewith, of a stationary pin upon which said carrier is slidably fulcrumed, a suitably operated cam shaft arranged in a plane which passes through the carrier fulcrum and extends approximately at right angles to the film, and a single cam on said shaft for oscillating said carrier longitudinally of the film and bodily shifting it in a straight line longitudinally of itself into and out of engagement with said film.

3. In a machine of the class described, the combination with a fulcrumed, vertically oscillatable carrier having pins rigid therewith for engagement with the film, of a stationary pin upon which said carrier is slidably fulcrumed, a suitably operated cam shaft arranged in a plane which passes through the carrier fulcrum and extends approximately at right angles to the film, and a single cam thereon for reciprocating said carrier longitudinally of itself in a straight line and oscillating it longitudinally of the film.

4. In a machine of the class described, the combination with a fulcrumed, vertically oscillatable carrier having suitable film engaging means rigid therewith, of a stationary pin upon which said carrier is slidably fulcrumed, a suitably operated cam shaft arranged between the film engaging means and the carrier fulcrum and a cam upon said cam shaft for oscillating the carrier longitudinally of the film and reciprocating it transversely thereof.

5. In a machine of the class described, the combination with a fulcrumed, vertically oscillatable and longitudinally reciprocable carrier plate having suitable film engaging means rigid therewith, and being formed with four bearing surfaces arranged in the form of a hollow square, of a stationary pin upon which said carrier plate is slidably fulcrumed, a suitably operated cam shaft, a single cam thereon having two concentric bearing faces and two eccentric bearing faces connecting the concentric bearing faces, all of said bearing faces of the cam being arranged to bear simultaneously upon the bearing faces of the hollow square.

6. In a device of the class described, the combination with an oscillatable and shiftable carrier having means for engagement with the film secured rigidly thereon, of a

- stationary pin upon which said carrier is slidably fulcrumed, a suitably operated cam shaft arranged in a plane which passes through the carrier fulcrum and extends approximately at right angles to the film, a single cam thereon for operating said carrier through a plane longitudinally of the film for shifting the carrier into and out of engagement with the film.
7. In a device of the class described the combination with a suitably operated, fulcrumed carrier, of a stationary fulcrum for the carrier and adjustment means for shifting the position of the fulcrum to vary the extent of the throw of the carrier.
8. In a device of the class described, the combination with an oscillatable carrier, of means for actuating the carrier, a stationary fulcrum for the carrier and adjustment means for shifting said fulcrum to vary the extent of throw of the carrier.
9. In a device of the class described the combination with an oscillatable carrier, of a suitably operated cam for actuating said carrier, a stationary shaft upon which said carrier is fulcrumed and adjustment means for shifting said fulcrum to vary the extent of the throw of the carrier.
10. In a device of the class described the combination with an oscillatable carrier, of a suitably operated cam shaft, a suitable cam thereon for oscillating and shifting said carrier, a fulcrum for the carrier, and adjustment means for shifting said fulcrum to vary the extent of the throw of the carrier.
11. In a device of the class described the combination with an oscillatable carrier, of a suitably operated cam shaft, a suitable cam thereon for oscillating and shifting the carrier, a stationary shaft upon which the carrier is fulcrumed, and a movable support for changing the position of said shaft to vary the throw of the carrier.
12. In a device of the class described, the combination with a vertically oscillatable and longitudinal reciprocable film carrier plate and a fulcrum therefor, of means for actuating said carrier plate to advance the film, and means for adjusting the fulcrum of said carrier plate to vary the extent of the throw of the carrier plate.
13. In a device of the class described, the combination with a vertically oscillatable and longitudinally reciprocable carrier, of means for actuating said carrier, a stationary fulcrum, a support for the fulcrum, and means for shifting said support to alter the position of the fulcrum, with respect to the carrier actuating means.
14. In a device of the class described the combination with a vertically oscillatable and shiftable carrier, of a cam shaft, a cam thereon arranged to oscillate and shift said carrier, a fulcrum for said carrier, a suitably guided support for said fulcrum, and adjustment means for shifting said support to vary the position of the fulcrum with respect to the cam shaft and thereby vary the extent of throw of the carrier.
15. In a device of the class described the combination with film advancing devices having an oscillatable and shiftable carrier for the film and a suitably operated cam for actuating the carrier, of a shaft upon which said carrier is fulcrumed, a support for said shaft, and means for moving the support to vary the position of the carrier fulcrum with respect to the cam.
16. In a device of the class described, the combination with film advancing devices having an oscillatable and shiftable carrier for the film, of a shaft upon which said carrier is fulcrumed, a support for said shaft, guide ways for said support and a regulating screw for shifting said support to vary the position of the shaft.
17. In a device of the class described a carrier for advancing the film, comprising a plate having film engaging means on one end, a longitudinal slot for a fulcrum on the other end, and four bearing faces for an operating cam, said faces being arranged in the form of a square and all being in the same plane.
18. In a device of the class described a film advancing mechanism, comprising a suitably operated cam shaft, a stationary stud shaft, a cam on the cam shaft, a block on the stud shaft, a film carrier supported by said cam and block, and adapted to be oscillated and shifted by said cam, and suitably supported retaining plates arranged on both sides of the carrier.
19. In a device of the class described, the combination with a stationary frame and a light shutter supported thereby, of a supporting mechanism adjustably mounted upon said frame, means for raising and lowering said supporting mechanism, film guiding mechanism carried by said supporting mechanism, a stationary pin secured to said supporting mechanism, a cam shaft journaled in said supporting mechanism, a cam on said cam shaft, an oscillatory and reciprocatory film carrier slidably fulcrumed upon said pin and actuated by said cam, and gearing between said shutter and cam shaft incorporating a flexible shaft.

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