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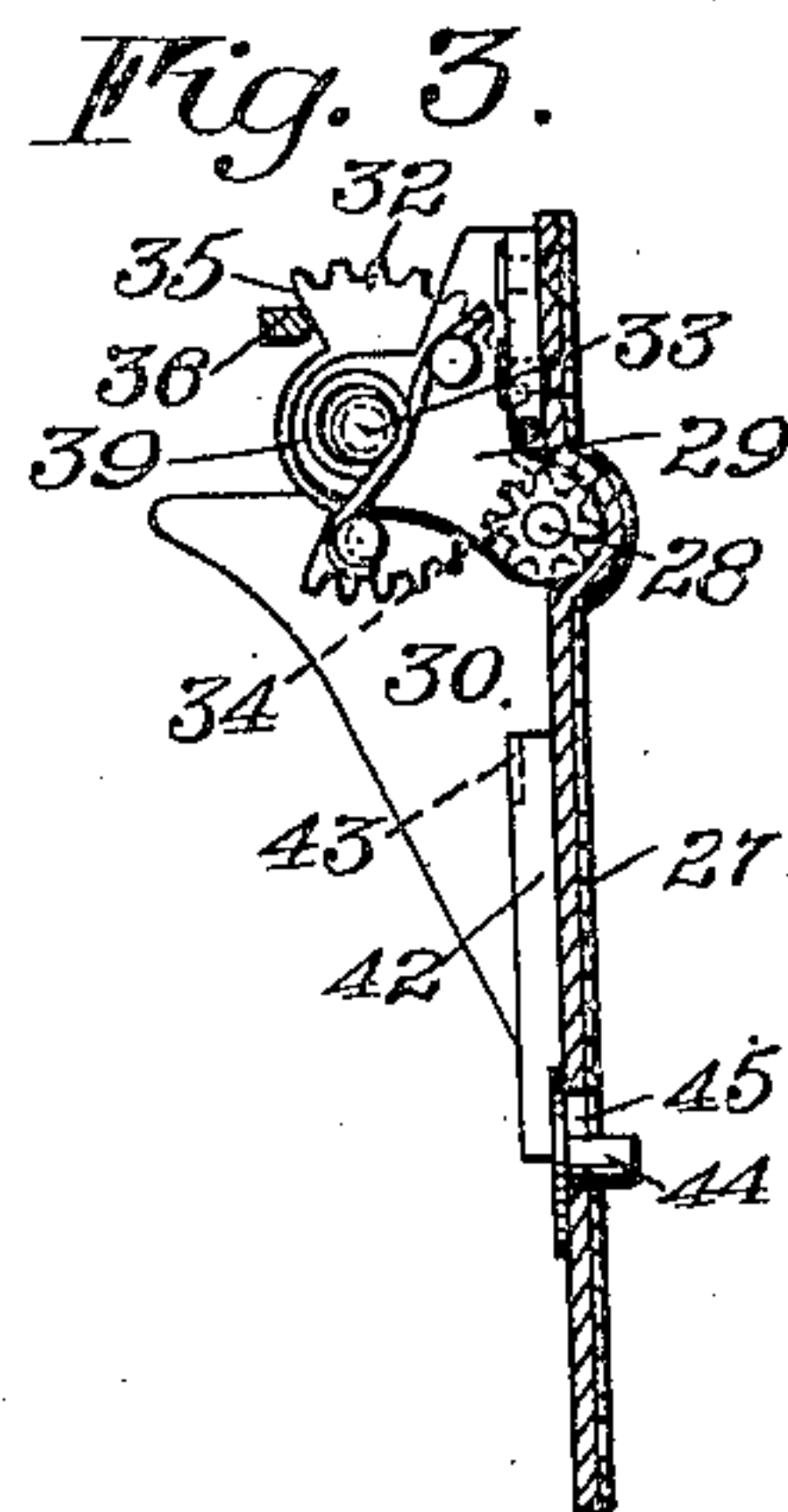
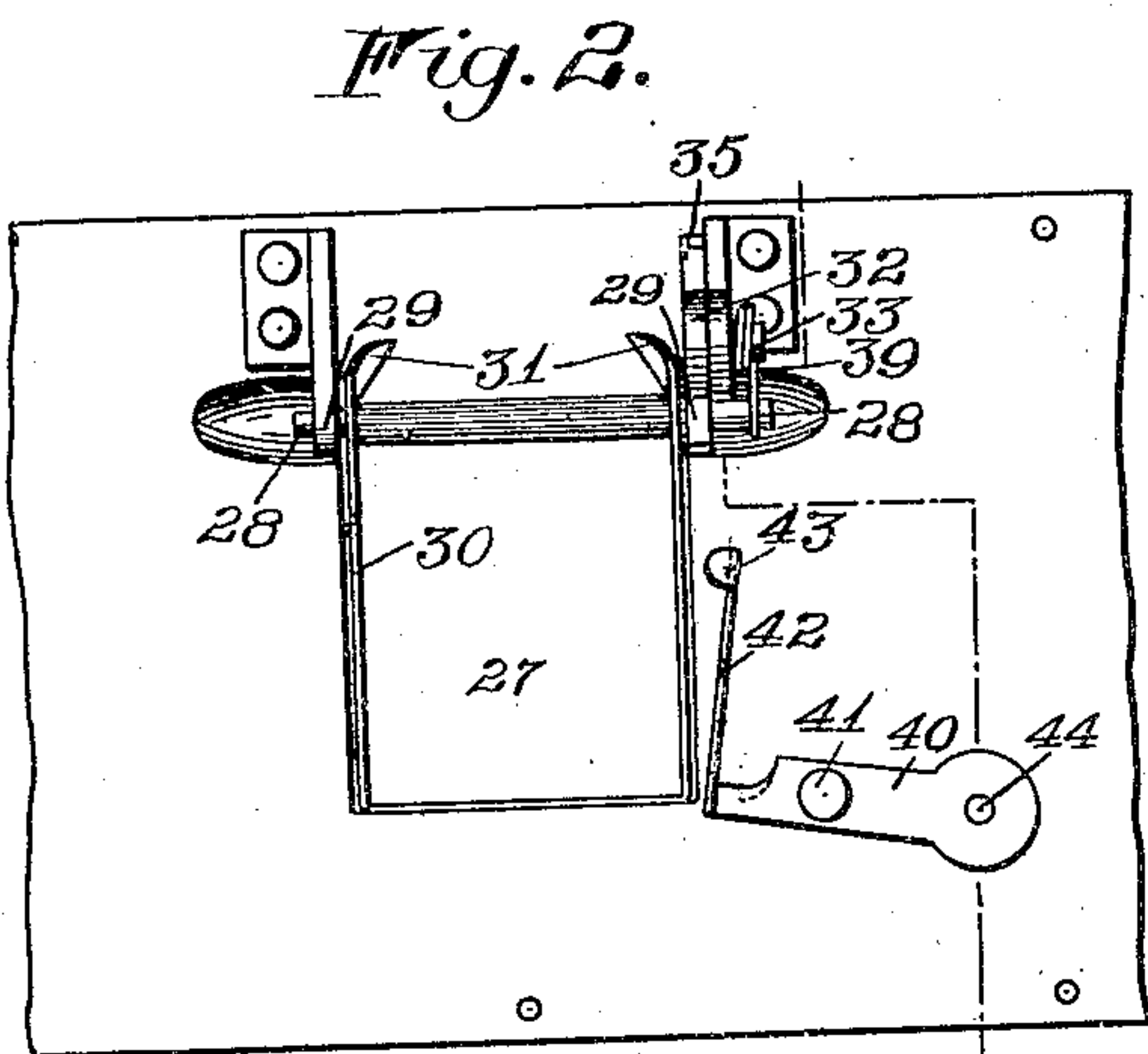
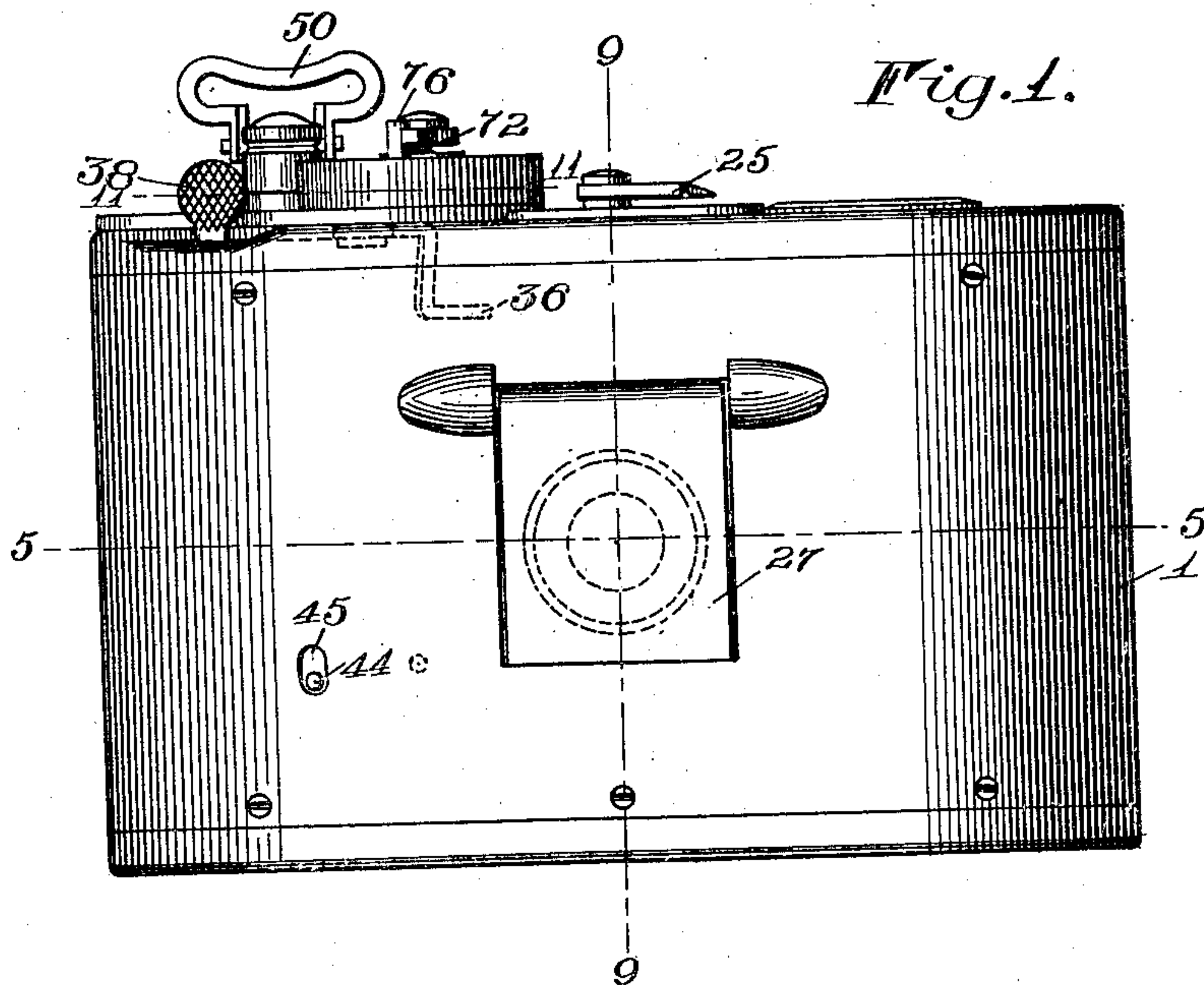
CAMERA.

APPLICATION FILED JUNE 18, 1909.

Patented May 23, 1911.

4 SHEETS—SHEET 1.

993,047.



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4 SHEETS—SHEET 2.

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Fig. 4.

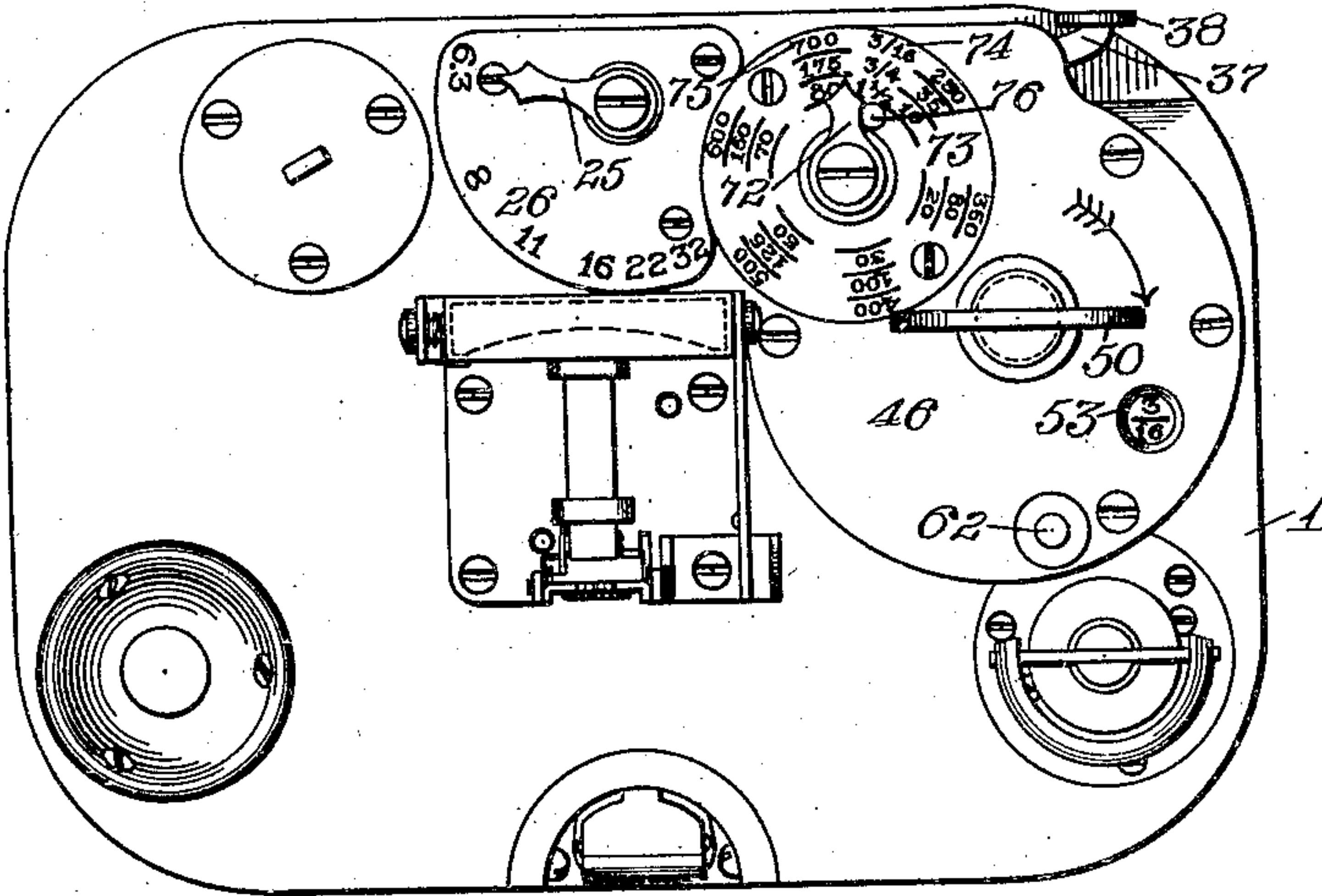
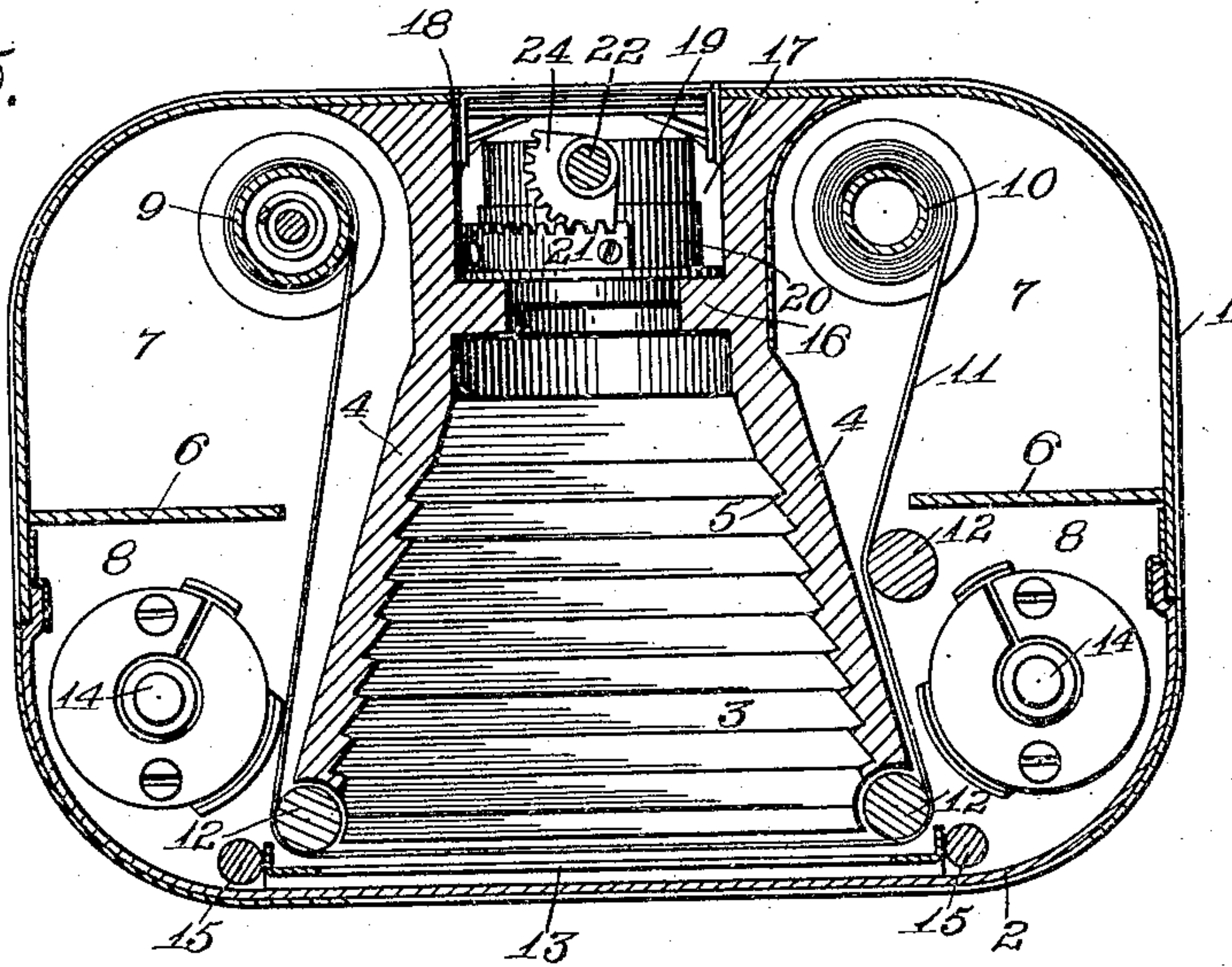


Fig. 5.



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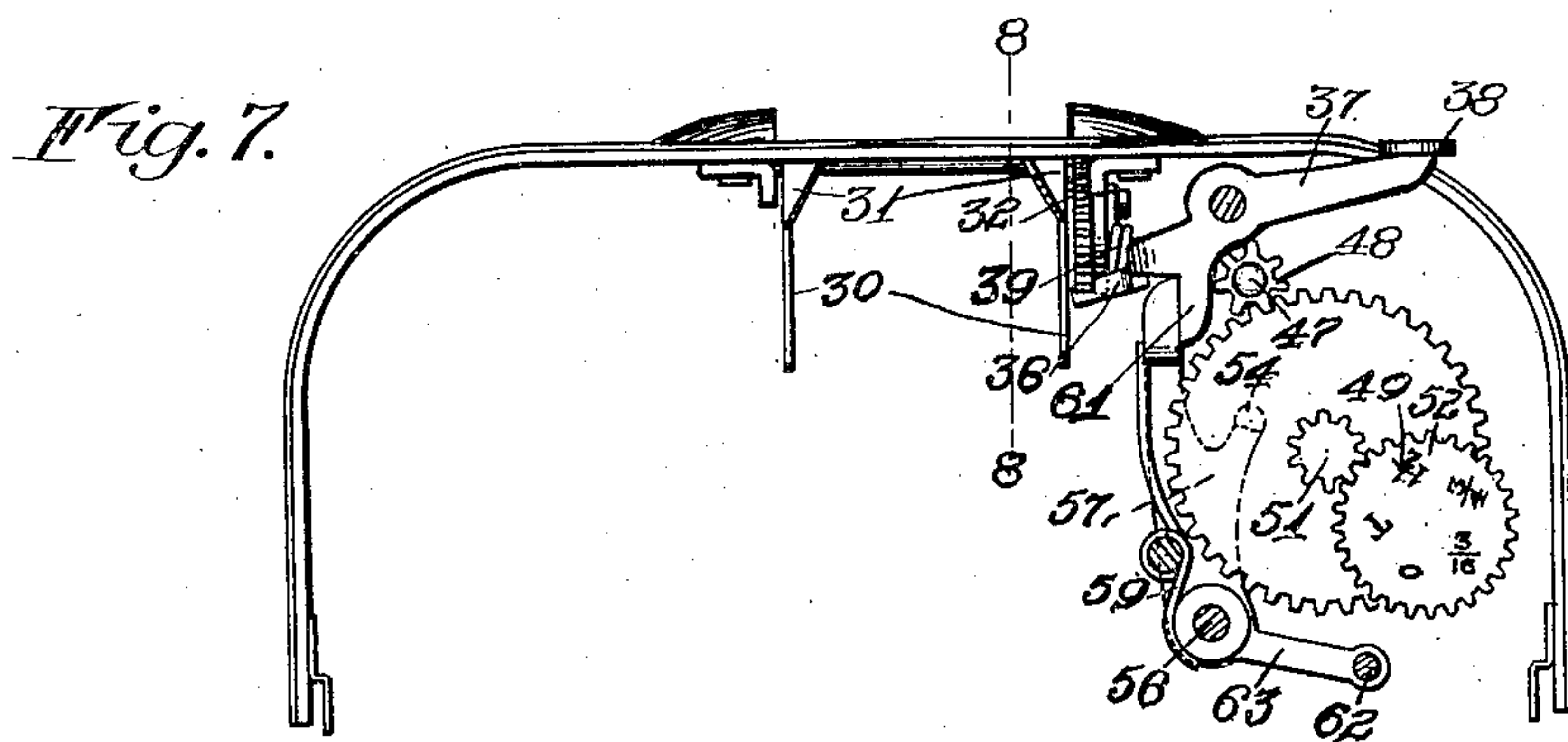
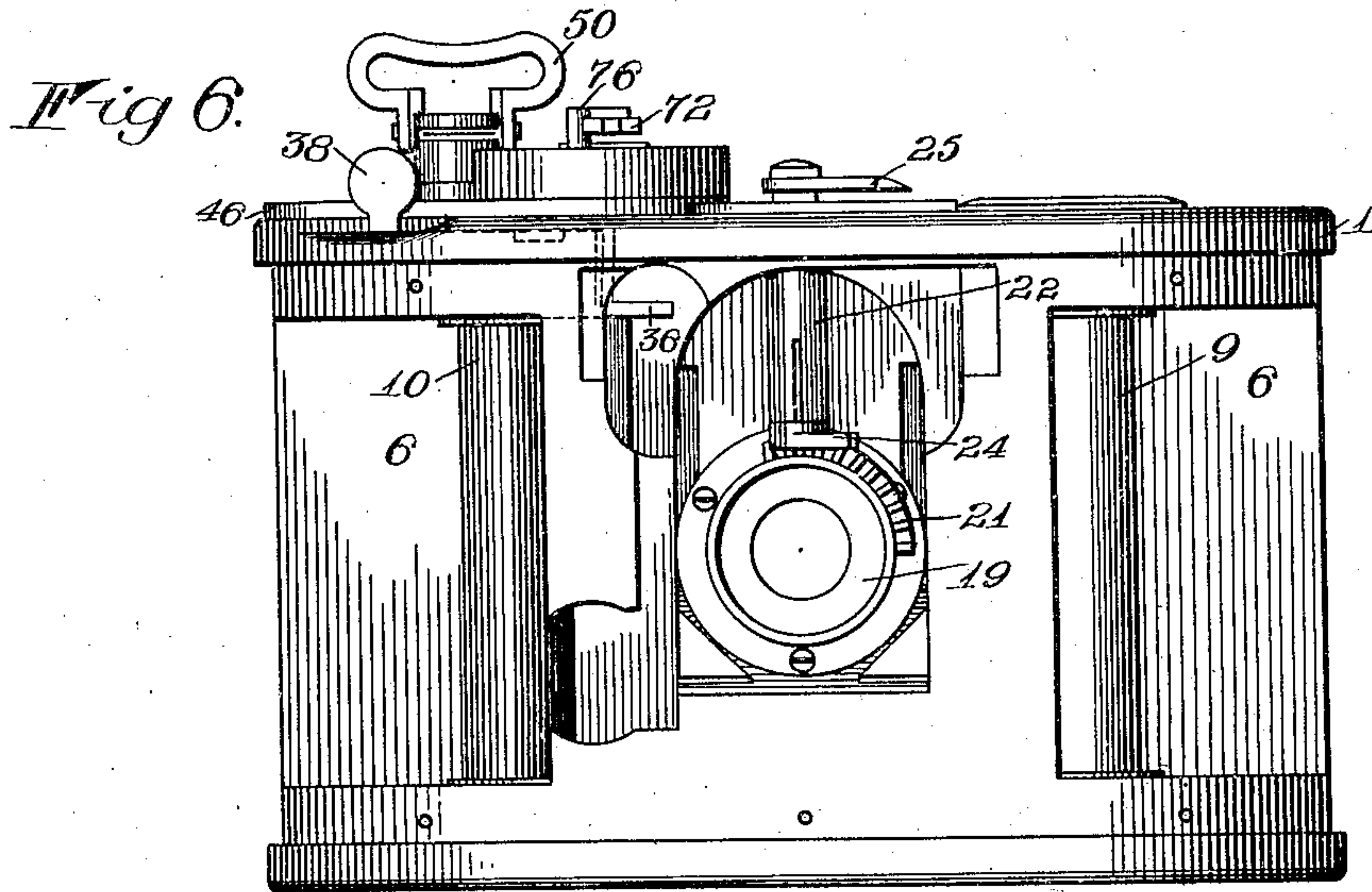
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4 SHEETS-SHEET 3.

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4 SHEETS—SHEET 4.

Fig. 8.

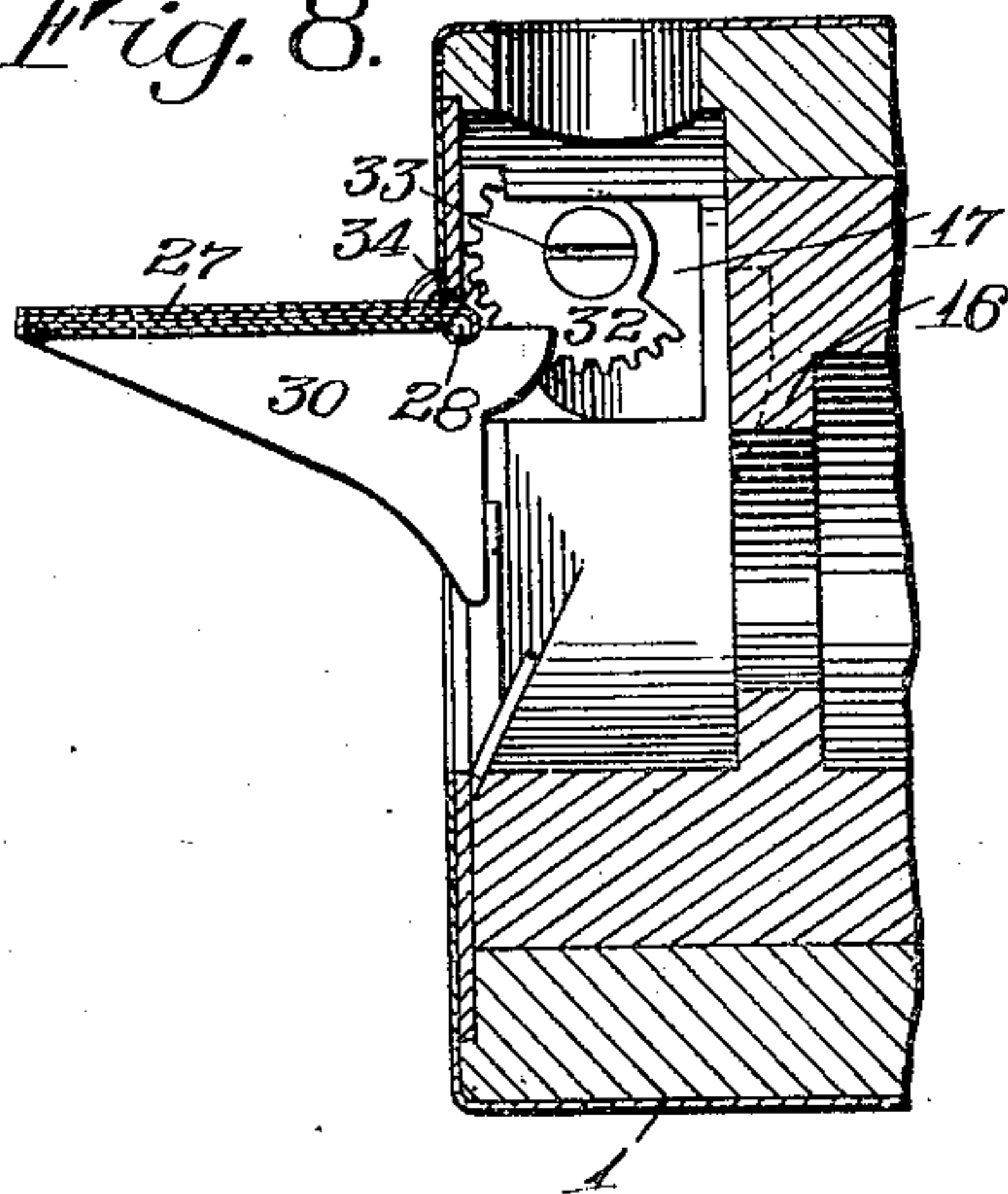


Fig. 9.

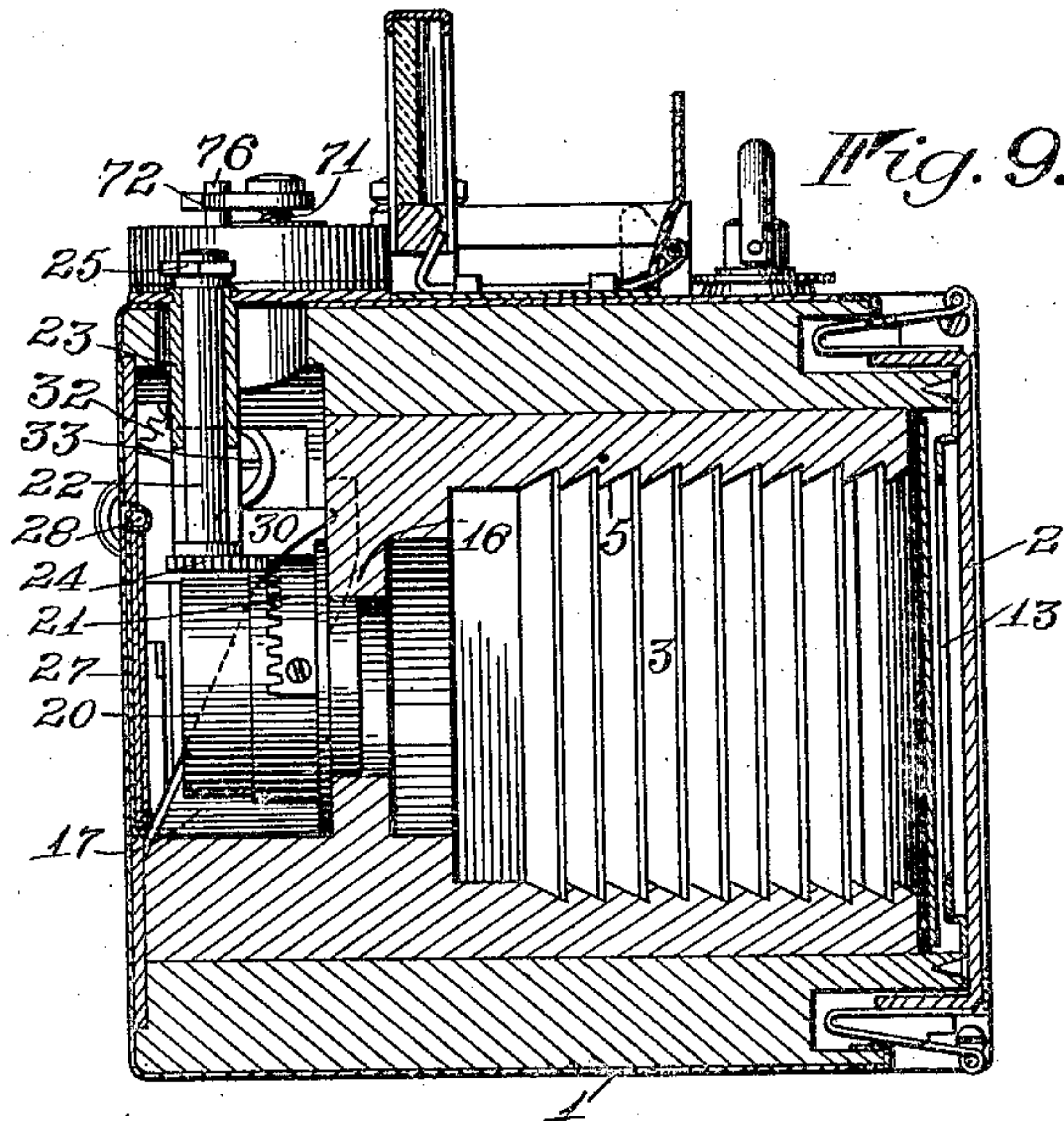


Fig. 10.

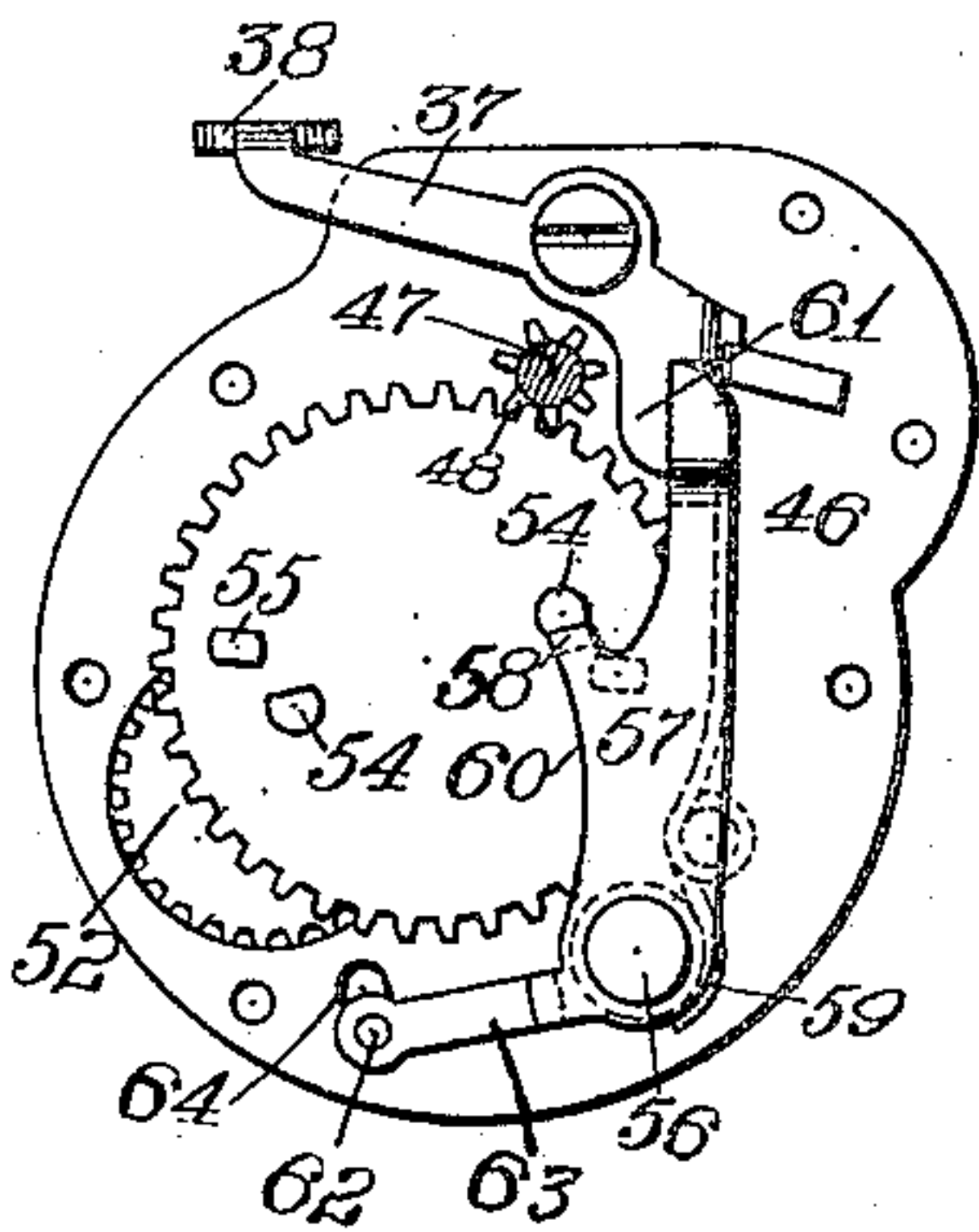


Fig. 11.

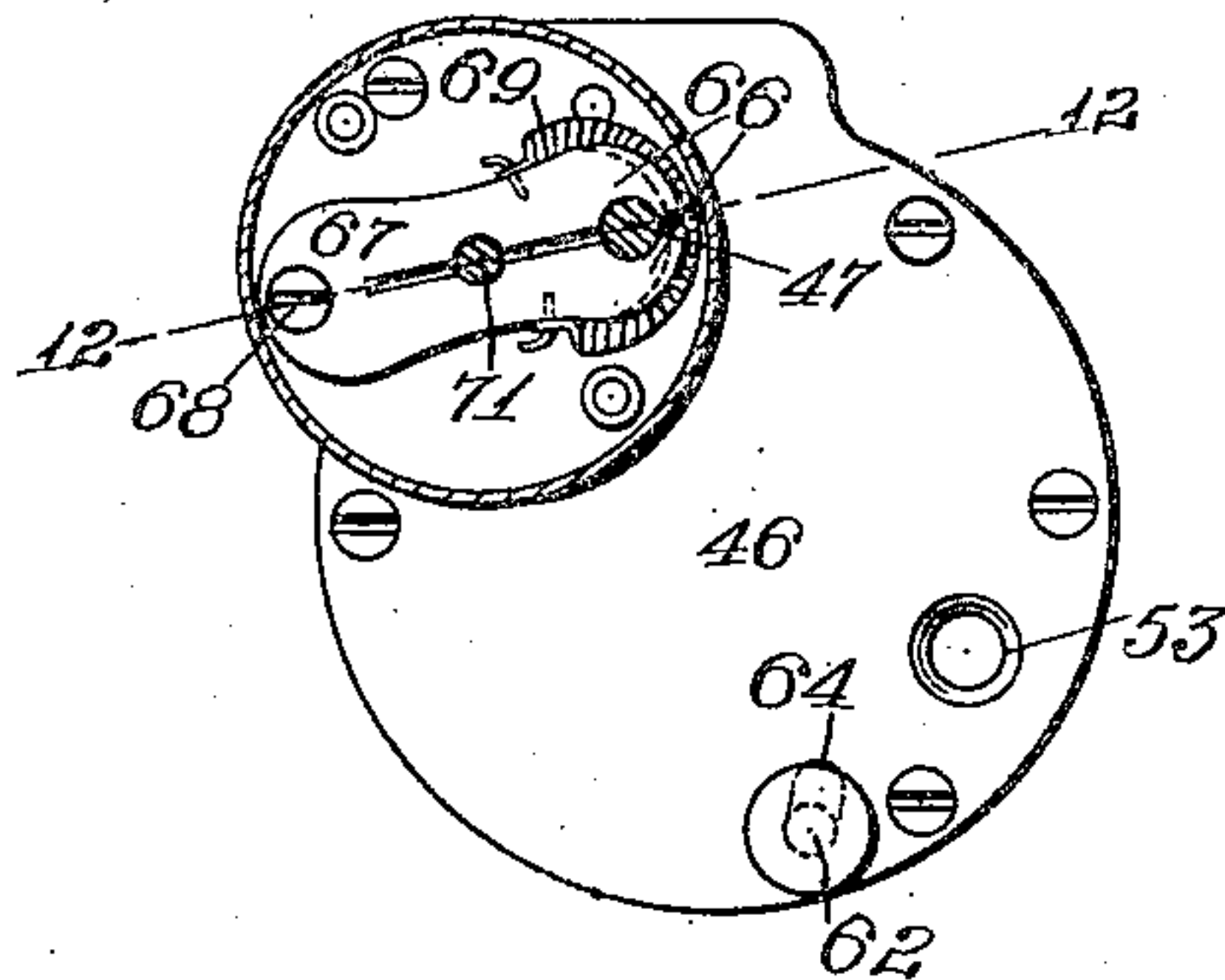
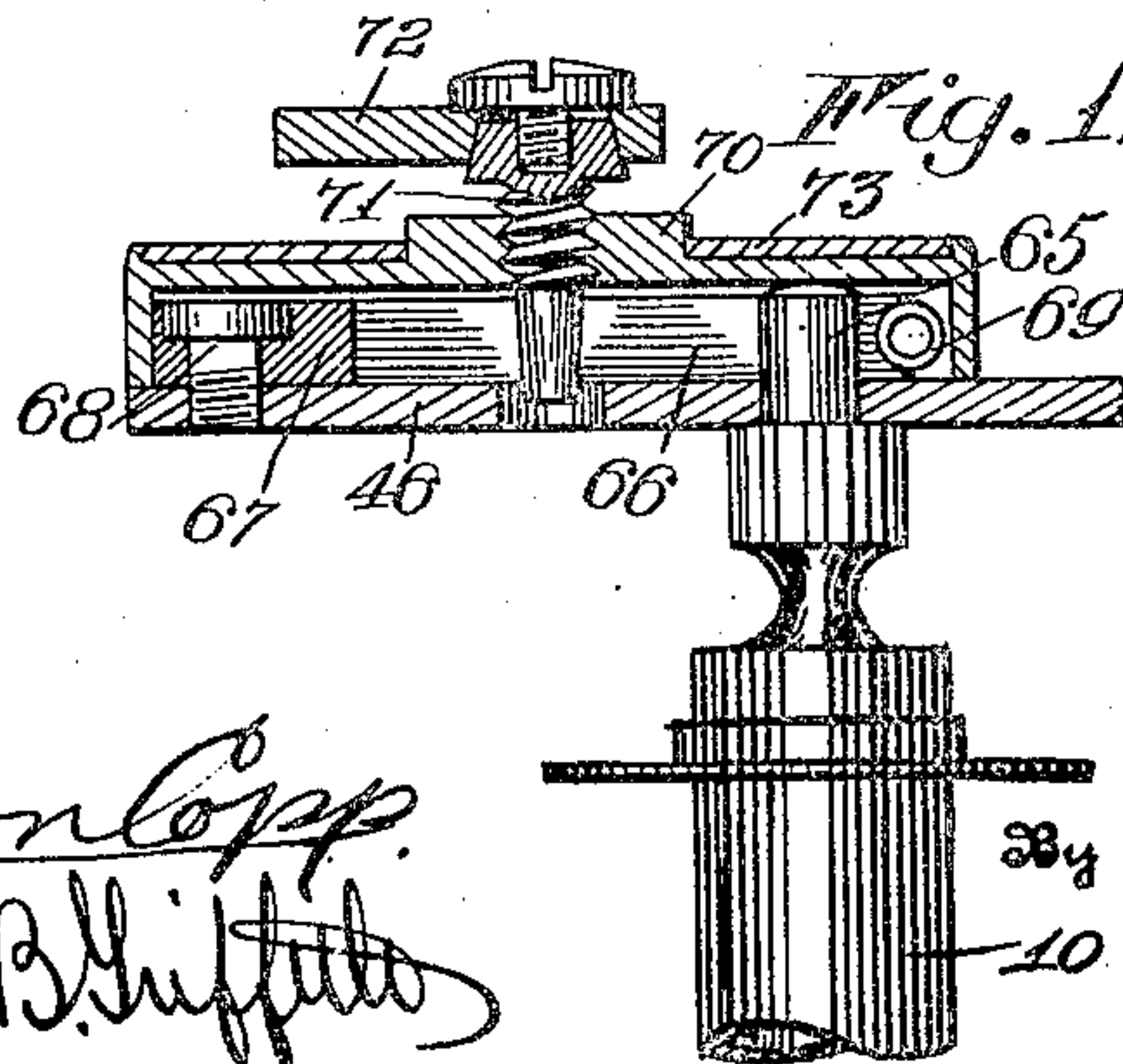


Fig. 12.



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CAMERA.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM F. FOLMER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Cameras; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

The present invention relates to photography and more particularly to photographic cameras, and it has for its object to provide a device of this nature that will be simple, compact and serviceable for general photographic work and which will offer advantages in arrangement and operation as to certain of the exposure mechanisms, the improvements relating to such general and particular features of camera construction as are hereinafter specified.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a front elevation of a camera constructed in accordance with and illustrating one embodiment of my invention, the parts so far as shown being in inoperative position; Fig. 2 is a detail rear elevation of the lens cover and its retaining catch, the same being shown in front elevation in Fig. 1; Fig. 3 is a side elevation of the parts shown in Fig. 2; Fig. 4 is a top plan view of the camera; Fig. 5 is a horizontal central section taken substantially on the line 5—5 of Fig. 1; Fig. 6 is a front elevation corresponding to Fig. 1, but with the front wall of the camera body or casing removed; Fig. 7 is a plan view of the shutter controlling mechanism, showing the relation of its actuating mechanism to the actuating devices of the lens cover, the front wall only of the camera casing being included; Fig. 8 is a vertical section taken substantially on the line 8—8 of Fig. 7, showing the lens cover in open position and the actuating devices therefor; Fig. 9 is a longitudinal central section taken substantially on the line 9—9 of Fig. 1; Fig. 10 is a bottom plan view of the shutter controlling mechanism shown in Fig. 7; Fig. 11 is a top plan view of the

journal plate upon which parts of the shutter mechanism are mounted, together with the retarding device for the latter, the housing thereof being in section substantially on the line 11—11 of Fig. 1; and Fig. 12 is a section through the retarding or brake mechanism taken substantially on the line 12—12 of Fig. 11.

Similar reference numerals throughout the several figures indicate the same parts.

The invention has been illustrated in the present embodiment in connection with a box camera of relatively small size in which useful application of the improvements offered have been taken advantage of in producing an instrument that, though comprised within narrow limits of space, is rendered as effective as larger devices of the kind through the employment of a curtain shutter (not usually found on small cameras) and in other ways. Quality in the product is therefore placed within reach without the bother of transporting and manipulating a large and cumbersome instrument, while, through the possibilities of enlargement, disparity in the relative sizes of the negatives produced may be compensated for.

Referring now more particularly to the drawings, and especially to Fig. 5 thereof, 1 indicates generally the body or casing of the camera, 2 the back and 3 the exposure chamber, the walls 4 of which latter are preferably provided with serrations 5 to break up marginal light rays and prevent the undesirable rays from being reflected to the rear of the chamber. These inner walls 4 are preferably of a rigid integral construction extending practically from front to rear of the casing and dividing the interior of the latter off, together with transverse partitions 6, into front chambers 7 and rear chambers 8. In the former are preferably arranged the rollers 9 and 10 of a curtain shutter 11 which passes over idlers 12 past the exposure opening 13 in rear of the exposure chamber 3 while in the latter are arranged the journal supports 14 for the film spools, the film therefrom being fed over idlers 15 past the exposure opening 13 in rear of the curtain 11.

As before stated the walls 4 of the exposure chamber 3 are preferably formed of an integral block and the latter is also provided with a transverse partition 16 that separates

the inclosed space into the before mentioned exposure chamber and a forward lens chamber 17 opening at 18 at the front of the camera body. The lens tube or mount 19 is
5 fixed in the partition 16 to occupy the lens chamber 17 and is provided in the present instance with an iris diaphragm of a well known type (details of which it is not
10 thought necessary to show) embodying the usual leaf-controlling ring 20 having a toothed segment 21 thereon.

Referring now additionally to Figs. 4 and 9, a shaft 22, suitably journaled at 23 in the casing extends from the exterior of the
15 latter to within the lens chamber 17, its inner end being provided with a toothed segment 24 meshing with the toothed member 21 on the diaphragm ring, while on the outer projecting end is secured a finger 25 that
20 serves both as an operating portion and as an indicator coöperating with a suitable scale or index 26 adjacently arranged on the exterior of the camera. By rotating the shaft 22 the diaphragm is restricted or enlarged, as
25 desired, the state of its adjustment being apparent from a reading on the scale 26.

The lens opening 18 in the front of the camera is normally closed by a flap cover 27 pivotally mounted to open outwardly or
30 exteriorly of the casing on a shaft 28 journaled at 29 on the inner wall of the latter (Figs. 1, 2 and 3). This flap serves in the capacity both of a shutter element and a sky shield for the lens, and for the latter reason
35 it is provided at its lateral edges with rearwardly turned walls or flanges 30, extensions 31 of which act as stops beyond the pivot to halt the cover in its closed position. The actuating devices for the flap embody in the
40 present instance a toothed segment 32 pivoted at 33 on a wall of the lens chamber 17 and meshing with a pinion 34 on the shaft 28, the said segment 32 being provided with a shoulder 35 engaged by a bent arm 36 on an oper-
45 ating lever 37 mounted, as will be herein-after described, on the top wall of the casing and having a projecting finger piece 38 (Fig. 7). The lever moves the segment 32 to open the lens cover against the tension of a spring
50 39, the tendency of which is to hold the flap closed.

To hold the lens cover and sky shield in its open position, when desired as for focusing with a screen, I provide a latch device
55 comprising in the present instance a lever 40 pivoted at 41 (Fig. 2) on the inside of the front wall of the casing, there being secured on one of its arms a resilient or yielding latch member 42 having an engaging por-
60 tion 43 movable toward and from the lens opening 18 and into and out of the path of one of the flanges 30 on the lens cover as the lever 40 is oscillated through the medium of a stud 44 projecting through a slot 45 in the
65 wall, the lever being preferably mounted

with sufficient frictional resistance to enable it to hold its operative and inoperative positions. When thus retained in its open position, the flap 27 is of course properly re-
70 leased by withdrawing the latch 43, but to provide against injury to the parts by careless or forgetful handling of the instrument, the latch member 42 is made of a yielding nature, as previously mentioned, with the re-
75 sult that it recedes easily from its position when the flap or lens cover is otherwise forcibly closed.

Passing now to the curtain shutter 11 and its actuating and controlling parts, the latter are in the present instance mounted prin-
80 cipally upon a journal plate 46 secured to the top wall of the casing (Figs. 4, 7, 10 and 11). Of the curtain rollers 9 and 10, the former is, in the present embodiment, the tension roller and the latter the winding roller and
85 the curtain itself is preferably of the type embodying a series of apertures ranging from a relative small size for fast work to one corresponding approximately to the size of the exposure opening 13 for time work.
90 The shaft 47 of the winding roller 10 is journaled in the plate 46 and provided with a fixed pinion 48 meshing with the winding gear 49, also mounted on the plate and hav-
95 ing attached thereto a winding key 50, arranged on the exterior of the camera. The gear 49 also carries a spur 51 meshing with a toothed indicator wheel 52, the characters on which are viewable through a sight aper-
100 ture 53 in the plate 46 and indicate that aperture of the curtain which, by reason of the degree of winding of the roller 10 is set to first pass across the exposure opening for an exposure.

Projecting from the under side of the gear 105 49 are winding stops 54 and arresting stops 55, one set of members being arranged on the same circumference with each other but on a shorter radius than the other set. Piv-
110 oted on the plate at 56, adjacent the gear, is a controlling lever 57 having a projection 58 thereon that is normally held in the path of the winding stops 54 by a spring 59 and which is displaced laterally into the
115 path of the arresting pins 55 by the engagement of the winding stops with a surface 60 on the lever, after which the projection 58 snaps back behind the winding stop as the winding roller 10 receives the curtain from
120 the tension roller against the resistance thereof. The controlling lever 57 is manually displaced to effect an exposure by the operating lever 37, heretofore described as the means for operating the lens cover 27,
125 said operating lever having a second arm 61 thereon engaging the end of the controlling lever 57. As the latter is moved thereby, the winding stop 54, which is at the time in engagement with the projection 58, is released for retrograde movement until the
130

projection, moving into the path of the arresting stops 55, is engaged by the approaching one of the latter, the same being so spaced as to thus halt the curtain as soon as the exposing aperture in the latter has passed the exposure opening of the camera. Furthermore, each winding stop 54 is so arranged with relation to one of the arresting stops 55 that subsequently, when manual pressure on the operating lever 37 is released and the controlling lever 57 is allowed to return under the influence of its spring 59, the projection 58 thereon will immediately engage behind a winding stop 54 before any appreciable lost movement of the curtain has occurred. It will thus be seen that with this train of operations, the effect of pressing the operating lever 37 is first to open the lens cover and sky shield 27 and almost simultaneously therewith to release the shutter, while when the operating lever is released the lens cover automatically closes. This is the procedure in instantaneous or automatically timed work.

A time exposure can be effected in either of two ways with the device of the present embodiment as the maximum or time exposure aperture of the curtain is the last to leave the winding roller and the tension roller has run down by the time this aperture is brought coincident with the exposure opening. The curtain may therefore be set "open," that is, with the time aperture coincident with the exposure opening and the exposure made by simply opening and closing the lens cover by means of the operating lever 37, the curtain being unaffected, or else the curtain may be set at the last stop with an opaque portion covering the exposure opening, the first movement of the operating lever 37 causing both the opening of the lens cover and the movement of the time or maximum aperture of the curtain to coincidence with the exposure opening, the subsequent movement of the lever serving to terminate the period of exposure simply by the closing of the lens cover. The latter plan is, however, preferable as the sensitized material is protected both by the lens cover and by the curtain and any accidental movement of the operating lever 37 sufficient to unseat the former but insufficient to cause the actuation of the curtain will not ruin the exposure.

Because of the protection afforded by the normally closed lens cover, the setting of the curtain can be changed at any time as occasion dictates even though, in winding, the successive apertures pass across the exposure opening until the one desired is in operative position. On the other hand it is sometimes desired to "run down" the shutter, that is, operate the aperture which is set for the exposure past the exposure opening without effecting the exposure in order to bring some

succeeding aperture into position. If the shutter could only be released by the operating lever 37, this would be impracticable as the lens cover would be similarly opened. I therefore provide an independent means for actuating the shutter without disturbing the lens cover and operating lever 37, which consists in the present instance of an operating stud 62, fixed directly on an arm 63 of the controlling lever 57 of the shutter mechanism which projects through a slot 64 in the journal plate 46 to the exterior of the camera, as shown in Figs. 4 and 10.

The means provided for automatically timing the duration of an exposure, that is, the speed with which the curtain aperture flashes across the exposure opening, will now be described. The shaft 47 of the winding roller, as before mentioned, is journaled in the plate 46 and as shown in Fig. 12, the end 65 is allowed to project beyond or on the exterior of the said plate where it is engaged upon opposite sides by two opposed, spring-pressed clamping jaws 66 (Fig. 11) that are preferably formed, as shown, by bifurcating a block 67 of resilient material, secured at 68 to the journal plate 46, the elasticity of the jaws, or rather their clamping pressure upon and frictional engagement with the shaft portion 65 being increased, if necessary, by a connecting spring 69. A cover plate 70, superposed upon the plate 46, forms a housing for the jaws and shaft and into this cover plate is threaded a tapered pin 71, the lower conical end of which is thus adapted to be advanced between or retracted from the clamping jaws 66 by a rotary movement to vary the clamping pressure exerted upon the winding roller shaft 65. In this way an adjustable brake mechanism is provided that retards the unwinding movement of the winding roller of the curtain to a greater or less degree, similarly increasing or diminishing the speed of the curtain apertures during the exposing movement, and an indicator 72 is preferably carried on the outer end of the controlling pin 71 which coöperates with an index or scale 73 on the housing to give evidence of the degree to which the adjustment effects the parts. This scale 73 is preferably of the form shown in Fig. 4 comprising radially arranged characters 74 representing the different sized curtain apertures and, upon the same circumference with each character, the characters 75 each of which indicates the speed of the exposure, when the indicator coöperates therewith, for the aperture on the same circumference with which it is alined. Thus with the indicator 72 pointing to the characters to the left of the stop 76 therefor in Fig. 4 it will give a speed of 700 for a $\frac{3}{16}$ aperture; 175 for a $\frac{1}{4}$ aperture, and so on.

I claim as my invention:

1. In a camera, the combination with the

- casing thereof having a lens opening arranged substantially centrally of the front wall thereof, of a lens cover cooperating with the opening to open exteriorly of the casing embodying a pivoted flap having connected for movement therewith a pinion and actuating devices for the flap comprising a toothed member cooperating with the pinion and an operating lever accessible from the exterior of the casing and arranged on the top thereof, said lever being provided with a downward extension for driving the toothed member.
2. In a camera, the combination with the casing thereof having a lens chamber therein opening to the exterior of the casing, of a lens cover cooperating with the opening embodying a pivoted flap adapted to open exteriorly of the casing, a shaft therefor having a pinion thereon, a toothed member mounted on a wall of the lens chamber to cooperate with the pinion and an operating member accessible from the exterior of the casing for driving the toothed member.
3. In a camera, the combination with the casing thereof having a lens opening therein, of a pivoted lens cover cooperating with the latter to open exteriorly of the casing and form a sky piece and a catch cooperating with the cover within the opening for holding the latter in its open position.
4. In a camera, the combination with the

casing thereof having a lens opening therein, of a pivoted lens cover cooperating with the latter to open exteriorly of the casing and form a sky shield, said cover being provided with lateral flanges and a catch at the side of the lens opening adapted to cooperate with one of the flanges for holding the cover in open position.

5. In a camera, the combination with the casing thereof having a lens opening therein, of a pivoted lens cover cooperating with the latter to open exteriorly of the casing and form a sky shield, and a latch on the casing movable into and out of position for engagement with a portion on the cover for holding the latter in open position, one of said engaging parts being of a yielding nature permitting the cover to be forcibly closed without injury to the parts while the latch is still in its engaging position.

6. In a camera, the combination with the casing thereof having a lens opening therein, of a pivoted lens cover cooperating with the latter to open exteriorly of the casing and form a sky shield, a shutter mechanism, a common operating member for the lens cover and shutter and means for operating the latter independently of the lens cover.

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