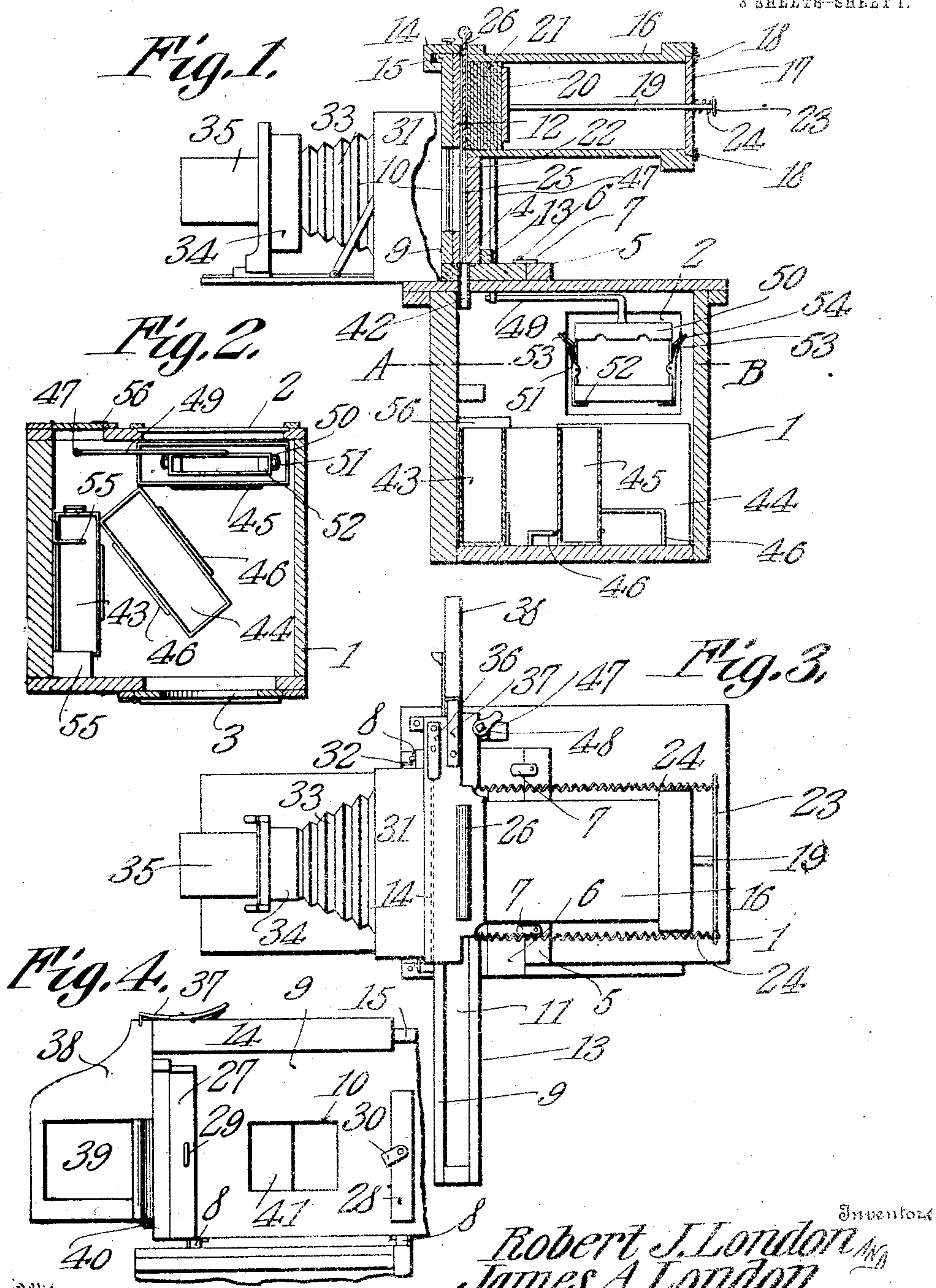


R. J. & J. A. LONDON.  
 PHOTOGRAPHIC MACHINE.  
 APPLICATION FILED JULY 29, 1909.

999,238.

Patented Aug. 1, 1911.

3 SHEETS-SHEET 1.



Witnesses

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3 SHEETS—SHEET 2.

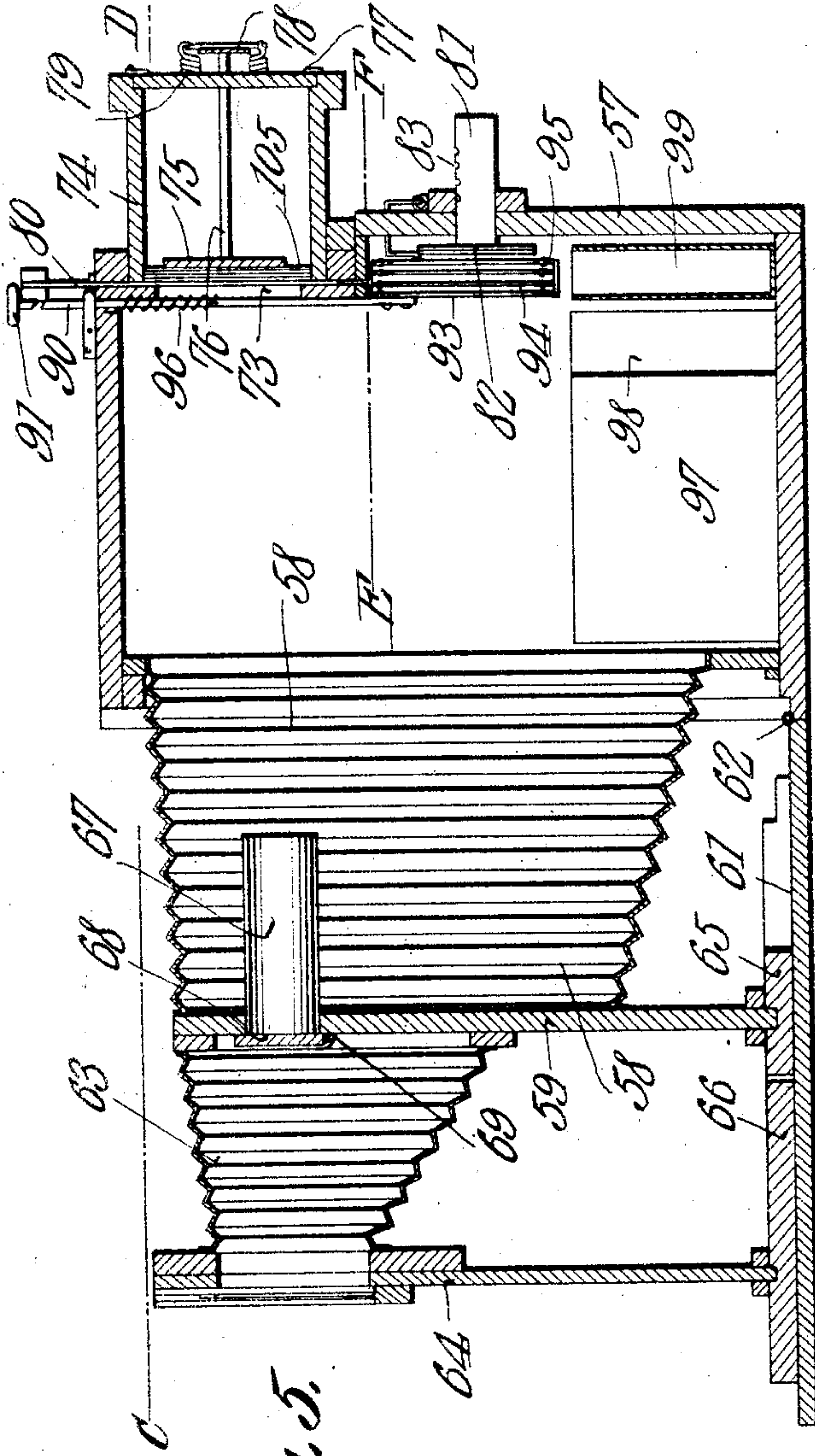


Fig. 5.

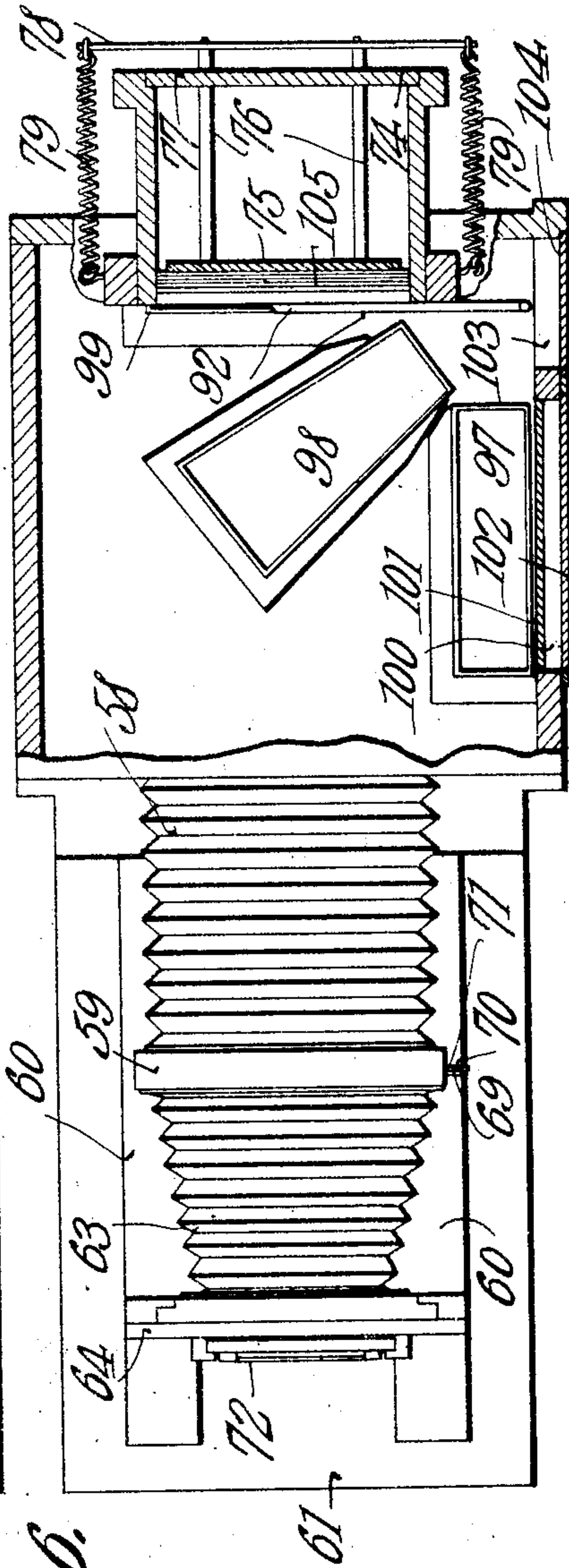


Fig. 6.

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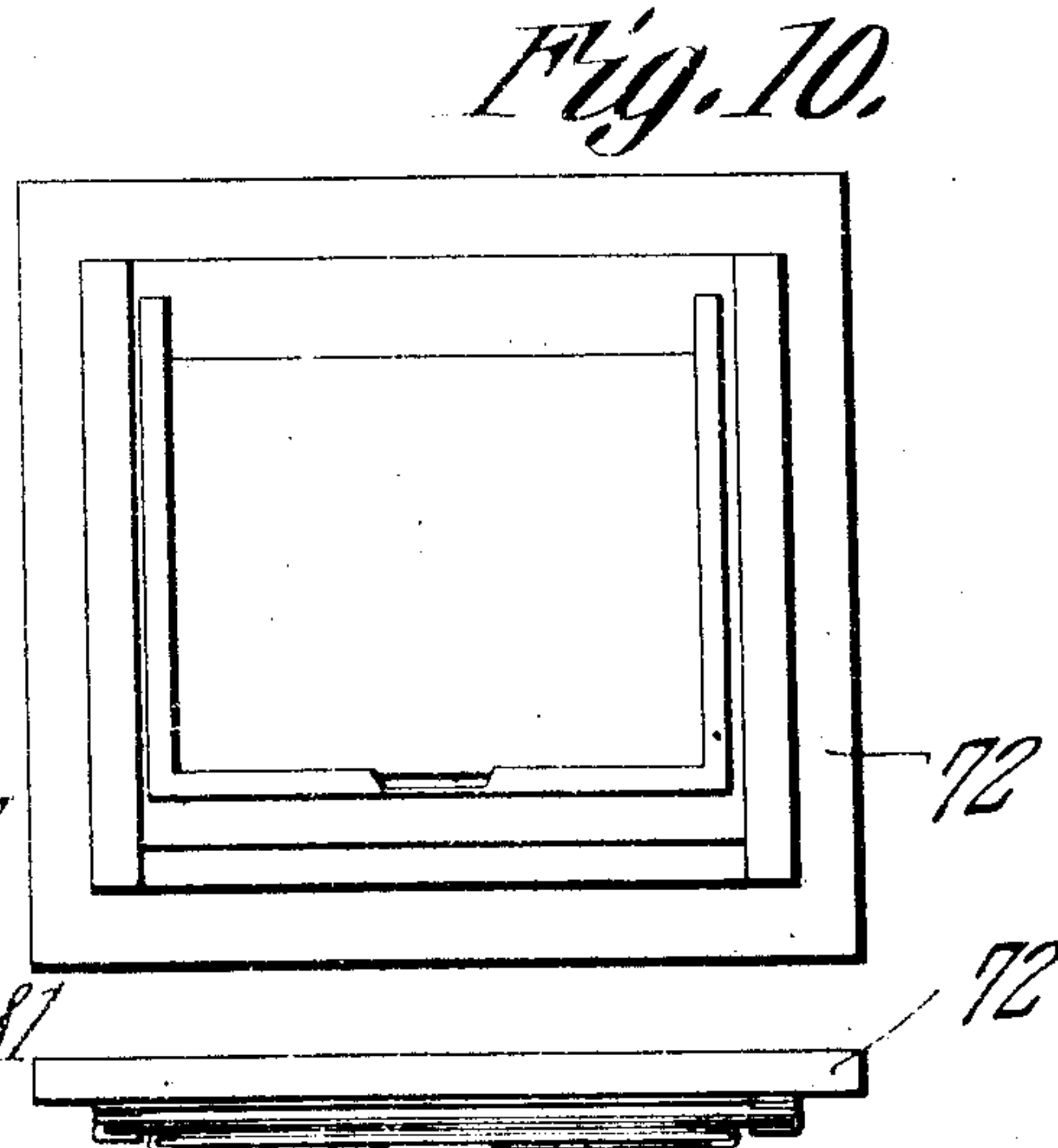
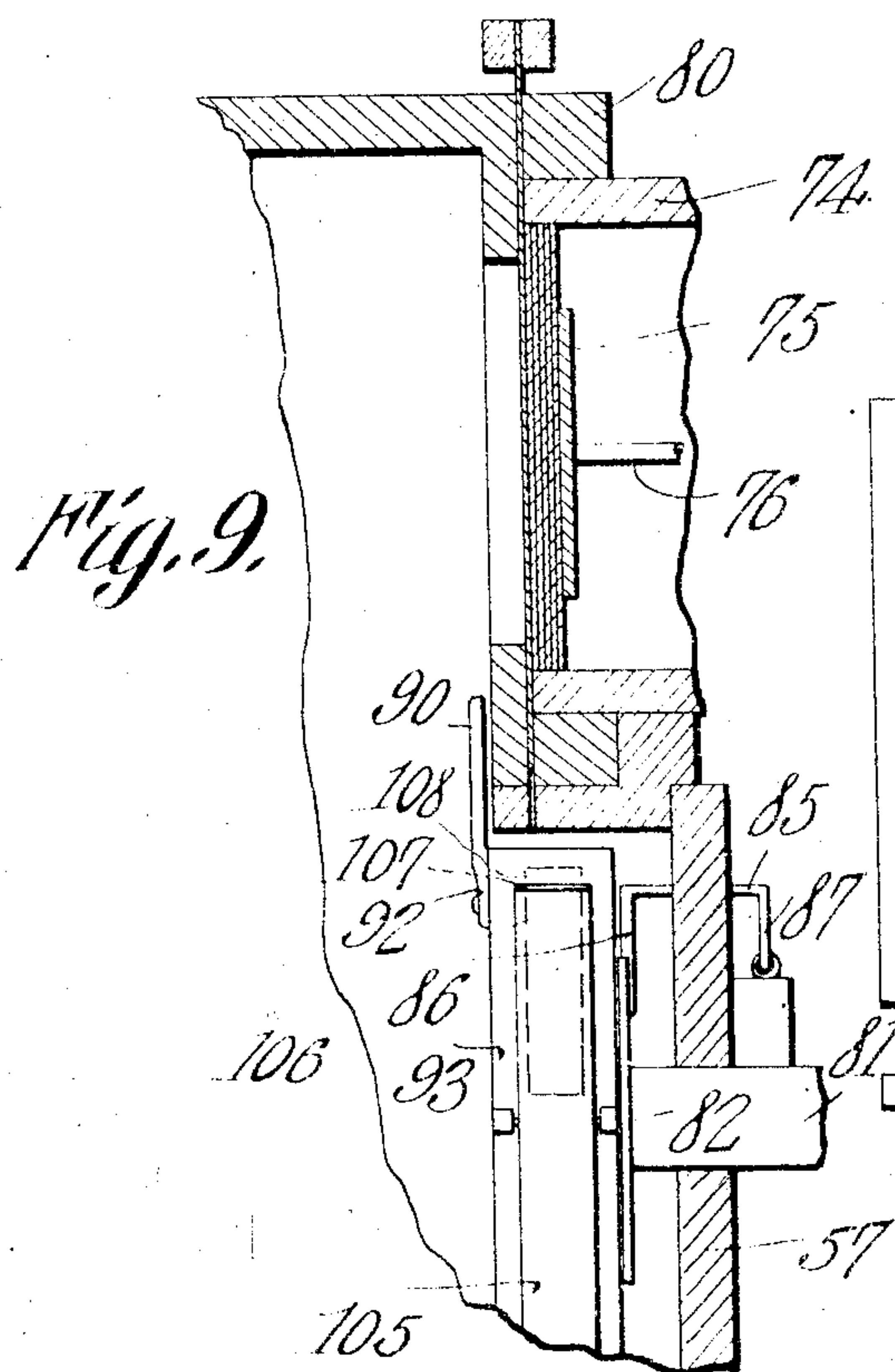
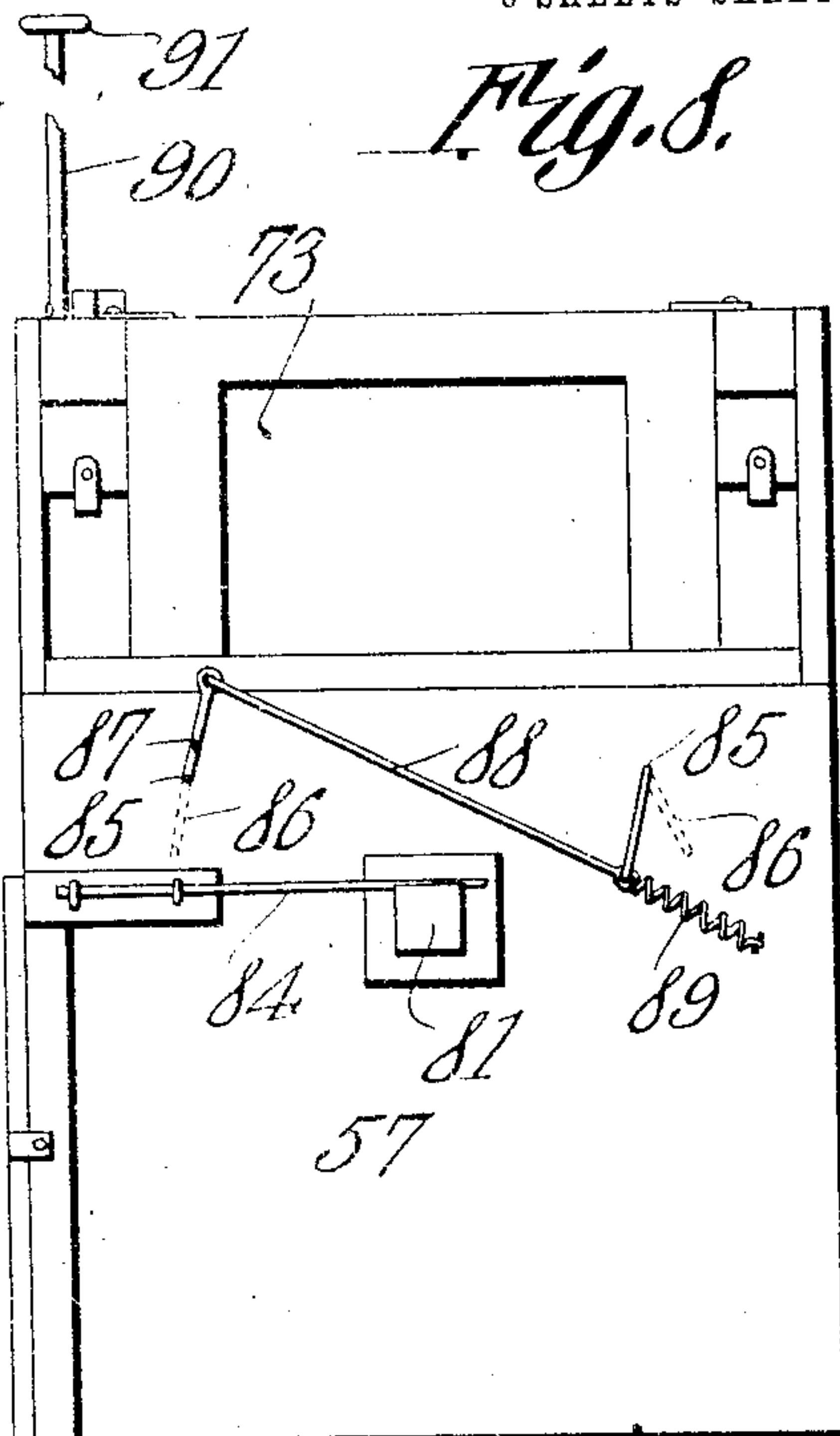
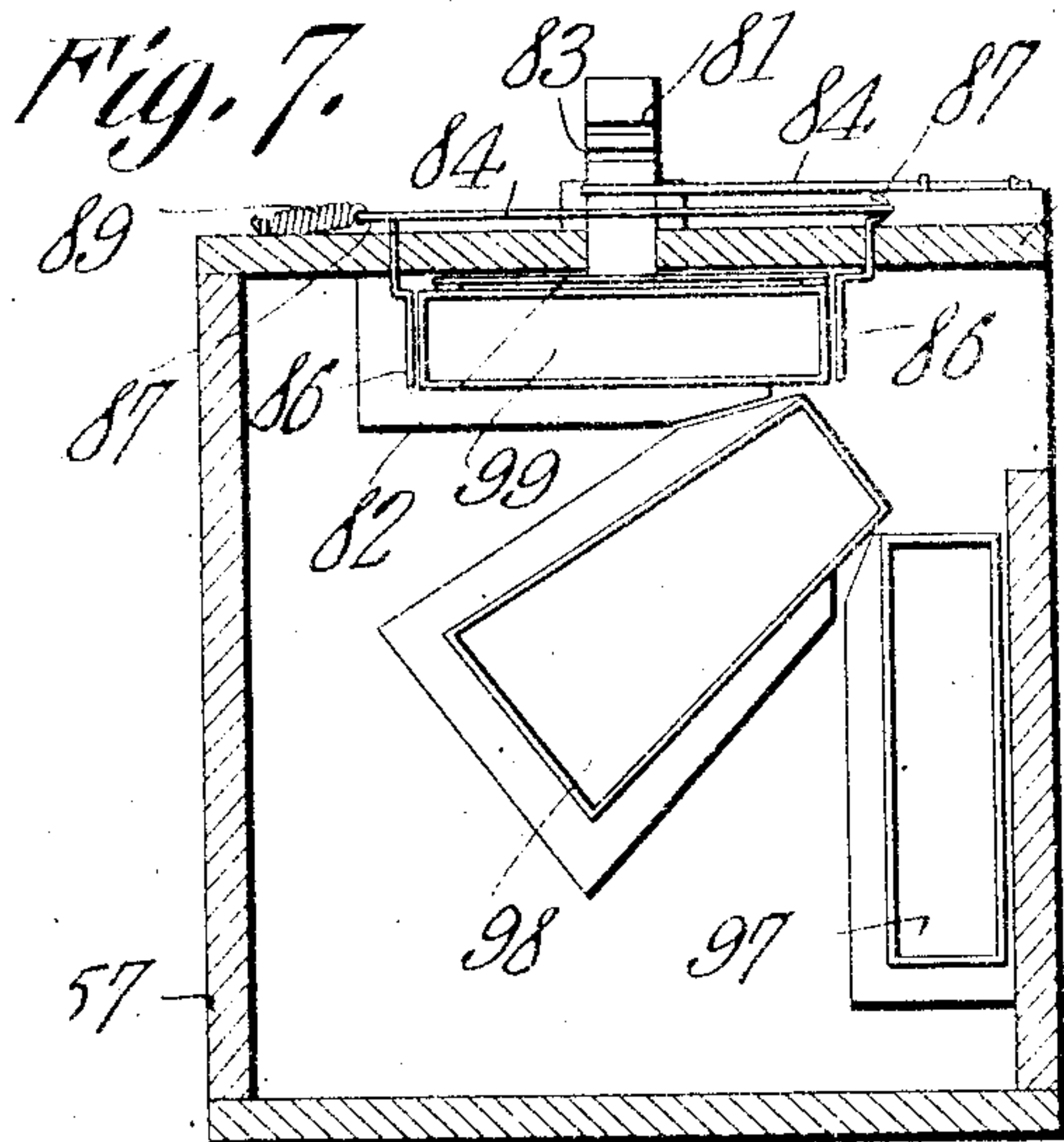


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3 SHEETS-SHEET 3.

999,238.



*Fig. 11.*

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# UNITED STATES PATENT OFFICE.

ROBERT J. LONDON AND JAMES A. LONDON, OF GRAVELTON, MISSOURI.

## PHOTOGRAPHIC MACHINE.

999,238.

Specification of Letters Patent.

Patented Aug. 1, 1911.

Application filed July 29, 1909. Serial No. 510,186.

### *To all whom it may concern:*

Be it known that we, ROBERT J. LONDON and JAMES A. LONDON, citizens of the United States, residing at Gravelton, in the county of Wayne, State of Missouri, have invented a new and useful Photographic Machine, of which the following is a specification.

This invention has reference to an improvement in a photographic machine and its object is to provide a machine wherein sensitive plates may be exposed to a light image produced by a suitable lens, after which the plates are transferred to the developing, washing and fixing baths contained in a dark box forming a part of the machine so that the use of a dark room for the finishing of negatives is unnecessary.

The machine may be arranged so that photographic negatives may be produced directly from the object to be photographed and any enlargements or copies may be produced from the negatives already in existence.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of this specification.

In the drawings:—Figure 1 is a vertical section, with parts in elevation, of a photographic machine for the production of finished negatives from objects to be photographed. Fig. 2 is a section on the line A—B of Fig. 1 with the plate carrier shown in the depressed position. Fig. 3 is a plan view of the structure shown in Fig. 1. Fig. 4 is a front view of a portion of the structure in Fig. 1 with the camera removed. Fig. 5 is a longitudinal section of a copying camera with the invention applied thereto. Fig. 6 is a section on the line C—D in Fig. 5. Fig. 7 is a section on the line E—F in Fig. 5 with parts omitted. Fig. 8 is a rear view of the structure shown in Fig. 5. Fig. 9 is a view on an enlarged scale of the magazine end of the structure shown in Fig. 5 in a section on a vertical plane through the magazine and with other parts shown in elevation. Fig. 10 is an elevation of the negative holder used at the front of the structure shown in Fig. 5. Fig. 11 is a top plan view of the structure shown in Fig. 10.

Referring to the drawings, more particularly Figs. 1, 2, 3 and 4, there is shown

a box or closure 1 capable of being rendered actinically light tight, though non-actinic light is permitted to enter through a window 2 and a door 3 each of which may be provided with the usual ruby glass. The window 2 is located on one side of the box 1, preferably above the middle line of the box, while the door 3 may be on the other side of the box and of a sufficient size to permit ready access to the box.

On top of the box are secured spaced strips 4—5 and between them there is secured a board 6 removably held in place by buttons 7 and hinges or catches 8.

The board 6 carries an upright board 9 having a suitably located passage 10 there-through of a size to permit a light image to pass to the sensitive plate of the largest size for which the apparatus is designed.

The board 6 has a slide extension 11 forming a track for another board 12 capable of sliding across the rear face of the board 9 in close contact therewith between the said board 9 and a guide 13 carried by the board 6 and extending along the said projection 11 of the said board 6. The board 12 carries at the upper edge an overhang 14 extending around the rib 15 along the upper front edge of the board 9. The board 12 is capable of sliding along the entire length of the board 9, which latter is as long as the board 6 and side extension 11.

Fast to the board 12 near the upper edge thereof is a magazine 15 conforming in shape in cross-sectional internal area to the size of the sensitive plates to be used in the machine. The end of the magazine 16 remote from the board 12 is normally closed by a cover 17 held in place by buttons 18.

Extending through the cover 17 is a rod 19 terminating at the inner end at a follower 20 and designed to push the sensitive plates indicated at 21 against the board 12 at the point immediately above an opening 22 therein capable of being brought into matched relation to the opening 10 in the board 9.

The rod 19 beyond the cover 17 carries a cross head 23 to which is connected a spring 24 extending to a fixed portion of the structure, these springs tending to move the follower 20 against the plates 21 within the magazine.

Extending across the magazine and



through the top of the structure carrying the same and also downward past the opening 22 and ending at the board 6 is a passage 25 of a width equal to the length of the plate 21 and of a thickness sufficient to permit a single plate at a time to pass. Arranged to enter the passage 22 to an extent sufficient to traverse the magazine 16 is a slide 26 of such thickness as to engage the front plate in the magazine and push the same along the passage 25 into coincidence with the opening 22, which latter is slightly smaller than the plate so that the plate may not pass through the said opening.

The front board 9 of the structure has on its front face two spaced strips 27—28, one provided with an eye 29 and the other with a button 30 so that a camera box 31 may be secured in place by means of a lug 32 adapted to the eye 29 and be held by the button 30, the camera being provided with the usual bellows 33, a lens carrier 34 and lens 35, it being understood that any of the focusing means commonly employed with cameras may be utilized in connection with the camera shown, which showing of the camera is not complete since any suitable known type of camera may be used and, therefore, the showing is made illustrative only. The particular type of camera indicated is the folding type of camera, thus permitting this portion of the structure when remaining in position to be folded into a small compass.

The magazine 16 together with the board 12 is capable of sliding along the board 9, either to position in coincidence with the optical axis of the lens 35 or to such an extent to one side thereof as to expose the opening 10 to view from the rear side of the board 9. Mounted on top the overhang 14 is a spring latch 36 so arranged as to engage stop means in the top of the board 9 to position the board 12 with relation to the opening 10, this being a common practice in portrait cameras. The overhang 14 is also provided with a spring catch 37 engaging the upper end of a frame 38 carrying a focusing screen 39 preferably of ground glass, this frame being held at the bottom by a bracket 40, the frame 38 thus being readily removable from the board 12 when desired. The range of movement of the board 12 is such that when it is at one limit of its movement the focusing screen 39 is coincident with the opening 10 in the board 9 and at the other limit of its movement the opening 22 in the board 12 is coincident with the opening 10 in the board 9.

Since it is often desirable to expose but a portion of the plate at a time, say, for instance, one half of the plate, a dark slide 41 may be introduced in a suitable passage at the end of the board 9 adjacent to the opening 10; the dark slide being of such length

as to cover one half of the opening 10. The latch 36 may be so arranged as to arrest the movement of the board 12 so that but one half a plate 21 is presented to the opening 10 and then further movement of the board 12 will present the other one half of the plate to the said opening, the portion of the plate already exposed being then protected by the dark slide 41.

Since the magazine 16 is above the opening 22 the plates 21 must be moved downward to the passage 25 from the said magazine before they are in the optical axis of the lens back of the openings 10 and 22 and this is accomplished by means of the slide 26, the frictional movement of the plate in the passage 25 being sufficient to hold the plate in position while the exposure is being made. On lifting the slide 26 to a sufficient extent the springs 24 will cause movement of the entire lot of plates 21 until the foremost plate is against the board 12 immediately above the plate then in coincidence with the openings 10 and 22, and on a second depression of the slide 26 the foremost plate in the magazine is moved downward through the passage 25 and engages the exposed plate and forces the latter still farther downward in the passage 25 while the other plate is moved into coincidence with the openings 10 and 22.

The passage 25 opens into a conduit 42 which in turn extends through the top of the box 1 and terminates inside of said box.

Within the box 1 and immediately below the conduit 42 there is lodged a tank 43, and in radial relation to a point close to one corner of the box 1 are other tanks 44 and 45, said tanks being held in position by strips 46 appropriately located on the bottom of the box 1.

Extending through the top of the box and located in the vertical axis from which the tanks 43, 44 and 45 radiate is a rod 47 having at its upper end a handle 48 exterior to the box and at its lower end within the box carrying a laterally projected frame 49, at the free end of which there is sustained a frame 50, preferably of an open rectangular shape and of a size to receive the plates 21. The frame 50 is open top and bottom and on the ends are pivoted levers 51 each formed at one end with an angle projection 52 arranged to normally project one toward the other below the frame 50 to engage and stop a plate entering the frame from above, these levers having the ends remote from the handle extensions 52 outwardly bent as indicated at 53 and are normally retained in position to cause the extensions 52 to remain in the path of the plate by springs 54, but such springs are yieldable to a force causing the movement of the extensions 52 out of the path of the plate within the frame 50.



The frame 50 is adapted to any one of the tanks 43, 44 and 45 and may be brought over any one of these tanks by turning the rod 47 upon its longitudinal axis.

5 Over the tank 42 are two spaced members 55 sufficiently separated to permit the introduction of the frame 50 between them but close enough together to engage the out-bent ends of the levers 51 when the frame 50 is  
10 moved downward and toward the tank 43.

When the slide 26 is depressed to cause the movement of the exposed plate into the conduit 42 the rod 47 has already been rotated to a position to carry the frame 50  
15 beneath the conduit 42 so that the dropping plate after passing through the conduit 42 is received in the frame 50 and caught by the angle extensions 52 on the lower ends of the levers 51.

20 The rod 47 is now rotated until above the tank 45 and then the rod is depressed until the frame 50 and the plate carried thereby is immersed in developing solution in said tank 45. The window 2 is located immediately above the tank 45 and the door 3 is  
25 high enough to be in line with the window 2 so that by raising the rod 47 from time to time the frame 50 and the plate therein will be elevated into line with the window 2 and  
30 a light opposite the door 3 will enable the operator to observe the progress of the development of the plate being treated.

When the development has proceeded to the desired extent the rod 47 is elevated and  
35 turned about its longitudinal axis until over the tank 44 and is then dipped therein, this tank containing washing water. The rod 47 is again manipulated to lift the frame 50 over the tank 44 and the rod is then  
40 turned until the frame 50 is over the tank 43 when by depressing the rod the frame 50 is moved toward the tank 43 until the stops 55 have engaged the out-turned ends 53 of the levers 51 and have caused the movement  
45 of these levers against the action of their springs 54 until the angle extensions 52 are moved out of the path of the developed plate and the latter gravitated into the tank 43, which latter contains a suitable fixing solution.  
50 tion.

When the plate has remained long enough in the fixing solution the tank 43 may be removed from the box 1 through a door 56 in one side of the box in a line with said tank.  
55 By this means a sensitive plate may be exposed to the light image of the lens 35 and then transferred in succession to the developing solution, washing bath and fixing bath without the plate being exposed to  
60 actinic light and without the necessity of taking the exposed plate into a dark room.

The invention heretofore described is adapted for the production of negatives by the direct photography of objects.

The invention is also adapted for the pro- 65 duction of copies or enlargements from negatives already produced and any of its salient features need not differ in material respects from the structure already described. 70

The copying camera is illustrated in Figs. 5 to 8, both inclusive.

The copying camera is provided with a box 57 at the front end of which there is secured a bellows 58 which in turn is made 75 fast at the forward end to a board 59 capable of sliding between the guides 60 on a base-board 61 and hinged at 62 to the bottom of the box 57. Attached to the front of the board 59 is another bellows 63 secured at its 80 forward end to a board 64 also capable of sliding on the base 61 between the guides 60, the board 59 being mounted on a block 65 and the board 64 being mounted on a block 66 adapted to the guides 60, the entire structure, so far as the base 61 has 85 parts carried thereby, being similar to that employed usually with cameras.

Mounted on the board 59 within the bellows 58 is a lens 67 of the type usually employed for copying, although the invention 90 does not depend in any manner upon the type of lens employed.

Pivoted to the front of the board 59 within the bellows 63 is a blind 68 capable of being 95 moved in front of the lens 67 to prevent the admission of light thereto or away from the lens to admit the light thereto, this blind being mounted on a shaft 69 extending to the exterior of the bellows 63 and 100 there provided with a handle 70 which may be caught behind a stop pin 71 on the board 59 and when so caught the blind 68 is in position to shut off light from the lens 67. The front board 64 carries guides for a 105 plate holder 72 designed to carry the negative through which the light is to be transmitted to the lens 67.

While not shown in the drawings, it is to be understood that the plate holder 72 may 110 be provided with adjusting means such as are usually employed in copying cameras for positioning the negative with reference to the lens.

The copying camera is designed more particularly for the making of prints from 115 negatives upon sensitized postal cards or other heavy-paper carriers having a sensitive surface.

The rear portion of the box 57 at the 120 upper end thereof is provided with an opening 73 in the focal axis of the lens 67 and this opening is normally closed by the delivery end of a magazine 74, similar to the magazine 16 of Fig. 1 but shaped to contain 125 postal cards or other heavy-paper carriers. This magazine is provided with a follower 75 mounted upon rods 76 extending through



a cover or cap plate 77 for the end of the magazine and the rods 76 are connected to a cross head 78 outside the magazine and this cross head is urged in the direction  
5 to cause the follower to move toward the delivery end of the magazine by appropriate springs 79.

The end of the magazine adjacent to the opening 73 is also open but the opening is  
10 larger than the opening 73, being as large as a postal card, while the opening 73 is somewhat smaller so that a postal card will be held by its edges from passing through the opening 73. Immediately above and be-  
15 low the open end of the magazine are passages for the slide 80 similar to the slide 26 and designed to move an exposed postal card through the opening below the magazine into the interior of the box 57, said box be-  
20 ing inset at the point where the magazine is secured to it, so that the postal card in being moved from the magazine to the opening below the magazine will enter the box 57 at a point some little distance from the  
25 rear wall thereof.

Extending through the rear wall of the box 57 is a bar 81, preferably square in cross section, and carrying at the end within the box a head 82, the purpose of which will  
30 be hereinafter set forth. The bar 81 on its upper end is formed with a series of spaced grooves 83 in any of which may be lodged a spring rod 84 holding the bar in different positions with the head end correspondingly  
35 farther into the interior of the box 57 or closer to the rear wall of the box as the case may be.

Extending through the rear wall of the box are rock shafts 85 in spaced relation  
40 one to the other and these rock shafts carry within the box rock arms 86 and outside the box other rock arms 87, the latter carrying a connecting link for simultaneous movement while a spring 89 holds the rock arms  
45 in a predetermined position, which position is that where the rock arms 86 have their free ends moved away one from the other.

Extending through the top of the box near one corner thereof is a rod 90 provided at  
50 the upper end with a manipulating handle or wheel 91. The lower end of the rod 90 is provided with a laterally projecting arm 92 carrying at its free end a receptacle 93 provided with a number of partitions 94,  
55 in spaced relation one to the other. The receptacle 93 is of such size as to hold in each space between the walls of the receptacle and the partitions the postal cards in such a manner as to present them to the de-  
60 veloping, washing and fixing baths and for this purpose the side walls of the receptacle are made of skeleton type and partition members are formed with studs or projec-  
tions 95 so that the sensitive surface of the

postal cards are held away from contact 65 with any part of the receptacle except at the studs 95 which may be close to the edge of the postal cards and so will not interfere with those portions of the sensitive surface which have been acted upon by the light. 70

The rod 90 is under control of a spring 96 tending to elevate the rod and this spring may also act and tend to hold the rod in position where the receptacle 93 will be in engagement with the head 82 at the inner 75 end of the bar 81.

Mounted on the bottom of the box 57 are tanks 97, 98 and 99 in radial relation to the axis of the rod 90. Above the tank 97 the side of the box 57 is provided with an open-  
80 ing 100 covered by a transparent plate 101, preferably of glass, of a character permitting the passage of light which is practically non-actinic to the sensitive surface of the postal cards or printing paper and 85 for this purpose orange glass commonly employed by photographers will be found sufficient. The opening 100 may be closed by a door 102. In a line with the tank 99 is an opening 103 through the sides of the 90 box and this opening is closed by a door 104.

Let it be assumed that within the magazine 74 there is a supply of postal cards indicated at 105, these cards being urged toward the open end of the magazine into 95 position to be in the focal plane of the lens 67 by the follower 75 under the action of the springs 79.

Since it is customary to print a considerable number of postal cards from one nega- 100 tive, the image produced by the lens may be focused upon a focusing screen located in the focal plane of the lens after the magazine has been removed, and then the focusing screen may be taken away and the maga- 105 zine placed in position after which the slide 80, which may be a dark slide and which will serve to render the magazine light tight, may be withdrawn from in front of the series of postal cards in the magazine and 110 then the sensitive surface of the foremost card, which sensitive surface is toward the lens, may be exposed to the light image produced by the lens on moving the blind 68 from in front of the lens, the light image be- 115 ing a duplicate, on a larger or smaller scale, of the negative within the holder 72.

When the light has acted on the postal card for a sufficient length of time the blind 68 is moved over the lens 67 to cut off the 120 light and then the slide 80 is moved downward to engage the top of the postal card and force the same downward out of the magazine and into the interior of the box 57. The normal position of the receptacle 125 93 is beneath the passage leading from the magazine to the interior of the box and below the magazine, this receptacle being



held in such position by the spring 96. The postal card so treated is assumed to be the first of the series and the head 82 on the bar 81 is assumed to be in the closest relation to the rear wall of the box 57 so that the postal card pushed out by the slide 80 will enter the foremost of the spaces in the receptacle 93. On the withdrawal of the slide 80 from in front of the series of postal cards, after having caused the movement of the first postal card considered into the receptacle 93, there is another postal card presented in the focal plane of the lens and the operation of subjecting the postal card to the light image may be repeated. The bar 81 is released from the spring rod 84 and the head 82 is moved into the interior of the box 57 until the spring rod snaps into the next groove 83 from the one first engaged, thus moving the receptacle 93 so that the second compartment in the receptacle 93 is in position to receive the second postal card discharge from the magazine on the re-insertion of the slide 80. These operations are repeated until the receptacle 93 is full of postal cards, if such a number of prints are desired, and then the rod 90 is rotated against the action spring 96 until the receptacle is over the tank 97, which tank is designed to be provided with a suitable quantity of a suitable developer. The rod 90 is now pushed downward against the action spring 96 until the postal cards within the receptacle 93 have become immersed in the developer and the action is permitted to proceed so long as the judgment of the operator may demand, but the operator may guide the developing by releasing the rod 90 and permitting the receptacle to rise until the front one of the postal cards is visible behind the glass pane 101, the door 102 being open. When the development has proceeded so far as needed the rod is released so that the receptacle 93 may be withdrawn from the tank 97 and the rod is turned until the receptacle 93 is over the tank 98 and then, on pressing the rod, the receptacle is dipped into the tank 98, which tank is assumed to contain water only, for washing purposes, after which the receptacle is moved around until over the tank 99, the bar 81 having in the meantime been moved outwardly until the head 82 is against the inner wall of the box 57. The receptacle 93 is provided at each end with a lever 105 like the levers 51 already described and each of these levers has a handle extension 106 like the handle extension 52 of the levers 51 and for the same purpose, and each lever is provided with a spring 107 like the spring 54 of the levers 51, and, furthermore, the end of each lever 105 remote from the handle extension 106 is outturned as indicated at 108 like the out-

turned ends 53 of the levers 51. When the receptacle 93 is above the tank 99 the outturned ends 108 of the levers 105 are in the path of the arms 86 of the rock shafts 85 and then by moving the rock arms against the action of the spring 89 they are brought into engagement with the levers 105, thereby causing the release of the cards which thereupon drop through the bottom of the receptacle 93, which latter is otherwise unobstructed to the passage of the cards, and they are received in the tank 99 in which is a suitable quantity of fixing solution. After the lapse of a sufficient time the door 104 may be opened and the tank 99 may be removed through the opening 103.

The operation may be repeated as often as necessary until the contents of the magazine 74 are exhausted, when the supplies of the machine may be renewed for further operation.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. In a photographing machine, a box, tanks therein for containing materials employed in the development and fixing of photographic images, and a receptacle for photo sensitive carriers located within the box and movable into operative relation to chosen ones of the tanks, said receptacle having a plurality of compartments for photo sensitive carriers and an adjustable means for the receptacle for limiting its movement in one direction.

2. In a photographic machine, a developing box, a member mounted for rotation within the top of the box, said member being slidable in the direction of its axis of rotation, a plurality of tanks within the box, a receptacle fixedly connected to said member and movable therewith into position above and into and out of any one of the tanks, said receptacle including oppositely arranged levers having means for supporting a sensitive material, and means at opposite sides of the path of the receptacle when descending into one of the tanks, for simultaneously engaging and shifting the levers when the receptacle is lowered into the tank to automatically release the sensitive material when brought into said tank.

3. In a photographing machine, a photographic lens, a slidable manually operated shutter, means for presenting photo-sensitive surfaces into the focal plane of the lens and into the path of the shutter, a dark box, receptacles therein for material suitable for the developing of the light images, a manually controlled receptacle movably mounted within the dark box, said shutter constituting means for directing an exposed sensitive surface out of the focal plane of the lens and into the receptacle, and means



for moving the receptacle at will into operative relation to any one of the tanks.

4. In a photographing machine, a dark box, a tank therein for holding material to be used in developing negatives, a member mounted on the box and detachably connected thereto, said member having a slide extension, a board upstanding from said member and having an opening to receive a light image, a board slidably mounted on said member and its extension and slidably engaging the first mentioned board, a magazine connected to and extending from the slidably board, there being a passage extending across the top of the magazine and through said member, there being an opening in the top of the box registering with the opening in said member, spring pressed means within the magazine for holding sensitive plates against the slidably board and above the opening in the member, and a shutter slidably mounted within the passage for directing sensitive plates downwardly one at a time through the registering openings and into the dark box.

5. A photographic machine including a dark box having an opening therein, a member detachably mounted on the box and having an opening registering with the opening in the box, said member being provided with an extension having a track, a front board upstanding from said member

and having an aperture, a camera box detachably connected to said board, another board upstanding from but movably mounted on said member and having an aperture, a magazine extending from the slidably board, spring pressed means within the magazine for holding sensitive plates against the slidably board, there being a passage extending through the magazine and registering with the openings in the member and the box, a shutter slidably mounted within said passage and constituting means for moving the plates one at a time into position in the focal plane of the lens in the camera box and for shifting the exposed plate through the registering openings and into the dark box, a manually shiftable receptacle within the dark box for the reception of plates discharged thereinto, and tanks for holding materials to be used in the development of the plates, said receptacle being shiftable to move the plates into the tanks.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

ROBERT J. LONDON.  
JAMES A. LONDON.

Witnesses:

WILLIAM J. MURRAY,  
HENRY M. BUTTS.