

F. M. HOLMES.
 PHOTOGRAPHING MACHINE.
 APPLICATION FILED APR. 17, 1906.

930,378.

Patented Aug. 10, 1909.

3 SHEETS—SHEET 1.

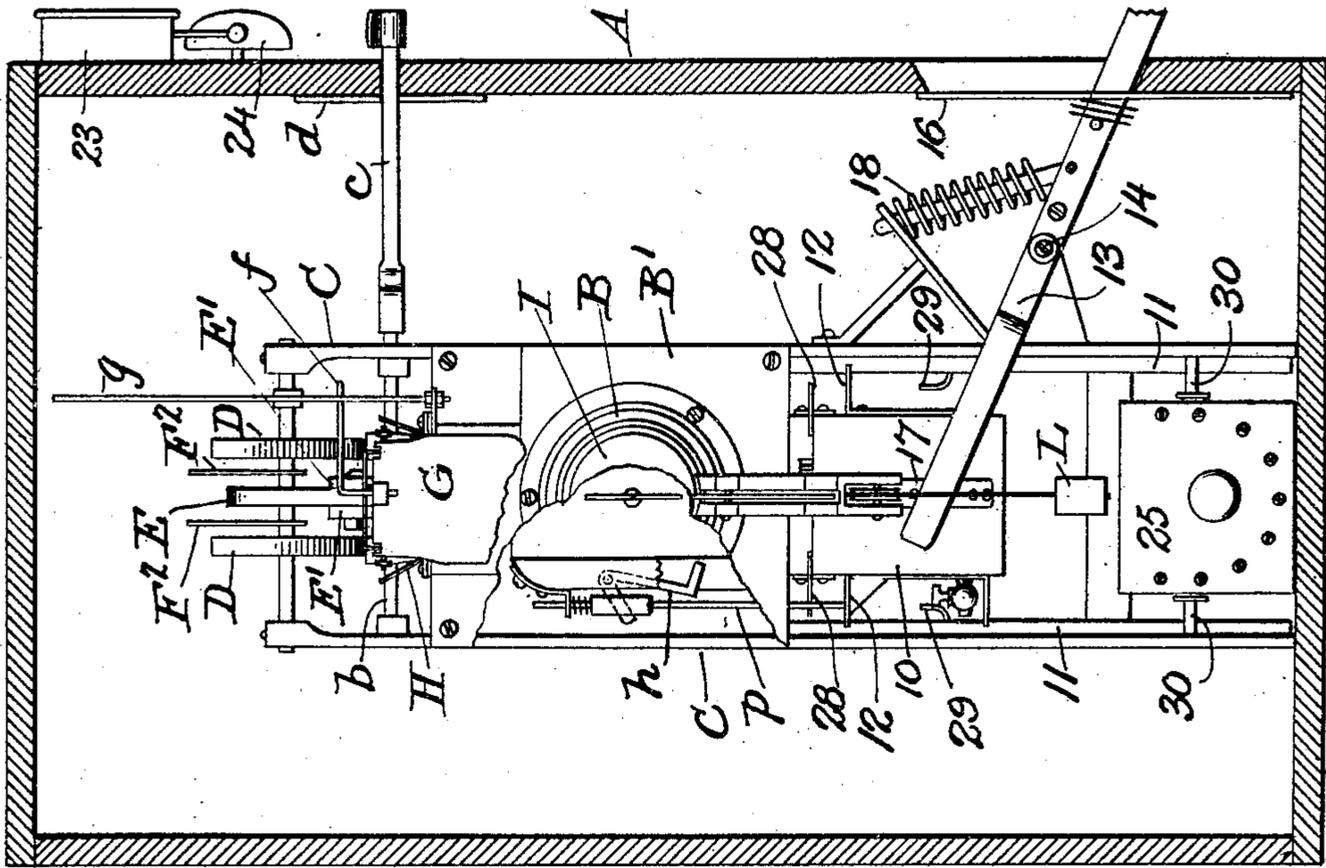


Fig. 2.

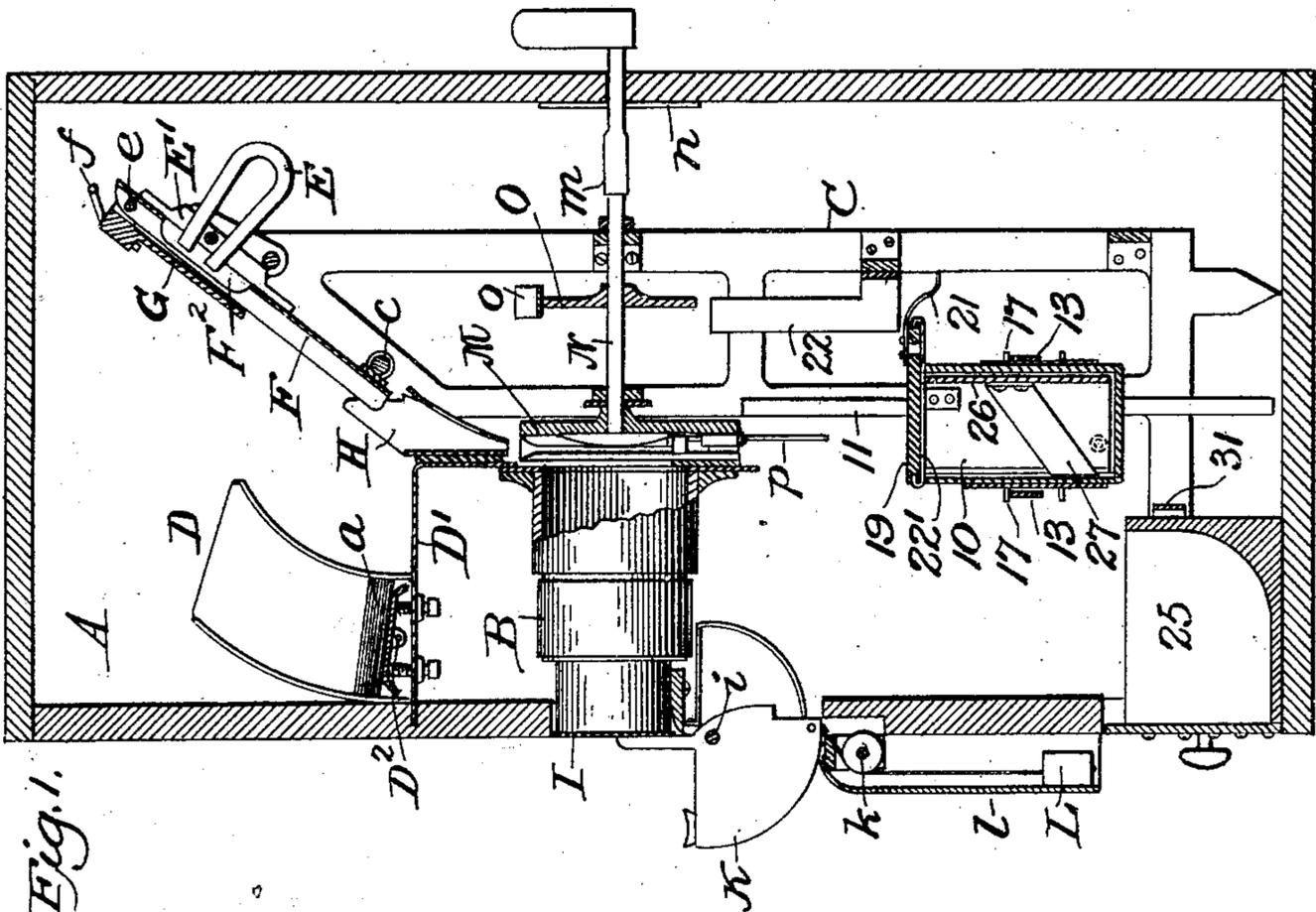


Fig. 1.

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 James F. Duhamel
 L. H. Grote

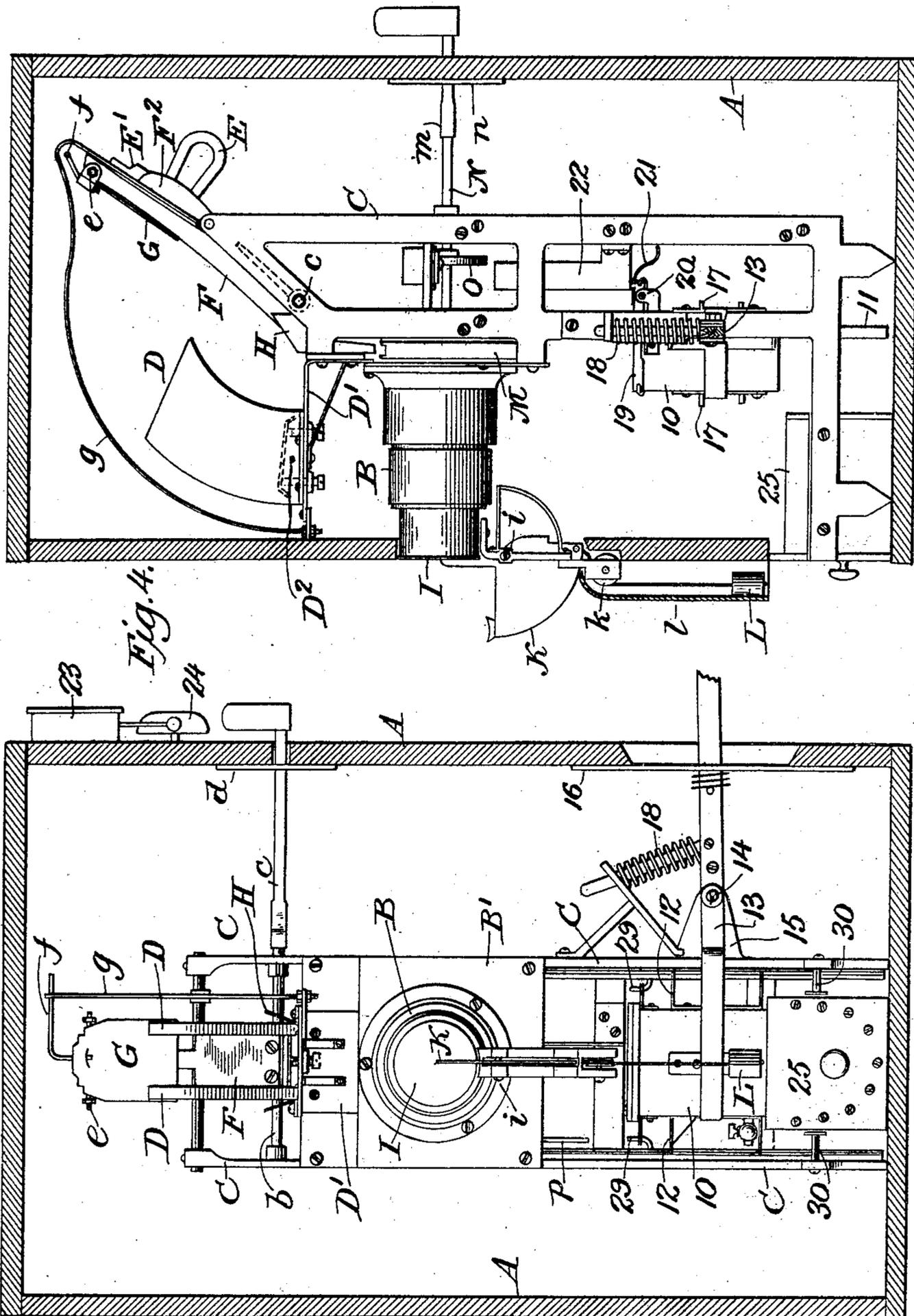
Inventor
 Frank M. Holmes
 By his Attorney North Caywood

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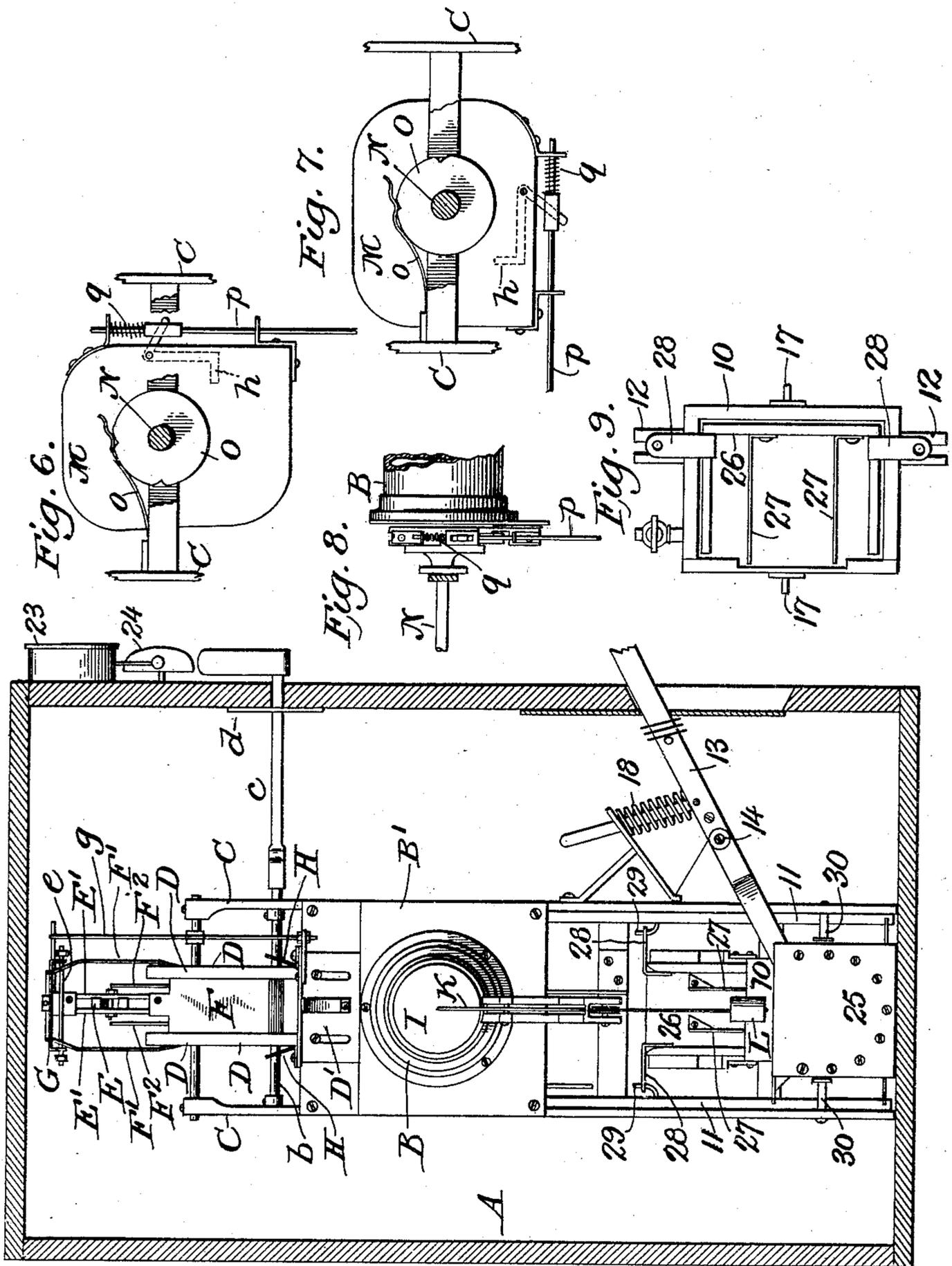
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3 SHEETS—SHEET 3.



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Fig. 5.

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UNITED STATES PATENT OFFICE.

FRANK M. HOLMES, OF NEW YORK, N. Y.

PHOTOGRAPHING-MACHINE.

No. 930,378.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed April 17, 1906. Serial No. 312,122.

To all whom it may concern:

Be it known that I, FRANK M. HOLMES, a citizen of the United States, residing at the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Photographing-Machines, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, forming part of this specification.

My invention has relation to that class of photographing machines wherein the photographic plate is located by mechanical means, for exposure, and by like means subjected to the action of the developer or developing liquid, then transferred to the fixing solution and thus completed for delivery.

The primary object of my invention is to provide or produce a photographing machine of the general class above named which shall be of comparatively few and simple parts, easy of construction, reliable and efficient in action, and which may be employed for the purposes of taking original pictures or copying other pictures by any person of ordinary skill.

Subordinate objects are to improve the means whereby the transfer of the plate from one point to another within the machine are made certain and reliable and not liable to get out of order and to render the parts durable and efficient for the purposes intended.

To accomplish the foregoing objects and to secure other and further advantages in the matters of construction, operation, application and use, my improvements involve certain new and useful peculiarities of construction, relative arrangements or combinations of parts and principles of operation, as will be herein first fully described and then pointed out in the claims.

In the accompanying drawings I have represented a photographing machine constructed and arranged for operation in accordance with my invention and involving my improvements, and in these drawings, Figure 1 is a vertical view, partly in section and partly in elevation, on a plane through the axis of the lens holder, showing the parts in position which they assume when the machine is not in operation. Fig. 2 is a vertical view, on a plane at right angles with Fig. 1, showing the plate feeding mechanism as turned down and the vessel containing the developer as elevated to receive a plate, por-

tions being shown as broken away to facilitate the illustration. Fig. 3 is a view somewhat similar to Fig. 2 but showing the plate feeding mechanism turned back to the position indicated in Fig. 1 and the vessel for containing the developer likewise restored to the position indicated in Fig. 1. Fig. 4 is a vertical view, partly in section and partly in elevation, affording a side elevation of the interior mechanism in the position shown in Figs. 1 and 3. Fig. 5 is a vertical section and elevation on a plane parallel with the front of the machine and showing the interior mechanism in elevation and in position which the parts assume when the vessel containing the developer is depressed to its extreme limit and the feed mechanism turned to an upright position. Fig. 6 is a sectional elevation of a fragment showing the plate holder and the detent by which the plate is held in ordinary upright position, and Fig. 7 is a similar view showing the plate holder turned through an angle of 90° from the position indicated in Fig. 6 and held in the new position. Fig. 8 is a detail view, in side elevation, showing the tripper applied in connection with the plate holder and corresponding with Fig. 6. Fig. 9 is a plan view of the vessel for containing the developer, the cover being omitted and the interior arrangements being shown in detail.

In all these figures like characters of reference, wherever they occur, indicate corresponding parts.

A represents a case of desired form and size and of suitable material within which the mechanism is located and from which light is excluded. One side of the case is preferably arranged so that it may be opened to permit of the easy introduction of a number of sensitized plates, admitting of the application in its place of a plate or piece with the usual flexible hood or cover to exclude light when the hand is inserted in the case, but these details may be provided for in any preferred manner and they are unnecessary to be shown herein.

B is the tube for containing the lens or lenses of any suitable character for photographing, the same being suitably mounted in connection with the frame for the mechanism, as on a front plate B¹ which is held in position by screws, the lens tube reaching through an aperture in the front wall of the case.

C, C, are the side frames for supporting the operating parts, the same being preferably of cast metal and suitably braced one to the other.

5 D, D, is a magazine suitable for containing a number of sensitized plates for use in the machine, a small number of these plates being represented at *a* in the magazine at Fig. 1. The magazine is composed of a bottom and
10 two side plates sustained upon a suitable bracket D^1 , the two side plates being separated by a suitable distance and having flanged margins to confine the sensitized plates between them, and the magazine is
15 therefore open at front, top and back. The bottom of the magazine is pivoted or hinged, as at D^2 , so as to tilt easily and thus enable the top one of the stack of sensitized plates to assume a position parallel with the chute
20 or the hinged arm as soon as it is struck by the magnet for commencing the operation of feeding. When the magazine is properly charged and a supply of the developer and of the fixer introduced, the machine is ready to
25 be operated.

The sensitized plates are successively withdrawn from the magazine by the mechanism provided for that purpose and subsequently deposited in the plate holder back of the lens
30 where they are each exposed in turn for photographing. To withdraw the plates from the magazine and to deposit them in the plate holder, the mechanism (called the feeding mechanism) is of peculiar construction. To lift the plates one at a time from
35 the stack, I employ a magnet, preferably of the horse-shoe pattern, represented at E. This magnet is sustained upon a swinging or hinged piece, F, mounted on a shaft *b*, the
40 latter being provided with a key, *c*, extending through to the exterior of the case, the opening for the key shaft in the case being protected by a suitable slide, as *d*, to exclude light. The piece F constitutes a chute and
45 is wide enough to easily accommodate one of the sensitized plates and permit it to slide down and out of the chute when released by the magnet. The chute with the magnet reaching through an opening in its bottom is
50 swung over by the key *d* and enters the front opening in the magazine, the walls of the magazine being suitably curved as indicated, so as not to interfere with the forward and backward movements of the chute.

55 The poles of the magnet or the extremities of the horse-shoe are very slightly inclined with respect to the bottom of the chute or with respect to the line drawn to one of them from the center of the shaft *c*. The purpose
60 of this is so that both poles of the magnet will not strike the plate at precisely the same time, but rather one pole first so that the plate will be lifted from the stack in an inclined direction, thereby preventing the mag-
65 net from so magnetizing the stack of plates

that it will be liable to lift more than one plate at a time. The magnet is applied to the chute and secured thereon by two side pieces E^1 , E^1 , between which it is pinched by a suitable bolt; and side pieces, as F^1 , F^1 , are
70 connected with the chute and extend so as to form a seating for the axis of the shutter, leaving an open space between them through which the magnet projects. The chute F is supplied at its upper part with a shutter, G,
75 the same being hinged, as at *e*, and arranged to be swung up or out of the way and over to the front of the magazine when the chute is turned forward to take up a sensitized plate. The purpose of the shutter is to cover
80 the plate against possible exposure to such little light as may possibly find its way into the case. The shutter G is supplied with a projecting arm or rod *f*, and a curved guide or wire *g* in the path of this arm *f* is applied
85 in connection with the frame of the machine. The rod *g* is so bent that as soon as the shutter is turned forward, the rod *g* bears on the projecting arm *f* and causes the shutter to open on its hinge. After the magnet has seized
90 one of the sensitized plates it is turned back to its final position when the shutter G closes over it and the plate is then released (by suitable means) from the magnet and slides down the chute F and into a guide, H, which
95 directs it in its fall into the plate holder at the rear of the lens holding tube. The plate is then in the position where it is to be exposed for receiving the picture. To detach the plate from the magnet after the chute
100 has been turned back to its final position, two pieces as F^2 and F^2 are applied on the rod which connects the upper part of the frame C, C, and these project up far enough so that when the chute is turned back they
105 will extend beyond the limit of the poles of the magnet and on each side of the magnet, passing through the open portion of the chute or between the projecting parts F^1 , F^1 . When the sensitized plates strike these pieces
110 F^2 and the magnet is turned farther back, the pieces separate the sensitized plate from the magnet and allow it to slide down the inclined chute by gravity. The plate holder is of peculiar construction as will be hereinafter
115 explained and is provided with a bent and hinged arm or lever *h* which operates to detain the plate in the proper position within the plate holder.

The exposure is effected by opening the
120 shutter I which covers the outer extremity of the lens holding tube B. This shutter I is mounted upon a piece K which is hinged, as at *i*, and adapted to be turned back into the case by pressing upon its outer extremity,
125 thereby opening the lens holding tube to the admission of light. This shutter is automatically closed as soon as the finger pressure is removed, it being supplied with a suitable weight, as L, connected to it by a cord
130

running over a pulley, *k*, and attached to the lower part of the piece *K*. When the piece *K* is turned into the case it elevates the weight *L* which, on being released effects the closing of the shutter *I*. The weight *L* travels up and down in a short section of tubing *l* which is provided for the purpose of covering it. By covering the lens in this manner and then by uncovering it at the proper time, the sitter is made to know precisely when the picture is being taken.

The plate holder, represented at *M*, is mounted upon an axis or shaft, *N*, and this shaft is supplied with a removable key, *m*, by which it may be operated from the exterior of the case, the opening through the case being protected by a suitable plate, *n*. Applied in connection with the shaft *N* is a disk, *O*, the same being notched at points 90° from each other, and a holding spring or detent, *o*, arranged to engage with the notches in said disk, operates to keep the holder either in its upright position or in a horizontal position, to either of which positions it may be adjusted.

The sensitized plates are of greater length than width, and when delivered to the plate holder they stand up endwise, which is the ordinary position for a plate intended to receive the picture of a single individual or subject. At times it is desirable to photograph a group or to turn the plate so that one of its longest sides will remain uppermost. It is for this turning of the plate that the plate holder is mounted upon a turning shaft. If the plate has been exposed in the plate holder and in upright position, then it is released by withdrawing the arm *h* so as to permit the plate to drop out of the holder.

This arm *h* is operated by suitable connections for the purpose through the medium of a rod *p* mounted in guides applied upon the plate holder and supplied with a suitable spring, *q*, to return the rod to its normal position. The rod engages with the lever or arm *h* and upon being raised will swing the lever back, thus releasing the plate. When the holder is turned, the rod *p* and the lever *h* turn with it, and before the plate can be released from the plate holder the latter must be turned back to its original upright position. The crank or lever on the outer end of the key *m* will indicate the position of the plate holder, whether upright or horizontal.

10 is a vessel for containing a suitable developing solution in which the plates are to be immersed after having been exposed and delivered from the plate holder. This vessel is mounted in the frame of the machine so as to be moved up and down, and for this purpose the frame is supplied with suitable guiding strips as 11, 11, and the vessel with projecting arms, as 12, 12, calculated to ride upon the guiding strips and confine the vessel to its proper path. A forked lever, 13, pivoted or hinged, as at 14, in a suitable bracket, 15, projects through to the exterior of the casing, the aperture in the casing being covered by a suitable plate, 16. The forked lever engages with suitable projections, as 17, on the side of the vessel and it is connected with a suitable spring, 18, by which it is automatically returned to its normal horizontal position after having been moved either up or down. To prevent evaporation of the developing solution, the vessel 10 is supplied with a cover, 19, the same being hinged, as at 20, and carrying a light spring, as 21. The cover projects slightly back of the hinge and in the path of this projecting part is located a stationary piece 22, the operation of which is, when the vessel is elevated, to cause the cover 19 to turn back so as to leave the top of the vessel open. When the vessel is raised to its uppermost position the spring 21 bears against the back of the vessel. This prevents the cover from swinging too far back or out of the vertical line, otherwise when the vessel is returned the cover could not automatically drop to its closed position, being inclined too far back beyond the hinge line and its center of gravity being then on the wrong side of the hinge line. A suitable stop cock is provided near the bottom of the vessel 10, as shown in Figs. 2 and 3 for the purpose of withdrawing the liquid from its tank whenever required. That the cover may effectually close the otherwise open mouth or top of the vessel, it is supplied with a sheet of soft rubber or similar material, represented at 22' and attached to the cover by being entered in grooves or channels around its margin, substantially as indicated or by other equivalent means of securing it in place. When the vessel 10 is elevated by depressing the outer end of the lever 13, the cover 19 is automatically opened and the rod *p* is elevated by contact with one of the guiding pieces 12, and this causes the detent *h* to release the plate which then drops into the open receptacle, after which the receptacle is lowered sufficiently to close the cover, or the lever 13 returned to its substantially horizontal position.

For convenience in noting the length of time the plate is immersed in the developing solution, the case is supplied upon its exterior with any suitable form of indicator or time piece, as 23, which may be wound and which is preferably provided with an alarm bell, as 24. After expiration of the proper limit of time, the plate is to be discharged from the vessel 10 and into the vessel 25, which latter contains the fixing solution. To effect this discharge of the plate from the vessel 10 the latter is supplied upon its interior with a suitable frame, 26, having strips 27, 27, inclined downwardly toward the front of the vessel 10, on which strips the plate is received, then lying in the developing

solution in an inclined position. Attached to the frame 26 on each side and passing out over the upper mouth of the vessel are arms 28, 28, the same being perforated to engage hooks or stops, as 29, 29, fastened upon the frame. When the vessel 10 is lowered below the location of the stops 29, the latter engage the arms 28 and sustain the frame 26 with the inclined pieces 27, and when the vessel is carried down far enough to expose the lowered ends of the inclined pieces 27, then the plate is free to slide from these inclined pieces and it is thus by gravity automatically projected into the vessel 25 and into the solution contained therein. From this vessel 25 the completed plate is withdrawn after having been sufficiently exposed to the fixing solution. The inclined pieces 27 project into a slight recess in the front wall of the vessel 10, as shown in Fig. 9, so that the plates will not become wedged between the wall of the vessel and the lower ends of the pieces 27.

To prevent the developed plate from becoming lodged in the vessel 25 so that it cannot be easily removed, the bottom of this vessel is preferably curved, substantially as indicated. The vessel 25 is in the form of a tray which may be easily slid into or out of the case, the front wall of the tray closing the opening in the front of the case. To properly guide the sliding tray to the position which it should occupy in the case, suitable guides, 30, 30, project inward from the side plates, and a stop, 31, at the rear of the tray prevents it from being pushed in too far.

The machine being constructed and arranged for operation substantially in accordance with the foregoing explanations will be found to admirably answer all the purposes or objects of the invention hereinbefore alluded to.

Having now fully described my invention, what I claim as new herein and desire to secure by Letters Patent, is:—

1. In a photographing machine, the combination with a magazine for containing a number of sensitized plates and a plate holder, of a hinged chute for withdrawing the plates one at a time from the magazine and permitting them to fall into the plate holder, said hinged chute being provided with a magnet, substantially as and for the purposes set forth.

2. In a photographing machine, the combination with the magazine and a plate holder of a hinged piece in the form of a chute, said piece being provided with a horseshoe magnet applied thereto, substantially in the manner and for the purposes set forth.

3. In a photographing machine, the combination with a magazine, a plate holder and a hinged chute for transferring plates from the magazine to the plate holder, of a shutter hinged upon the said hinged chute, sub-

stantially as shown and for the purposes set forth.

4. In a photographing machine, the combination with the hinged chute and the hinged shutter applied thereon, of an arm projecting from the shutter and a rod for bearing on said arm to open the shutter as the chute is turned forward and permit it to close as the chute is turned backward, substantially as and for the purposes set forth.

5. In a photographing machine, the combination with the magazine having a curved front and back, of the hinged chute having a magnet applied thereon, said chute being arranged to be swung into the magazine between the side plates thereof, substantially as and for the purposes set forth.

6. In a photographing machine, the combination with the hinged chute having a magnet and a shutter applied in connection with the chute, of a removable key arranged to be applied upon the axis of the chute, for the purposes and objects named.

7. The combination with the hinged chute and the magnet applied in connection therewith, of the stationary pieces arranged to project through an opening in the chute and beyond the final position of the magnet poles for the purpose of detaching the sensitized plate from the magnet at the time and in the manner set forth.

8. In a photographing machine, the combination with the hinged chute, a magazine for sensitized plates, and a plate holder, of a guide located between the lower end of the chute and the plate holder and arranged to direct the plates from the chute into the plate holder, substantially as and for the purposes set forth.

9. In a photographing machine, the combination with the lens holding tube and means for mechanically feeding sensitized plates to a position for exposure, of a plate holder for receiving the sensitized plates, said holder being mounted upon a shaft or axis and arranged to be turned so that the plate may be exposed with one edge either vertical or horizontal, as may be desired, substantially in the manner and for the purposes set forth.

10. The combination of the plate holder, a hinged detent applied thereon, a rod connected with said detent, a movable vessel for containing a developing solution, and an arm on said vessel arranged to contact with and lift the said rod, substantially as shown and described.

11. In a photographing machine, the combination with the frame, of a vertically adjustable vessel for containing a developing solution, a plate holder, and means for releasing a plate from said holder when the vessel is elevated, substantially as set forth.

12. The combination with the vessel for containing a developing solution, of a hinged

cover, means for adjusting the said vessel up and down, and means for automatically opening the said cover when the vessel is elevated, substantially as and for the purposes set forth.

13. The combination with the vessel for containing a developing solution, of a hinged cover, means for adjusting the said vessel up and down, a stationary piece for contacting with a projecting portion of the cover when the vessel is raised, and a spring connected with the cover, substantially as and for the purposes set forth.

14. In a photographing machine, the combination of a vessel for containing a developing solution, means for adjusting said vessel up and down, a frame for sustaining a sensitized plate within the vessel, and means for arresting said frame when the vessel is lowered, substantially as set forth.

15. In a photographing machine, the combination of a vessel for containing a developing solution, means for adjusting said vessel up and down, a frame for sustaining a sensitized plate in an inclined position within the vessel, and arms and hooks for arresting said

frame when the vessel is lowered, substantially as set forth.

16. In a photographing machine, the combination with the frame and case, of a sliding vessel for containing a fixing solution, a vertically adjustable vessel for containing a developing solution, means for sustaining a sensitized plate in the second vessel, and means for automatically discharging the plate from the second vessel into the first one, substantially as set forth.

17. In a photographing machine, the combination of the feeding mechanism, a plate holder, a vertically adjustable vessel for containing a developing solution, means for sustaining a sensitized plate therein and means for discharging the plate therefrom, and a sliding vessel for containing a fixing solution, substantially as set forth.

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

FRANK M. HOLMES.

Witnesses:

L. H. GROTE,
WORTH OSGOOD.