

Aug. 14, 1928.

G. A. SVANBERG

1,680,709

COIN CONTROLLED PHOTOGRAPHIC MACHINE

Filed Sept. 18, 1926

6 Sheets-Sheet 1

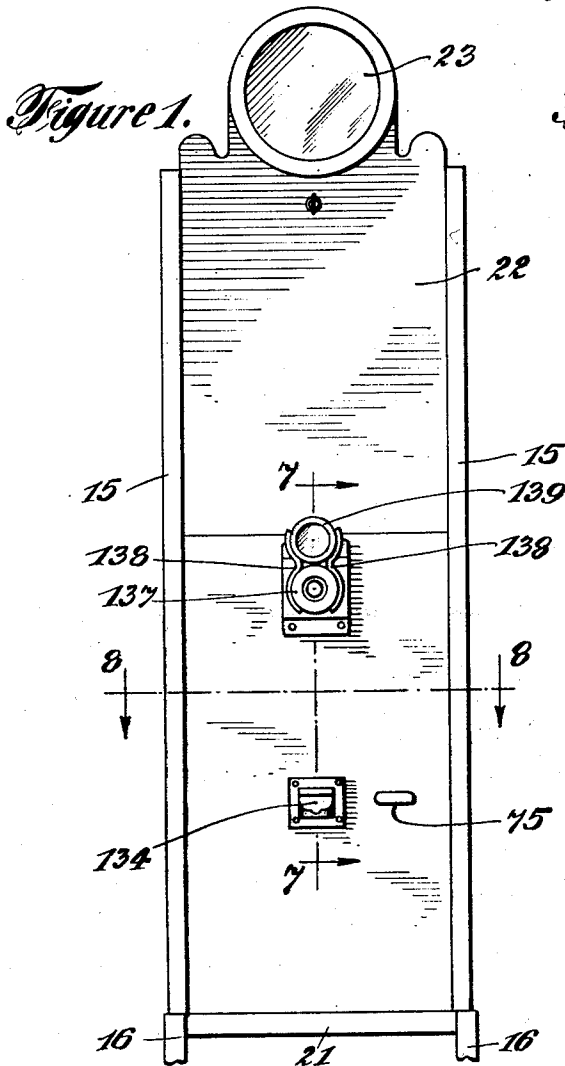
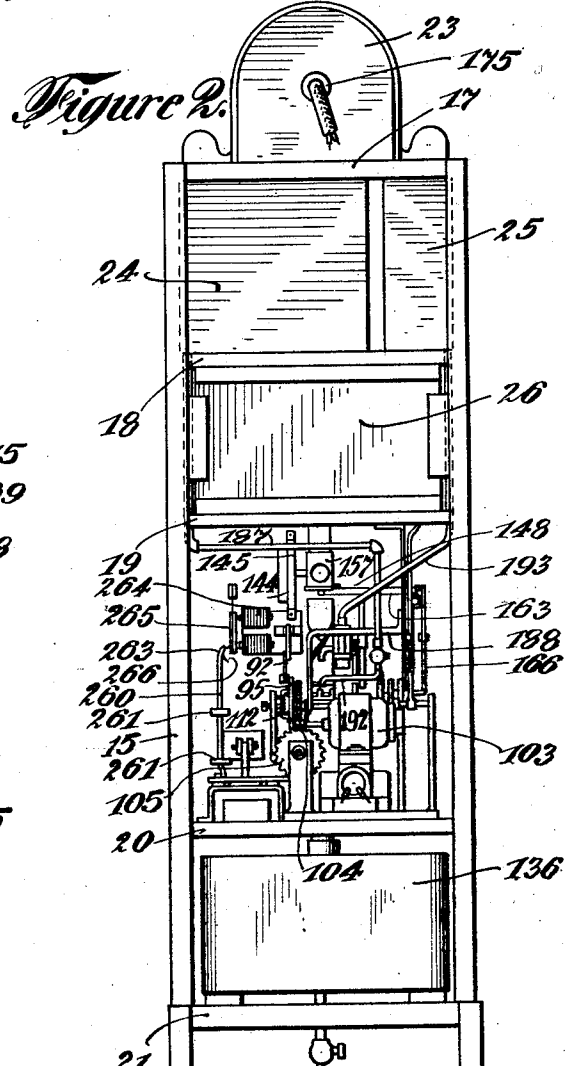


Figure 3.

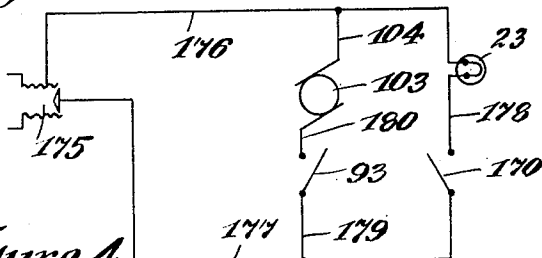
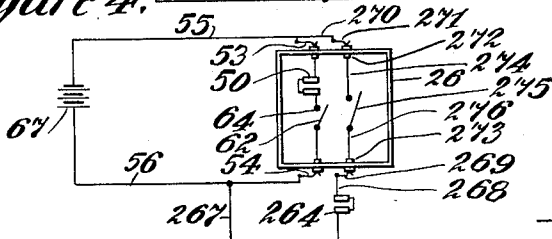


Figure 4.



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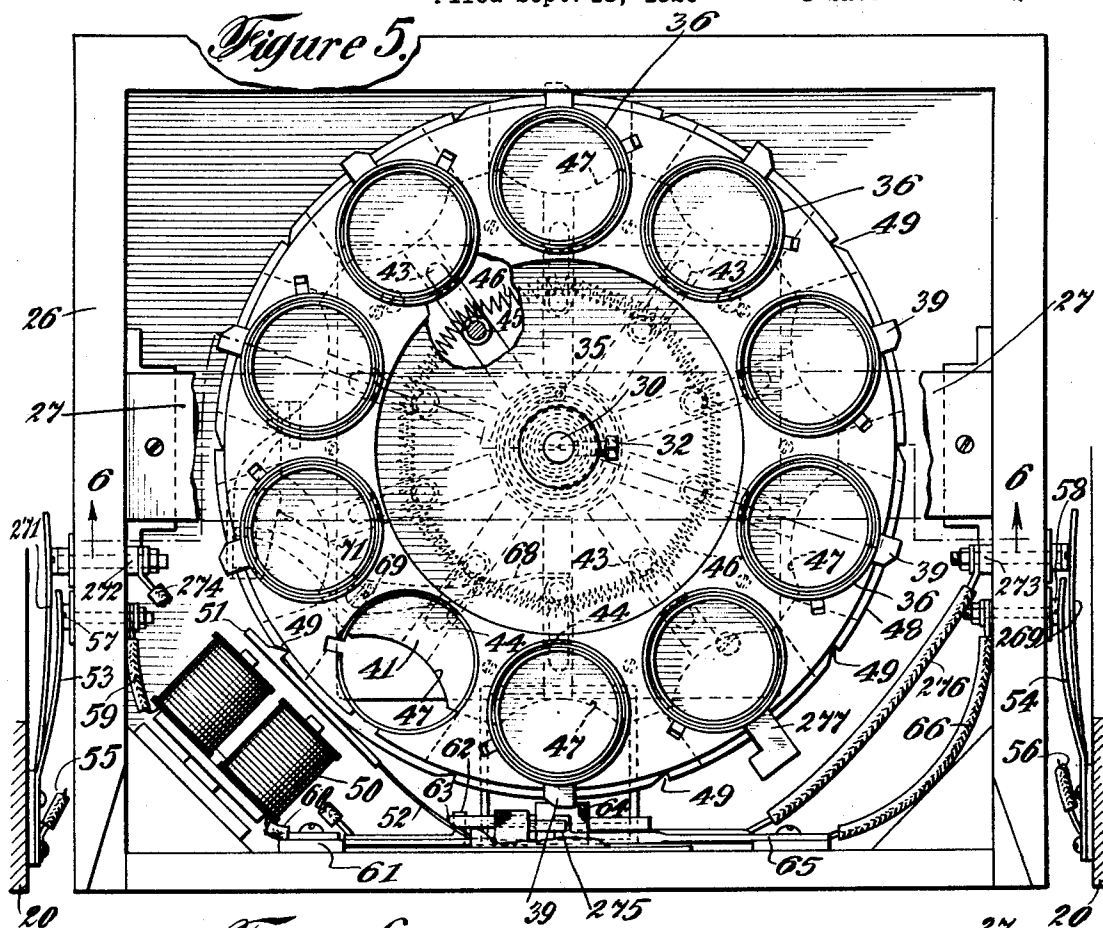
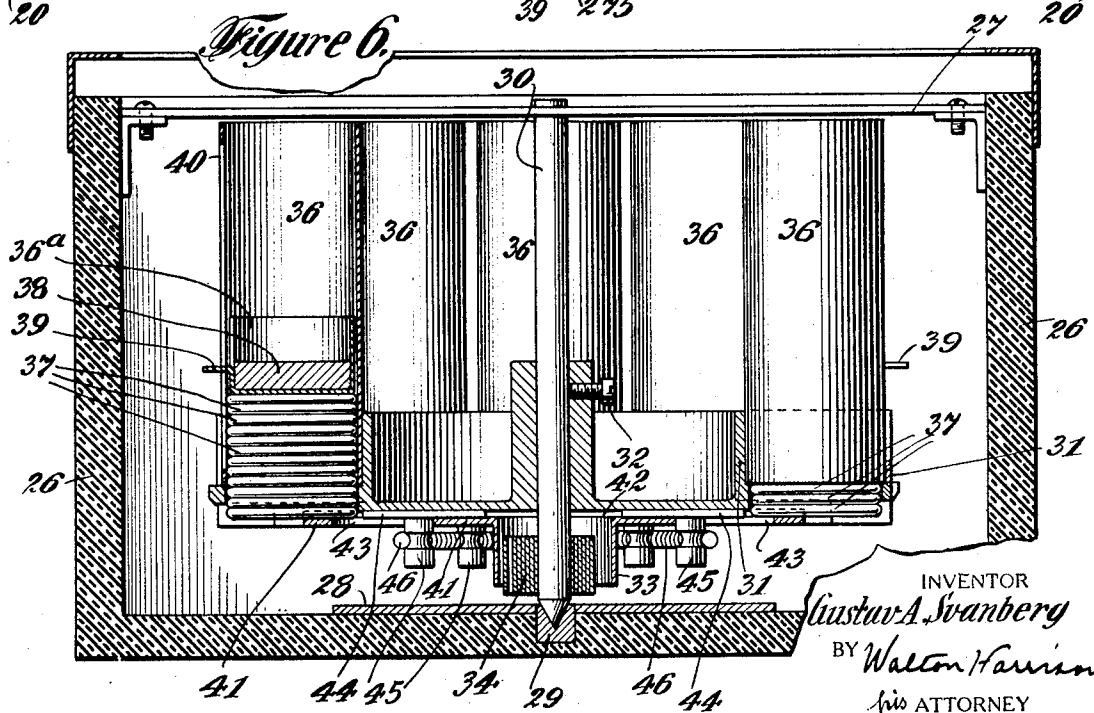
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Filed Sept. 18, 1926

6 Sheets-Sheet 2



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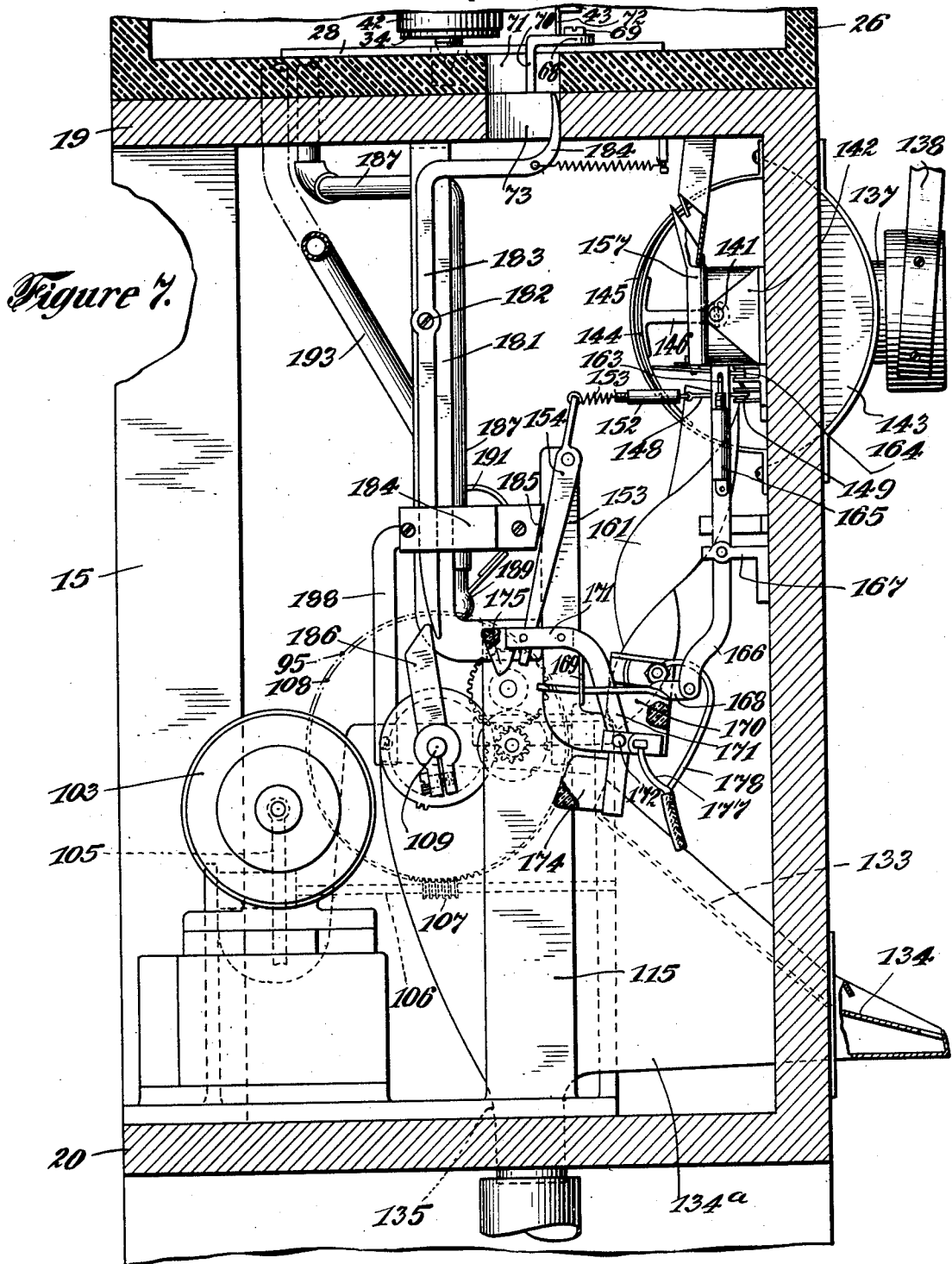
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COIN CONTROLLED PHOTOGRAPHIC MACHINE

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6 Sheets-Sheet 3



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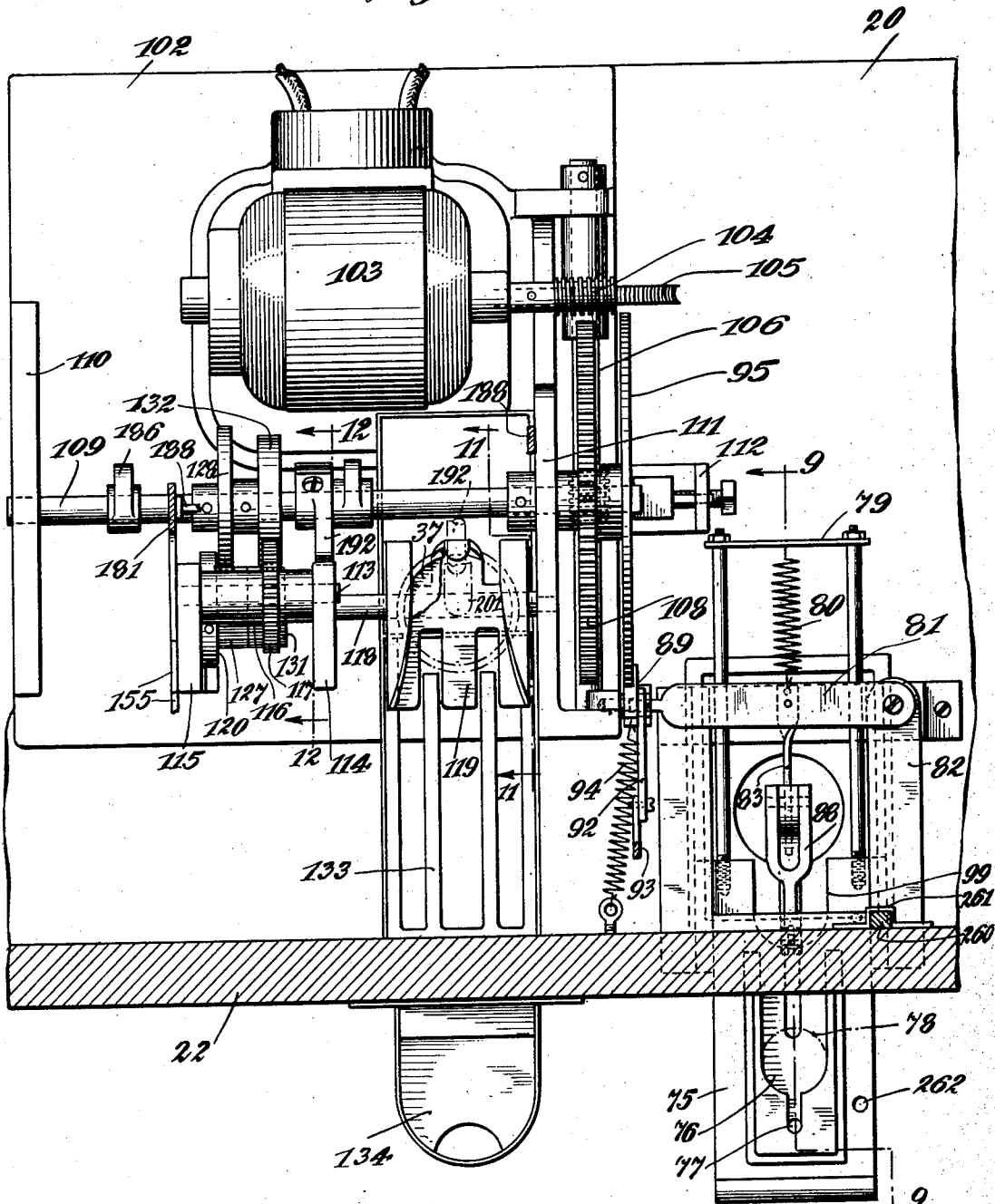
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COIN CONTROLLED PHOTOGRAPHIC MACHINE

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6 Sheets-Sheet 4

Figure 8.



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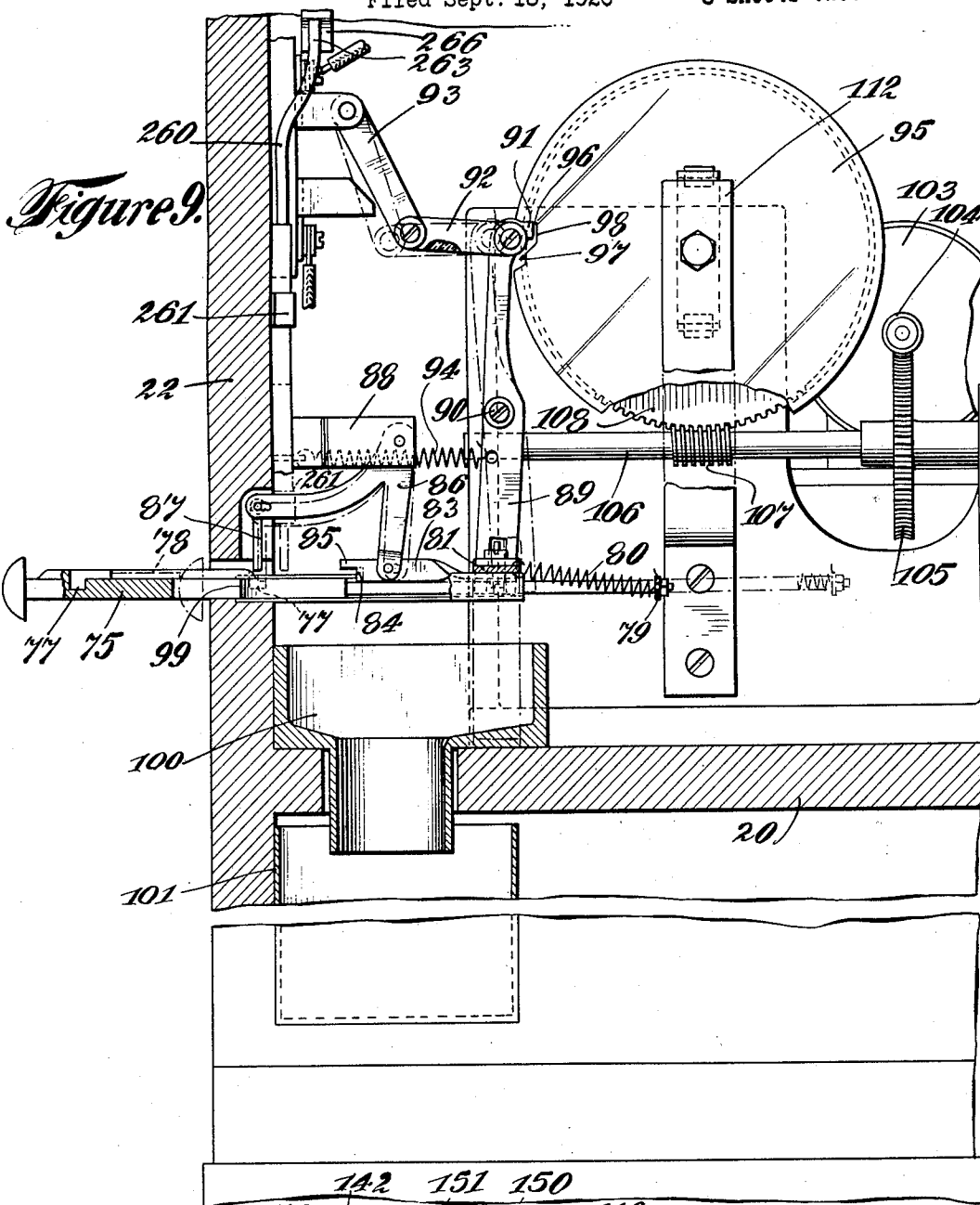
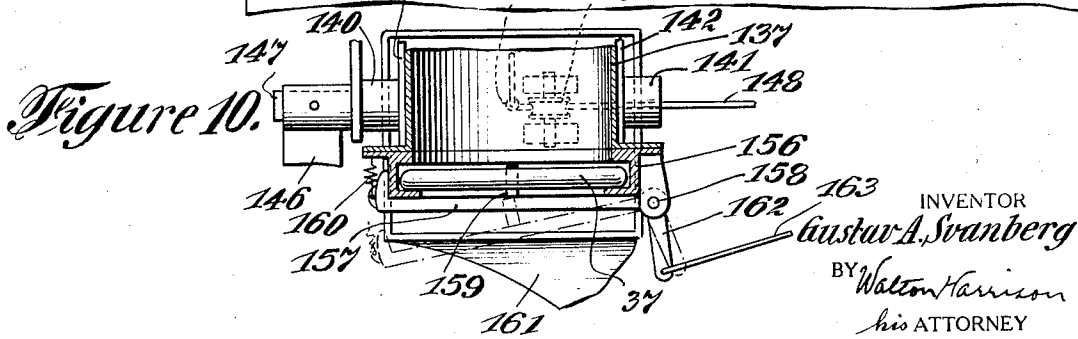
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COIN CONTROLLED PHOTOGRAPHIC MACHINE

Filed Sept. 18, 1926

6 Sheets-Sheet 5



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1,680,709

COIN CONTROLLED PHOTOGRAPHIC MACHINE

Filed Sept. 18, 1926

6 Sheets-Sheet 6

Figure 11.

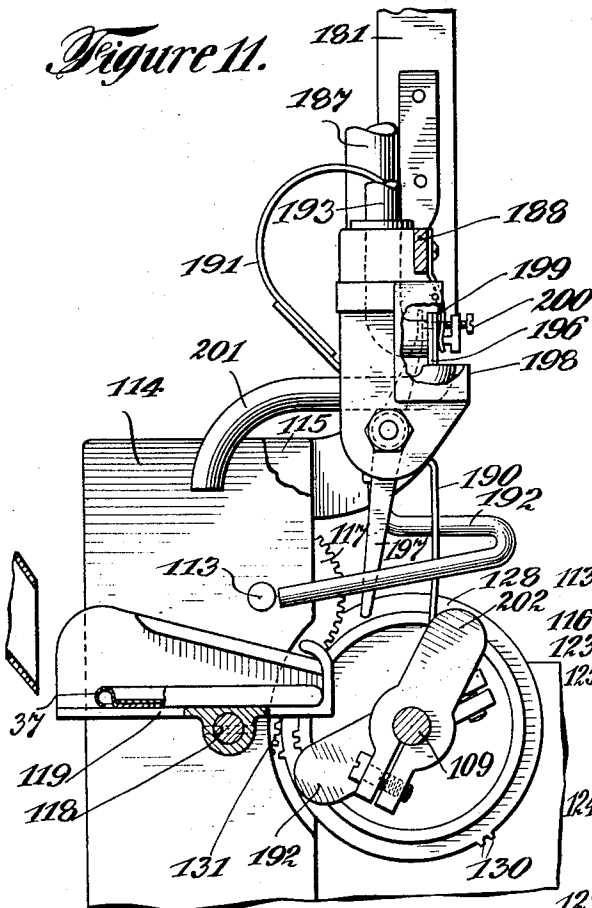


Figure 12.

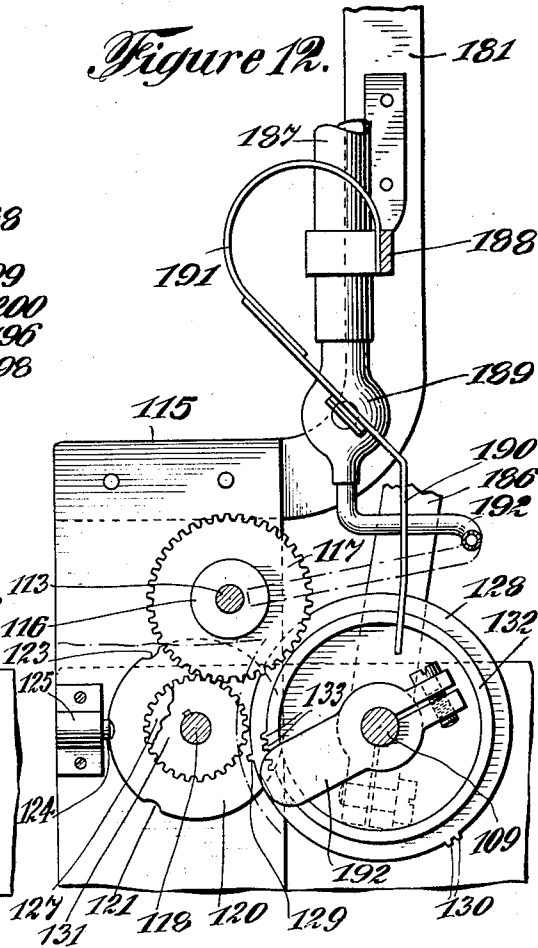


Figure 13.

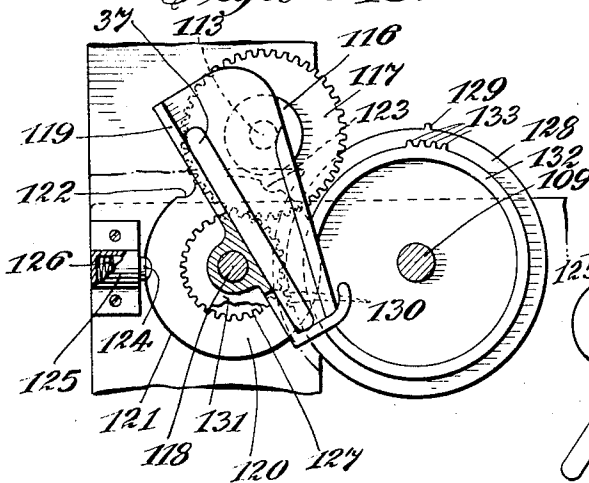
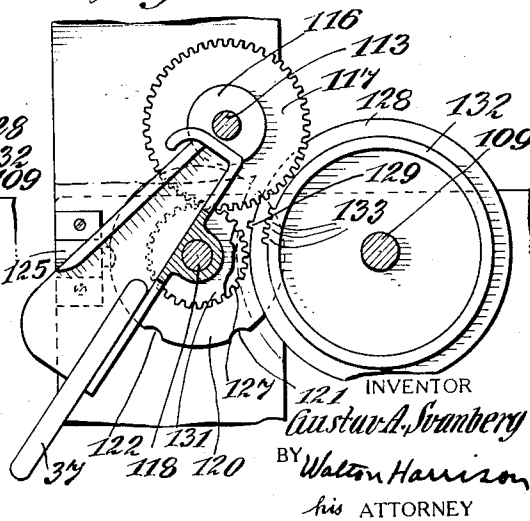


Figure 14.



UNITED STATES PATENT OFFICE.

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COIN-CONTROLLED PHOTOGRAPHIC MACHINE.

Application filed September 18, 1926. Serial No. 136,229.

My invention relates to coin-controlled photographic machines of the type of which the insertion of a coin causes the machine to perform in successive order all of the steps required to make and deliver a finished photograph.

More particularly stated, I seek to produce a device of this general character so arranged and co-related as to present a number of distinct advantages, as hereinafter more particularly described, my invention including a number of new parts, improvements and combinations, as pointed out in the appended claims.

Reference is made to the accompanying drawings forming a part of this specification in which like reference characters indicate like parts throughout the several figures.

Figure 1 is a fragmentary front elevation of the machine.

Figure 2 is a rear elevation thereof, the back plate being removed.

Figure 3 is a diagram of the plug connection and circuit for energizing the lamp and the motor of the machine.

Figure 4 is a diagram of the wiring of a battery circuit used in the machine.

Figure 5 is a plan view of the magazine for holding and delivering the photographic plates.

Figure 6 is a section on the line 6—6 of Figure 5, looking in the direction indicated by the arrows.

Figure 7 is a section on the line 7—7 of Figure 1, looking in the direction indicated by the arrows.

Figure 8 is a section on the line 8—8 of Figure 1, looking in the direction indicated by the arrows.

Figure 9 is a section on the line 9—9 of Figure 8, looking in the direction indicated by the arrows.

Figure 10 is a fragmentary section, on the line 10—10 of Figure 7, looking in the direction indicated by the arrow.

Figure 11 is a fragmentary section on the line 11—11 of Figure 8, looking in the direction indicated by the arrows and showing the plate holder as level.

Figure 12 is a section on the line 12—12 of Figure 8, looking in the direction indicated by the arrows.

Figure 13 is a fragmentary section on the

line 13—13 of Figure 8, showing the plate holder as tilted to drain off the water used in washing off the developing fluid.

Figure 14 is a section on the same line as Figure 13, and shown in the plate holder as tilted to discharge and deliver the plate, now a finished photograph.

The frame of the machine appears at 15 and has the form of a casing, resting upon supporting legs 16, and provided with a top plate 17, supporting shelves 18, 19, 20, and a floor plate 21. The face plate of the casing is shown at 22 in Figure 1.

Supported upon the top plate 17 is an electric lamp 23, used at night and whenever for any reason darkness prevails. The purpose of this lamp is to illuminate the features and form of the person to be photographed. The lamp does not burn continuously, but its light is automatically turned on and off as hereinafter described.

Resting upon the shelf 18 is a tank 24 for holding water, and a tank 25 for holding a quantity of developing fluid used in treating the photographic plates.

Removably fitted into the casing 15 and normally resting upon the shelf 19 is a magazine box 26, made of insulating material and having the form shown more particularly in Figures 5 and 6.

The magazine box 26 is provided at its top with a bridge plate 27, and at its bottom with a floor plate 28 and a bearing 29. Engaging the bearing 29 and extending vertically therefrom through a hole in the bridge plate is the magazine shaft 30, carrying a magazine wheel 31, secured firmly upon it by a set screw 32 and thus revoluble with it.

The magazine wheel 31 carries a barrel 33 extending downwardly from it and having an annular form, as indicated at the bottom of Figure 6.

A helical spring 34, located within the barrel 33, is secured at its outer end to a stationary pin 35, as indicated in Figure 5, the inner end of the spring being secured to the magazine shaft. The spring is always under tension to some extent, and has a tendency to turn the magazine wheel in a clockwise direction according to Figure 5. Hence to wind the spring the magazine wheel is turned by hand in a counter-clockwise direction according to this figure. The magazine wheel is adapted to make one com-

plate revolution in order for the spring to be completely wound or unwound.

The magazine wheel carries a number of cylinders 36, in this instance ten, which serve as photographic plate holders. The photographic plates contained within the cylinders 36 are shown at 37, and are each in the form of wide and flat cup.

Each cylinder 36 carries a weight holder 36^a, having the form of a rather deep cup, and each weight holder carries a weight 38, having the form of a disk.

Each plate holder is provided with a tongue 39, made of metal and protruding radially outward through a slot 40 with which the plate holder is provided. The tongue 39 serves as an actuating member for controlling an electric circuit, for purposes hereinafter more particularly set forth.

Each cylinder 36 is open at its bottom. Below the cylinders 36, which are arranged in the form of a circle, is a substantially circular foot plate 41, carried by the barrel 33 and revoluble with the magazine wheel 31. This foot plate 41 is located slightly below the bottom of the magazine wheel, so as to leave a little space 42 intervening between the bottom of the magazine wheel and the top of the foot plate.

The foot plate 41 is provided with a number of slots 43, disposed radially, one slot for each cylinder 36. Located within the space 42, between the bottom of the magazine wheel and the top of the foot plate 41, are a number of slides 44, one for each cylinder 36. Each slide 44 carries a pin 45, extending downwardly and through the adjacent slot 43. A single spring 46 encircles the entire group of pins 45, and is always under tension. The slides are movable radially outward, within limits controlled by the lengths of the slots 45. The purpose of the spring 46 is to retract the slides, which it does by its pressure upon the pins 45.

The foot plate 41 is provided upon its outer periphery with a number of notches 47, one for each cylinder 36, and the lowermost plates in the respective tubes 36 extend outwardly so as to slightly overhang these notches. By this arrangement, at any time, the lowermost photographic plate is readily dislodged by a thrusting movement of the adjacent slide 44.

The magazine wheel 31 is provided with a peripheral rim 48, and this rim is provided with notches 49, one for each tube 36. A magnet 50 is mounted within the magazine box 26, and is located adjacent the rim 48. This magnet is provided with an armature 51, in the form of a hook and carried by a leaf spring 52. This leaf spring normally maintains the armature in the position indicated for it in Figure 5. With the armature in this position it serves as a hook, extending partially into the notch 49 im-

mediately adjacent. The magazine wheel is now locked in stationary position. Although its tendency is to turn in a clockwise direction according to Figure 5, as above explained with reference to the action of the helical spring 34, it is restrained by the armature 51, acting as a hook.

Whenever the magnet 50 is momentarily energized, as hereinafter more completely described, it attracts the armature and draws it out of engagement with the rim 48. This releases the magazine wheel for a moment, whereupon it turns far enough to bring the next successive notch 49 into position adjacent the magnet, so that the armature again locks the magazine wheel.

The manner in which the magnet 50 is energized at intervals will now be explained.

Two contact springs 53 and 54 are mounted within the casing 26 and located oppositely to each other, as indicated in Figure 5. Connected with these springs are wires, 55 and 56, by aid of which the magnet is supplied with current, as hereinafter explained. The magazine box 26 carries a pair of contact bolts 57 and 58, so located as to engage the contact springs 53 and 54 whenever the magazine box is housed within the casing. A wire 59 leads from the contact bolt 57 to the magnet 50, and thence a wire 60 leads to a plate 61. This plate is connected with a stationary contact arm 62. A contact spring 63 is disposed immediately over the contact arm 62, and is normally out of contact therewith. The contact spring is quite delicate, however, and may be flexed or bent slightly downward and thus brought into engagement with the stationary contact arm 62. The contact spring 63 carries an actuating plate 64, and whenever this actuating plate is depressed the spring is flexed as just described. The contact spring 63 is connected with a plate 65, and from this plate a wire 66 leads to the contact button 58. A battery 67, which may be a dry battery and located at any convenient point within the casing 20, is connected with the two wires 55 and 56 shown in Figure 5.

With the machine in normal use, and the magazine wheel locked as above described, some one of the tubes 36, with its supply of photographic plates 37, is in close proximity to the actuating plate 64, and that individual tube for the time being furnishes all of the plates used. The particular tube thus drawn upon for its supply of plates is in such position that the tongue 39 extending radially outward from it is located just above the actuating plate 64, as may be understood from Figure 5.

The magazine box 15 carries a lever 68, journaled to rock upon a pivot bolt 69, the latter extending upwardly from the floor plate 28, as indicated at the top of Figure 7. The lever 68 is provided with a portion

70 which extends downwardly through an opening 71 in the bottom of the magazine box. The lever 68 is further provided with a wing 72, extending upwardly and into close proximity to some one of the pins 45, as indicated in Figures 5 and 7.

The shelf 19, which supports the magazine box 26, is provided with an opening 73, so located that with the magazine box resting upon this shelf the opening 73 is in registry with the opening 71. The two openings 71 and 73 are used for enabling the lever 68 to be tripped, from time to time, by mechanism located below the shelf 19, as hereinafter described.

Each time the lever 68 is thus tripped from below, it is rocked in a clockwise direction according to Figure 5, and each time it is thus rocked it shifts the position of the adjacent pin 45, causing the adjacent slide 44 to move radially outward and to dislodge the lowermost photographic plate 37 in the cylinder 36. The plates thus dislodged, one at a time, drop downwardly and are each guided into the camera, as hereinafter described. The lever 68 and the adjacent slide 44 are retracted to normal position by the spring 46.

As plate after plate is thus ejected from the tube 36, the tube at last becomes empty and when this occurs the tongue 39, reaching the bottom limit of its travel, rests upon and depresses the actuating plate 64. Hence the contact spring 63 is depressed, and brought into engagement with the stationary arm 62, as above explained. This completes a circuit through the magnet 50.

The circuit may be traced as follows: Battery 67, wire 55, contact spring 53, contact bolt 57, wire 59, magnet 50, wire 60, plate 61, stationary contact arm 62, contact spring 63, plate 65, wire 66, contact bolt 58, contact spring 54 and wire 56, back to battery. This energizes the magnet 50 as above described, causing the armature to momentarily disengage the rim 48 and allow the magazine wheel to turn slightly. This brings a new tube 36 into position for discharging its photographic plates.

When the last tube is emptied the machine is automatically locked as hereinafter described, so that it cannot be further used for the time being.

The magazine is now empty, and should be replenished with photographic plates. This is done by removing the magazine box 26, refilling each of the tubes 36 with the photographic plates 37, and turning the magazine wheel to the limit of its travel in a counter-clockwise direction according to Figure 5. The magazine box is next replaced in the casing.

I will next describe the structure and action of the coin control mechanism.

Referring more particularly to Figures

8 and 9, a coin slide is shown at 75, and is provided with a coin pocket 76 and with a safety notch 77. A coin resting in the coin pocket, appears at 78.

The coin slide is further provided with an end plate 79. A tensile spring 80 is connected with the end plate 78, and extends therefrom to a rocking lever 81, journaled upon the frame work 82.

Mounted upon the rocking lever 81 is a bar 83, having an end portion 84 formed into shape to serve as a limiting stop for the coin 78, as indicated in Figure 9, whenever the slide is pushed inwardly. The end portion 84 is provided with a brow 85, for the purpose of slightly overhanging the coin.

Pivotally connected with the bar 83 is a bellcrank lever 86 which carries a locking pin 87, adapted to extend into the safety notch 77 whenever the coin slide is in a position suitable for this purpose. The bellcrank lever is journaled upon a stationary post 88, having a general Y-form, as indicated in Figure 8. The bellcrank lever is controllable by movements of the bar 83, and this bar is shifted slightly to the right according to Figure 9 by the coin 78, as the inward travel of the coin slide lodges the edge of the coin against the end portion 84 of the bar 83. Whenever this occurs the bellcrank lever is rocked very slightly in a counter-clockwise direction according to Figure 9, so that the locking pin 87 is thrust downwardly into the safety notch 77, now in registry therewith. This locks the coin slide, and prevents it from being drawn or thrust outwardly into its normal position, until it is released by the withdrawal of the locking pin 87, due to a reverse rocking movement of the bellcrank lever, as hereinafter described.

The rocking lever 81 is connected at one of its ends with the lower end of a vertically extending lever 89, this lever being journaled to rock upon a pin 90.

The lever 89 is at its upper end fashioned into a pawl 91, and is pivotally connected with a link 92, made of insulating material as indicated in Figure 9.

Pivotally connected with the link 92 is an electric power switch 93, so arranged as to be opened whenever the lever 89 is rocked in a clockwise direction according to Figure 9 and closed when rocked in a counter-clockwise direction according to this figure, as indicated by full and broken lines. A tensile spring 94 extends from the lever 89 to an adjacent portion of the framework, and has a tendency to rock the lever 89 in the proper direction to open the power switch 93.

Located adjacent the power switch 93 is a revoluble disk 95, operated as hereinafter described, and normally stationary but adapted to make exactly one revolution, 130

slowly and in a counter-clockwise direction according to Figure 9, each time the machine is operated by the insertion of a coin.

The disk 95 is provided upon its periphery with a notch 96, having two successive steps 97 and 98. Each time the coin slide 75 is pushed inwardly, so as to rock the lever 89 in a counter-clockwise direction according to Figure 9, as indicated by broken lines in this figure, the pawl 91 is withdrawn from the notch 96, thus releasing the disk 95. This disk, driven as hereinafter explained, thereupon makes a single turn in a counter-clockwise direction according to Figure 9, which restores the notch to its normal position. Just before the disk finishes its single revolution the pawl 91 re-enters the notch 96, engaging in rapid succession first the step 97 and then the step 98, thus bringing the disk to a standstill. The lever 89, under the control of the pawl 91, therefore makes in rapid succession two successive rocking movements, in a clockwise direction according to Figure 9. The first of these movements, incidental to the thrusting movement of the pawl 91 against the step 97, causes the bellcrank lever to rock very slightly in a counter-clockwise direction according to Figure 9, so as to lift the locking pin 87 out of the safety notch 77 but not above the level of the coin 78, so that the outward movement of the coin slide causes the coin to lodge against the locking pin 87, now stationary, and to drop through an opening 99 in the slide. The second movement of the lever 89, which is incidental to the thrust of the pawl 91 against the second step 98, restores the bellcrank lever 86 to its normal position, indicated by full lines in Figure 9, and opens the power switch 93 as indicated by dotted lines in this figure.

A coin funnel 100, supported by the floor 20, is located below the coin slide. Below the floor 20, and below the coin funnel which extends through this floor, is a drawer 101, serving as a till. The coins are gathered into this drawer 101, and at intervals are removed therefrom.

Mounted upon the shelf 20 is a base plate 102, and supported by this base plate is an electric motor 103.

The shaft of the motor carries a worm 104, and engaging this worm is a worm wheel 105, shown more particularly in Figure 9. A shaft 106 carries the worm wheel 105, and also carries a worm 107. This worm engages a worm wheel 108, mounted rigidly upon a revoluble shaft 109, this shaft being journaled upon two plates 110, 111 and a hanger 112.

The shaft 109 is driven at slow speed, turning in a clockwise direction according to Figure 7, this being in a counter-clockwise direction according to Figures 11 to 14 inclusive. The shaft 109 makes its complete

revolution in about a minute and a half and then stops, as may be understood from the foregoing explanation relative to the wheel 95.

Located adjacent the shaft 109 and parallel therewith is a relatively short shaft 113, journaled upon a pair of plates 114, 115, which are supported by the base plate 102. Encircling the shaft 113 and extending practically the distance between the plates 114 and 115 is a revoluble barrel 116, carrying a gear wheel 117 which turns with it.

Below the shaft 113 is a rocking shaft 118, extending through and journaled upon the three plates 111, 114 and 115. The rocking shaft 118 carries a plate holder 119, having the form shown, and secured rigidly to the rocking shaft so as to rock therewith.

The rocking shaft 118 also carries a centering disk 120, mounted rigidly upon it and having three peripheral notches 121, 122, 123. A pawl 124, mounted in a housing 125 and pressed upon by a spring 126, is adapted to extend slightly into any one of the notches 121, 122, or 123, according to the position of the centering disk. Each time the pawl enters any one of the notches, the rocking shaft 118 is for the time being locked rather firmly in the position corresponding to the notch entered by the pawl. The purpose of the centering disk is to render definite the various positions into which the rocking shaft 118 is rocked from time to time, as may be understood from Figures 11, 13 and 14.

A gear wheel 127 is mounted rigidly upon the rocking shaft 118, and thus has a fixed relation to the rocking shaft and to the centering wheel 120.

Mounted rigidly upon the shaft 109 and located in the same plane as the gear wheel 127 is a mutilated gear wheel 128, provided with a single tooth 129 located upon its periphery, and with two teeth 130, also located upon its periphery but spaced a little distance away from the tooth 129.

At different moments during the rotation of the shaft 109, the gear wheel 127 is engaged, first by the two teeth 130 and then by the single tooth 129, and each time the gear wheel 127 is thus engaged, it is so actuated as to rock the shaft 118 in a clockwise direction according to Figures 12, 13 and 14.

Mounted rigidly upon the rocking shaft 118 is a gear wheel 131, which meshes with the gear wheel 117. Mounted rigidly upon the shaft 109 and in the same plane as the gear wheel 117 carried by the shaft 113, is a mutilated gear wheel 132. This gear wheel is provided with four teeth 133, grouped together as shown, and as the shaft 109 makes its single turn, in a counter-clockwise direction according to Figures 11 to 14 inclusive, the teeth 133 momentarily engage the gear wheel 117, causing the shaft 113 to rock in

a clockwise direction, and the rocking shaft 118 to rock in a counter-clockwise direction according to the figures just mentioned.

The parts just described are so arranged
 5 that when a photographic plate 37, after its exposure as hereinafter described, is by the action of the machine deposited in the plate holder 119, as indicated in Figure 11, the plate holder is always level and the photo-
 10 graphic plate rests face upward upon it. The shaft 109 now makes its turn in a counter-clockwise direction according to Figure 11, and the following steps take place in succession: First, the plate holder remains
 15 horizontal for a little less than half the time required for the shaft 109 to make its turn. In practice, the plate holder remains horizontal for about forty seconds. At the beginning of this period a charge of develop-
 20 ing fluid is delivered upon the photographic plate 37 which, owing to its cup-like form, readily retains the charge, and during the time period just mentioned, develops the plate. Next the two teeth 130 of the mutil-
 25 ated gear wheel 128 are carried into engagement with the gear wheel 127, causing the rocking shaft 118 to rock slightly in a clockwise direction according to Figure 13, as indicated in this figure. By this
 30 movement of the shaft 109, the pawl 125 disengages the notch 122 and enters the notch 121, locking the rocking shaft in its new position. The photographic plate being now inclined, it is washed as hereinafter de-
 35 scribed in order to remove from it the developing fluid, or so much thereof as remains upon it. Next the four teeth 133 of the mutilated gear wheel 132 are momentarily brought into engagement with the gear
 40 wheel 117, rocking it in a clockwise direction according to Figure 14, to an extent commensurate with the aggregate length of the group of four teeth 133; that is to say, the shaft 118 rocks twice as far as it did when ac-
 45 tuated under control of the two teeth 130. Hence the notch 121 is moved away from the pawl 125, and the notch 123 takes its place, and locks the shaft 118, for a moment only, with the plate holder in the inclined
 50 position indicated for it in Figure 14.

The photographic plate, now converted into a finished photograph, simply glides off the plate holder by its own weight into a delivery chute 133, terminating in a tray 134,
 55 from which it is picked out by hand.

The water used for washing the plate, and draining off the plate after it passes into the delivery chute 133, is by means of an inclined floor 134^a and a funnel 135 guided into a receptacle 136, where it accumulates. By
 60 means of a valve 136^a the receptacle is emptied from time to time as required.

I make provision whereby the machine is automatically locked and thus thrown out of
 65 commission, whenever the supply of photo-

graphic plates in the magazines becomes ex-
 70 hausted.

A locking bolt 260, shown more particularly in Figures 2 and 8, extends through guides 261 and is thus mounted to slide ver-
 75 tically. The lower end of the locking bolt is bent slightly to the right according to Figure 2, this being to the left according to Figure 8. The coin slide 75 is provided with a hole 262, shown in the lower right hand
 80 corner of Figure 8, and this hole serves as a socket into which the lower end of the bolt can be thrust, in much the same manner that the bolt of any lock is thrust into its socket.

The upper end of the sliding bolt is pro-
 85 vided with a hook 263, and adjacent this hook is a magnet 264, provided with an armature 265, carrying a curved leaf spring 266. When the sliding bolt is in its upper-
 90 most position its weight is supported by the spring 266, and thus by the armature of the magnet. Whenever the magnet is energized it attracts its armature and thereby releases the locking bolt, which thereupon drops
 95 downwardly by its own weight.

A wire 267 leads from the magnet 264 to the wire 56, which is connected with the bat-
 100 tery 67, as may be understood from Figure 4. From the magnet 264 a wire 268 leads to the contact spring 269, and from the wire 55 a
 95 wire 270 leads to a contact spring 271.

The two contact springs just mentioned are mounted upon the walls of the casing, and located upon opposite sides of the posi-
 100 tion occupied by the magazine box 26, as may be understood from Figures 4 and 5. These contact springs 269 and 271 are in form like the two contact springs 53 and 54 above described.

The magazine box 26 carries a pair of con-
 105 tact bolts 272 and 273, and from the contact bolt 272 a wire 274 leads to a small switch 275, from which a wire 276 leads to the contact bolt 273.

In order to close the switch 275 I provide
 110 an arm 277, supported by the magazine wheel and shown more particularly in Figure 5. The arm 277 is carried by the last plate holder 36 to be emptied, and is so arranged as to engage and close the switch 275
 115 after the last plate is dislodged from this plate holder, so that the magazine is completely exhausted. When this occurs, the closure of the switch 275 closes an electric circuit, which may be traced upon the dia-
 120 gram shown in Figure 4, as follows: battery 67, wires 55 and 270, contact spring 271, contact bolt 272, wire 274, switch 275, wire 276, contact bolt 273, contact spring 269, wire 268, magnet 264, wire 267 and wire
 125 56, back to battery 67.

The magnet 264 being thus energized, at-
 130 tracts its armature 265, whereupon the locking bolt 260 drops into its lowermost position, its lower end being thrust into the hole

262 in the coin slide, and locking the coin slide.

The machine remains in this condition until the magazine is replenished, and the locking bolt 262 is raised by hand into its normal position, indicated in Figure 2.

The camera mechanism is shown in Figure 1, in the upper right hand portion of Figure 7, and in Figure 10.

The camera appears at 137, and is fitted with a pair of supporting arms 138 which carry a convex mirror 139. The camera is provided with a pair of trunnions 140, 141, which extend through holes in the camera box 142, so that the camera is journaled to the camera box and can be angularly adjusted in a vertical plane; that is, can be rocked up and down.

This arrangement is to enable the person whose photograph is to be taken to bring himself properly into focus. He moves the camera by hand into such position that his image, as he sees it in the mirror 139 carried by the camera, is in the center of the mirror, and appears normal; and when this is done he is properly in focus. Thus whether the person be tall, or of medium height, or of less than medium height, he can easily and quickly adjust the camera accordingly, and by observing the mirror can determine when his position, relatively to the camera, is correct for purposes of taking his photograph.

To maintain the camera in a vertical plane I provide a guide 143, and to hold the camera in fixed position when adjusted I provide it with a friction brake 144, of arcuate form, this brake fitting neatly against a stationary brake shoe 145, also of arcuate form, as may be understood from Figure 7.

Each time the camera is rocked angularly upward or downward the brake is actuated accordingly and by its friction against the brake shoe 145 holds the camera in the position into which it is thus brought. The brake shoe 145 is carried upon an arm 146, the latter being fixed upon a neck 147 carried by the trunnion 140, as indicated in Figure 10.

The camera is provided with a shutter release which is not shown, being of the usual construction and well known in the art. This shutter release is operated by means of a flexible cable 148, engaging pulleys 149 and 150, together with a guide 151. The cable 148 is connected with a turnbuckle 152, and the latter is connected with a spring 153, secured to a lever 154. The spring 153 is always under tension, so that the shutter release cable 148 is maintained taut.

The lever 154 is journaled upon a hanger bar 155, which is mounted upon the plate 115. The lever 154, always under tension from the spring 153, normally occupies the position indicated for it in Figure 7, and can be rocked in a counter-clockwise direction according to this figure. The cable 148 is operated by

rocking movements of the lever 154, which is actuated as hereinafter more fully described.

The camera 137 is provided with a plate receptacle 156, and a plate supporter 157 is carried by this plate receptacle and pivotally mounted thereon by means of a pivot pin 158.

The plate supporter 157 is provided with a supporting pin 159, adapted to extend into the bottom of the plate receptacle, in such manner as to support a photographic plate 37 therein.

A spring 160 tends to hold the plate supporter in its normal position, indicated by full lines in Figure 10, and with the plate supporter in its normal position it is adapted to sustain a plate 37, resting edgewise upon the pin 159. However the plate supporter can be swung upon its pivot, in a counter-clockwise direction according to Figure 10 into the position indicated for it by broken lines in this figure, the spring 160 being capable of stretching enough to permit this movement. The plate 37, left unsupported by the pin 159, drops downwardly into a chute 161, and guided by this chute is landed face upward upon the plate holder 119. Here it goes through the steps of developing, washing, etc., above described at length.

In order to enable the plate supporter 157 to swing outwardly, as indicated by broken lines in Figure 10, I provide it with an arm 162, shown more particularly in Figure 10, and connected with this arm is a cable 163. This cable engages a pulley 164, and is connected with a turnbuckle 165, carried by a lever 166, so arranged that the cable is pulled and released by rocking movements of this lever.

The lever 166 is journaled upon a bracket 167, and is at its lower end pivotally connected to a link 168. This link extends through and is guided by a stationary eye 169, carried by the hanger bar 155, and is slidable endwise within this eye. Whenever the link 168 is thrust to the right according to Figure 7 the cable 163 is pulled, the plate supporter 157 swings outwardly, and the photographic plate 37 is released as above described.

An electric switch 170, provided with a rocking arm 171, is used for controlling the electric lamp 23 at the top of the casing. The rocking arm 171 is journaled upon a pin 172, carried by the hanger bar 155. The switch is normally open, as indicated in Figure 7, the lamp being unlighted, but if the arm 171 be rocked in a clockwise direction according to this figure, the switch is closed and thus causes the lamp 23 to be lighted. The arm 171 is provided at its ends with blocks 173, 174 of insulating material, these blocks being movable in order to rock the arm back and forth.

Electric current for energizing the lamp 23 is obtained by means of a plug connection 175 from which wires 176 and 177 lead

to the lamp 23 and the switch 170, a wire 178 leading from the switch 170 to the lamp 23. From the wire 177 a wire 179 leads to the other switch 93 above described, and from this switch a wire 180 leads to the motor 103. A wire 104 from the motor is tapped on to the wire 176. These connections may be understood by an inspection of the diagram in Figure 3.

A hanger bar 181 is secured to the top of the plate 115, and extends upwardly therefrom to the shelf 19 to which it is also secured, as indicated in Figure 7. Journaled upon this hanger bar by means of a pin 182 is a tripping lever 183, provided with an end portion 184 which extends up into the opening 73, to a point practically flush with the top of the shelf 19, but not high enough to interfere with the easy removal and replacement of the magazine box. The end portion 184 is formed into a hook as indicated, and is adapted to swing slightly upward whenever the lever 183 is rocked in a counter-clockwise direction according to Figure 7; and thus to engage the depending portion 70 of the lever 68, so as to trip this lever and cause a photographic plate to be dislodged, as above described.

For the purpose of guiding the lever 183 in its movements, I extend it through a guide plate 184, carried by the hanger arm 181. This guide plate also serves as a stop for limiting the travel of the lever 154, and for this purpose is provided with an anvil face 185, as indicated in Figure 7.

Located beneath the lower end of the lever 183 and mounted rigidly upon the revoluble shaft 109 is an arm 186. This arm is so located that by its rotation with the shaft 109 it is brought successively into engagement with the lower end of the lever 183, the block of insulating material 173 carried by the switch arm 171, the lower end of the lever 154, the adjacent end of the movable link 168, and the block of insulating material 174 carried upon the lower end of the switch arm 171.

The arm 186 normally occupies the position indicated for it in Figure 7. That is, it is in close proximity to the lower end of the lever 183, and in such position that by making a single rotation with the shaft 109, in a clockwise direction according to Figure 7 as indicated by the arrow, it trips the lever 183, which thereupon actuates the magazine mechanism and causes the release of a single photographic plate, as above explained.

Assuming the various parts to be so proportioned and arranged that the shaft 109 makes its single revolution during a period of ninety seconds, here is what takes place under control of the arm 186:

First, the arm 186 trips the lever 183, the ultimate result being that the magazine mechanism discharges a single photographic

plate, which finds its way as above described into the camera; second, the arm 186 engages the block of insulating material 173, and by moving it closes the switch 170 and thereby energizes the electric lamp 23, at the same time tripping the lever 154 and causing the shutter mechanism of the camera to be opened; third, the arm 186 engages and pushes against the link 168, which causes the shutter mechanism to close—the instant of its closure marking the time limit, usually about forty seconds, of the exposure of the photographic plate; and fourth, the arm 186 engages the block of insulating material 174, opens the electric switch 170, and returns to normal position. This turns off the electric current from the lamp 23, leaving the lamp unlighted and the switch 170 in its normal position.

A water pipe 187 is connected with the water tank 24, and leads downwardly therefrom. It is supported by a bracket 188, which is simply a bar of angle iron extending from the hanger arm 181 to the plate 111, and secured thereto.

The water pipe 187 is provided with a valve 189, and this valve carries a tripping arm 190 whereby it is opened, and a spring 191 whereby it is closed. The spring 191 is simply a leaf spring having a general C-shape, one of its ends being secured to the bracket 188 and the other being secured to the tripping arm 190.

For the purpose of actuating the tripping arm 190 in order to open the valve 189 I provide a cam 192, mounted upon and revoluble with the shaft 109. This cam is in the same vertical plane as the tripping arm, and so located that the rotation of the cam actuates the tripping arm. Each time the tripping arm is thus actuated by the cam it opens the valve 189 of the water pipe, but as soon as the cam disengages the tripping arm the spring 181 closes the valve and restores the tripping arm, and consequently the valve, to normal position. This opening and closing of the valve 189 allows water to flow from the water tank through the water pipe, for a few seconds. The water pipe is provided with a portion 192 of reduced diameter, bent around as indicated in Figures 11 and 12. This portion serves as a nozzle, and is so located as to discharge water freely into the plate holder 119, so as to wash a photographic plate resting thereupon, as elsewhere described.

Connected with the tank 25 which holds the developing fluid is a pipe 193, supported upon the bracket 188, as indicated in Figure 11, and provided with a clack valve 196. The valve has a lever 197 whereby it is opened and closed.

The lever 197 is connected with a spring 199, by means of a screw adjustment 200. The valve 196 is opened by the rocking

movement of lever 197 in a counter-clockwise direction according to Figure 11, and is closed by a rocking movement of this lever in a clockwise direction according to this figure. A portion 201 of the pipe 193 serves as a nozzle for delivering a charge of the developing fluid into a photographic plate 37, carried by the plate holder 119.

For the purpose of actuating the arm 197 I mount a cam 202 upon the shaft 109.

The action of the cam 202 in tripping the arm 197 to open the pipe for supplying the developing fluid is closely analogous to the action of the cam 192 to open the pipe for supplying the water, and need not be further described. Suffice it to say that during each revolution of the shaft 109 the clack valve 196, controlling the delivery of the developing fluid, is opened abruptly and quickly closed, and then the valve 194, controlling the delivery of the water, is opened a little more slowly, and after a pause of a few seconds, is closed.

By this arrangement a charge of developing fluid is fed into the plate 37, where it remains for a few seconds, and it is then washed away by the water, as above described.

The operation of my device may be summarized as follows:

In order to get the machine into condition for use, the plug connection 175 is brought into communication with an electrical supply, the magazine is filled with photographic plates, and the locking bolt 200 is raised by hand into its normal position as indicated in Figure 2.

Suppose, next, that a customer wishes to operate the machine. He stands in front of the camera, and looks at his image in the mirror 139. He moves the camera up or down by hand, and shifts his own position backward or forward, or to the right or left as occasion may require, until his image as he sees it in the mirror is normal and properly centered. He also assumes any pose which may suit his fancy.

The customer next places in the coin pocket 76 of the coin slide 75 a coin of proper denomination and size, and pushes the coin slide inward, to the limit of its travel. If in doing this he disturbs his position to any appreciable extent, he quickly corrects his position, reassumes his pose, and then stands still.

As the coin slide travels inward the coin is thrust edgewise against the box 83, rocking the bell crank lever 86 as indicated by full and broken lines in Figure 9, the locking pin 87 now locking the coin slide rigidly in position and preventing the removal of the coin, which still remains in the coin pocket.

The inward movement of the coin slide causes the bar 83, with the coin thrust edge-

wise against it, to rock the lever 81. This movement rocks the lever 89, so as to withdraw the pawl 91 from the notch 96 and leave the disk 95 free to rotate, and also closes the power switch 93. Hence, the motor is energized and the mechanism driven by the motor is started into action.

The shaft 109 now makes its single revolution as above described.

The cam 186, turning with the shaft 109, controls most of the steps essential to taking the photograph. First the arm 186 actuates the tripping lever 183, whereupon this lever causes the magazine to dislodge a single photographic plate 37, which glides down into the camera; next the arm 186 rocks the arm 171 of the power switch 170, which is thereby closed and turns electric current upon the lamp 23 and lights this lamp. Then the arm 186 rocks the lever 154, which opens and closes the shutter mechanism of the camera, in the manner well understood in this art; next the arm 186 pushes the link 168 endwise, causing the photographic plate, which has now been exposed, to be released, and to glide downwardly through the chute 161 and to rest, face upward, upon the plate holder 119, then the arm 186 rocks the switch arm 171 back into its normal position thus opening the switch 170 and extinguishing the light of the lamp 23; and lastly the arm 186 returns to its normal position.

While the arm 186 thus makes its single rotation, the two cams 192 and 202 are also turning with the shaft 109. Under control of the cam 202 and parts actuated thereby the clock valve 196 is momentarily opened and a charge of developing fluid delivered into the photographic plate resting face upward upon the plate holder 119, and under control of the cam 192 and parts actuated thereby the valve 189 is opened and a stream of water is turned upon the photographic plate, washing it off.

The rotation of the shaft 109 also causes the rocking shaft 118, carrying the plate holder 119, to be actuated by means of the gearing shown in Figures 11 to 14 inclusive, so as to rock the photographic plate into different positions of inclination, as above described, and for the purpose mentioned.

As the shaft 109 reaches the end of its rotation the pawl 91 enters the notch 96 of the disk 95, engaging in succession the two steps 97 and 98, and under control of these two steps the lever 89 makes two successive movements above described, one movement controlling the release of the coin slide and the restoration thereof to normal position, the coin held by the slide being dislodged and dropping into the till, the other movement opening the switch 93 so as to de-energize the motor, and also locking the disk 95 and leaving the machine ready for the insertion of another coin.

The customer picks up the finished photograph from the tray 134, and leaves the machine in the condition in which he found it, except with one more coin in the till and one less photographic plate in the magazine.

I do not limit myself to the precise mechanism shown, as variations may be made therein without departing from my invention, the scope of which is commensurate with my claims:

I claim:

1. In a photographic machine the combination of a casing, a camera journaled upon said casing and free to move angularly in relation thereto, brake mechanism carried by said casing and connected with said camera, for holding said camera in different angular positions of adjustment, a plate supporter connected with said camera for supporting a plate within said camera during the exposure of said plate, mechanism connected with said plate supporter for causing said plate supporter to release said photographic plate after the exposure thereof, and a plate holder for receiving said photographic plate and holding it in position to be developed and washed.

2. In a photographic machine the combination of a casing, a camera journaled upon said casing and free to move angularly in a plane vertical relatively thereto, means common to said casing and said camera for holding said camera in different angular positions of adjustment within said plane, a plate supporter connected with said camera for supporting said plate within said camera during the exposure of said plate, mechanism connected with said plate supporter for causing said plate supporter to release said photographic plate after the exposure thereof, a plate holder for receiving said photographic plate and for holding it in position to be developed and washed, and means for guiding said photographic plate from said camera to said plate holder.

3. In a photographic machine the combination of a casing, a camera journaled upon said casing and free to move angularly in relation thereto, brake mechanism carried by said casing and connected with said camera for holding said camera in different angular positions of adjustment, a mirror mounted upon said camera and movable therewith, for the purpose of enabling a person, by observing his image in said mirror, to ascertain when he is within the focus of said camera, a plate supporter connected with said camera for supporting a photographic plate therein during the exposure of said plate, mechanism connected with said plate supporter for causing said plate supporter to release said photographic plate after its exposure thereof, a plate holder for receiving said photographic plate, and means for guid-

ing said photographic plate from said camera to said plate holder.

4. In a photographic machine the combination of a casing, a camera journaled upon said casing and movable relatively thereto, brake mechanism common to said casing and said camera for holding said camera in different positions relatively to said casing, a mirror carried by said camera and normally fixed relatively thereto, for assisting a person to focus the camera upon himself, a plate supporter connected with said camera for supporting within said camera a photographic plate during the exposure of said plate, mechanism connected with said plate supporter for causing said plate supporter to release said photographic plate after the exposure thereof, a plate holder for receiving said photographic plate and holding it in position to be developed and washed, and means for guiding said photographic plate from said camera to said plate holder.

5. A machine of the character described, comprising magazine mechanism for holding a supply of photographic plates, a magazine box carrying said magazine mechanism and provided with an opening, a casing provided with a shelf for detachably supporting said magazine box thereupon and further provided with an opening located to register with the opening in said magazine box when said magazine box rests upon said shelf, a camera mounted within said casing, photographic mechanism located within said casing and provided with mechanism for reaching through both of said openings and engaging said magazine mechanism so as to cause said magazine mechanism to drop a photographic plate, and means for guiding said photographic plate into said camera.

6. A machine of the character described, comprising magazine mechanism for holding a supply of photographic plates, a magazine box carrying said magazine mechanism and provided with an opening through which said photographic plates are adapted to drop when released by said magazine mechanism one at a time, a casing provided with a shelf for detachably supporting said magazine box, said shelf having an opening located to register with the opening in said magazine box whenever said magazine box is supported by said shelf, a camera mounted within said casing, and means for guiding a photographic plate into said camera.

7. A machine of the character described, comprising magazine mechanism for holding a supply of photographic plates, a magazine box carrying said magazine mechanism and provided with an opening through which said photographic plates are adapted to drop one at a time, a casing provided with a shelf for detachably supporting said

magazine box and having an opening located to register with the opening in said magazine box when said magazine box is thus supported by said shelf, a camera mounted within said casing, and photographic mechanism located within said casing and co-acting with said camera for taking photographs, said photographic mechanism being normally disconnected from said magazine mechanism, but provided with actuating mechanism for engaging said magazine mechanism through said openings in order to cause said magazine mechanism to drop photographic plates one at a time, and means for guiding into said camera one at a time said photographic plates thus dropped.

8. In a photographic machine of the character described the combination of a camera for exposing a photographic plate, a plate supporter connected with said camera for supporting said plate within said camera during the exposure of said plate, mechanism connected with said plate supporter for causing said plate supporter to release said photographic plate after the exposure thereof, a plate holder for receiving said photographic plate and holding it in position to be developed and washed, and means for guiding said photographic plate from said camera to said plate holder.

9. In a photographic machine of the character described a combination of the camera for exposing a photographic plate, a plate supporter connected with said camera for supporting said photographic plate within said camera during the exposure of said plate, mechanism connected with said plate supporter for causing said plate supporter to release said photographic plate after the exposure thereof, a rocking shaft, a plate holder carried by said rocking shaft and positioned to receive the photographic plate after its release from the camera, means for developing and washing the photographic plate as it rests upon the plate holder, and means for actuating said rocking shaft in order to dislodge said photographic plate from said plate holder.

10. In a photographic machine of the character described the combination of a camera for exposing a photographic plate, means for dislodging from said camera said photographic plate after its exposure therein, a rocking shaft, a plate holder carried by said rocking shaft, means for guiding said photographic plate from said camera to said plate holder, mechanism for directing a charge of developing fluid upon said developing plate as held by said plate holder, and mechanism for actuating said rocking shaft in order to tilt said photographic plate into an inclined position.

11. In a photographic machine of the character described the combination of a

camera for exposing a photographic plate, means for dislodging from said camera said photographic plate after its exposure therein, a rocking shaft, a plate holder carried by said rocking shaft, means for guiding said photographic plate from said camera to said plate holder, mechanism for directing a charge of developing fluid upon said photographic plate as held by said plate holder, mechanism for actuating said rocking shaft in order to tilt said plate holder and the photographic plate carried thereby, and mechanism for washing off said photographic plate while thus tilted.

12. In a photographic machine of the character described the combination of a camera, means for developing a photographic plate dislodged from said camera after the exposure of said photographic plate therein, a plate holder having the form of a tray and adapted to receive and support said plate, means for delivering a charge of developing fluid upon said photographic plate as supported by said plate holder, mechanism for discharging water upon said plate in order to wash off any developing fluid thereupon, and mechanism connected with said rocking shaft for rocking the same in one direction in order to facilitate the washing of the plate, and for rocking said shaft in another direction in order to dislodge said plate, now a finished photograph from the plate holder.

13. In a photographic machine of the character described the combination of a camera, means for releasing from said camera a photographic plate after its exposure in said camera, a plate holder for receiving said plate as thus released from said camera, a rocking shaft for supporting said plate holder, means for supplying a charge of developing fluid to said photographic plate while said plate is supported by said plate holder, means for directing a stream of water upon said plate while thus held by said plate holder, a revoluble shaft disposed against said rocking shaft, mechanism connected with said revoluble shaft for causing said revoluble shaft to make one revolution and then to stop, and gearing connected with said revoluble shaft and with said rocking shaft and driven by said revoluble shaft for causing said rocking shaft to rock into an inclined position favorable for the washing of said photographic plate, and then into a different inclined position in order to dislodge said photographic plate, now a finished photograph, from said plate holder.

14. In a photographic machine of the character described the combination of an electric motor, gearing connected with said motor and driven thereby, said gearing including a revoluble shaft and a disk carried by said shaft and revoluble therewith, mechanism for stopping and starting said

motor so as to cause said revoluble shaft and said revoluble disk carried thereby to make a single revolution and then stop, and photographic mechanism connected with
 5 said revoluble disk and controllable by movements thereof for taking and developing a photograph.

15. In a photographic machine of the character described the combination of an
 10 electric motor, gearing connected with said motor and driven thereby, said gearing including a revoluble shaft and a disk carried by said shaft and revoluble therewith, mechanism for stopping and starting said
 15 motor so as to cause said revoluble shaft and said revoluble disk carried thereby to make a single revolution and then stop automatically, and photographic mechanism connected with said revoluble disk and con-
 20 trollable by movements thereof for taking and developing a photograph.

16. In a photographic machine of the character described the combination, with a camera, means for exposing a photographic plate
 25 therein and mechanism for releasing said plate from said camera after its exposure, of an electric motor, gearing connected with said motor and driven thereby, said gearing including a revoluble shaft, mechanism con-
 30 trollable by the operator for starting and stopping said motor so as to cause said shaft to make a single turn and then stop automatically, lighting mechanism associ-
 35 ated with said camera for exposing said photographic plate in taking a photograph, and controller mechanism connected with said lighting mechanism for throwing said
 40 lighting mechanism into and out of action, said controller mechanism being connected with said shaft and controllable by rotation thereof so as to energize and de-energize said
 lighting mechanism once only during the single revolution of said shaft.

17. In a photographic machine of the character described the combination with a camera, means for delivering into said camera a
 45 photographic plate to be exposed and means for releasing said photographic plate from said camera after its exposure therein, of a plate holder for receiving said plate after
 50 its release from the camera, a rocking shaft connected with said plate holder for supporting said plate holder and the plate carried thereby, means for actuating said rock-
 55 ing shaft in order to tilt said plate holder into different positions, a supply of develop-

ing fluid, mechanism for delivering a charge of said developing fluid from said supply to said plate as held by said plate holder, a
 60 water supply, and mechanism connected with said water supply and co-acting with said rocking shaft, for directing a stream of water from said water supply to said photographic plate as said plate holder occupies one of
 65 the positions into which it is tilted.

18. In a photographic machine of the character described the combination with a camera, means for delivering thereinto a photo-
 70 graphic plate to be exposed, and means for releasing said photographic plate from said camera after its exposure therein, of a plate holder for receiving said plate after its release from said camera, a rocking shaft con-
 75 nected with said plate holder for supporting said plate holder and the plate carried thereby, mechanism for actuating said rocking shaft in order to tilt said plate holder into different positions, a supply of developing
 80 fluid, mechanism for delivering a charge of said developing fluid from said supply to said plate as held by said plate holder, a water supply, and mechanism connected with
 85 said water supply and co-acting with said rocking shaft, for directing water from said water supply to said photographic plate as said plate holder occupies one of the posi-
 tions into which it is tilted.

19. In a photographic machine of the character described the combination of a casing, photographic mechanism mounted
 90 therein, a magazine box detachably engaging said casing, a magazine wheel mounted within said magazine box for the purpose of carrying a supply of photographic plates, means for causing said magazine wheel to
 95 deliver said photographic plates one at a time to said photographic mechanism within the casing, electric mechanism mounted within said magazine box and connected with
 100 said magazine wheel for controlling said magazine wheel, and contact mechanism carried partly by said magazine box and partly by said casing, and controllable by the re-
 105 moval and replacement of said magazine box for removably including said electric mechanism in an electric circuit which is partly within said magazine box and partly
 within said casing.

Signed at Edgewater, in the county of Bergen and State of New Jersey, this 16th
 110 day of Sept., 1926.

GUSTAV A. SVANBERG.