

March 26, 1935.

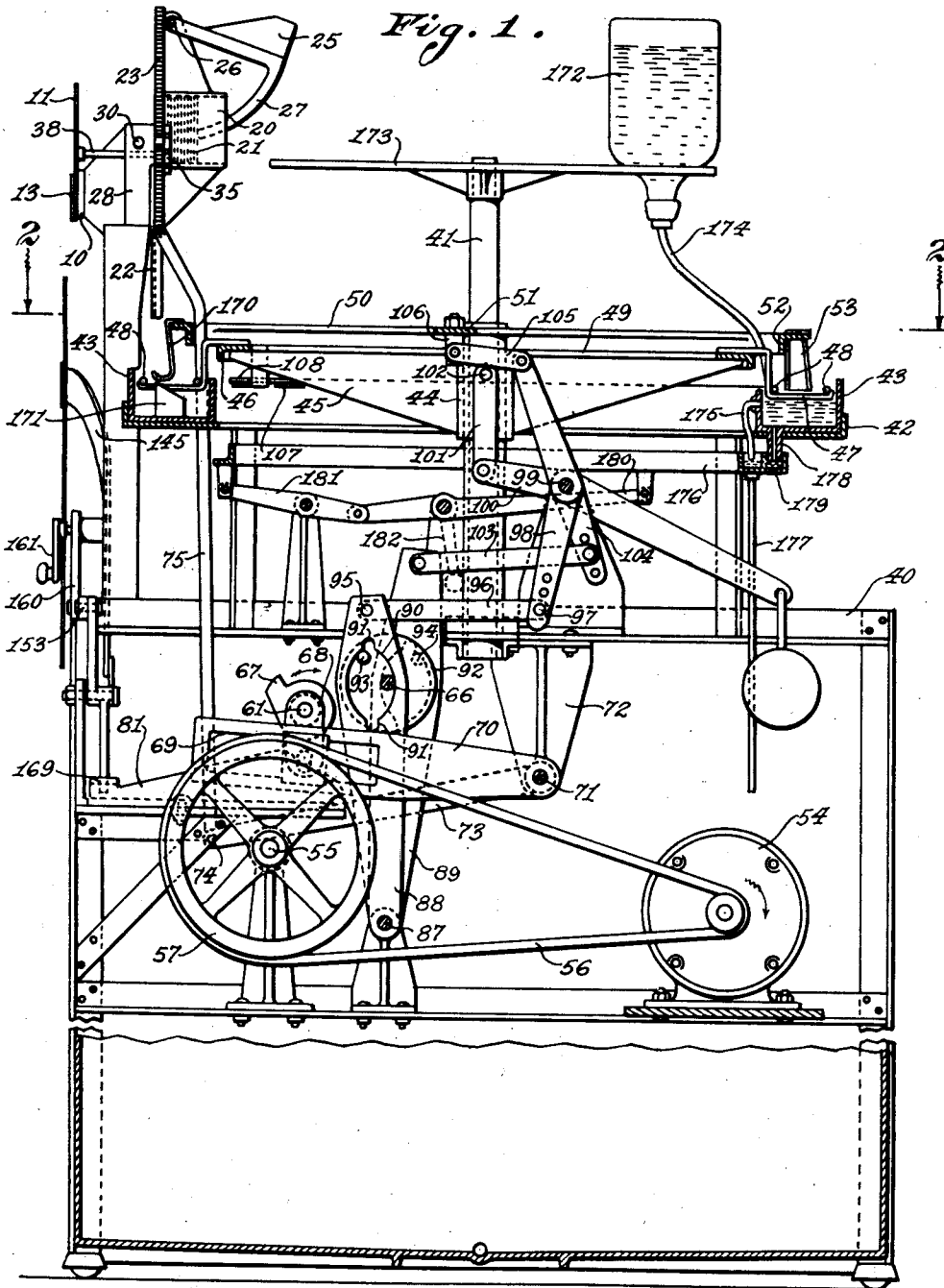
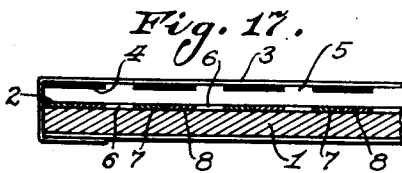
C. L. SMITH

1,995,825

PHOTOGRAPHY MACHINE

Filed Feb. 6, 1933

4 Sheets-Sheet 1



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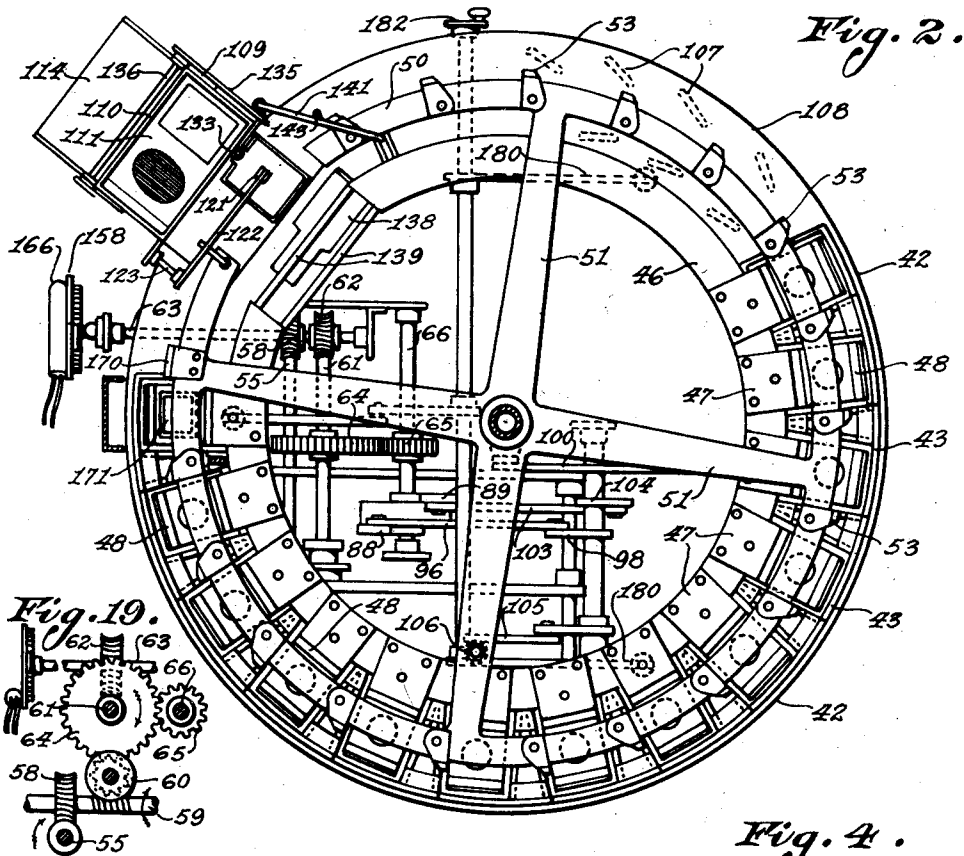
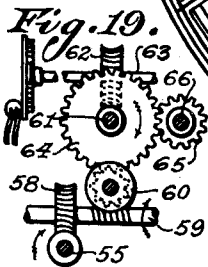
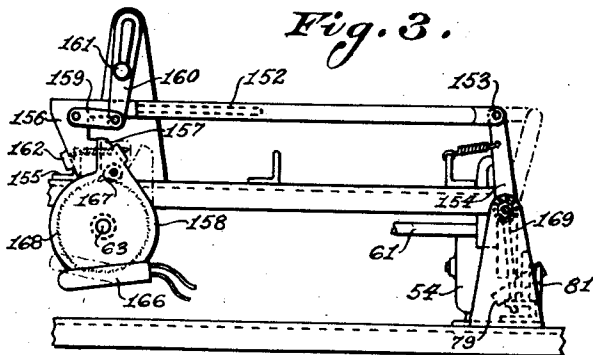
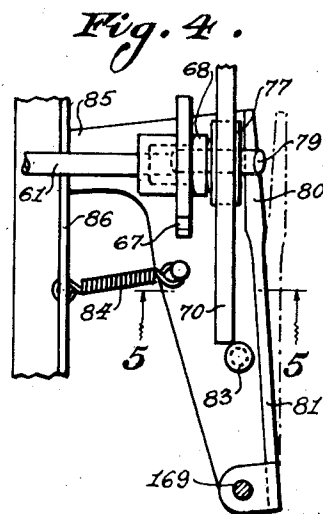
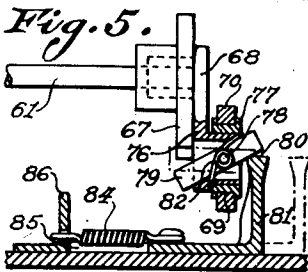
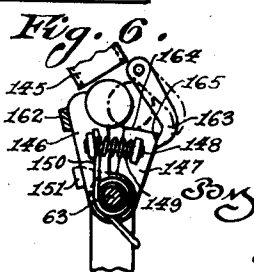
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PHOTOGRAPHY MACHINE

Filed Feb. 6, 1933

4 Sheets-Sheet 2



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1,995,825

PHOTOGRAPHY MACHINE

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4 Sheets-Sheet 3

Fig. 7.

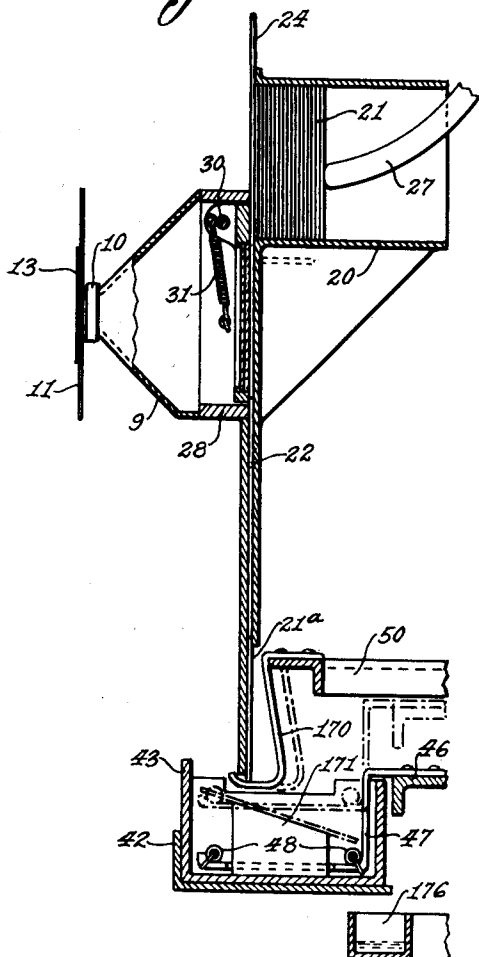


Fig. 8.

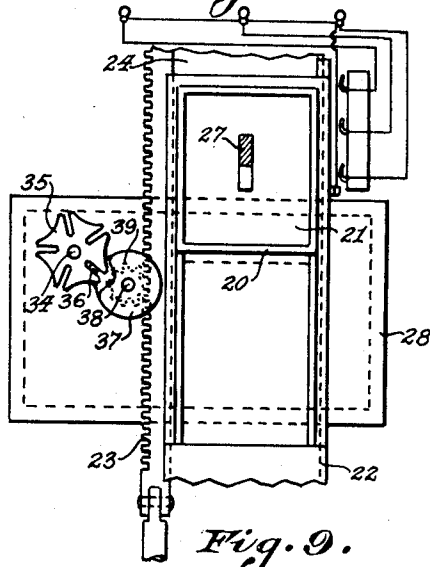


Fig. 9.

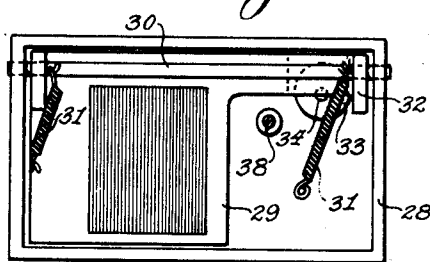


Fig. 10.

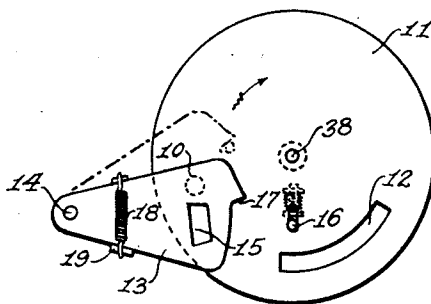
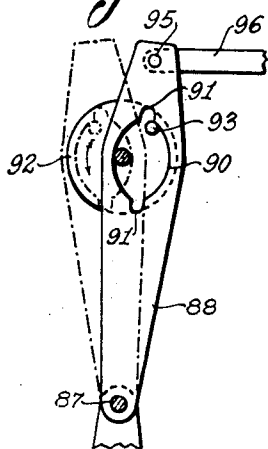


Fig. 11.



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Fig. 12.

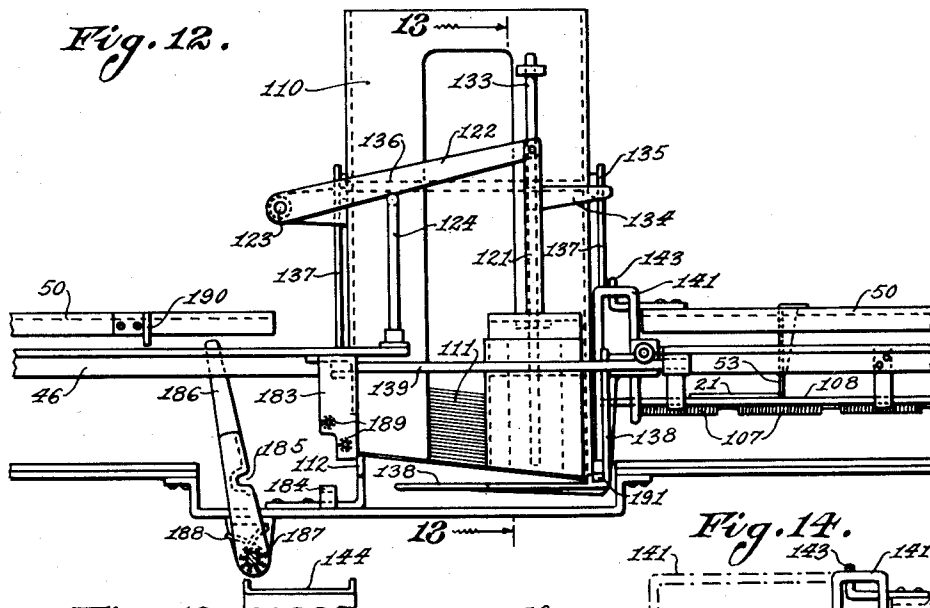


Fig. 13.

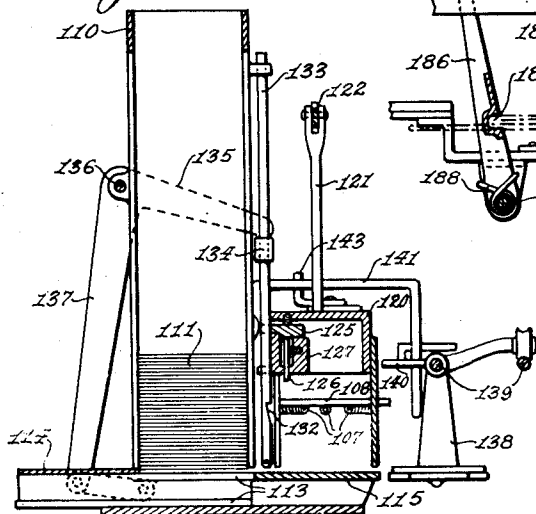


Fig. 16.

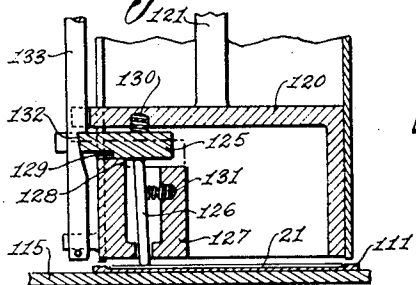


Fig. 14.

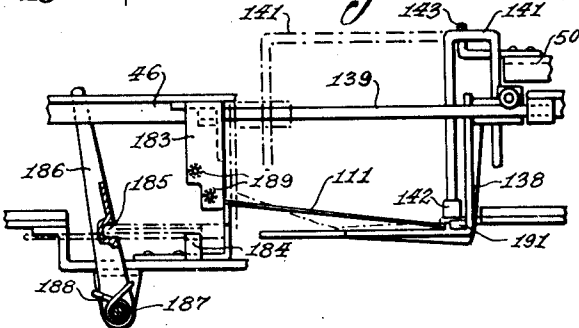


Fig. 15.

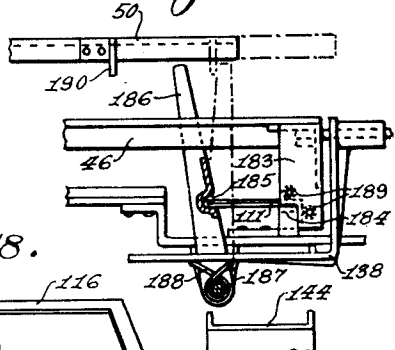
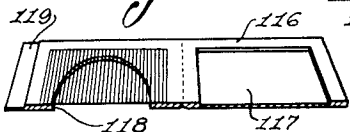


Fig. 18.



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UNITED STATES PATENT OFFICE

1,995,825

PHOTOGRAPHY MACHINE

Charles L. Smith, St. Louis, Mo., assignor of
one-half to Harvey A. Smith, St. Louis, Mo.

Application February 6, 1933, Serial No. 655,433

11 Claims. (Cl. 95—14)

This invention pertains to photographic machines, and more particularly to automatic machines whereby a sitter may obtain a photograph of himself by the insertion of a coin in the machine.

One of the objects of this invention is to provide an automatic machine whereby upon insertion of a coin, or other suitable operation, an exposure may be made on a photographic plate and the plate passed through developing mechanism and delivered to the purchaser in a finished condition.

Another object is to provide a novel mechanism for carrying out the various functions of such a machine.

Another object is to provide an automatic machine capable of making a composite photograph involving a plurality of exposures taken through a screen the screen being differently adjusted during different exposures.

Another object is to provide novel mechanism for developing the picture and suitably mounting the same for delivery in a finished condition.

Another object is to provide an improved method of automatic development.

Further objects will appear from the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a view in side elevation of a machine embodying this invention partially in section and with the outer casing removed;

Figure 2 is a section on line 2—2 of Figure 1;

Figure 3 is a detail of the mechanism for initiating the operation of the machine and timing its duration;

Figure 4 is a detail plan view of a part of Figure 3 somewhat enlarged;

Figure 5 is a section on line 5—5 of Figure 4;

Figure 6 is a detail of the coin actuated mechanism for initiating the operation of the machine;

Figure 7 is an enlarged sectional detail view of Figure 1 illustrating the camera portion of the device;

Figure 8 is a rear view of a portion of the mechanism shown in Figure 7;

Figure 9 is a detail of the screen shifting device;

Figure 10 is a detail of the shutter mechanism;

Figure 11 is a detail of the devices for timing the several movements of the developing mechanism;

Figure 12 is a view in elevation of the binding mechanism as seen from the center of the machine;

Figure 13 is a section on line 13—13 of Figure 12;

Figure 14 is a detail of Figure 12 with parts in section;

Figure 15 is a detail of Figure 14 with the parts in another position;

Figure 16 is an enlarged sectional detail of a part of Figure 13 with parts in a different position;

Figure 17 is a magnified sectional view of a picture which may be produced by this machine illustrating its structure and operation;

Figure 18 is a sectional view of the binder or mounting which is applied to the finished picture; and

Figure 19 is a detail view of the worm gear drive.

The type of picture which this machine is designed to produce is a popular novelty in which a plurality of different pictures appear on the same print. Each individual picture is produced by a photograph taken through a line screen so that the plate is exposed only along a succession of narrow parallel strips. A second exposure is taken in a similar manner but with the line screen shifted relatively to the plate so that the picture of the second exposure is composed of similar parallel strips, each placed alongside of the strips of the first exposure. A third exposure may be made in a similar manner with the screen shifted to a third position. When such a photograph is viewed through a screen similar to that through which the exposures were made, only one of the above described pictures appears through the screen. When the screen is shifted, however, the next picture appears and the third picture may be made to appear upon a further shift of the screen. In this way by relative movement between the screen and the photograph an apparent movement in the photograph may be observed.

This arrangement is illustrated in Figure 17 in which 1 represents the photographic plate and an emulsion 2. A screen 3 is provided with a series of opaque lines 4 arranged in parallel relation and spaced apart so as to provide a succession of gaps or transparent lines 5. When a three-exposure picture is to be made the strips 4 are made twice as wide as the gaps 5. The exposure is made with the screen between the plate and the camera lens so that the light affects the emulsion 2 only along certain parallel strips 6 which are exposed through the gaps 5. If the screen 3 is now shifted laterally through a distance equal to the width of the gap 5 and a

second exposure made a second picture will be formed on the emulsion 2 which picture will be confined to the series of parallel strips 7 adjacent the strips 6. The screen may now again be shifted an equal distance and a third exposure made which now affects the emulsion along a third group of strips 8 adjacent the strips 7.

When this plate is developed a composite picture is produced. When this picture is viewed through a screen such as the screen 3 above described any one of the component pictures may be viewed by shifting the screen to such a position as to expose through the gaps 5 the set of strips 6, 7 or 8 belonging to the picture which it is desired to view. As the lines on the screen are very narrow and closely spaced, there being as high as two hundred lines per linear inch in some cases, the picture formed by the uncovered strips blends into a complete whole so as to be easily recognizable. If, however, three exposures were made, say for instance portraits of a human face each with a different expression, the shifting of the screen relatively to the plate will cause an apparent change of expression in the portrait.

Referring more particularly to Figures 1 and 7 to 10 inclusive, a camera 9 is provided having a suitable lens 10 and a shutter disc 11. The disc 11 may be made to rotate on its axis by mechanism which will presently be described and is provided with an opening in the form of an arcuate slot 12 positioned to rotate past the lens 10. An auxiliary shutter plate 13 is pivoted at 14 on a suitable support and has an opening 15 which may be moved opposite the lens 10. These parts may be suitably supported on the casing or enclosure in which the machine may be housed but which is not shown in the drawings because this portion may be varied to suit the particular location in which the machine is operated. The shutter disc 11 is arranged to rotate in the direction indicated by the arrow in Figure 10 for making an exposure. The disc is provided with a spring pressed dog 16 arranged to engage an outwardly extending lug 17 on the plate 13. The latter plate may be held by a spring 18 against a stationary stop 19. As the disc 11 rotates in the direction of the arrow the dog 16 engages the lug 17 so as to raise the plate 13 to such a position as to bring the opening 15 opposite the lens 10 at the same instant that the opening 12 comes opposite said lens. The opening 15 is somewhat elongated so that it continues to uncover the lens during the time that the opening 12 is passing the same at the end of such time the dog 16 passes out from under the lug 17 and permits the plate 13 to drop down against the stop 19 and close the shutter. In this way each complete revolution of the disc 11 will open the shutter to expose the plate for a definite interval.

Mounted in the rear of the camera 9 is a magazine 20 adapted to hold a supply of picture plates 21. These plates may be of any suitable type. A convenient form has been found to be a cardboard plate with a sheet of photographic paper adhesively secured to the front face thereof.

A chute provided by a pair of guide slots 22 extends vertically downwardly from the magazine 20 through the camera 9 and to the developing mechanism as will be explained later. These slots are arranged to guide opposite edges of the photographic plate in its passage through the camera. The lower portion of the chute is enclosed so as to prevent light from reaching the plate during its passage therethrough from the camera to the developing mechanism. A ver-

tically slidable rack 23 is mounted adjacent the chute 22 and carries a feed plate 24 which slides up and down past the front of the magazine 20 and operates to feed the plates from said magazine to the camera. A weight 25 pivoted at 26 has an arm 27 extending into the magazine 20 from the rear and resting against the stack of plates 21 so as to feed the same forward in the magazine. Mounted for transverse movement in a frame 28 within the camera 9 is a screen holder 29 carrying the screen 3. The holder 29 is shiftable laterally on a transverse guide rod 30 mounted in the frame 28. Said holder is urged to the left and downwardly, Figure 9, by springs 31. The holder has a head 32 adapted to bear against an eccentric or other cam 33 on a shaft 34 which also carries the star wheel 35 of a Geneva movement including a pin 36 carried by a disc 37 on a shaft 38 which carries a pinion 39 engaging the rack 23. The rack 23 is moved by mechanism, which will be described later, in a double stroke upwardly and downwardly for each operation of the machine. The shutter disc 11 is carried on the shaft 38 which also carries the pinion 39 and the pin 36 of the Geneva movement. During the up stroke of the rack 23 the shaft 38 makes three revolutions. During this movement the shutter is opened three times by cooperation of the openings 12 and 15 as already described. During the same movement the pin 36 operates to turn the star wheel 35 through three partial revolutions. The timing is such that the movement of the star wheel takes place between the periods during which the shutter is open. Accordingly after each shutter opening the star wheel rotates the cam 33 through a definite part of a revolution and the action of this cam on the head 42 operates to shift the holder 29 and its screen 3 through a corresponding distance. As the screen 3 is located between the photographic plates and the lens 10 within the camera, each exposure will, therefore, be made on a different portion of the photographic plate as exposed in different positions of the screen 3. On the return stroke of the rack 3 the shaft 38 will be turned in the reverse direction an equal amount. Accordingly the star wheel 35 and the holder 29 will be moved backward to their original positions. During this return movement the shutter disc 11 rotates in a reverse direction to that during which the exposures were made. During each such rotation the spring pressed dog 16 will ride over the cam shaped upper edge of the lug 17, the pin yielding as it passes over the lug; accordingly the plate 13 is not moved and the shutter remains closed during this return movement.

During this return movement, however, the feed plate 24 engages the upper edge of a new plate 21 in the magazine 20 and moves it downwardly into the camera to a position for exposure. At the same time the newly inserted plate forces the plate which has just been exposed out of the camera through the chute 22 to be caught and held in the position indicated at 21a in Figure 7. From this position the plate is delivered to the developing mechanism which will now be described.

Referring now more particularly to Figures 1 and 2 a main frame 40, which is shown in the drawings as constructed of angle iron, has mounted in the center thereof an upstanding column 41. Mounted on the frame 40 and concentric with the column 41 is a ring shaped support 42. Mounted at regular intervals around the ring 42 is a series of cup shaped developing trays 43. Mounted for

sliding movement on the column 41 is a wheel shaped support generally indicated at 49 having a hub 44 which slides on the column 41, spider arms 45 and a rim 46. The hub 44 is splined to the column 41 so as to prevent rotary movement of this support while permitting a vertical sliding movement.

Mounted on the rim 46 at regular intervals therearound is a series of holders 47. Each of these holders is formed so that when the wheel shaped support is in its lowermost position the holder will dip into one of the trays 43. The vertical movement of the wheel shaped support is controlled as will be described later so as to raise these holders out of a solution contained in the trays. Each holder is provided on its upper surface with a pair of runners 48 adapted to receive and hold a picture plate in such a manner that the same may be slid along the runners from holder to holder.

Rotatably mounted on the column 41 and above the uppermost position of the holder at 49 is a shifter indicated generally at 50. This shifter also has spider arms 51 and a rim 52 upon which are mounted at intervals therearound shifter fingers 53. The shifter 50 is fixed as to its vertical elevation, but is rotatable so that it may oscillate to move the fingers 53 horizontally in order to shift a picture plate from one holder 47 to the succeeding one.

Mechanism for moving these parts in proper timed relation will now be described. A motor 54 is connected to drive a shaft 55 by means of a belt 56 running on a pulley 57 on said shaft. The shaft 55 is connected by a worm gear reduction 58 to drive a cross shaft 59 which in turn operates through a worm reduction 60 to drive the main operating shaft 61. The shaft 61 is connected through a worm gear reduction 62 to drive a timing shaft 63 which accordingly rotates very slowly. The shaft 61 is connected through a pair of spur gears 64 and 65 to drive an auxiliary operating shaft 66. Starting the motor 64, therefore, sets all of these shafts into operation.

Fixed to the shaft 61 is a dog 67. Loose on the shaft 61 is a crank arm 68. The lower end of the crank arm 68, see Figure 1, carries a slide operating in a guide slot 69 in an arm 70 fixed to a rock shaft 71 journaled in a bracket 72 on the main frame 40. The shaft 71 carries another arm 73 which is pivoted at its outer end at 74 to a link 75 whose other end is connected to the rack 23. The arrangements are such that under normal conditions the crank 68 being loose on the shaft 61 will remain stationary. However, means are provided for connecting this crank to the shaft in order to oscillate the arm 70 and thereby the arm 73 to raise and lower the rack 23 for operating the camera mechanism as already described.

The mechanism for connecting the crank arm 68 to the shaft 61 is illustrated in Figures 3, 4 and 5. The lower end of the crank arm 68 carries a hollow crank pin 76 on which is journaled a slide block 77 which slides in the guide slot 69 of the arm 70. Pivoted within the hollow crank pin 76 at 78 is a clutch member 79. The outer or right-hand end, Figure 5, of the clutch member 79 normally rests on the cam shaped edge 80 of a controlling member 81. This engagement holds the clutch member 79 in the position illustrated in Figure 5 against the tension of a spring 82 tending to move it on its pivot in a clockwise direction. The controlling member 81 has an angular shape as will be seen from Figures

4 and 5 and is pivoted at 83 on the main frame and retained by a spring 84 in the position shown in Figures 4 and 5. This position is determined by an abutment 85 engaging a member 86 of the frame as a stop. By moving the controlling member 81 outwardly or to the right, Figure 4, on its pivot against the tension of the spring 84 the cam edge 80 may be moved out from under the end of the clutch member 79 so that said member is then permitted to rotate in a clockwise direction under the influence of the spring 82. Such movement brings the left-hand end of the clutch member, as seen in Figure 5, into the path of movement of the dog 67 thereby causing said dog in its rotation to engage the clutch member 79 and pick up the crank 68 so as to cause the latter to rotate with the shaft 61. Such rotation will cause the arm 70 to move up and down through a predetermined angle thereby raising and lowering the rack 23. Upon release of the controlling member 81 the spring 84 moves it back to its original position and as the crank arm 68 comes around to its lowermost position the clutch member 79 engages the cam edge 81 and is moved thereby to the position of Figure 5 which movement releases it from engagement with the dog 67 and stops the operation of the camera.

Pivoted at 87 on a bracket on the main frame is a pair of levers 88 and 89. Each of these levers is formed with a cam slot of symmetrical form having an arcuate cam portion 90 and a rectilinear portion 91. These levers are mounted so that the shaft 66 passes through these cam slots of both levers. Mounted on the shaft 66 between the two levers 88 and 89 and fixed to rotate with the shaft is a disc 92. This disc carries on its forward face, Figure 11, a pin 93 rotating in the cam slot in the lever 88. On the opposite or rearward face of the disc 92 is a similar pin 94 operating in the cam slot of the lever 89. It will be seen that the rotation of the disc 92 acts through the pin 93 to oscillate the lever 88 on its pivot. While the pin is moving along the arcuate surface 90 the lever remains stationary in its angular position as shown in Figure 11. This is due to the fact that the arc of the portion 90 is concentric in this position of the lever with the shaft 66. In this position the pin 93 engages one side of the cam slot while the other side rests against the shaft 66. Accordingly the lever is held stationary in this position. When the pin 93 enters the rectilinear portion 91 of the cam slot the lever will start to move with the pin and will continue to move until it has reached a position on the other side of the shaft 66 symmetrical with the position shown in Figure 11. It will be seen that the movement therefore, is adapted to cause the levers 88 and 89 to take up an oscillating movement with a pause of considerable duration at each end of its stroke.

The upper end of the lever 88 has pivoted thereto at 95 a link 96 whose other end is pivoted at 97 to one arm 98 of a bell crank pivoted on a pin 99 and whose other arm 100 is connected by a link 101 at 102 to the hub 44 of the holder support 49. This train of connections will operate to raise and lower the support 49 with a pause of predetermined duration in each position. This operates to dip the holders 47 into the trays 43, hold them there for a definite interval, raise them out of the trays and again hold them stationary for a definite interval.

The other lever 89 is connected by a link 103 75

to a lever 104 also pivoted on the pin 99 and whose upper end is connected by a link 105 to a swivel pin 106 on the shifter 50. It will be seen that these connections will cause the shifter 50 to oscillate about the column 41 through a predetermined angle with a pause of definite interval at each end of its stroke. The movements of the holder support 49 and the shifter 50 are coordinated by this mechanism so that the holders 47, one of which is carrying a picture plate resting on the runners 48, are lowered to dip the plate into a solution in one of the trays 43. After a definite interval of immersion the holders are raised to bring the picture plate out of the solution. The raising of the holders positions the same relatively to the shifting fingers 53 so that the picture plate is ready for engagement by one of said fingers. The shifter 50 is now moved angularly about the column 41 which movement causes one of the fingers 53 to engage the picture plate and shift it from one holder 47 to the succeeding one. There is now a pause in the movement of the shifter 50 while the holder 49 is lowered to immerse the picture plate in the solution in the next tray 43. While the holder support 49 pauses in its lower position with the picture plate immersed, the shifter 50 executes its return stroke and then pauses while the holder support 49 is again raised. A succeeding finger 53 is now ready to engage the picture plate to shift it onward at the next stroke of the shifter. In this way the picture plate is shifted from tray to tray and immersed in each one in succession.

The trays 43 do not occupy the entire ring 42 but, as shown in Figure 2, a certain portion of this ring carries a series of heating elements 107. There may be electric resistance units, or any other suitable type of heater, and are mounted on the holder support 49 so as to move therewith. Also mounted on said holder support and just over the heating elements 107 is a pair of runners 108. These runners may be simply glass tubes, or rods, bent to the proper form and mounted on the holder support 49 in proper alignment with the runners 48 of the various trays 43 so that when its photographic development has been completed it is shifted to the runners 108 so that during the latter portion of its travel it passes over the heaters 107 to be thoroughly dried during such passage.

After passing over that portion of the ring which carries the heating elements 107 the picture plate is shifted into a binding or mounting device indicated generally at 109 in Figure 2. This binding device is illustrated more particularly in Figures 12 to 16 inclusive. A container 110 is open at the bottom so that the lowermost mount rests at its edges on a pair of guides 112 only one of which is visible in the drawings. The guides 112 are at different levels so that the mounts 11 are stacked therein at an inclination to the horizontal as will be seen from Figure 12. Arranged to slide in guides 113 is a feeding plate 114 which is mounted at the same angle as the mounts 11 in the magazine 110 and moves in alignment with the lowermost mount in the stack to push the same out from under the rest. The guides 112 extend out beyond the magazine so that a mount so ejected will still be supported in inclined position on the said guides.

In its ejected position the mount is supported by the extensions of the guides 112 over a horizontal support 115. The mount is constructed as illustrated in Figure 13 with a backing portion 116 having a recess 117 adapted to receive

the picture plate. A cover or frame portion 118, carrying the cover screen, is attached to the backing portion 116 and suitably scored as to be folded thereover and has a tab 119 coated with a suitable adhesive so that it may be attached to the back of the backing member 116 after folding. In its ejected position the binder is also placed in line with the runners 108 over which the picture plate travels and which terminates adjacent the lower end of the ejected mounting but spaced thereabove so that the picture plate 21 as it is fed off of the end of the runners 108 drops onto the mount. The spacing of the runners above the mount provides that as the picture plate passes off the runners its leading edge will tip downwardly and the plate will be inverted during its fall upon the mount. The picture is so positioned that the plate is dropped into the recess 117 face up.

Positioned above the picture plate thus deposited upon the mount is a vertically sliding frame 120 suspended on a rod 121 which in turn is suspended from a lever 122 pivoted at 123 on a suitable support and supported by a bracket 124 on the holder ring 46. As this ring is in raised position when the picture plate is delivered to the mount said plate will be delivered under the frame 120. This frame is suitably guided for sliding movement and has mounted therein a special pawl comprising a horizontal head 125 secured on a vertical stem 126. The stem 126 passes loosely through a guide 127 while the head 125 rests upon a shoulder 128. Under normal conditions the head 125 is retracted to the right, Figures 13 and 16, so that the shoulder 128 is engaged in a notch 129 in the head 125. This position is illustrated in Figure 13.

This pawl is pressed downwardly by a spring 130 and to the left, Figure 16, by a spring 131. This pawl is positioned so that the lower end of the stem 126 extends into the recess 117 of the mount without touching its bottom. During the normal rise and fall of the ring 46 the frame 120 also rises and falls. In its downward movement it presses the backing portion 116 of the mount downwardly to a horizontal position so as to bend the mount at its scored line as indicated in dotted lines in Figure 14. So long, however, as there is no picture plate contained in the recess 117 there will be no further action of this mechanism. When, however, a picture is contained in said recess the stem 126 will contact with the same upon downward movement of the frame 120. This contact will lift the pawl until the notch 129 clears the shoulder 128 whereupon the spring 31 will force the pawl outwardly to the position shown in Figure 16. In this position the tip of the head 125 engages a notch 132 in a vertical rod 133 suitably guided for vertical movement on the magazine 110, or otherwise. When so engaged the upward movement of the frame 120 will lift the rod 133.

The rod 133 has adjustably secured thereon a collar 134 engaging the end of one arm 135 of a bell crank lever pivoted at 136 and whose other arm 137 is connected by a link to the feeding slide 114. Accordingly as soon as a picture plate is delivered to the mount the slide 114 is operated to feed a new mount out of the magazine, and the new mount pushes ahead of it the one containing the picture plate which is moved outwardly onto a supporting bracket 138. The mount passes onto this bracket in its semi-folded position with one end still resting on the guide 112. The bracket 138 is guided for sliding movement along a pair of

supporting rods 139 suitably supported on the frame or the support 42. Engaged in a slot in an arm 140 on the bracket 138 is a downward extension on a lever arm 141 pivoted at 142 on a suitable fixed support. This arm is arranged to be actuated by a dog 143 on the shifter ring 50.

When the shifter moves to shift a picture plate the arm 141 is swung on its pivot so as to carry the bracket 138 to the left, Figures 14 and 15, to the extreme position shown in Figure 15. As this movement begins the upwardly bent portion of the mount which still rests upon the guide 112 abuts against a depending bracket 183 on the ring 46. As the bracket 138 is shifted the folded portion of mount 111 is forced to slide up the right-hand face of the bracket 183 thereby folding the mount at its scored line between the portions 116 and 118. As the movement continues the mount is forced to pass under the guide 112 which forces the portion 118 of the mount back upon the portion 116 and brings the gummed tip 119 against a moistening pad 191 to moisten the adhesive thereon. As the movement continues the folded mount is carried onto a support 184 and its end inserted in a notch 185 on a rocking bracket 186 pivoted at 187 on a suitable portion of the frame. This bracket is controlled by a spring 188 to maintain it yieldingly in the position shown in Figure 14. With the folded mount now in the position shown in Figure 14 the ring 46 is lowered carrying the bracket 183 downwardly. This bracket is equipped with a pair of rollers 189 offset with respect to one another both horizontally and vertically. The lowermost of these rollers engages the projecting tab 119 and folds it downwardly. The shifter 50 is now moved to the right, Figure 15, which causes a dog 190 thereon to engage the upper end of the bracket 186 to swing said bracket to the right, Figure 15. This forces the folded mount to the right which causes it to pass over the lowermost roller 189 which action causes said roller to fold the tab 119 under the folded mount and secure the same adhesively thereto. The ring 46 is now raised which lifts the bracket 183 causing the rollers 189 to raise that side of the completely folded and sealed mount. This partly disengages the mount from the notch 185 and as the shifter ring 50 now returns to the left the bracket 186 is released and moves to the left thereby dropping the folded mount which is deposited in a chute 144 which carries it out of the cabinet and delivers it to the purchaser.

In order to initiate the operation of the machine a coin chute 145 which passes through the front wall of the casing or enclosure in which the machine is housed terminates at a pair of controlling or locking members, shown in Figure 6. Loosely mounted on the end of the timing shaft 63 are the locking members 146 and 147. These are joined together by a loose link 148 in the form of a short bar headed at both ends to limit the extent of separation of the two arms 146 and 147. On this bar is mounted a spring 149 which yieldingly forces the locking elements to their extreme separation. A spring 150 holds the member 146 against a stop 151 so as to fix its normal position. A starting bar 152 is pivoted at one end at 153 to a lever 154 and has an extensible connection with a head 156 which is slidably supported in a frame member 155 at its outer end. This head has a downwardly extending lug adapted to engage a dog 157 on a timing disc 158 loose on the shaft 63. The head 156 is connected by a link 159 to an arm 160 which in turn is connected to

a crank handle 161 which protrudes from the outer casing of the machine so as to be operable by the customer. The dog 156 has a rearwardly protruding projection 162 adapted to engage the arm 146 as shown in Figure 6. The arm 146 may move pivotally on the shaft 63 until it engages the arm 147 which latter arm is normally held against movement by a latch 163. This latch has a portion 164 extending into the coin chute 143 so as to be engaged by a coin issuing from that chute. The arm 147 also has a shoulder 165 on which the coin is delivered from the coin chute. The arrangement is such that when a coin passes down the chute it is delivered on the shoulder 165 and under the portion 164 of the latch and also in the path of movement of the arm 146. With the coin so positioned movement of the arm 146 to the right, Figure 6, will cause said coin to lift the latch 163 and release the arm 147. Until the arm 147 is so released the movement of the arm 146 is restricted by its engagement with the arm 147. When released by the coin, however, both arms may move to the right, Figure 6, and in so moving the coin is passed out from under the portion 164 and delivered to a suitable container, not shown. The device shown in Figure 6 acts to lock the apparatus until a coin is deposited in the chute.

Mounted on the timing disc 158 is a mercury switch 166 connected in any suitable manner to control the operation of the motor 54. When the starting bar 152 is shifted to the right, Figure 3, it rotates the disc 158 to the right thereby tipping the mercury switch 166 so as to close said switch and start the motor. The disc 158 carries a spring pressed pawl 167 adapted to engage a ratchet wheel 168 fixed to the shaft 63. Accordingly when the disc 158 is shifted by operating of the starting bar the pawl 167 holds it against return movement and keeps the switch 166 in circuit closing position. With the machine in operation, however, the shaft 63 is rotated very slowly in a counter-clockwise direction, as seen in Figure 3, and this movement after a definite time interval sufficient to permit complete operation of the machine returns the switch 166 to circuit opening position and stops the motor.

The lever 154 to which the starting bar is connected is pivoted at its lower end at 169 to the controlling element 81. Shifting the starting bar 152 to the right, Figure 3, will, therefore, operate to move the controlling element 81 so as to release the clutch member 79 to start the operation of the camera mechanism as previously described.

The operation of this machine is, therefore, as follows. The machine is set up in a suitable enclosure, not shown, with the lens 10 opposite a suitable opening in the enclosure. A suitable seat for the customer may also be provided and a photographic lamp, such as a mercury vapor lamp, may be advantageously positioned to illuminate the subject for photographing.

Suitable instructions for operation are posted outside the enclosure and the customer takes his proper position before the camera in accordance with such instructions. He deposits a coin in the chute and then operates the locking mechanism shown in Figure 6 as already described. Operation of the handle 161 shifts the starting bar 152 to the right, Figure 3. This movement swings the disc 158 to the right thereby closing the switch 166 and setting the disc for timing of the complete operation. At the same time the lever 154 is shifted so as to swing the controlling member 81 to release the clutch member 79.

Closing the switch 166 starts the motor 54 which sets the camera and the developing mechanism into operation. The clutch 79 connects the arm 70 for operation by the shaft 51 through the crank 68. The arm 70 acting through the shaft 71, the arm 73 and the ring 75 operates to raise and lower the rack 23. During its upper movement the rack 23 operates through the gear 39 to rotate the shutter disc 11. This causes three successive operations of the shutter as described. After each such operation the Geneva movement turns the star wheel 35 through a partial revolution thereby causing the cam 33 to shift the screen 3. Accordingly each successive exposure is made with the screen in a different position. Switching mechanism operated by the rack 23 is arranged to light in succession three signal lamps placed before the customer to warn him when each exposure is about to be made. This is to enable him to move or change his expression between exposures. Each light remains lighted during the exposure so as to warn the sitter to hold each pose while the exposure is being made. On the return movement of the rack 23 the various parts are restored to their original position ready for a new operation and the plate 24 feeds a succeeding picture plate 21 to the camera thereby forcing the exposed plate out of the camera and down the chute 22 to the position 21a. In this position the plate is caught by a supporting finger 170 mounted on the shifter 50 just above the first tray 43. This first tray contains no solution but has mounted therein an inclined table 171. The mechanism described in connection with Figure 1 now operates to successively raise and lower the holders 47 and to swing the shifter 50. The picture plate is delivered to the position 21a, Figure 7, while the holders 47 are in their lower position. Upon the next movement of the shifter 50 the finger 170 is slid out from under the picture plate which is thereby dropped upon the inclined table 171. This causes the lower edge of the picture plate to slide inwardly or to the right, Figure 7, depositing the picture plate face down upon the table 171. It will be seen that this mechanism operates to deliver the picture face down to the developing mechanism.

Upon elevation of the holders 47 the picture plate is now picked up by said holders and carried into the path of the shifting fingers 53. These fingers operate to shift the plate to a succeeding holder. This holder then moves to dip the plate in the solution in the next tray 43. By continued operation of this mechanism the plate is moved successively from tray to tray and dipped in each one for a proper period. The solutions are arranged to accomplish proper developing and fixing of the picture in the time provided. When cardboard picture plates are used, as above described, the plate floats on the solution in each tray.

When the picture plate has passed through the last solution tray it is deposited on the runners 108 where it is passed step by step over the heaters 107 and thoroughly dried. Upon completion of the drying the plate is delivered to the binding device. In delivering the plate to the binding device it is inverted and the binder is then wrapped about it and adhesively secured after which the picture is delivered to the chute 144 which delivers it to the customer.

In order to provide for proper replenishing of the developing solutions a bottle or container 172 may be mounted in a suitable rack 173 and con-

nected by a tube 174 with a tray 43. There may be a container 172 for each tray. These containers are supplied with an ample amount of the proper solution. The lower end of the conduit 174 is arranged to deliver the solution at a very low rate, usually drop by drop, to the trays 43. An overflow tube 175 is provided for each tray and discharges into a circular trough 176 suitably supported below the ring 42. The trough 176 may be connected by a drain 177 to a suitable waste container, not shown. Thus the solution is continually being replenished and is kept fresh and a sufficient quantity in each tray.

In order to provide for periodic discharge of all the trays, each tray is equipped with a drain tube 178 which dips into a mercury cup 179 mounted in the trough 176. The trough 176 may be supported in any suitable manner for raising and lowering the same. In Figure 1 a system of levers 180 and 181 is arranged to support the same and connected to an operating arm 182 whereby the levers may be manipulated to lower the trough. This carries the mercury cups 179 out of engagement with the drain tubes 178 and allows the solutions in all the trays to discharge into the trough 176 and out by the drain 177. This operation may be performed whenever the supply of picture plates in the magazine is exhausted and must be replenished.

It will be seen, therefore, that this invention provides a machine whereby a novelty picture of the type described can be automatically taken by a plurality of exposures and be promptly developed and suitably mounted and delivered. The entire operation may be controlled by coin actuated devices. The developing mechanism is such that each picture is passed through a complete and thorough developing process which is accurately timed and thereafter the picture is completely dried and ready for delivery.

While this invention has been described as a unitary machine it will be understood that individual features or subcombinations thereof may be useful by themselves without reference to the other features or the complete combination, and it is understood that the employment of such individual features and subcombinations is contemplated by this invention and within the scope of the appended claims. It is obvious that various changes may be made, within the scope of the appended claims, in the details of construction without departing from the spirit of this invention; it is to be understood, therefore, that this invention is not limited to the specific details shown and/or described.

Having thus described the invention, what is claimed is:

1. In a photography machine of the character described, developing mechanism comprising a series of bath trays, means for dipping a plate into said trays, and means movable from tray to tray for shifting a plate from tray to tray.

2. In a photography machine of the character described, developing mechanism comprising a series of bath trays, a series of holders dipping into said trays, means for moving said trays and holders relatively, and means movable from tray to tray for shifting a plate from holder to holder to be dipped into successive trays.

3. In a photography machine of the character described, developing mechanism comprising a series of bath trays, holders mounted to dip into said trays, means for moving said trays and holders relatively, runners on said holders to receive the plate to be developed, and means for shifting

the plate from holder to holder on said runners.

4. In a photography machine of the character described, developing mechanism comprising a series of bath trays, a support on which said trays are mounted in consecutive order, a carrier having a series of holders arranged to dip into said trays, means for moving said support and said carrier relatively to insert and remove said holders from said trays, and movable means adapted to shift a plate from holder to holder so as to dip the same successively into different trays.

5. In a photography machine of the character described, developing mechanism comprising a series of bath trays, a series of holders dipping into said trays, means for moving said trays and holders relatively, means moving from tray to tray for shifting a plate from holder to holder to be dipped into successive trays, and means for drying the plate at the end of the series of trays.

6. In a photography machine of the character described, developing mechanism comprising a series of bath trays, a series of holders dipping into said trays, means for moving said trays and holders relatively, means for shifting a plate from holder to holder to be dipped into successive trays, means for drying the plate at the end of the series of trays, and means for mounting the finished plate.

7. In a photography machine of the character described, developing mechanism comprising a series of bath trays, one of said trays having a downwardly directed discharge spout, and a mer-

cury cup cooperating with said spout to provide a valve for discharging the tray.

8. In a photography machine of the character described, developing mechanism comprising a series of bath trays, said trays having discharge spouts, a carrier having a series of mercury cups cooperating with said spouts to provide discharge valves for said trays, and means for shifting said carrier to operate said valves.

9. In a photography machine of the character described, developing mechanism comprising, a series of bath trays, a series of holders movable vertically into and out of said trays, and a horizontally movable shifter adapted to shift a plate from holder to holder when out of said trays.

10. In a photography machine of the character described, developing mechanism comprising, a series of bath trays arranged in an arcuate path, a series of holders movable vertically into and out of said trays, and a horizontally movable shifter adapted for arcuate oscillation along said path to shift a plate from holder to holder when out of said trays.

11. In a photography machine of the character described, developing mechanism comprising, a series of bath trays, a series of holders movable vertically into and out of said trays, a horizontally movable shifter adapted to shift a plate from holder to holder when out of said trays, and a dryer arranged at the end of the series of trays, said shifter operating to move the plate progressively along said dryer.

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