

J. J. SHAFER.
 PHOTOGRAPHIC PRINTING MACHINE.
 APPLICATION FILED OCT. 27, 1909.

Patented Nov. 29, 1910.

3 SHEETS-SHEET 1.

977,138.

Fig. 1.

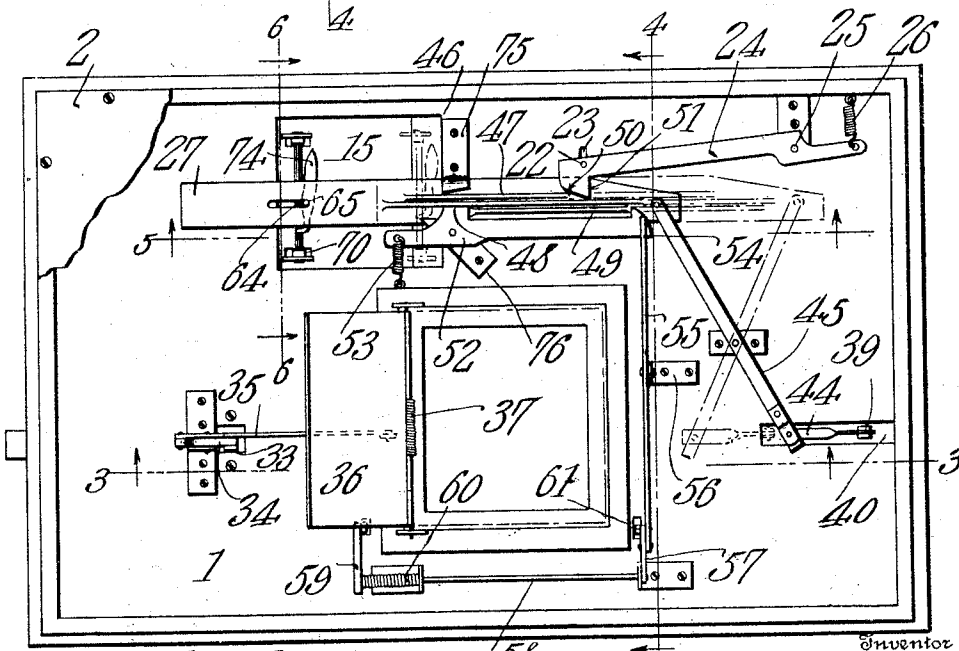
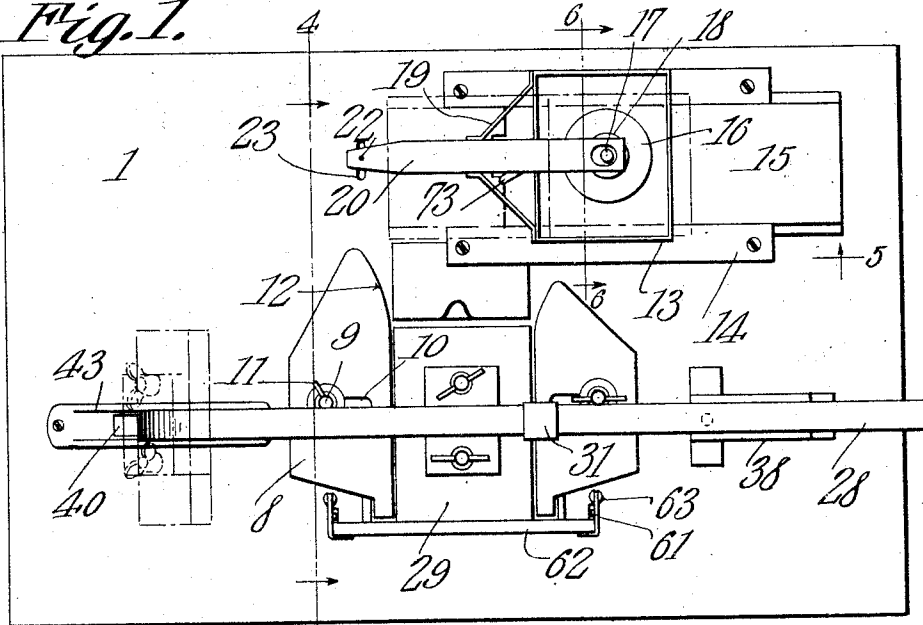


Fig. 2.

Witnesses

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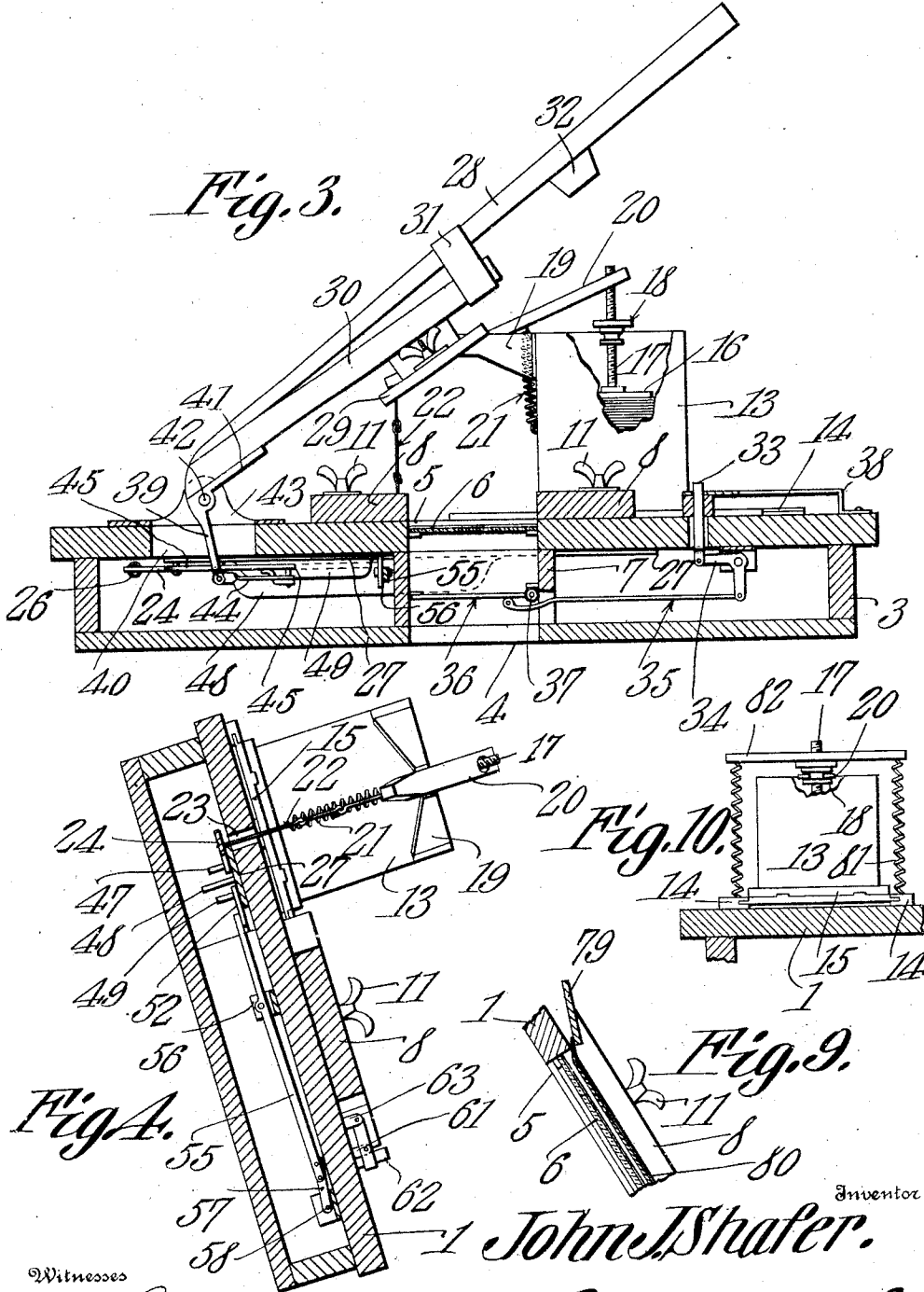
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3 SHEETS—SHEET 2.



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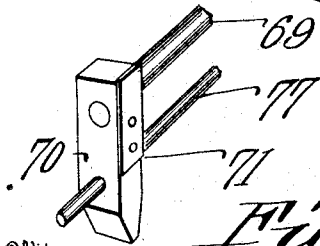
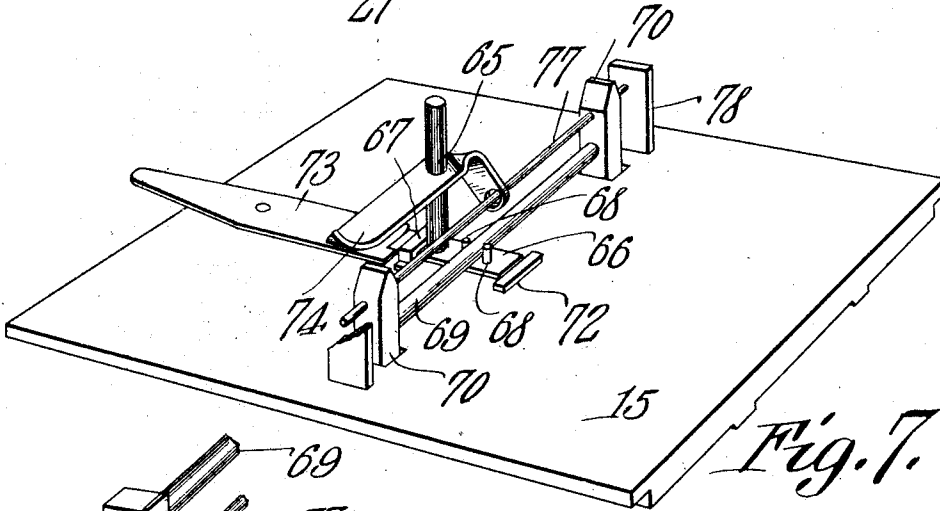
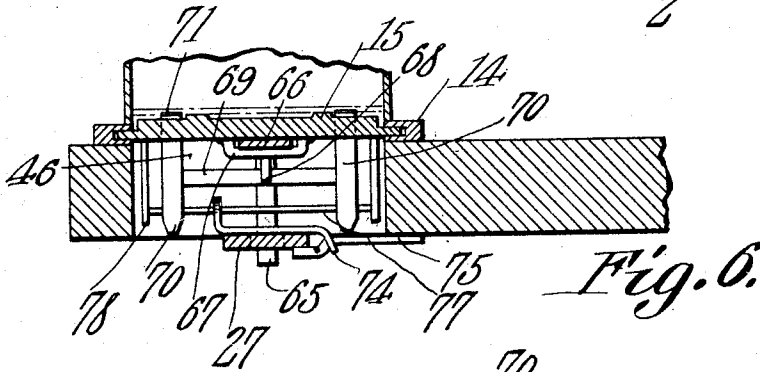
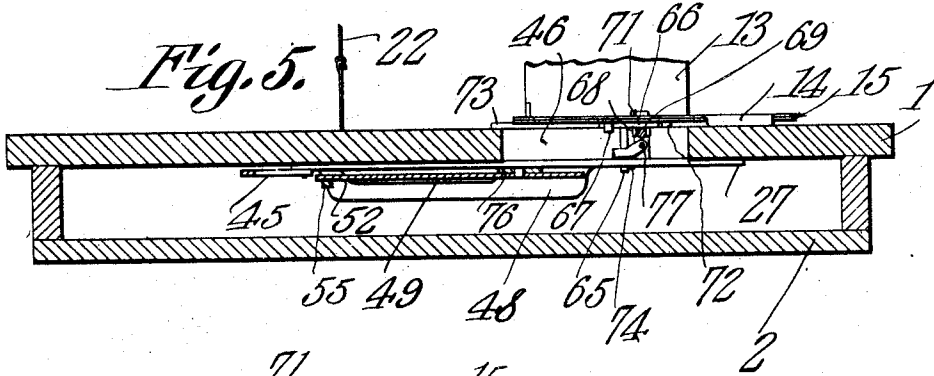
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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PHOTOGRAPHIC-PRINTING MACHINE.

977,138.

Specification of Letters Patent.

Patented Nov. 29, 1910.

Application filed October 27, 1909. Serial No. 524,917.

To all whom it may concern:

Be it known that I, JOHN J. SHAFER, a citizen of the United States, residing at Lenox, in the county of Macomb and State of Michigan, have invented a new and useful Photographic-Printing Machine, of which the following is a specification.

This invention is a photograph printing machine and the object of the invention is to provide a simple and efficient device by which post cards may be rapidly fed from a hopper to a proper position in contact with the negative and discharged from the said position after being printed.

The invention seeks to provide a machine of this character in which the operations of feeding the card to the negative and discharging the same therefrom will be performed automatically upon the manipulation of a single lever carrying the presser plate by which the post card is held in position against the negative during printing. This and other objects are attained in the apparatus illustrated in the accompanying drawings which illustrate one embodiment of the invention, all of which will be hereinafter first fully described and the novel features of which will be subsequently pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the front side of the device. Fig. 2 is a similar view of the rear side of the same. Fig. 3 is a longitudinal section on the line 3—3 of Fig. 2. Fig. 4 is a transverse section taken on the lines 4—4 of Figs. 1 and 2. Fig. 5 is a longitudinal section taken on the line 5—5 of Fig. 2. Fig. 6 is a transverse section on the line 6—6 of Fig. 2. Fig. 7 is a perspective view looking at the under side of the slide. Fig. 8 is a detail perspective view of one of the trips on the card-feeding slide. Fig. 9 is a detail sectional view taken through the negative holding compartment, showing an amplification. Fig. 10 is a detail elevation partly in section showing a modification of the means for applying pressure to the cards within the hopper.

In carrying out my invention, I employ a face plate 1 and a back plate 2 which is spaced from the face plate and connected thereto by the plates or beams 3, as shown. When the device is in use, it is set up in an inclined position, as shown in Fig. 4, and may be secured in that position by any means most convenient to the operator. The face plate

and back plate are provided with registering openings 4 and 5 near their lower edges when so set up and at about the center of the same and the negative 6 is supported in alinement with these openings between the same upon cleats or similar devices provided for that purpose upon intermediate beams or sills 7. Upon the face plate, at the sides of the opening 5, are adjustably secured the guiding plates or blocks 8 by means of set screws 9 inserted through transverse slots 10 therein and provided with thumb nuts 11 by means of which they may be secured in proper position to accurately center a post-card over the negative. The upper ends of these guide blocks 8 are inclined or flared, as indicated at 12, so that the post-card which may be delivered from the hopper will be thereby guided toward the opening 5 in the face plate and consequently be caused to accurately drop upon the negative and into contact therewith. Above the said guide plates and slightly to one side of the same is provided a hopper 13 within which the post-cards are placed, and at the base of the said hopper, upon the face plate, are guides 14 in which a slide 15 is mounted in position to move across the back of the hopper and remove from the same the rearmost post-card which will be thereby carried to a position beyond the side of the hopper and will then drop between the guide plates 8 and onto the negative. In order to maintain the cards in the proper position within the hopper and prevent them from twisting therein so that they will not feed easily and smoothly, I provide a follower 16 which rests upon the cards and from which a threaded stem or standard 17 rises, a nut 18 being mounted on the said threaded stem or standard, as clearly shown. On the side of the hopper I provide brackets 19 between the outer ends of which a presser arm 20 is pivoted, one end of said arm projecting over the hopper and provided with an opening through which the threaded stem or standard 17 plays. This end of the presser arm 20 will at times bear upon the nut or collar 18 and thereby exert a pressure upon the cards which will permit the slide to easily and accurately engage the proper card and feed the same from the hopper, it being understood that as the supply of cards diminishes the nut or collar 18 will be adjusted toward the upper end of the stem or standard 17 and consequently will always be in

position to be engaged by the end of the presser arm while at the same time the follower 16 may remain in contact with the uppermost card. The arm is held normally toward the nut or collar 18 by a spring 21 which is secured to the said arm and the side of the hopper, as shown in Fig. 3, and as will be readily understood. The opposite end of the presser arm has secured thereto a link or pitman 22 which passes thence through an opening 23 in the face plate and has its lower end attached to a spring dog 24 fulcrumed on the under side of the face plate near one corner of the same, as indicated at 25, the outer end of the said dog being held normally toward the adjacent edge of the face plate by a spring 26 so that the inner end of the said dog, to which the link or pitman 22 is attached, will be held normally over a slide 27 mounted on the under side of the face plate, as will be presently more fully described.

The operating lever or handle 28 is fulcrumed at one end upon the front of the face plate in such position as to extend across the negative-receiving opening, and the presser plate 29 is carried by the said lever or handle through an intermediate or supplemental arm 30 held to the operating lever by a loop or bracket 31. Near its free end on its under side, this operating lever or handle carries a block 32 which, when the handle is in its lowest position, will rest upon a pin 33 mounted vertically in the face plate and having its lower end pivoted to one arm of a bell crank lever 34, the other arm of which is connected by a connecting rod 35 with a shutter 36 hinged within the negative receiving compartment by a spring hinge 37. It will be seen at once that when the lever is lowered so as to actuate the pin 33 the shutter 36 will be opened through the action of the bell crank lever 34 and the connecting rod 35 so that light may pass through the negative to the post-card held in contact with the same, and that upon the lifting of the lever the shutter will be immediately closed through the action of the spring hinge 37. The peculiar manner of supporting the presser plate permits the operating lever or handle to act upon the same somewhat in the nature of a spring so that the necessary force may be exerted upon the post-card to hold the same in smooth intimate contact with the negative without the plate being pressed against the negative with such force as to break the negative. In order to hold the lever against the card with the force necessary, I provide the loop 38 on the base plate adjacent to the pin 33 so that when the lever is lowered, the free end of the same will lie immediately over and upon the said loop which may then be grasped by the operator so that in order to prevent undue loosening of the card from

the negative it is only necessary to hold the end of the lever closely against the said loop, as will be readily understood.

At its fulcrumed end, the operating lever is provided with a depending finger 39 which extends through a slot 40 in the face plate and forms one arm of an angle plate, the other arm 41 of which is secured to the under side of the lever. The fulcrum pin 42 passes through the angle plate at the bend of the same and has its ends fitted in brackets or lugs 43 on the front of the face plate at the sides of the slot 40, as clearly shown, and as will be readily understood upon reference to Figs. 1 and 3. The lower end of the finger 39 is pivoted to one end of a link 44 which has its opposite end pivoted to a rock lever 45 fulcrumed upon the under side of the face plate and having its upper end pivoted to the slide 27 hereinbefore mentioned. This slide 27 extends across and below the opening 46 formed in the face plate to register with the lower end of the hopper 13 and is provided on its back, near that end to which the lever 45 is pivoted, with three ribs 47, 48 and 49. The upper rib 47 has its end adjacent the end of the slide, standing substantially at a right angle to the face of the slide in position to engage the beveled edge 50 on the head 51 of the spring dog 24, so that when the slide is drawn toward the right in Fig. 2 the said abrupt end of the rib 47 will turn the dog 24 on its pivot 25, but when the slide is moved in the opposite direction the inclined end of the rib 47 will bear against the side of the head 51 and thereby spring the dog away from plate 1. This will cause the dog to ride behind the rib and consequently exert a rearward pull upon the link 22 and thereby raise the presser arm 20 from its engagement with the nut or collar 18 and consequently relieve the pressure from the cards within the hopper 13. The intermediate rib 48 serves as a stop to limit the pivotal movement of the dog 24 under the influence of the spring 26, and also serves to limit the movement of a spring lever 52 fulcrumed upon the base plate at the opposite side of the slide 27 and held normally upward toward the rib 48 by a spring 53, as will be readily understood. The free end of this lever 52 is provided with a head 54 arranged in position to engage and ride upon the lower rib 49 and extending over the upper end of a lever 55 fulcrumed upon a suitable bracket 56 on the inner side of the face plate and having its lower end pivoted to a crank arm 57 on one end of a rock shaft 58 which is journaled upon the base plate near the lower edge of the same and has a similar crank arm 59 at its opposite end. A spring 60 coiled around the said rock shaft and attached to the same at one end and at its opposite end to one of the bearings of the

shaft, holds the shaft normally against the action of the lever 55. The free ends of the crank arms 57 and 59 are connected by links 61, passing through the face plate, to a bail or card rest 62, the side arms of which are pivoted, as at 63, upon the front side of the face plate so that the bail extends across the lower end of the opening 5 therein and thereby support the post-card. It will be seen that upon the movement of the slide 27 toward the right the lever 52 will be sprung away from the plate by the rib 49 and its head 54 will bear rearwardly the upper end of the lever 55 so that the lower end of the said lever through the crank arms 57 and 59 of the rock shaft 58 will lift the bail or card rest 62 sufficiently to permit the post-card to drop out under the same. Upon the movement of the slide 27 in the opposite direction the lever 52 will be swung downwardly around its pivot by the rib 49 so as to be released from the lever 55, and the spring 60 will then at once act upon the rock shaft so as to return the several parts to the former position in which the post-card is supported.

The slide 27 is provided near that end which appears at the left in Fig. 2 with a longitudinal slot 64 through which passes a pin 65 depending from the card-engaging slide 15. The pin 65 is carried by a small plate 66 held to the slide 15 by a keeper 67 and having a slight sliding movement through the said keeper (see Fig. 7). The plate 66 is disposed at about the center of the slide 15 and has depending from its under surface a pair of pins 68 which pass on opposite sides of a rod 69 connecting a pair of dogs 70 which extend through the slide and are provided at their upper ends with small teeth 71 adapted to engage the under side of the post-card and thereby positively feed the same to the negative in the operation of the slide. In the form of the invention illustrated, the tooth 71 appears as a small thin plate secured to the side of the dog but it will be understood, of course, that this exact construction is not essential. The plate 66 is limited in its movement in one direction by a fixed stop 72 secured to the under side of the slide 15, and in the opposite direction by a movable stop 73 which is pivoted to the under side of the slide 15 and has its free end projecting beyond the edge of the same, as shown most clearly in Fig. 7. When the movable stop is turned into position to engage the end of the plate 66, the said plate will be held immovably between the said movable stop and the fixed stop 72 so that movement of the dogs 70 will be prevented. Should the stop 73, however, be turned out of the path of the plate 66 the dogs may have a slight movement, and this movement will be effected by a trip 74 which is mount-

ed loosely on the pin 65 and rests upon the slide 27. The free end of the trip is bent into position to ride against a stop or bracket 75 on the inner side of the face plate, the said bracket serving also as a support to hold the slide 27 against the face plate, as will be readily understood. In order to further hold the said slide 27 in its proper operative position, a second bracket 76 is provided therefor at the side opposite the bracket 75. The trip 74 has its inner end engaged over a rod 77 extending between the dogs 70 and passing through the same and having its ends pivoted in lugs 78 on the under side of the slide 15 at the edges of the same. When the stop 73 is thrown out of engagement with the plate 66 the trip 74 will project slightly away from the connecting rod 77 and the dogs 70 so that the said dogs will be held in such position as to engage the post-card. When the free end of the trip is brought against the bracket or stop 75 through the action of the slide 27 said free end will be swung toward the dogs and the other end will exert a slight pull upon the rod 69 so that the dogs will be vibrated and the teeth 71 of the same released from the post-card which may then drop into position against the negative.

It is thought the operation and advantages of my improved printing apparatus will be readily understood. A supply of post-cards is placed within the hopper 13 and the negative from which prints are to be made is supported within the negative compartment provided by the sills or beams surrounding the openings 4 and 5 in the face plate and the back plate, and a post-card is placed against the negative to start the operation. It is then necessary only to raise and lower the handle or operating lever 28 until the supply of post-cards has been exhausted in order to make the desired illustrations upon the cards. When the lever is brought down so as to hold the post-card against the negative, the shutter will be opened, as hereinbefore described, and will be held opened to admit light through the negative to the card as long as the lever is depressed. Upon the lifting of the lever, the shutter automatically closes and cuts off the light while a second sensitized post card is being fed into position behind the negative. When the lever is raised the finger 39 will actuate the lever 45, as before described, and the slide 27 will thereupon be moved toward the right of Fig. 2, as before stated. This movement of the slide 27 will actuate the lever 52 to discharge the printed post-card, and will turn the dog 24 out of the path of the rib 47 and consequently permit the spring 21 to draw the presser arm 20 down upon the nut or ring 18 so as to exert the required pressure upon the post-cards

within the hopper. These movements will occur before the card feeding slide 15 is actuated, owing to the fact that the slot 64 in the slide 27 will ride past the pin 65 until the outer end of the slot engages the said pin. When the end of the slot 64 has been brought into engagement with the pin 65, the slide 15 will be actuated so as to detach the lowest post-card and carry the same from the hopper into position to drop upon the negative. The impulse given to the pin 65 by the end of the slot 64 will swing the free end of the trip 74 slightly forward of the rods 69 and 77 and the dogs 70 will thereby be caused to engage the bottom of the post-card so as to positively carry the same from the hopper. When the slide has about completed its movement said free end will strike against the stop or bracket 75 and the trip will thereby be swung rearwardly so as to act on the rod 77 and thereby vibrate the dogs so as to release the teeth of the same from the post-cards and hold them below the cards so that they will not act on the cards while the slide is returning to its initial position. Should it be desired to use photographic paper which is lighter than post-cards, the movable stop 73 will be turned into such position as to engage the plate 66 and hold the same against movement independently of the slide, and the dogs will then be held constantly inoperative.

The device is intended primarily for use in printing post-cards, as stated, but it may be readily adapted for printing other forms of photographs, and the blocks or plates 8 may be adjusted so as to accommodate printing paper of various sizes. The arrangement shown and described for maintaining pressure upon the post-card within the hopper not only furnishes a ready means for maintaining the pressure notwithstanding the diminution in the supply of cards, but also permits the follower to be easily removed from the hopper in order to permit a supply of post-cards to be placed therein. A sheet of ruby paper may be placed over the shutter and the shutter provided with a central opening in order to prevent the light acting on the post-card while the same is being properly centered upon the negative. The lever or operating handle may be held depressed for a longer or shorter period of time in order that the printing may be properly measured according to the light in which the work is being done.

In Fig. 9 I have shown an amplification of the feeding mechanism in which an upper deflecting plate 79 is arranged between the upper ends of the blocks 8. The card will pass under this deflecting plate 79 and will be positively guided to the negative and prevented from falling away from face plate. A strip of felt 80 is secured to the lower end

of this deflecting plate and extends therefrom over the negative to serve as a cushion between the negative and the presser plate 29.

In Fig. 10 I have shown a modified arrangement of the devices for applying pressure to the cards within the hopper. In this form of the device, the spring 21 is not employed but a spring 81 is provided at each side of the hopper, the said springs being secured at their lower ends to the guides 14 and at their upper ends to a cross bar 82 arranged above the hopper and having a central opening through which the stem 17 projects. The end of the lever 20 is, in this instance, swiveled upon the nut 18 and bears against the underside of the cross bar 82.

Having thus described my invention, what I claim is:—

1. A photograph printing apparatus comprising an upright frame having a negative receiving opening, a hopper located above said opening, a card supporting bail located adjacent the lower end of said opening, means for feeding a card from the hopper to the negative receiving opening, means for operating the bail to discharge the printed card, a lever, and connections between it and both said means for operating them alternately.

2. The combination of a frame having an upright negative receiving opening, a hopper disposed above the said opening, means for feeding a card from the hopper, and guide plates adjustably secured at the sides of the said opening to guide a card into the same.

3. The combination of a frame having a negative receiving opening, a normally closed shutter arranged within the said opening, a slidable pin mounted in the frame at one side of the said opening, a loop secured on the frame adjacent to the said pin, connections between the inner end of the said pin and the shutter, and an operating lever mounted on the frame at the opposite side of the negative receiving opening and carrying a presser plate adapted to enter the said opening, the said lever being arranged to bear upon the slidable pin and lie upon the loop adjacent thereto.

4. In a photograph printing device, the combination of a frame having an upright negative receiving opening, a hopper mounted on the frame above the said opening, a slide arranged to move across the bottom of the hopper to feed a card therefrom, means for operating the said slide, and concurrently operating means for applying pressure to the cards in the hopper on the feeding movement of the slide and for relieving the cards of such pressure on the return movement of the slide.

5. In a photograph printing machine, the combination of a frame having a negative

receiving opening, a hopper disposed adjacent the said opening, means for feeding cards from the said hopper, a follower within the hopper, a presser arm mounted on the side of the hopper, and means for actuating the said presser arm to apply pressure to the follower during the feeding of the cards and to remove the pressure when the cards are not being fed.

6. The combination of a frame having a negative receiving opening, a hopper arranged adjacent the said opening, a follower within the hopper, a stem rising from the follower, a collar adjustably mounted on the stem, a presser arm fulcrumed at the side of the hopper, a spring acting on the said presser arm to hold it in contact with the adjustable collar, and means for actuating the presser arm in opposition to the said spring.

7. The combination of a frame having a negative receiving opening, a hopper arranged adjacent the said opening, a card feeding slide arranged to move across the bottom of the hopper, a follower within the hopper, a presser arm bracket on the side of the hopper, a presser arm pivoted to the bracket, means for causing the arm to press upon the follower, a lever mounted on the frame, a link connecting the said lever with the presser arm, and means for operating the card feeding slide and the said lever whereby the presser arm will be released from the follower during the return movement of the slide.

8. The combination of a frame having a negative receiving opening, a hopper arranged adjacent the said opening, means for feeding a card from the hopper, a card rest arranged adjacent the lower end of the negative receiving opening, and actuating mechanism connected with the card rest and the card feeding means whereby the card rest will be manipulated to release a printed card prior to the movement of the card feeding means.

9. The combination of a frame having a negative receiving opening, a hopper mounted on the frame adjacent said opening, a card rest arranged adjacent the lower end of the negative receiving opening to support a card in said opening, a card feeding slide arranged to move across the hopper and feed a card therefrom, an operating slide, connections between the said slide and the card rest, connections between the operating slide and the feeding slide, and means for moving the operating slide.

10. The combination of a frame having an upright negative receiving opening, a hopper mounted on the frame adjacent said opening, a card rest mounted on the frame at the lower end of said opening, a slide arranged to feed a card from the hopper, a

follower within the hopper, means for operating said slide; and connections between the slide, follower, and card rest whereby the latter will be operated to discharge a printed card before the feeding movement of the card feeding slide and whereby pressure will be supplied to the follower before the feeding movement of the said slide and removed therefrom during the return movement of the slide.

11. The combination of a frame having an upright negative receiving opening, a hopper arranged adjacent the said opening, a card feeding slide arranged to move across the bottom of the hopper, an operating slide, connections between it and said card feeding slide, a follower within the hopper, a presser arm arranged to act on the follower, a dog mounted on the frame, a link connecting the said dog with the presser arm, a cam rib on the operating slide adapted to engage the end of said dog and actuate the same to remove the presser arm from the follower, and means for actuating the operating slide.

12. The combination of a frame having an upright negative receiving opening, a card rest mounted on the frame at the lower end of the said opening, and a rock lever fulcrumed on the frame, connections between one end of the lever and the card rest, a slide mounted on the frame and provided with a cam rib, a second lever fulcrumed on the frame in position to be engaged by the said cam rib and having its free end arranged under said rock lever, and means for actuating the said slide.

13. The combination of a frame having an upright negative receiving opening, a card rest mounted on the frame at the lower end of the said opening, a rock shaft mounted on the under side of the frame and provided at its ends with crank arms, links connecting the said crank arms with the card rest, a rock lever fulcrumed on the frame and connected to one of the said crank arms, and means for actuating the said lever.

14. The combination of a frame having an upright negative receiving opening, a hopper mounted on the frame adjacent the said opening, a card feeding slide arranged to move across the bottom of the hopper, a follower within the hopper, a card rest mounted on the frame at the lower end of the negative receiving opening, levers mounted on the frame, means connecting them with the follower and with the card rest, respectively, an operating slide having cam ribs adapted to act upon the said levers, connections between the operating slide and the card feeding slide, and means for actuating the operating slide.

15. The combination of a frame having an upright negative receiving opening, a hopper arranged adjacent the said opening,

a card feeding slide in the bottom of the hopper, a follower within the hopper, a card rest mounted on the frame adjacent the lower end of the negative receiving opening, a lever and dog mounted on the frame, means connecting them with the said card rest and with the follower respectively, an operating slide provided with cam ribs adapted to act upon the said lever and dog and with an intermediate rib forming a stop for the free ends of the same, and means for actuating the said card-feeding slide by the movement of the operating slide.

16. The combination of a frame having an upright negative receiving opening, a hopper upon the frame, a card feeding slide arranged to move across the bottom of the hopper, a follower within the hopper, a card rest mounted on the frame at the lower end of the negative receiving opening, an operating lever mounted on the frame and having a finger extending from its pivoted end through the frame, a rock lever mounted on the under side of the frame, a link connecting the rock lever with the said finger, and connections between the rock lever and the card feeding slide, the follower, and the card rest, respectively.

17. The combination of a frame, a hopper thereon, a card feeding slide arranged to move across the bottom of the hopper, a vibratory dog carried by the said slide and projecting through the same, an actuating slide mounted below the card feeding slide, and a pin and slot connection between the card feeding slide and the dog.

18. The combination of a frame, a hopper thereon, a card feeding slide in the bottom of the hopper, a dog carried by the said slide and projecting through the same, a trip, means connecting it with the dog, and an actuating slide having a pin and slot engagement with the said trip to operate the card feeding slide and the dog.

19. The combination of a frame, a hopper thereon, a slide in the bottom of the hopper, dogs mounted on and extending through the slide, a movable plate mounted on the under side of the slide, means connecting the plate with the dogs, a pin depending from the said plate, an actuating slide having a longitudinal slot engaging the said pin, and

stops on the card feeding slide to hold the plate against movement.

20. The combination of a frame, a hopper mounted thereon, a card feeding slide in the bottom of the hopper, dogs mounted on the slide and extending through the same, a connecting rod between the dogs, a slidable plate on the under side of the card feeding slide, pins thereon engaging the said connecting rod, a fixed stop on the slide adjacent one end of the said plate, a movable stop on the slide arranged to engage the other end of the said plate, an actuating slide, and means whereby the latter will act upon the said plate to move the dogs and the card feeding slide.

21. The combination of a frame, a hopper thereon, a card feeding slide in the bottom of the hopper, an actuating slide mounted on the under side of the frame and provided with a longitudinal slot, brackets holding the said slide to the frame, a pair of dogs carried by the card feeding slide and extending through the same, a connecting rod between the said dogs, a plate on the under side of the slide, means on the plate for engaging the said connecting rod, a pin depending from the said plate through the longitudinal slot in the actuating slide, a pivot rod extending between the dogs, and a trip mounted on the said pin and engaging the said pivot rod and adapted to impinge against one of the brackets supporting the actuating slide.

22. The combination of a frame, a hopper thereon, a card-feeding slide arranged to move across the bottom of the hopper, vibratory dogs on said slide, and means for operating the said slide and the dogs and having a lost motion connection therewith.

23. The combination of a frame, a hopper thereon, a card-feeding slide in the hopper, vibratory dogs carried by said slide, and operating means common to the dogs and the slide.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN J. SHAFER.

Witnesses:

ALBERT F. LINDKE,
W. H. ACKER.