June 2, 1925. 1,540,340

C. KESSES

PHOTO ENLARGING MACHINE

Filed May 3, 1922 2 Sheets-Sheet 1

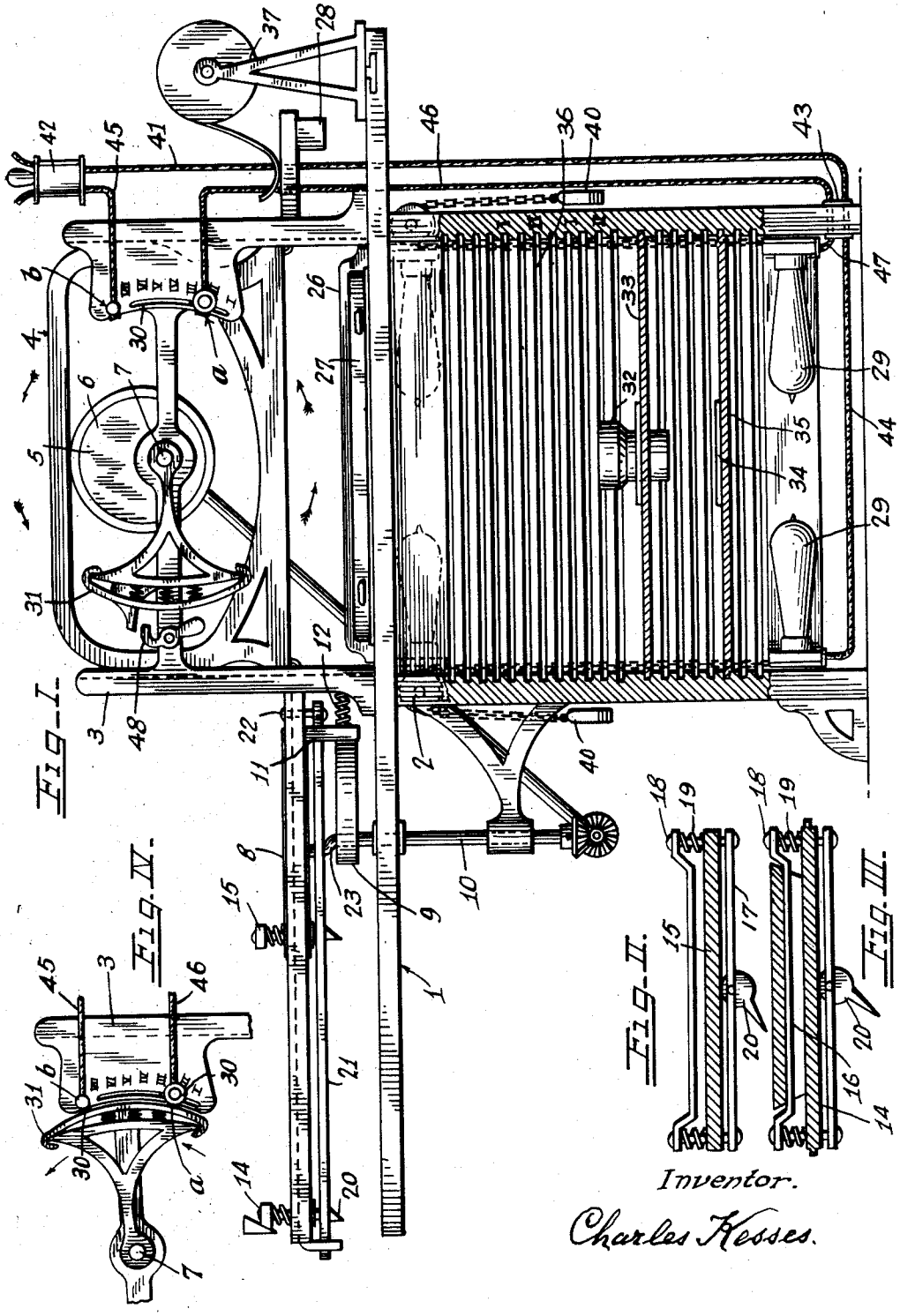


Fig. I.

Fig. IV.

Fig. II.

Fig. III.

Inventor.

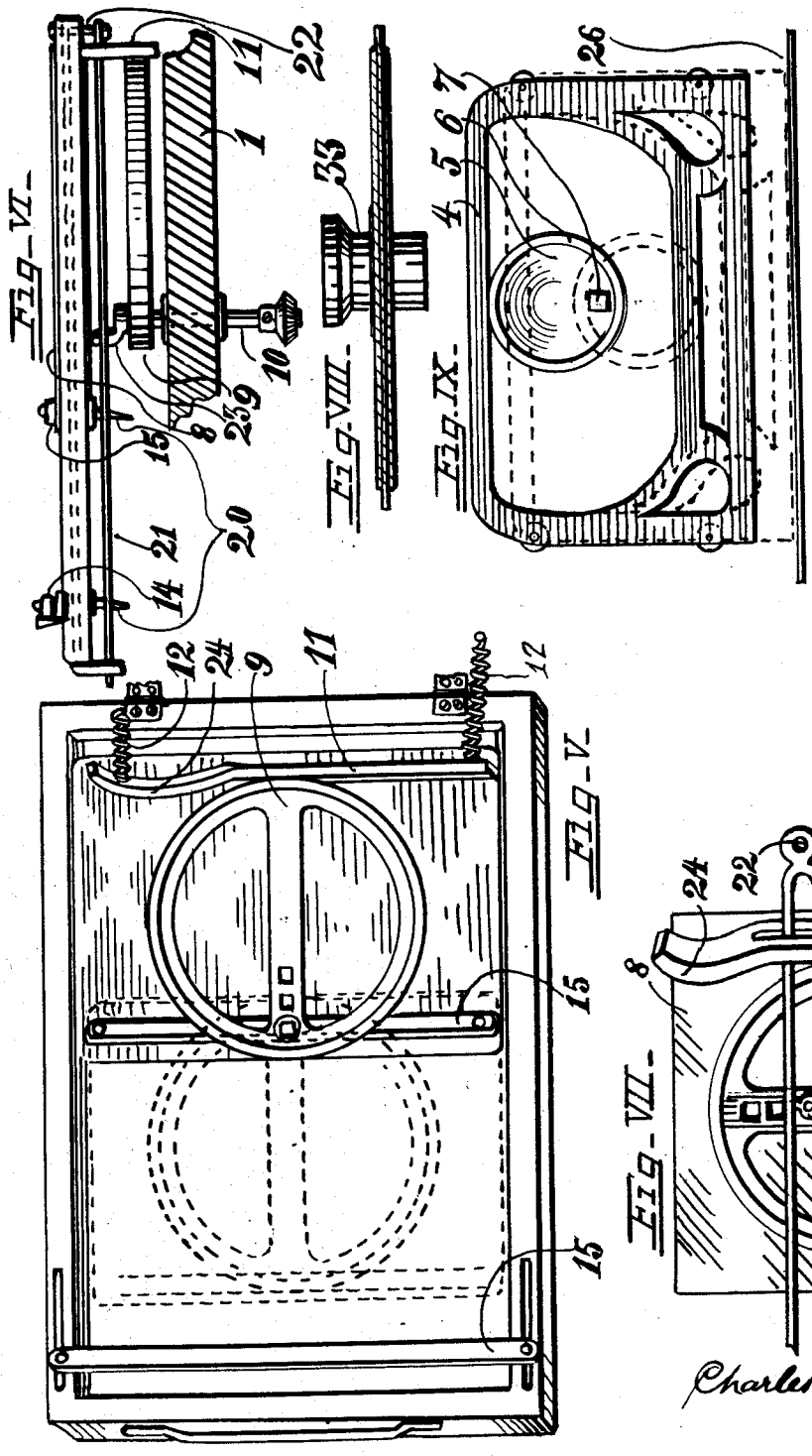
Charles Kesses.

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Filed May 3, 1922 2 Sheets-Sheet 2



Patented June 2, 1925. 1,540,340

UNITED STATES PATENT OFFICE.

CHARLES KESSES, OF NEW YORK, N. Y.

PHOTO-ENLARGING MACHINE.

Application filed May 3, 1922. Serial No. 558,197.

To all whom it may concern:

Be it known that I, CHARLES KESSES, citizen of the United States, and resident of New York city, in the county of New York and State of N. Y., have invented certain new and useful Photo-Enlarging Machines, of which the following is a specification.

My invention is related to my application for a photo printing machine, patented May 3, 1922 No. 1,417,832, for exposing intermittent successive photos, for the size in the length and the width required, said device is operating in conjunction with an exposure clock, which regulates the time of the exposure for the pictures from one to sixty seconds, and the objects in this application are;—

First; to use for enlarging purpose a lens without the usual rack and pinion movement which is stationarily secured to a lensboard and selectively positioning said lensboard on various fixed positions for exposing different sizes of pictures from different sizes of negatives without focusing.

Second; an intermittently operating feeding mechanism which can be adjusted to advance the strip for the size of the pictures required and wherein can be fed from a roll, or strips of sheet material.

Third; an exposure device for intermittently exposing pictures, which can be regulated for shorter or longer exposure.

Fourth; means provided to hold the paper with the intermittently operating press and means to prevent movement of the advancing gripper during said exposure.

Fifth; an automatically operating cutting mechanism, which can be adjusted to cut different sized pictures after the exposure.

Sixth; contact printing with flat negatives on single sheets, also successive pictures on rolls of paper or on a strip of sheet material.

Seventh; contact printing with two or three negatives for exposing successive combination pictures, whereby each picture is exposed with all of said negatives, for instance, a portrait in the centre, a frame design on the outside and a name in one corner.

Eighth; a reciprocating brush carrier, shown in my Patent No. 1,417,832 can be easily operatively connected to this machine, to dust the negatives before every exposure.

So to build a machine which can be operated by power or by hand, for printing by enlarging or by contact, to be a useful instrument for the commercial or portrait photographer and for the bromide printer.

I attain these objects by the mechanism illustrated in the accompanying drawings in which—

Fig. I is a vertical view of the machine, including an enlarging device having a number of vertical spaced positions, which are arranged to give fixed focus positions for a lens support and negative support.

Fig. II is a gripping device to hold and to release the paper, said gripper is operative in the reciprocating carrier.

Fig. III is a view of a cutter and gripper, said device can be moved to different positions for the size of the pictures required.

Fig. IV is a view of a device for regulating the time of the exposure.

Fig. V is a view of the bottom of the intermittent feeding mechanism, showing a carrier moved by a cam in two positions.

Fig. VI is a horizontal view of said feeding mechanism.

Fig. VII is a top view of said cam, a lever which is moved by a second cam for operating the gripping device and showing a curve which is arranged for stopping the carrier during the exposure.

Fig. VIII is a side view of a lens without the usual rack and pinion movement, which is stationarily secured in a board provided for inserting in fixed positions.

Fig. IX is a front view of the press, a cam for lifting said press, a dotted line position of said press and said cam showing a period of rest for said press, till the cam lifts the press out of a fixed position.

The table 1, its legs 2, a front and a rear support 3 is secured to said table. A press 4 is movably arranged in guide rails, which are secured to said supports. A shaft 7 carrying a cam 5 is journaled in said supports. Said cam is set in bearings in a rim 6, which is operative on a plane surface to reciprocate said press in said supports. A large opening in the press 4 is provided for lifting said press with the cam 5, a view of the press and the cam is shown separated in Fig. IX, and a second posi-

tion in a dotted line. This large opening allows the press to hold the paper in position during the time of the exposure.

An intermittent feeding mechanism is with suitable hinges secured to the press 4. A view of said mechanism from below is shown in Fig. V and a horizontal view in Fig. VI. A carrier 8, a second view shown in a dotted line position, is reciprocated by a cam 9. A shaft 10 turns in bearings in the table 1. Said shaft is with gears and shafts operatively connected to the mainshaft 7, for operating the feeding device. Different fixed positions are arranged in the cam 9 for the shaft 10, for giving the carrier 8 the right movement for the size of the picture required. An upright board 11 is secured to said carrier and suitable springs 12 are provided to press said board against said cam. A curve 24 in the upright board 11, shown in Fig. VII, is provided to prevent the movement of the carrier 8 during the exposure. A combination of a cutter and a receiving gripper 14 is movably secured to the feeding device. Suitable screws are provided for adjusting said combination to different positions, for the size of the pictures required. An advancing gripper 15, a separate view is shown in Fig. II, is secured to the carrier 8. Said grippers consisting of one rail 16, which is above the board, one rail 17 below the board and both of said rails are joined together with screws 18. Suitable springs 19 around said screws lift the upper rail 16. Cam levers 20 arranged in the rail 17 to open and to close said grippers. A lever 21 is with a pin 22 secured to the frame, its lower end is movably arranged in a bracket. A cam 27 is secured to the shaft 10 for moving the lever 21, thereby operating the cam levers 20, which are hanging in said lever in such a position to close one gripper, when the other opens and to exchange this operation by each half turn of the cam 27. The cam 23 and the upright board 11 must have the right height to allow for the up and down movement of the press.

The negative which is used by contact printing is with suitable clamps secured in the printing frame 26. A drawer 27 which is arranged in said frame is provided for inserting suitable mats. A weight 28 is secured to the right side of the press 4 to balance the feeding mechanism.

By feeding from a roll, place the roll on the bracket 37 and feed the strip facing downward over the right hand extension board, underneath the press 4, over the sliding board 8, and under the advancing and receiving gripper.

By feeding sensitive strips of sheet material remove the bracket 37. Suitable guiderails which can be adjusted to hold different widths of paper, are in the sliding board, on the extension and below the press, which can be adjusted to hold different widths of a strip in a good position.

An enlarging device for exposing successive pictures which are enlarged on a roll of paper is arranged between the legs or standards 2. A lamp cabinet 29 for the exposure of the pictures is slidably arranged in said enlarging device. Said lamp cabinet is hanging over rollers and supported by weight 40 for the purpose of lifting or to lower said lamp cabinet to the different positions required. A lens 32 without the usual rack and pinion movement is secured to a support 33 and a negative 34 with a support 35 arranged to fit in a number of vertical spaced grooves 36 which are secured in said enlarging device for selectively positioning said lens and said negative on various fixed positions to expose different size enlarged pictures from a negative for the purpose of eliminating the focusing of the pictures and make the operator's work quick and easy. A view of said lens with its support being shown in Figure 8. Said grooves 36 must be on every side in said device to hold said supports and to cover all the indirect light from the lamp cabinet 29.

When enlarging from one size to another then positions for said grooves must have corresponding numbers and arranged in a manner as required for this purpose, for instance, one of said grooves to hold the lens with its support must be numbered I and one groove to hold the negative with its support N–1 said grooves must enlarge said negative to a given size and to throw with said lens the focus of the picture on the face of the sensitive paper which is inserted in the printing frame 26, a second set of said grooves must be numbered II one groove to hold said lens and one to hold said negative, said grooves must be in positions to enlarge a negative with the same lens to a different size picture and throw the focus of said picture in the same position in said printing frame, another set of said grooves for said lens and said negative must be numbered III and must enlarge in the same manner to a different size and so forth, to enable any photographer to enlarge a negative to a given size without focusing.

A switch 30 controls and to regulate the time of the exposure of said pictures are arranged on the front support 3. Said switch consists of two parts, part *a* and part *b*, part *b* is secured to said front support and part *a* is in suitable guide rails movably arranged on said support. A circuit closer 31 is carried by a bracket which is secured to the main shaft #7. Suitable springs arranged between said circuit closer and said bracket to give perfect circuit connections

to the contacts in part *a* and part *b*, said circuit closer must have the form of a part of a circle and be in such a position to close the circuit by the contacts *a* and *b* by every revolution of the main shaft 7. The part *a* is adjustable to provide means for the operator to move said part to different positions for changing the distance between both of said parts, arranged for the purpose to change through said means the time of the exposure, for instance, if the machine is given with any kind of power a speed to rotate the main shaft once in 12 seconds and part *a* and part *b* are mostly together and the length of the circuit closer is ¼ of a circle then the circuit is closed for 3 seconds, by moving said parts *a* and said part *b*, mostly as far apart as the length of said circuit closer, then the circuit is closed for a moment. By running the machine at different speeds and changing the position of part *a* different exposures can be arranged with said exposure regulating device.

The electric current conduits connect the switch 30 to the lamp cabinet 29. The positive current is led in a conduit 41 from a main switch 42 to a contact socket 43, which is inserted in the rear wall of said enlarging device. A conduit 44 to lead said current from said socket to the lamps in the lamp cabinet 29. The negative current is led in a conduit 45 to the part *b* in the switch 30. A conduit 46 is secured to the part *a* to lead the current to the contact socket 43 and a conduit 47 to lead said current from said contact socket to said lamps. The conduits 44 and 47 must be flexible and of the right lengths to allow the movement of said lamp cabinet to its upper position.

The machine is set in motion with a suitable crank or with a power wheel which is secured to a main shaft 7. A sliding bolt 48 is secured to the front support 3 to arrest the motion of the bracket which carries the circuit closer 31, to provide means for the operator to start or to stop with said sliding bolt the action of the machine.

Now I show the cooperation of the several parts throughout a complete circle of movements involved in the operation of the machine for the exposure of one of the successive enlarged pictures on a roll of sensitive paper. A roll of said paper is placed on its bracket 37, feed the strip facing downward underneath the press 4 over the carrier 8 under the advancing gripper 15 receiving 14 and regulates the cam 9 for the size of the pictures required, regulate the switch 30 for the time of the exposure place the lens 32 and the negative 34 with its supports in the required grooves 36, move the lamp cabinet 29 under said negative pull the sliding bolt 48 thereby setting the machine in motion, the press 4 moves down to the printing frame 26 the advancing gripper 15 moves in an open position toward said frame, the press 4 presses the paper in the focus of the picture for the exposure, the circuit closer 31 closes the circuit on part *a* and part *b*, to expose with the lamp cabinet 29 the picture, the grippers exchange their operation and the advancing gripper 15 grips the paper, said circuit closer opens said circuit, said press lifts the paper out of said printing frame said advancing gripper advances the paper to said receiving gripper, the cam levers 20 exchange the operation of said gripper and the machine is ready for the next operation.

When the machine is used to expose successive pictures by the contact printing process, then the supports for the lens and for the negative are not used, move the lamp cabinet 29 under the printing frame 26, secure the negative 34 with suitable clamps in said printing frame and print as usual.

To expose successive combination pictures whereby each picture is exposed with two or three negatives, for instance a portrait negative in its centre a frame design negative on the outside and with a negative having the name of the studio in one corner, place those negatives next to each other in the direction of the movement of the strip, regulate the cam 9 for the width of one of said negatives and print as usual.

I am aware that prior to my invention enlarging devices had been made, wherein grooves are arranged for holding a lens with a usual rack and pinion movement for focusing, or a camera with a front focusing device, but I never seen fixed positions arranged for a lens-board which is provided with a stationarily secured lens, my object is to do away with focusing by enlarging.

What I claim as my invention and desire to secure by Letters Patent—

1. In a photographic enlarging machine in combination with a printing frame, an intermittently operating reciprocating press adapted for holding the paper during the exposure in a fixed focus position arranged in said printing frame, a feeding mechanism for intermittently advancing a strip of paper, an enlarging device comprising a support for a lens and a support for a negative, said lens being stationarily secured in its support, means arranged for selectively positioning said lens with its support and said negative with its support on various fixed and corresponding numbered positions, the first of said positions for said lens and the first of said positions for said negative arranged to enlarge said negative and to throw the focus of the picture with said lens on the face of said paper, a second of said positions, one for said lens and one for said negative arranged to enlarge a picture from said negative to a different size and to throw the focus of said picture on said paper and a

number of said corresponding positions for said lens and for said negative arranged in the same manner to enlarge at each of said positions for a different size, to provide means to enlarge different size pictures on each of said positions, lamps to expose said pictures, an exposure regulating device for regulating the time of said exposures, circuits for connecting said exposures, regulating device to said lamps, means to close the circuit on said exposure regulating device when the press is holding said paper in said fixed position, a suitable driving mechanism for operating said machine at a given speed and an operating lever arranged to start or to stop the operation of the machine when said paper is lifted by said press out of said fixed focus position and is advanced by said feeding mechanism.

2. In a photographic enlarging device in combination with a printing frame, a reciprocating press for holding the paper during the exposure in said frame, a support for a lens and a support for a negative, said lens being stationarily secured in its support, vertically spaced means arranged for selectively positioning said lens and its support and said negative with its support on various fixed and corresponding numbered positions, one of said positions for said lens and one of said positions for said negative to provide means to enlarge said negative and to throw the focus of the picture with said lens on the paper in said frame and a series of said corresponding positions for said lens and said negative to enlarge from each set of said corresponding positions a different size picture from said negative and to throw with said lens the focus of said pictures in the same position, a lamp to expose the picture, an open switch on the lamp circuit and means to close said circuit when said press is moved to hold the paper in said frame.

Signed at New York city in the county of New York and State of N. Y. this 26 day of April, A. D. 1922.

CHARLES KESSES.