

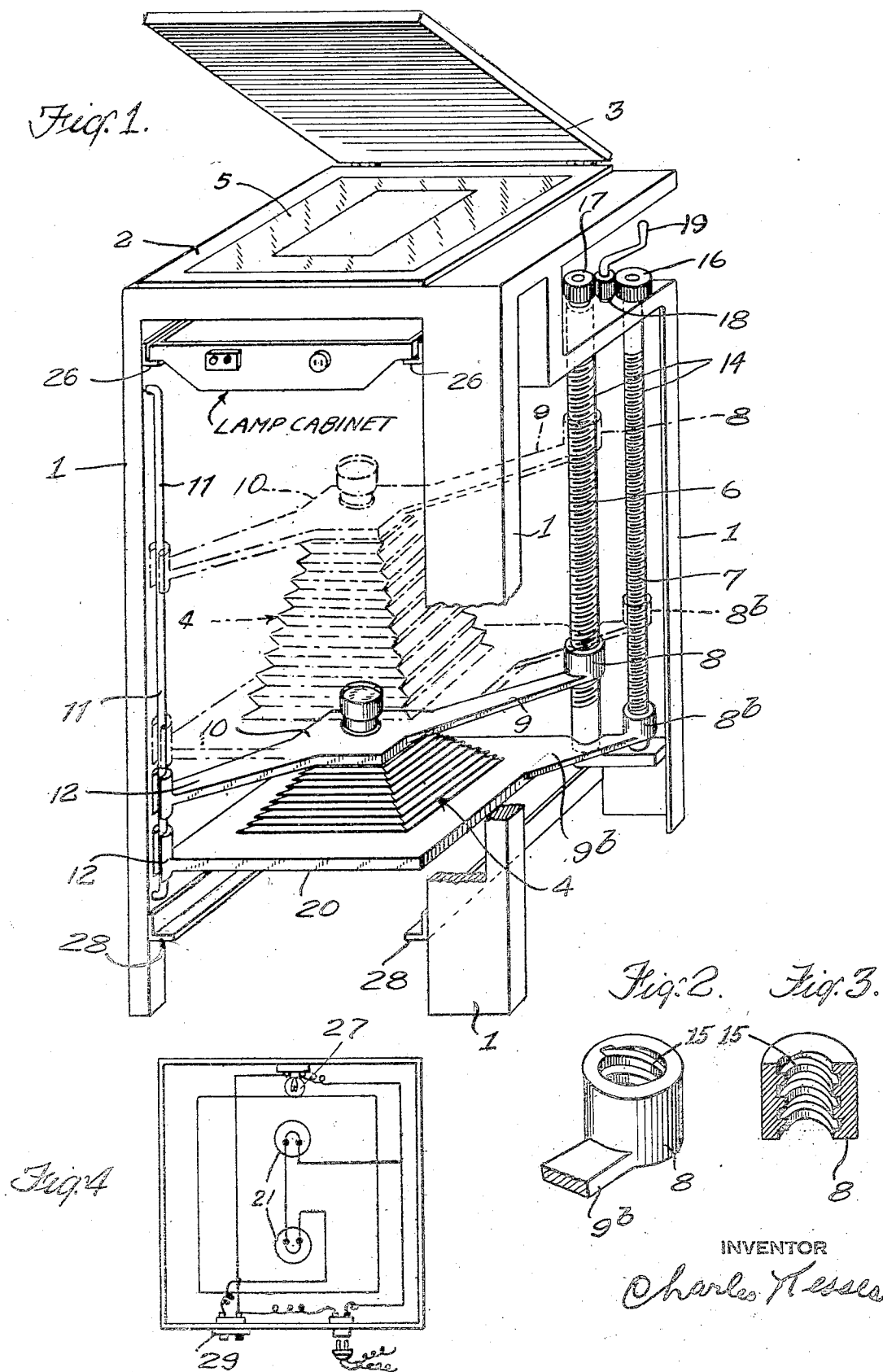
April 2, 1946.

C. KESSES

2,397,668

AUTOMATIC FOCUSING ENLARGER AND CONTACT PRINTER

Filed Nov. 14, 1944



UNITED STATES PATENT OFFICE

2,397,668

AUTOMATIC FOCUSING ENLARGER AND
CONTACT PRINTER

Charles Kesses, New York, N. Y.

Application November 14, 1944, Serial No. 563,332

7 Claims. (Cl. 88—24)

This application is an improvement over my Patent No. 1,540,340, Photo enlarging machine, filed May 3, 1922, and patented June 2, 1925.

The first object of this invention is to make a universal printer plain in construction, a practical instrument for professional and amateur, to print contact with negative or film and to enlarge pictures of different sizes from different sizes of negatives without focusing.

The second great advantage is to do away with focusing, to prevent eye strain, as this printer is always in focus.

Third, this device is provided with two positions for the lamp cabinet, one of said positions below the negative slide in the automatic focusing device for exposing enlargements and the second of said positions below the printing frame for exposing contact prints.

I attain these objects by mechanism illustrated in the accompanying drawing, in which:

Figure 1 is a perspective view taken from the right side and of the complete fixed focus device.

Figure 2 shows a perspective view of round member having a center opening to fit over the shaft to provide means to move the lens slide in a path at right angles to said shaft.

Figure 3 shows one half of said named member.

Figure 4 is a view from above showing the inside of a lamp cabinet.

Similar numbers refer to similar parts throughout the specification.

Figure 1 shows legs to support the fixed focus device. A printing frame 2 is secured to the upper part of said legs. A hinged pressure board 3 is secured to said printing frame. A camera 4 is arranged for up and downward movement. A focal plane position 5 is arranged in said printing frame. Two shafts 6 and 7 are arranged in suitable bearings which are secured to the upper and lower parts of the right side of the rear leg 1. A round member 8 is shown in Fig. 2, and a half cut of said member, in Fig. 3, which must fit over the shaft 6, for the purpose to hold an extension member 9 secured to the lens slide to hold said lens slide 10 at right angle position to the shaft 6. A guide rod 11 is secured to the upper and lower parts of the left front leg 1. A guide member 12 is secured to the lens slide and its other end is provided with a fork to engage the guide rail 11, for the purpose of holding the lens in center of the device during the up or downward movement of said lens. A second round member 8b is arranged on shaft 7, in the same manner as the first named round member,

arranged holding the negative slide 9b in a position at right angles to shaft 7. A glass plate or other means is provided to hold the sensitive paper in a fixed position and a pressure board to press the paper into said printing frame.

For the purpose of moving the lens and the negative slides, spiral springs 14 are secured around both shafts 6 and 7, and grooves 15 are arranged inside of both round members 8, in such a manner as to engage said screw threads to lift or lower both of said slides, by the turning of said shafts.

A gearwheel 17 is secured to the shaft 6, which moves the lens slide, and the gearwheel 16 is secured to shaft 7, to move the negative slide, and the gearwheel 18 is meshed and interposed between said first and second named gearwheels for the purpose of turning both shafts in one direction. The number of teeth on the smaller gearwheel 16, is proportioned to the number of teeth on the larger gear wheel 17. A crank 19 is secured to the gearwheel 18, to move the lens slide and the negative slide upward, by turning the crank to the right and to lower said slides by the return movement of said crank.

On the drawing it will be seen that the gearwheel 17 on shaft 6 is smaller in proportion than the gearwheel 16, and that the shaft 6 is larger in diameter than shaft 7, to give the lens slide a greater speed than the negative slide 20, to regulate its speed according to the focal length of lens and I secure the screw threads to the shaft 6 greater degree to moderate the speed of said lens slide to throw the focus with said lens in the focal plane position at each and every stage of movement during the upward or downward movement of both slides.

Figure 4 is a view of the inner side of a lamp cabinet showing the electric circuit connections to the lamps. The lamps 21 are arranged below the negative slide 20.

To enlarge different sizes of pictures from different sizes of negatives or film, place the negative face upward in the center of the negative slide 20, and turn the crank 19, until the required size of picture can be seen in focal plane position by the pilot lamp 27. Place the photographic paper face downward in the focal plane position at 5, and close the pressure board 3, and turn the switch 29, to expose to enlarge or reduce pictures.

A device to expose contact prints or film; place the lamp cabinet on the bracket 26 below the printing frame 2.

A lamp cabinet is provided consisting of a

pilot light 27 and of an open single switch; the positive and the negative current are connected to the pilot light, and to the lamps and the positive current is led from said pilot light to one side of the open single switch, and a separate wire is connected to the other end of said switch and to the lamps to light the lamps by closing the switch.

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

1. In an automatically focusing device, a printing frame provided with a hinged pressure board to press the photo paper into said printing frame, a mechanical movement consisting of two screw shafts parallel to each other, round members having center openings fitted into the screw threads on said shafts, extension members secured to the round members carrying slides in rectilinear paths parallel to the screw shafts, the slides carrying means providing for holding a lens or negative, gearwheels secured to both of said screw shafts, a drive gear interposed and meshed to both of said gearwheels and a crank shaft secured to said drive gear to operate the device, a number of teeth on first gearwheel and a number of teeth on said second gearwheel proportioned for moving the slides at different rates so that the focus of the image projected is always maintained no matter to what height the lens and plate holder are moved nor what the ratio of enlargement may be, and a device provided for holding the lens and the negative slide in the center of the enlarging device during their up and downward movement.

2. The device of claim 1, in which the means holding the lens and the negative in the center of the device comprise a rail member parallel to the screw shafts and guide members secured to said lens and negative slides and means on said guide members for engaging said rail member holding said slides in the center of the device during their movement.

3. The device of claim 1, the hinged pressure board secured to said printing frame, and means to print in said printing frame with said automatic focus device different sizes of enlargements from different sizes of negatives.

4. In an automatically focusing device having a mechanical movement consisting of two screw shafts parallel to each other, round members having center openings fitted into the screw threads on said shafts, extension members secured to the round members carrying slides in rectilinear path parallel to the screw shafts, the slides carrying means providing for holding a lens or negative, gearwheels secured to both of said screw shafts, a drive gear interposed and meshed to both of said gear wheels and a crank

shaft secured to said drive gear to operate the device, a number of teeth on first gearwheel and a number on said second gearwheel proportioned for moving both slides at different rates so that the focus of image projected is always maintained no matter to what height the lens and plate holder are moved nor what the ratio of enlargement may be, and a device provided for holding the lens and the negative slides in the center of the enlarging device during their up and downward movement.

5. The device of claim 1, in which said printing frame is provided with a hinged pressure board to press the sensitive sheets of paper on a flat negative to expose contact prints with suitable lamps, and to press sensitive sheets of paper into said focal plane position to print with said automatically focussed device and suitable lamps, enlargements of different sizes.

6. The device of claim 1, in which said mechanical means comprises two shafts in parallel position and at right angles to said lens and negative slides, the top and bottom of said shafts being arranged in bearings, to permit the turning of both said shafts in their bearings, and gearwheels arranged on said shafts to provide means to turn both of said shafts in the same direction by the forward and by the return movement of a crank secured to said drive gear, provided to operate the automatically focusing enlarger.

7. In an automatically focusing enlarger having a mechanical movement comprising two screw shafts, parallel to each other, round members having center openings fitted onto the screw threads on said shafts, extension members secured to the round members carrying slides in rectilinear paths parallel to the screw shafts, both slides carrying means providing for holding a lens and negative, gearwheels secured to both of said screw shafts, a drive gear interposed and meshed to both of said gears, a crank secured to said drive gear provided to operate the automatic focusing enlarger, the screw shafts being arranged in the following manner, first; the diameter of said first shaft is larger than on said second shaft, second; the screw threads around said first shaft are positioned at a greater pitch and third; the number of teeth on said first gearwheel and the number of teeth on said second gearwheel are proportioned in such a manner as to provide for moving both slides at different rates so that the focus of an image projected is always maintained no matter to what height the lens and plate holder are moved nor what the ratio of enlargement may be, through the movement of said crank.

CHARLES KESSES.