Aug. 27, 1940. C. KALISH 2,212,834

EXPOSURE TIMER

Filed July 26, 1939 3 Sheets-Sheet 1

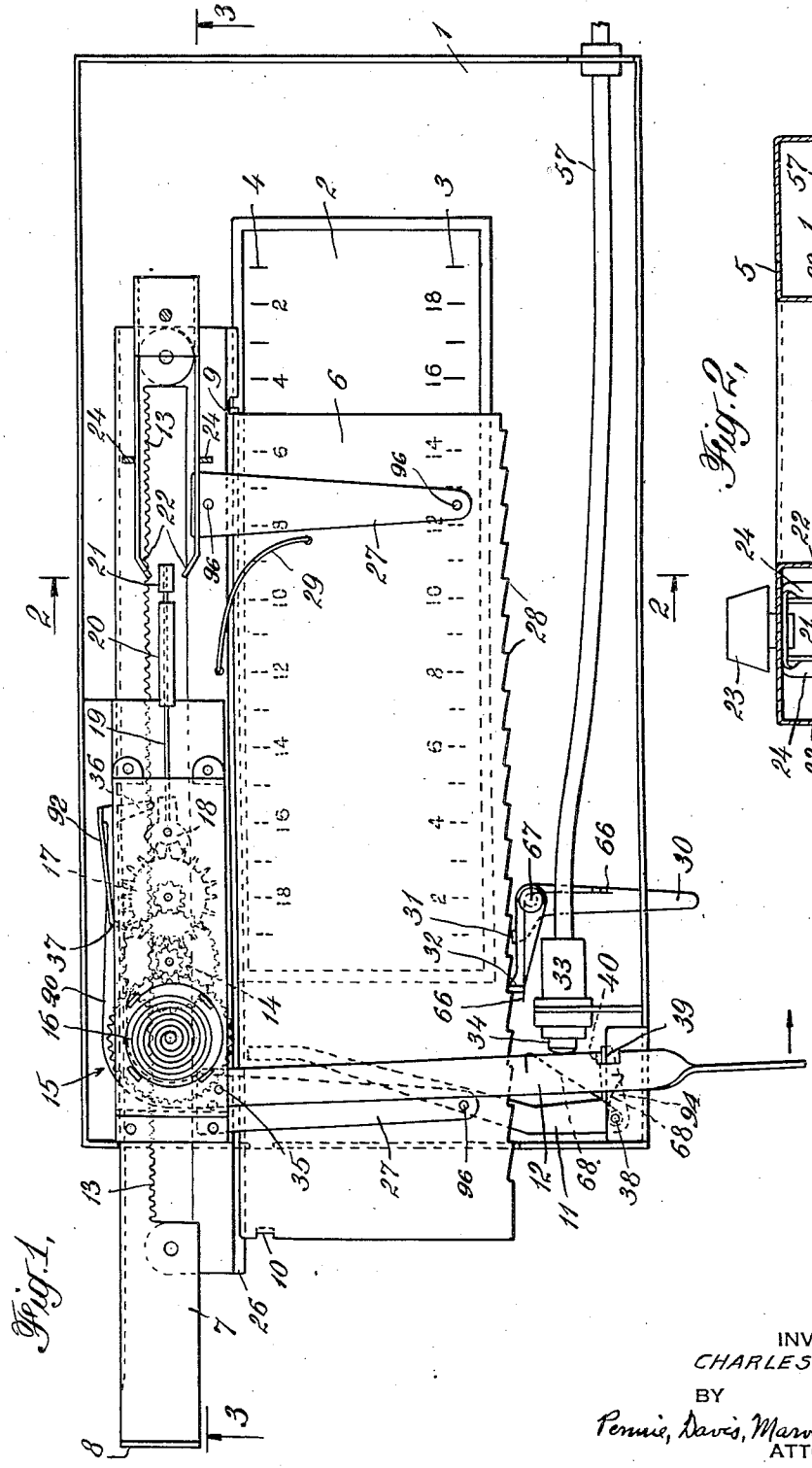


Fig. 1.

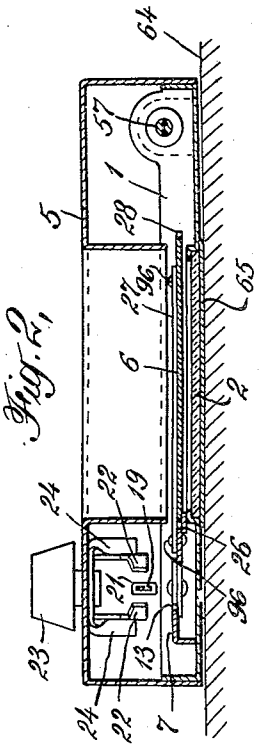


Fig. 2.

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EXPOSURE TIMER

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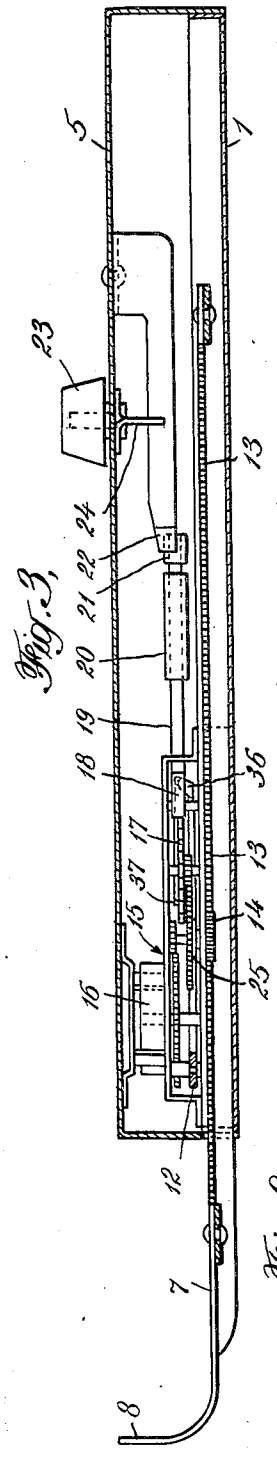


Fig. 3.

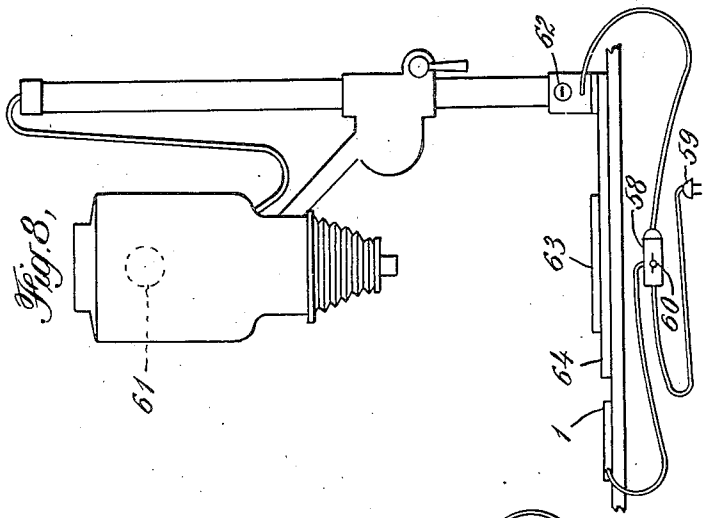


Fig. 8.

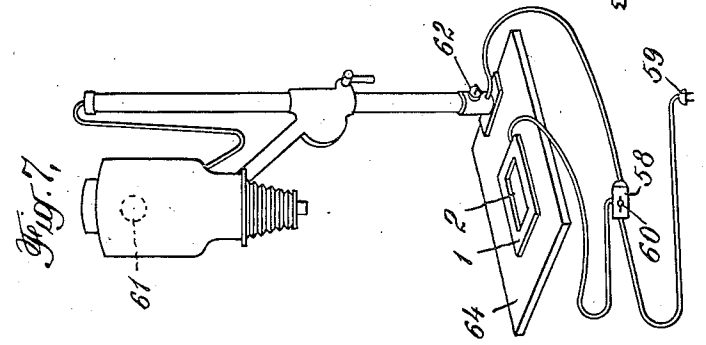


Fig. 7.

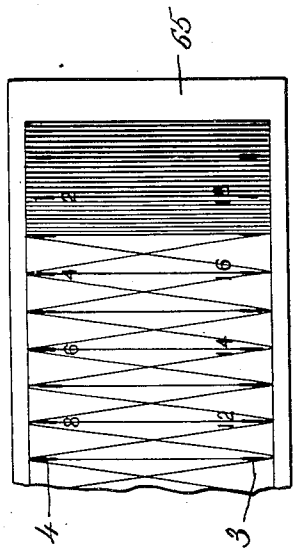


Fig. 9.

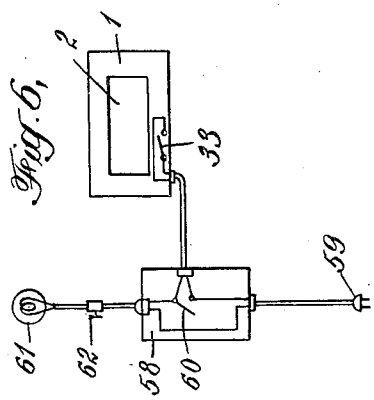


Fig. 6.

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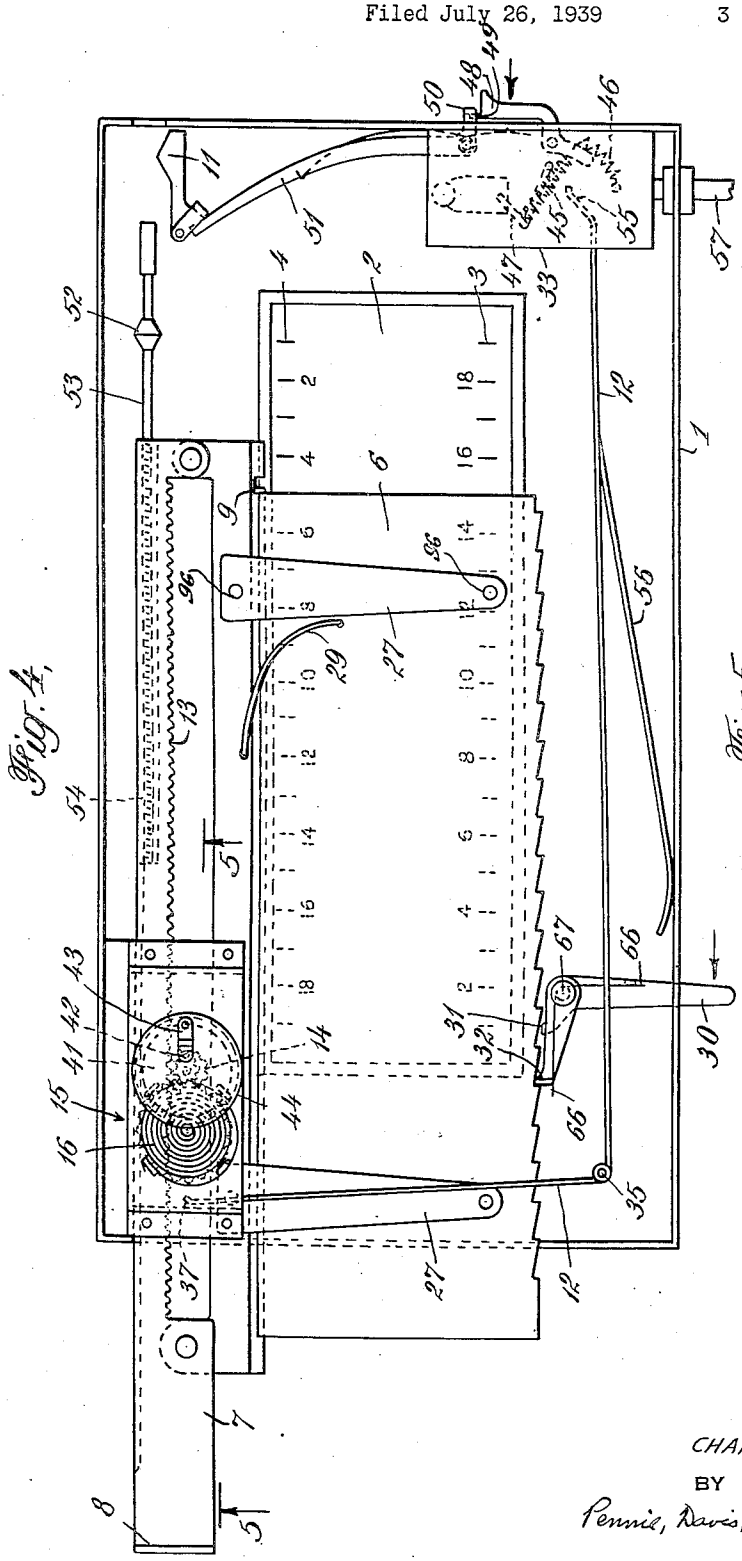


Fig. 4.

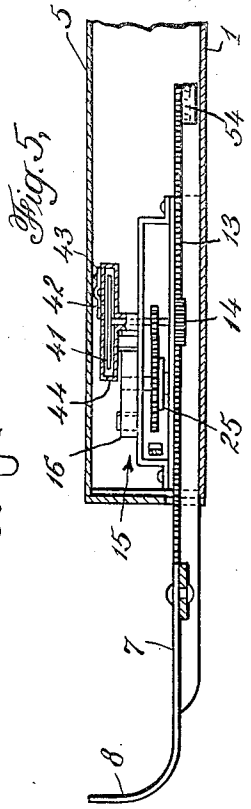


Fig. 5.

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UNITED STATES PATENT OFFICE

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EXPOSURE TIMER

Charles Kalish, Brooklyn, N. Y.

Application July 26, 1939, Serial No. 286,572

5 Claims. (Cl. 95—10)

This invention relates to photography, and more especially to the timing of exposures during photographic printing and the like. The purpose of the invention is to eliminate calculations and practically all estimates in determining the necessary length of exposure of light sensitive material in making photographic prints, for example, contact prints and enlargements, and in making photo-engraving plates and in duplicating negatives.

To this end, I provide a novel test frame in which a test print may be made from the selected negative. This printing frame includes mechanism which not only automatically controls the printing lamp, but also automatically exposes the test print in calibrated gradations from under-exposed through correct exposure to over-exposed, so that upon development of the test print the correctly exposed portion may readily be determined by visual observation, and identified by a calibration mark, and thereafter any desired number of correctly exposed prints of the particular negative involved may be printed under the automatic control of the test frame mechanism.

Among the factors which normally enter into the calculations necessary in making a photographic enlargement, and which may be disregarded are: (1) the brightness of the enlarging lamp; (2) the distance from the lamp to the easel on which the photographic paper is placed; (3) the average density of the negative; (4) the speed and other characteristics of the emulsion of the particular photographic paper; (5) the strength and temperature of the developing bath; and (6) the actual length in seconds of exposure required to give a satisfactory print. Some of these factors do not exist in the case of contact prints.

From the foregoing it will be observed that the correct time of exposure, which is related to all of the above-itemized variables, is determined by means of this invention without it being necessary for the operator to know how long, in seconds, or in any other time units, the correct exposure may be. Thus in connection with the actual timing of the print no clock is required, and a mere novice can, from the first, make entirely satisfactory prints from different types of negatives, or negatives of different density.

Referring to the drawings:

Fig. 1 is a plan view of the printing frame portion of the exposure timer constructed according to and embodying my invention, the cover having been removed to illustrate the operating mechanism;

Fig. 2 is a vertical cross-sectional view in elevation of the device of Fig. 1, taken across line 2—2;

Fig. 3 is a longitudinal elevational view of the device of Fig. 1 along the line 3—3 of Fig. 1;

Fig. 4 shows a modified form of test frame also constructed according to and embodying my invention, generally similar to the form of Fig. 1, but including an alternative form of actuating mechanism;

Fig. 5 is a cross-sectional view of the device of Fig. 4, taken along the line 5—5 of Fig. 4;

Fig. 6 shows a circuit diagram of the electrical connections forming a part of the present invention;

Fig. 7 is a perspective view of a conventional photographic enlarging device with a test frame constructed in accordance with my invention in place ready to make a test strip;

Fig. 8 is a side view of the machine of Fig. 6 as arranged to make an enlargement with the length of exposure automatically controlled; and

Fig. 9 is a diagrammatic illustration of a fragment of a test strip printed in the device of this invention.

The device of my invention indicated generally by reference numeral 1, comprises a hollow member of rectangular shape and having a rectangular opening in the center. I have shown a rectangular frame for illustrative purposes but the frame may be of other shapes, i. e., a right-angle, and the opening, instead of being rectangular, as shown, may be the space between the reaches of the arms forming the frame. The frame may be made of any suitable material, such as sheet metal or the like. In one embodiment of the device, the outside dimensions of the frame were about 6x8 inches and the dimensions of the opening were about 2x6 inches. In the rectangular opening a piece of transparent glass 2 is secured, and provision is made for inserting, and suitable means for holding, a strip of light sensitive material, as paper, underneath the glass 2.

Referring now to the form of invention illustrated in Fig. 1, it is seen that the glass 2 has engraved along each longitudinal margin thereof a row of opaque numbered calibrations, 3 and 4, painted or otherwise formed with opaque material. The rows of calibrations on glass 2, shown at 3, 4, may be so disposed with respect to the test strip of light sensitive material that the same are photographically printed on the

test strip. However, the row of numbered calibrations 4 need not necessarily be arranged to print on the test strip, but may be marked on the cover of the device, for example, as will be more clear as the description proceeds. The test strip, although hereinafter referred to as "paper", could, of course, be of any desired material having a photosensitive surface.

Beneath the cover 5 (Fig. 2) a flat plate or slide member 6, preferably of metal, is arranged to move in and out of the frame parallel to the glass and between the source of light and the paper so as to prevent the passage of light through the frame opening to the photosensitive paper disposed beneath when the slide 6 is completely closed. The slide 6 is opened by drawing out the arm 7 by means of finger-hook 8 which causes an upturned lug 9 on the arm to bear against and engage the end of the slide and thus draw the slide 6 out along with arm 7. Along the recessed edge of arm 7 are cut or otherwise formed a row of uniformly sized teeth forming a rack 13, which engages a pinion 14 of a clockwork mechanism 15 enclosed within one side of the hollow frame 1. When arm 7 is withdrawn from the frame, carrying its component rack 13, pinion 14 is revolved and the clockwork mechanism is thereby wound up, thus providing power to close the slide 6 automatically at a predetermined rate upon operation of the release 12.

The clockwork motor 15 includes rack and pinion 13, 14 just referred to, the clock-spring 16, an escapement wheel 17, and the necessary gear train in between. This gear train is shown more clearly in Fig. 3. Extending from escapement 18 is a pendulum comprising a pendulum shaft 19 near the far end of which is a pendulum weight 20. The rate of oscillation of this pendulum controls the speed of operation of the clockwork motor, and thus controls the rate at which slide 6 moves between the glass 2 and the photosensitive paper disposed beneath the glass. The greater the amplitude of oscillation of pendulum weight 20, the more slowly the motor runs. Hence to control the speed of the shutter, a striker 21 is secured to the end of pendulum shaft 19, and two spaced-apart fingers 22 are arranged to limit the movement of striker 21 therebetween. These fingers may conveniently be of light spring metal, the inturned ends of which normally spring apart. A manual adjusting device is provided to force the fingers 21, 22 together so as to adjust the spacing between the ends thereof. This adjusting device is more clearly shown in Fig. 2 and comprises a control knob 23 mounted outside and above the cover 5 and which when rotated serves to rotate wings 24, thus pressing spring fingers 22 closer and closer together progressively, to decrease the spacing between them. Alternatively, the spring fingers may be arranged so as normally to touch each other, and a cam provided between them to separate them further as it is rotated by knob 23. In order that the winding operation and the driving operation of the spring motor may be independent even though the mechanism be interconnected through the rack and pinion, a ratchet 25 (Fig. 3) is provided between pinion 14 and the remainder of the clockwork mechanism.

In order that the electric circuit, which would usually control a printing lamp, may be interconnected with the shutter-operating mechanism, an electric switch 33 is disposed and secured within the frame 1 so that a spring-pressed switch button 34 normally holds the switch open when the button is released. In the position shown in Fig. 1 the switch button 34 has been pressed in by release arm 12 so as to close the electric circuit.

Release lever 12 extends across and beyond the frame from the point where it is pivoted on pin 35. Beyond pin 35, arm 12 is bent substantially at 90° to form a short arm 90. At the extremity of the short arm a wedge point 36 is formed to bear against the lower end of pendulum spring 19 adjacent the point of attachment to escapement 18. Also fastened to the short arm 90 of release lever 12 is an extension piece 92 formed to provide an inwardly bent detent 37 to engage one of the star-shaped teeth of escapement wheel 17, simultaneously with the engagement of spring 19 by wedge point 36. When release lever 12 is in the position of Fig. 1, the detent 37 and the wedge point 36 are disengaged, but when the lever 12 is moved backward against the direction of the arrow in Fig. 1, wedge point 36 bears against and prevents pendulum spring 19 from oscillating, and detent 37 moves between the teeth of and locks escapment wheel 17 against turning, and thus locks the entire clockwork mechanism. Such locking, however, does not prevent arm 7 from being drawn out to wind up the motor and "set" the shutter.

Trip member 11 is disposed within the forepart of frame 1 underneath slide 6 and lever 12 to a pivot 38 at which point it is bent at substantially 90° to form a short arm 94 having a notched end 39. This notched end cooperates with a downturned lug 40 on the side of release lever 12. Lug 40 is held in notch 39 by means of a wire spring 66 which is looped around pin 38, one of its ends being hooked over lever 12 and the other of its ends being hooked over the short arm 94 of trip member 11. Hence, while plate or slide 6 is automatically closing, tripping member 11, lever 12 and switch 33 are locked in the position shown. However, at the instant the slide is closed a downturned lug 10 on the left-hand end of the shutter (as seen in Fig. 1) bears against and engages the end of the long arm of trip member 11 moving it slightly to the right (as shown), thus allowing lug 40 to slip out of notch 39, whereby release lever 12 is caused to move against the direction of the arrow by the combined action of spring 33 and the spring pressure behind switch button 34. This movement of release lever 12 simultaneously opens the electric switch 33 and the electric circuit connected thereto, and causes detent 37 to lock escapement wheel 17 and simultaneously causes the wedge point 36 to engage pendulum spring 19.

With the mechanism in the relative (locked) position last described, lug 40 will be caused to rest on release lever 12 at a point near the inside bend of the lever and will remain there under the pressure of spring 66. Therefore, while the slide is being opened by drawing out the arm 7 the clockwork mechanism remains in its locked position due to the engagement with arm 90 and switch 33 remains in its open position. For this reason slide 6 will remain stationary at any point to which it may be withdrawn from frame 1 and will not begin to close until release lever 12 is moved to notch 39 by pressure in the direction of the arrow.

A feature of the present invention which is of considerable practical importance is a mechanism whereby the travel of the slide 6 as it closes may be made either continuous or intermittent,

at the discretion of the operator. To this end the slide is mounted so as to move a short distance toward and away from the edge of arm 7 on a longitudinal guide shelf 26 formed along the inside edge of arm 7. To restrict the movement of the slide, it is secured to arm 7 by means of two parallel links 27 one end of each of which is pinned to the shutter, and the other end of each of which is pinned to the slide. The pins 96, 96 are arranged in pairs on lines which are parallel to the edge of the slide and to the edge of the arm, in order to assure permanent parallelism between the slide and the arm. Along the longitudinal edge of slide 6, remote from arm 7, saw-teeth 28 are cut so as to have a pitch which corresponds to the spacing of the calibrations 3 and 4. Slide 6 and arm 7 are also connected by a curved wire spring 29, as shown in Fig. 1.

Adjacent the row of teeth 28 is a pawl 32 pivoted on a pin 67. This pawl is urged in the direction of teeth 28 by a wire spring 66 which is looped around pin 67. One end of spring 66 presses the pawl in the direction of teeth 28 and the other end of the spring presses against the edge of lever 30, which is also pivoted on pin 67. Lever 30 is pivoted with sufficient friction to hold it in any adjusted position; while pawl 32 swings freely on pin 67. An extension of lever 30 beyond pin 67 carries an upturned lug 31 which engages pawl 32 when lever 30 is moved in the direction of the arrow. This operation will disengage pawl 32 from teeth 28; whereas moving lever 30 in the direction against the arrow releases pawl 32 to cooperate with teeth 28. Therefore, when arm 30 has been moved against the direction of the arrow, as shown in Fig. 1, pawl 32 engages one of teeth 28, thus holding the slide stationary while slide 7 proceeds to close at a steady rate. As the angle of parallel arms 27 departs more and more from 90° with the edge of the slide, the slide is moved sideways over the surface of guide shelf 26 progressively toward arm 7, until the engaged tooth is disengaged from pawl 32, and the slide is jumped forward until it is engaged by pawl 32 being spring pressed against the next tooth by the resiliency of wire spring 29. Thereafter, as long as the slide 6 and arm 7 continue to move toward their closed position the motion of the slide 6 will be intermittent, viz., the shutter will move towards closed position in jumps of one tooth each. The result of this intermittent motion is to expose the photo-sensitive paper in areas of discernible width, namely, a strip the full width of the sheet equal to the pitch of teeth 28, such areas being substantially uniformly exposed for progressively different lengths of time. On the other hand, when lever 30 is moved in the direction of the arrow of Fig. 1, lug 31 draws pawl 32 away from and out of engagement with teeth 28, in which event the clockwork motor 15 will close slide 6 at a steady or continuous rate. In either case, i. e., continuous or intermittent motion, the rate of closure of the shutter is predetermined by adjustment of control knob 23.

In Figs. 4 and 5, a modified form of test frame also constructed according to and embodying my invention as illustrated. Basically, the general arrangement of this form is similar to that illustrated in Figs. 1, 2 and 3, corresponding parts being designated by the same reference numerals in each case, the main difference being in the specific nature of the mechanism. As before, the device comprises a hollow rectangular member having a central opening of generally rectangular shape in which is placed preferably a glass 2 carrying numbered graduations 3 and 4. A similar slide member 6 is likewise arranged to move parallel to the glass and is drawn out by an arm 7 having a finger-hook 8. The slide 6 is attached to arm 7 by means of parallel links 27 and a wire spring 29 as before. The mechanism by which the slide 6 may be caused to close either in a continuous or in an intermittent motion, as preferred, may be identical with that above described. In this form of my invention, a clockwork mechanism 15 is also provided, but in this instance the escapement is not controlled by an escapement wheel, an escapement and a pendulum, but by a governor 41. Although this governor may take any one of several well known forms, the governor illustrated comprises a thin, circular box 44 within which rotates a wheel connected to the gear chain of the motor. This box is filled with a viscous liquid, such as heavy oil, through a filling hole 42 closed by cap 43. The braking effect of this type of governor depends upon the viscosity of the contained fluid, and hence the operation speed of the motor can be adjusted by changing the viscosity by introducing a small amount of more or less viscous fluid through the hole 42. Different forms of governors will, of course, have different means for adjustment appropriate thereto.

The motor mechanism is locked and released by means of release lever 12 terminating at one end in a detent 37 which locks the motor when it engages a tooth of an adjacent gear wheel. This release lever is pivoted on pin 35, on the opposite side of the frame from the motor mechanism, where after bending approximately 90°, it continues along the side of the frame to cooperate with an electric switch 33. This switch may be of the tumbler or snap switch type which opens and closes by a snap action through the medium of two coil springs 45 and 46. Spring 45 actuates a contact arm 47, and spring 46 provides a snap action to the control knob 48. Control knob 48, which is preferably mounted on the outside of the frame for easy access, is provided with a latch 49 shaped to engage the end 50 of a trigger bar 51. Knob 52 is secured to a rod 53 which may be screwed in or out of a threaded socket 54 provided on arm 7. By thus screwing rod 53 in or out of its socket an adjustment is provided for knob 52 whereby the timing of the release mechanism may be set as desired in relation to the closing of the shutter.

When the closing slide member 6 reaches its final, closed position, knob 52 strikes trip member 11 which in turn moves trigger bar 51 inwardly, releasing latch 49 and allowing control knob 48 to move outwardly under the tension of spring 46. Upon release of control knob 48, as above described, the switch mechanism snaps open and contact arm 47 striking against the end 55 of release lever 12 presses it inwardly against the tension of leaf spring 56. This movement in turn causes detent 37 at the other end of lever 12 to engage a tooth of the adjacent gear wheel and lock the motor, and simultaneously, causes the electric circuit connected by lead wire 57 to the printing lamp to be opened.

From the foregoing description it will be seen that in the embodiment of Fig. 4 the electric switch is automatically opened at the instant the shutter is closed; and the clockwork mechanism is locked whenever the switch is open,

but is released upon manual closure of the switch. Therefore, when the slide is drawn out to any position it will be locked there, and will be released immediately upon closure of the switch by pressure on control knob 46 in the direction of the arrow.

The electrical circuit arrangement which would usually be employed in connection with the present invention is illustrated in the circuit diagram of Fig. 6 where the test frame is represented by numeral 1, and the automatically operated switch by numeral 33. An auxiliary switch device 58 is also provided to facilitate the use of the invention. This auxiliary device comprises a housing in which a snap switch is concealed, there being a control knob for the switch operable on the outside and conveniently marked with "On" and "Off" positions. This switch device may be permanently connected by a flexible wire of convenient length to the test frame proper, and by another flexible wire to a connection plug 59 suitable for insertion in a standard electric power receptacle. On one end or side of this switch device 58 is a receptacle adapted to receive a standard electric attachment plug which normally would be connected by a flexible wire lead to a printing lamp or enlarging machine. It will, therefore, be seen that to employ the present invention no permanent changes in wiring need be made, the only requirement being that the electric attachment plug which normally is connected to the printing lamp or enlarging machine is simply plugged into the auxiliary switch device, and the attachment plug which is connected to the switch device is inserted in an electric power receptacle. After this has been done, the above-described test frame mechanism, including electric switch 33, will automatically control the printing or enlarging machine lamp when the electric switch 60 in device 58 is open, as shown in Fig. 6. With switch 60 in the open position, the indication thereon should read "On." On the other hand when switch 60 reads "Off," it will be electrically closed, and the test frame in accordance with the present invention will not operate the printing lamp 61, in which event it may be manually operated as usual by a separate switch as at 62.

Operation

The operation of the timing device in accordance with my invention may most conveniently be described in connection with Figs. 7, 8 and 9. Although, as first stated, the present invention is applicable to various photographic uses, it presently appears to be most useful in connection with photographic enlarging; so for that reason the operation of the device will be described in connection with an enlarging machine. The operation of my device for contact printing as well as for other uses will then be obvious to those skilled in the art.

The lamp of the enlarging machine is first connected to the auxiliary switch device 58 as described in connection with Fig. 6, and the switch 60 is then turned to "Off." The printing lamp in the enlarger may then be illuminated by closing switch 62, and a selected negative placed in the machine and focused in accordance with usual practice. The test frame 1 is then placed on easel 64 in such position that a representatively exposed portion of the projected image will fall on the glass 2 in the rectangular opening in the test frame. The printing lamp is then switched off by switch 62 and a strip of photosensitive paper (not shown) is placed beneath the test frame under the rectangular opening in frame 1. This strip of photosensitive paper should be of the same sensitivity grade as will be used in making the final print. Arm 7 is then drawn all the way out, in which position it will be automatically locked as previously described; and switches 62 and 60 should be switched to the "On" position. If release lever 12 of the test frame is then pressed in the direction of the arrow, the printing lamp will be illuminated simultaneously with the release of the slide. Assuming that lever 30 has been set for intermittent operation of the slide 6, the closing movement of the shutter will then cause the photosensitive paper to be exposed successively less and less along its length, the time of exposure preferably consuming an exposure range from over-exposure to under-exposure. At the instant the slide 6 completes its movement to entirely cover the test strip paper within or underneath the frame, the printing lamp will automatically be extinguished, after which the strip may be removed from the test frame and developed for a standard length of time in the developing bath which is expected to be used for the final prints. Inspection of this test strip will show, in addition to other things, whether the tensioning adjustment of knob 23 (which need be only approximate) was correct, whether a grade of photosensitive paper correct for the particular negative used has been selected, and if the grade was incorrect whether a harder or softer grade should be used.

Development of the test strip exposed in accordance with the foregoing procedure will produce a test strip of the nature represented in Fig. 9 wherein calibration numbers identify certain areas of progressively different densities. By direct visual inspection of this developed test strip the area correctly exposed may thereupon immediately be ascertained. For the purpose of illustration it may be assumed that the area designated by calibration number 14 is chosen. (As previously described the calibration numbers 3 will be photographically printed on the test strip. The calibration numbers 4 may or may not be printed on the test strip, as will later be explained.)

Test frame 1 may now be removed from easel 64 without disturbing the electrical connections. A sheet of photographic paper of suitable size for the enlargement should next be placed on the easel, as shown at 63, Fig. 8, after which the arm 7 should be withdrawn until the end of slide member 6 is opposite calibration mark 14 of the row of calibration numbers 4. The end of shutter 6 thus functions as an index cooperating with the calibrations. Then, when it is desired that a correctly timed exposure be made, it is necessary merely to press release 12 (Fig. 1) on the test frame, which operation will simultaneously illuminate the printing lamp and release the slide of the test frame. During its travel from calibration number 14, of calibrations 3, to closed position, at the end of the test strip, the shutter will automatically expose the enlargement for the same length of time that the selected test area was exposed on the test print, because the moving shutter traverses the same distance at the same rate of speed in both cases. To this end, the two rows of calibrations should, of course, be laid out on the same scale. Calibrations 4 which are arranged to read in the opposite direction from calibrations 3, need not be printed on the test strip because they are ordinarily employed only in timing the print. Thus it will

be understood that a correct exposure will be given the enlargement or other print, without its being necessary that the operator be aware of how long, in seconds, for example, that exposure may be. It will also be clear that as many similar prints as required may be made by automatically controlling the exposure time through the simple expedient of drawing the shutter of the test frame out to the selected calibation number and releasing it, for each duplicate print.

In reference to the test strip the term "area" is intended to include any portion or location on the test strip which may be selected as representing a degree of exposure, regardless of whether the test strip was exposed with continuous motion or with intermittent motion of the shutter. It should further be understood, in regard to the graduated exposure of the test strip, that it is immaterial whether the photosensitive paper remains stationary while the shutter moves, whether the paper moves while the obscuring slide remains stationary or whether they both move simultaneously; the same result being achieved in any case, provided there be relative movement of the paper and slide, or the equivalent. Similarly, although for simplicity the test frame has been shown as including a rectangular opening substantially in the center thereof, the frame may be constructed with one end (as for example the left end, looking at Fig. 1) enlarged sufficiently to cover slide 6 and arm 7 even when the arm is fully extended, thus providing a complete enclosure for all of the mechanism to protect it from dust and injury. In such event the finger-hook 8 may extend through a suitable slot in the cover.

It will also be evident that various other modifications of the mechanism described may readily be devised by those skilled in the art without departing from the scope of the present invention.

I claim:

1. In combination, an exposure timer comprising a frame, an opening therein, a slide member mounted in said frame for reciprocating movement over said opening, the slide normally covering said opening, means to withdraw the slide from the frame to uncover the opening, means to lock the slide in the withdrawn position, slide lock release means, means to cause the slide to move back into the frame automatically upon release thereof to overlie the opening, and means to govern the speed of the return movement, a light source, and an electric switch actuatable by the release means and also by the closure of said slide, said switch being connected to and controlling the light source, whereby operation of the release means closes the circuit with the light source and closing of the slide opens said circuit.

2. In combination, an exposure timer comprising a frame, an opening therein, a manually withdrawable slide member mounted in said frame for reciprocating movement over said opening, the slide normally covering said opening, means to lock the slide in the withdrawn position, slide lock release means, and means to cause the slide to move back into the frame upon release thereof to overlie the opening, means to govern the speed of the return movement, a printing light source, control means automatically actuated simultaneously with the release means and with the complete return into the frame of the slide, and coupling means connecting said control means to the printing light source whereby said light source is automatically energized simultaneously with the release of said slide and deenergized with the complete return of said slide into the frame.

3. An exposure timer comprising a frame, an opening therein, a slide member mounted in said frame for reciprocating movement over said opening, the slide normally covering said opening, means to withdraw the slide from the frame to uncover the opening, means to lock the slide in the withdrawn position, slide lock release means, means to cause the slide to move back into the frame at a predetermined rate of speed upon release thereof to overlie the opening, means to cause intermittent movement of the slide upon return thereof and means to govern the speed of the return movement.

4. An exposure timer comprising a frame, an opening therein, a slide member mounted in said frame for reciprocating movement over said opening, the slide normally covering said opening, means to withdraw the slide from the frame to uncover the opening, means to lock the slide in the withdrawn position, slide lock release means, means to cause the slide to move back into the frame at a predetermined rate of speed automatically upon release thereof to overlie the opening, means to cause intermittent movement of the slide during return thereof, means to disengage said last named means to cause continuous movement of the slide during the return thereof, and means to govern the speed of the return movement.

5. An exposure timer comprising a frame, an opening therein, a slide member mounted in said frame for reciprocating movement over said opening, the slide normally covering said opening, means to withdraw the slide from the frame to uncover the opening comprising an extending member connected to said slide, means to lock the slide in the withdrawn position, slide release means, means to cause the slide to move back into the frame automatically at a predetermined rate of speed, upon release thereof to overlie the opening, which means comprise an actuating motor coupled to said slide, a plurality of parallel arms each pivoted at one end to said shutter and at the other end to said extending member, a spring coupling said slide to said extending member, teeth along an edge of the slide parallel to the direction of longitudinal motion thereof and opposite to said extending member, and a pawl mounted within the frame cooperating with said teeth whereby the longitudinal movement of said slide is intermittent, and means to vary the rate of speed of the return movement.

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