W. M. GREEN.

CAMERA.

APPLICATION FILED APR. 29, 1916.

1,270,612.

Patented June 25, 1918.

3 SHEETS—SHEET 1.

Fig. 1.

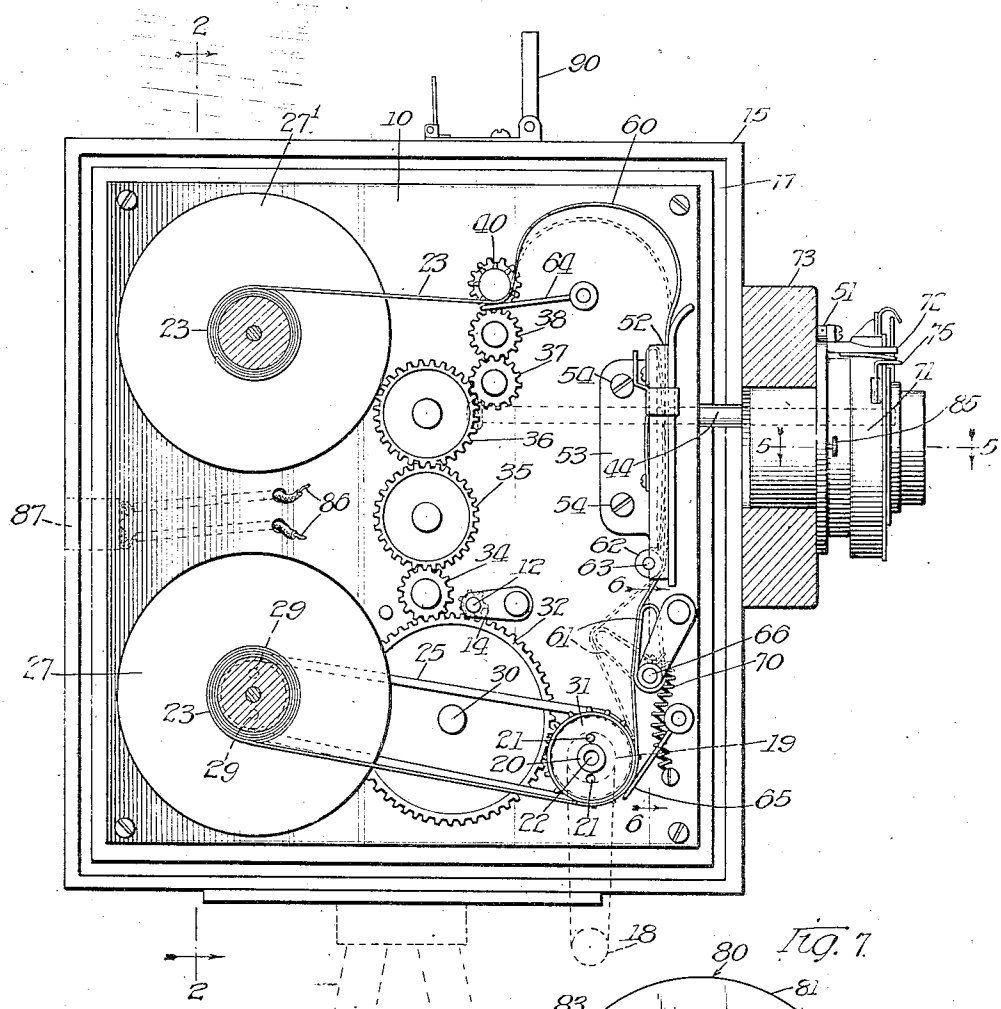
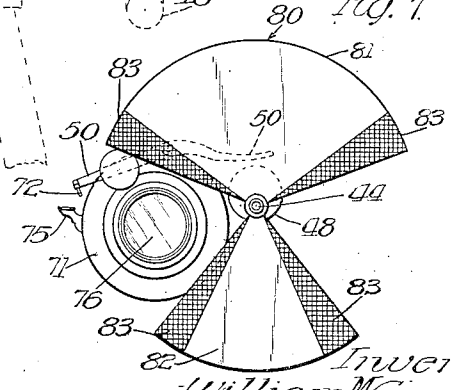


Fig. 7.



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3 SHEETS—SHEET 2.

Fig. 2.

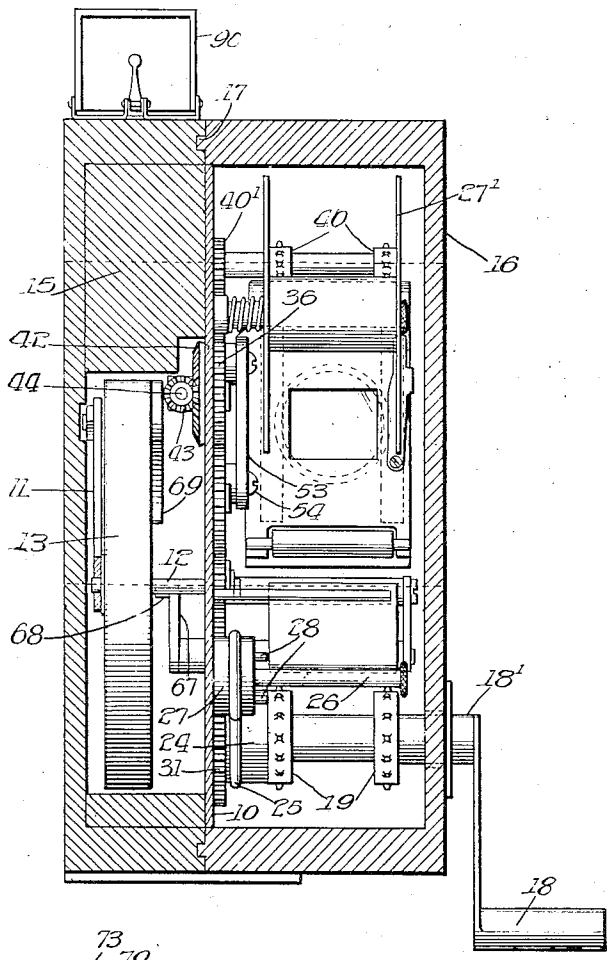


Fig. 5.

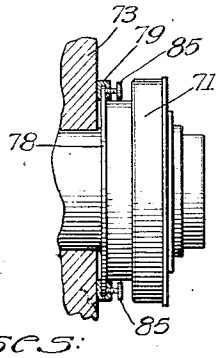
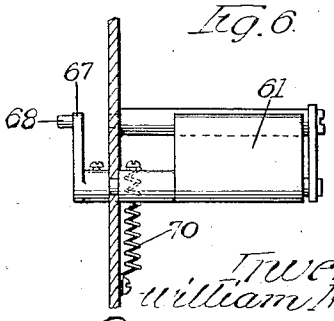


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 3.

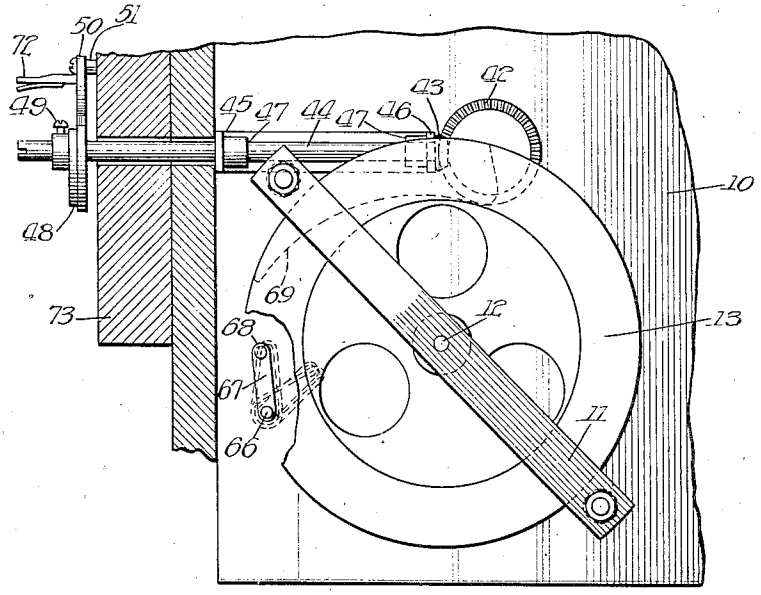
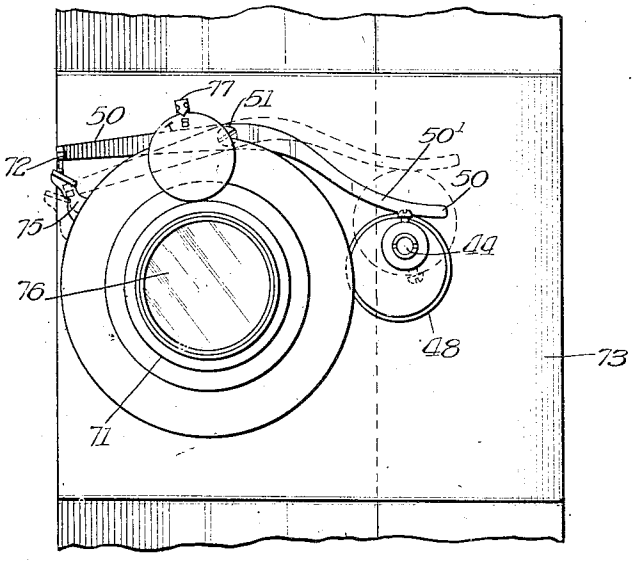


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM M. GREEN, OF EVANSTON, ILLINOIS.

CAMERA.

1,270,612. Specification of Letters Patent. Patented June 25, 1918.

Application filed April 29, 1916. Serial No. 94,471.

To all whom it may concern:

Be it known that I, WILLIAM M. GREEN, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cameras, of which the following is a specification.

My invention relates to improvements in cameras and has especial reference to the cameras of the intermittently-movable film type.

One of the objects of my invention is to simplify, cheapen the cost of production; increase the durability and efficiency of such devices.

Other and further objects of my invention will become readily apparent to persons skilled in the art, from a consideration of the following description when taken in conjunction with the drawings, wherein:—

Figure 1 is a side elevation showing the film spools or reels and shutter box in section and showing the cover removed.

Fig. 2 is a section taken on line 2—2 of Fig. 1.

Fig. 3 is a broken off transverse section of the rear portion of the camera.

Fig. 4 is a front view of the shutter box, shutter, and means for operating it.

Fig. 5 is a section taken on line 5—5 of Fig. 1.

Fig. 6 is a section taken on line 6—6 of Fig. 1.

Fig. 7 is a front view of the shutter used when the camera is projecting pictures.

In all the views the same reference characters are employed to indicate similar parts.

In my copending application, filed March 23rd, 1916, Serial No. 86,071, I have shown, described and claimed several features that are present in the present application and which are not claimed herein, but which are common to both structures. In my present application the structure disclosed is very much simplified.

As in my former application the camera mechanism is mounted upon a metal back plate 10, upon which the operating mechanism is rotatably supported. A cross bar 11 is secured to diagonally opposite studs to provide an outboard bearing support for the shaft 12, carrying the fly wheel 13. The shaft 12, upon which the fly wheel is supported, passes through the plate 10 and carries on its inner end a pinion 14. A back support, of wood or other similar material, 15, is secured to the plate 10, and a removable cover 16 incloses the projecting mechanism and is secured to the back support at the tongue and groove joint 17, which joint is substantially light-tight. The cover 16 carries a perforation for insertion of the operating handle 18, which is removably associated with a lower film-moving sprocket drum 19. The removable handle 18 is provided with a cylindrical part 18′ which slips over a hollow cylindrical projection 20 of the drum 19. The drum 19 carries perforations 21 within which projections from the handle are adapted to be inserted. The projection 20 enters the handle and also serves as a bearing for the shaft 22 of the drum. The pins on the handle entering the perforations 21—21 of the drum serve as drivers, by which the drum may be rotated by means of the handle for moving the mechanism and the film 23. The driving sprocket drum 19 also carries a belt drum 24 around which a belt 25 passes for driving the rotatable shaft 26 carrying the film receiving reel 27. The shaft 26 also is provided with a grooved drum 27, around which the belt 25 passes. The latter drum carries drivers 28—28 that engage in perforations 29 made in the drum of the reel 27. Mounted on the shaft 22 is a gear wheel 31, which meshes with the gear wheel 32, that is rotatable upon the stud 30. The latter gear wheel rotates the pinion 14 that drives the fly wheel 13.

Intermediate gear wheels and pinions, 34 to 38 inclusive, are mounted upon studs and are intended for transmitting the power from the handle 18 and the gear wheel 32 to the unwinding film-moving sprocket structure 40, which is thus rotated in proper driving relation with the rotation of the sprocket drum 19. The gear wheel 36 is connected through the plate 10 to a beveled gear 42 on the opposite side of the plate, which meshes with the beveled pinion 43 secured to the rotatable shutter-operating shaft 44. This shaft is provided with bearings 45 and 46 and carries collars 47 to prevent axial displacement. On its outer end it carries an adjustable rotatable shutter moving cam 48 secured thereto by a screw 49, whereby to oscillate the shutter operating lever 50 on its pivot 51.

The film chute 52 is secured to the back plate 10 by a bracket 53 and screws 54.

The film 23 is unwound from the reel 27', by the driving sprocket 40, making a loop, as at 60, then passes through the film chute 52 and from thence in front of the intermittently moving or vibrating film-moving arm 61, around a roller 62 that is mounted upon a shaft 63, and then over the primary driving sprocket 19, after which it is wound upon the rotating reel 27, by means of the impositively driven belt 25. To compensate for differences in speed of the rotating reel 27 and the belt 25, there is some slippage between the sheaves over which the belt passes and to compensate for the variation in diameter of the receiving reel, as the film is being wound thereon. The film is held on the respective sprocket drivers by the spring pressed fingers 64 and 65.

The means for driving the film intermittently consists of the pivoted arm 61, secured to the shaft 66, which passes through the plate 10 into the space at the back of the plate and carries on its rear end another arm 67, which is provided with a projection 68 for coöperation with the arm moving cam 69 secured on the inside surface of the fly wheel 13. The spring 70 normally holds the projecting stud outwardly, as shown in full lines, in Fig. 3. The rotation of the fly wheel 13 causes the front end of the cam plate 69, carried thereby, to engage the stud 68 and move the arm 67 inwardly into the dotted line position against the resilient opposing effect of the spring 70. When the rear end of the cam plate passes the projecting stud 68 the spring 70 returns the arm 67 to its normal vertical position, as shown in Fig. 8, and it also returns the film moving arm 61, which is now moving idly, to the full line position shown in Fig. 1. The film moving arm 61 being secured to the same shaft, the shaft 66,-as the rearwardly situated arm 67, the film 23 is first moved into dotted line position, shown in Fig. 1, at which time part of the loop 60 is taken up, and while the driving sprocket 19 is taking up the loop made in the lower portion of the film, below the film chute, the arm 61 is idly returned by spring 70 to its normal vertical position. The film 23 in the chute is then standing substantially still, at which time the shutter is open or is being opened.

The shutter mechanism adapted for use in connection with my camera is of well known type and is contained in the casing 71 operable by the usual shutter lever 75, and secured to the shutter box 73 on the front of the casing of the instrument. The shutter mechanism contained in the casing 71 is what is known in the art as the B T I type of shutter. 72 is the front end of the shutter operating lever 50 used for moving the shutter lever 75. 76 is the lens and 77 is the usual movable lever adapted to control the mechanism of the shutter so as to cause it to operate either instantaneously; in accordance with the bulb, or to produce a time exposure, whereby the shutter is held open for an indefinite period of time by one movement of lever 75 and closed at the end of that period by another movement of the lever 75. The casing 71 is rotatable about its axis, having a flange 78, contained in a fixed guide ring 79 and secured in adjusted position by screws 80.

The rotation of the shaft 44 causes the rotation of the cam 48 under the end 50' of the camera lever 50, producing an oscillation of the lever 50 upon the pivot 51 and the depression of the lower end 72 of the lever 50 into contact with the operating lever 75 of the shutter mechanism opens the shutter which is automatically closed when end 72 of lever 50 is raised. The shutter casing 71 may be bodily rotated to the left, as shown in Fig. 7, so that the lever 75 is no longer in the path of the extended end 72 of the lever 50, by this means the shutter mechanism is made inoperative. The shutter 71 may be used in taking pictures, but when it is desired to project the pictures from the camera, which may be done by inserting a lamp, within the camera, as shown in my copending application, a rotating shutter 80 consisting of opaque segments 81 and 82, covering substantially 80° and 40°, respectively, having boundary edges 83, more or less translucent, and which edges conveniently can be made of wire cloth or the like, is mounted upon the shaft 44 and rotated in time relation with the movement of the film 23. These edges modify the abruptness with which the picture is shown. The segment 81 passes over the lens of the camera during the time that the film is in motion, the shorter diametrically opposite segment 82, obscuring the picture during the period while the film is at rest. The opening spaces on either side of the shutter permitting the picture to be projected upon the receiving surface, dividing the period into two intervals of time, at each movement of the film.

The wires 86, leading from the attachment plug 87 are intended for connection with a lamp to be inserted in the camera when it is desired to project pictures therefrom.

90 is the finder mounted upon the upper part of the casing.

Having described my invention, what I claim is:—

1. In combination with a moving picture camera, having a film strip and means for intermittently moving said film, of a shutter; a camera lever, movable in synchronism with the movement of the film to operate said shutter; a shutter moving arm, and a casing containing the said shutter and supporting said arm, rotatable to move said arm out of the path of said camera lever.

2. In combination with a moving picture

camera, having a film strip and means for intermittently moving said film, of a shutter; a camera lever, movable in synchronism with the movement of the film to operate said shutter; a shutter-moving arm projecting from the shutter casing in the path of said lever; a casing, containing said shutter and supporting said arm, rotatable to move said arm out of the path of said lever, and means to secure the casing in selected position.

3. In combination with a moving picture camera, having a film strip and means for intermittently moving said film, of a shutter; a camera lever; a cam for operating the said lever, movable by the means employed to move said strip, in synchronism therewith to open said shutter; automatic means to close said shutter; a shutter-moving arm projecting from said casing; a casing containing said shutter and supporting said arm, rotatable to move said arm out of the path of said lever; means to hold the shutter either open or closed indefinitely when the operating arm is moved out of the path of said lever and means to secure the casing in selected position.

In testimony whereof I hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM M. GREEN.

In the presence of—
FORÉE BAIN,
MARY F. ALLEN.