

PATENT SPECIFICATION

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 (72) Inventor DAVID EASTON BEACH



(54) PHOTOGRAPHIC CAMERAS

(71) We, EASTMAN KODAK COMPANY, a Company organized under the Laws of the State of New Jersey, United States of America do hereby declare the invention
 5 New York 14650, United States of America do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following
 10 statement:—

The present invention relates to a photographic camera having a shutter release lever, the actuation of which also effects
 15 another camera function, such as the sensing and/or dislodging of the striker of a percussion ignitable flashlamp.

It is an object of the present invention to provide a camera mechanism wherein the amount of travel of the shutter release button to effect camera operation is minimized. It is a further object of the present invention to provide a camera mechanism wherein the timed sequence of operation of
 20 various camera functions responsive to movement of the shutter release button can be adjusted.

In accordance with the present invention there is provided a camera comprising a housing, an exposure mechanism in the housing operable to expose a frame of film, a body release lever mounted on the housing for movement from a first position to a second position for operating the exposure mechanism, a generally U-shaped
 30 rocker member having a pair of legs extending in a direction generally parallel to the direction of movement of the body release lever and a portion interconnecting one end of each of the leg, the rocker member being angularly movable from a rest position about an axis intercepting the legs at points spaced from said portion to effect a camera function, and means interconnecting the body release lever and
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the rocker member for rotating the rocker member from its rest position upon movement of the body release lever from its first position toward its second position.

In the accompanying drawings:—

Fig. 1 is an exploded perspective view, partially broken away, of a portion of a camera constructed in accordance with the present invention;

Fig. 2 is an assembled view of the camera elements shown in Fig. 1; and

Fig. 3 is a side elevation of a portion of the camera elements shown in Fig. 1.

Because cameras are well known, the present description is directed in particular to elements forming part of, or cooperating more directly with, apparatus in accordance with the present invention. It is to be understood that camera elements not specifically shown or described may take various forms well known to those skilled in the art.

Referring to the drawings, the illustrated camera includes a housing (a portion of which is shown and designated by reference numeral 10) which supports a body release lever 12 with an integral button 13, optical elements 14 within a view-finder cavity, and a percussion flash cube firing mechanism generally designated at 16. The camera illustrated as the preferred embodiment of the present invention is adapted to receive in a socket, a percussively ignitable flash cube (not shown) which is fireable synchronously with the operation of the camera shutter by mechanisms described in our co-pending application No. 25295/71 (Serial No. 1,339,510).

Percussively fireable flash cubes are generally known in the art and comprise a base for supporting a plurality of percussively ignitable flash lamps, and impacting members or striker wires associated with each flash lamp, and supporting or indexing means. Since such flash lamps are

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well known in the art, they will not be described in detail here. In order to fire one of the lamps, an actuating member is inserted through an opening in the base and into the cube to dislodge the striker wire from its energized position. The striker wire then rapidly strikes the base of the flash lamp to ignite percussively the primer, which, in turn, deflagrates into the envelope, to ignite the combustible material and fire the lamp. In the energized position, the striker wire is located over an opening in the cube base. After igniting the lamp, the striker wire remains in contact with the lamp base and is not over the opening in the base of the cube.

Although there are several known ways for effecting synchronous flash exposures, the drawings show a mechanism adapted to perform a variety of functions in various situations. The absence of an energized striker at the camera firing site is indicated by a visual warning signal in the viewfinder. The mechanism is provided with means for dislodging an energized striker wire to ignite a flash lamp.

Body release lever 12 is pivotally mounted on camera housing 10 by means of a tab 18 which rests in a slot 20 in the housing and by a threaded stud 22 which extends through a hole 24 in a second tab 26 of the body release lever. A coil spring 28 urges tab 26 upwardly against a nut 30 which may be adjusted during camera manufacture to selectively raise and lower the pivot point of body release lever 12 for purposes to be explained hereinafter.

The camera may include one of many known exposure mechanisms operable to expose a frame of film therein. As illustrated, a shutter release lever 32 is mounted on the housing 10 by means of a stud 34 for rotation in a clockwise direction, as therein viewed, against the force of a spring 36 to trip the shutter. A rocker linkage 38 is pivotally mounted on housing 10 above the viewfinder cavity and includes a tab 40 which cooperates with another tab 42 on body release lever 12, when the lever is depressed, so as to rotate shutter release lever 32 to trip the shutter.

A pair of legs 44 and 46 depend from body release lever 12 and are aligned with corresponding openings in housing 10, one such opening 48 being shown in Fig. 2. If required, any known mechanism may be provided below the openings to prevent depression of body release lever 12, such as to prevent accidental double exposure and/or to prevent tripping the shutter whilst the film is being advanced to the next frame.

A rocker member 50 having a pair of depending pivot legs 52 and 54 is mounted between body release lever 12 and the viewfinder cavity and pivots about the

ends of legs 52 and 54 in notches 56 and 58 in camera housing 10. A roller 60 is carried on rocker member 50 and contacts a ramp-shaped cam surface 62 on body release lever 12 (best seen in Fig. 3). The cam surface is shaped so that depression of the body release lever results in a smooth and accelerated rotation of rocker member 50 about the ends of its legs.

To conserve space in the camera housing, body release lever 12 and rocker member 50 are located above and straddling the viewfinder cavity. Additional conservation of space is accomplished by tripping the shutter mechanism after only limited travel of the body release lever 12. However, since this travel is used to operate camera elements requiring a large amount of travel, as will be discussed hereinafter, the movement of the body release lever must be amplified, and this is partially accomplished by the cam configuration of roller 60 and ramp 62 and by the relative lengths of shutter release lever 12 and rocker member 50, i.e. slight movement of body release lever 12 results in amplified angular movement of rocker member 50.

A lever 61 is pivotally mounted on camera housing 10 by means of a stud 63 so that angular displacement of rocker member 50 is transmitted thereto by a lost motion spring 64. A slide 66, which effects the flash sensing functions, is coupled to lever 61 for movement therewith. Spring 64 abuts a pin 67 on the rocker member 50 to urge the latter in a counterclockwise direction as viewed in Fig. 1.

A coupling 68 is pivotally mounted on a post 70 and is biased in a counterclockwise direction as viewed in Fig. 1 by means of a torsion spring 72. Counterclockwise rotation of the coupling 68 is limited by a lug 74 extending from the camera housing. A tab 78 on coupling 68 is in abutting engagement with a tab 80 on the slide 66 to limit movement of the slide by the position of coupling 68. A sector gear 82 on coupling 68 is provided for driving a second sector gear 84 on a striker sensing probe 86.

Probe 86 normally lies flush with, or below, the outer surface of the camera housing, and can be extended through an opening in the housing. The probe is guided by a pin 88 extending through a slot 90 and by the surfaces defining the opening in the camera housing. Probe 86 is displaced upwardly until it abuts against the striking leg of a flash cube, or until pin 88 engages the lower end of slot 90.

A flag 100 is mounted for pivotal movement about a pair of pins 102 and is biased toward a raised position out of the field of view of the viewfinder by a leaf spring 104. Flag 100 is provided with an

abutment 106 which is engageable by slide 66 and displaceable thereby to a position across the viewfinder.

The sensing function of the mechanism can now be explained. Assuming a flash cube has been inserted in the camera socket, the depression of body release lever 12 causes rocker member 50 to rotate from its full line to its phantom line position (Fig. 3) causing displacement of slide 66 by spring 63 and lever 61. As slide 66 moves, tab 80 thereon engages tab 78 of coupling 68 and rotates the latter in a clockwise direction, whereby sector gear 82 moves probe 86 upwardly. If there is a flash cube striker (not shown) in its path, probe 86 is halted and additional movement of body release lever 12 is taken up in lost motion spring 64. If, there is no striker leg in its path, probe 86 is moved to its extreme upward position and slide 66 engages flag abutment 106 to move flag 100 across the viewfinder. The latter occurrence warns the photographer that he cannot make a flash exposure with the flash cube in its present orientation in the camera, and he may then release shutter release lever 12 to refrain from making the exposure. Of course, at the photographer's option, lever 12 may be continued to be depressed to make an exposure without flash.

Means can also be provided as disclosed in our copending application No. 25295/71 (Serial No. 1,339,510) for preventing slide 66 from moving to lower the signal into the viewfinder if a flash lamp is not mounted on the camera.

Since shutter release lever 12 operates both the exposure mechanism and also viewfinder signal 100 upon movement of the body release lever 12 toward the viewfinder cavity, adjustment of the mechanism is critical so that the photographer is warned of a bad bulb in sufficient time to cancel operation of the exposure mechanism. In other words, depression of lever 12 must pivot rocker member 50 sufficiently to cause signal 100 to appear in the viewfinder before tab 42 moves lever 38 sufficiently to rotate lever 32 to a position in which it trips the shutter. For this reason, the axis about which lever 12 pivots may be moved by adjusting nut 30. Moving the axis upwardly away from the viewfinder cavity by turning the nut in a counter clockwise direction results in greater movement of rocker 50 before shutter operation, while moving the axis downwardly toward the viewfinder has the opposite effect. This adjustment may be made in the factory during camera assembly.

WHAT WE CLAIM IS:—

1. A camera comprising a housing, an exposure mechanism in the housing oper-

able to expose a frame of film, a body release lever mounted on the housing for movement from a first position to a second position for operating the exposure mechanism, a generally U-shaped rocker member having a pair of legs extending in a direction generally parallel to the direction of movement of the body release lever and a portion interconnecting one end of each of leg, the rocker member being angularly movable from a rest position about an axis intercepting the legs at points spaced from said portion to effect a camera function, and means interconnecting the body release lever and the rocker member for rotating the rocker member from its rest position upon movement of the body release lever from its first position toward its second position.

2. A camera according to Claim 1 wherein the body release lever is mounted on the housing for pivotal movement about an axis parallel to the axis of angular movement of the rocker member.

3. A camera according to Claim 1 or 2, further comprising a sensing member movable a predetermined distance against a spring bias to sense the existence or non-existence of a predetermined camera condition and movable beyond said predetermined distance if said condition does not exist, and lost motion spring means interconnecting the rocker member and the sensing member for moving the sensing member against its spring bias when the rocker member moves away from its rest position.

4. A camera according to Claim 1, 2 or 3, further comprising means interconnecting the body release lever and the exposure mechanism for operating the exposure mechanism upon movement of the body release lever, and means for adjusting the amount of travel of the body release lever required to operate the exposure mechanism relative to the amount of travel of the body release lever required to move the rocker member to effect said camera function, whereby the sequence of operation of said camera function and the exposure mechanism can be adjusted.

5. A camera according to Claim 4 wherein the body release lever is pivotally mounted on said housing, the two interconnecting means are spaced apart along the body release lever from the pivotal mounting of the body release lever and the adjusting means includes means for moving the pivotal mounting of the body release lever in a direction generally perpendicular to the spacing between the two interconnecting means.

6. A camera according to any one of the preceding Claims, wherein said camera function includes the actuation of a war-

abutment 106 which is engageable by slide 66 and displaceable thereby to a position across the viewfinder.

The sensing function of the mechanism 5 can now be explained. Assuming a flash cube has been inserted in the camera socket, the depression of body release lever 12 causes rocker member 50 to rotate from its full line to its phantom line position (Fig. 3) causing displacement of slide 66 by spring 63 and lever 61. As slide 66 moves, tab 80 thereon engages tab 78 of coupling 68 and rotates the latter in a clockwise direction, whereby sector gear 82 moves 15 probe 86 upwardly. If there is a flash cube striker (not shown) in its path, probe 86 is halted and additional movement of body release lever 12 is taken up in lost motion spring 64. If, there is no striker leg in its 20 path, probe 86 is moved to its extreme upward position and slide 66 engages flag abutment 106 to move flag 100 across the viewfinder. The latter occurrence warns the photographer that he cannot make a flash exposure with the flash cube in its present 25 orientation in the camera, and he may then release shutter release lever 12 to refrain from making the exposure. Of course, at the photographer's option, lever 12 may be 30 continued to be depressed to make an exposure without flash.

Means can also be provided as disclosed in our copending application No. 25295/71 (Serial No. 1,339,510) for preventing slide 35 66 from moving to lower the signal into the viewfinder if a flash lamp is not mounted on the camera.

Since shutter release lever 12 operates both the exposure mechanism and also 40 viewfinder signal 100 upon movement of the body release lever 12 toward the viewfinder cavity, adjustment of the mechanism is critical so that the photographer is warned of a bad bulb in sufficient time to 45 cancel operation of the exposure mechanism. In other words, depression of lever 12 must pivot rocker member 50 sufficiently to cause signal 100 to appear in the viewfinder before tab 42 moves lever 38 sufficiently to rotate lever 32 to a position in 50 which it trips the shutter. For this reason, the axis about which lever 12 pivots may be moved by adjusting nut 30. Moving the axis upwardly away from the viewfinder 55 cavity by turning the nut in a counter clockwise direction results in greater movement of rocker 50 before shutter operation, while moving the axis downwardly toward the viewfinder has the op- 60 posite effect. This adjustment may be made in the factory during camera assembly.

WHAT WE CLAIM IS:—

1. A camera comprising a housing, an 65 exposure mechanism in the housing oper-

able to expose a frame of film, a body release lever mounted on the housing for movement from a first position to a second position for operating the exposure mechanism, a generally U-shaped rocker 70 member having a pair of legs extending in a direction generally parallel to the direction of movement of the body release lever and a portion interconnecting one end of each of leg, the rocker member being angularly movable from a rest position about 75 an axis intercepting the legs at points spaced from said portion to effect a camera function, and means interconnecting the body release lever and the rocker 80 member for rotating the rocker member from its rest position upon movement of the body release lever from its first position toward its second position.

2. A camera according to Claim 1 85 wherein the body release lever is mounted on the housing for pivotal movement about an axis parallel to the axis of angular movement of the rocker member.

3. A camera according to Claim 1 or 2, 90 further comprising a sensing member movable a predetermined distance against a spring bias to sense the existence or non-existence of a predetermined camera condition and movable beyond said pre- 95 determined distance if said condition does not exist, and lost motion spring means interconnecting the rocker member and the sensing member for moving the sensing member against its spring bias when the 100 rocker member moves away from its rest position.

4. A camera according to Claim 1, 2 or 3, further comprising means interconnecting 105 the body release lever and the exposure mechanism for operating the exposure mechanism upon movement of the body release lever, and means for adjusting the amount of travel of the body release lever required to operate the exposure mechanism 110 relative to the amount of travel of the body release lever required to move the rocker member to effect said camera function, whereby the sequence of operation of said camera function and the exposure 115 mechanism can be adjusted.

5. A camera according to Claim 4 wherein the body release lever is pivotally 120 mounted on said housing, the two interconnecting means are spaced apart along the body release lever from the pivotal mounting of the body release lever and the adjusting means includes means for moving the pivotal mounting of the body release lever in a direction generally perpendicular 125 to the spacing between the two interconnecting means.

6. A camera according to any one of the preceding Claims, wherein said camera function includes the actuation of a war- 130



ning signal to alert the user of the occurrence of a predetermined exposure characteristic.

7. A camera according to Claim 1, constructed substantially as hereinbefore de-

scribed with reference to, and as shown in, the accompanying drawings.

L. A. TRANGMAR, B.Sc., C.P.A.,
Agent for the Applicants.

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