

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) PHOTOGRAPHIC CAMERA

(71) We, EASTMAN KODAK COMPANY, a Company organized under the Laws of the State of New Jersey, United States of America of 343 State Street, Rochester, 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 statement:—

The present invention relates to photographic cameras for use with percussion ignitable flashlamp units (hereinafter referred to as "of the kind defined") comprising one or more flashlamps, the or each flashlamp having a primer and a pre-energized striker which, upon being released from its energized condition, strikes the primer to activate the lamp.

In accordance with the present invention there is provided a photographic camera having a shutter, means for receiving a percussion-ignitable flashlamp unit of the kind defined and a mechanism for synchronizing the actuation of the shutter and the ignition of a flashlamp of a received unit, wherein said mechanism comprises a release member, energy storage means coupled to the release member to store energy in response to initial actuation of the release member and a synchronizing member coupled to the energy storage means which, during further movement of the release member, is discharged to move the synchronizing member in an operative path to actuate the shutter and cause ignition of a flashlamp of a received unit.

In the accompanying drawings:—

Fig. 1 is a perspective view of a photographic camera of a type wherein the mechanism of the present invention might be used, a multilamp, percussion-ignitable flashlamp unit being shown mounted for operation;

Fig. 2 is a cut-away perspective view to

an enlarged scale, of the flashlamp unit showing a pre-energized striker;

Fig. 3 is a front elevation showing the operating mechanism for the shutter and flashlamp unit according to one embodiment of the present invention;

Fig. 4 is a front elevation showing the operating mechanism for the shutter and flashlamp unit according to another embodiment of the present invention; and

Fig. 5 is a front elevation showing the operating mechanism for the shutter and flashlamp unit according to yet a third embodiment of the present invention.

As illustrated, a camera body 12 houses a viewfinder 14, an objective 18, and a release member 19 having a pressure surface 10. A flashlamp unit 16 is shown mounted on the camera body 12.

As illustrated, the flashlamp unit comprises a base 28 having an access opening 29 therein to permit passage of an actuating member therethrough. Mounted on base 28 are retaining elements 31 and 32 (Fig. 2) which retain an arm of a striker spring 22. The lower arms of spring 22 is retained by elements 31 and 32 and has an upturned end 33 which engages and lodges a percussion leg 34 of a striker spring 22 in a pre-energized position. A percussion-ignitable flashlamp 36 includes a percussion tube 37 and the flashlamp is held in position on the base such that the tube will be rapidly impacted by the striker spring upon release thereof by a camera or other mechanism.

The elements are shown in full lines in their positions prior to operation. Broken lines are used to indicate the position of the elements at mid-operation. Release member 19 is slidably mounted on the camera body 12 by means of pins 38 which are fixed on camera body 12 and extend into elongated slots 39 in release member 19. A link member 40 is pivotally mounted within the camera body 12 on a fixed pivot 42. A pin 90

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43 on the release member 19 is engaged in an elongated slot 44 on one end of the link member 40. A pin 46 on the opposite end of the link 42 is secured to the upper end of a spring 53, the lower end of which is connected to a pin 54 mounted on a synchronizing member 60. The synchronizing member 60 is slidably mounted inside the camera body 12 by means of pins 74 secured to the camera body 12 and extending into elongated slots 76 in the synchronizing member 60. The synchronizing finger 78, a shutter triggering finger 79 and a latching finger 81. A latching member 90 is pivotally mounted in the camera body 12 to rock about a pivot pin 92 and a latch spring 98 biases the latch member 90 to a and is guided by means of projections 140 is in the latch position, a latch stop 94 engages the latching finger 81 of the synchronizing member 60.

Slidably mounted within the camera body is a latch release member 99, the upper end of which engages the lower end of the release member 19 and the lower end of which engages the end portion of the latch member 90.

The operation of the embodiment shown in Fig. 3 is as follows: The operator depresses the release member 19 by applying a downward force at surface 10. The downward motion of release member 19 causes the link member 40 to rock in a counterclockwise direction (as viewed in Fig. 3) about its pin 42. Pin 46 of link member 40 moves in a predominantly upward direction carrying with it the upper end of spring 53. Synchronizing member 60 moves upwardly until the latching finger 81 engages the latch stop 94 of latch member 90. In this position, the flash actuating finger 78 at the upper end of synchronizing member 60 extends through the access opening 29 in the base 28 of the flashcube and into engagement with or spaced adjacent to the striker 34. Continued depression of the body release member 19 extends spring 53 to store energy therein and pivots the latch member 90 in a counterclockwise direction. The latch member 90 is constructed so that it releases synchronizing member 60 when sufficient energy is stored by spring 53 to actuate the flash and effect operation of the shutter. When latch member 90 releases the synchronizing member 60, the synchronizing member moves upwardly under the urging of spring 53 so that the striker 34 of the striker spring 22 is moved upwardly over the stop 33 and is released for striking engagement with the percussion tube 37. This motion is synchronized with the movement of shutter trigger finger 79 into engagement with shutter opening means 100 to release the shutter.

In Figure 4 there is shown another embodiment of the present invention. The elements are shown in full lines in their position prior to operation. Broken lines indicate the element positions in operation. A release member 110 is slidably mounted on a camera body 112 with surface 113 conveniently accessible to the operator. Projections 114 fixed within camera body 112 are engaged in elongated slots 115 in release member 110 to guide the latter. The lower end of a spring 117 is connected to a projection 118 on the release member 110. A link member 120 is pivotally mounted on a pivot 124 and the upper end of spring 117 is connected to a projection 122 on the link member 120. A synchronizing member 130 is slidably mounted in the camera body and is guided by means of projections 140 fixedly mounted within the camera body. A projection 142 on the synchronizing member 130 moves within an elongated slot 144 in the link member 120. The camera body 112 has an opening 146 in alignment with the opening in the base of the flashlamp unit and the percussion leg or striker of the flashlamp unit is positioned to permit synchronizing member 130 to thrust thereagainst when moving upwardly in an operative stroke. A pre-energized shutter 150 abuts the lower end of synchronizing member 130 prior to operation.

Intended operation of the Fig. 4 embodiment is as follows. The operator depresses release member 110 by applying a downward force at surface 113. The motion of release member 110 is transmitted to the link member 120 by means of the spring 117 which urges the link member 120 to turn in a counterclockwise direction. The turning of the link member 120 urges the synchronizing member 130 upwardly until it engages the striker 34 in the flashlamp unit where the synchronizing member 130 is restrained. Link member 120 is no longer free to turn and further depression of release member 110 results in tensioning of spring 117 and increased force applied to the striker 34.

When the force reaches a sufficient level, the stored energy of the spring 117 is transmitted by means of the link member 120 to the synchronizing member 130 and the striker 34 is dislodged to strike and actuate the flashlamp unit. Upon sufficient movement of the synchronizing member 130, the pre-energized shutter 150 is freed to effect exposure of film receivable in the camera casing.

In Fig. 5 there is shown another embodiment of the present invention. The elements are shown in full lines in their positions prior to operation. Broken lines are used to indicate the positions during operation. A release member 200 is slidably mounted on a camera body 201 and is 130

located to have a contact surface 202 conveniently accessible to the operator. Projections 203 fixed within camera body 201 are engaged within elongated slots 206 on the release member 200 and serve to guide the latter. A link member 210 is pivotally mounted on a fixed pivot 212. A pin 214 on release member 200 is engaged in an elongated slot in one end of the link member 210.

A synchronizing member 218 is slidably mounted within the camera and is guided by means of fixed projections 220. A collar 224 is secured to the synchronizing member 218 at a point approximately midway between the centre and bottom of the synchronizing member 218. A coil spring 230 is interposed between a spring support surface 232 on the link member 210 and the collar 224 so as to encircle the lower end of synchronizing member 218.

A stop pin 226 is fixed to the camera body 201 and, when engaged by the collar 224, terminates the upward operative movement of the synchronizing member 218. The camera body 201 has an opening 228 in alignment with the opening in the base of the flashlamp unit permitting the synchronizing member 218 to engage the striker 34 of the flashlamp unit.

Intended operation of the Fig. 5 embodiment is as follows. The operator depresses release member 200 by applying a downward force at surface 202. The downward movement of the release member 200 causes the link member 210 to turn about its pivot 212 in a counterclockwise direction thereby resulting in an essentially upward movement of the spring support surface 232. Spring 230 being compressed between spring support surface 232 and collar 224 urges the synchronizing member 218 upwardly into restraining engagement with the striker 34 of the flashlamp unit. Further depression of the release member 200 results in energy storage in spring 230. When the stored energy reaches a sufficient level, the striker 34 is released by the upward movement of the synchronizing member 218 to actuate the flash device. At the same time the upward movement of the synchronizing member 218 causes synchronized actuation of shutter operating means 234.

WHAT WE CLAIM IS:—

1. A photographic camera having a

shutter, means for receiving a percussion-ignitable flashlamp unit of the kind defined and a mechanism for synchronizing the actuation of the shutter and the ignition of a flashlamp of a received unit, wherein said mechanism comprises a release member, energy storage means coupled to the release member to store energy in response to initial actuation of the release member and a synchronizing member coupled to the energy storage means which, during further movement of the release member, is discharged to move the synchronizing member in an operative path to actuate the shutter and cause ignition of a flashlamp of a received unit.

2. A photographic camera as claimed in claim 1, wherein the energy storage means comprises a spring.

3. A photographic camera as claimed in claim 2, wherein a pivoted latch retains the synchronizing member in an inoperative position during the initial movement of the release member so as to tension the spring and is subsequently moved to an operative position by means of the release member to allow actuation of the synchronising member by means of the spring.

4. A photographic camera as claimed in claim 3, wherein a pivoted link member is connected to the release member and the spring interconnects the pivoted link member and the synchronizing member.

5. A photographic camera as claimed in claim 2, wherein a pivoted link member has one end connected to the synchronizing member and the other end connected to one end of the spring the other end of the spring being connected to the release member.

6. A photographic camera as claimed in claim 2, wherein the spring is a compression spring and a pivoted link member has one end connected to the release member and the other end bearing against one end of the spring, the other end of which bears against the synchronizing member.

7. A photographic camera according to claim 1 constructed substantially as hereinbefore described with reference to, and as shown in, Figure 3, Figure 4, or Figure 5 of the accompanying drawings.

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A synchronizing member 218 is slidably mounted within the camera and is guided by means of fixed projections 220. A collar 224 is secured to the synchronizing member 218 at a point approximately midway between the centre and bottom of the synchronizing member 218. A coil spring 230 is interposed between a spring support surface 232 on the link member 210 and the collar 224 so as to encircle the lower end of synchronizing member 218.

A stop pin 226 is fixed to the camera body 201 and, when engaged by the collar 224, terminates the upward operative movement of the synchronizing member 218. The camera body 201 has an opening 228 in alignment with the opening in the base of the flashlamp unit permitting the synchronizing member 218 to engage the striker 34 of the flashlamp unit.

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2. A photographic camera as claimed in claim 1, wherein the energy storage means comprises a spring.

3. A photographic camera as claimed in claim 2, wherein a pivoted latch retains the synchronizing member in an inoperative position during the initial movement of the release member so as to tension the spring and is subsequently moved to an operative position by means of the release member to allow actuation of the synchronising member by means of the spring.

4. A photographic camera as claimed in claim 3, wherein a pivoted link member is connected to the release member and the spring interconnects the pivoted link member and the synchronizing member.

5. A photographic camera as claimed in claim 2, wherein a pivoted link member has one end connected to the synchronizing member and the other end connected to one end of the spring the other end of the spring being connected to the release member.

6. A photographic camera as claimed in claim 2, wherein the spring is a compression spring and a pivoted link member has one end connected to the release member and the other end bearing against one end of the spring, the other end of which bears against the synchronizing member.

7. A photographic camera according to claim 1 constructed substantially as hereinbefore described with reference to, and as shown in, Figure 3, Figure 4, or Figure 5 of the accompanying drawings.

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