March 20, 1956 F. FAULHABER ET AL 2,738,716

CONTROL OR RELEASE DEVICE FOR PHOTOGRAPHIC CAMERAS

Filed May 17, 1952 2 Sheets-Sheet 1

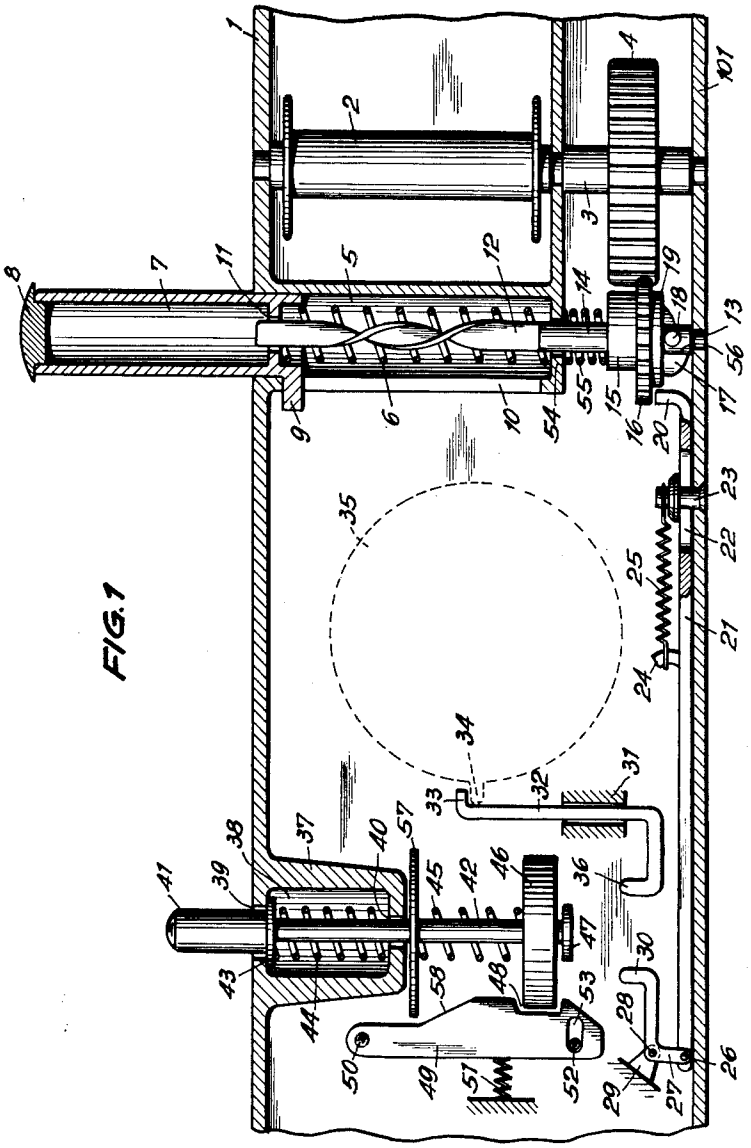


FIG. 1

INVENTORS
FRITZ FAULHABER
RICHARD SOMMER
BY Mack + Blum
ATTORNEYS

March 20, 1956 F. FAULHABER ET AL 2,738,716

CONTROL OR RELEASE DEVICE FOR PHOTOGRAPHIC CAMERAS

Filed May 17, 1952 2 Sheets-Sheet 2

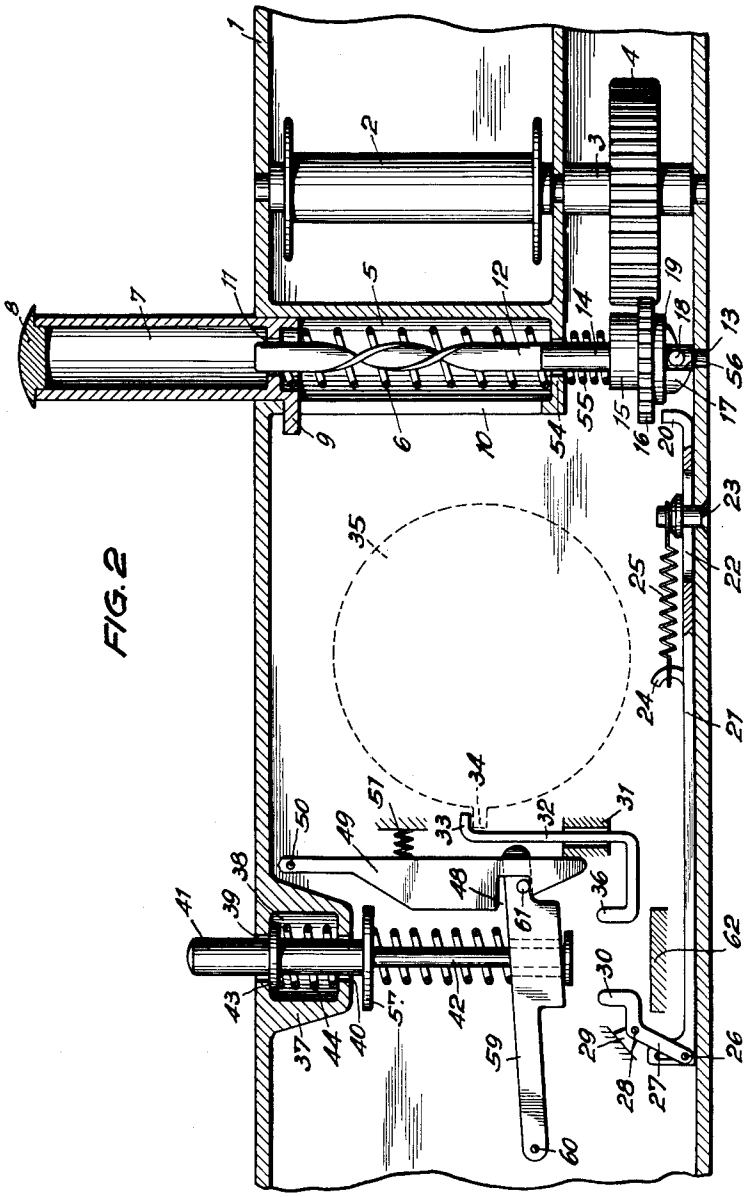


FIG. 2

INVENTORS
FRITZ FAULHABER
RICHARD SOMMER
BY Mock + Blum
ATTORNEYS

United States Patent Office 2,738,716 Patented Mar. 20, 1956

2,738,716

CONTROL OR RELEASE DEVICE FOR PHOTOGRAPHIC CAMERAS

Fritz Faulhaber, Schonthal, Bezirk Boblingen, and Richard Sommer, Braunschweig, Germany, assignors to Voigtlander, A. G., Braunschweig, Germany, a corporation of Germany

Application May 17, 1952, Serial No. 288,452

Claims priority, application Germany May 23, 1951

4 Claims. (Cl. 95—31)

This invention relates to control or release devices, and has particular relation to control or release devices for photographic cameras, in which one control or release member is used for adjusting or controlling several elements having different functions.

It has been known to use a single key or member for simultaneously releasing the shutter and actuating double-exposure prevention means. In order to actuate all parts, in this construction it was necessary to carry out the control movement not only partially, but completely. If these known constructions are handled superficially or hastily, it often happens that, owing to only partial pressing of the key, the control action is incomplete. If thus by insufficient action on the key only the shutter is released and the double-exposure prevention means is not actuated, upon repeated pressing double-exposure will take place.

According to the present invention, this disadvantage is eliminated by not causing actuation or control of the elements to be released by the key or the like directly, but utilizing the pressure exerted on the key merely for driving or releasing a separate control or release member which, when put in motion or when rendered free of motion, effects the control step positively and unchangeably. By proceeding in this manner, release or operation or several elements, which are independent from each other and have different functions, will not be dependent on a subjective and, therefore, possibly inaccurate action, but rather on a proceeding which, after its initiation, takes place positively and safely, and is terminated only after actuation of all elements to be released has taken place.

The control member used for this purpose can be actuated in various ways. The drive can be brought about by potential, as well as kinetic energy. The first mentioned possibility corresponds, for example, to a spring which is put under tension by pressing the key and is caused to hurl the control member, after unlocking, so that the latter, moving freely, but preferably guided, causes release of the respective parts. In the above mentioned second case, apart from other solutions, the control member can be designed as a fly-member, which is pushed by the key or an actuated rotating member, and is thus caused to effect release of all of the respective elements.

The control member need not be a separate element. It may form a unit with the accumulator of force, i. e. a loaded and released spring can abut against the parts to be released directly, i. e. without the use of intermediate elements. Although it is possible in using a separate element as the control member, to allow the control member to act in a completely free movement on the parts to be released, in technical constructions it is preferably, in view of the functional cooperation of all parts, to guide said member by some means in such manner that it is urged toward the place where the release proper has to occur. If the fly-member consists of a disc, the use of a rod, for example, on which

the disc can glide, is sufficient. Such rod can be connected with the key.

A lever can be likewise used as the release member. Such linked elements have no place in the movement and a uniform surface impact at the place of release, is obtained in their use.

Loading of the accumulator, which actuates the control member after release, for example loading of a spring, can be effected by the key member, in a particularly simple manner. The arrangement can be such that the same key member effects also release of the control organ, for example at the end of the loading step. According to a preferred embodiment, a rod connected with the control key is elastically held in operative position and a disc, which is movable on said rod, and is pressed downward by means of a pressure spring actuated by the key, is held by a movable lock, so that upon pressing down the key the pressure spring is put under tension, and after the release of said lock, the disc gliding on a connecting rod, is hurled against the parts to be released. Said lock is preferably provided with a starting surface or the like, which, during or after, loading the pressure spring, comes in contact with a projection of a connecting rod, said projection bringing about release of the lock by causing its displacement or swinging.

The same arrangement may contain—instead of the disc serving as the control member—a one-armed lever surrounding the connecting rod, one end of said lever having a stationary pivot and being capable of swinging, while its other end is held in operative position in a recess of the lock. The lock proper may be of known design. We prefer the use of a lock consisting of a one-armed lever, which is preferably pivoted in parallel position relative to the connecting rod and is provided with a lateral recess for the control member. Owing to its form and position, it requires relatively little space.

In order to restore the operative position of the control member, i. e. to reintroduce it after release into the recess of the lock, it is sufficient to provide the connecting rod on its lower end with a projection, which carries along the control member during the brackward movement of the connecting rod until said member enters said recess and is held there again as before.

It is preferable to arrange the working points of the parts to be released, which are actuated by the control member, in the same plane, so that they are contacted by the abutting control member simultaneously. In order to limit the deflection of the parts to be released, said parts can be arranged in such manner, for example above an abutting surface, that they can be deflected only by a predetermined, mostly small, distance.

The appended drawings illustrate some embodiments of the invention, to which the invention is not limited. Those parts of the camera, which do not form part of the present invention, particularly the means for preventing double-exposure and means for transporting the film, may be of any suitable structure and design.

In the appended drawings, Figure 1 is a longitudinal, sectional view of a camera and means for transporting the film, means for locking transport of the film, shutter release and control device;

Figure 2 is a similar illustration showing a modified embodiment of the control device.

Referring now to the drawings in detail, Figure 1 shows camera casing **1**, containing a film spool **2**, a toothed wheel **4** being fastened to the lower portion **3** of the shaft of said spool. A hollow key **7** provided with knob **8** is displaceable in and guided by a cylindrically shaped part **5** of the camera casing, against the action of spring **6**. Said key is provided with a projecting part **9** which is guided by the vertical, stationary slot **10**. An inner

quadrangular opening 11 of key 7 surrounds a likewise quadrangular rotatable spindle 12, which is helically wound and journalled at 13 in camera casing 1. The lower, cylindrical portion 14 of spindle 12 carries a rotatable body. The latter consists of an eccentric 15, the function of which does not form part of the invention, a pinion 16, which is located under the eccentric and is in engagement with the beforementioned toothed wheel 4, a collar 19 arranged below pinion 16, and a cam 17, which is arranged below collar 19, has an inclined guide surface and surrounds shaft 14. A pressure spring 55, which surrounds shaft 14, is arranged between eccentric 15 and wall 54 of casing part 5. A pin 18 projects from one side of shaft 14 at the level of cam or guide surface 17. The upward directed bent end 20 of connecting rod 21 bears against collar 19, said rod 21 being guided by slot 22 and bolt 23 arranged in bottom wall 101 of the camera. A draw spring 25 fastened to bolt 23 and hook 24 of rod 21, presses rod 21 against collar 19. The other end of rod 21 (the left end in the drawing) is connected by means of pin 26 with angle lever 27, which is capable of swinging about pin 28 arranged on a stationary part 29 of the camera. Bent end 30 of lever 27 points vertically upward. A member 32 is displaceably held by a likewise stationary bearing 31 of the camera. An upper hook-like end 33 of member 32 laps over release lever 34 of the objective shutter 35, which is merely indicated in dotted line. The lower end of member 32 is bent twice, so that end portion 36 points vertically upward, like bent end 30 of lever 27. Above said end parts 30 and 36, the upper part of camera casing 1 has a hollow space or chamber 38 surrounded by walls 37. A control key 41 and connecting rod 42 fastened thereto, are guided by opening 39 and 40 of said chamber. A ring-shaped projecting part 43 of rod 42, limits movement of key 41 and rod 42 in upward direction. Chamber 38 houses a pressure spring 44, which surrounds rod 42. Below chamber 38, a disc 57 is firmly connected to rod 42 and below the disc 57, spring 45, likewise surrounding rod 42, is supported by a heavier disc 46, which is displaceable on rod 42 and is held by disc-like end portion 47 of rod 42. The rim or edge of disc 46 can enter recess 48 of a lever 49, said recess serving as a bar or lock for disc 46. This lever 49 is fastened in the camera by pin 50 and is capable of swinging about pin 50; it is held in active position, i. e. pressed against the edge of disc 46, by spring 51, and is limited in this movement by a pin 52 in slot 53.

The device operates as follows:

Upon pressing key 7 downward, i. e. toward the interior of the camera, by exerting pressure on knob 8, key 7 is guided by means of projection 9 in slot 10, while helically wound spindle 12 is caused to rotate owing to its engagement with opening 11. As the unit consisting of eccentric 15, pinion 16, collar 19 and cam 17 is pressed downward by spring 55, said unit will be caused to rotate, by the action of pin 18 on vertical surface 56 of cam 17. Pinion 16, which is in engagement with toothed wheel 4, rotates toothed wheel 4 and film spool 2, so that transport of the film takes place. When key 7 is pressed downward completely, one area of the film will be transported, whereby a conventional means for compensating for the increasing diameter of the wound film roll is used. Upon release of knob 8, spring 6 causes key 7 to move upward, i. e. out of the camera. During this upward movement of key 7, spindle 12 rotates in opposite direction. During rotation in this direction, pin 18 finds no abutment and moves along inclined guide surface 17 and presses the unit including collar 19, pinion 16 and eccentric 15, upward against the pressure of spring 55. In this step, the teeth of pinion 16 glide in the teeth of toothed wheel 4, having a corresponding width. After collar 19 reaches a certain level, hook 20 of rod 21, which is under the action of spring 25, slips under collar 19 and holds thus guide surface 17 and its vertical surface 56, out of engagement with pin 18. Further transport of the film is

locked, because repeated pressing down of key 7 brings about only idle motion of the key and spindle 12, in the absence of engagement between surface 56 and pin 18. In order to restore the original condition, simultaneously with the release of the objective shutter, withdrawal of rod 21 must also be effected. In order to secure safe and uniform performance of both functions, the arrangement shown in the drawing on the left is actuated. Pressure exerted on release key 41, puts under tension spring 44 which tends to keep key 41 always in the ready for use position. During this step, disc 57 exerts pressure on spring 45, the other end of which is supported by disc 46, which is blocked by recess 48 of lever 49. Upon compressing spring 45, which accumulates power for subsequent release, disc 57 approaches oblique surface 58 of member 49, comes in contact with the latter and causes gradually its displacement to the left in the drawing. In the meantime rod 42 has been pressed downward to a level, at which projection 47 of rod 42 is situated lower than elements 30 and 36, i. e. said projection has passed between said elements and is not capable of preventing movement of disc 46. When the highest tension of spring 45 is attained, member 49, which has been laterally displaced by co-action of disc 57 and inclined surface 58, releases disc 46. Disc 46 is now hurled downward, guided by rod 42, and strikes the ends 30 and 36 of angle lever 27 and release rod 32, respectively. As a result of this, shutter release lever 34 is actuated by the action of hook 33, owing to displacement of rod 32 in bearing 31, so that the film is exposed, and, on the other hand, angle lever 27 is caused to swing, and this lever causes then retraction of rod 21, against the action of spring 25. Thus, the right end of rod 21, i. e. hook 20, is also withdrawn from its position under collar 19. Spring 55 presses eccentric 15, together with pinion 16, collar 19 and guide surface 17, downward, so that connection between pin 18 and front surface 56 is restored. Thus, film can be transported and the entire proceeding can be repeated.

The functions of the device shown in Figure 2 are not different from those of the device according to Figure 1. In the device of Figure 2, the control member used instead of disc 46, is a lever 59, which is pivoted at and capable of swinging about bolt 60 and is held by a pin 61 in the recess 48 of locking lever 49. An abutting surface 62 is provided below parts 30 and 36 in order to limit movement of elements 30 and 36.

It will be understood that this invention is not limited to the specific elements, constructions, steps and other details specifically described and/or illustrated in the drawings and can be carried out with various modifications without departing from the scope of the invention, as defined in the appended claims.

What is claimed is:

1. In a photographic camera having a shutter release lever and having a film transporting locking means including a release lever, said levers having coplanar abutment portions; means for commonly acting upon said portions to actuate the release levers and effect simultaneous release of the shutter and of the film transporting locking means and including a manually depressible push button slidably carried by a wall of the camera and slidable inwardly thereof, spring means normally holding the push button in an inoperative position, a rod connected to and constituting an axial prolongation of the push button, a disc fixedly circumposed on the rod, a spring coiled on the rod and abutting the disc at one end and constituting a means for accumulating release energy upon depression of the push button and inward movement of the rod, a control member loosely fitted on the rod and against which the other end of the spring bears, said control member being engageable under the drive of the spring with the abutment portions of said release levers to actuate the release levers, a locking lever pivoted adjacent one of its ends in the camera in a position along-

side the rod and swingable toward and away from the rod about an axis transverse to the axis of the rod, spring means acting on the locking lever to urge it in the direction of the rod, said locking lever having a free end portion adjacent the control member, said free end portion being provided with a notch facing the rod to lockingly receive the control member and hold it against movement on the rod towards the abutment portions of the release levers and said locking lever being formed intermediate the notch and its pivoted end with an inclined surface facing the rod and adapted to be engaged by the disc in the inward movement of the rod to cause the locking lever to swing away from the rod and release the control member whereupon the control member is driven on the rod by the spring into engagement with the abutment portions of the release levers and stop means on the free end of the rod to limit the movement of the control member.

2. A device as claimed in claim 1, including a second inclined surface on the locking lever intermediate its free end and the notch and against which the control member engages upon the outward movement of the push button and the rod to swing the locking lever away from the rod so as to position the notch for reengagement with the control member.

3. A device as claimed in claim 1, wherein the control member includes a one-armed lever which is swingable about a fixed pivot in the camera toward and away from the abutment portion of the release levers and which has a free end provided with a bore loosely surrounding the rod and with a pin engageable in the notch in the locking lever.

4. A device as claimed in claim 1, wherein the control member is a disc freely circumposed on the rod.

References Cited in the file of this patent

UNITED STATES PATENTS

1,326,119	Touchette	Dec. 23, 1919
2,227,964	Drotning	Jan. 7, 1941
2,238,115	Johnson	Apr. 15, 1941
2,307,748	Philips	Jan. 12, 1943
2,308,017	Mihalyi	Jan. 12, 1943
2,309,382	Cazin	Jan. 26, 1943
2,398,412	Crumrine	Apr. 16, 1946

FOREIGN PATENTS

97,014	Sweden	Aug. 3, 1939