

1109,036



PATENT SPECIFICATION

DRAWINGS ATTACHED

1,109,036

Date of Application and filing Complete Specification: 27 May, 1966.

No. 23788/66.

Application made in Germany (No. R40800 IXa/57a) on 4 June, 1965.

Complete Specification Published: 10 April, 1968.

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Index at acceptance:—G2 A (12A1, 14A4C1)

Int. Cl.:—G03 b 9/00

COMPLETE SPECIFICATION

Photographic Roll-Film Camera

We, FRANKE & HEIDECKE G.M.B.H., a German body corporate, trading as Rollei-Werke Franke & Heidecke, of 196 Salzdhumerstrasse, Braunsschweig, Germany, 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:—

This invention relates to a photographic roll film camera having an objective tube with between-lens shutter and diaphragm, which tube can be pulled out and secured axially in the "ready" position by being rotated about its axis.

The fitting of an object of this type of construction with a complete between-lens shutter involves substantial constructional costs if, for example, the shutter release is to be effected from the camera housing, and if the shutter setting means is to be coupled to the film wind mechanism and possibly an alternate lock provided between the film wind and the shutter release. The invention has for an object to make provision for these features without undue constructional expense.

According to the invention there is provided a photographic roll film camera having an objective tube with between-lens shutter and diaphragm, which tube can be pulled out and axially secured in the "ready" position by being rotated about its axis, the shutter and the diaphragm being arranged in the objective tube and the shutter drive means and the diaphragm setting means being fixedly arranged on the camera body, and a reciprocally movable shutter driving lever mounted on said objective tube lying in the path of travel of driver means on a shutter master drive member only when the objective tube is secured in the ready-for-exposure position, progressive running-down movement of said master member causing the forward and return movements of the shutter driving lever.

The driver means on the master drive

member may consist of two lugs which are successively operative, one of said lugs being effective to move the shutter driving lever in the opening direction and into the path of the second driving lug, so that the latter then re-closes the shutter.

The diaphragm drive means is preferably under the action of a spring, which tends to adjust the largest or smallest aperture value of the diaphragm, and the diaphragm setting member on the camera housing forms the movable stop for the diaphragm driving means on the objective, so that when the objective tube is rotated and secured, the diaphragm is open to the adjusted stop value against the action of the spring and, when the objective is disengaged, the diaphragm is automatically closed by freeing the diaphragm driving means. According to a further feature of the invention, two latch means are provided for securing the objective tube in the "ready" position, one of said latch means being ineffective when the shutter master drive member is tensioned, while the other can be disengaged manually and, upon movement of the tube from the ready-for-exposure position, is prevented from re-engaging and thus is simultaneously effective in this position as a lock for the shutter release member.

In this way, a substantially fool-proof operation of the camera is achieved in a simple manner while providing for economical construction. The effect obtained by the different locking means is that the camera is immediately ready for exposure when the "ready" position is produced by pulling out and latching the tube, because the shutter drive means must be tensioned with the movement of the tube, while on the other hand release of the shutter is only possible when the objective tube is in the "ready" position. It is assumed that the film wind mechanism is coupled in known manner with the setting of the shutter driving means or that the film wind mechanism and the shutter release are connected to one another by

[Price 4s. 6d.]

an alternate lock in order to avoid double exposures and unexposed pictures.

One embodiment of the invention is illustrated by way of example in the accompanying drawings in three different operational positions, only those parts essential for an understanding of the invention being shown. In detail:

Figure 1 is a rear elevation showing the parts in the position ready for exposure;

Figure 2 is a similar view to Figure 1 showing the parts during the shutter release and with the shutter open; and

Figure 3 shows the position of the parts upon commencing to rotate the objective tube.

Of the objective tube, shutter and diaphragm, there are only shown the tube 1 with the shutter blade driving lever 2 and the diaphragm driving member 3.

The tube is formed with longitudinal grooves 4 which merge at both ends into peripherally extending grooves (not shown), so that said tube can be displaced axially on fixed studs (not shown) between two limit positions and can be rotated either in each limit position or at least in the pulled-out position. The shutter blade drive lever 2 is a double-armed lever with two pins 7 and 8. A master member 9 of the shutter drive has two driver lugs 10 and 11 which are engageable with the driver pins 7 and 8 during clockwise movement of the master member about a stud 24. A tail 12 of the master member 9 terminates in a bent-over lug 13 with which is engageable a latch end 14 of a double-armed shutter release lever 15, 17 pivoted on a stud 16. The arm 17 of the release lever abuts under spring pressure against a collar 18 on a release actuating rod 19 formed with a press button 20.

In Figure 1, the master member 9 is in the tensioned position. When the shutter release button 20 is actuated, the release lever 15, 17 is pivoted clockwise and the latch 14 disengages from the lug 13 on the master member 9, so that the latter is turned clockwise about the stud 24 under the influence of a tension spring 21 and the lug 10 abuts the pin 7, thereby turning the shutter blade driving lever in the counterclockwise direction. In the position in which the driver lug 10 slides off the pin 7 (Figure 2), the shutter is opened. At this instant, the driver lug 11 engages the pin 8 and, with continued running-down movement of the master member, an inclined end face 22 of the lug 11 forces the pin 8 downwardly and thereby swings the shutter blade driver member 2 back to its original position. In order that the master member 9 can be returned to the tensioned position by rotation in the counter-clockwise direction, the driver lug 10 is formed as a spring-loaded latch which is pivotable about a stud 23, so that the lug 10 can slide over the pin 7.

Pivotable about a fixed stud 25 is a lever 26, which is tensioned by a spring 27 in the

counter-clockwise direction and which is provided with a bent-over lug 28 slidable on an edge 29 of the master member 9. As the master member 9 runs down the lever 26 follows and is thereby swung in the counterclockwise direction so that its lug 30 lies in the path of movement of a projection 5 on the tube 1. In this way, rotation of the objective tube about its axis is prevented while the shutter is running down and while the shutter is untensioned.

Opposite the projection 5 the tube 1 is formed with an enlargement 6 having an arcuate face 35 and a slot 31 into which a latch 32 on a lever 33 is engageable when the tube 1 is in the ready-for-exposure position. The latch 32 is releasable by actuating a key 34 and, provided the master member is tensioned and the locking latch 30 is consequently raised, the objective tube 1 can now be rotated in the clockwise direction to the position shown in Figure 3, the grooves 4 then permitting the objective tube to be pushed on the fixed studs into the camera housing. The pins 7 and 8 then pass out of the path of movement of the driver lugs 10 and 11 on the master member 9, so that if the latter should be released it would run down without any affect. However, since the locking lever 33 is held in the unlatching position by the edge 35 of the enlargement 6, the lug 32 thereon is now in the path of movement of a collar 35¹ on the release rod 19 and the latter is thus locked against actuation.

The diaphragm drive member 3 is coupled through a toothed segment 36 to a toothed rack 37 guided by means of a slot 38 on pins 39 on the tube 1. The rack 37 is urged towards the right by a spring (not shown) so that a shoulder 40 thereon abuts a lever 41. The position of this lever 41 is determined by a cam disc 42 on a shaft 43 which can, for example, be connected to an external diaphragm setting knob or in known manner to an exposure meter. If the objective tube 1 is rotated out of the "ready" position, the shoulder 40 is lifted from the lever 41, and the rack 37 is pulled towards the right to close the objective diaphragm. When the objective tube is again secured in the "ready" position, the shoulder 40 is re-engaged with the lever 41, whereby the adjusted diaphragm stop value is again produced.

WHAT WE CLAIM IS:—

1. A photographic roll film camera having an objective tube with between-lens shutter and diaphragm, which tube can be pulled out and axially secured in the "ready" position by being rotated about its axis, the shutter and the diaphragm being arranged in the objective tube and the shutter drive means and the diaphragm setting means being fixedly arranged on the camera body, and a reciprocally movable shutter driving lever mounted on said objective tube lying in the path of travel of



an alternate lock in order to avoid double exposures and unexposed pictures.

One embodiment of the invention is illustrated by way of example in the accompanying drawings in three different operational positions, only those parts essential for an understanding of the invention being shown. In detail:

Figure 1 is a rear elevation showing the parts in the position ready for exposure;

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Figure 3 shows the position of the parts upon commencing to rotate the objective tube.

Of the objective tube, shutter and diaphragm, there are only shown the tube 1 with the shutter blade driving lever 2 and the diaphragm driving member 3.

The tube is formed with longitudinal grooves 4 which merge at both ends into peripherally extending grooves (not shown), so that said tube can be displaced axially on fixed studs (not shown) between two limit positions and can be rotated either in each limit position or at least in the pulled-out position. The shutter blade drive lever 2 is a double-armed lever with two pins 7 and 8. A master member 9 of the shutter drive has two driver lugs 10 and 11 which are engageable with the driver pins 7 and 8 during clockwise movement of the master member about a stud 24. A tail 12 of the master member 9 terminates in a bent-over lug 13 with which is engageable a latch end 14 of a double-armed shutter release lever 15, 17 pivoted on a stud 16. The arm 17 of the release lever abuts under spring pressure against a collar 18 on a release actuating rod 19 formed with a press button 20.

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Pivotable about a fixed stud 25 is a lever 26, which is tensioned by a spring 27 in the

counterclockwise direction and which is provided with a bent-over lug 28 slidable on an edge 29 of the master member 9. As the master member 9 runs down the lever 26 follows and is thereby swung in the counterclockwise direction so that its lug 30 lies in the path of movement of a projection 5 on the tube 1. In this way, rotation of the objective tube about its axis is prevented while the shutter is running down and while the shutter is untensioned.

Opposite the projection 5 the tube 1 is formed with an enlargement 6 having an arcuate face 35 and a slot 31 into which a latch 32 on a lever 33 is engageable when the tube 1 is in the ready-for-exposure position. The latch 32 is releasable by actuating a key 34 and, provided the master member is tensioned and the locking latch 30 is consequently raised, the objective tube 1 can now be rotated in the clockwise direction to the position shown in Figure 3, the grooves 4 then permitting the objective tube to be pushed on the fixed studs into the camera housing. The pins 7 and 8 then pass out of the path of movement of the driver lugs 10 and 11 on the master member 9, so that if the latter should be released it would run down without any affect. However, since the locking lever 33 is held in the unlatching position by the edge 35 of the enlargement 6, the lug 32 thereon is now in the path of movement of a collar 35¹ on the release rod 19 and the latter is thus locked against actuation.

The diaphragm drive member 3 is coupled through a toothed segment 36 to a toothed rack 37 guided by means of a slot 38 on pins 39 on the tube 1. The rack 37 is urged towards the right by a spring (not shown) so that a shoulder 40 thereon abuts a lever 41. The position of this lever 41 is determined by a cam disc 42 on a shaft 43 which can, for example, be connected to an external diaphragm setting knob or in known manner to an exposure meter. If the objective tube 1 is rotated out of the "ready" position, the shoulder 40 is lifted from the lever 41, and the rack 37 is pulled towards the right to close the objective diaphragm. When the objective tube is again secured in the "ready" position, the shoulder 40 is re-engaged with the lever 41, whereby the adjusted diaphragm stop value is again produced.

WHAT WE CLAIM IS:—

1. A photographic roll film camera having an objective tube with between-lens shutter and diaphragm, which tube can be pulled out and axially secured in the "ready" position by being rotated about its axis, the shutter and the diaphragm being arranged in the objective tube and the shutter drive means and the diaphragm setting means being fixedly arranged on the camera body, and a reciprocally movable shutter driving lever mounted on said objective tube lying in the path of travel of



5 driver means on a shutter master drive member only when the objective tube is secured in the ready-for-exposure position, progressive running-down movement of said master member causing the forward and return movements of the shutter driving lever.

10 2. A photographic roll film camera according to claim 1, wherein the shutter master drive member is provided with two driver elements which are successively operative, one of said elements being effective to move the shutter driving lever in the opening direction and into the path of the second driving element, so that the latter then re-closes the shutter.

15 3. A photographic roll film camera according to claim 1 or 2, wherein the diaphragm drive means is under the action of a spring which tends to set the largest or smallest aperture value of the diaphragm, and wherein the diaphragm setting means on the camera housing forms a stop for a driver member of the diaphragm drive means on the objective, said driver member opening the diaphragm to the adjusted stop value when the objective tube is latched and freeing the diaphragm drive means when the objective tube is unlatched.

20 4. A photographic roll film camera according

ing to claim 3, wherein the diaphragm drive means is under the action of an opening spring, the direction of action of the spring being opposite to the effective direction of coupling of the diaphragm setting means with the driver member of the diaphragm drive means.

30 5. A photographic roll film camera according to any of claims 1 to 4, comprising two latching means for the objective tube in the "ready" position, one of said latching means being disengageable by tensioning the shutter master driver member, while the other is disengaged manually, said other latching means, when the tube is moved from the "ready" position, being prevented by an enlargement on the tube from re-engaging and, in this position, being simultaneously effective as a shutter release lock.

40 6. A photographic roll film camera as claimed in claim 1 substantially as described with reference to and as illustrated in the accompanying drawings.

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