

PUBLISHED

MAY 4, 1943.

BY A. P. C.

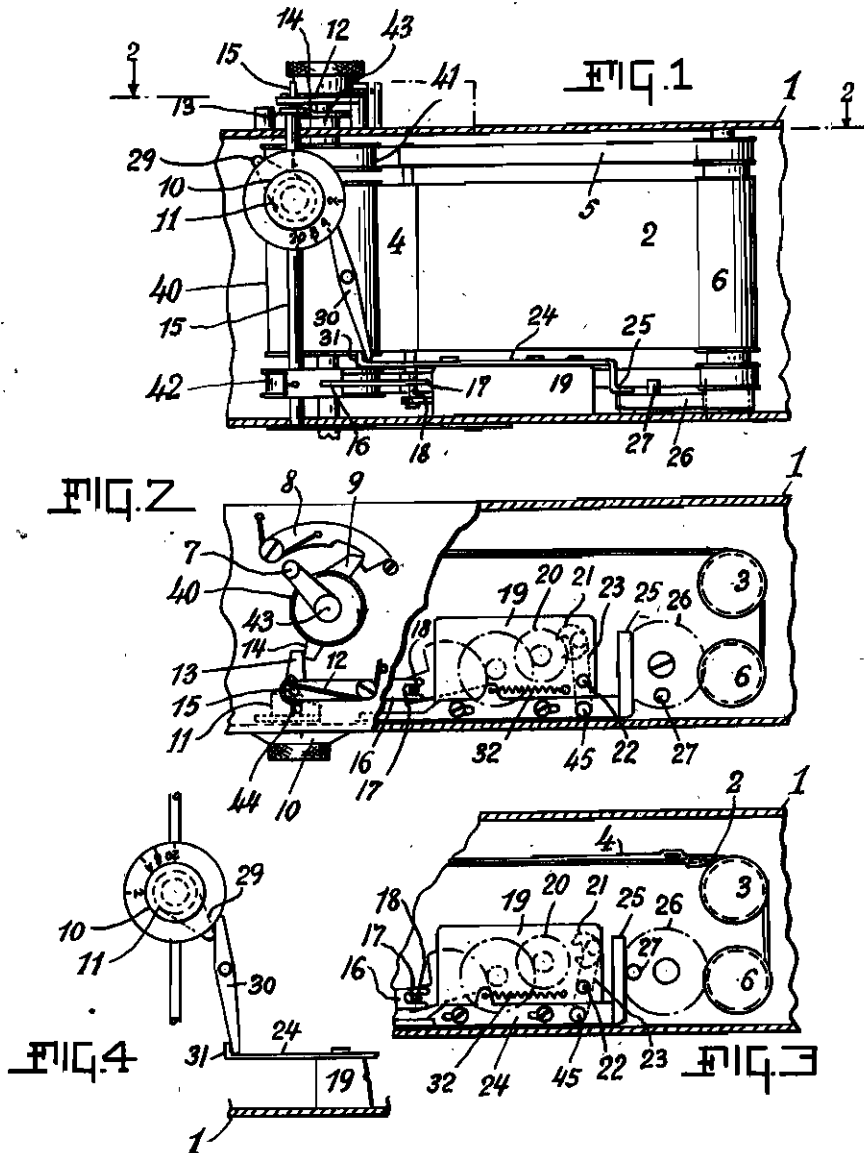
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PHOTOGRAPHIC FOCAL PLANE SHUTTERS

Filed July 16, 1941

Serial No

402,643



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PHOTOGRAPHIC FOCAL PLANE SHUTTERS

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Application filed July 16, 1941

This invention relates to focal plane shutters for photographic cameras in which the two shutter curtains are independently released and which also includes an escapement for retarding the movement of the second curtain in order to obtain longer exposures. If the camera is provided with a motor for rapid operation there may not be sufficient time for the escapement to be rewound or moved back into its starting position before the next release of the shutter. The object of the invention is to provide means for disengaging the escapement speed regulator from the escapement as soon as the second curtain is disengaged from the escapement and before the shutter has been rewound for the next exposure. The disengagement of the regulator permits the escapement to be rewound more quickly. The invention will be best understood by referring at once to the accompanying drawing in which

Fig. 1 is a view in elevation of a camera mechanism embodying the invention with parts in section and parts broken away. The mechanism is seen from the objective side or the front of the camera.

Fig. 2 is a sectional view of Fig. 1 taken substantially on the line 2—2 thereof.

Fig. 3 is a view of parts of Fig. 2 with some elements shown in a different position to illustrate the operation.

Fig. 4 is a detail view of certain parts shown in the other figures.

The camera and shutter mechanism are of the type shown in U. S. Patents 1,652,553, Dec. 13, 1927 and 2,122,671, July 5, 1938. The camera 1 is provided with a focal plane shutter consisting of a leading curtain 2 and a second follow up curtain 4 which are opened by the usual spring curtain rollers 8 and 3 respectively. When the shutter is closed the second curtain is wound up upon a curtain roller 40 and the first curtain is stretched across the exposure opening by ribbons which are wound upon the drums 41 and 42 secured to the shaft 43. Back of the curtain roller there is mounted a pawl 6 adapted to be engaged by a finger 9 for holding the second curtain immovable until said finger is released. The finger 9 is connected to move with the curtain roller 40 as indicated. The pawl 6 is pushed aside and the finger 9 released by another finger 7 which is connected to move with the curtain shaft 43. On the side of the curtain roller opposite the finger 9 the roller 40 carries a nose 14 which rotates with the roller when the second curtain is released. However, the rotary movement of the nose 14 may be delayed by an

arm 13 which is carried by a rod 15 which projects upwards through a guiding slot 44 in the camera, Fig. 2. A spring 12 urges the rod 15 outward into engagement with a cam 11 which is rotated or set with the slow timing knob 10. Near its bottom the rod 15 carries a lever arm 16 having a forked end 17 which engages a pin 18 on the first member or wheel of the escapement 19.

The arm 13 on the rod 15 is adjusted towards or away from the nose 14 by the rotation of the cam 11. If the arm 13 projects quite a distance into the path of the nose 14 the latter will require more time for pushing the arm aside and the movement of the second curtain is retarded accordingly. The action of the nose against the arm rotates the arm and the rod 15, hence also causes rotation of the lever arm 16 to start the escapement as will be understood. This happens when the second curtain is released.

The speed of the escapement is regulated by a regulator or pallet 21 which engages the last wheel 20 of the escapement. The pallet is carried by an arm 23 pivoted at 22 and pivotally engaged at 45 with a slide 24 having an arm 25. The latter may be engaged by a pin 27 on a gear 26 which meshes with a gear on the curtain spring roller 6.

When the shutter is released in the usual manner, not necessary to describe or illustrate because it is common knowledge in the art, the run off of the second curtain is retarded in accordance with the setting of the slow time knob 10, the setting of which through the cam 11, rod 15 and arm 13 times the disengagement of the nose 14 from the arm 13 and whereby the escapement is started as above described. The curtain ribbons are as usual wound upon the roller 8 and through rotation of the gear 26 the pin 27 contacts the slide part 25, Fig. 3, and pushes the slide leftwards whereby to disengage the pallet from the escapement so the latter can at once start its rewinding or return movement to be ready for the next exposure.

In the foregoing description it has been assumed that the knob 10 has been set for exposures more than 1/20 of a second as indicated in Figure 1 where the numeral "1" is uppermost. For such exposures it is clear that the run off of the second curtain is retarded to an extent which is regulated by the timed position of the arm 13. The curtain is retarded and the escapement is started as described and after the exposure the escapement pallet is automatically disengaged thereby providing a quick return movement of the escapement which is the object of the invention,

For exposure $1/20$ of a second the knob 10 is rotated anticlockwise to bring the numeral "20" uppermost as in Fig. 3. In this case the arm 13 is entirely removed from the path of the nose 14 and the curtain is not retarded. Additional means are provided to completely disengage the escapement from the shutter when the timing is set at $1/20$ of a second.

For this purpose the timing knob 16 carries a nose 26, Fig. 4, which, when the numeral "20" is opposite the usual index, not shown, engages a

pivoted lever 30 and rotates it clockwise so that the lower end of said lever by engagement with a hook 31 of the slide 24 pulls the latter so far to the left in Fig. 3 that it can no longer be engaged by the pin 27 on the gear 26. This arrangement also insures that the operation of the second curtain is not at all interfered with by the escapement for exposures less than $1/20$ of a second. Such lower exposures are set by the usual timing knob 46 on the top of the camera.

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