

## AMENDED SPECIFICATION

Reprinted as amended in accordance with the Decision of the Superintending Examiner, acting for the Comptroller-General, dated the fifth day of February, 1942, under Section II, of the Patents and Designs Acts, 1907 to 1942.

## PATENT SPECIFICATION



Application Date: Feb. 2, 1939. No. 3552/39.

524649

Complete Specification Accepted: Aug. 12, 1940.

### COMPLETE SPECIFICATION

#### Improvements in and relating to Photographic Roll-film Cameras

We, JOHAN STEENBERGEN, a Dutch subject, OTTO DIEBEL, a German citizen, HUGO FRAUENSTEIN, a German citizen, EMIL ENGLISCH, a German citizen, HERMANN SCHUBERT, a German citizen, and CONRAD KOCH, a German citizen, all trading at IHAGEE KAMERAWERK STEENBERGEN & COMPANY, of 24, Schandauer Strasse, Dresden, A.19, Germany, and KARL NÜCHTERLEIN, a German citizen, of 48, Warthaer Strasse, Dresden, A.9, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described in and by the following statement:—

This invention relates to improvements in photographic cameras and more particularly to a photographic roll-film camera including a cassette spool, a film-winding spool, a main winding shaft operable to wind up the film spool and also, if desired, to set the shutter, and a film guiding device in the form of a sprocket shaft, for engagement with the marginal perforations in the film, arranged in positive driving engagement with the main winding shaft, the film, after exposure, being adapted to be rewound on to the cassette spool.

In the case where the shutter is also set by the film winding shaft, it is desirable to provide a friction coupling between the film spool and the winding shaft so as to compensate for differences in the diameters of various film spools employed and enable, if necessary, the shutter setting operation to be continued beyond the finish of the film-winding movement.

Now, during the film rewinding operation, the main winding shaft is rotated, through the friction coupling if the latter is provided, in the reverse direction by the film spool, which is itself rotated directly by the pull on the film. The

sprocket shaft also rotates in the reverse or film-rewinding direction owing to its positive engagement with the main shaft and also owing to its engagement with the perforations in the film: Provided, therefore, that the main shaft is rotated at the same speed as the film spool, as will occur normally, the rewinding of the film will proceed smoothly.

If, however, for any reason, for example, the initial tightening of a loosely wound film, the film should move without rotating the winding shaft, or when a friction coupling is provided, owing to a sudden pull or jerk applied to the wound film, due to a sudden increase in the speed of rewinding, slip should occur between the film spool and the winding shaft, the sprocket shaft, which must rotate at a speed dependent on the speed of movement of the film, owing to its positive connection with the winding shaft, transmit its motion to the winding shaft, as a result of which the rewinding operation will be rendered more difficult and the film will be liable to be torn.

It is known to provide a photographic roll film camera of the kind set forth, wherein means are provided for disengaging the sprocket shaft from the film winding shaft, when the film is to be rewound on to the cassette spool.

According to this invention, in a photographic roll film camera of the above kind wherein means are provided for disengaging the sprocket shaft from the film-winding shaft when the film is to be rewound on to the cassette spool, we provide a pinion fixed on each of said sprocket and winding shafts, and an intermediate pinion normally engaging both the other two pinions and so mounted as to be disengageable from the pinion on the winding shaft. The intermediate pinion may be axially immovably mounted on a

[Price 1/-]

spindle slidably mounted in the frame of the camera, suitable means being provided for displacing the intermediate pinion out of engagement, such as a cam acting on one end of the spindle and operable by a manual control member, such as a key, having a projection or pin thereon engaging the cam, movement of the control member or key in one direction causing the cam to move the spindle, against the action of a spring thereon, to disengage the intermediate pinion from the winding shaft and free the sprocket shaft. This control member or key also, preferably at the same time, releases a pawl which normally engages a ratchet geared to the winding shaft and prevents the reverse rotation of the said shaft when the mechanism is set for winding the film forwards. Movement of the control member in the other direction re-engages the pawl with the ratchet and allows the intermediate pinion to re-engage the pinions on the film-winding and sprocket shafts.

In order that the invention may be fully understood, we shall now describe one embodiment thereof by way of example by reference to the accompanying drawings, in which:—

Fig. 1 is a general view of the operating mechanism of a roll film camera embodying the improvements in accordance with the invention,

Fig. 2 is a sectional view of a portion of the camera mechanism showing the means for driving the sprocket shaft, the intermediate pinion being shown in the engaged position;

Fig. 3 is a similar view to Fig. 2, but showing the intermediate pinion in the disengaged position and the sprocket shaft consequently free,

Fig. 4 is a plan view taken on the lines 4—4 of Fig. 2, and

Fig. 5 is a part sectional view taken on the line 5—5 of Fig. 2, showing the pawl and ratchet mechanism for locking the winding shaft against reverse rotation.

Referring first to Figures 1—4, 1 is a plate forming part of the frame of the camera in which is mounted a film-winding shaft 2, the lower end of which extends beneath the frame member 1 and carries a pinion 3 with which engages, through a friction coupling 4, a sleeve 5 which forms a headpiece for receiving the film-winding spool 6 shown in dotted lines in the drawing. The friction coupling serves to compensate for different diameters of film spools employed.

The film-winding shaft 2 can be operated in any desired manner for the winding of the film, for example, as shown, by means of a hand lever 7 through the medium of a one-way clutch 8, which,

however, forms no part of this invention. A further gear or pinion 9 is mounted on the said shaft for engagement with the shutter-winding mechanism so that the shutter 10 is also wound when the shaft 2 is rotated. As this shutter-winding mechanism forms no part of the invention, it has not been thought necessary to describe this in any greater detail. Fuller details of a camera embodying this mechanism will be found in the specification of co-pending Application No. 500,626 to which the reader is referred.

The frame plate 1 also carries at some distance from the shaft 2 a sprocket shaft 11 having thereon a pinion 12 and a pair of sprockets 13 which are adapted to engage the perforations in the film and serve to guide, and assist the movement of, the film during its winding movement. This sprocket shaft 11 is *per se* well known in the art.

Between the shafts 2 and 11 is located an intermediate pinion 14 which is carried on a spindle 15 slidably mounted in a sleeve 16 secured to the underside of the frame member 1. The spindle 15 extends upwardly through the frame member 1 and, surrounding the upwardly extending portion thereof, is a spring 17 which bears against the upper surface of a frame 1 and a flanged head portion 18 of the spindle 15. The said spring normally forces the spindle 15 in an upward direction and maintains the intermediate pinion 14 in engagement with the aforesaid pinions 3 and 12.

For the purpose of disengaging the pinion 14 from the pinion 3, a manual control member is provided consisting of a key 19 having a handle 20. The key 19 is formed as a sleeve which rotatably surrounds an upstanding pin or post 21 carried by the frame plate 1. This sleeve carries a laterally projecting pin 22. Located beneath the pin 22 of the sleeve-like key 19 is an archute-shaped disc-like member 23 having a depending projection 24 at one side thereof and forming a cam member for depressing the spindle 15. This arcuate disc-like member freely partly surrounds the key 19, the downward projection 24 bearing on the frame 1 and the opposite side of the disc normally resting on the head 18 of the spindle 15 of the intermediate pinion 14. The cam disc 23 thus normally, i.e. when the handle 20 is turned to the position shown in Figures 1 and 2, lies in an inclined or sloping position with respect to the frame plate 1 and the pin 22 is out of engagement with the disc member 23 so that there is no pressure on the spindle 15 with the result that the pinion 14 is in engagement with the pinions 3 and 12.

The camera mechanism is thus, in this position, set for winding-on the film for the purpose of making a further exposure.

5 If, now, it should be desired to rewind the film back on to the cassette spool 25, which is effected by means of a rewinding device 26 located at the opposite lower side of the camera and operable to rotate  
10 the cassette spool 25; the handle 20 is first turned into the position shown in Figure 3, whereby the pin 22 will be caused to slide over and depress the cam disc 23. Pressure is thus applied to the spindle 15  
15 and the latter is depressed against the action of its spring 17 whereby the intermediate pinion 14 is disengaged from the winding shaft pinion 3 and the sprocket shaft 11 becomes free to rotate independently of the winding shaft 2.  
20

On rotation of the cassette spool 25 to rewind the film, the sprocket shaft 11 will partake in the movement of the film. If, owing to the film having been loosely  
25 wound on the winding spool, a certain movement of the film in the reverse direction should take place before the spool 6 and the winding shaft 2 commence to rotate, or, by reason of a pull or jerk  
30 exerted on the film due to a sudden increase in the speed of re-winding, slip occurs between the film spool 6 and the winding shaft 2, which is possible owing to the presence of the friction coupling 4  
35 between these members, the sprocket shaft 11, being free, will merely partake in this movement irrespective of the movement, if any, of the winding shaft 2. If, however, the sprocket shaft 11 were not dis-  
40 engaged from the winding shaft 2, the sprocket shaft 11, on being rotated by the movement of the film, would transmit the movement to the winding shaft 2 with the result that the operation of rewinding  
45 would be rendered considerably more difficult and the film would be liable to be torn at the points of engagement of the sprockets 13 with the marginal perforations in the film. By disengaging the  
50 sprocket shaft 11 in accordance with this invention, any danger of tearing the film is entirely obviated.

The aforesaid mechanism for controlling the intermediate pinion 14 may also  
55 be employed to actuate a pawl and ratchet for locking the winding shaft against rotation in the reverse direction when the camera mechanism is set for picture-taking. Such an arrangement is illustrated in Figure 5.  
60

On the shaft 2 is arranged a pinion 27, with which engages a further pinion 28 carried on a spindle 29 mounted in the frame member 1. A pawl 30 is pivoted to  
65 the frame at 31 and is normally held in

engagement with the pinion 28 by means of a spring 32, thereby permitting forward rotation of the shaft 2 but preventing reverse rotation thereof. The lower end of the key 19 is cut away or slotted so as to  
70 form a shoulder 33 which, on the rotation of the said key 19 into the position shown in Figure 3 corresponding to the disengaged position of the pinion 14, bears against the free end of the pivoted pawl  
75 30 and moves the latter on its pivot, thereby disengaging it from the ratchet pinion 28. By this means, the winding shaft 2 is released for reverse rotation on the re-  
80 winding of the film. It will be understood that the free end of the pawl 30 in the engaged position lies within the recess formed in the key 19.

Having now particularly described and ascertained the nature of our said inven-  
85 tion and in what manner the same is to be performed, we declare that what we claim is:—

1. A photographic roll film camera including a cassette spool, a film-winding  
90 spool, a main winding shaft operable to wind up the film spool and also if desired to set the shutter, and a film guiding device in the form of a sprocket shaft for engagement with the marginal perforations  
95 in the film, arranged in positive driving engagement with the main winding shaft, the film, after exposure, being adapted to be rewound on to the cassette spool, wherein means are provided for disengaging the  
100 sprocket shaft from the film-winding shaft, when the film is to be rewound on to the cassette spool, the sprocket shaft being driven by the winding shaft through the medium of a pinion on each  
105 of the said shafts and an intermediate pinion normally engaging both the other pinions and being so mounted as to be disengageable from the pinion on the winding shaft for the purpose of un-  
110 coupling the sprocket shaft from the said winding shaft during rewinding of the film.

2. A photographic roll film camera as claimed in Claim 1, wherein the inter-  
115 mediate pinion is axially immovably mounted on a spindle slidably mounted in the frame of the camera.

3. A photographic roll film camera as claimed in Claim 2, wherein manually  
120 operable means are provided for displacing the intermediate pinion.

4. A photographic roll film camera as claimed in Claim 3, wherein the means  
125 comprises a cam acting on one end of the spindle and operable by a control member, such as a sleeve-like key surrounding an upstanding pin or post on the camera frame having thereon a projection or pin  
130 engaging the cam, such that the move-

ment of the said control member in one direction causes the cam to move the spindle, against the action of a spring thereon, to disengage the intermediate pinion and free the sprocket shaft.

5  
10  
15  
20  
25  
30  
35  
40  
45  
50  
55  
60  
65  
70  
75  
80  
85  
90  
95  
100  
105  
110  
115  
120  
125  
130  
135  
140  
145  
150  
155  
160  
165  
170  
175  
180  
185  
190  
195  
200  
205  
210  
215  
220  
225  
230  
235  
240  
245  
250  
255  
260  
265  
270  
275  
280  
285  
290  
295  
300  
305  
310  
315  
320  
325  
330  
335  
340  
345  
350  
355  
360  
365  
370  
375  
380  
385  
390  
395  
400  
405  
410  
415  
420  
425  
430  
435  
440  
445  
450  
455  
460  
465  
470  
475  
480  
485  
490  
495  
500  
505  
510  
515  
520  
525  
530  
535  
540  
545  
550  
555  
560  
565  
570  
575  
580  
585  
590  
595  
600  
605  
610  
615  
620  
625  
630  
635  
640  
645  
650  
655  
660  
665  
670  
675  
680  
685  
690  
695  
700  
705  
710  
715  
720  
725  
730  
735  
740  
745  
750  
755  
760  
765  
770  
775  
780  
785  
790  
795  
800  
805  
810  
815  
820  
825  
830  
835  
840  
845  
850  
855  
860  
865  
870  
875  
880  
885  
890  
895  
900  
905  
910  
915  
920  
925  
930  
935  
940  
945  
950  
955  
960  
965  
970  
975  
980  
985  
990  
995

5. A photographic roll-film camera as claimed in Claim 3 or 4, wherein the means for moving the intermediate pinion also actuates a pawl normally engaging a ratchet geared to the winding shaft and preventing reverse rotation of the said shaft, swinging of the control member of key in a direction to disengage the inter-

mediate pinion also releasing the pawl and thereby freeing the winding shaft for reverse rotation thereof. 15

6. A photographic roll-film camera embodying the improvement substantially as hereinbefore described and illustrated in the accompanying drawings. 20

Dated the 16th day of January, 1939.

S. SOKAL,

1, Great James Street, Bedford Row,  
London, W.C.1,

Chartered Patent Agent.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

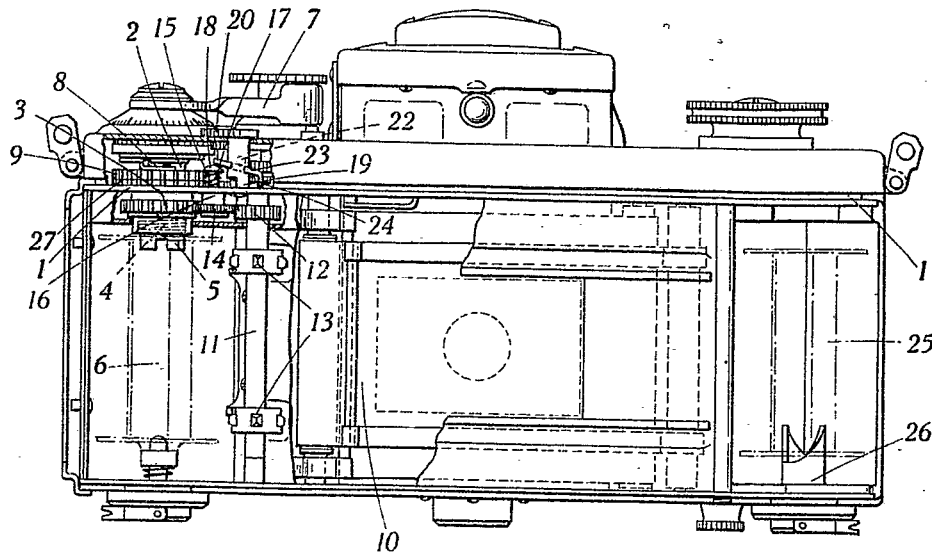


Fig. 2.

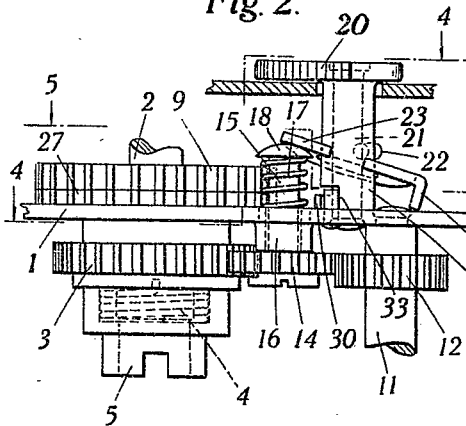


Fig. 3.

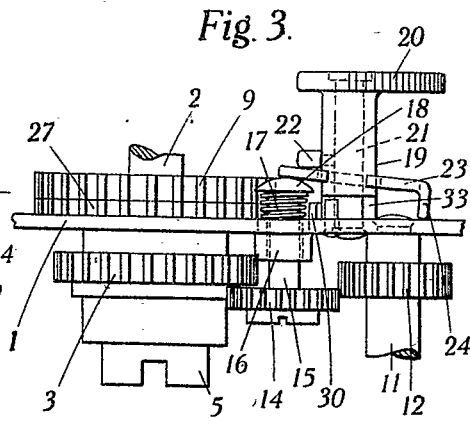


Fig. 4.

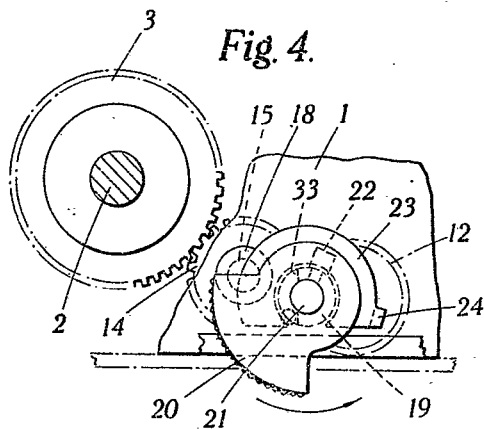


Fig. 5.

