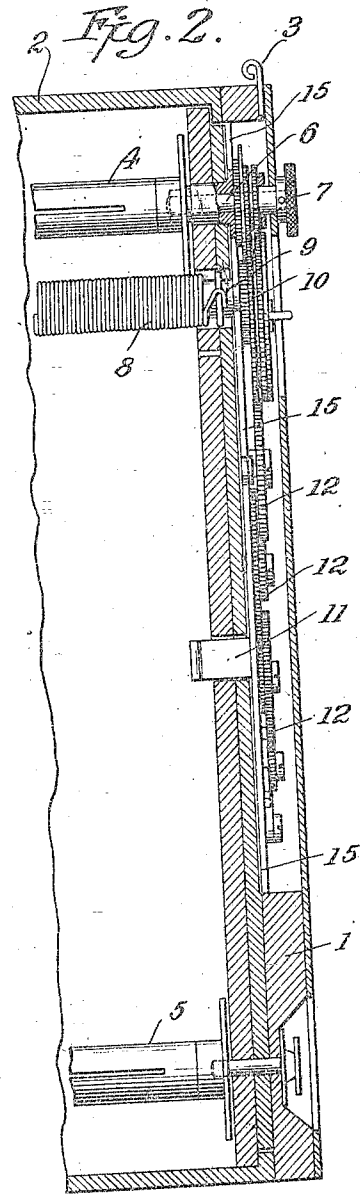
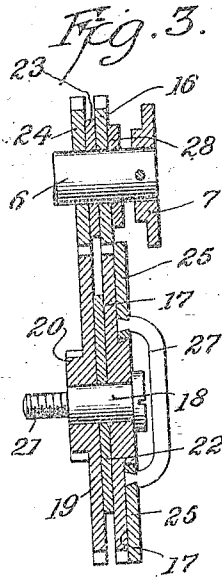
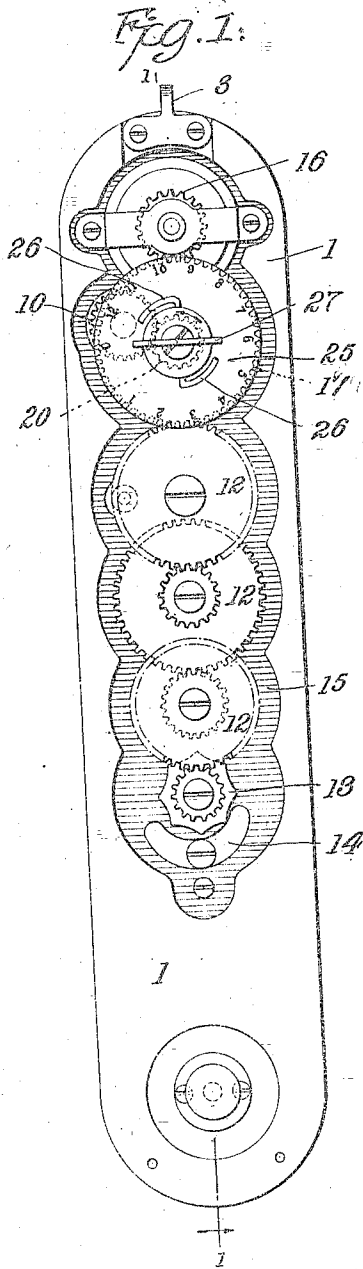


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 CAMERA.
 APPLICATION FILED JULY 29, 1916.

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1,216,543.



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CAMERA.

1,216,543.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CARL BORNEMANN and EZRA C. CLARK, both citizens of the United States, and both residents of the city of Binghamton, county of Broome, and State of New York, have invented certain new and useful Improvements in Cameras, of which the following is a specification, reference being had to the accompanying drawings.

This invention is an improvement upon that for which we filed application for Letters Patent of the United States December 17, 1915, Serial No. 67,314, to which we refer for a more complete disclosure of the details of construction and operation of the mechanism other than that immediately involved in this invention.

The purpose of this present invention, the same as that of the former one, is to provide a camera with means whereby the feeding of the film for making successive exposures may be automatic and yet under the perfect control of the operator, whereby great speed in the making of exposures is possible; and our former apparatus was provided, among other things, with an indicator which disclose the number of exposures that had been made on any given film and consequently the amount of unexposed film yet available to the operator for additional exposures; but that index was operated solely by the motor and only when it effected the movement of the film, so that if the operator at any time desired to make an exposure by hand, then inasmuch as the indicator was only operated when the motor was used, there was of course no record produced of such hand made exposure; consequently if the operator forgot to advance the indicator correspondingly with the number of his hand made exposures, then the indicator instead of being a guide correctly notifying the operator of the condition of his apparatus, might become affirmatively misleading, resulting in faulty, if not valueless exposures.

It is the purpose of this present invention therefore to equip an apparatus of the class stated with parts so constructed and

associated together that the indicator will properly record any exposure, whether effected through the instrumentality of the motor or by hand, thus under all circumstances serving as a safe guide to the operator.

Referring to the drawings, Figure 1 is an elevation of the side of a folding camera embodying our invention, the cover plate which will ordinarily protect the mechanism being removed; Fig. 2 is a vertical sectional view, some of the parts being shown in elevation, taken on the line 1-1 of Fig. 1; Fig. 3 is a longitudinal detail partly in elevation showing the parts more immediately involved in this invention.

In the drawings, 1 represents the body of the camera, 2 the removable back, 3 one of the supports for the usual carrying handle, 4 the winding spool, 5 the delivery spool, 6 the spindle for the winding spool, 7 the knurled thumbnut on the end of the spindle 6 whereby it may be conveniently turned by hand, 8 the motor, in this case a spring, as fully explained in said application, 9 the shaft for the motor, 10 the pinion on the end of the shaft, it being the main driving gear of the apparatus, 11 the tripping lever whereby the motor is released and stopped, 12 the chain of gearing, 13 the escapement, 14 the vibrator. These last two parts differ slightly from the construction shown in said pending application but their functions are the same. 15 is the base plate upon which we prefer to support the chain of gearing.

In our said previous invention the indicator plate was placed at the lower end of the chain of gearing and was actuated step by step by a pawl connected with and operated by the level 11, so that if that lever was not moved, which would be the case if the winding spool was actuated by hand instead of by the motor, then there would be no movement of the indicator disk, hence one or more exposures would have been made without any record thereof. Under this present construction therefore we transpose the indicator from the lower or tail end of the chain of gearing to or near to the

opposite end and supplement it by added parts which will now be described, as follows:

As stated above, 6 is the center for the winding spool. Its construction and method of operation are now so well understood as not to require explanation. 7 is the knurled thumbnut on its exposed outer end whereby it may be turned by hand. 16 is a small pinion mounted on and which turns with the spindle 6, and it gears into a larger gear 17, which is loosely mounted on the axis 18 of the larger gear 19, which is driven by the pinion 20, which latter is preferably integral with it, by the main driving gear 10 on the motor shaft. The axis 18 is preferably supported upon the base plate 15 by the threaded extension 21 thereof.

22 and 23 are mere spacing washers located between the gears. 24 is a gear on the center 6 whereby, as explained in said application, the take-up spool is rotated when the motor is employed. 25 is the index plate. It is provided, as seen best in Fig. 1, with a series of numerals, in the present instance 1 to 12. Other designations and of any desired number may be employed.

The index plate 25 is suitably supported upon the outer surface of the gear 17 in such manner that it may be turned thereon. We prefer to employ spring fingers 26 located between the gear 17 and the dial plate and so arranged in any known way that the dial plate will be frictionally held on the gear. We also provide the dial plate with a raised web or finger plate 27 whereby it may be conveniently turned. The spring friction fingers 26 may, if desired, be attached to the gear 17 and so shaped that they will take the necessary frictional bearing upon the dial plate. 28 is a washer or equivalent device which holds the gear 16 in position.

The operation is obvious. When the motor is used its driving pinion 10 will rotate the pinion 20 and the large gear 19, which is integral with the latter, and it in turn will rotate the gear 24 and through it the spindle 6 of the take-up spool, to which it is connected, in the manner explained in said pending application, whereby the spindle may be rotated by hand without rotating the chain of gearing, so that when the motor is used all parts associated with these two gears 19 and 24 will likewise rotate, that is to say; the washers 22 and 23, the gears 16 and 17, the dial plate 25 and the knurled thumbnut 7, will all simultaneously rotate to the extent that they are driven by the motor. When, however, it is desired to turn the winding spool, either for the purpose of making an exposure or otherwise, then by proper manipulation of the knurled thumbnut 7, the spindle 6 and the winding spool

connected with it, will be rotated in the same direction as before, but owing to the peculiar connection between the gear 24 and the spindle there will be no rotation of the chain of gearing, but the gear 16, which is fast upon the spindle 6, and through it the gear 17 carrying the dial plate 25 with it, because of the frictional connection between the two, will be rotated, so that the dial plate will properly register the number of exposures made, whether the take-up spool has been operated by the motor or by hand, and thus a correct record will be made whereby the operator may know with assurance the position of his film.

It will be obvious to those who are familiar with such matters that modifications may be made in the details of construction and to some extent their method of combination and yet the essentials of the invention be retained. We therefore do not limit ourselves to that which we have herein described and illustrated which shows one form only in which our invention may be constructed.

We claim:

1. A film roll camera having a take-up spool, a center for the spool, a motor located within the body of the camera box and in rear of the path of the film, means whereby the spool may be rotated both by the motor and by devices independent thereof, gearing upon the spool center actuated by the motor and also by said independent devices and an indicator operated by said gearing.

2. A film roll camera having a power driven take-up spool, means whereby the spool may be rotated in one direction independently of the power mechanism, a motor located within the body of the camera, an indicator actuated by the rotation of the spindle of the take-up spool, and means whereby the dial-plate of the indicator may be adjusted independently of the rest of the mechanism.

3. A film roll camera having a motor located in rear of the path of the film and entirely within the body of the camera box and which positively rotates the take-up spool in one direction, means to stop and start the motor at predetermined times, an indicator observable from the exterior of the camera, means independent of the motor whereby the spindle of the take-up spool may be rotated, and gearing so connecting the indicator with the said spindle that the indicator will be operated by the rotation of the spindle.

4. A film roll camera having a power driven take-up spool, a winding spindle for the spool, two gears, one fast and the other loose upon the winding spindle, an axis parallel with the spindle and two gears upon it, one of which engages with the loose gear

on the spindle and the other with the fast gear on the spindle.

5 A film roll camera having a power driven take-up spool, a winding spindle for the spool, two gears, one fast and the other loose upon the winding spindle, an axis parallel with the spindle, two gears upon the axis, one of which engages with the loose gear on the spindle and the other with the

fast gear on the spindle, an indicator plate 10 carried by the gear which engages with the fast gear on the spindle, and means whereby the dial plate may be adjusted relative to the other mechanism.

In testimony whereof we have signed our 15 names to this specification.

CARL BORNMANN.
EZRA C. CLARK.