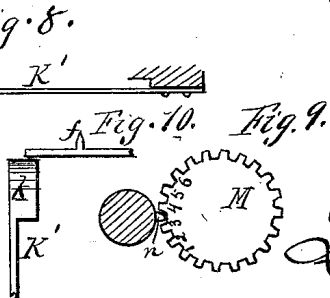
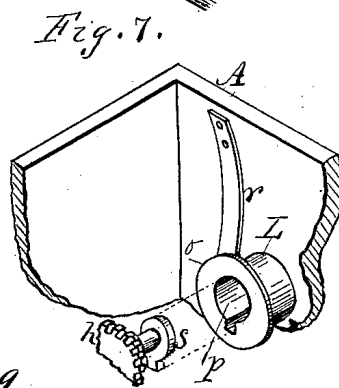
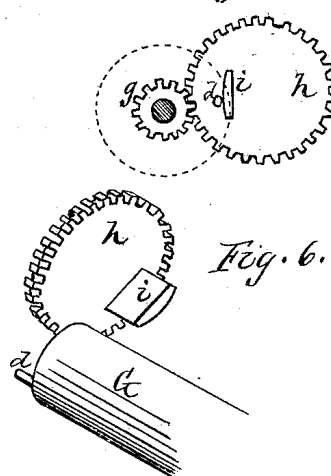
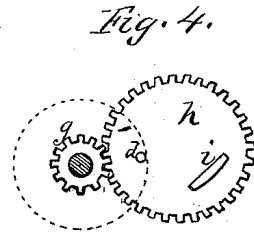
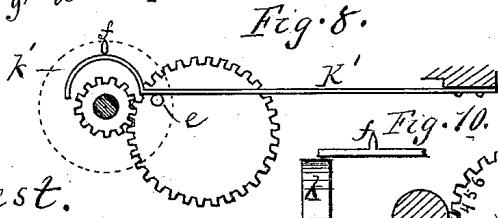
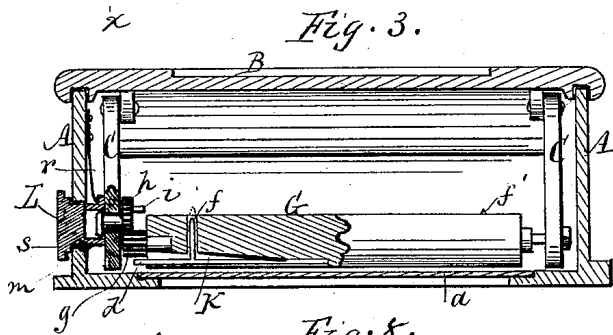
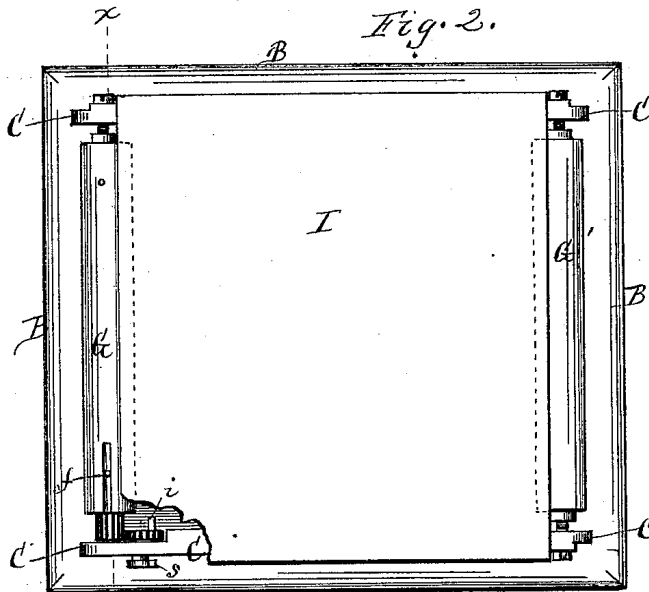
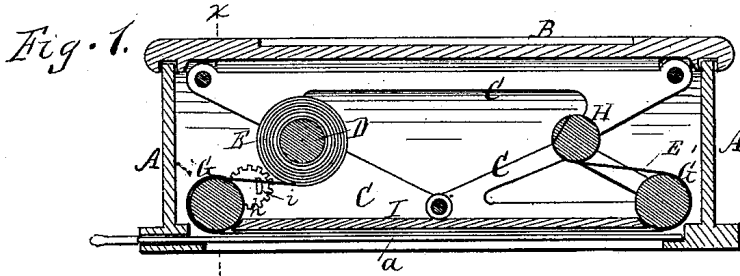


(No Model.)

L. H. BANNISTER.  
ROLLER HOLDER FOR PHOTOGRAPHIC FILMS.

No. 405,454.

Patented June 18, 1889.



Attest.  
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# UNITED STATES PATENT OFFICE.

LOUIS H. BANNISTER, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE EASTMAN DRY PLATE AND FILM COMPANY, OF SAME PLACE.

## ROLLER-HOLDER FOR PHOTOGRAPHIC FILMS.

SPECIFICATION forming part of Letters Patent No. 405,454, dated June 18, 1889.

Application filed August 3, 1885. Serial No. 173,370. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS H. BANNISTER, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Roller-Holders for Photographic Films; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the drawings accompanying this application.

My improvement relates to holders for photographic films in which the sensitive paper is wound upon a reel and passes over rollers in such a manner that exposures can be made in consecutive order by simply turning the rollers.

The invention consists in the following construction and arrangement:

In the drawings, Figure 1 is a central vertical section of the case across the rollers. Fig. 2 is a bottom view of the interior section of the device containing the frame and rollers, looking upward, a portion of the exposure-bed being broken away to show the gearing. Fig. 3 is a cross-section in lines  $x x$  of Figs. 1 and 2. Figs. 4 and 5 are diagrams of the gears for giving the automatic action to the pricking-point, Fig. 4 showing the point depressed or drawn into the guide-roller, and Fig. 5 showing it thrown out to produce the pricking action. Fig. 6 is a perspective view of the same parts. Fig. 7 is a perspective view of the sliding indicator and the key-head that engages with it. Fig. 8 is an elevation showing a modification of the devices for operating the pricking-point. Fig. 9 is an elevation of the indicating and registering attachment. Fig. 10 is a detail view.

The device is made up of two principal parts—a case A of square or rectangular form, provided with the exposure-slide  $a$  in one face and open on the other, and a cover B, that fits the open side, said cover being provided with a jointed frame C, that holds the rollers and other working parts on which the paper winds. These parts are fitted removably together, the cover fitting closely to the back of the case, and the rollers and other working parts projecting down loosely into the case, as shown.

D is a shaft forming the reel upon which the roll of sensitive paper E is wound.

G G' are two guiding-rollers at opposite sides, and H is a take-up roller, on which the paper is wound from the reel.

I is a flat bed between the rollers G G', which forms the exposure-surface next the slide  $a$ . The paper, as it is unwound from the reel, passes around the measuring-roller G, thence over the flat bed I, thence around the guide-roller G, and finally around the take-up roller H. By turning the mechanism the paper can be wound up as fast as the exposures are made. Thus far the apparatus is similar to that shown in Patents Nos. 316,933, 317,049, and 317,050, May 5, 1885.

My improvement is as follows:

K is a spring arm or lever secured in a recess in one end of the measuring-roller G, provided with an end  $d$ , that projects beyond the end of the roller. The spring-arm is also provided with a pricking-point  $f$ , that projects through a hole in the roller and opens on the opposite side. In its normal condition the point is depressed within the surface of the roller; but when actuated by the means hereinafter described it is made to project beyond and prick a hole through the paper that passes around the measuring-roller.

$g$  is a small spur-pinion on the end of the roller G, and  $h$  is a spur gear-wheel that engages therewith, the gear-wheel being pivoted in one side of the frame C and resting in a countersink therein, as shown most clearly in Fig. 2. This gear-wheel on the inside is provided with a wing  $i$ , Fig. 6, which stands outward in the path of the projecting end  $d$  of the spring-arm K. It will be seen that the pinion will make several revolutions while the gear-wheel is making one, owing to the disproportion in size. Therefore during most of the rotation of the gear-wheel the wing  $i$  will be turned away from or out of the path of the projection  $d$ , as shown in Fig. 4. Therefore the roller G will revolve and feed the film along without throwing out the pricking-point  $f$ ; but at one point in the rotation of the gear-wheel the wing  $i$  will be brought within the path of the projection  $d$ , and the latter will strike it, as shown in Fig. 5, thereby depressing the spring-arm K in the roller, and causing the prick-point  $f$  to protrude on

the opposite side of the roller and prick a hole in the paper. The intervals at which the prick-point is protruded are such that a full exposure of the paper is run off before being pricked, the prick-marks thus indicating the line of separation between the exposures. A stationary prick-point  $f'$  may be used at the opposite end of the roller, which will leave a light mark at each revolution, but not such as to mar the paper, and this will serve, together with the prick-mark at the other end, to draw the dividing-line between the exposures. Another form is shown in Fig. 8, in which a pin  $e$  on the gear-wheel  $h$  strikes and raises a lever  $K'$ , that has a curved head  $k'$ , over which the projecting end of the spring-arm rides, thereby raising the prick-point in contact with the paper. The advantage of the arrangement before described is that it is automatic in movement, so that when a certain determinate number of revolutions have been given, and which can be known by a suitable indicator on the outside, or by an alarm of any suitable kind, it will be known to the operator that one exposure of the paper has been removed and the next one is in position.

$L$  is a cylindrical collar, that I denominate the "indicator," which rests closely but freely in an opening in the exterior case  $A$  and in axial line with the gear-wheel  $h$ . On the outer end of the indicator is a milled head  $m$ , by which it is operated by the fingers. The cylindrical neck that rests in the side of the case is of such length as to allow a certain degree of end movement in and out, and it is also provided outside the case with a single tooth or spur  $n$ , Fig. 9, that engages with a toothed registering-wheel  $M$ , pivoted outside the case, this registering-wheel being provided with numbers from 1 upward corresponding with the teeth, as shown. On the inner end of the indicator  $L$  is a rim  $o$ , and in its inner end is a key-hole socket  $p$ , Fig. 7.  $r$  is a flat or coiled spring pressing against the inner rim  $o$  of the indicator and having a tendency to throw it inward to the farthest extent.

$s$  is a key-shaped head on the outer end of the shaft of the gear  $h$ , which comes in line with and rests in the key-hole socket  $b$  when the parts are engaged together.

Any suitable means may be used to indicate the revolutions of the indicator, either a mark on the indicator that registers with a corresponding mark on the case or an alarm of any kind.

The advantage of this arrangement is that it allows a ready connection and disconnection of the measuring-roller  $G$  with an indicating and registering device on the outside without enlarging the case or producing loose action of the interior section. The exterior case  $A$  has to be of determinate size in order to fit the camera, and the interior frame  $C$  must also be made close-fitting to the box; hence in order to insert the frame into the

box the indicator  $L$  must have end movement, first being drawn out to enable the frame  $C$  to be inserted, and then being pushed in to make the connection with the gearing. To insert the frame, the indicator is first drawn out, and is then turned around till the key coincides with the key-hole socket, and is then pushed in to make the engagement.

Of course the relative disproportion of the gears  $g$   $h$  may be varied at pleasure, according to the size of the exposures to be made. Each revolution of the indicator  $L$  will measure one exposure, and the number of exposures will be registered by the wheel  $M$  as each revolution of the collar moves the registering-wheel forward one notch.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a roller-holder for photographic films, the combination, with the measuring-roller, of a spring or lever carrying a pricking-point, a pinion on the shaft of the roller, and a gear with which the pinion engages, provided with a device by which the pricking-point is projected at intervals to mark the line of separation between the exposures of the film, as set forth.

2. In a roller-holder for photographic films, the combination, with the measuring-roller, of a spring or lever carrying a pricking-point, a pinion on the shaft of the roller, a gear with which the pinion engages, provided with a device by which the pricking-point is projected at intervals to mark the line of separation between the exposures of the film, and an indicator connected with gear from the outside, whereby each turn of the indicator will indicate an exposure, as set forth.

3. In a roller-holder for photographic films, the combination, with the measuring-roller  $G$ , of the spring or lever  $K$ , provided with the projecting end  $d$ , the pinion  $g$  on the shaft of the roller, and the gear  $h$ , with which the pinion engages, said gear being provided with a wing  $i$ , which is intermittently brought in position to depress the spring-arm and project the pricking-point, as herein shown and described.

4. In a roller-holder for photographic films, the combination, with the measuring-roller, of a spring or lever carrying a pricking-point, a pinion on the roller, a gear with which the pinion engages, provided with a device by which the pricking-point is projected at intervals to mark the line of separation between the exposures of the film, and an indicator connected with the gear from the outside, said indicator having a degree of free end movement and provided with a key-hole socket at its inner end, and the gear provided with a key-head to engage with said socket, as set forth.

5. In a roller-holder such as described, the combination, with a roller actuated by contact with the film, of a film-marker and devices intermediate the roller and marker for actuating the latter, substantially as described.

6. In a roller-holder, and in combination with the film supporting and feeding devices and a roller moving in unison with the film as the latter is advanced or fed, a film-marker  
5 and actuating mechanism therefor deriving motion from said roller, substantially as described.

7. In a roller-holder such as described, and in combination with the measuring-roller  
10 thereof, a film-marker rotating in unison with the measuring-roller and caused to engage the film at regular intervals occurring after two or more rotations of the measuring-roller, substantially as described.

15 8. In a roller-holder such as described, and in combination with the measuring-roller thereof, a film-marker moving in unison with the measuring-roller and held normally from contact with the film during the rotation of

the roller, and devices operating upon said  
20 marker to bring it into contact with the film at intervals, substantially as described.

9. In a roller-holder such as described, and in combination with the film actuating and measuring devices, a reciprocating marker  
25 held normally removed from the film, and actuating mechanism connected to the measuring devices and operating to project the marker toward the film, substantially as and  
30 for the purpose specified.

In witness whereof I have hereunto signed  
my name in the presence of two subscribing  
witnesses.

LOUIS H. BANNISTER.

Witnesses:

E. STARING,  
R. F. OSGOOD.