

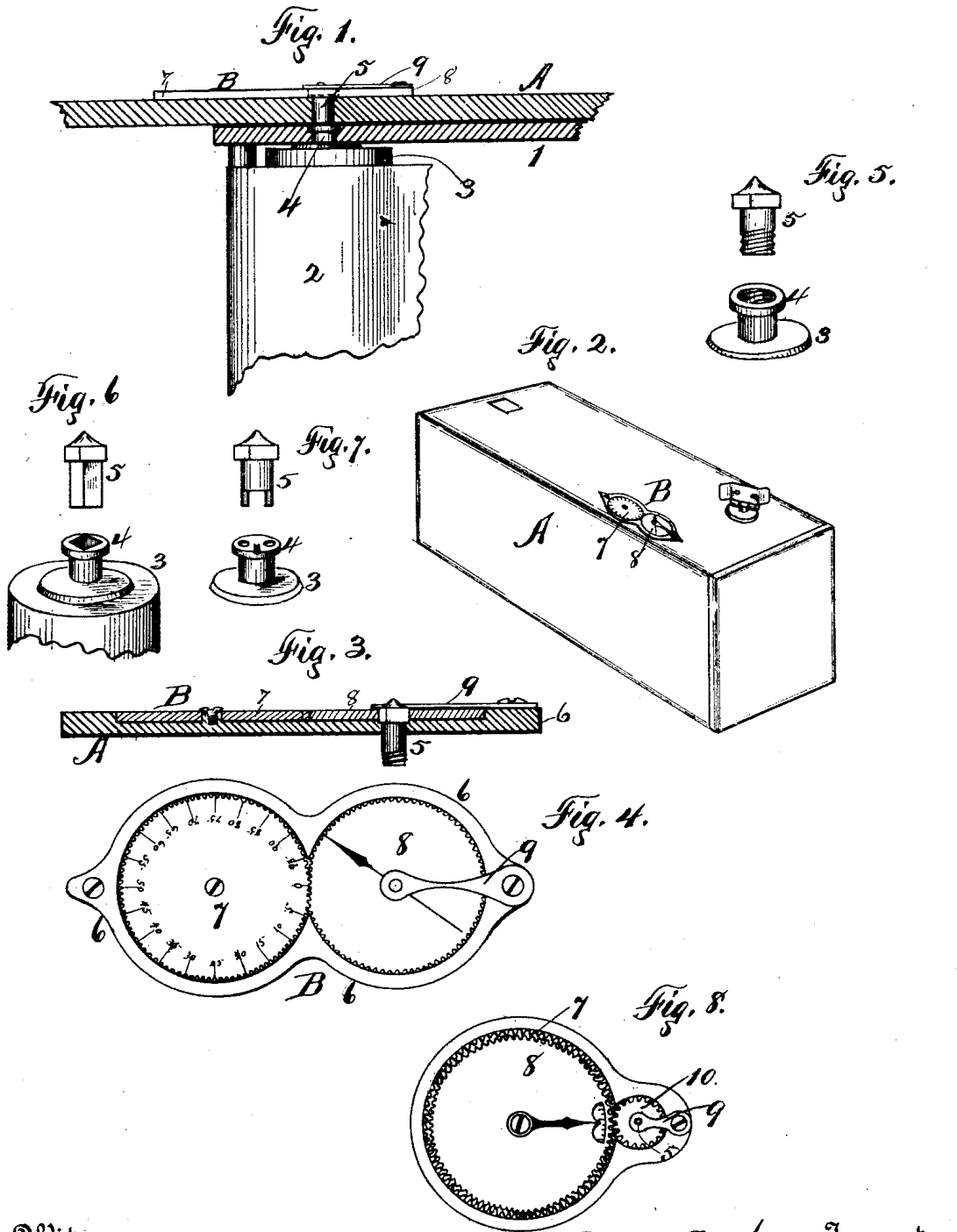
(No Model.)

E. E. MOORE.

AUTOMATIC REGISTERING PHOTOGRAPHIC APPARATUS.

No. 459,411.

Patented Sept. 15, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

ELLIS E. MOORE, OF SYRACUSE, NEW YORK.

AUTOMATIC REGISTERING PHOTOGRAPHIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 459,411, dated September 15, 1891.

Application filed January 6, 1891. Serial No. 376,850. (No model.)

To all whom it may concern:

Be it known that I, ELLIS E. MOORE, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Automatic Registering Photographic Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to devices for automatically registering and indicating the number of exposures made in a photographic apparatus adapted to use a continuous strip or sheet of film or sensitized paper of any kind, which is mounted upon rolls in a frame which is detachable from the case or otherwise.

My object is to register the successive exposures and numerically indicate them, so that the operator can always know the exact number he has remaining not used by means of a geared and numbered disk or dial and a differential feed-gear meshing therewith and actuated by the rotation of the axis of an idler-roll, upon which the feed-gear is mounted and which is frictionally rotated by the contact of the sheet of film therewith whenever the sheet is moved by the winding up of it onto the winding-roll after each exposure.

My invention consists in the several novel features of construction and operation hereinafter described, and which are specifically set forth in the claims hereto annexed. It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of the idler-roll, the film-sheet, a longitudinal section of part of the casing, and of the detachable film-holding frame, and an edge view of the register. Fig. 2 is an isometrical elevation of a camera with my register attached thereto. Fig. 3 is a vertical longitudinal section of the register detached. Fig. 4 is a top plan view of the same. Fig. 5 is a detail of the end of the axis of the idler and of the screw-pin detachably connecting the differential feed-gear to the register. Fig. 6 is a like view of the same parts differing somewhat in their construction from that shown in Fig. 5. Fig. 7 is a like view of the same parts, showing still another construction. Fig. 8 is a top plan of a register in which the differential feed-gear is mounted on top of the registering-dial and geared pinions

mounted upon the axis of the idler-roll and engaging with both said gear and said dial, an opening being cut through the differential gear to permit the inspection of the figures upon the registering-dial.

A is the camera, and 1 is a side of the frame holding the film 2, said frame not being shown in full, as it is of ordinary construction and is not a part of my invention.

An idler-roller 3 is journaled upon the axis 4 in the sides of said frame, and the film passes over it and bears with frictional contact against it, so that said roller is rotated by the winding up of the film after an exposure is made in the usual manner. One end of this axis is either drilled and screw-threaded to receive the threaded axial extension 5 or made with an angular mortise to receive an extension of like form, or with two or more recesses to receive pins or studs upon the inner end of such extension, and all these forms of such extension are detachable from the axis. The outer end of this extension is squared, as shown, for the reasons hereinafter stated.

B is the register, comprising a casing 6, recessed to receive the registering-dial 7, geared on its periphery, and provided with the figures on its outer face, substantially as shown, and also to receive the differential feed-gear 8. The registering-dial is mounted upon a central pivot. The feed-gear 8 is provided with a central opening of proper form and size to fit upon the angular extension of the axis, or is otherwise secured thereto. An arm 9, mounted upon the case, extends over the center of the differential gear and affords a bearing for the outer end of the axial extension when desired. A pointer integral with the differential gear indicates when it has made a full revolution, and also when the idler-roller has made a full rotation, and also when the paper has been moved the length of one negative, said roller being of a circumference equal to said length of a negative. The registering-dial, as shown, has one hundred teeth or cogs, and the differential feed-gear has one less, so that when the feed-gear makes a full revolution, as indicated as aforesaid, the registering-dial will revolve one cog less than a full revolution, and thus register one upon it with each revolution of said feed-gear.

When I wish to remove the frame from the camera, I remove the extension, and replace it when the frame is replaced.

In Fig. 8 the feed-gear is on top of the registering-dial, and both are mounted upon a single central pivot. A geared pinion 10 engages with the feed-gear. A smaller geared pinion under the pinion 10 engages with the registering-dial, and both pinions are mounted upon the axial extensions and rotated by its rotation. In this construction there is one less cog upon the feed-gear than upon the dial, and said gear has a perforation exposing the figures upon the dial; also, it requires several rotations of the pinions to rotate the feed-gear a full revolution and the dial one cog less than a full revolution and the size of the idler-roller should be reduced in proportion to the difference in the diameters of the feed-gear and the pinion 10; also, both of these pinions should have the same number of cogs. The effect of this latter differential rotation of the feed-gear and the dial is to shift the dial one figure each rota-

tion, as in the other construction. The register is secured to the camera-case by screws, as shown. 25

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the camera and the frame carrying the negative-film, the roller in said frame, and the removable extension of the axis of said roller, of differential feed and registering gears actuated by the rotation of said roller. 30 35

2. Differential feed and registering gears in engagement, in combination with an idler engaging therewith and mounted upon and rotated by the rotation of the removable outer section of the axis of the film-roller in a camera. 40

In witness whereof I have hereunto set my hand this 18th day of November, 1890.

ELLIS E. MOORE.

Witnesses:

H. P. DENISON,
C. W. SMITH.