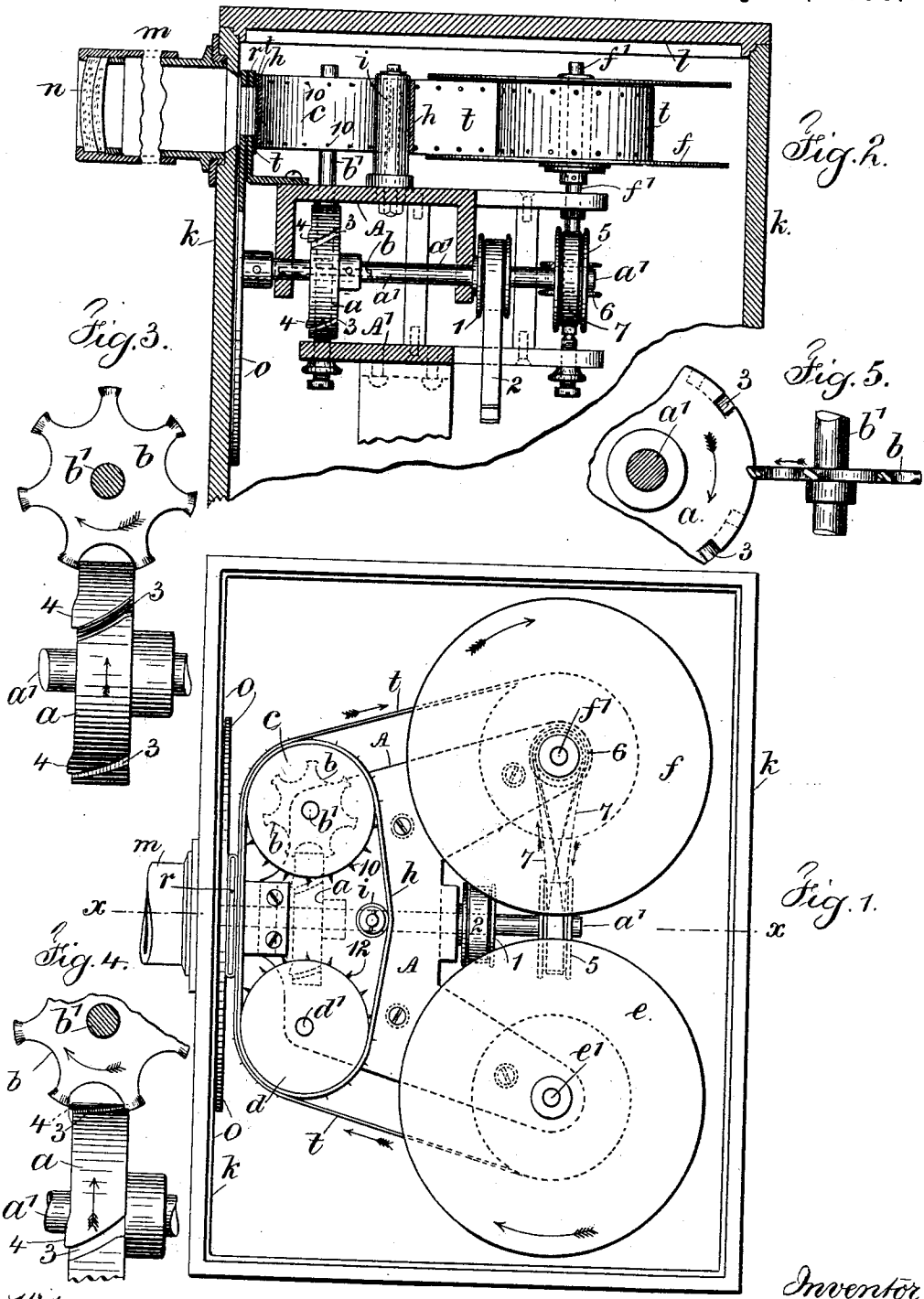


(No Model.)

A. N. PETIT.  
SERIES PHOTOGRAPHIC CAMERA.

No. 560,424.

Patented May 19, 1896.



Witnesses  
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# UNITED STATES PATENT OFFICE,

ADEMOR N. PETIT, OF ROSEVILLE, NEW JERSEY, ASSIGNOR TO HIMSELF,  
AND JOSEPH LIVINGSTON, OF NEW YORK, N. Y.

## SERIES PHOTOGRAPHIC CAMERA.

SPECIFICATION forming part of Letters Patent No. 560,424, dated May 19, 1896.

Application filed July 16, 1895. Serial No. 556,153. (No model.)

*To all whom it may concern:*

Be it known that I, ADEMOR N. PETIT, a citizen of the United States, residing at Roseville, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Intermittent Feeding Devices for Photographic Films, of which the following is a specification.

My invention relates to a photographic camera employing a considerable continuous length of sensitive film upon which are photographed rapidly-moving objects in their various natural and successive positions of movement, so that the same can be thereafter reproduced for spectacular purposes.

My invention relates particularly to devices for imparting an intermittent feeding movement to the sensitive film, or, in other words, to feed forward the film and momentarily stop the same while the exposure is made and to continuously repeat such movements and keep the strip of sensitive film straight, flat, and smooth, especially at the point where the exposures are successively made.

In carrying out my invention I employ a power-wheel upon a shaft driven by any suitable mechanism. This wheel has grooves across its periphery, and I provide a feed-wheel in a plane at right angles to that of the power-wheel, and this feed-wheel has teeth that stop against the edge of the power-wheel and are passed across the face of the power-wheel through its grooves. I prefer to make the feed-wheel with teeth and the power-wheel of such a width that two adjacent teeth of the feed-wheel come at opposite edges of or straddle the power-wheel. I also provide upon the shaft of the feed-wheel a drum having circumferential rows of pins near the respective edges and upon another shaft a corresponding drum and around the two drums an endless band with perforations for the pins and an adjustable roller for keeping the band taut. I provide spools for the strip of sensitive film—one from which the film is delivered for exposure and another upon which the film is wound after exposure and which is driven by a friction-band from a pulley on the shaft of the power-wheel. This band slips when the film-strip is stopped and winds it up when released and maintains a tension

on the film-strip. I prefer to have the film-strips perforated along the edges to engage the pins of the drums. I also employ a lens, lens tube and shutter, and a plate with an opening and behind which the film from the roll is drawn along with and upon the face of the endless band.

In the drawings, Figure 1 is a plan view representing my improvements. Fig. 2 is a vertical section and partial elevation at the line *x x*. Fig. 3 is a plan view of the power and feed wheels on a larger scale. Fig. 4 is a partial plan view of said parts in a different position, and Fig. 5 is an elevation of the power and feed wheels. Figs. 3, 4, and 5 show the same parts on a larger scale than the other figures.

My improved intermittent feeding device is supported by frames *A A'* and preferably contained within a box *k*, having a cover *l*, a lens-tube *m*, and lens *n*. A shutter *o* is employed and is connected to and rotated by the power-wheel shaft *a'*, and the shutter passes between the inner surface of the box and a plate *r*, fastened to the frame *A* and having an opening opposite the lens-tube. The frames *A A'* are supported by the frame carrying the power mechanism, and the same is not shown in the drawings. These parts just enumerated are employed in connection with my invention, but form no essential part of the same, as some or all of them have been used before.

The power-wheel *a* is upon a horizontal shaft *a'*, supported by the frame *A*, and upon this shaft is a pulley 1, and a belt 2 from a driving mechanism of any suitable character passes over the pulley 1 to rotate the power-wheel *a*. This power-wheel *a* is made with equidistant grooves 3 cut in and across its periphery. The edge of the wheel at the receding end of each groove is made with cam projections 4.

The feed-wheel *b* is upon a vertical shaft *b'*, passing through the frame *A* and having a bearing therein and in the frame *A'*. This feed-wheel is made with teeth projecting beyond its periphery, which teeth are preferably made diverging—that is, the adjacent edges of adjoining teeth are parallel, as seen in Figs. 3 and 4, and the other surfaces of the

teeth are inclined, as seen in the edge view, Fig. 5. The spaces between the teeth of the feed-wheel *b* are just sufficient to receive and straddle the periphery or rim of the power-wheel *a*, and while the power-wheel is moving between the teeth of the feed-wheel from one groove 3 to the next there is no movement of the feed-wheel or parts operated thereby; but as soon as the advancing end of an inclined groove comes to a tooth the cam projection 4 on the other edge of the wheel acts on its adjacent tooth, moving it away, and the first-named tooth enters the groove 3, and it is acted upon by the power-wheel and moved across its face, thus turning the feed-wheel one tooth at a time.

Upon the shaft *b'* of the feed-wheel is a drum *c*, having upon its surface and near the top and bottom edges ranges of equidistant pins 10. I provide another drum *d* of similar construction to the drum *c*. This drum *d* is upon a shaft *d'*, having bearings in the frames *A A'* and has a series of equidistant pins 12 corresponding to the pins 10 on the drum *c*. An endless belt *h* of flexible and non-elastic material, such as parchment or rawhide, passes around said drums and over an adjustable tension-roller *i*, connected to the frame *A*. This belt is perforated along its edges with holes that coincide with the pins 10 and 12 of the drums *c d*, and the rotation of the drum *c*, by means of the belt *h*, causes the drum *d* to rotate. I employ companion spools *e f* upon shafts *e' f'*, having bearings in the frames *A A'*, and the long continuous strip of sensitive film *t* is stored on the spool *e* and passes from there around the drums *d c* upon the surface of the belt *h* to the receiving-spool *f*, and in so doing passes back of the plate *r*, having the opening. The film *t* is approximately as wide as the endless belt *h*, and it is provided along its edges with equidistant holes to receive the pins 10 and 12 of the drums. A tension is thus put upon the strip of film which keeps it out straight, and it is caused to move along progressively with the belt *h* by the action of the feed-wheel. I provide a pulley 5 on the power-shaft *a'* and a pulley 6 on the spool-shaft *f'*, and a belt 7 passes around said pulleys, and said belt receives a constant movement from the power-shaft and its larger pulley 5, the action of which is to keep the film *t* taut on the drum *f* as the belt slips on the pulley 6; but the moment the feed-wheel operates to draw the film forward for a fresh place to be exposed this belt causes the spool *f* to rotate and take up the slack film.

The shutter *o* is preferably a disk of hard rubber on the power-shaft, having as many openings as there are blank spaces on the power-wheel *a* between the grooves and agreeing in position with these spaces—that is, the film *t* is moved forward a distance equal to the length of the opening in the plate *r* each time a tooth of the feed-wheel *b* passes through a groove of the power-wheel *a*, and at this

time the imperforate portion of the shutter is passing across the opening in the said plate and excluding the light. While the teeth of the feed-wheel are held by the power-wheel between its grooves the film is at rest, and at this time the opening in the shutter moves over the opening in the plate *r* and exposes the film. These operations are repeated alternately and at any desired speed, according to the power applied.

It is obvious that the power-wheel and the feed-wheel as two devices that operate together are capable of imparting motion as an actuating mechanism in other relations to that shown in the present application.

I claim as my invention—

1. The combination with a power-shaft adapted to being rotated, of a power-wheel upon said shaft having equidistant grooves in and extending diagonally across its periphery and cam projections on one side and adjacent to one end of said grooves, a shaft and a feed-wheel thereon having inclined teeth with the adjacent edges of adjoining teeth parallel and at opposite sides of or straddling the power-wheel whereby the feed-wheel is held and then moved progressively as the teeth pass one at a time through the grooves of the power-wheel, substantially as set forth.

2. The combination with a power-shaft and power-wheel, of a feeding-wheel engaging the power-wheel and to which an intermittent feeding motion is imparted, a shaft for the feeding-wheel and a drum mounted thereon, an adjacent shaft and drum and an endless belt passing around said drums, a spool for a long continuous strip of sensitive film, the film passing over the surface of the endless belt and another spool for winding up the film, substantially as set forth.

3. The combination with a power-shaft and power-wheel, of a feeding-wheel engaging the power-wheel and to which an intermittent motion is imparted, a shaft for the feeding-wheel and a drum mounted thereon and having equidistant pins in ranges near the top and bottom edges, an adjacent shaft and similar drum mounted thereon, a tension-roller and endless belt having edge perforations agreeing with the pins and passing around the drums and tension-roller, a film-storage spool and a receiving-spool and their shafts for receiving a long continuous strip of sensitive film having edge perforations also agreeing with the pins and passing over the surface of the belt, substantially as set forth.

4. The combination with a power-shaft and power-wheel, of a feeding-wheel engaging the power-wheel and to which an intermittent motion is imparted, a shaft for the feeding-wheel and a drum mounted thereon having equidistant pins in ranges near the top and bottom edges, an adjacent shaft and similar drum mounted thereon, a tension-roller and endless belt having edge perforations agreeing with the pins and passing around the drums and tension-roller, a film-storage spool

and a receiving-spool and their shafts for receiving a long continuous strip of sensitive film having edge perforations also agreeing with the pins and passing over the surface of the belt, and a pulley 5 on the power-shaft, a pulley 6 on the shaft *f'* of the spool *f*, and a belt 7 passing over said pulleys for applying a tension and intermittently rotating the spool *f*, substantially as set forth.

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5. The combination with a power-shaft adapted to being rotated, of a power-wheel upon said shaft having equidistant grooves in and extending diagonally across its periphery, a shaft and a feed-wheel thereon having teeth bearing against the edges of the power-

wheel and adapted one at a time to pass through the grooves of the power-wheel as the wheel is progressively rotated, a drum upon the shaft of the feed-wheel, an adjacent drum and a shaft therefor, an endless belt passing around the drums and adapted to receive a long sensitive film, a spool from which the film is delivered and a spool for receiving the film, substantially as set forth.

Signed by me this 12th day of July, A. D. 1895.

A. N. PETTIT.

Witnesses:

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HAROLD SERRELL.