

(No Model.)

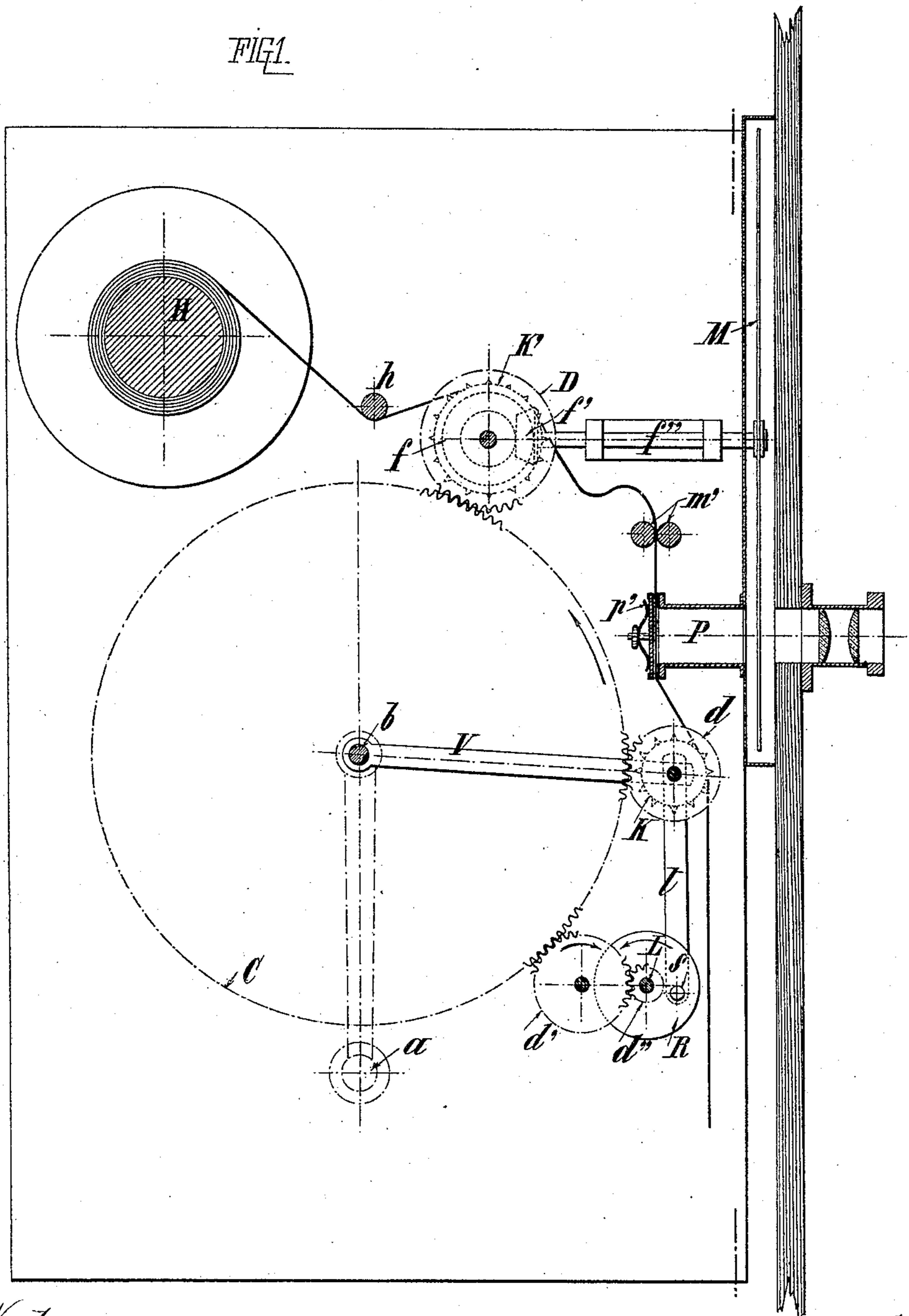
2 Sheets—Sheet 1.

M. J. H. JOLY.
KINETOGRAPHIC CAMERA.

No. 574,851.

Patented Jan. 5, 1897.

FIG. 1.



Witnesses
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Inventor
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by J. J. Mauro,
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(No Model.)

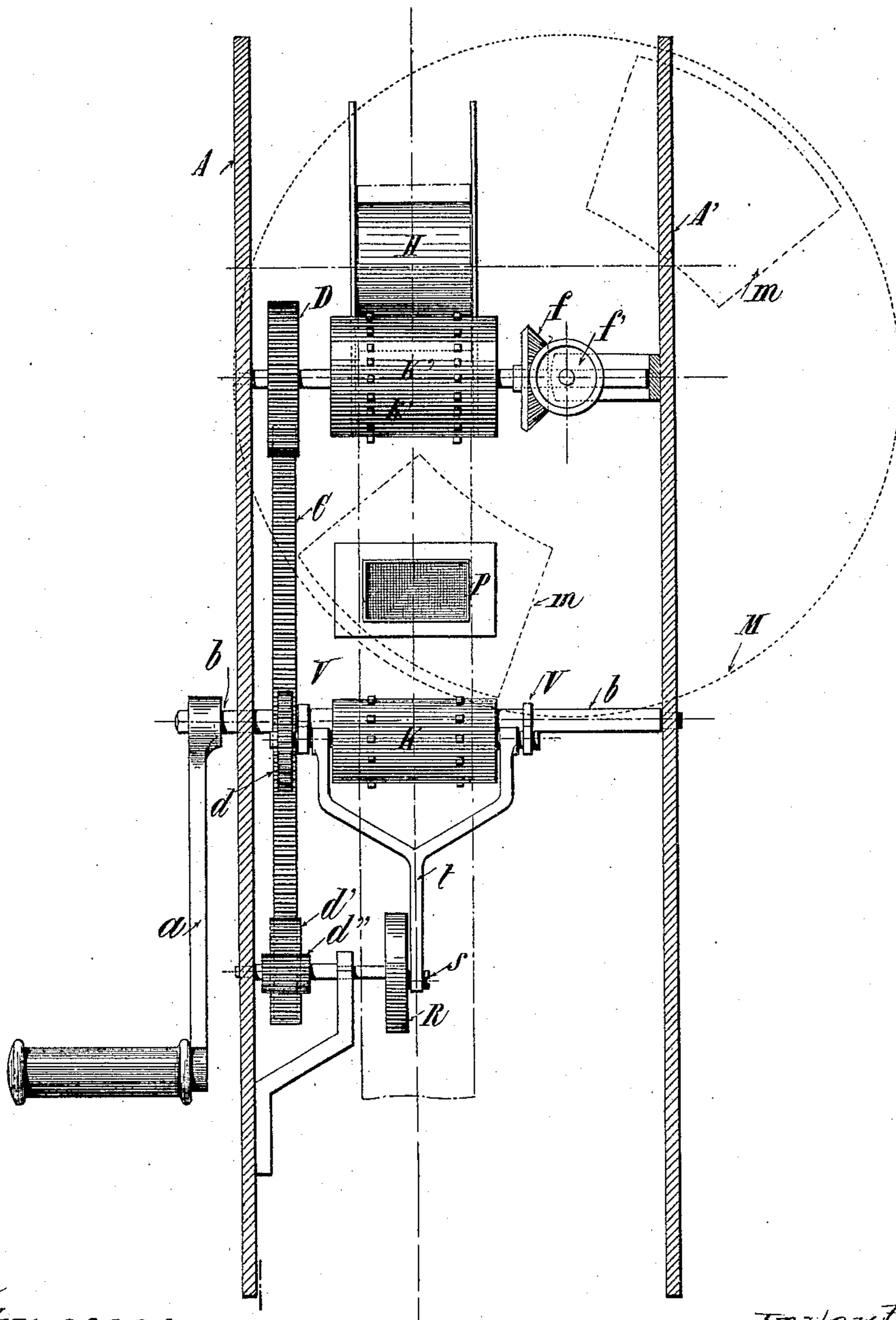
2 Sheets—Sheet 2.

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KINETOGRAPHIC CAMERA.

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Patented Jan. 5, 1897.

FIG 2.



Witnesses
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UNITED STATES PATENT OFFICE.

MARIE JOSEPH HENRI JOLY, OF PARIS, FRANCE.

KINETOGRAPHIC CAMERA.

SPECIFICATION forming part of Letters Patent No. 574,851, dated January 5, 1897.

Application filed October 16, 1896. Serial No. 609,133. (No model.) Patented in France March 17, 1896, No. 254,836.

To all whom it may concern:

Be it known that I, MARIE JOSEPH HENRI JOLY, of Paris, France, have invented certain new and useful Improvements in Chronophotographic Apparatus, also capable of being used for projecting positives, as fully described in the following specification, and for which I have obtained French Patent No. 254,836, dated March 17, 1896.

10 This invention has reference to chronophotographic apparatus whereby a large number of photographs may be taken within a specified time, but which may also serve as a picture-projecting apparatus, and particularly
15 relates to the mechanism for imparting an intermittent movement to the film through the dark chamber.

My invention can be best described in connection with the accompanying drawings,
20 wherein—

Figure 1 is a vertical sectional view through an apparatus embodying the invention; and Fig. 2 is an end view, partly in section.

The various elements of the apparatus are
25 placed between two metal plates $A A'$, in which are the bearings of the various arbors. The apparatus is of course inclosed in a dark chamber and movement of the parts obtained from any suitable motor. In the present description it will be assumed that the movement is
30 imparted by hand from a crank a . This crank is mounted on a shaft b , upon which is secured a large gear-wheel C . The latter gears with three pinions $D d d'$, which last gears with the pinion d'' , the object of which will be explained hereinafter. The film is wound upon
35 a roller H , whose shaft is mounted in the upper part of the casing. From this roller H the film passes, as shown in Fig. 1, under a guide-roller h , whence it passes over roller
40 K' , provided with two series of teeth k' , that enter holes in the margins of the film. The roller K' is mounted on an arbor, on one extremity of which is fixed the gear-wheel D , that gears with the large wheel C . At the other extremity of the same arbor is mounted a beveled pinion f , which engages a second beveled pinion f'' on the extremity of arbor
45 f'' , which carries the obturator or shutter M . This shutter is a simple opaque disk with exposure-apertures m therein. From roller D
50 the film passes between two small guide-roll-

ers $m' m'$ and thence behind the objective P . The film then goes to a second feed-roller K identical with K' and finally arrives at the
55 bottom of the apparatus, where it is wound on a receiving-roller, (not shown,) as usual.

In order that the apparatus should operate with the best results, it is indispensable that there be a stoppage or arrest of the film at
60 the instant one of the windows m of the shutter registers with the tube P in front of the film. I shall now explain how this arrest is obtained. Large wheel C gears, as stated, with the intermediate d' , which in its turn
65 actuates pinion d'' . This pinion is mounted on arbor L , which has on its end a disk R , carrying a crank-pin s . The latter is, by means of a forked arm t , connected with the shaft of a drum K , supported by two rods V ,
70 connected at their ends to the arbor of gear-wheel C , upon which they swing as a pivot. It will be understood that the pinion d , which is mounted on the arbor of drum K , remains constantly in gear with wheel C during the
75 back or forth movement given to it by the crank R and the wheels $d' d''$.

By observing the operation of the machine it will be understood that the reciprocation of the drum produces the stoppages during
80 the movement of the film. The film being arranged as shown, if the crank a be turned the drum K' and the shutter are set in motion. The film unwinds from the roller H and forms a fold or loop after leaving the
85 drum K' , as already explained in my patent dated October 20, 1896, No. 569,875, and therefore need not be further described.

In the apparatus shown it will be assumed that the gear-wheel C rotates in the direction
90 of the arrow, Fig. 1. Crank-pin s will then move from right to left and push feed-roller K toward the top of its course. Wheel d is thus reciprocated in the same direction as that of the rotation of wheel C , and if the
95 two speeds, that of the reciprocation of wheel d and that of the rotation of gear-wheel C , be the same it will be seen that wheel d will not be rotated, since the same teeth of the two wheels remain in engagement. On the
100 other hand, in the second part of the movement of pin s , *i. e.*, when it descends, wheel d is reciprocated in an opposite direction to that of the rotation of wheel C , and will thus be

rotated at a speed which will be that imparted to it by wheel C if wheel *d* were in an invariable position, plus that transmitted by its bodily movement. Drum K will therefore be
 5 rotated at a speed to quickly advance the film through the dark chamber by an intermittent movement. It is not necessary that the upward movement of wheels *d* and K should be of a velocity equal to that of wheel
 10 C. It suffices that the decrease in speed of rotation of wheel K be such that the latter should simply displace along the film without carrying it along and consequently without pulling upon that portion of the film
 15 which at this time is behind the exposure-opening.

The sizes of the wheels D *d*, as well as that of rollers K K', are calculated so that the two rollers feed each other the same quantity of
 20 film. In like manner the dimensions of bevel-gears *f f'* are calculated so that one of the windows or exposure-openings of the shutter is presented opposite the objective when the film is stationary. The rear end of the tube
 25 P is closed by a grooved plate *p*, in the groove of which passes the film.

When instead of taking a series of negatives I want to project positives, I may place
 30 a mirror at the back of the dark chamber on a simple frame and cause the luminous rays to come from the rear, which would permit the projection of the images on a screen placed at a distance.

Having thus described my invention, what
 35 I claim is—

1. In a chronophotographic or shifting picture apparatus, wherein a picture-bearing film is employed, a feed-roller acting on the film to form a loop or fold therein in advance
 40 of the dark chamber and rotated by a continuous movement to unwind the film, a second feed-roller acting on the film after it leaves the dark chamber, said roller being mounted on a movable support, and means
 45 for turning said roller on its axis and for oscillating its support, thereby intermittently advancing the film through the dark chamber, substantially as described.

2. The combination with means for unrolling the film, said film having perforations
 50 therein at regular intervals, of a rotating reciprocating roller having teeth thereon engaging the perforations in the film and act-

ing to pass the film through the dark chamber by an intermittent movement, and means
 55 for imparting said movements or rotation and reciprocation to the roller, substantially as described.

3. The combination with means for unrolling the film, the latter having perforations
 60 therein at regular intervals, of a roller having teeth thereon engaging the perforations in the film and acting upon the latter after it leaves the dark chamber, a gear-wheel for rotating said roller about its axis, and means
 65 for reciprocating the roller through an arc the center of which coincides with the axis of the driving-gear, substantially as described.

4. In apparatus of the kind described, wherein a perforated film is employed, the
 70 combination with means for unrolling the film, of a driving-gear, a frame pivoted at one end on the axle of the driving-gear, a roller, having pins thereon adapted to engage the perforations in the film, journaled
 75 in the other end of the frame, a pinion on the end of the shaft of the roller meshing with the driving-gear, and means for reciprocating the frame, whereby an intermittent movement of the film through the dark chamber
 80 is effected, substantially as described.

5. In an apparatus of the kind described wherein a perforated film is employed, the combination with a driving-gear, a toothed
 85 drum acting on the film to unwind the same and rotated from the driving-gear through an intermediate pinion, a swinging frame having its pivotal axis coincident with that of the driving-gear, a second toothed roller
 90 acting on the film to intermittently advance it through the dark chamber, said roller being journaled in the free end of the frame and having a pinion on its axle meshing with the driving-gear, means—such as a disk,
 95 a crank-pin on the disk and a pitman—operated from the driving-gear for reciprocating the frame about its axis, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

MARIE JOSEPH HENRI JOLY.

Witnesses:

GEO. C. HAZELTON, Jr.,
 EDWARD BARBARY.