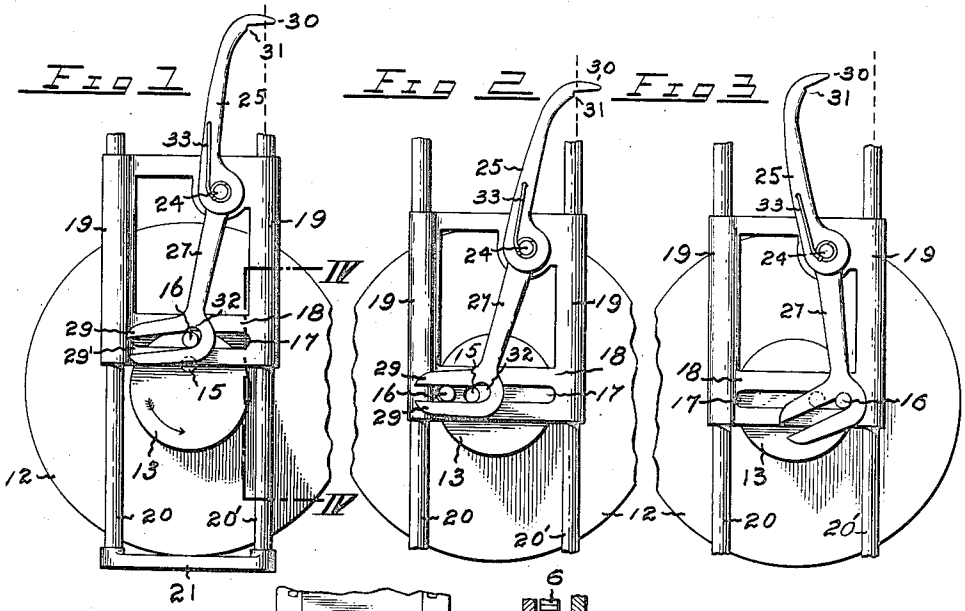
E. HARTER.

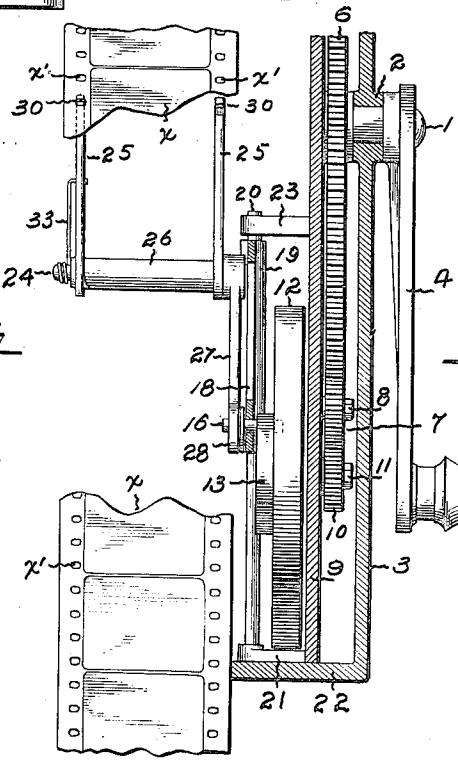
MECHANICAL MOVEMENT.

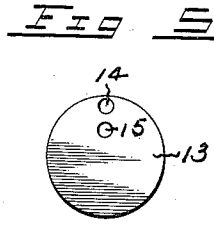
APPLICATION FILED DEC. 30, 1914.

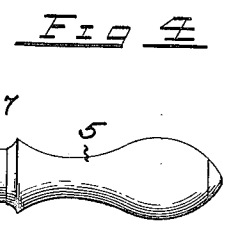
1,163,916.

Patented Dec. 14, 1915.









WITNESSES:

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UNITED STATES PATENT OFFICE.

ELI HARTER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE POCKET MOVIE CAMERA COMPANY, A CORPORATION OF NEVADA.

MECHANICAL MOVEMENT.

1,163,916. Specification of Letters Patent. Patented Dec. 14, 1915.

Application filed December 30, 1914. Serial No. 879,624.

To all whom it may concern:

Be it known that I, ELI HARTER, a citizen of the United States, residing at the city and county of San Francisco, State of California, whose post-office address is Hearst Building, have invented new and useful Improvements in Mechanical Movements, of which the following is a specification.

This invention relates more particularly to intermittent feed mechanisms for motion picture films and will be described in that connection; it being understood however that the invention is not thereby limited to that particular use, among the many uses within its range of adaptability.

Among the objects sought to be accomplished are, to produce a mechanical movement more particularly for motion picture film feeding mechanisms, by means of which the feeding mechanism is engaged, advanced and disengaged and returned to the first position; that will operate at relatively high speeds; that will operate noiselessly at all speeds; that will operate with the minimum wear and tear on the film; and that can be operated by a continuous rotary motion.

Other objects and advantages will appear as the description progresses.

In the drawing accompanying and forming part of the present specification, to which like reference characters have been applied, a simple form of putting this invention into practice is shown. I do not wish to be understood as confining this invention to the disclosures made in said drawing and description, as many variations may be introduced, within the spirit of this invention, as defined in the claims succeeding the said description.

In the one sheet of drawing: Figure 1 is a diagrammatic side elevation of an embodiment of this invention, adapted to the feeding of motion picture films, showing the feeder in the first period of engaging the perforations in the films. Fig. 2 is a similar view of the same showing the feeder in full engagement and intermediate the descending stroke. Fig. 3 is a similar view of the same illustrating the feeder disengaged and intermediate the ascending stroke. Fig. 4 is a rear elevation partially broken away in cross section on the line IV—IV Fig. 1, better to illustrate the construction and relation of the underlying parts, of a complete film feeding mechanism constructed in accordance with this invention, mounted within a motion picture camera or projecting machine a fragmentary section of which is shown in cross section. Fig. 5 is a diagrammatic fragmentary detail of the face of the crank disk, illustrating the adjusting sockets for the crank pin for varying the stroke of the feeder.

In detail the construction illustrated in the drawings, includes the drive shaft 1, journaled in the bearing 2 formed in the side wall 3 of the camera. The shaft 1 is driven by the crank 4 provided with the handle 5. The main driving gear 6 is fixed on the shaft 1, and enmeshed with the idle pinion 7, journaled on the stud 8 fixed in the base plate 9 installed in the camera. The pinion 7 is enmeshed with the driven pinion 10 fixed on the shaft 11, journaled in a bearing formed in the base plate 9. The fly wheel 12 is fixed on the shaft 11 on the opposite side of the base plate 9. The fly wheel is provided with an embossment serving as a crank disk 13. The crank disk is provided with the sockets 14 and 15, into either of which the crank pin 16 may be inserted, according to the length of stroke desired, as hereinafter more fully explained.

The crank pin 16 engages the slot 17 in the slide 18 provided with the parallel lateral guides 19—19, engaging the guide rods 20—20′ fixed in the cross base 21, secured to the bottom 22 of the camera; and at the top in the brackets 23 fixed to the base plate 9. The slide 18 is provided with the outwardly extending stud 24 fixed therein.

The feeder forks 25—25 are fixed on the sleeve 26 oscillatable on the stud 24. The swing arm 27 is fixed on the inner end of the sleeve 26 and extends downwardly forming an extension of the feeder forks, and is provided with a divided head 28, the opposite jaws 29 of which engage opposite sides of the crank pin 16. The forks 25 are provided with the points 30—30, spaced apart a distance equal to the distance between the perforation X′—X′ in the opposite margin of the film X.

The film is fed downward from the upper reel to a take-up reel beneath, the intervening film following a vertical line substantially parallel with the axis of the guide rod 20′. In the position shown in Fig. 1,

the points 30 have just entered the perforation X′ in the film; rotation of the shaft 1 by means of the crank and handle 4 and 5, rotates the train of gears 6, 7 and 10, rotating the shaft 11, the fly wheel 12, and the crank pin 16 in the direction indicated by the arrow in Fig. 1. The rotation of the crank pin as described carries the pin 16 forward against the surface of the upper jaw 29 inclined thereto. The interval of travel of the pin 16 on either side of the vertical centers, for a limited distance is substantially horizontal, causing no appreciable rise or fall of the slide 18; and for convenience this interval will be termed the "dwell interval" so far as the vertical movement of the slide is concerned. The advance of the pin within the slot 17 carries the head 28 forward, pushing the points 30 completely into the perforations X′ against the shoulder 31. At the moment of complete engagement of the fork with the film, the pin 16 takes effect on the slot 17, causing the descent of the slide 18, carrying the forks 25 downward, which pulls the film along therewith; the film passing between the aperture plate and the usual friction plate of the film guide. The slot 17 being substantially parallel with the slot 29′, (between the jaws 29—29) during the descending interval, the relative position of the swing arm 27 remains unchanged during the descending stroke; which is one of the particular advantages of this invention.

The center of the stud 24 being off set with regards to the axis of movement of the pin and the vertical movement of the slide permits the slot 17 and the slot 29′ to come into and remain substantially parallel during the down stroke. Owing to these offset centers and the horizontal engagement of the slot 17 with the pins 16, no backward or forward movement or oscillation of the head 28 is possible, until the pin begins to approach a position approximating the lower vertical center, at which time it engages the closed end of the slot in the head, instantly swinging the arm 27 across its vertical center, releasing the points 30 from the perforations X′ in the film; at this same instant the pin 16 rises into the notch 32, see Fig. 3. This notch and pin engagement securely locks the arm 27 with the pin 16 during the upstroke, so that the points 30 must follow substantially a D shape orbit determined by the revolutionary combination of the pin engaging the head 28; preventing the possibility of the points 30 engaging or fouling the now stationary film, as the slide 18 is forced up by the rising of the pin 16 to the original position, see Fig. 1, for repeating the feeding operation. The stroke of the feeder is equal to the distance between the negative exposures on the film, so that when properly framed in a projecting machine, each negative will stop in register with the aperture in the aperture plate, as originally photographed.

To prevent the pin 16 making any audible sound or click in entering the notch 32 the torsion spring 33 wound about and engaging the stud 24, has its opposite ends inserted in the adjacent fork 25 against which it exerts a backward pull, holding the end of the slot in the head 28 away from impact with the pin at that moment; also tending to hold the fork away from the film, should the head 28 accidentally disengage from the pin 16, preventing the forks damaging the film.

The points 30 entering and leaving the perforations X′ during the "dwell" periods at the top and bottom of the stroke, saves the film from much incidental wear and tear, as the points 30 do not drag back and forth across the edge of the film perforations while there is any downward pull on the points; that is to say, the film is stationary at the time the points move in and out, and the arc of the swing of the forks on the center 24 is such, that the points 30 swing away from the edges of the perforations when they engage and disengage therefrom.

All of the operative parts are in constant contact engagement with their actuating parts, so that the change of direction of any part is not accompanied by an appreciable impact, sufficient to cause a sound audible outside of the machine. This is a substantial advantage in taking motion pictures of wild life; birds in particular, that are easily frightened and suspicious of any unusual sound; it also removes from the projecting machine the clicking sound now present in the intermittent feed mechanism in the conventional machine.

Removing the pin 16 from the socket 14 and placing it in the socket 15 reduces the vertical stroke of the feeder one half, and the substitution of a plate having a corresponding aperture makes it possible to impress a greater number of exposures upon a given length of film; this variation of the stroke not effecting the spirit of this invention, and the length of the stroke and the manner of its accomplishment being susceptible to a wide variation.

Having thus described this invention, what I claim and desire to secure by Letters Patent is:

1. A mechanical movement including a rotary pin; a slide operated by said pin; a fork pivoted on said slide, and having a slotted engagement with said pin.

2. A mechanical movement including a rotary pin; a slide; a transverse slot in said slide engaging said pin; a fork pivoted on said slide and engaging said pin.

3. A mechanical movement including a

rotary pin; a slide; a transverse slot in said slide engaging said pin; a fork pivoted on said slide on a center lateral to the axis of the movement of said pin with respect to the line of travel of said slide; and having a slotted engagement with said pin.

4. A mechanical movement including a rotary pin; a slide; a transverse slot in said slide engaging said pin; a fork pivoted on said slide, and having an arm with a slotted head engaging said pin.

5. A mechanical movement including a rotary pin; a slide; a transverse slot in said slide engaging said pin; a fork pivoted on said slide, and having an arm; a slotted head on said arm engaging said pin, and having a notch extending beyond the edge of said slot.

6. A mechanical movement including a rotary pin; a slide; a member pivoted on said slide and having a sliding engagement with said pin during the forward stroke, and a pivotal engagement with said pin during the reverse stroke.

7. A mechanical movement including a rotary pin; a slide having a transverse slot engaging said pin; a guide for said slide; a feeder pivoted on said slide having a slot and notch engagement with said pin, whereby said feeder follows a substantially D shape orbit.

8. A mechanical movement including a rotary pin; a slide; a member pivoted on said slide on a center lateral to the axis of rotation of said pin with respect to the line of travel of said slide, and having a sliding engagement with said pin during the forward stroke, and a pivotal engagement with said pin during the reverse stroke.

9. A mechanical movement for motion picture feeders; including a rotary pin; means for rotating said pin in its orbit; a guide; a slide engaging said guide and having a slot engaging said pin; a feeder pivoted on said slide and having an oscillating engagement with said pin.

10. A mechanical movement for motion picture feeders including a rotary pin; means for rotating said pin in its orbit; a guide; a slide engaging said guide and having a slot engaging said pin; a feeder pivoted on said slide on a center lateral to the axis of rotation of said pin, and having a sliding engagement with said pin during the forward stroke, and a pivotal engagement with said pin during the reverse stroke.

In testimony whereof, I have hereunto set my hand this 23rd day of December 1914.

ELI HARTER.

Witnesses:
BALDWIN VALE,
A. J. HENRY.