

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Cinematograph Film Feeding Mechanism

We, HAWK LIMITED, of Treforest Trading Estate, Pontypridd, South Wales, a British Company, do hereby declare this invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to cinematograph film feeding mechanism and has for its object to provide improved mechanism which moves the film step-by-step and avoids the disadvantages of uneven feed resulting in flicker and the possibility of tearing the film which is sometimes met with in existing feed mechanisms.

It has, however, already been proposed to provide mechanism for the intermittent feed of cinematograph film, consisting of a pair of pins, arranged to engage the perforations formed along both margins of a film strip, and carried at the ends of a cross-arm secured at the forward end of a swinging claw arm formed with an elongated guide slot engaging a fixed support and pivot pin. The rear end of the claw arm is provided with a box within which is rotated a cam having the outline of a "circular triangle," i.e. a three-point constant diameter cam. Rotation of the cam causes the claw arm and hence the pins to have a substantially straight downward operative motion with the pins in engagement with the perforations and an approximately circular idle return motion with the pins free of the perforations.

According to the present invention, the feeding mechanism is so arranged that the intermittent feed of the film is effected solely by a feed claw arm mounted for simultaneous pivoting and reciprocating movement on a fixed post said arm having a pair of teeth at one end to engage the film perforations in one film margin only and having its other end secured to a shallow open-sided rectangular box within which is pivoted on an eccentric axis a three-point constant diameter cam.

The cam may be driven to rotate in any well-known manner, by, for example, a train of gear wheels driven from an electric motor.

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It is pivoted on the housing or the like and rotates within the feed arm cage and its contour is such that the movement of the feed arm is first forward to engage the film perforations, then rapidly downwardly to feed the film and finally slowly rearwardly and upwardly to be in position for the next step.

The invention is illustrated in the accompanying drawings, of which Figure 1 is a side elevation partly in section of a toy projector with the side cover open, and Figures 2a to 2d show in detail the progressive steps in the drive mechanism.

The casing or box 11 has a lens 12 mounted in an opening in its front wall, and behind said lens supports a lamp 13 screwed or otherwise secured to a bracket 14, the power for the lamp being supplied over the lead 15 from a number of dry cells 16 housed in the casing and connected in series, the circuit to the lamp being completed through the walls of the casing on operation of a switch (not shown). The film 20 is guided past the front of the lens by a guide 17 clipped to the outside of the front wall of the casing and retained by a cover plate 18 secured to said casing and supporting a leaf spring 19 bearing on said guide. A beam concentrating cowl 21 is secured to the plate 18.

The film 20 is formed with the usual feed perforations and is fed past the lens by the feed claw which consists of a reciprocating and rocking arm 22 formed with teeth 23 spaced to correspond with the spacing of the perforations and with an elongated slot 24 to engage a fixed post 25 secured to the wall of the casing. At its inner end the arm 22 is secured to a shallow open sided rectangular box 26 with which co-acts a three point constant diameter cam 27 pivoted in the plate 28 secured to the casing and driven through the gear wheels 29 and 30 journaled in said plate 28 by an outer handle, journaled on the spindle 31.

In Figure 1 the arm 22 is shown in full lines in its neutral position, and in dotted lines in its upper and lower driving positions.

The motion of the drive arm 22 is effected

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solely by the co-action of the cam 27 with the rectangular box 26 moving with a clockwise rotation as shown in Figures 2a to 2d. The surface *a* of the cam provides the up and down and forward and back movements of the box, whilst the surfaces *b* and *c* keep the box steady in the positions to which it is driven by the surface *a*; for instance, when the arm and cam are as shown in the position in Figure 2a, the arm is at the top of its movement, the box being in its forward position; as the surface *a* leaves the wall *p* of the box, to engage the wall *q* (Figure 2b) the box is raised and consequently the arm swings about its pivot and moves downwardly in a straight line to its bottom position. As the surface *a* then engages the wall *r* (Figure 2c), the box is moved rearwardly and the arm travels back with it in substantially a straight line until the surface *a* engages the wall *s* (Figure 2d) to depress the box, whereby the arm is swung upwardly in readiness for the next cycle. Throughout these motions, the surfaces *c* and *d* of the cam during the engagement of the surface *a* with the walls of the box do not exert any force on said walls, but simply serve to steady the box.

By means of this mechanism the motion of the feed arm in its vertical downward feed stroke is rapid whilst its withdrawal and return stroke is less rapid, whereby a clean and uniform step-by-step motion is imparted to the film.

What we claim is:—

1. Cinematograph film feeding mechanism in which the intermittent feed of the film is effected solely by a feed claw arm mounted for simultaneous pivoting and reciprocating movement on a fixed post said arm having a pair of teeth at one end to engage perforations in one film margin only and having its other end secured to a shallow open-sided rectangular box within which is pivoted on an eccentric axis a three-point constant diameter cam.

2. Cinematograph film feed mechanism constructed arranged and adapted to be operated substantially as hereinbefore described and as illustrated in the accompanying drawings.

Dated this 12th day of May, 1953.

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PROVISIONAL SPECIFICATION

Cinematograph Film Feeding Mechanism

We, HAWK LIMITED, of Treforest Trading Estate, Pontypridd, South Wales, a British Company, do hereby declare this invention to be described in the following statement:—

This invention relates to photographic film feeding mechanism and has for its object to provide improved mechanism which moves the film step-by-step and avoids the disadvantages of uneven feed resulting in flicker and the possibility of tearing the film which is sometimes met with in existing feed mechanisms.

To this end and in accordance with the invention, the feed mechanism comprises means to impart to the feed arm a rapid feed movement and a slow return movement. The feed arm is mounted for pivoting and sliding movement on a pin secured to the projector or the like

housing and is formed or provided at its end remote from the feed prongs with a rectangular cage in which operates a heart-shaped cam.

The cam may be driven to rotate in any well-known manner, by, for example, a train of gear wheels driven from an electric motor. It is pivoted on the housing or the like and rotates within the feed arm cage and its contour is such that the first movement of the feed arm is forwarded to engage the film perforations, rapidly downwardly to feed the film and slowly rearwardly and upwardly to be in position for the next step.

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SHEETS 1 & 2

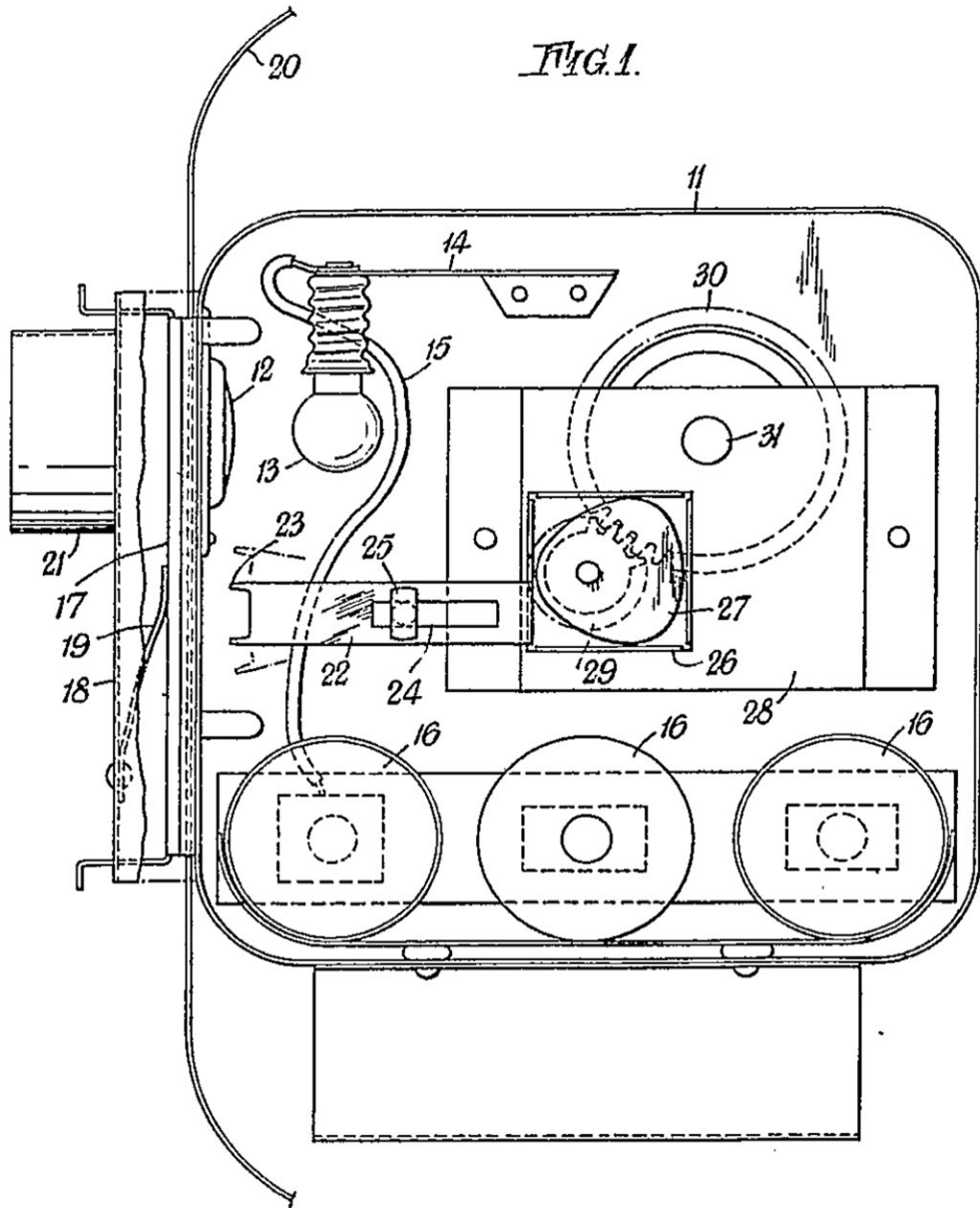


FIG. 1.

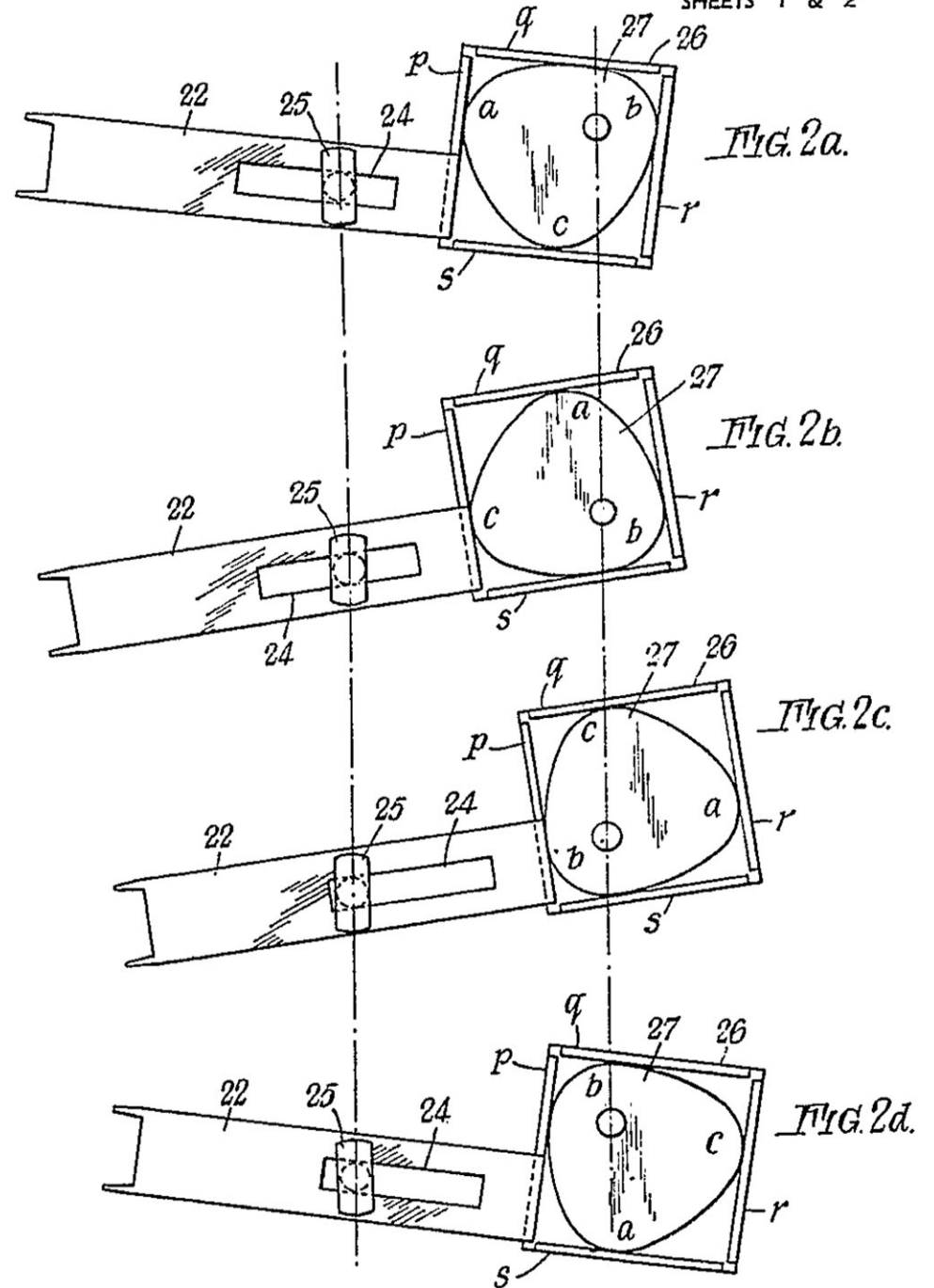


FIG. 2a.

FIG. 2b.

FIG. 2c.

FIG. 2d.