Jan. 15, 1924. 1,480,864

P. A. REED

INTERMITTENT FEED MECHANISM FOR CINEMATOGRAPHIC APPARATUS

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Fig. 1.

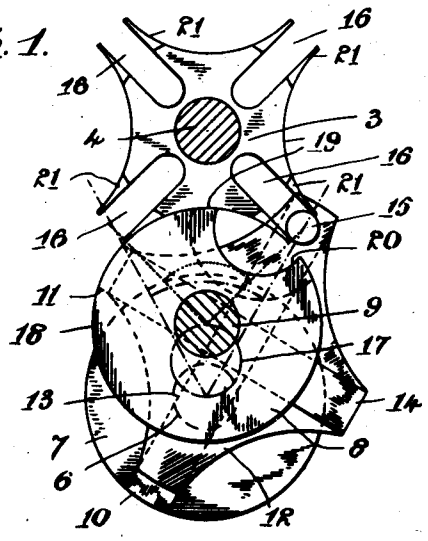
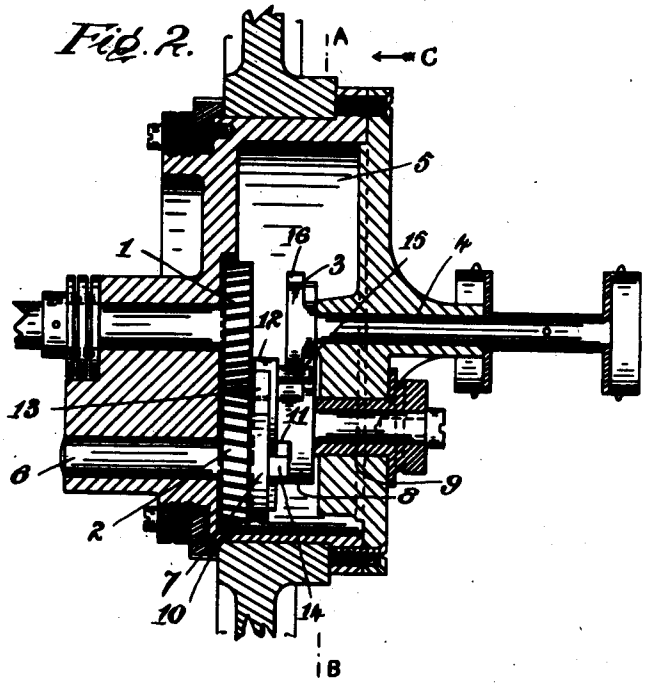


Fig. 2.



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Fig. 3.

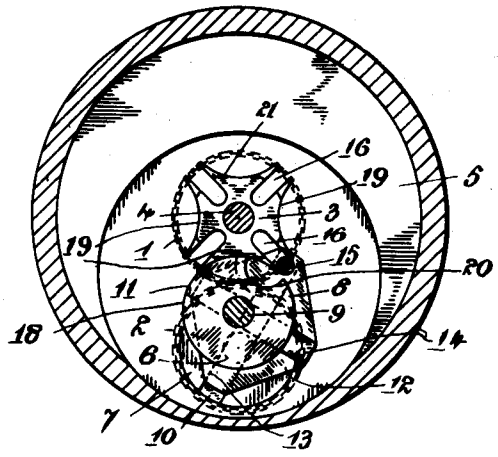


Fig. 4.

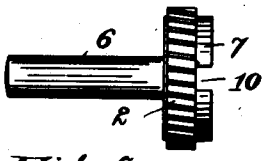


Fig. 5.

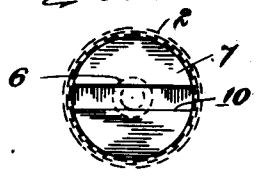


Fig. 6.

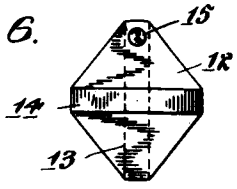


Fig. 7.

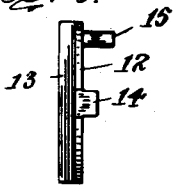


Fig. 8.



Fig. 9.

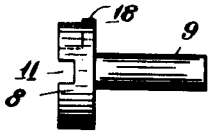


Fig. 10.

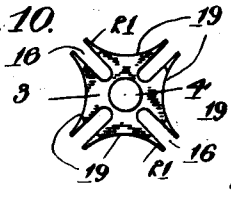
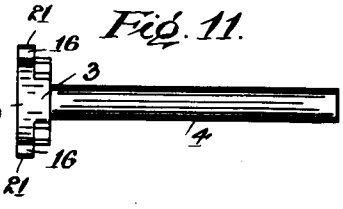


Fig. 11.



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INTERMITTENT FEED MECHANISM FOR CINEMATOGRAPHIC APPARATUS

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Fig. 12.

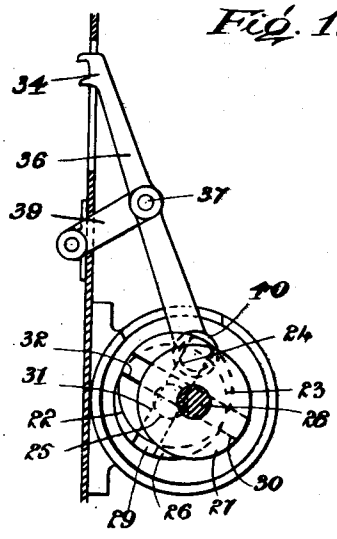
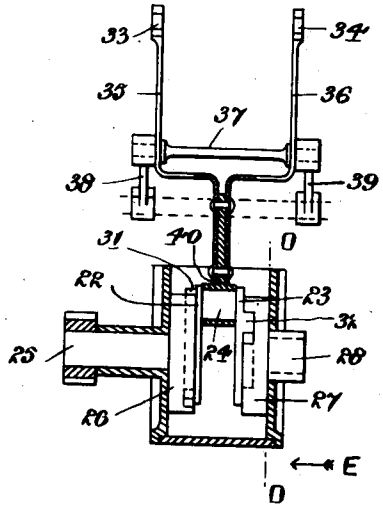


Fig. 13.



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Patented Jan. 15, 1924. 1,480,864

UNITED STATES PATENT OFFICE.

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INTERMITTENT FEED MECHANISM FOR CINEMATOGRAPHIC APPARATUS.

Application filed January 10, 1921. Serial No. 436,323.

To all whom it may concern:

Be it known that I, PERCY ALFRED REED, a subject of the King of Great Britain, residing at London, England, have invented certain new and useful Improvements in and Relating to Intermittent Feed Mechanism for Cinematographic Apparatus, of which the following is a specification.

The present invention relates to improvements in relating to intermittent feed mechanism, and for use in cinematographic apparatus, of the kind adapted to accelerate the film shift period and lengthen the stationary period.

The present invention may be conveniently and advantageously applied to cinematographic apparatus in which the intermittent feed mechanism is of the Maltese cross type, or of the pin and claw type.

According to the present invention, in intermittent feed mechanism of the kind above referred to, the drive is transmitted from a driving element by a cross coupling connecting axes which are parallel to but out of line with each other.

Thus, for example, in a cinematograph film-feed mechanism of the Maltese cross type, the cross coupling may form the finger wheel member to accelerate the action of the Maltese cross with easy or gradual start and finish.

The present invention may be conveniently and advantageously carried into practical effect by uniting two axes which are out of line but mutually parallel by an Oldham coupling.

The medial member having cross strips or projections on opposite faces, unites with grooves in two discs or heads which face each other and are fixed on the ends of the two axes.

The position of the grooves and strips may be reversed.

In intermittent film feed mechanism of the Maltese cross type the coupling is introduced between the even driving gear of the cinematograph action and the Maltese cross, the driving pin for which is mounted on an arm of the cross of the medial member of the coupling so that this medial member becomes the finger wheel member whose pin presents and retires itself to enter and leave tangentially the slot of the Maltese cross without impact, and owing to the revolving of the centre of the medial member on a circle described on the line of centres of the two axes as a diameter accelerates the action of the Maltese cross with easy or gradual start and finish.

According to which axis is the driving axis the driving pin is on the cross arm remote from that axis, but the driving pin can be on either side of the cross arm to suit the particular arrangement of the movement.

The facing discs or flanges or heads and the medial member may be all equal size discs, and the driven disc or flange or head may serve as the locking rim for the shaped ends of the arms of the Maltese cross, such driven disc or flange or head being notched to allow the arms of the Maltese cross to pass; also to allow the driving pin on the medial disc or member to pass as it moves towards or away from the centre of the driven disc as the medial disc or member revolves.

The mechanism according to the present invention is well suited for enclosure in an oil bath in the usual or appropriate manner.

The film shift period being accelerated by a device substantially as herein described, appropriate adjustment of the shutter cover period of a cinematograph machine must follow as a matter of course.

The operation of "masking" may be provided for in accordance with any known or approved methods.

The medial member can also be fitted with two driving pins 180° apart so as to impart two accelerated impulses to a Maltese cross at each revolution of the driving disc.

In the accompanying drawings there is illustrated by way of example two forms of intermittent feed mechanism under the present invention for use in cinematograph apparatus.

In the drawings:—

Fig. 1 is a diagrammatic view showing the application of an Oldham coupling under the present invention as part of an intermittent film feed mechanism.

Fig. 2 is a part sectional side view and Fig. 3 a sectional view on the line A—B of Fig. 2, looking in the direction of the arrow C illustrating a constructional embodiment of Fig. 1 suited for a Maltese cross type of feed mechanism.

Figs. 4, 5, 6, 7, 8, 9, 10 and 11 are detail views of the various components forming the feed mechanism of Figs. 2 and 3.

Fig. 12 is a side view and Fig. 13 is a sectional front view illustrating a variant form of feed mechanism according to the present invention adapted for a pin or claw movement, Fig. 12 being taken on the line D, D of Fig. 13 looking in the direction of the arrow E.

Referring to Figs. 1 to 11 of the accompanying drawings the coupling is introduced between the even driving gear 1, 2, of the cinematograph action and the Maltese cross 3 mounted on the usual sprocket spindle 4. The coupling and the cross are enclosed in an oil bath provided by a casing or oil box 5. On the gear shaft 6 is a disc or flange 7 and facing this disc 7 is a second disc or flange 8 on a shaft 9. The axes of the shafts 6 and 9 are out of line but mutually parallel. The disc 7 has a groove 10 and the disc 8 a groove 11.

A medial member 12 has diametrical cross strips or projections or tongues 13 and 14 on opposite faces, respectively and at right angles to each other, the tongue 13 engaging with the groove 10 of the disc 7 and the tongue 14 engaging with the groove 11 of the disc 8.

A driving pin 15 is mounted on an arm of the cross of the medial member 12 of the coupling so that this medial member becomes the finger wheel member whose pin 15 presents and retires itself to enter and leave tangentially the slots 16 of the Maltese cross 3 without impact, and owing to the revolving of the centre of the medial member 12 on a circle 17 (Fig. 1) described on the line of centres of the two axes as a diameter accelerates the action of the Maltese cross with easy or gradual start and finish.

The convex rim 18 of the second or driven disc or flange 8 serves as a locking rim for the concave edges or rim 19 of the Maltese cross 3, the driven disc 8 having a notch 20 to allow the arms 21 of the Maltese cross 3 to pass. The notch 20 also allows the driving pin 15 on the medial member 12 to pass as it moves towards or away from the centre of the driven disc 8 as the medial member 12 revolves.

In Figs. 12 and 13 there is illustrated a variant form of film feed mechanism adapted for a pin and claw movement.

In this arrangement the medial member of the coupling comprises two discs 22, 23 connected by a bridge piece 24 serving as a crank pin. On the gear shaft 25 is a disc or flange 26 and facing this disc is a second disc or flange 27 on a shaft 28. The axes of the shafts 25 and 28 are out of line but mutually parallel.

The disc 26 has a groove 29 and the disc 27 has a groove 30. The discs 22 and 23 comprising the medial member have tongues 31 and 32 respectively, the tongue 31 engaging with the groove 29 and the tongue 32 engaging with the groove 30. A pair of claws 33, 34 on levers 35 and 36 are connected by a fulcrum pin 37 under the influence of radius links 38 and 39. The levers 35 and 36 are connected to the bridge piece 24 of the medial member of the coupling by a sleeve and flange connection 40. Thus with a form of feed mechanism as above arranged the claws describe a substantially D shaped path, pulling the film down in the flat part of the D and leaving it and returning for the next pull down on the curved part of the path.

What we claim is:—

1. In a cinematographic apparatus, intermittent feed mechanism for accelerating the film shift period and lengthening its stationary period, said mechanism comprising a pair of shafts mounted parallel to but out of line with each other, a cross coupling having a floating member between the two shafts, means for engaging and moving the film, an operative connection between the said floating member of the cross coupling and the film engaging and moving means, and means to rotate one of said shafts, said floating member of said cross coupling transmitting an accelerated intermittent movement to the film.

2. In a cinematographic apparatus, intermittent feed mechanism for accelerating the film shift period and lengthening its stationary period, said mechanism comprising a pair of shafts mounted parallel to but out of line with each other, a coupling between the two shafts comprising two discs facing each other and a medial member united to the facing discs by tongues and grooves at right angles to each other, means for engaging and moving the film, an operative connection between the medial member of said coupling and the film engaging and moving means, and means to rotate one of said shafts, said medial member transmitting an accelerated intermittent movement to the film.

3. In a cinematographic apparatus, intermittent feed mechanism for accelerating the film shift period and lengthening its stationary period, said mechanism comprising a pair of shafts mounted parallel to but out of line with each other, a coupling between the two shafts comprising two discs facing each other and a medial member united to the facing discs by tongues and grooves at right angles to each other, means for engaging and moving the film, a Maltese cross movement between the medial member of said coupling and the film engaging and moving means, said medial member forming the finger wheel member of said Maltese cross movement, and means to rotate one of said shafts, said medial member trans-

mitting an accelerated intermittent movement to the film.

4. In a cinematographic apparatus, intermittent feed mechanism for accelerating the film shift period and lengthening its stationary period, said mechanism comprising a pair of shafts mounted parallel to but out of line with each other, a coupling between the two shafts comprising two discs facing each other and a medial member united to the facing discs by tongues and grooves at right angles to each other, means for engaging and moving the film, a Maltese cross movement between the medial member of said coupling and the film engaging and moving means, said medial member forming the finger wheel member of said Maltese cross movement, and the edge of a facing disc forming the notched locking rim of said Maltese cross movement, and means to rotate one of said shafts, said medial member transmitting an accelerated intermittent movement to the film.

5. In a cinematographic apparatus, intermittent feed mechanism for accelerating the film shift period and lengthening its stationary period, said mechanism comprising a pair of shafts mounted parallel to but out of line with each other, a coupling between the two shafts comprising two corresponding discs having grooves at right angles to each other and a medial member having tongues fitting in said grooves, means for engaging and moving the film, an operative connection between the medial member of said coupling and the film engaging and moving means, and means to rotate one of said shafts, said medial member transmitting an accelerated intermittent movement to the film.

In testimony whereof I affix my signature.

PERCY ALFRED REED.