

C. ROSSI.
DRIVING MECHANISM FOR KINEMATOGRAPH APPARATUS:
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935,167.

Patented Sept. 28, 1909.

Fig. 1

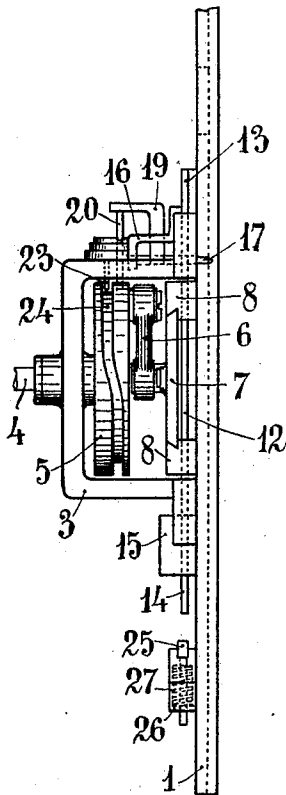


Fig. 2

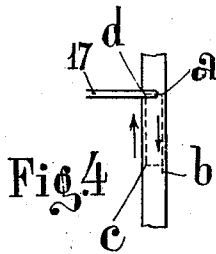
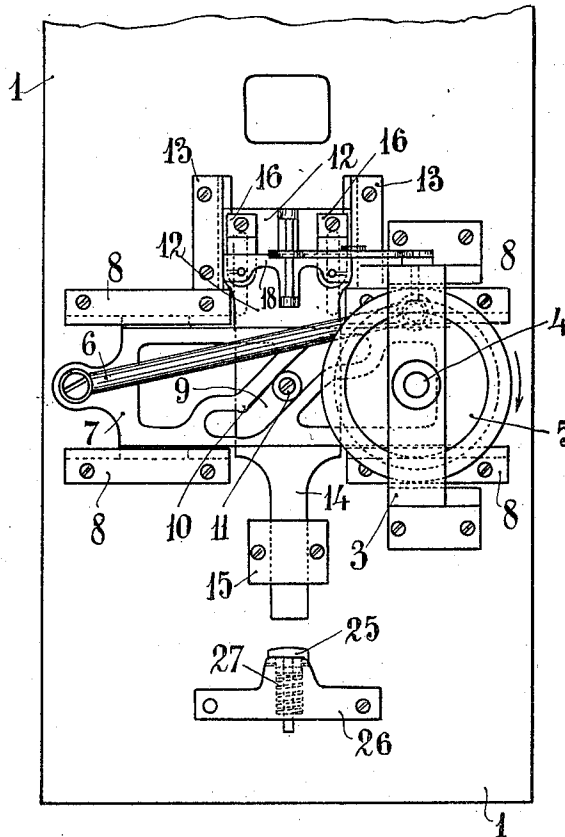
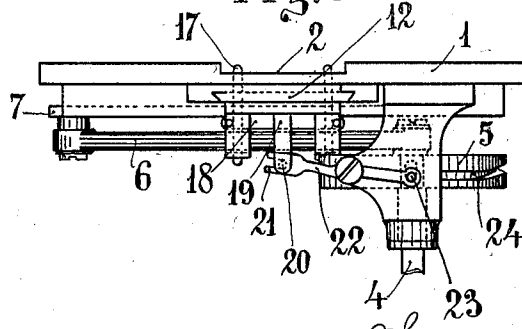


Fig. 4

Fig. 3



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DRIVING MECHANISM FOR KINEMATOGRAPH APPARATUS.

935,167.

Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed June 5, 1908. Serial No. 436,947.

To all whom it may concern:

Be it known that I, CARLO ROSSI, a subject of the King of Italy, residing at Turin, Italy, have invented a certain new and useful Improved Driving Mechanism for Kinematograph Apparatus, of which the following is a specification.

It is well known that in kinematograph and like apparatus, it is necessary to bring about an intermittent driving of the band or film, and that this can be obtained by means of reciprocating movement of two claws or the like engaging, during their operative travel, perforations in the edges of the film.

This invention relates to a mechanism for driving a band or a film, and is particularly applicable to use in connection with any kind of kinematograph apparatus used either for projecting or for exposing the film, and which has special advantages as regards the uniformity and precision of the movement as well as the wear of the edges of the perforations.

A construction of mechanism according to this invention is illustrated by way of example in the accompanying drawing in which—

Figure 1 is a side elevation, Fig. 2 a front elevation and Fig. 3 a plan. Fig. 4 shows the path followed by the points of the claws.

On a plate 1 provided with a groove 2 of rectangular cross-section in which the band or the film moves is mounted by means of a bracket 3, a spindle 4 driven in any suitable manner, to which is keyed the crank-disk 5 controlling the connecting rod 6. The other end of the connecting rod is pivoted on a frame 7 which is horizontally movable between guides 8. This frame is provided in the center with a slot 9 of the shape shown in Fig. 2 and having a slight projection at 10. With this slot engages a head 11 secured to a part 12 capable of sliding between guides 13 and provided with a tail 14 guided at 15. To the part 12 are secured projections 16 through which, at their sides folded downward, pass claws 17, in such manner that the said downward sides constitute, together with the corresponding holes in the part 12, the supports in which the claws 17 slide. The claws 17 of which there may be two, three or four pairs instead of one, are also secured to the two ends of a cross-bar 18, secured to a part 19 having the shape of a bend, the spindle 20 of which

can slide in the bifurcated end 21 of a lever 22 pivoted to the support or bracket 3, the other end of the said lever carrying a head or roller 23 engaging in the cam groove 24 in the rim of the crank-disk 5 (Fig. 3). In line with the tail 14 of the part 12 is mounted a stop 25 held raised in its guide 26 by a helical spring 27, for the purpose of producing constant motion and allowing for wear of the different parts, when the end of the tail 14 comes into contact with the stop.

The working of the mechanism will be readily understood from the above description.

The drawing shows the frame 7 and the part 12 in their central positions. If the crank-disk 5 is rotated in the direction of the arrow (Fig. 2), the frame 7 will be moved toward the right by the connecting rod 6, and the slot 9 will bring about the lowering of the head 11 and consequently of the part 12. As the extensions 16 guiding the claws 17 are secured to the part 12, the claws are thus moved. When the head 11 is opposite the end of the inclined portion of the slot 9, the part 12 will withdraw a little under the action of the projection 10 and while the head 11 slides in that portion of the slot which is parallel to the axis of the movement of the frame 7 (and when consequently the part 12 remains stationary), the head 23 of the lever 22 is opposite the inclined portions of the groove 24. On further turning the crank-disk 5, the lever 22 will be oscillated, and its bifurcated end will move back the spindle 20, and with the latter the part 19, the cross-bar 18 and the claws 17 which in that way are withdrawn in the interior from the groove in which they travel, thus releasing the film.

Owing to the projection or boss 10 on the wall of the slot 9, and to the withdrawal of the part 12 resulting therefrom, when the claws 17 become withdrawn from the perforation of the film, they are not at the end of their stroke, the result of which is that all friction on the edges of the perforations which is the chief cause of their wearing out, is avoided. The further rotation of the crank-disk 5 results in the moving of the frame 7 toward the left and consequently in the raising of the part 12, the claws 17 held in the interior of the plate being at the same time raised owing to the position of the lever 22. When the claws have reached the end of the return stroke, they are pushed forward

so as to project outside the plate, by means of the lever 22, the head 23 of which engages with another inclined portion of the groove 24. The claws 17 engage then with other perforations of the film and begin another driving motion. The movement of the point of the claws 17 is shown for the sake of clearness, in dotted lines in Fig. 4. It descends from *a* to *b*, moves back a little to *c*, then rises to *d* and returns to *a*.

For the purpose of doing away with the influence of play due to the wearing of the parts, which would affect the length of travel, there is arranged a spring controlled stop 25 which pushes back the tail 14 of the part 12 as soon as it reaches the end of its travel and consequently reduces the whole play to one side. Such a mechanism brings about a uniform driving of the film and does away with any causes of injury to its perforations, for the transmission of movement from the crank-disk 5 to the frame 7 being effected by means of the connecting rod 6, the speed of travel of the frame 7 as well as that of the part 12 and of the claws varies in accordance with a sinusoidal diagram, so that the moment the claws have engaged with the perforations, they do not drive the film suddenly but first advance at a reduced speed which gradually increases until it reaches the maximum at the center of the travel, after which it again decreases until it becomes zero at the end of the stroke.

The method of transmitting movement to the part 12 by means of the slot 9 makes it possible to change, by changing the inclination of the slot, the time occupied by the travel of the claws relatively to the time occupied by a complete movement, so that in an apparatus intended for projecting photographs, it is possible, by reducing the inclination of the slot relatively to the vertical axis, to increase the duration of exposure to light, and thus to obtain clearer views. In the construction shown in the accompanying drawing, the descent of the part 12 takes a quarter of the time during which the crank-disk 5 makes a complete revolution, but it will be understood that by reducing the inclination of the slot relatively to the axis of the part 12, it is possible to make the travel of the part to last say only one-sixth, one-seventh or one-eighth of the time required by the disk 5 for making a complete revolution. In that case, it will be naturally necessary to modify the cam groove in the

rim of the crank-disk 5, so that the claws should be brought into engagement with the perforations of the film, and withdrawn therefrom at the desired periods.

What I claim as my invention and desire to secure by Letters Patent is:—

1. An intermittent driving mechanism for a band or film, comprising a crank-disk and a transverse frame, a connecting rod between the crank-disk and the frame, a plate intermittently raised and lowered by the frame, claws carried by said plate for engaging the band and means for causing the claws to periodically engage with and move the band, and disengage therefrom.

2. An intermittent driving mechanism for a band or film comprising a crank-disk, a reciprocating frame having a central inclined slot therein, a connecting rod between the crank-disk and the frame, a plate intermittently raised and lowered by the frame, and claws carried by said plate for engaging the band.

3. An intermittent driving mechanism for a band or film comprising a crank-disk and a transverse frame, a connecting rod between the crank-disk and the frame, a plate intermittently raised and lowered by the frame, claws carried by said plate for engaging the band, means for causing the claws to periodically engage with and move the band, and disengage therefrom, and a spring-controlled stop, operating as described.

4. An intermittent driving mechanism for a band or film comprising a crank-disk having a cam groove therein, a rod connected to said crank-disk, a frame reciprocated by said rod and having a central inclined slot therein, a projection on that portion of the frame forming one wall of said slot and adjacent one end of the latter, a head engaging said slot, a plate carrying said head and mounted to reciprocate in guides, claws mounted on the plate, and means controlled by the grooved crank-disk for effecting the engagement and disengagement of the claws with and from the band periodically.

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

CARLO ROSSI.

Witnesses:

CARLO ANTON ING,
LOUIS ALBAN.