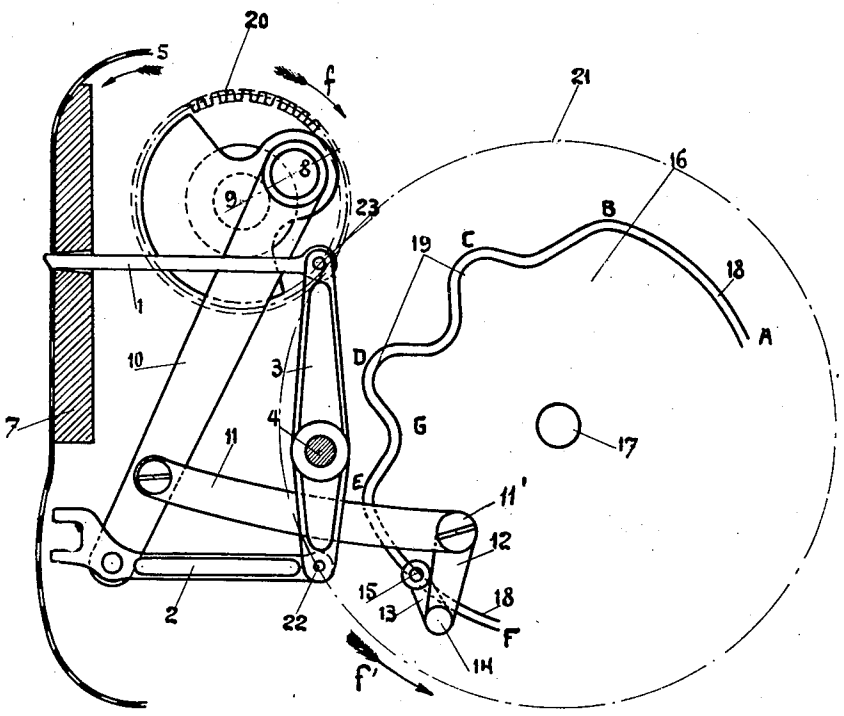
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EXPOSURE CONTROLLING DEVICE FOR CINEMATOGRAPHIC VIEW TAKING APPARATUS

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EXPOSURE-CONTROLLING DEVICE FOR CINEMATOGRAPHIC VIEW-TAKING APPARATUS

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In certain cinematographic view taking apparatuses and the like, devices are commonly used for causing the film to advance intermittently between two successive periods of exposure during which the film is held stationary. In particular, devices have been used which comprise longitudinally pivotable registering pins engaging the film perforations in order to hold the film in its stationary exposure positions together with film-advancing pins exerting a compound motion during which they first engage the film perforations, then draw the film along through a distance corresponding to one picture, release it and finally return to their original position. The registering and film-advancing pins are mechanically connected in a manner such that when the latter draw the film onwards, the registering pins are released and when they are released in their turn the registering pins reengage the film. The film-advancing pins are controlled from a shaft rotating at constant speed through suitable transmission means. These devices show the drawback of allowing only a comparatively short exposure the time of which is substantially equal to the time required for drawing the film through the length of one picture. In those cases where it is desired to provide overexposure, it may be necessary to allow, in the same apparatus, the film to remain stationary during two or more cycles of motion of the film-advancing pins. I achieve this result, according to my invention by using uniformly moving mechanical means acting on the transmission between the control shaft and the said film-advancing pins so as to allow the latter to be operative only during one of their cyclic movements out of two or three whereas their longitudinal motion is prevented during the remaining cyclic movements during which they idle transversally at a certain distance from the film. During this idle motion the longitudinal motion of the registering pins is also prevented so that they may remain in the film perforations.

I have shown by way of example on appended drawing a form of execution of my invention as applied to the device disclosed in French Patent No. 523,383 filed on August 31, 1920 in the name of Labrely.

Referring to the drawing, the registering pins 1 and the film-advancing pins 2 are pivotally secured at 23 and 22 to the two ends of the lever 3 pivotally secured at 4 to the frame of the apparatus. The film 5 moves in the usual manner in the guideway 7. The movement of the crank pin 8 secured to the shaft 9 is transmitted through the connecting rod 10 to the film advancing pins 2. The connecting rod 10 is pivotally secured to one end of a guiding rod 11 the other end of which is pivotally secured through a spindle 11′ to the arm 12 of a crank lever 12—13. This crank lever is mounted through its apex on the pivot 14 carried by the frame of the apparatus. The arm 13 of the crank lever carries a roller 15 adapted to move in the cam-shaped groove 16 rotating round the shaft 17. This groove has two circular parts 18 the centre of which is at 17, said parts being connected through a series of windings 19. The shaft 17 is controlled through two gear wheels 20, 21 one of which is secured to the crank pin shaft 9 and the other to the cam shaft 17.

The cam is executed as follows:

Each circular part AB, EF and each receding part BC, CD, DE of the windings corresponds to a complete cycle of movement for the film-advancing pins 2. The direction of rotation of the two shafts is shown by the arrows *f*, *f*′. When the roller 15 arrives at F, the pins 2 are substantially in the middle of their return motion. Between F and E no movement is imparted to the roller 15 and to the shaft 12 and thus as explained in above mentioned Patent 523,383, the two sets of pins execute a complete cycle of movements during which the film is drawn along through one picture length. When the roller 15 passes from E to D and during the first half EG of its movement, the longitudinal forward motion of the film-advancing pins will be exactly compensated by the rearward motion of the guide rod 11. During the second half GD of the movement of the roller, the rearward longitudinal motion of the pins 2 is again compensated by the forward motion of the

guide rod 11. The result is a complete immobility of the pivots 22 and 23 and consequently of the registering pins 1 while the roller 15 travels through EB. When it passes through BA the pins will resume their operative motion and so on.

My invention is obviously not limited to use in cinematographic view taking apparatuses and may be applied with any device comprising a rotary part controlling through a suitable lever arrangement, a part moving along a closed circuit, so as to transform its motion into a simple reciprocating motion along a curvilinear element or a straight line.

What I claim is:

1. A control mechanism comprising film advancing pins, means for causing same to move parallel to the film band and perpendicularly to the film surface, registering pins for the film, means for making the latter reciprocate perpendicularly to the film surface, mechanical means connecting the registering pins with the film advancing means whereby latter releases the film when the former engages it and reversely, a part, carrying a cam-shaped groove comprising series of windings the transversal magnitude of which corresponds to that of the movement of the film advancing pins perpendicular to the film band, means for making these windings advance at the rate of one winding per cycle of operation, an arrangement projected and retracted by the groove windings and acting on the film advancing pins for compensating the action on said pins of the first mentioned means in the direction perpendicular to the film surface and means leading the arrangement from one series of windings to the next while a predetermined number of cycles of operations is being performed and keeping same inoperative during the said number of cycles.

2. A control mechanism comprising film advancing pins, means for causing same to move parallel to the film band and perpendicularly to the film surface registering pins for the film, means for making the latter reciprocate perpendicularly to the film surface, mechanical means connecting the registering pins with the film advancing means whereby latter releases the film when the former engages it and reversely, a part, carrying a cam-shaped groove comprising series of windings the transversal magnitude of which corresponds to that of the movement of the film advancing pins perpendicular to the film band, means for making said part rotate whereby these windings advance at the rate of one winding per cycle of operation, a link arrangement projected and retracted by the groove windings and acting on the film advancing pins for compensating the action on said pins of the first mentioned means in the direction perpendicular to the film surface and means leading the said arrangement from one series of windings to the next while a predetermined number of cycles of operations is being performed and keeping same inoperative during the said number of cycles.

3. A control mechanism comprising film advancing pins, means for causing same to reciprocate parallel to the film band and perpendicularly to the film surface, registering pins for the film mechanically interconnected with the film advancing pins, a rotary cam arrangment consisting of arc-shaped elements the centre of which is on the axis of rotation of the cam arrangement and intermediary winding parts and a link arrangement controlled by said cam arrangement and adapted when it is controlled by the winding parts of the cam to compensate the control of the first mentioned means on the film advancing pins in the direction perpendicular to the film and to be inoperative when it is engaged by the arc-shaped elements.

4. A control mechanism comprising a drive shaft, film-advancing pins, an eccentric crank pin controlled by the shaft, a connecting rod connecting said crank pin to a point of the pins near their operative end, registering pins, a lever connecting same with the film advancing pins, a pivot for said lever between the two sets of pins, a rotary cam consisting of arc-shaped elements the centre of which is on the axis of rotation of the cam and intermediary winding elements, a guiding rod pivotally secured to the connecting rod and a link arrangement controlled by the cam acting on said guiding rod and adapted when it is controlled by the winding parts of the cam to compensate the control of the connecting rod on the film advancing pins in the direction perpendicular to the film and to be inoperative when engaged by the arc-shaped elements.

5. A control mechanism comprising a drive shaft, film-advancing pins, an eccentric crank pin controlled by the shaft, a connecting rod connecting said crank pin to a point of the pins near their operative end, registering pins, a lever connecting same with the film advancing pins, a pivot for said lever between the two sets of pins, a rotary cam consisting of arc-shaped elements the centre of which is on the axis of rotation of the cam and intermediary winding elements showing a number of receding parts, a roller cooperating with the cam, a guiding rod pivotally secured to the connecting rod, a crank lever the axis of which is stationary and the arms of which are pivotally secured to the guiding rod and to the roller, the movements transmitted by the cam to the guiding lever being such as will, when the roller is in the receding parts of the cam, compensate the advance motion imparted by the connecting rod to the film-advancing means in the direction perpendicular to the film.

6. A control mechanism comprising a

drive shaft, film-advancing pins, an eccentric crank pin controlled by the shaft, a connecting rod connecting said crank pin to a point of the pins near their operative end, registering pins, a lever connecting same with the film advancing pins, a pivot for said lever between the two sets of pins, a rotary cam consisting of arc-shaped elements the center of which is on the axis of rotation of the cam and intermediary winding elements showing a number of receding parts, a roller cooperating with the cam, a guiding rod pivotally secured to the connecting rod, a crank lever the axis of which is stationary and the arms of which are pivotally secured to the guiding rod and to the roller, and gear wheels operatively connecting the drive shaft and the rotary cam, the movements transmitted by the cam to the guiding lever being such as will, when the roller is in the receding parts of the cam, compensate the advance motion imparted by the connecting rod to the film-advancing means in the direction perpendicular to the film.

7. A control mechanism for a part moving in a closed circuit comprising a drive shaft, an eccentric crank pin controlled by the shaft, a connecting rod connecting said crank pin to the moving part, a rotary cam consisting of arc-shaped elements the centre of which is on the axis of rotation of the cam and intermediary winding elements showing a number of receding and advancing parts, a roller cooperating with the cam, a guiding rod pivotally secured to the connecting rod, a crank lever the axis of which is stationary and the arms of which are pivotally secured to the guiding rod and to the roller, and means whereby the drive shaft controls the rotary cam, the movements transmitted by the roller to the crank lever being such as will when the roller is in the receding and advancing parts of the cam, compensate the reciprocating motion of the controlled part in a given direction.

In testimony whereof I have signed my name to this specification.

ANDRÉ LÉON VICTOR CLÉMENT DEBRIE.