Oct. 22, 1929. G. A. KERESTES 1,732,755

MOTION PICTURE MACHINE

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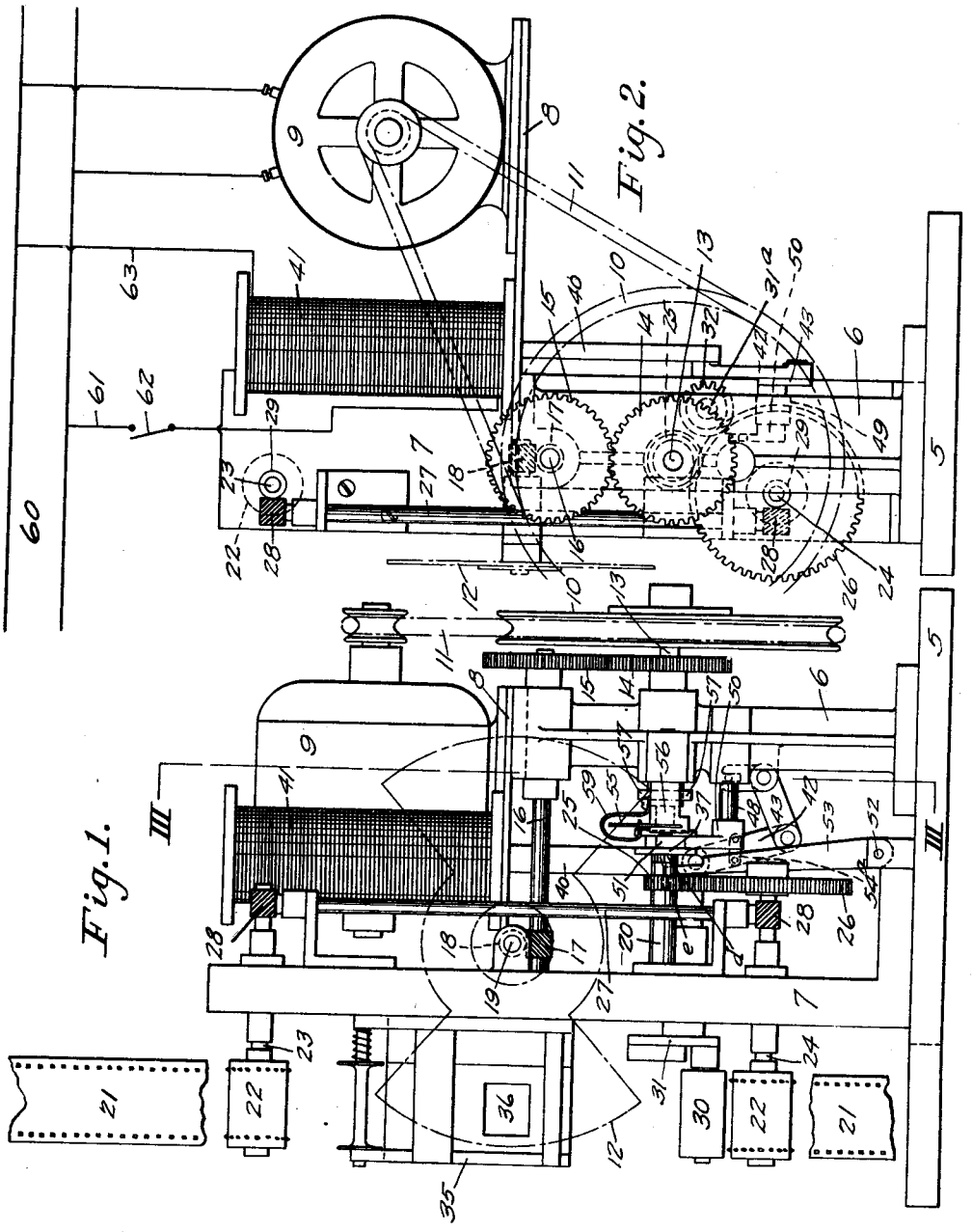


Fig. 2.

Fig. 1.

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Fig. 3.

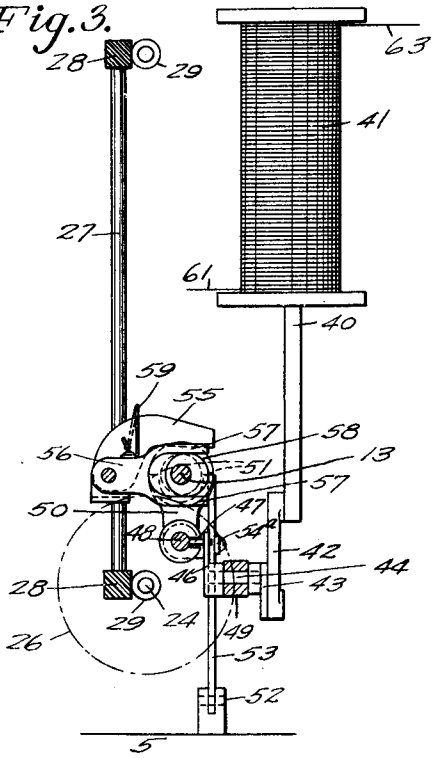


Fig. 4.

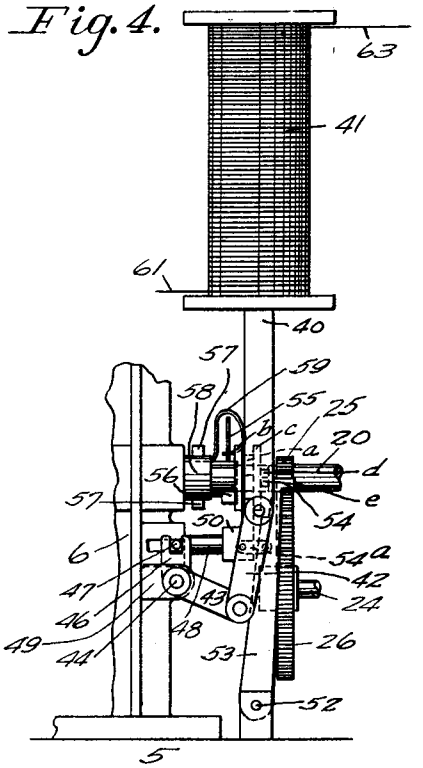
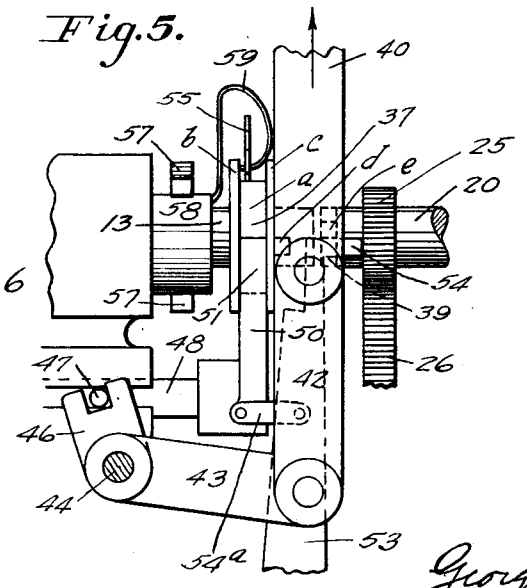


Fig. 5.



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UNITED STATES PATENT OFFICE

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MOTION-PICTURE MACHINE

Application filed May 28, 1927. Serial No. 194,952.

This invention relates to improvements in motion picture projecting machines, and more particularly to a motion picture machine embodying means for stopping the movement of the film at intervals with a picture in the frame or gate of the machine, without stopping the machine.

In the machines of the character stated, as heretofore constructed, considerable trouble has been encountered in stopping the film feeding mechanism just at the desired instant, i. e., when a complete picture is in the frame, without stopping the movements of other moving parts of the machine, such, for example, as the shutter and its actuating mechanism.

Among the objects of the present invention are, to provide simple and efficient means for automatically stopping the movement of the film at the desired instant; to provide means coacting with the film stopping means, operable in conjunction with the film feed mechanism, to permit a movement of the stopping means to arrest the movement of the film only when a complete picture is framed; and means, operable from a distance, for automatically stopping and starting the film feed mechanism without affecting the shutter driving mechanism.

In the accompanying drawings, which illustrate an application of my invention:

Fig. 1 is a front elevational view of a moving picture machine embodying my invention;

Fig. 2, a side elevational view;

Fig. 3, a detail view, partly in elevation and partly in section, the section being taken on line III—III of Fig. 1;

Fig. 4, a detail elevational view taken at right angles to the view of Fig. 3; and

Fig. 5, a detail elevational view, particularly showing the clutch and stop means for controlling the movement of the clutch embodied in my invention.

Referring to the drawings, 5 designates a bed plate, and 6 and 7 are standards or uprights entering into the construction of the machine. Standard 6 is designed to carry a shelf 8 upon which a small electric motor 9 is mounted. 10 is a band wheel designed to be driven by a belt 11, leading from the drive shaft of the motor.

The picture projecting lens of the machine, as well as the lamp employed in connection therewith, are not shown. It is evident that they may be disposed at any convenient and desired points. The shutter of the machine is indicated by the numeral 12.

The band wheel 10 is mounted on an end of a main driving shaft 13, the latter having its bearings on the standard 6. Drive shaft 13 is designed to be continuously driven and has fixedly mounted thereon, a gear 14 which meshes with a gear 15 carried at one end of a shaft 16. The opposite end of shaft 16 carries a worm pinion 17, and worm 17 engages a worm pinion 18 disposed on an end of the shutter shaft 19. It will be noted that, by the means just described, the shutter 12 is continuously driven by the main drive shaft 13 and the intermediate gearing located between the gear 14 and the shutter.

Located in line with the main drive shaft 13, and adapted to be driven thereby, is a horizontally disposed drive shaft 20. Shaft 20 is designed to drive the film 21, extending from a reel, not shown, by means of the film feed mechanism including film wheels 22, respectively mounted on shafts 23 and 24, a pinion 25 on shaft 20 meshing with a gear wheel 26, and a vertically extending shaft 27 having worm pinions 28 arranged to engage corresponding pinions 29 carried on the respective shafts 23 and 24.

In the construction illustrated, and in addition to the film feed mechanism described, I provide a film beater device 30, for imparting an intermittent movement to the film and causing each successive picture to be moved into register with the frame opening. The beater is mounted on a crank 31, carried on an end of a shaft 31ª, which extends through the standard 7 and has a pinion 32 thereon designed to engage gear wheel 26 on the driven shaft 24. The beater 30 operates in conjunction with the film, so that upon each revolution of the beater a complete picture will be positioned over the opening of the frame or gate. The frame 35, which may be of the usual or any preferred construction, is sup-

ported from the standard 7 and is provided with a gate or opening 36.

In machines of the character to which this invention relates, it is of the utmost importance to provide means for automatically stopping the film feeding mechanism at the desired instant, namely, only when a complete picture is in the opening of the frame, and the present invention is particularly directed to accomplishing this purpose.

The means illustrated for accomplishing the end just mentioned include a clutch mechanism, means for actuating the clutch mechanism, and means for preventing the operation of the clutch mechanism, to arrest the movement of the film feed mechanism, until the desired instant. These several mechanisms will now be described.

Slidably mounted on the inner end of the drive shaft 13, is a clutch member designated generally by the numeral 37; said member is keyed to the shaft 13 and, as illustrated, includes a hub portion *a* and two annular members or disks *b* and *c* carried on the hub and spaced from each other. Member *c* is provided with a projecting lug *d* adapted to be moved into and out of engagement with a lug *e* of another clutch member 39, fixed to the driven shaft 20. The clutch member 37, as shown, is designed to be moved into and out of operative engagement with member 39 by electro-magnetic means and mechanism interposed between the core 40 of a solenoid 41 and the said clutch member. The said interposed mechanism includes a depending bar or link 42 pivotally attached at one end to the core 40, and at its opposite end pivotally connected with a link 43 carried on an end of a rock-shaft 44 disposed in a bearing 49 supported on the standard 6.

Rock-shaft 44, at its other end, carries a forked member 46 adapted to engage a pin 47 projecting from a horizontally reciprocable shaft 48, the latter also being supported in bearing 49 on the standard 6. Shaft 48 has secured to its inner end a clutch member engaging element 50. This element 50 has a vertically extending portion forked at its upper end to provide arms 51 adapted to be entered in the space between the spaced-apart members *b* and *c* of the slidable clutch member 37.

Pivotally connected with the base of the machine, at 52, is a vertically extending member 53 carrying at its upper end a stop-lug 54. Member 53 is connected with element 50 by a link 54^a, and is moved with element 50 to carry the stop-lug 54 into and out of the path of travel of the lug *e* of clutch member 39, to prevent any rotation, due to momentum, of driven shaft 20 after the slidable clutch member 37 has been moved out of engagement with clutch element 39.

The means for preventing the operation of the clutch members, to arrest the movement of the film feed mechanism, except at the desired instant, as illustrated and as preferred, include a blade-like detent member 55 secured to and movable with a rock-member 56, supported from the standard 6, and arms 57 projecting from the rock member, and arranged to engage and be actuated by a cam 58 fixed on the main drive shaft 13.

Blade member 55 is arranged adjacent to the slidable clutch element 37 and in the path of the sliding movement thereof when in its lowered position and out of said path when in its raised position. 59 designates a spring wire element having one end rigidly secured to the rock member 56 and its other end loosely attached to the stop blade member 55. The function of spring element 59 is to prevent the blade from remaining in contact with the periphery of either of the disks *b* and *c* should said blade strike either periphery during the shifting movement of the clutch element, and to aid in centering the blade relatively to the said movable clutch member.

It will be understood that the movement of the means for preventing the sliding movement of the clutch mechanism to released position, and particularly the movement of blade member 55 is so timed in relation to the film feed driving mechanism that said member is in its uppermost position at the instant a complete picture is in the frame. Consequently, the movable clutch member can never be shifted during a change of pictures or when a partial picture is in the frame. The movement of the blade 55 and its timing is effected by a cam 58 carried on the continuously revolving drive shaft 13.

The contour of cam 58 and the mounting thereof on drive shaft 13 is such that it functions to raise the blade 55 free of the movable clutch member just at the instant the beater 30 has positioned a complete picture in the frame opening and has moved out of contact with the film.

The electric current employed for operating the machine is obtained from a main line, indicated by the numeral 60, and, as illustrated, the main line is connected with the motor 9 and with the solenoid 41. Current for energizing the core 40 of the solenoid to cause it to be drawn upwardly for moving the clutch mechanism to disconnect the film feed driving mechanism is obtained through conductor 61, switch 62, and conductor 63. Closing the circuit leading to the solenoid by the switch 62 energizes the core 40 to raise bar 42 and actuate the clutch moving mechanism including the reciprocal shaft 48 and its clutch engaging member 50. It will be understood that the switch 62 may be positioned at any desired point from the machine, for example, within convenient reach of a lecturer on a platform at a distant point from the machine.

It is evident that, in place of the beater 30 and its actuating mechanism, a Geneva or other film movement may be employed; also, that the shifting member of the clutch may be moved otherwise than by electrically operated means.

What I claim is:

1. In a motion picture machine, a picture frame having an opening and a shutter for coaction with a film, a drive shaft, intermittent film feed mechanism, means for drivingly connecting the shutter with the drive shaft, means including a slidable clutch member for connecting the film feed mechanism with the drive shaft, means for preventing a release of the clutch to arrest the film feed mechanism except when a complete picture is in register with the frame opening including a rocking member positioned adjacent the slidable clutch member and arranged for movement into and out of the path of travel of the clutch member and a cam on the drive shaft for actuating the rocking member, and means for shifting the clutch member.

2. In a motion picture machine, a picture frame having an opening, a drive shaft, a driven shaft in line with the drive shaft, clutch means between the said shafts, a film feed mechanism operatively connected with the driven shaft, electro-magnetic means for shifting the clutch means to arrest the movement of the film feed mechanism, and stop means actuated by the drive shaft and timed relatively to the film feed mechanism to prevent a movement of the clutch to release position except when a complete picture is in the frame opening, said stop means including a rocking member having an arm movable into and out of the path of movement of the clutch means, a cam on the drive shaft, and a connection between the cam and the rocking member.

3. In a motion picture machine having a projection opening and a shutter for coaction with a film, a drive shaft, a film-feed mechanism, a clutch device for connecting the film-feed mechanism with the drive shaft, means to shift the clutch device comprising a reciprocatory shaft, a rock shaft operable to reciprocate the last mentioned shaft, means to operate the rock shaft, a connection from the reciprocatory shaft to said clutch device, a rocking member having a detent member movable therewith preventing shifting of the clutch device except when a complete picture is in registry with said opening, a positioning spring for said detent member, an operating cam for said rocking member driven by the drive shaft, and means to drive the said shutter from the drive shaft.

In testimony whereof I affix my signature.

GEORGE A. KERESTES.