D. D. DANIEL.

ATTACHMENT FOR MOTION PICTURE MACHINES.

APPLICATION FILED SEPT. 18, 1919.

1,361,143.

Patented Dec. 7, 1920.

3 SHEETS—SHEET 1.

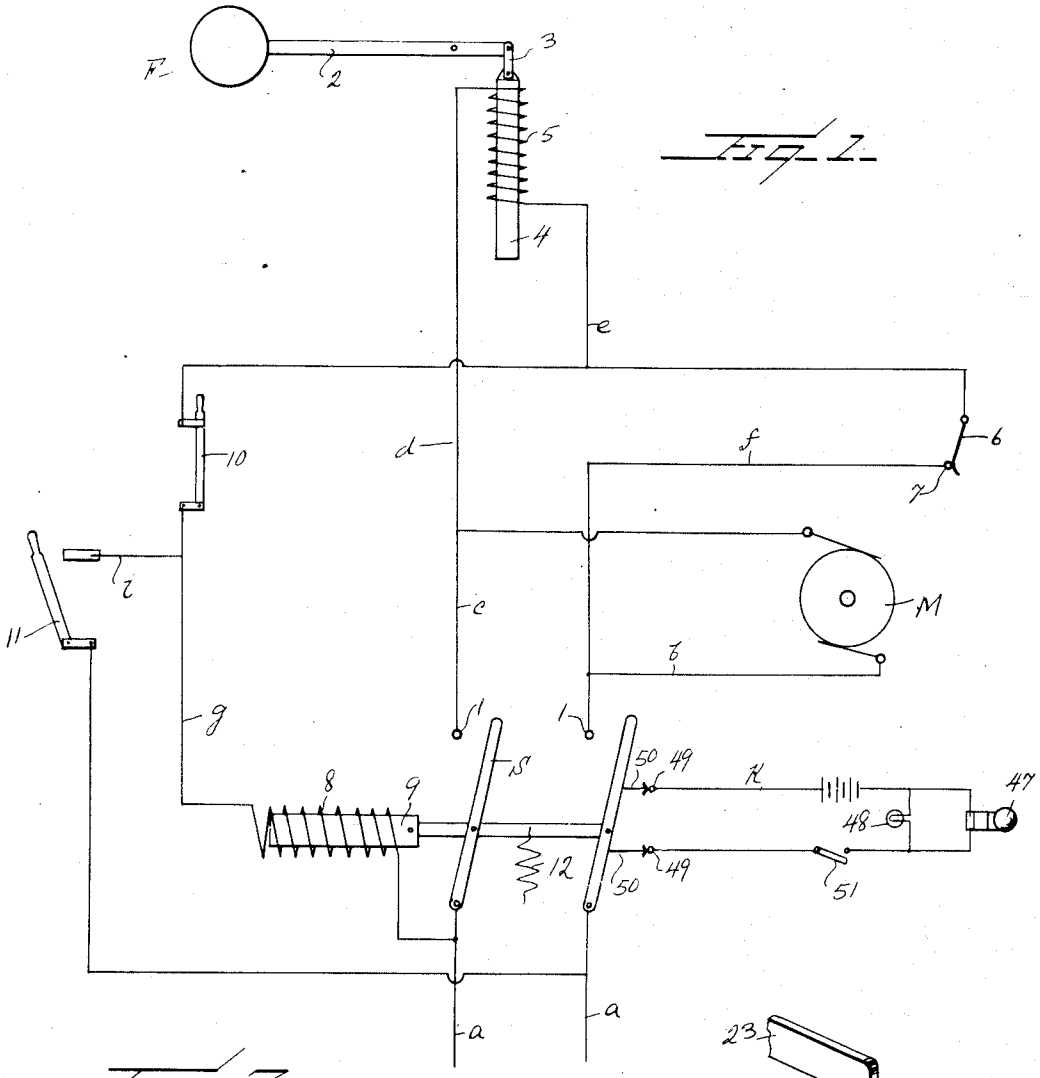


Fig. 1.

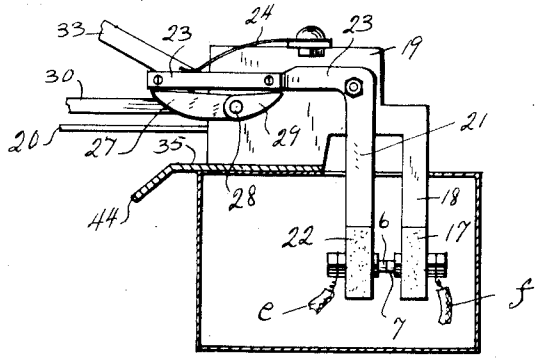


Fig. 7.

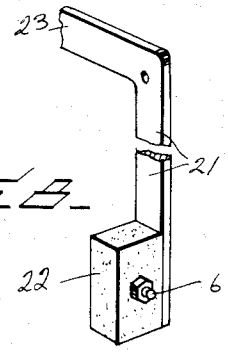


Fig. 8.

Inventor

D. D. Daniel

By Watson E. Coleman

Attorney

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Fig. 2.

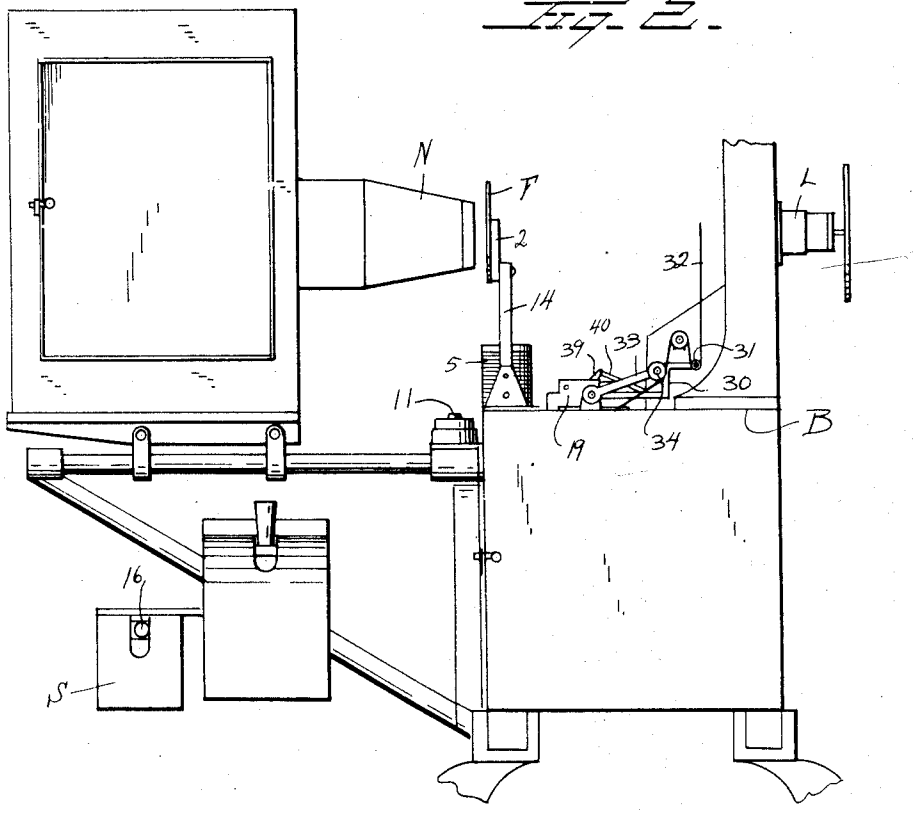
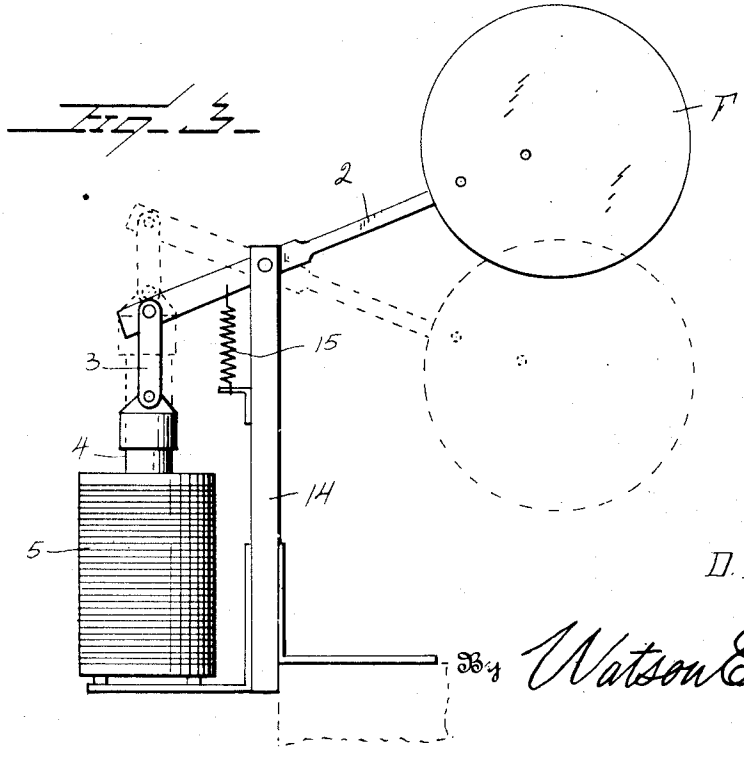


Fig. 3.



Inventor

D. D. Daniel

By Watson E. Coleman

Attorney

D. D DANIEL.

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3 SHEETS—SHEET 3.

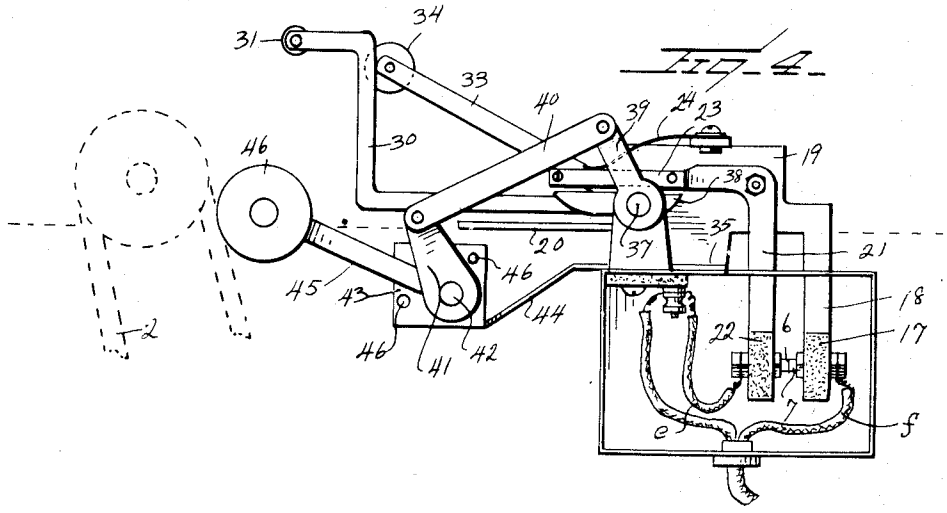


Fig. 4.

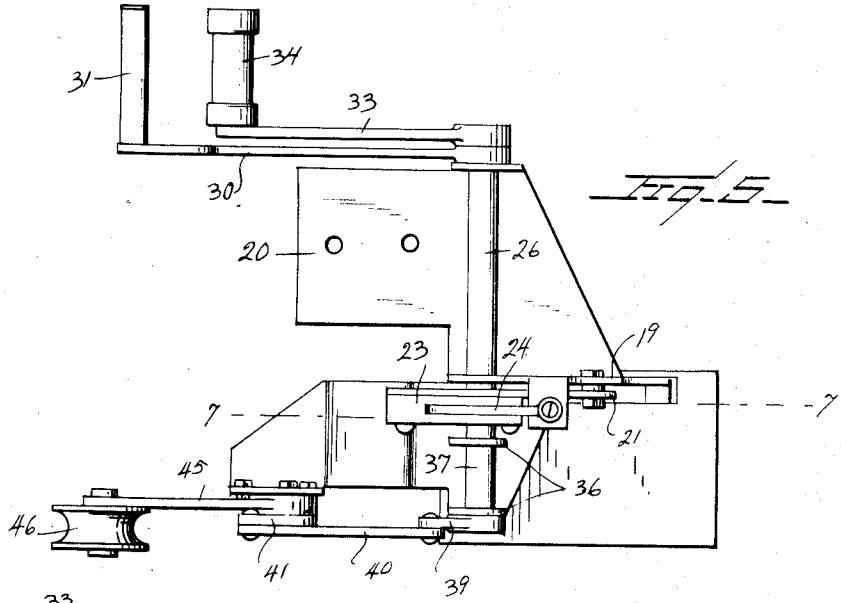


Fig. 5.

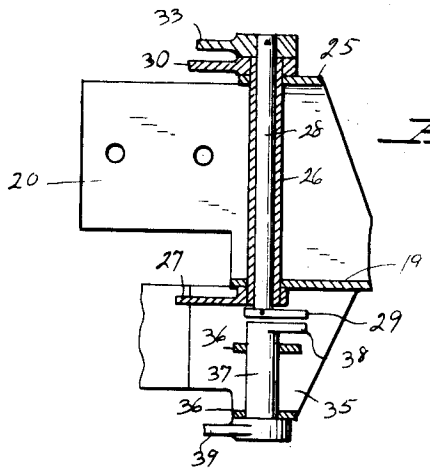


Fig. 6.

Inventor

D. D. Daniel

By Watson E. Coleman

Attorney

UNITED STATES PATENT OFFICE.

DOSSEY D. DANIEL, OF RICHMOND, VIRGINIA.

ATTACHMENT FOR MOTION-PICTURE MACHINES.

1,361,143. Specification of Letters Patent. Patented Dec. 7, 1920.

Application filed September 18, 1919. Serial No. 324,634.

To all whom it may concern:

Be it known that I, DOSSEY D. DANIEL, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Attachments for Motion-Picture Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to attachments for motion picture machines and primarily it is an object of the invention to improve upon the structure particularly disclosed in my prior Patent No. 1,168,607, granted January 18, 1916.

A further object of the invention is to provide a novel and improved attachment of this general character adapted for use in connection with a moving picture machine in which an electric motor is the power employed for driving the mechanism, and wherein the attachment is provided with means whereby the machine is entirely safe from the danger of fire, the parts being so constructed and arranged that immediately upon the stopping or breaking of the film the motor circuit will be automatically opened and the machine stopped.

An additional object of the invention is to provide a novel and improved attachment of this general character which automatically operates to break the supply or feed circuit for the machine to both stop the motor and shut off the light in the event of any pronounced irregularity in the travel of the film, such as breakage or the like, or upon derangement of the driving connection from the motor.

An additional object of the invention is to provide a novel and improved attachment of this general character wherein a controlling switch is interposed in the main leads for the electrical system of the picture machine, and wherein said main switch can be readily moved into closed position under the influence of a subsidiary circuit, and wherein the fire shutter of the machine will be automatically moved to closed position and the operating motor automatically stopped upon irregularity in the travel of the film or upon derangement of the driving connection between the motor and the machine.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved attachments for motion picture machines whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a schematic view illustrating an attachment constructed in accordance with an embodiment of my invention;

Fig. 2 is a fragmentary view in side elevation of a conventional type of moving picture machine with my improved attachment as herein embodied applied thereto;

Fig. 3 is a fragmentary view in elevation of the fire shutter and the operating means therefor, as herein included, a second position of the shutter being indicated by dotted lines;

Fig. 4 is an enlarged fragmentary view in elevation illustrating the circuit breaker as improved in my attachment, as herein disclosed, the driving belt from the motor being indicated by the dotted lines;

Fig. 5 is a view in top plan of the structure illustrated in full lines in Fig. 4;

Fig. 6 is a fragmentary view partly in top plan and partly in section, illustrating in detail the mounting of the independently operable controlling members for the circuit breaker;

Fig. 7 is a sectional view taken substantially on the line 7—7 of Fig. 5, and

Fig. 8 is a fragmentary view in perspective of the movable contact comprised in the circuit breaker, as herein disclosed.

In the schematic illustration of my invention as afforded by Fig. 1, *a* denotes conductors leading from a suitable source of electrical energy, and preferably from the circuit of the house or place of exhibition. The leads *a* are operatively connected with a two pole switch S, of a conventional type, and which coacts in a convenient manner with the stationary contacts 1.

M denotes the motor for driving in a well known manner the mechanism of a moving picture machine, and preferably through a belt connection indicated at 2 in Fig. 4. The motor M is electrically connected with the

conductors *b* and *c*, so that when the switch S is in closed position the desired circuit will be created for operating the motor M.

F denotes a fire shutter mounted upon an end portion of a vertically swinging arm 2, and which shutter, when the circuit is closed through the conductors *b* and *c*, is maintained in a position out of line with the rays emitted from the nozzle N for projecting the pictures through the lens L of the mechanism of the machine. During the period of projection the fire shutter F in the present embodiment of my invention is held in a position below the rays emitted from the nozzle N, so that no obstruction or hindrance will be offered thereto. The arm 2 has operatively engaged therewith, preferably through the medium of the elongation 3, the armature or core 4, comprised in the electromagnet 5.

The magnet 5 is in electrical connection with the conductor *c* through the conductor *d*, also in proper electrical connection with the magnet 5 is a conductor *e* leading to the movable contact 6 comprised in the circuit breaker to be hereinafter more particularly referred to.

The stationary contact 7 has leading therefrom a conductor *f* with electrical connection with conductor *b* hereinbefore referred to.

In view of the foregoing it will be noted that when the motor circuit is closed through the conductors *b* and *c*, a circuit will also be closed through the conductors *d*, *e* and *f* when the contacts 6 and 7 are in engagement, so that the magnet 5 will be energized and the armature moved to a position to swing the arm 2 to arrange the fire shutter F in the desired position out of alinement with the rays of light emitted from the nozzle N.

8 denotes a second electromagnet having its core or armature 9 operatively engaged with the switch S, and said electromagnet 8 is interposed in a conductor or lead *g* connecting the conductor *a* and the conductor *e*, so that when the circuit is closed through the contacts 6 and 7 the switch S will be held in its closed position.

Interposed in the conductor *g* is a switch 10, preferably a push button, whereby the circuit which is initially closed through the contacts 6 and 7 may be broken at the will of the operator.

Leading from the second conductor *a* to the conductor *g* is a lead or conductor *i* having interposed therein a switch 11, preferably a push button, and which, when the switch S is in open position, is adapted to be closed, in order to create the desired circuit through the conductors *i* and *g* to momentarily energize the electromagnet 8, so that the switch S will be moved into closed position. It is to be understood that after the switch S has been moved into closed position by closing of the switch 11, said switch S will be further maintained in closed position through the circuit passing through the contacts 6 and 7.

Should the circuit through the contacts 6 and 7 be broken, and particularly by movement of the contact 6 into open position, the switch S will automatically be moved into open position by gravity, or by a suitably positioned spring 12, preferably the latter.

It will also be understood that when the circuit is broken through the contacts 6 and 7 the fire shutter F will move into a position directly between the nozzle N and the lens L, so that ignition of the film is prevented.

Under normal condition, during the operation of the machine, the circuit is closed through the contacts 6 and 7, but in the event of any irregularities in the travel of the film, such as breakage, undue slackage or tension, or from other causes, the movable contact 6 will be thrown into open position through a mechanism to be hereinafter described. The mechanism to be described also includes a means whereby the movable contact 6 will be thrown into open position upon derangement of the driving connection between the motor and the mechanism of the machine, and more particularly upon breaking or jumping off of the belt 2^a, which is now generally employed in moving picture machines now in use.

As is particularly illustrated in Fig. 3, the arm 2 of the fire shutter is supported intermediate its length for vertical swinging movement by the upper end portion of a vertically disposed post 14, suitably mounted upon the base of the machine, although I do not wish to be understood as limiting myself in this respect.

I also find it of advantage to employ in connection with the arm 2 a tractile member 15, herein disclosed, as a coil spring, which operates to further facilitate the moving of the fire shutter F into working position in the event of the circuit being broken through contacts 6 and 7.

As is illustrated in Fig. 2 the switch S is suitably supported by the frame or base of the picture machine, although it can be located as best meets the occasions of practice, and said switch is provided with a handle 16, so that said switch may be manually thrown into open or closed position, as may be required.

As is particularly illustrated in Figs. 4 to 7, the stationary contact 7 is carried by an insulating block 17, suitably affixed to an arm 18, depending from an upstanding wing or flange 19. The wing or flange 19 is carried by a plate 20, which is adapted to be suitably anchored upon the base of the machine. Pivotally engaged with the wing or

flange 19 is a depending arm 21, which has movement toward or from the arm 18 and the lower portion of said arm 21 has affixed thereto an insulating block 22, which carries the movable contact 6.

The pivoted end portion of the arm 21 is provided with an extension 23, preferably at right angles thereto, and constantly bearing down upon the extension 23 is a suitably arranged spring 24. The spring 24 operates to normally maintain the contacts 6 and 7 in engagement to close the circuit therethrough.

The plate 20 is provided with a second upstanding wing or flange 25, and said wings or flanges 19 and 25 rotatively support a tubular shaft 26. An end portion of the shaft 26 is provided with a cam member 27, which underlies the extension 23, so that upon rotation of the shaft 26 in one direction the cam 27 operates to swing the extension 23 upwardly and the contact 6 in a direction away from the contact 7, so that the circuit through said contacts 6 and 7 will be broken.

Extending through the tubular shaft 26 is a second shaft 28, which is also provided with a cam 29 underlying the extension 23 so that upon rotation of the shaft 28 in one direction the cam 29 will also swing the extension 23 upwardly and thereby move the contact 6 out of engagement with the contact 7 to break the circuit through said contacts.

Suitably affixed to the shaft 26 is an arm 30 provided with a roller 31, which is disposed within the loop of the film 32. In the event the film should stop from any cause, the slack will be substantially instantly drawn out of the film and the latter will engage the roller 31 with comparatively great force, and instantly swing the arm 30 upwardly, with the result that the cam 27 carried by the shaft 26 will raise the extension 23 and thereby separate the contacts 6 and 7 and thereby break the circuit therethrough. Upon breaking of this circuit the switch S will automatically assume an open position, so that the fire shutter will move into working position and the motor M will stop.

The shaft 28 has affixed thereto an arm 33 carrying a roller 34, which engages the film 32. The roller 34 lies on the film 32, so that in the event of the film breaking or becoming unduly slack the arm 33 will drop and thereby rock the shaft 28 in a direction to cause the cam 29 to move the extension 23 upwardly to separate or open the contacts 6 and 7.

The wing or flange 19, in the present embodiment of my invention also extends below the plate 20, and the lower portion of said wing or flange 19 is provided with the outstanding and substantially horizontally disposed table or shelf 35. This table or shelf 35 is provided with a pair of upstanding and alined bearings 36, in which is rotatively mounted a stub shaft 37. This stub shaft 37 is also provided with a cam 38 underlying the extension 23 of the arm 21, so that upon rotation of the shaft 37 in one direction the cam 38 will operate to swing the extension 23 upwardly and thereby separate the contacts 6 and 7 to break the circuit therethrough. The stub shaft 37 is also provided with an upstanding rock arm 39, to which is pivotally engaged an end portion of a link 40. The opposite end portion of the link 40 is pivotally engaged with an upstanding rock arm 41 carried by a second stub shaft 42. The second stub shaft 42 is rotatively engaged with a bearing 43 carried by an extension 44 of the table or shelf 35.

Secured to and extending outwardly from the stub shaft 42 is an elongated rock arm 45 provided at its outer end portion with a roller 46, which lies upon a stretch of the driving belt 2, which is in operative connection with the motor M. Should the belt 2 become broken or otherwise deranged the arm 45 will drop, resulting in sufficient rotation of the stub shaft 37 to cause the cam 38 carried thereby to swing the extension 23 upwardly and thereby break the circuit between the contacts 6 and 7.

The arm 45 travels between the outstanding stop pins 46 carried by the bearing 43, so that the arm 45 is prevented from having undue or unnecessary swinging movement.

In order that a suitable alarm may be given when the switch S is automatically moved into open position I find it of advantage to employ a local circuit k having interposed therein an audible signal 47, preferably a bell, and a visual signal 48, preferably a lamp. The circuit k is normally open, and includes the stationary spaced contact 49. The circuit is closed through the contacts 49 when the switch S is in open position by the contact 50 carried by said switch S.

I also find it of advantage to interpose in the circuit k the circuit closer 51 adapted to be manually operated, so that when it is not desired to have the local circuit k operate, the same may be conveniently broken.

From the foregoing description, it is thought to be obvious that an attachment for motion picture machines constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my in-

vention in practice except as hereinafter claimed.

I claim:

1. In a moving picture apparatus, the combination with a motor circuit; of a switch interposed in the motor circuit and tending normally to move into open position, a shunt circuit leading from the motor circuit, a normally closed circuit breaker interposed in the shunt circuit, an electro-magnet interposed in a branch of the shunt circuit and coacting with the switch to maintain the switch in closed position during the period the motor circuit is closed, a second shunt circuit leading from a branch of the motor circuit to a branch of the first named shunt circuit, an electro-magnet interposed in said second shunt circuit, and a fire shutter operatively engaged with said last named electro-magnet, said electro-magnet, during the period the motor circuit is closed, operating to maintain the fire shutter in open position.

2. An attachment for a motor driven motion picture machine including a switch controlling the motor circuit, said switch tending normally to move into open circuit position, a shunt circuit coacting with the motor circuit, one branch of the shunt circuit being in communication with a branch of the motor circuit in advance of the switch, the second branch of the shunt circuit being in connection with the motor circuit inwardly of the switch, an electro-magnet interposed in the first named branch of the shunt circuit and coacting with the switch to maintain the switch in closed position during the period the motor circuit is closed, a circuit breaker interposed in the shunt circuit, said circuit breaker comprising two relatively movable contact members, means for normally maintaining the contact members in engagement to close the shunt circuit and energize the electro-magnet to maintain the motor circuit closed, and means coöperating with the driving connection with the motor and automatically separating the contact members of the circuit breaker upon derangement of the driving connection with the motor.

3. An attachment for a motor driven motion picture machine including a switch controlling the motor circuit, said switch tending normally to move into open circuit position, a shunt circuit coacting with the motor circuit, one branch of the shunt circuit being in communication with a branch of the motor circuit in advance of the switch, the second branch of the shunt circuit being in connection with the motor circuit inwardly of the switch, an electro-magnet interposed in the first named branch of the shunt circuit and coacting with the switch to maintain the switch in closed position during the period the motor circuit is closed, a circuit breaker interposed in the shunt circuit, said circuit breaker comprising two relatively movable contact members normally in engagement to close the circuit, movable members mounted for actuation upon the stopping or breaking of the film, each of said members upon such actuation operating to separate the contact members of the circuit breaker.

4. An attachment for a motor driven motion picture machine including a switch controlling the motor circuit, said switch tending normally to move into open circuit position, a shunt circuit coacting with the motor circuit, one branch of the shunt circuit being in communication with a branch of the motor circuit in advance of the switch, the second branch of the shunt circuit being in connection with the motor circuit inwardly of the switch, an electro-magnet interposed in the first named branch of the shunt circuit and coacting with the switch to maintain the switch in closed position during the period the motor circuit is closed, a circuit breaker interposed in the shunt circuit, said circuit breaker comprising two relatively movable contact members normally in engagement to close the circuit, movable members mounted for actuation upon the stopping or breaking of the film, each of said members, upon such actuation, operating to separate the contact members of the circuit breaker, and an additional movable member mounted for actuation upon derangement of the driving connection between the motor and the mechanism, said last named member, upon such actuation, also operating to separate the contact members of the circuit breaker.

In testimony whereof I hereunto affix my signature.

DOSSEY D. DANIEL.