G. J. SCHAFFER.

AUTOMATIC FIRE PREVENTIVE DEVICE FOR MOVING PICTURE PROJECTION MACHINES.

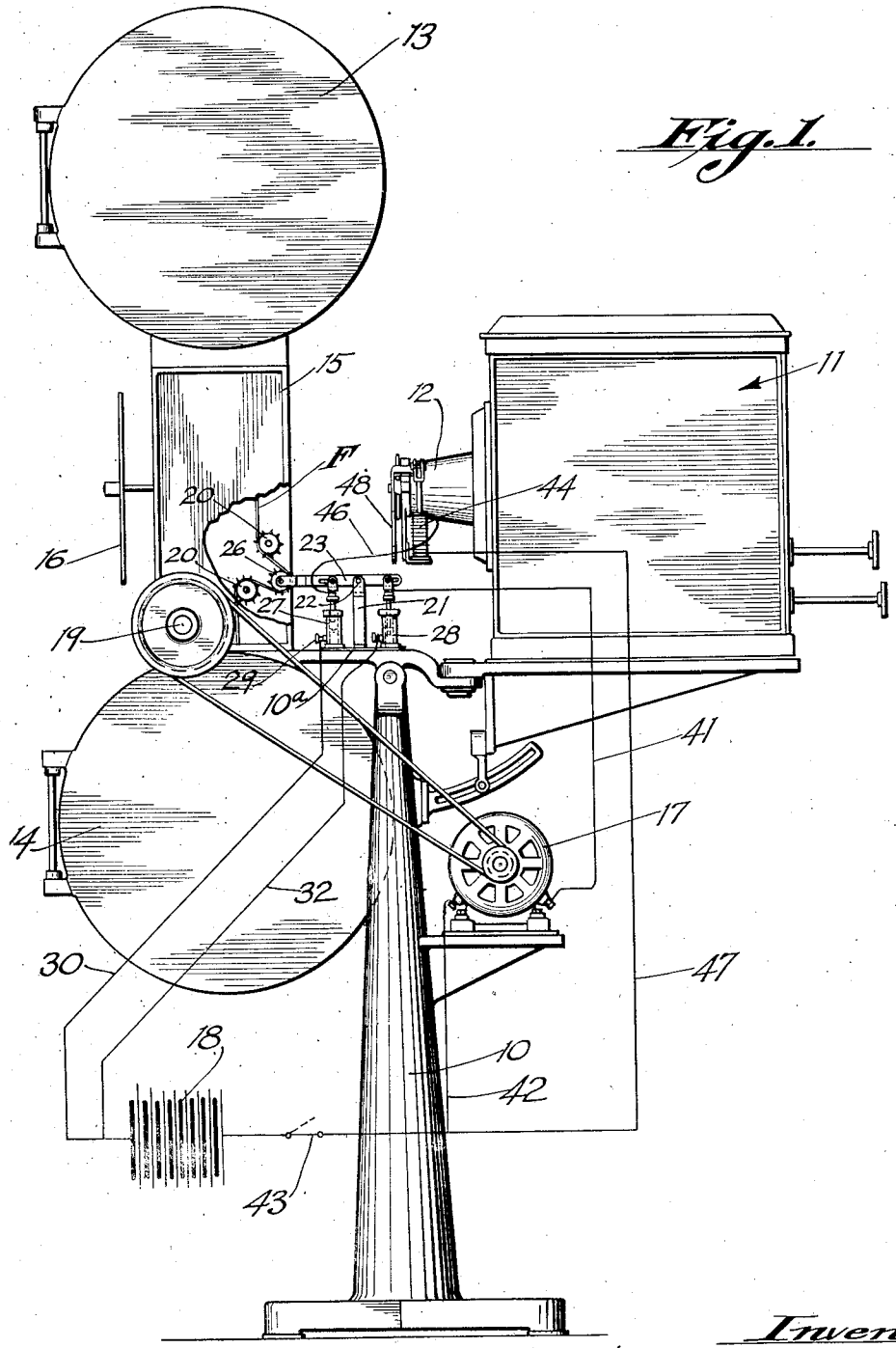
APPLICATION FILED JAN. 18, 1921.

1,409,120.

Patented Mar. 7, 1922.

3 SHEETS—SHEET 1.

Fig. 1.



Inventor.

GEORGE J. SCHAFFER.

Hazard & Miller

Attorneys.

PHOTO-LITHO. by SACKETT & WILHELMS CORP. N.Y.

G. J. SCHAFFER.

AUTOMATIC FIRE PREVENTIVE DEVICE FOR MOVING PICTURE PROJECTION MACHINES.

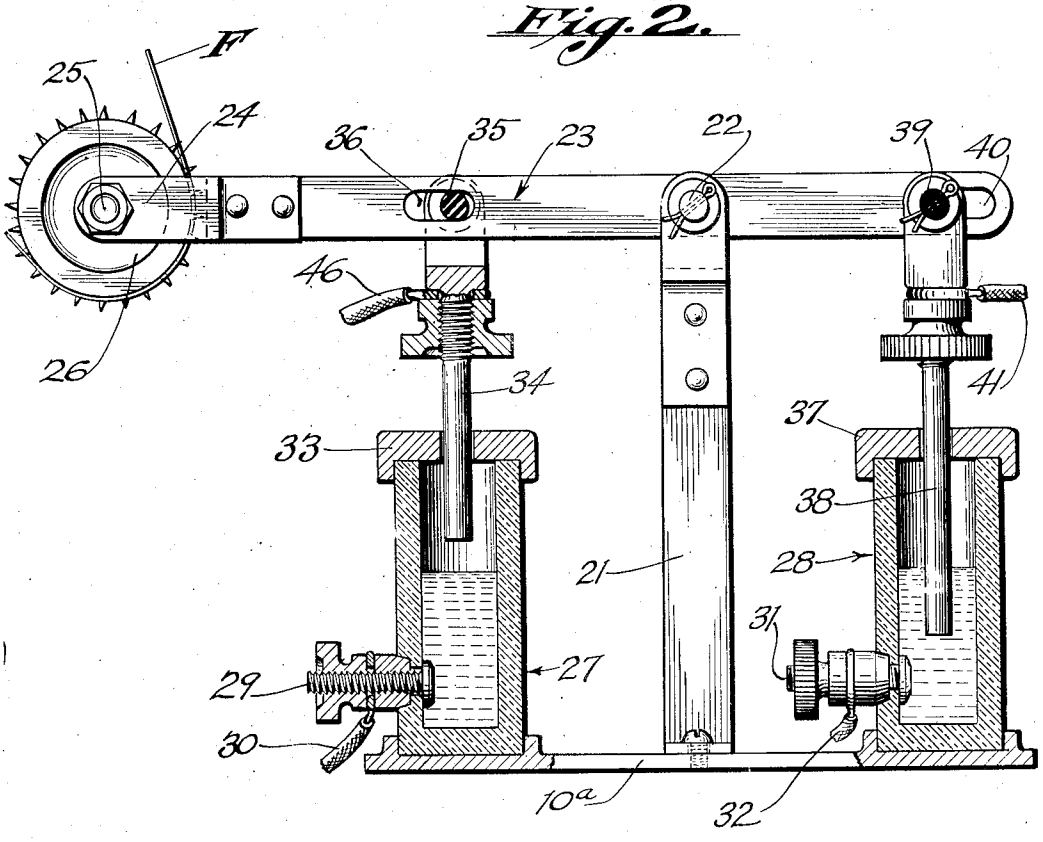
APPLICATION FILED JAN. 18, 1921.

1,409,120.

Patented Mar. 7, 1922.

3 SHEETS—SHEET 2.

Fig. 2.



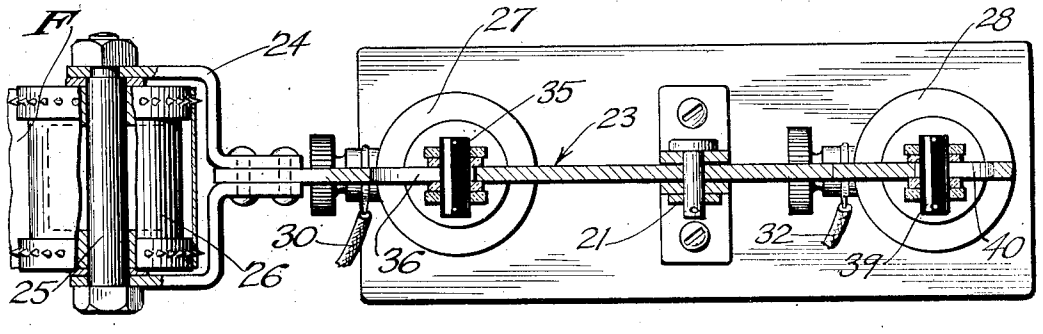


Fig. 3.

Inventor:
GEORGE J. SCHAFFER.
Hazard & Miller
Attorneys.

G. J. SCHAFFER.

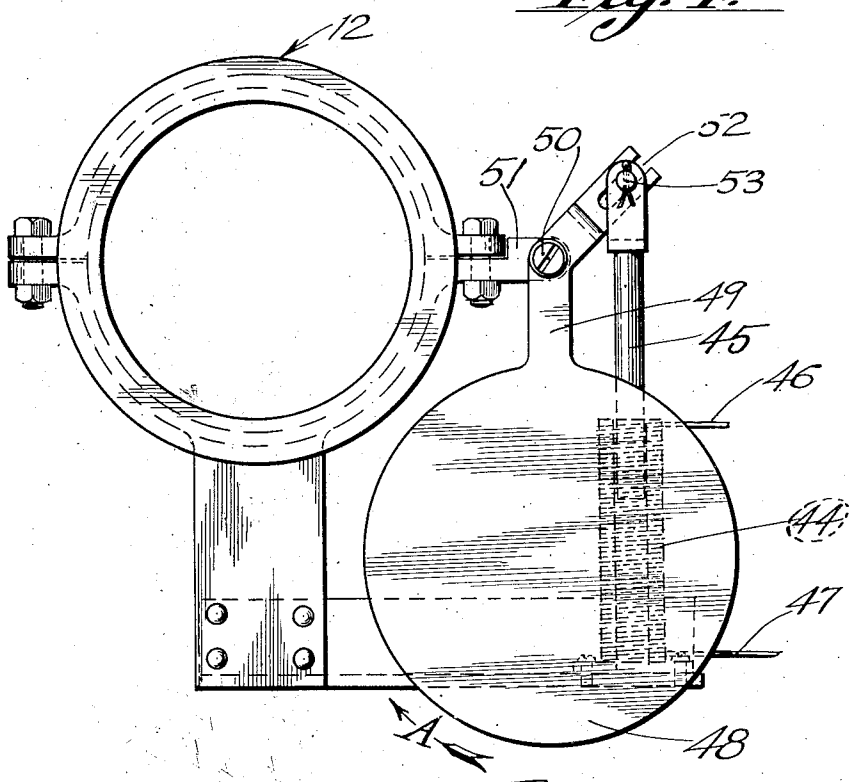
AUTOMATIC FIRE PREVENTIVE DEVICE FOR MOVING PICTURE PROJECTION MACHINES.

APPLICATION FILED JAN. 18, 1921.

1,409,120. Patented Mar. 7, 1922.

3 SHEETS—SHEET 3.

Fig. 4.



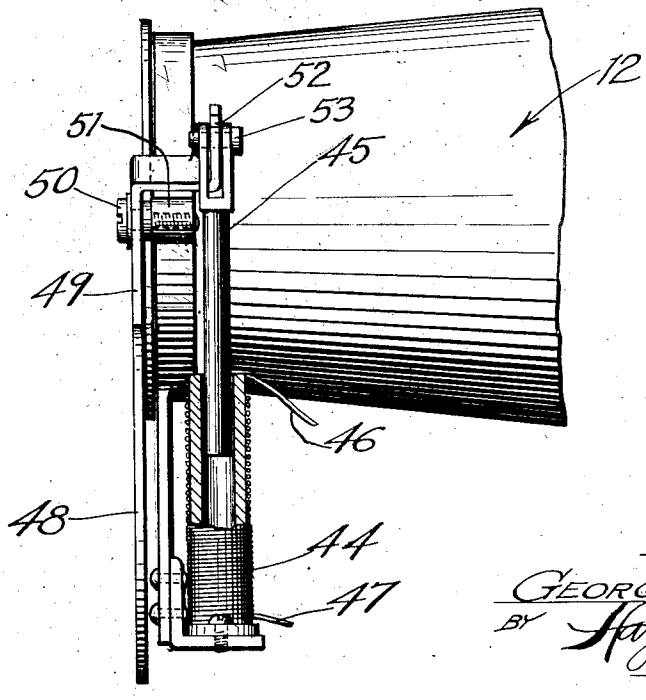


Fig. 5.

Inventor:
GEORGE J. SCHAFFER.
BY Hazard & Miller
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE J. SCHAFFER, OF LOS ANGELES, CALIFORNIA.

AUTOMATIC FIRE-PREVENTIVE DEVICE FOR MOVING-PICTURE-PROJECTION MACHINES.

1,409,120. Specification of Letters Patent. Patented Mar. 7, 1922

Application filed January 18, 1921. Serial No. 438,176.

To all whom it may concern:

Be it known that I, GEORGE J. SCHAFFER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Automatic Fire-Preventive Devices for Moving-Picture-Projection Machines, of which the following is a specification.

My invention relates generally to motion picture projecting machines, and more particularly to automatically operating means that is capable of being applied to motion picture projecting machines for the purpose of preventing fires resulting from the ignition of the film in the event that movement of the latter stops for any reason, for instance, as a result of breakage of that portion of the film that is engaged by the film moving mechanism positioned between the film magazines.

It will be understood that in motion picture projecting machines it is necessary to use condensing lenses between the electric lamp and the film, and if, while the machine is in operation, the film stops in its movement, and which action frequently occurs as a result of breakage of the film as it travels through the driving and looping mechanisms, there is danger of ignition of the film as a result of the concentrated light rays thrown thereonto by the condensing lenses, and it is the purpose of my invention to entirely eliminate this possibility of fire and its attendant dangers to life and property by providing relatively simple and efficient means that will automatically act instantly upon the breakage of the film to operate a cut-off plate or douser in front of the projecting lens and simultaneously to open the circuit in which is located the motor that actuates the film moving and looping mechanism.

A further object of my invention is to provide a light ray cut-off plate or douser, and a motor circuit cut-out or switch that are capable of being readily combined with practically all forms of motion picture projecting machines now in general use, and further, to provide relatively simple and positively acting means for actuating said douser and motor circuit switch, and further, to arrange said parts so that their operations or functions are controlled by the film that is passing through the projecting machine with which my improved safety devices are utilized.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts, that will be hereinafter more fully described and claimed and illustrated in the accompanying drawings, in which

Figure 1 is an elevational view of a motion picture projecting machine, the same being equipped with my improved fire preventive device, and with the electric circuits associated with said device shown in diagram.

Fig. 2 is an elevational view, partly in vertical section, of that portion of the device that includes the circuit opening and closing devices, and the means controlled by the film for actuating said devices.

Fig. 3 is a plan view, partly in section, of the parts illustrated in Fig. 2.

Fig. 4 is an elevational view of the douser or plate that is utilized for cutting off the rays of light from the condensing lenses.

Fig. 5 is an elevational view of the douser, with parts thereof in section.

Referring by numerals to the accompanying drawings which illustrate a practical embodiment of my invention, 10 designates the base of an ordinary form of motion picture projecting machine, 11 the lamp housing of said machine, 12 the condensing lens housing or barrel, 13 and 14 the film reel housings or magazines, 15 the housing or frame for the film moving and looping mechanisms, 16 the revolving shutter, 17 the electric motor that drives the film moving and looping mechanisms and which motor receives electrical energy from a suitable source such as a battery 18.

Motor 17 has suitable driving connections with the main driving shaft 19 of the film moving and looping mechanisms, and forming a part of said film moving and looping mechanisms are sprocket wheels 20 over which the film is adapted to pass. All of the parts specified are of ordinary construction, well known in the art, and form no part of my invention.

Arranged on a horizontally disposed portion of the framework of the projecting machine, for instance, a plate or table such as 10^a that is positioned between the lamp housing 11 and frame or housing 15 is a post or upright bracket 21, and fulcrumed on a hori-

zontal pivot 22 thereupon is a horizontally disposed bar 23. The forward end of this bar is forked or bifurcated as designated by 24, and journaled on a horizontally disposed pin or bolt 25 that is seated in the arms of the forked portion is a drum or roller 26, beneath which the film, such as F, is adapted to pass as it travels from one roller 20 to the other. The position of roller 26 with respect to rollers 20 is such that under normal conditions or while the film is traveling at proper speeds through the machine the tension on that portion of the film between the rollers 20 is such as to maintain bar 23 in approximate horizontal position, as illustrated in Figs. 1 and 2.

Arranged on plate or table 10^a and preferably spaced at equal distances away from and on opposite sides of the post or standard 21 are small cups or containers 27 and 28, the same being formed of glass, porcelain or other suitable insulation, and said cups being partially filled with mercury.

The head of a contact pin or screw 29 that is seated in the wall of cup 27 makes direct contact with the mercury in said cup, and connected to and leading from said pin or screw to the battery 18, or similar source of electrical energy, is a conductor 30. Leading from a similar contact pin or screw 31 that is seated in the wall of mercury cup 28 is a conductor 32, the same being electrically connected to battery 18. The top of mercury cup 27 is closed by a suitable cap 33, and arranged to slide freely through a centrally arranged aperture in said cup is a contact pin or rod 34, the upper end of which has pivotal and sliding connection with bar 23 by means of a pin 35 formed of suitable insulating material, and which pin 35 passes through a longitudinally disposed slot 36 in said bar. The length of pin 34 is such that when bar 23 is in its normal horizontal position, as illustrated in Figs. 1 and 2, the lower end of said contact pin or rod occupies a position a short distance above the surface of the body of mercury within cup 27. Consequently the circuit in which pin 34, the mercury within cup 27, and conductor 30 are located, is normally open.

Positioned on top of mercury cup 28 is a cap 37 through which is arranged to slide freely a contact pin or rod 38, the upper end of the latter having pivotal and sliding connection with bar 23 by means of a pin 39 of suitable insulating material, and which passes through a longitudinally disposed slot that is formed in bar 23. The length of this contact pin or rod 38 is such that when bar 23 occupies its normal horizontal position the lower portion of said contact pin or rod is immersed in the mercury, and consequently the circuit in which said pin, contact member 31 and conductor 32 are located, is normally closed.

Connected to and leading from the upper portion of contact pin or rod 38 to one pole of the motor 17 is a conductor 41, and leading from the opposite pole of the motor to the battery 18, or source of electrical energy, is a conductor 42 in which is located a suitable switch 43. Located adjacent to the forward end of the condensing lens barrel 12, is a solenoid 44 having a sliding core 45, and leading from one end of the winding of this solenoid to contact pin or rod 34 is a conductor 46. Leading from the opposite end of the winding of this solenoid is a conductor 47, the same being electrically connected to conductor 42, preferably at a point between the motor 17 and switch 43.

The douser or device utilized for cutting off the rays of light that are projected forwardly by the condensing lenses within the barrel 12 comprises a disc-like plate 48 of opaque material, from the edge of which projects a short bell crank 49, and which latter is fulcrumed at 50 to a lug or bracket 51 that projects laterally from the forward portion of barrel 12. Normally, this douser depends from its fulcrum point and occupies a position below and to one side of the opening through housing 12, as illustrated in Fig. 4, but when said douser is actuated or shifted into position to cut off the passage of light rays through barrel 12 it is swung laterally and upwardly in the direction indicated by the arrow A, Fig. 4. The free end of bell crank 49 is slotted, as designated by 52, and arranged for sliding movement therein is a pin 53 that is carried by the bifurcated upper end of the solenoid core 45.

Under normal conditions or while the film is traveling in the usual manner around the rollers 20 and 26 the tension of said film maintains bar 23 in a substantially horizontal position with rod 34 out of contact with the mercury in cup 27 and with the lower portion of rod 38 submerged in the mercury in cup 28. Thus, when switch 43 is closed electrical energy from battery 18 will flow though conductor 42 to the motor, and from the opposite side of said motor the current will pass through conductor 41, contact rod 38, through the body of mercury in cup 28, through contact member 31 and conductor 32 back to battery 18. Thus, motor 17 will be operated and through the driving connections associated with said motor the film moving and looping mechanisms will be continuously operated.

In the event of breakage of the film while the same is passing through the actuating and looping mechanisms the tension upon roller 26 will be relieved, thereby permitting the weighted end of bar 23, or the end carrying the film-engaging roller 26, to move downwardly. Following this swinging movement of bar 23 upon its fulcrum the lower end of contact rod 34 will enter the body of

mercury in cup 27, thereby closing the circuit in which said parts are located, and immediately solenoid 44 will be energized, due to the passage of current through battery 18, through a part of conductor 42, conductor 47, the winding of said solenoid, conductor 46, contact member 34, mercury within cup 27, and conductor 30 which leads to battery 18.

As solenoid 44 is thus energized core 45 will be drawn downwardly, with the result that bell crank 49 will be swung upon its fulcrum and douser 48 will be elevated in position immediately in front of the condensing lens barrel 12. Such action necessarily cuts off passage of condensed light rays to the film and consequently all danger of ignition of said film from said condensed light rays is eliminated.

Immediately following the closing of the circuit as just described by the contact of member 34 with the mercury in cup 27 the lower end of pin or rod 38 will be withdrawn from the mercury in cup 28, and thus the circuit in which said parts are located will be opened. Inasmuch as contact rod 38 and the mercury within cup 28 are located in the motor circuit the current supply from the battery 18 to motor 17 will be cut off, with the result that the motor will cease to function until the broken film has been reunited and the parts of the automatic safety device have been restored to their normal positions.

A device of my improved construction is comparatively simple, may be readily combined with practically all forms of motion picture projecting machines now in general use, is controlled directly from the film that is passing through the machine, is entirely automatic in operation, and provides efficient means for eliminating all possibility of fires resulting from the ignition of the film from the condensed light rays of the projecting machine when said film stops as a result of breakage while passing through the moving and looping mechanisms.

It will be readily understood that minor changes in the size, form and construction of my improved fire preventive device for moving picture projecting machines may be made and substituted for those herein shown and described, without departing from the spirit of my invention, the scope of which is set forth in the appended claim.

I claim is my invention:

The combination with a motion picture projecting machine and its condensing lenses, of a fulcrumed member having means engaging the film of the machine so as to retain the member in normal position, said member being arranged to swing upon its fulcrum upon the release of said engaging means through breakage of the film, contacts carried by said fulcrumed member at the respective sides of its fulcrum, circuits including the respective contacts and a source of energy, said contacts being arranged to open one of said circuits and close the other when the fulcrumed member is in normal position, and to close the first circuit and open the other when the member swings upon its fulcrum, actuating means in the first circuit, an operating motor for the projecting machine in the second circuit, and means for cutting off the light from said lenses, normally in inoperative position and adapted to be moved into operative position by the energizing of said actuating means.

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

GEO. J. SCHAFFER.