Nov. 28, 1933. W. S. JEWELL 1,937,061

AUTOMATIC CIRCUIT BREAKER FOR MOTION PICTURE APPARATUS

Filed May 3, 1930 2 Sheets-Sheet 1

Fig. 1.

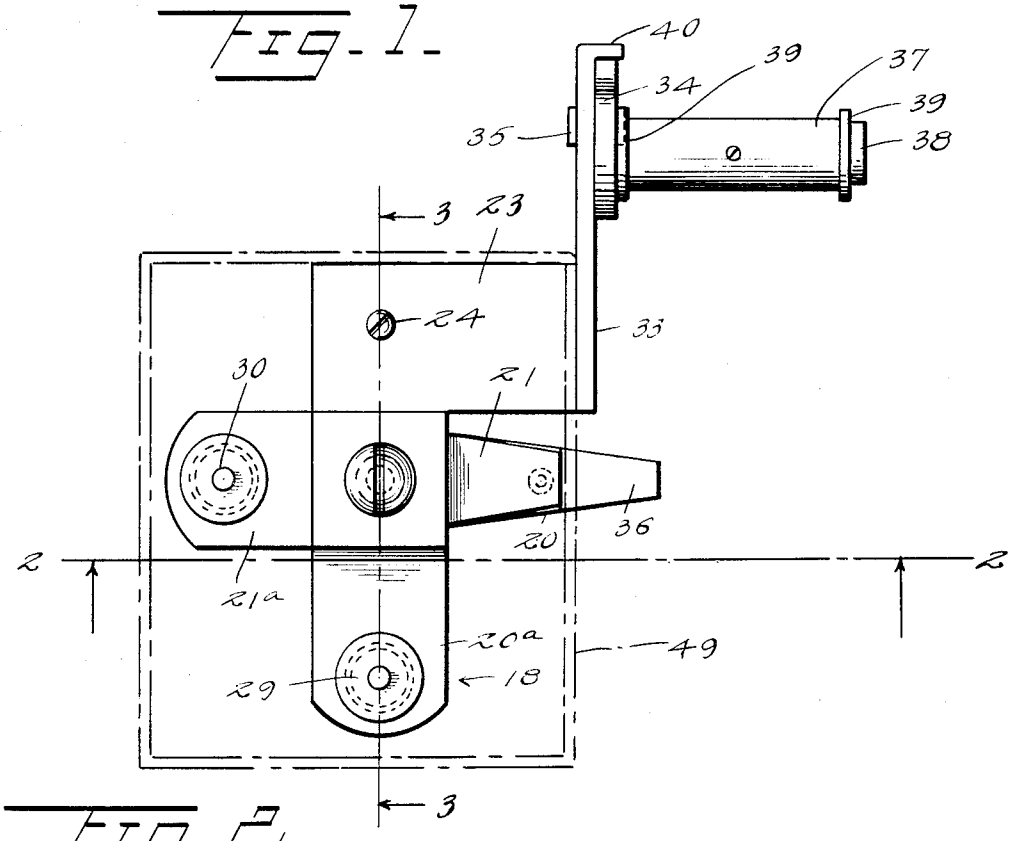
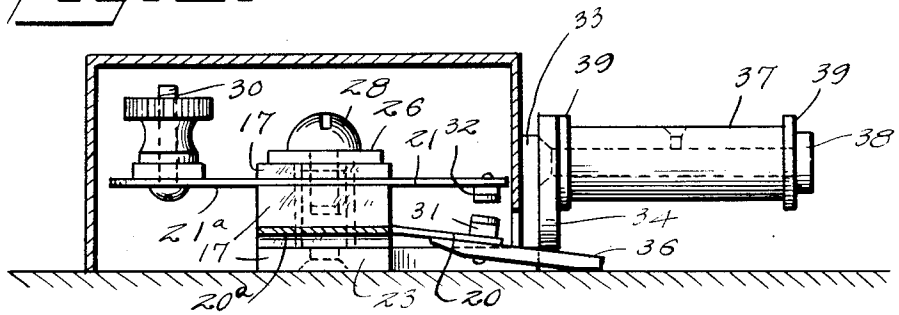


Fig. 2.



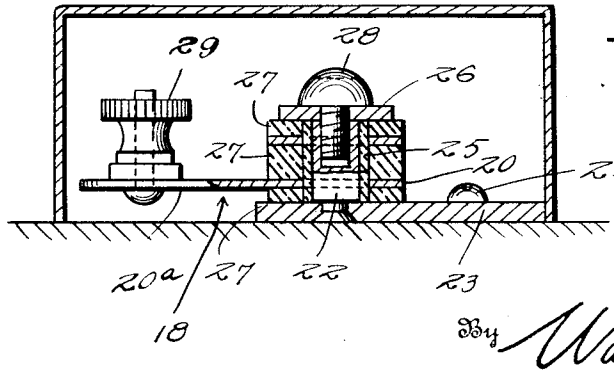


Fig. 3.

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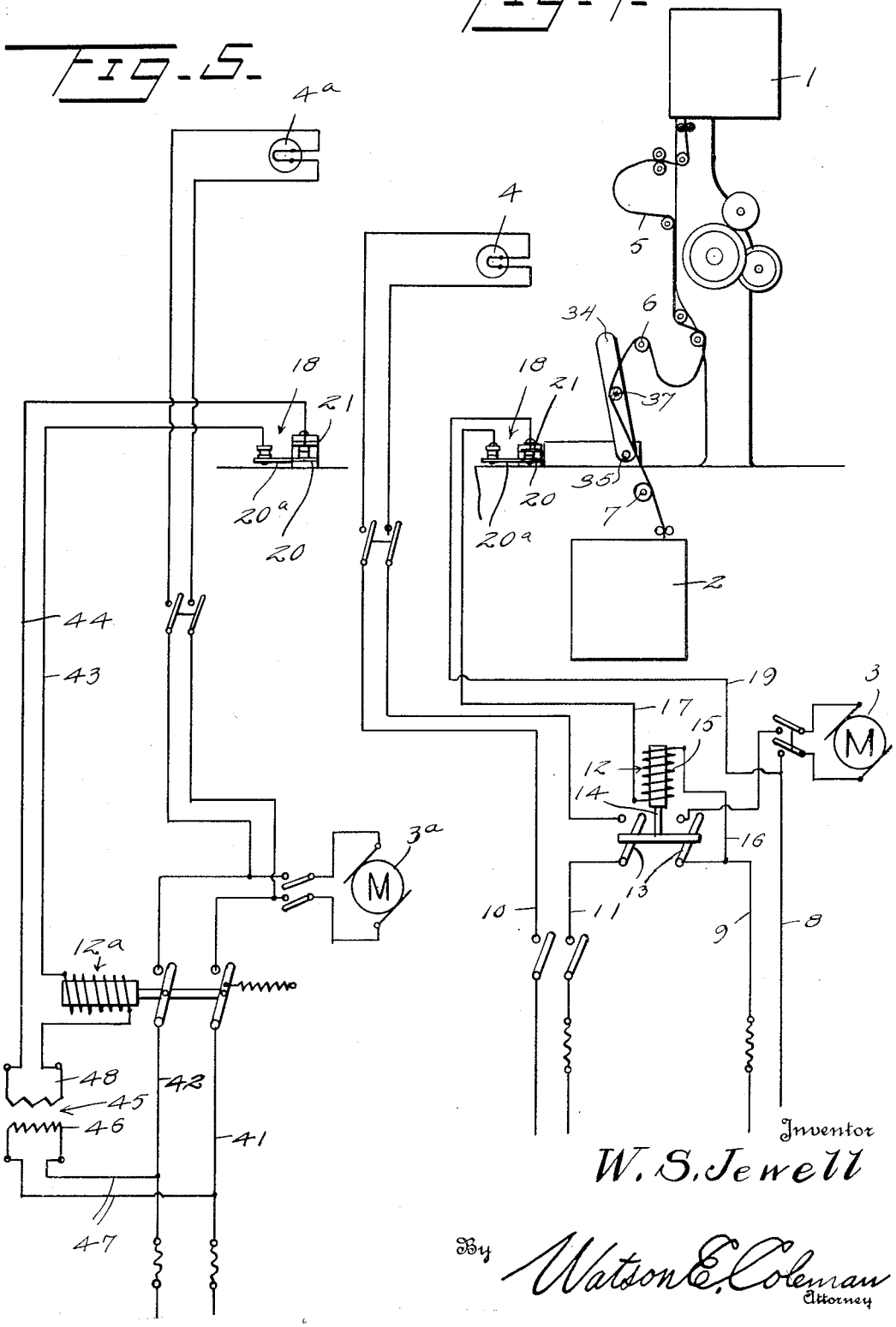
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Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE

1,937,061

AUTOMATIC CIRCUIT BREAKER FOR MOTION PICTURE APPARATUS

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2 Claims. (Cl. 200—52)

This invention relates to motion picture apparatus, and more particularly to an automatic circuit breaker for such apparatus.

The invention has for one of its objects to provide a novel device of the character stated which shall be adapted to automatically break the motor and lamp circuits of a motion picture apparatus in the event of the breakage of the film or in the event of a failure of the film to feed properly through the apparatus, to the end that the possibility of fire and material damage to the film may be reduced to the minimum.

The invention has for a further object to provide a device of the character stated which shall be adapted to be readily mounted upon a motion picture apparatus of any type, which shall be adapted to be readily connected in the motor and lamp circuits of the apparatus, which shall be adapted to permit an operative connection therebetween and the film to be readily established to maintain in circuit closing position until the film breaks or fails to feed properly through the apparatus, which shall be adapted to render the apparatus inoperative until such connection is established and after such connection is broken, and which will not interfere with the feeding of the film through the apparatus.

The invention has for a further object to provide a device of the character stated which shall be simple, compact and capable of being manufactured at a comparatively low cost, which shall be rapid and positive in its circuit breaking action, and which shall be adapted to be installed without making any changes or alterations in the apparatus.

With the foregoing and other objects in view, the nature of which will appear as the description proceeds, the invention consists in the construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, wherein:—

Figure 1 is a top plan view of the circuit breaker with its operating toggle in inactive position;

Figure 2 is a sectional view taken on the plane indicated by the line 2—2 of Figure 1, with the toggle in active position;

Figure 3 is a sectional view taken on the plane indicated by the line 3—3 of Figure 1;

Figure 4 is a diagrammatic view illustrating the manner in which the circuit breaker is adapted to be mounted upon a motion picture apparatus and connected in the motor and lamp circuits of the apparatus, and

Figure 5 is a similar view illustrating the circuit breaker in a slightly different form of motor and lamp circuit.

For the purpose of illustrating its application and operation, the circuit breaker is shown applied to a motion picture apparatus of the Powers 6B type. This apparatus, which is well known and diagrammatically illustrated, embodies an upper magazine 1, a lower magazine 2, a motor 3 and a lamp 4. The mechanism for feeding the film 5 from the magazine 1 to the magazine 2 and operated by the motor 3, embodies a feed roll 6, and a guide roll 7 located below the feed roll. The film 5 passes rearwardly over the feed roll 6 and forwardly over the guide roll 7, and after passing over the guide roll is wound upon the reel located in the magazine 2.

The motor 3 is connected to a source of current by conductors 8 and 9, and the lamp 4 is connected to the source of current by conductors 10 and 11. An electrically operated switch 12 is connected in the conductors 9 and 11, and comprises blades 13 which are connected to the core 14 of a solenoid. One terminal of the coil 15 of the solenoid is connected by a conductor 16 to the conductor 9, and the other terminal of the coil is connected by a conductor 17 to my improved circuit breaker 18, the circuit breaker being in turn connected to the conductor 3 by a conductor 19. The switch 12 is of well known construction, and it is deemed unnecessary to describe it further than to say that it is closed when its solenoid is energized and opened when its solenoid is de-energized. It is also deemed unnecessary to further describe the film feeding mechanism and other parts of the apparatus.

The circuit breaker 18 controls the solenoid of the switch 12, and it comprises a lower blade 20 and an upper blade 21 which are fixed to a post 22 extending upwardly from a base 23. The post 22 and base 23 are made of metal, and the base is adapted to be secured through the medium of screws 24 upon the motion picture apparatus in a plane located between and in a plane located rearwardly of the feed roll 6 and guide roll 7. The blades 20 and 21 are insulated from the post 22 by a fibre sleeve 25, and they are insulated from each other, the base 23 and a metal washer 26 by fibre washers 27, the washer 26 serving to hold the blades, sleeve and fibre washers in assembled relation on the post and being secured in place by a screw 28. The blades 20 and 21 are provided with angularly related extensions 20^a and 21^a, respectively. The blade extension 20 carries a binding post 29 to which the conductor 17 is secured, and the blade extension 21^a carries

a binding post 30 to which the conductor 19 is secured. The blades 20 and 21 are provided at their free terminals with opposing contacts 31 and 32, respectively, and they are resilient and function to normally urge the contacts into engagement with each other.

The circuit breaker 18 is located rearwardly of the normal path of the film 5 between the feed roll 6 and guide roll 7, and its blades 20 and 21 occupy a position at right angles to such path. The base 23 is provided with an elongated extension 33 which is located at one lateral side of the film path and extends to a point forwardly beyond such path.

A lever 34 is pivotally secured at one end, as at 35, to the front end of the base extension 33 for movement in a plane at right angles to the film path. The lever 34 is adapted to occupy an active and an inactive position. When it is in an active position, the lever 34 is substantially horizontal and its free end rests upon an impact or striking strip 36 extending longitudinally from the blade 20. The weight of the lever 34 is greater than the resilient power of the blade 20, and due thereto, the lever holds the blade in a downwardly inclined position in contact with the strip 36, with the result that the contacts 31 and 32 are out of engagement with each other. When in an inactive position, the lever 34 is vertical or nearly so, and the contacts 31 and 32 are in engagement with each other. The lever 34 is adapted to be held in inactive position by the film 5, and to permit this to be done, the lever is provided with a roller 37 which contacts with the front side of the film at a point between the feed roll 6 and guide roll 7. The roller 37 is loosely mounted upon a pin 38 extending at right angles from the lever 34 and located thereon at a point near the upper end thereof. The roller 37 is provided with terminal flanges 39 which contact with the edges of the film 5 to prevent the latter from moving out of contact with the former. A lug 40, which is carried by the rear end of the base extension 33 and is located in a plane above the pivot 35 of the lever 34, prevents the lever from being moved into a position forwardly beyond the vertical, so as to thus insure the movement of the lever into active position when it is released by the film 5, the movement of the toggle into this latter position resulting in the opening of the circuit breaker 18 and the consequent stopping of the motor 3 and the extinguishing of the lamp 4.

In practice, when the motion picture apparatus is at rest and before the threading of the film therethrough, the lever 34 is in active or circuit breaker opening position, with the result that the accidental starting of the motor and the accidental lighting of the lamp cannot occur. After the film has been threaded through the apparatus and attached to the reel of the lower magazine, the lever 34 is raised into inactive or circuit breaker releasing position, and the roller 37 is positioned in contact with the front side of the film and in the loop formed therein between the feed roll 6 and the guide roll 7. The motor may be now started and the lamp lighted. During the operation of the apparatus, the film will support the lever 34 in its inactive position until such time as a break occurs in the film or the film fails to feed properly through the apparatus. The breaking of the film releases the lever 34 for movement into active position. The failure of the film to feed properly through the apparatus enlarges the loop in which the roller 37 is located, and when this occurs, the lever 34 is released for movement into active or circuit breaker opening position.

It should be apparent from the foregoing description, taken in connection with the accompanying drawings, that the circuit breaker functions positively and automatically on the breaking of the film or on its failure to feed properly to effect the stopping of the motor and the extinguishing of the lamp of the apparatus, and that due thereto, the possibility of fire and of material damage to the film is reduced to the minimum.

While the circuit breaker is shown and described in connection with a particular make of motion picture apparatus, it is to be understood that it may be used in connection with any other make of such apparatus. When it is used in connection with other makes of apparatus, the electrically operated switch may be connected in the motor and lamp circuit of such other apparatus in the manner illustrated in Figure 5. In this figure, the motor 3^a and lamp 4^a of the apparatus are connected to a source of current by conductors 41 and 42, and the electrically operated switch 12^a is inserted in these conductors. This switch, which is similar to the switch 12, has the terminals of its coil connected by conductors 43 and 44 to the binding posts 29 and 30 of the circuit breaker 18. The current for the operation of the solenoid of the switch 12^a is applied by a step-down transformer 45 which has its high tension coil 46 connected by conductors 47 to the conductors 41 and 42 and which has its low tension coil 48 connected to the conductors 43 and 44.

All parts of the circuit breaker, with the exception of the lever 34, are covered by a short circuit-proof and a fire resisting hood 49 which is made of fibre and is provided with an opening 50 through which the impact strip 36 extends for engagement by the lever.

While I have described the principle of the invention, together with the structure which I now consider the preferred embodiment thereof, it is to be understood that the structure shown is merely illustrative and that such changes may be made, when desired, as fall within the scope of the invention as claimed.

I claim:—

1. A circuit breaker comprising a pair of resilient members, means for mounting the members in spaced relation to each other and insulating them from each other, confronting contacts carried by each member and normally contacting with each other, an extension carried by one of said members, a rockable member mounted for downward swinging movement in the path of said extension, stop means for preventing the upward forward swinging of the rockable member forward of the vertical, and means carried by the rockable member and engageable with a vertically moving taut sheet to hold the rockable member in upright position, said rockable member upon breaking of the sheet or loosening thereof gravitatingly swinging downward into engagement with said extension to move the contacts apart.

2. A controlling switch for the motor and lamp circuit of a moving picture apparatus, including two contact supporting members and confronting contacts carried thereby, one of said members being resiliently urged to carry its contact in engagement with the contact of the other member, a casing wherein said members

are disposed, the members being insulated from each other and the casing, the casing having a slot and the lowermost member having an extension extending outward through said slot, an arm operatively pivoted upon said casing for movement from a vertical position to a lowered, approximately horizontal position, the extension being disposed in the path of movement of said arm as it moves to a horizontal position, the arm having an outwardly projecting roller adapted to engage a taut motion picture film and be supported in a raised position thereby, whereby when said film breaks or slackens, the arm will drop on to said extension and break the circuit through the motor and lamp, and means preventing said arm being moved away from said extension beyond a vertical position.

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