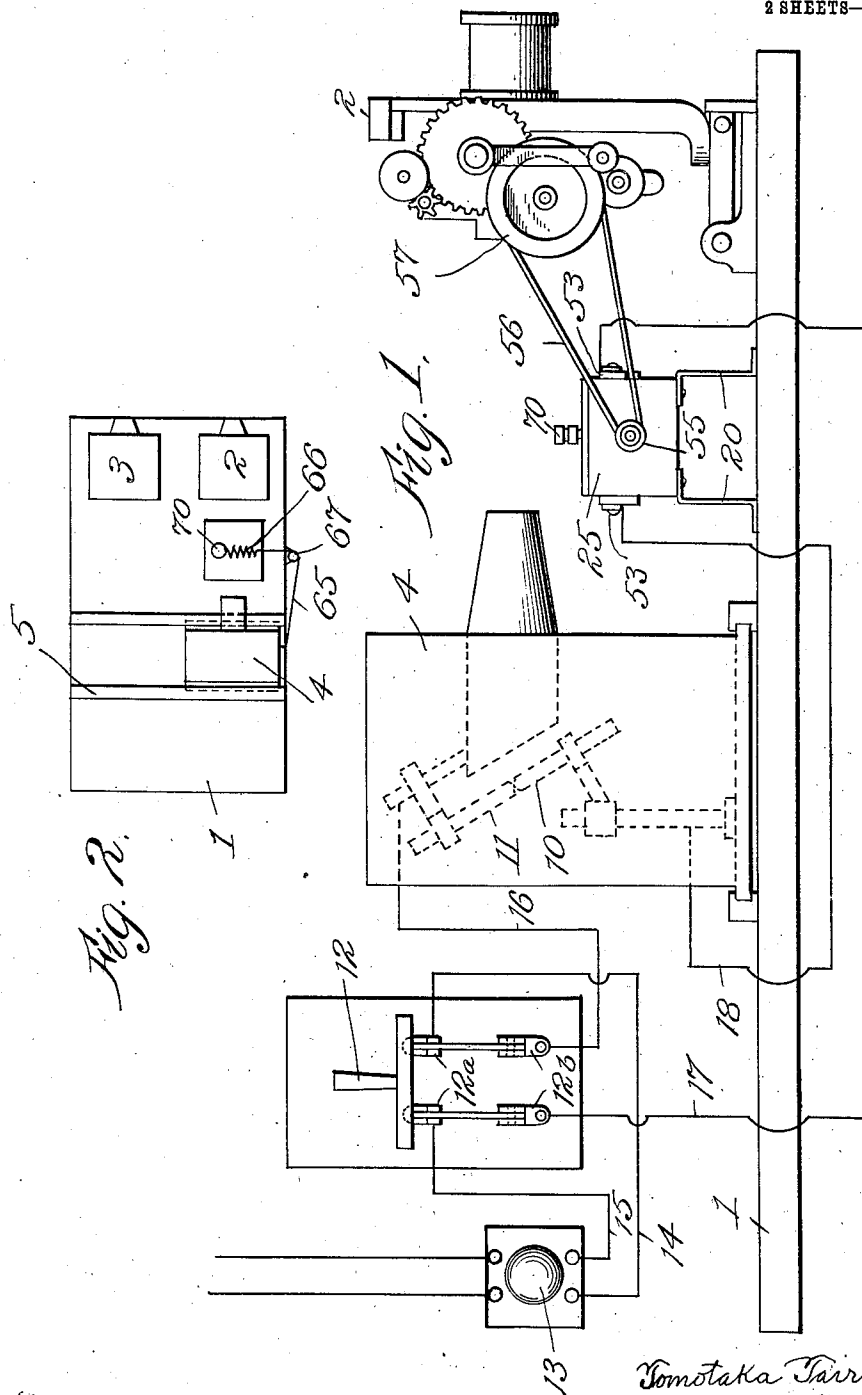


T. TAIRA.
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APPLICATION FILED APR. 6, 1909.

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Patented Nov. 2, 1909.

2 SHEETS—SHEET 1.



Witnesses:
Clara Hohenstein
Marion Gifford.

Tomotaka Taira
Inventor.

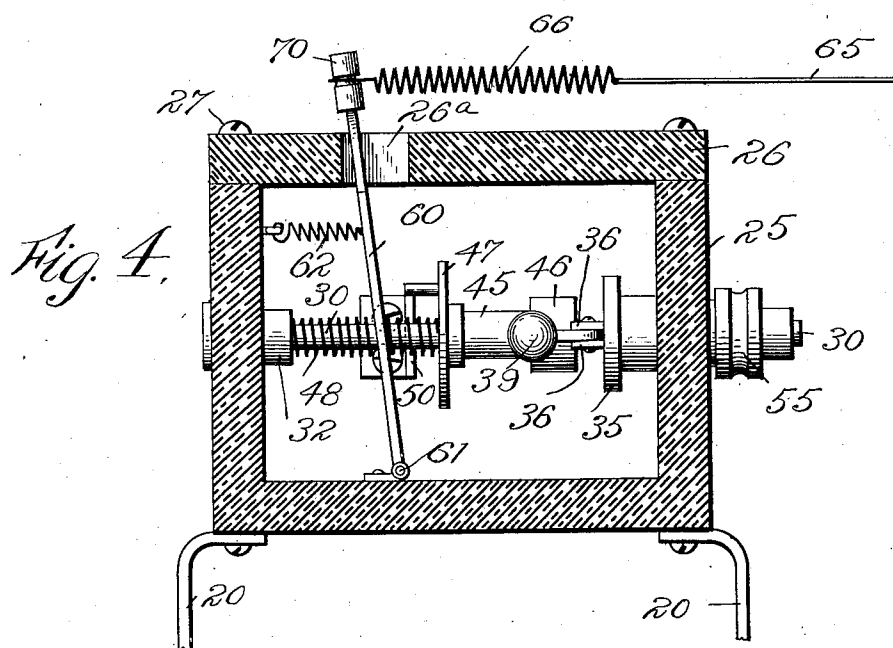
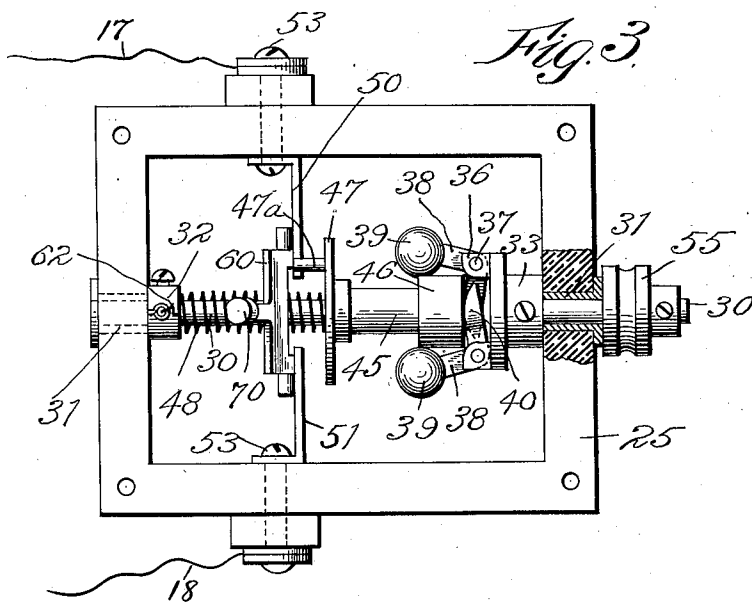
By his Attorneys *Smith & Pugh*

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UNITED STATES PATENT OFFICE.

TOMOTAKA TAIRA, OF FRESNO, CALIFORNIA.

CONTROLLING-SWITCH FOR MOVING-PICTURE MACHINES AND STEREOPTICONS.

939,110.

Specification of Letters Patent.

Patented Nov. 2, 1909.

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To all whom it may concern:

Be it known that I, TOMOTAKA TAIRA, a subject of the Emperor of Japan, residing in the city of Fresno, in the county of Fresno and State of California, have invented certain new and useful Improvements in Controlling-Switches for Moving-Picture Machines and Stereopticons, of which the following is a full, clear, and exact description.

In the operation of moving picture machines, it is necessary to employ a very powerful light for projecting the pictures upon the screen. Many disastrous fires have been caused in the operation of these machines by reason of the inflammable picture film taking fire from the extreme heat of the arc light which is usually employed, the heat from the light setting the film on fire when the film is stopped or slowed down below the normal rate of running. To overcome this difficulty, many devices have been produced, mainly in the line of automatic shutters which act as screens between the light and the picture film when the machine is stopped. It has also been proposed to provide automatic means shutting off the light when the machine is stopped to avoid this same danger, but so far as I am aware, no satisfactory arrangement has yet been produced for automatically cutting out the electric light and surely preventing setting fire to the film when it is slowed down or stopped and automatically reestablishing the light circuit when the proper working speed of the film is resumed.

It is at present a common practice to arrange in juxtaposition a moving picture machine and a stereopticon so that the same arc lamp may be employed for both purposes, the arc lamp being usually movably mounted so that it can be conveniently shifted into working relation with either apparatus.

The object of my present invention is to provide a simple and reliable automatic switch for controlling the circuit of the electric arc lamp which supplies the light for either the moving picture machine or the stereopticon, said switch being so arranged that when the moving picture machine is operated, the light will be extinguished whenever the picture film stops or slows down below a proper working speed, and when the stereopticon is being employed the circuit for the arc lamp will be maintained to supply the light continuously.

The improved controlling switch is directly included in the circuit of the arc light and suitably connected up with a part of the moving picture machine so as to make or break the circuit according to the operation of said machine, and also connected with the adjustable lamp so as to close the circuit when the lamp is shifted into position to operate with the stereopticon.

In the preferred form of the switch, I provide a centrifugal governor driven by a rotary part of the moving picture machine and arranged to move the movable contact of the switch into and out of contact with the switch terminals, according to whether the machine is operating at normal speed or drops below normal. In this manner the circuit is closed or opened, as the speed of the picture machine varies, with the result that the intense heat of the arc light will never be concentrated upon a stationary or slow-moving section of the picture film. The further advantages of this arrangement are the saving of the current whenever the light is not desired by reason of the stopping of the machine, and further, the automatic making of the circuit for immediately starting the light when the picture machine is again operated.

The second feature of my invention includes an auxiliary switch arm which is mechanically connected with the movable frame or case of the arc lamp, so that when the arc lamp is shifted into position to operate with the stereopticon, the circuit will be closed independently of the operation of the centrifugally controlled contact.

In order that my invention may be fully understood, I will first describe the same with reference to the accompanying drawings and afterward point out the novelty more particularly in the annexed claims.

In said drawings, Figure 1 is a diagrammatic side elevation of a picture exhibiting apparatus, illustrating my invention. Figure 2 is a diagrammatic plan view of the main parts of the same. Figure 3 is a plan view of my improved automatic switch. Figure 4 is a vertical longitudinal sectional view of the same.

I have represented diagrammatically in Figs. 1 and 2 a platform or table 1 upon which are mounted a kinetoscope or moving picture machine 2, a stereopticon 3 and an arc lamp 4. It will be observed from Figure 2 that the moving picture machine 2 and

stereopticon 3 are arranged in parallel relation and that the arc lamp 4 is mounted upon transverse guides or ways 5 so as to be placed in operative relation with either the moving picture machine 2 or stereopticon 3. This is a common arrangement of such apparatus to facilitate the use of the arc lamp for illuminating the film of the moving picture machine in one position, or the plates or slides of the stereopticon in another position.

10 and 11 are the carbons of the arc lamp mounted in any usual manner within the lamp frame or casing 4.

12 is the main controlling hand-operated switch which is preferably of the usual double-blade knife switch type.

13 represents a fuse in the light circuit.

14 and 15 are circuit wires leading from the fuse 13 to the main switch terminals 12^a.

16 is a circuit wire leading from one of the main switch terminals 12^b to the arc lamp carbon 11. 17 is a circuit wire leading from the other main switch terminal 12^b to one terminal of my improved automatic switch, and 18 is a circuit wire leading from the other arc lamp carbon 10 to the other terminal of my improved automatic switch.

From this explanation of the light circuit, it will be observed that my improved switch is included directly in the circuit of the arc lamp, said automatic switch controlling the making and breaking of said circuit in the manner which will now be explained.

Mounted upon the platform 1 upon any suitable standard such as the legs 20 shown in the drawings is a switch box 25 formed of some suitable insulating material such as slate, hard-rubber, glass or porcelain. This switch box 25 is provided with a removable cover 26 secured in place by screws 27.

Freely journaled in the switch box 25 and extending from end to end thereof is a rotary shaft 30, suitable bearings 31 being provided in the end walls of the switch box, and adjustable collars 32 and 33 being secured upon the shaft 30 to prevent longitudinal movement of the shaft in the switch box. Carried by the collar 33 is a wheel or disk 35 formed with diametrically opposite inwardly presented ears or lugs 36 within which are freely pivoted at 37 two small bell crank levers 38, each one of which carries at its outer end a small ball or weight 39 and is formed at its inner end with a cam-faced foot 40 for the purpose which will presently appear.

45 is a tube or sleeve freely mounted upon the shaft 30 and formed at one end with an enlarged collar 46 which rests normally in engagement with the cam-faced feet 40 above referred to. This tube or sleeve 45 carries at its opposite end a contact plate or disk 47 which is presented in operative relation to the switch terminals 50 and 51. A pin

47^a projects from disk 47 into position to engage terminals 50 and 51 to hold the tube 45 and connected parts against rotation, and a spiral spring 48 surrounding the shaft 30 and confined between collar 32 and disk 47 serves to hold the sleeve 45 in rearward position with the head 46 in engagement with the feet 40 and the contact disk 47 out of contact with the terminals 50 and 51. The switch terminals 50 and 51 project inwardly from opposite sides of the switch box 25 and are secured in place by suitable terminal screws 53 to the outer ends of which the circuit wires 17 and 18 are electrically connected.

It will be observed with particular reference to Fig. 3 of the drawings that the switch terminals 50 and 51 are separated upon the central longitudinal plane of the switch box so that normally the circuit through said terminals is broken.

The outer end of the shaft 30 carries a small band pulley 55 from which a band or strap 56 extends and passes around a grooved wheel or pulley 57 which may be the fly wheel or other rotating part of the moving picture machine 2.

60 is an auxiliary switch arm journaled in the bottom of said switch box 25 at 61 and formed of yoke-shape so as to straddle the shaft 30 and spring 48. This auxiliary switch arm is of sufficient width to make contact with the two switch terminals 50 and 51, it being observed that switch arm 60 is presented upon the opposite sides of the terminals 50 and 51 from the contact disk 47. A spring 62 connects the switch arm 60 with one of the end walls of the switch box 25 to hold the same normally out of contact with the switch terminals 50 and 51. A cord 65 is connected with the upper end of the switch arm 60, preferably through a short section of spiral spring 66 and extends from the switch arm around a pin or roller 67 mounted upon a stationary support and has its opposite end connected at some suitable point with the adjustable lamp frame or casing 4.

The upper end of the auxiliary switch arm 60 projects through an opening 26^a in the cover plate 26 of the switch box. An insulated handle 70 of hard-rubber or other suitable material is applied to the upper end of the switch arm 60 to enable the operator to close the circuit for the lamp by hand in testing the operation of the apparatus.

The operation of the apparatus provided with my improved automatic switch will be clear from the following brief explanation: When the operator prepares the apparatus for an exhibition, the main controlling switch 12 is of course moved into circuit closing position so that the circuit for the arc lamp is open only at the switch terminals 50 and 51. By pressing over the switch lever

60 by hand and holding it in that position, the operator can, if he wishes, get sufficient light from the lamp to obtain a preliminary focus of the pictures upon the screen. When the moving picture machine is in use, the film operating mechanism is started, which will cause the rotation of the shaft 30 and governor arms 38 with the result that the bridging contact disk 47 will be forced to the left as shown in Figs. 3 and 4, completing the circuit for the lamp through the switch terminals 50 and 51. This position of parts is maintained so long as the picture machine is operated at the proper speed. In the event of the slowing down of the film operating mechanism, or the stopping of this mechanism for any reason, the slowing down of the shaft 30 will permit the spring 48 to move the contact disk 47 away from the switch terminals 50 and 51 with the result that the light will be extinguished and all danger of fire from the exposure of the stationary or slow-moving film to the heat of the light, obviated. In this way, the lamp is automatically extinguished and the circuit remains broken while the picture machine is out of operation. Another advantage resulting from this arrangement is the saving of the electric current. When the moving picture machine is again started, the corresponding rotation of the shaft 30 will automatically again complete the circuit and restart the arc lamp.

When the operator desires to exhibit pictures with the stereopticon 3, he simply shifts the lamp 4 to the left in Fig. 2 of the drawings with the result that the switch arm 60 will be actuated through the connection 65, 66 with the lamp and the circuit for the lamp will be closed by reason of the contact of switch arm 60 with the terminals 50 and 51. The circuit is maintained in this way so long as the stereopticon is in use.

The main advantages resulting from the use of my improved automatic switch in the connection explained are the avoidance of the danger of fire, economy in the use of the electric current, and the great convenience in the operation of the apparatus. The switch not only automatically extinguishes the lamp when conditions necessitate it, but when the moving picture machine is started, the circuit for the lamp is again automatically completed without the necessity for any special attention on the part of the operator.

It will of course be understood that the specific form of connection between the switch arm 60 and lamp 4 is not essential to the scope of my invention, and that any suitable mechanical connection may be employed, so long as the movement of the lamp causes the shifting of the switch arm for making and breaking the circuit as explained.

In constructing my improved switch, the

enlargement or collar 46 and contact disk 47 may be formed separately from the tube 45 or one or both of these parts may be rigidly connected with said tube.

What I claim is:—

1. The combination of a moving picture machine and an electric lamp, with an automatic speed controlled switch directly included in the circuit of said lamp, and suitably connected with the moving picture machine to break the circuit for said lamp when the moving picture machine slows down or stops, and to complete the circuit for said lamp when the moving picture machine is operated at the proper speed.

2. The combination with a moving picture machine, an electric lamp and a circuit for said lamp, of switch terminals directly included in said lamp circuit, a bridging contact plate adapted to close the circuit through said switch terminals, and a speed governor operated by the moving picture machine and adapted to move said contact plate into and out of electrical contact with said switch terminals for making and breaking the lamp circuit.

3. The combination of a moving picture machine, an electric lamp therefor, and a circuit for said lamp, with an automatic controlling switch directly included in said lamp circuit and comprising spaced switch terminals, a contact plate adapted to move into contact with said switch terminals, a spring retaining said contact plate out of contact with said terminals, a speed governor adapted to move said contact plate into contact with said terminals, and means for driving said governor from said moving picture machine.

4. In an apparatus of the character described, the combination of a moving picture machine, a stereopticon, an electric lamp adapted to be shifted into operative relation with either said moving picture machine or stereopticon, a circuit for said electric lamp, separated switch terminals directly included in said lamp circuit, and two independently operated bridging contact plates adapted to independently close the circuit through said switch terminals.

5. In an apparatus of the character described, the combination of a moving picture machine, a stereopticon, an electric lamp adapted to be shifted into operative relation with either said moving picture machine or stereopticon, a circuit for said electric lamp, separated switch terminals directly included in said lamp circuit, and two independently operated bridging contact plates arranged upon opposite sides of said switch terminals and adapted to independently close the circuit through said switch terminals.

6. The combination of a moving picture machine, a stereopticon, an electric lamp adapted to be shifted into operative relation

with either said moving picture machine or stereopticon, a circuit for said electric lamp, separated switch terminals directly included in said lamp circuit, an automatic bridging
5 contact plate actuated by said moving picture machine and adapted to close the circuit through said switch terminals, and a second contact member operatively connected with said adjustable lamp and also adapted
10 to complete the circuit through said switch terminals.

7. The combination of a moving picture machine, an electric lamp therefor, and a circuit for said lamp, with an automatic controlling switch directly included in said lamp
15

circuit and comprising spaced switch terminals, a rotary shaft, a contact plate loosely supported upon said shaft and adapted to move into contact with said switch terminals, a spring upon said shaft retaining said
20 contact plate out of contact with said terminals, a speed governor fast upon said shaft and adapted to move said contact plate into contact with said terminals, and means for driving said shaft from said moving picture
25 machine.

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