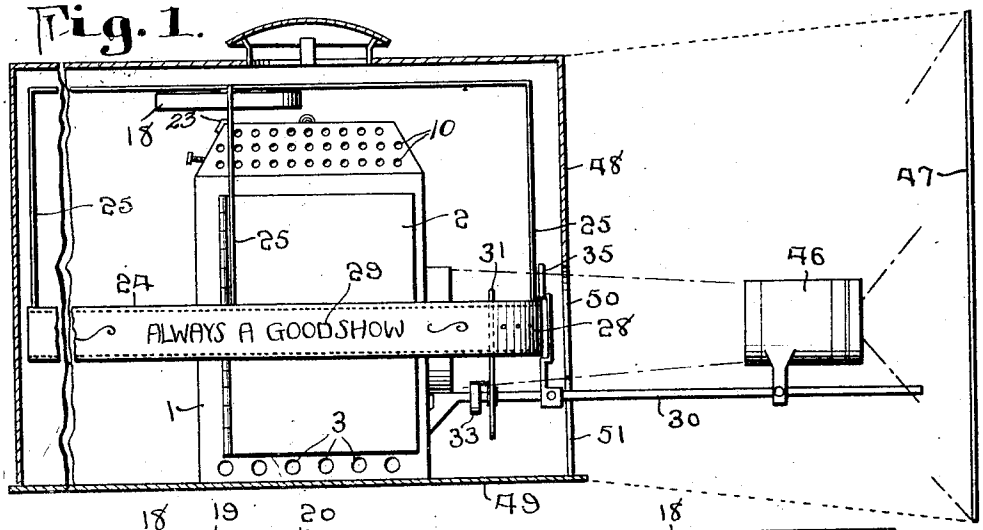
Dec. 7, 1926. 1,610,055

H. H. HORNBECK

ADVERTISING PROJECTING MACHINE

Filed Dec. 2, 1924 2 Sheets-Sheet 1

Fig. 1.



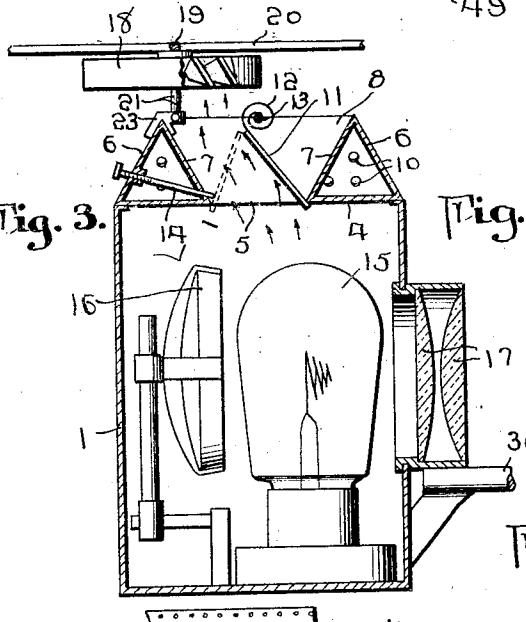


Fig. 3.

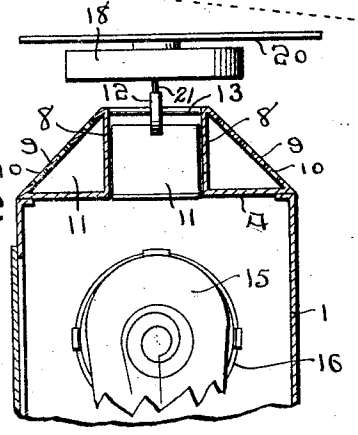


Fig. 2

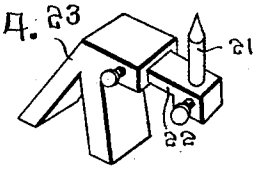


Fig. 4.

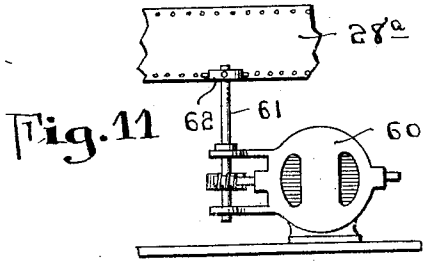


Fig. 11

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Fig. 5.

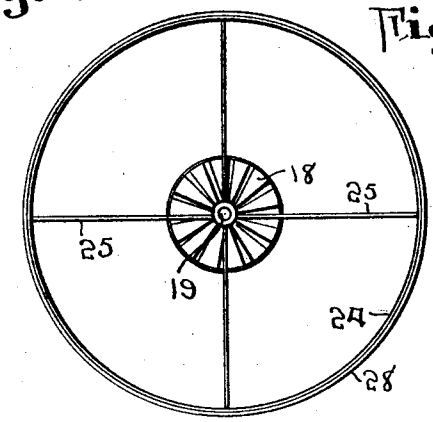


Fig. 6

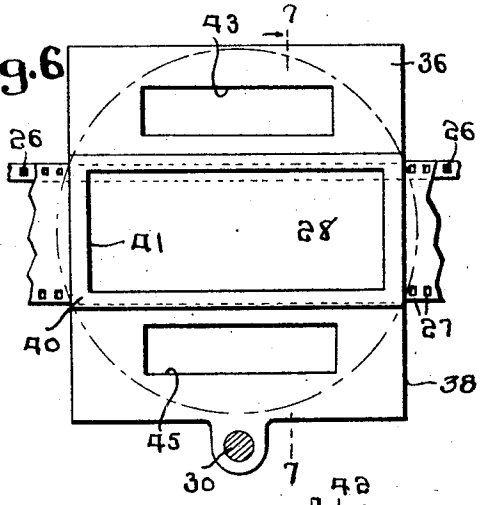


Fig. 8

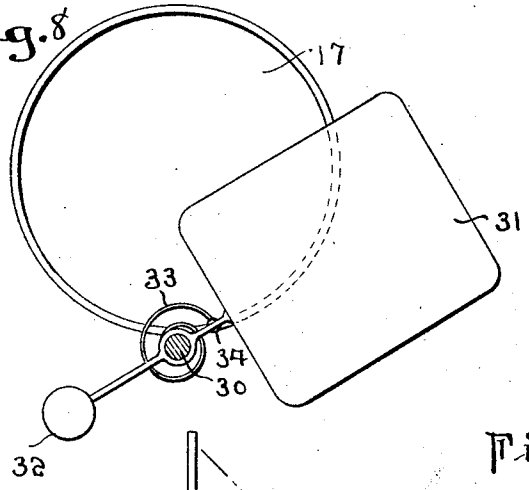


Fig. 7.

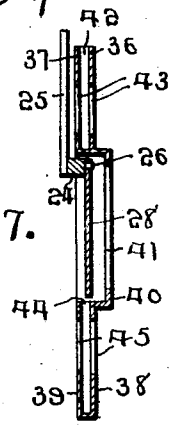


Fig. 9.

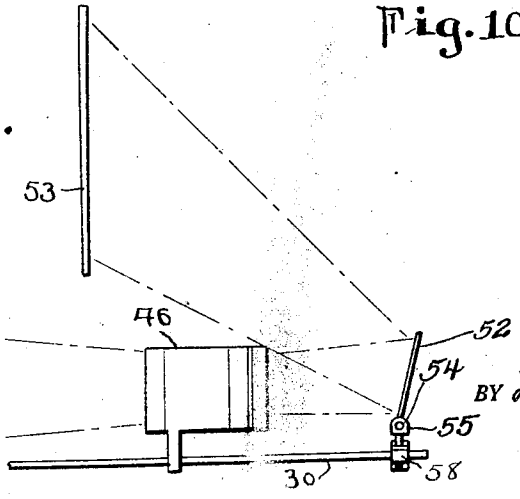
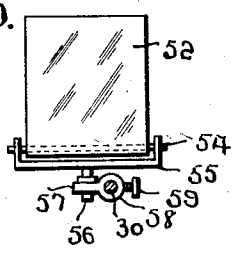


Fig. 10.



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Patented Dec. 7, 1926. 1,610,055

UNITED STATES PATENT OFFICE.

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ADVERTISING PROJECTING MACHINE.

Application filed December 2, 1924. Serial No. 753,461.

This invention relates to improvements in advertising projecting machines and the primary object of the invention is to furnish an advertising projector which will throw the advertising data on a suitable screen.

Another object of the invention is to furnish a projecting apparatus which will exhibit moving advertising data at very little cost to the operator.

A further object is to provide a projecting apparatus having a propeller wheel or fan driven by a hot air current, the current of air being generated by the heat from the same lamp employed in projecting the advertising data.

A still further object is to provide an advertising projector of the above character in which the flow of heated air to the fan wheel or propeller is regulated by a temperature responsive element, so that a free flow of the current of air may take place when the lamp is first illuminated, and whereby the flow of air will be gradually cut off after the propeller wheel has reached a predetermined speed, so as to prevent too rapid rotation of the propeller wheel after the machine is started.

Another object is to combine the propeller wheel with a film supporting spider or skeleton frame, the propeller wheel being preferably detachably connected to the film supporting spider in order that either a left or right turning propeller wheel may be used with the spider to facilitate two kinds of projection, i. e.—to opaque screen or through a transparent screen.

A further feature of the invention resides in an adjustable bearing for supporting the propeller wheel, this bearing being adjustable both horizontally and vertically to accommodate film of different widths and to properly position the film relatively to the light source, framing device, condenser, etc.

The invention also includes a novel light shield adapted to normally extend across the beam opening in the lamp casing and thermostatically controlled, so that it will automatically uncover said opening after the heat from the light rays have reached a predetermined intensity.

A film framing device of novel construction, also forms part of my invention and this device is so constructed that stationary slides may be used with the same, to furnish immovable advertising data combined with the moving data.

A further object of the invention is to provide a lamp casing or the like with a support adapted to carry an objective lens, and an adjustable mirror, if desired, the adjustable mirror functioning as a reflector to direct the projected image on to a screen arranged above or to one side or the other of the light source.

Ordinary moving picture film such as the "Professional Standard" or "Safety Standard", may be used with the present invention, but instead of arranging the letters or the like across the film, I arrange the same lengthwise and preferably running from left to right, so that the film in moving in a clockwise direction will pass between the light source and the objective lens, and as a result the data on the film will be displayed on a suitable screen properly arranged to receive the projected image.

With the foregoing objects outlined and with other objects in view which will appear as the description proceeds, the invention consists in the novel features hereinafter described in detail, illustrated in the accompanying drawing, and more particularly pointed out in the appended claims.

Referring to the drawings:

Figure 1 is a longitudinal vertical sectional view of my improved apparatus.

Fig. 2 is a transverse vertical sectional view of the lamp casing and parts of the propeller wheel, and the damper plate for regulating the passage of heated air to the latter.

Fig. 3 is a longitudinal vertical sectional view of the lamp casing, propeller wheel, damper, etc.

Fig. 4 is a perspective view of the novel bracket used to support the propeller wheel, film carrying spider, etc.

Fig. 5 is a top plan view on a reduced scale, of the propeller wheel and film supporting spider.

Fig. 6 is a front view of the framing device.

Fig. 7 is a vertical sectional view of said device taken on line 7—7 of Fig. 6.

Fig. 8 is a front view of the thermostatically controlled light shield.

Fig. 9 is a side view of the lens shown in use with the light reflector, employed in directing the projected image on to a screen arranged above or to one side of the lamp casing.

Fig. 10 is a detail view of said reflector

disclosing the manner in which it may be adjusted in various ways.

Fig. 11 is a view of a modification in which the film supporting spider is driven by a small electric motor instead of by the propeller wheel.

In the drawing, 1 designates a lamp casing provided with a hinged door 2 and having air inlet apertures 3 in its lower end. The top of the lamp casing is formed by a rectangular plate 4 having an aperture 5 at its central portion to permit the air heated in the lamp casing to flow upwardly and out of said casing. Arranged above the top 4 are front and rear tapered outer walls 6 and front and rear tapered inner walls 7. Parallel inner side walls 8 are also arranged above the top 4 and these walls are connected to tapered outer side walls 9 having apertures 10 to permit the circulation of air through the chamber 11 formed by the walls 6, 7, 8 and 9. This feature will prevent overheating of the upper portion of the lamp casing and uncontrolled heat from reaching the fan. The walls 7 and 8 form a hopper shaped opening which is about twice as long at its upper end as at its lower end, and arranged in this opening is a damper or flap valve 11 connected at its upper end to one end of a thermostatic spring 12, the other end of the spring being connected to a shaft 13 which extends across the opening.

Normally the valve 11 is in the position shown in Fig. 3 but after the lamp within the casing is illuminated, the rising heated air will affect the thermostatic spring 12 and cause the latter to expand, so that the damper 11 will gradually move toward the left into the dotted line position shown in Fig. 3 and consequently a large proportion of the heated air will pass to the right of the damper instead of to the left. To regulate the opening of the damper 11 a set-screw 14 is provided, this set-screw extending through the two rear walls 6 and 7, and projecting into the opening at the top of the lamp casing to abut against the damper 11.

An incandescent lamp 15 is arranged within the casing and its rays are reflected by a reflector 16. The condensing lenses 17 are provided at the front of the lamp casing and the reflector 16 directs the rays of the lamp through these lenses in the usual way.

As stated above, the current of heated air rising through the top of the lamp casing, is preferably utilized to drive a propeller wheel 18. This propeller wheel may be constructed to turn either to the right or left, and it is preferably provided with a screw 19 to detachably connect the same to a film supporting spider formed of horizontal arms 20 and vertical portions 25. The wheel 18 rotates on a hardened pin 21 vertically adjustably connected to a horizontal rod 22, the latter being adjustable forwardly or rearwardly on a bracket 23 which rests on the peak of the two rear walls 6 and 7. From this it may be seen that the wheel 18 and the spider element 20—25 carried thereby can be adjusted forwardly or rearwardly or up and down to accommodate films of different widths and to properly position the film relatively to the light rays.

The spider 20 has a ring 24 at the lower ends of its arms 25 and this ring, as best shown in Figs. 6 and 7, has teeth or hooks 26 to engage the ordinary sprocket openings 27 in a strip of motion picture film 28. The teeth 26 are preferably arranged a proper distance apart to take care of various types of motion picture film now in general use.

The advertising matter to be displayed is arranged on this film, and if it consists of letters, it may be photographed on the film, and preferably runs from left to right as shown at 29 in Fig. 1. It is obvious that this film may be of the inflammable or non-inflammable type and that the advertising data may be arranged on the same in various ways without departing from the spirit of of the present invention.

The lamp casing is preferably provided with a forwardly extending rod 30, which is rigidly connected to the casing, and arranged on this rod immediately in front of the lenses 17 is a pivotally mounted shield 31, shown in detail in Fig. 8. This shield preferably consists of a plate of sufficient size to cover or substantially cover the lenses 17 and it is provided with a counterweight 32 which normally tends to move the same to a position directly in front of the lenses 17. This shutter or shield is also thermostatically controlled, and to this end a thermostatic spring 33 has one of its ends connected to the shutter support 34 and its other end anchored on the rod 30. If inflammable film is employed, it is obvious that if a shutter were not placed between the lenses 17 and the film, then the light rays would be concentrated on the film before the propeller wheel 18 was rotating at sufficient speed, and this would cause the film to catch fire. Therefore the shield 31 when the device is not in use covers the lenses 17 and the shield remains in this position until the propeller wheel 18 is rotating at sufficient speed to prevent the beam of light from concentrating at any one point on the film. After the wheel 18 has reached a predetermined speed, the light rays will have affected the thermostatic spring to such an extent, that the spring will automatically force the shutter 31 out of the path of the light rays, and then the light may project through the film. This safety feature forms an important part of the present invention.

A framing device is also mounted on the rod 30 preferably in an adjustable manner,

and this framing device is for the purpose of permitting the light rays to project the image without also showing the sprocket openings 27 in the film. The framing device is shown in detail in Figs. 6 and 7 and it preferably consists of upper and lower spaced plates 36—37 and 38—39. These plates are separated by a rectangular frame 40 having an opening 41 to permit the light rays after passing through the film 28 to pass on to the objective lens, which will be described later. The frame opening 41 is of such size as to permit the light rays to pass through the advertising data on the film while the frame 40 blocks out that portion of the projected image consisting of sprocket holes and the spring 24 and consequently the projected image will be clear cut and will not be marred by the sprocket openings.

The plates 36 and 37 form an upper pocket 42 having openings 43 in its walls. The plates 38 and 39 also form a pocket 44 having openings 45. These pockets may receive stationary slides containing data to be projected in combination with the moving data. From Fig. 7 it may be seen that the frame 40 is of such construction that the film 28 may extend into the same and into close relation to the opening 41 so as to prevent light rays from passing above or below the film and through the opening.

Arranged forwardly of the framing device and adjustably mounted on the rod 30 is an objective lens 46 which, as shown in Fig. 1, may be used to concentrate the projected image on a suitable screen 47.

If desired, a housing 48 having a base 49 may be used to enclose the major portion of the mechanism. The housing 48 is preferably removable from its base 49 and it has an opening 50 to permit the passage of light rays. This opening merges at its lower end into a vertical slot 51 which may receive the rod 30 when the housing is placed over the lamp box.

As best shown in Figs. 9 and 10, the mechanism may be combined with an auxiliary reflector 52 when desired for the purpose of directing the image to a screen 53 arranged above or to one side of the lamp box. This reflector 52 is preferably mounted on a shaft 54 which may turn within apertures in a yoke 55. The apertures are of such size as to prevent free movement of the shaft 54, but the shaft may be rocked when pressure is applied to the reflector 52, it being understood that the reflector is rigidly mounted on the shaft 54. The yoke 55 has a stem 56 that is adjustable axially in an arm 57 carried by a ring 58 which may slide along or turn around the rod 30. A set-screw or the like 59 is employed to lock the ring 58 in position.

Instead of driving the film by means of the propeller wheel 18, I may drive the film 28[a] by a small electric motor 60, (see Fig. 11). In this embodiment, the motor will actuate a shaft 61 having a sprocket wheel 62 to engage the sprocket openings 63 in the film, and the film will be supported by a spider 20 in the same manner as shown in Fig. 1.

While I have disclosed the preferred forms of the invention, I am aware that changes may be made in the details shown without departing from the spirit of the invention as expressed in the claims.

What I claim and desire to secure by Letters Patent is:

1. An advertising projector including a lamp box provided with a lamp and having condenser lenses to permit the passage of light rays, a passageway at the upper portion of the lamp box to permit air heated by the lamp to travel upwardly, a propeller wheel arranged above the passageway and adapted to be driven by heated air travelling through the passageway, a spider device comprising a plurality of arms radiating from the propeller wheel and attached thereto, each of said arms having a vertical extension, a ring element connected to the lower ends of said extensions and having a plurality and outwardly directed spurs, and a film element encompassing said ring and provided with spaced apertures to receive said spurs, the heat rising from the lamp causing the propeller wheel to rotate and communicate rotary motion to the film and carry the data thereon past the lens.

2. An advertising projector including a lamp box provided with a lamp and a condenser to permit the passage of the light rays, a passageway at the upper portion of the box to permit the flow of air heated by the lamp, from the box, a propeller wheel arranged above the passageway and adapted to be driven by the heated air travelling through the passageway, a shaft extending across the passageway, a thermostatic element mounted on the shaft, a damper carried and actuated by the thermostatic element for regulating the flow of heated air through the passageway, and a film actuated by the propeller wheel and adapted to be moved in front of said lamp.

3. An advertising projector including a lamp box provided with a lamp and a condenser lens to permit the passage of light rays from the box, a hopper-shaped passageway at the upper portion of the box to permit the flow of air heated by the lamp from the box, a propeller wheel arranged to be driven by the current of heated air flowing through the passageway, a swinging damper adapted to direct the air flowing through the passageway, a thermostatic element for controlling the movement of said damper, and a film actuated by the propeller wheel

and arranged to be moved in front of said condenser lens.

4. A projecting apparatus including a lamp box containing a lamp and condenser lenses to permit the light rays to pass from the box, a passageway communicating through the upper portion of the box to discharge a heated current of air from the latter, means actuated by the heated air passing through said passageway for feeding a film in front of the lenses, and a ventilating conduit surrounding said passageway and having outwardly opening vent ports, said vent ports permitting free circulation of air through said conduit and reducing the intensity of heat radiated from the upper portion of the lamp box in the direction of the film feeding means.

5. In a projecting apparatus, a lamp box provided at its upper end with a central aperture forming a passageway for the discharge of heated air, a chamber surrounding said passageway, and outwardly opening vent ports in the outer walls of the chamber to permit air to circulate therethrough, said vent ports permitting free circulation of air through said conduit and reducing the intensity of heat radiated from the upper portion of the lamp box in the direction of the film feeding means.

6. A projecting apparatus including a lamp casing having a central aperture at its top to discharge heated air from the box, a substantially pyramidal outer wall at the upper end of the box, a hopper shaped inner wall cooperating with the first mentioned wall and with the top of the casing to form a central passageway, and a chamber surrounding the passageway the outer walls of said chamber having vent ports to permit the circulation of air through the chamber and reduce the intensity of heat radiated from the upper portion of the lamp box in the direction of the film feeding means.

7. In a projecting apparatus, a source of light and heat, a passageway for organizing a stream of heated air generated by said source, a condenser lens and an objective lens associated with said source, a bracket device supported contiguous to said passageway and having a horizontal guideway, a bar movable in said guideway, a pin vertically movable through said bar, means for holding said bar in adjusted position in said guideway, means for holding said pin in adjusted position in said bar, a fan wheel rotatably mounted on the pin, a film carrier actuated by the propeller wheel and arranged to carry a film between the condenser lens and the objective lens.

8. A projecting apparatus including a lamp casing provided with a source of light and heat, a passageway at the upper end of the casing to permit the discharge of heated air from the casing, a thermostatically controlled damper for regulating the passage of heated air through the passageway, manually operated means for determining the extent of said regulation, a propeller wheel arranged above the passageway and adapted to be rotated by heated air flowing through the passageway, a condenser lens and an objective lens associated with the lamp casing, and a film support actuated by the propeller wheel and adapted to feed a film between the condenser lens and the objective lens.

9. In a projecting apparatus, the combination with a source of light and heat, of a film movable in front of the source of light, actuating means for the film operable by heat waves from the light and heat source, a shutter adapted to normally prevent the light rays from reaching the film, means directly responsive to the heat from the source of light for controlling the position of the shutter, and means operative by the heat from the source of light for controlling the path of the heat waves leading to the film operating means.

10. A projecting apparatus including a light source condenser lens for directing the light rays, an objective lens, a film movable between the condenser and objective lens, actuating means for the film operable by heat waves from the light and heat source, a shutter movable between the condenser lens and the film, means directly responsive to the heat from the light rays for controlling the position of the shutter, means operative by the heat from the light rays for controlling the path of the heat rays leading to the film operating means.

11. In a projecting apparatus, a light source, a condenser lens and objective lens for directing the light rays, a film movable between the condenser and objective lens, actuating means for the film operable by heat waves from the light and heat source, a pivotally mounted shield adapted to prevent light rays from normally reaching the film, means operative by the heat from the light rays for controlling the position of the shield, and means operative by the heat from the light rays for controlling the path of the heat rays leading to the film movable means.

12. A projecting apparatus comprising a lamp and a lamp casing having an upper passage for the escape of hot air, a rotatory wheel having blades arranged in the path of said air, a movable damper arranged in the said passage to normally direct the rising air to the said blades of the wheel, a heat-extended device for moving the damper whereby as the heat increases said air is deflected towards and beyond the rim of the wheel, said casing having an opening for the emission of light from the lamp, a film,

and attachments carried by the wheel for supporting the film adjacent to said light opening of the casing.

13. A projecting apparatus comprising a lamp and a lamp casing having an upper passage for the escape of hot air, a rotatory wheel having blades arranged in the path of said air, a movable damper arranged in the said passage to normally direct the rising air to the said blades of the wheel, a heat-extended device constructed to directly support and move the damper whereby as the heat varies the air is deflected towards or from the blades of the wheel, said casing having an opening for the transmission of light from the lamp, a film, and attachments carried by the wheel for supporting the film adjacent to the said light opening of the casing.

14. A projecting apparatus including a lamp box containing a lamp and condenser lens to permit the light rays to pass from the box, a passageway at the upper portion of the box to discharge a heated current of air from the latter, means actuated by the heated air flowing through said passageway for feeding a film in front of the lens, and means operative by the heated air flowing through said passageway for controlling the path of the same.

15. A projecting apparatus including a source of light and heat and a condenser lens to direct the rays from the lamp, a passageway above the lamp to organize the current of air heated by the lamp, means actuated by the heated air flowing through said passageway for feeding a film in front of the lens, and a thermostatic element affected by the heat from the lamp for controlling the passage of the heat to the film feeding means.

In testimony whereof I affix my signature.

HARLEY H. HORNBECK.