R. I. ATHERTON.

PORTABLE CINEMATOGRAPH PROJECTOR.

APPLICATION FILED AUG. 24, 1920.

1,391,990.

Patented Sept. 27, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

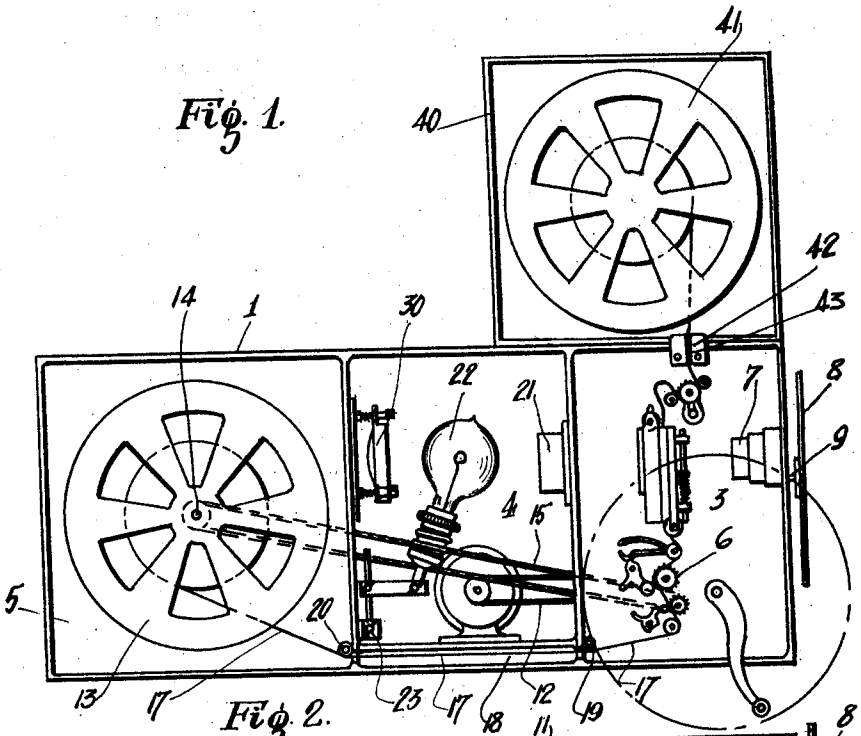


Fig. 2.

Fig. 3.

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2 SHEETS—SHEET 2.

Fig. 4.

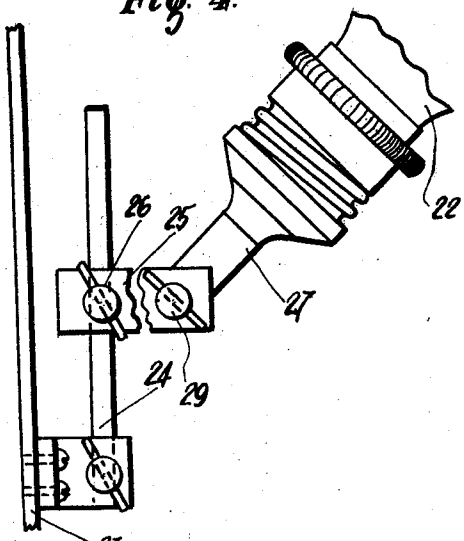


Fig. 5.

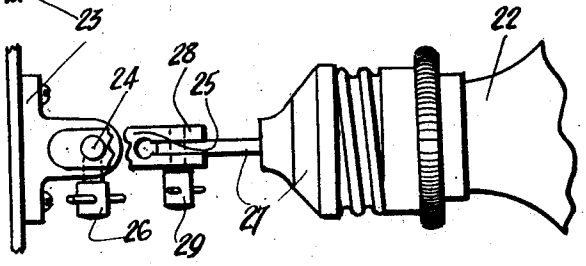


Fig. 6.

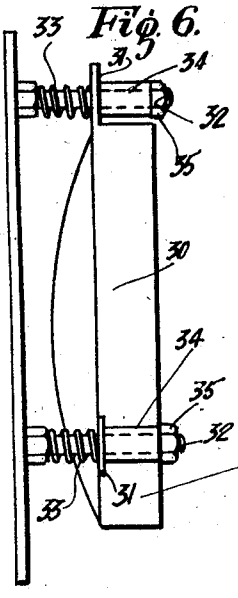
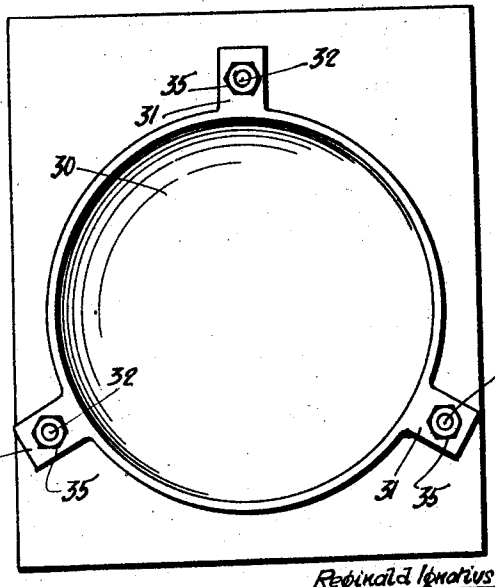


Fig. 7.



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UNITED STATES PATENT OFFICE.

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PORTABLE CINEMATOGRAPH-PROJECTOR.

1,391,990. Specification of Letters Patent. Patented Sept. 27, 1921.

Application filed August 24, 1920. Serial No. 405,713.

To all whom it may concern:

Be it known that I, REGINALD IGNATIUS ATHERTON, subject of the King of Great Britain and Ireland, residing at "Elmdene," Ballards Lane, North Finchley, in the county of Middlesex, England, have invented certain new and useful Improvements in Portable Cinematograph-Projectors, of which the following is a specification.

My invention relates to an improved construction and arrangement of portable cinematograph projector and has for its particular object the provision of an arrangement which shall enable the complete isolation of the film from the lamp or other illuminating device at all times so as to insure immunity from accident through the ignition of the film.

According to my invention the projecting apparatus comprises a case of metal or other suitable fire-proof material, divided into a series of separate compartments to contain the projecting apparatus itself, the film spool boxes and driving gear and the film each completely isolated from the lamp compartment.

In carrying out my invention I employ a rectangular case of metal or other suitable fire proof material divided longitudinally by a vertical partition, and the portion of the casing upon one side of this partition is again divided by transverse partitions into three separate compartments. The forward compartment contains the actual projecting apparatus of any convenient ordinary construction, the central compartment contains the lamp or other illuminating device together with a reflector and condenser for concentrating the light upon the film in the gate of the projecting apparatus. The lamp or other illuminating device is mounted so as to be capable of universal adjustment in any direction, for the purpose of centralizing the light with the condenser, and a suitable reflector, preferably of the Mangin lens mirror type, is adjustably mounted upon the rear wall of this compartment so that it may act to concentrate and reflect the light in the required direction.

This center comparment is completely isolated from the forward compartment containing the projecting apparatus and the rear compartment containing the take-up spool, so that at no time can the film come into contact or proximity with the lamp or other illuminating device, thus preventing all possibility of ignition of the film and affording complete immunity from accident due to this cause. The rear compartment contains a take-up spool, adapted to be driven in unison with the projecting apparatus and serves to wind up the film as it is fed through the projector.

A narrow channel or passage passes beneath the central compartment containing the lamp or other illuminating device and connects the rear compartment containing the take-up spool with the forward compartment containing the projecting apparatus, so that the film remains inclosed in the casing at all times and is thus protected against accidental ignition or damage.

The take-up spool is mounted upon a suitable spindle, situated in the side of the casing remote from that containing the three compartments and is driven from the mechanism of the projecting apparatus through suitable gearing. The projecting apparatus may, however, be driven by a suitable motor, the speed of which is controlled through a regulator, or it may be driven by hand.

The film is fed to the projector from a spool box or holder, adapted to be mounted upon the upper portion of the casing, and a slot is provided in the forward compartment containing the projecting apparatus, and a similar slot is also provided in the spool-box containing the film. The spool-box is mounted upon the casing so that these slots superimpose and the film is fed through this slot to the projecting apparatus so that it is at no time exposed but is always contained either in the spool-box or in the casing.

When not in use the spool-box, containing the film, may be detached from its position on the casing and may be stowed away in the casing on that side of the partition remote from the three compartments, so that the whole projecting apparatus will comprise a compact rectangular case containing all the necessary mechanism and free from external projections.

The three compartments are each closed by a separate door upon one side so that the mechanism in each compartment may be examined at any time without placing the various compartments into communication with each other. For this purpose I prefer to employ a suitable sliding door to cover

the side of the center compartment containing the lamp or other illuminating device, while suitable hinged doors are mounted upon the guides in which this center door slides, and respectively cover and close the sides of the forward and rear compartments.

When a handle is provided to enable the projecting apparatus to be driven by hand, this may be made detachable so that it may be removed and placed within the casing when the latter is not in use, and in order that it may be used with the door open or closed as desired, the revolving shutter for the projecting apparatus may be arranged either within the casing or outside thereof, in which latter case it may be mounted upon a suitable spindle so that it can be detached and placed within the casing when the apparatus is not in use so as to render the apparatus more portable.

In order that my invention may be more readily understood reference is made to the accompanying drawings in which:—

Figure 1 is a side elevation of a suitable construction of my improved portable cinematograph projector looking upon the side containing the three compartments, the doors of which have been removed so as to show the arrangement of the apparatus therein.

Fig. 2 is a part sectional plan of the same showing the doors in place.

Fig. 3 is an end view looking upon the front of the apparatus.

Figs. 4 and 5 are details of the construction of the universal mount for supporting the lamp or other illuminating device, and;

Figs. 6 and 7 are respectively side and front elevation of the reflector and method of mounting the same.

Referring to the drawings, the rectangular casing 1 is divided longitudinally by the vertical partition 2, and upon one side of this partition is provided the three compartments 3, 4 and 5. In the forward of these compartments 3 is provided the projecting apparatus 6 of any convenient construction and the projecting lens 7 is mounted in the front of the casing in line with the projecting apparatus, while the rotatable shutter 8 is mounted on the spindle 9 and connected to the projecting apparatus by suitable gearing.

This shutter 8 on the spindle 9 is arranged so that it may be detached when the apparatus is not in use and be placed inside the casing in the large compartment 10 on one side of the partition 2. This compartment 10 contains a suitable electric motor 11 by means of which the projector may be driven through a driving belt 12. In the rear compartment 5 is provided a take-up spool 13 mounted upon a spindle 14 adapted to turn in bearings in the partition 2. This spindle 14 is connected with the projecting apparatus 6 through the driving chain 15, through the medium of the friction clutch 16 on the spindle 14.

The film 17, as it passes through the projector 6, is led into the forward end of the passage 18 arranged beneath the center compartment 4 and connecting the front compartment 3 with the rear compartment 5. Suitable rollers 19 and 20 are provided at the front and rear of this passage, and the film passes under or over these rollers 19 and 20 and through the passage 18 to the take-up spool 13 in the rear compartment 5 without passing out of the case 1 or being exposed in any way to the lamp or other illuminating device contained in the center compartment 4.

The center compartment 4 is provided with the condenser 21 mounted in the division between it and the front compartment 3 and in line with the gate of the projecting apparatus 6 in the front compartment. Behind this condenser 21 is mounted the half-watt projecting lamp 22 or other suitable illuminating device. This lamp 22 is supported upon a mount to enable universal adjustment of the lamp so as to centralize it with the condenser. This mount is shown in detail in Figs. 4 and 5 and comprises a bracket 23 mounted upon the wall between the center compartment 4 and the rear compartment.

In this bracket is clamped a vertical rod 24 by means of a clamping screw, so that it may be raised or lowered and clamped in any desired position. Upon this vertical rod 24 is mounted the arm 25 which engages over the rod 24 and may swivel about it or slide up and down thereon. This arm 25 may be clamped in position on the rod 24 by the clamping screw 26. In the forward end of the arm 25 is hinged the lamp holder 27 which engages in the forked end 28 of the arm 25 and may swivel around the clamping screw 29. In this manner the lamp may be adjusted either for centralization with the condenser 21 or may be moved nearer to or farther away from it.

Behind the lamp 22 is mounted a Mangin lens mirror 30 or other suitable reflector. The lens mirror 30 is arranged in a suitable mount having three projecting lugs 31 by means of which it is mounted upon the wall between the center compartment 4 and the rear compartment 5, in the manner shown in detail in Figs. 6 and 7. These lugs 31 engage over pins 32 and springs 33 are arranged upon these pins 32 behind the lugs 31 so as to press the lugs 31 forward against the tubular distance pieces 34 also arranged on the pins 32 and held in place by means of suitable nuts 35.

By adjusting any or all of the nuts 35 the lens mirror 30 may be adjusted angularly to concentrate the light in the desired

direction or may be moved backward or forward for focusing purposes, while the springs 33 support the mirror flexibly and so prevent distortion or damage owing to expansion or contraction.

The center compartment 4 is provided with a sliding door 36, adapted to slide vertically in guides 37 on each side of the compartment, so that when this door 36 is closed, the center compartment 4 is completely isolated from the front compartment 3 containing the projecting apparatus and the rear compartment 5 containing the take-up spool, and also from the passage 18 connecting these two compartments.

Upon the guide 37 at the front of the compartment 4 is hinged a door 38 adapted to cover the side of the front compartment 3 so as to inclose the projector mechanism, and upon the rear guide 37 is hinged a door 39 adapted to cover the rear compartment 5 and so inclose the take-up spool 13.

The spool-box 40 containing the spool 41, on which is wound the film prior to its being passed to the projector, is mounted upon the forward upper end of the casing 1 when required for use. This spool-box 40 is provided with a slot 42 which coincides with a slot 43 in the upper surface of the casing 1 and which leads into the forward compartment 3 containing the projecting apparatus 6. The film from the spool 41 is passed through the slots 42 and 43 into the front compartment 3 and then into the projecting apparatus. After passing through the projecting apparatus the film is led away through the passage 18 to the rear compartment 5 and is then re-wound upon the take-up spool 13.

The film is completely inclosed at all times during use and is also isolated from the center compartment 4 containing the lamp 22 so that it is not exposed to the heat of this lamp and cannot become ignited or otherwise damaged.

I claim:—

1. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, an illuminating device in a compartment between these two compartments and a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool.

2. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, an illuminating device in a compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, and a compartment at one side of the casing extending from back to front and containing the gearing connecting the projector mechanism with the take-up spool.

3. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, an illuminating device in one of the compartments completely isolated from the other compartment containing the projecting apparatus and film, and a detachable spool-box containing the film adapted to be mounted on the casing over the compartment containing the projector mechanism and slots in the spool box and the casing through which the film is threaded to the projector mechanism.

4. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, an illuminating device in a compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, a detachable spool box containing the film adapted to be mounted on the casing over the compartment containing the projector mechanism and slots in the spool box and the casing through which the film is threaded to the projector mechanism.

5. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, an illuminating device in a compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, a compartment at one side of the casing extending from back to front and containing the gearing connecting the projector mechanism with the take-up spool, and a detachable spool box containing the film adapted to be mounted on the casing over the compartment containing the projector mechanism and slots in the spool box and the casing through which the film is threaded to the projector mechanism.

6. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, an illuminating device in a compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, guides on each side of the center compartment, a door to this compartment adapted to slide in these

guides, doors to each of the front and rear compartments and hinged connections between these doors and the guides on each side of the center compartment about which they may turn.

7. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, an illuminating device in a compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, a detachable spool box containing the film adapted to be mounted on the casing over the compartment containing the projector mechanism, slots in the spool box and the casing through which the film is threaded to the projector mechanism; guides on each side of the center compartment, a door to this compartment adapted to slide in these guides; doors to each of the front and rear compartments and hinged connections between these doors and the guides on each side of the center compartment about which they may turn.

8. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, a center compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool; a condenser mounted on the wall between the front and center compartments, a reflector mounted upon the wall between the center and rear compartments, and an illuminating device adjustably mounted between the condenser and the reflector.

9. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, a center compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, a compartment at one side of the casing extending from back to front and containing the gearing connecting the projector mechanism with the take-up spool, a condenser mounted on the wall between the front and center compartments, a reflector mounted upon the wall between the center and rear compartments and an illuminating device adjustably mounted between the condenser and the reflector.

10. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, a center compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, a detachable spool box containing the film adapted to be mounted on the casing over the compartment containing the projector mechanism, slots in the spool box and the casing through which the film is threaded to the projector mechanism, a condenser mounted on the wall between the front and center compartments, a reflector mounted upon the wall between the center and rear compartments and an illuminating device adjustably mounted between the condenser and the reflector.

11. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, a center compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, a detachable spool box containing the film adapted to be mounted on the casing over the compartment containing the projector mechanism, slots in the spool box and the casing through which the film is threaded to the projector mechanism; guides on each side of the center compartment, a door to this compartment adapted to slide in these guides; doors to each of the front and rear compartments, hinged connections between these doors and the guides on each side of the center compartment, about which they may turn, a condenser mounted on the wall between the front and center compartments, a reflector mounted upon the wall between the center and rear compartments and an illuminating device adjustably mounted between the condenser and the reflector.

12. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, a center compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, a condenser mounted on the wall between the front and center compartment, a lens mirror reflector mounted on a series of pins, springs on these pins behind lugs on the reflector, screw-threaded nuts on the pins on the other side of these lugs by which the reflector may be adjusted, a half-watt lamp adjustably mounted between the condenser and reflector, a holder for the lamp on one end of an arm, a vertical rod upon which this arm may swivel and slide,

a clamp to secure the arm in position and a bracket to support the vertical rod upon the wall of the center compartment.

13. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, a center compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, a compartment at one side of the casing extending from back to front and containing the gearing connecting the projector mechanism with the take-up spool, a condenser mounted on the wall between the front and center compartment, a lense mirror reflector mounted on a series of pins, springs on these pins behind lugs on the reflector, screw threaded nuts on the pins on the other side of these lugs by which the reflector may be adjusted, a half-watt lamp adjustably mounted between the condenser and reflector, a holder for the lamp on one end of an arm, a vertical rod upon which this arm may swivel and slide, a clamp to secure the arm in position and a bracket to support the vertical rod upon the wall of the center compartment.

14. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, a center compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, a detachable spool box containing the film adapted to be mounted on the casing over the compartment containing the projector mechanism, slots in the spool box and the casing through which the film is threaded to the projector mechanism, a condenser mounted on the wall between the front and center compartment, a lens mirror reflector mounted on a series of pins, springs on these pins behind lugs on the reflector, screw threaded nuts on the pins on the other side of these lugs by which the reflector may be adjusted, a half-watt lamp adjustably mounted between the condenser and reflector, a holder for the lamp on one end of an arm, a vertical rod upon which this arm may swivel and slide, a clamp to secure the arm in position and a bracket to support the vertical rod upon the wall of the center compartment.

15. In a portable cinematograph projector, a casing, a series of separate compartments in the casing, projector mechanism in one compartment at the front of the casing, a take-up spool in a rear compartment, a center compartment between these two compartments, a channel connecting the front and rear compartments through which the film passes from the projector mechanism to the take-up spool, a detachable spool box containing the film adapted to be mounted on the casing over the compartment containing the projector mechanism, slots in the spool box and the casing through which the film is threaded to the projector mechanism; guides on each side of the center compartment, a door to this compartment adapted to slide in these guides; doors to each of the front and rear compartments, hinged connections between these doors and the guides on each side of the center compartment about which they may turn, a condenser mounted on the wall between the front and center compartment, a lens mirror reflector mounted on a series of pins, springs on these pins behind lugs on the reflector, screw-threaded nuts on the pins on the other side of these lugs by which the reflector may be adjusted, a half-watt lamp adjustably mounted between the condenser and reflector, a holder for the lamp on one end of an arm, a vertical rod upon which this arm may swivel and slide, a clamp to secure the arm in position and a bracket to support the vertical rod upon the wall of the center compartment.

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