Feb. 16, 1960 R. H. LARSON ET AL 2,925,009

SOUND SLIDE FILM MACHINE

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Fig. 1.

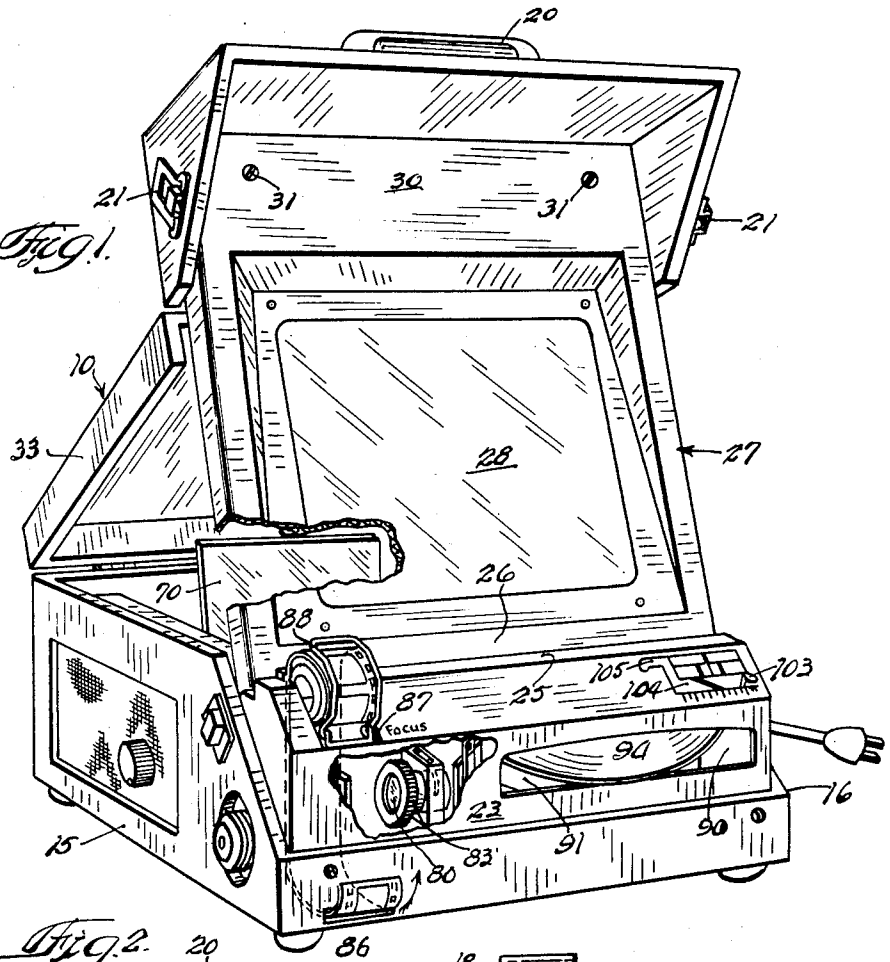
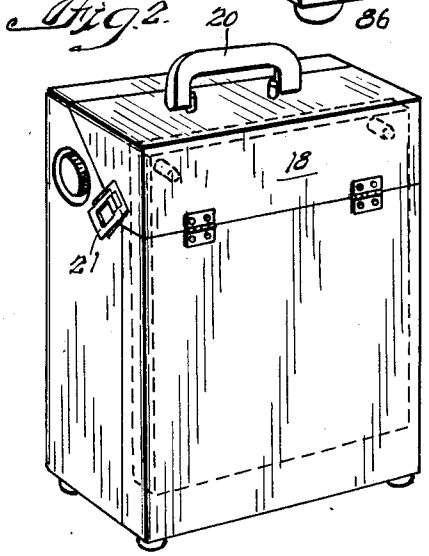


Fig. 2.



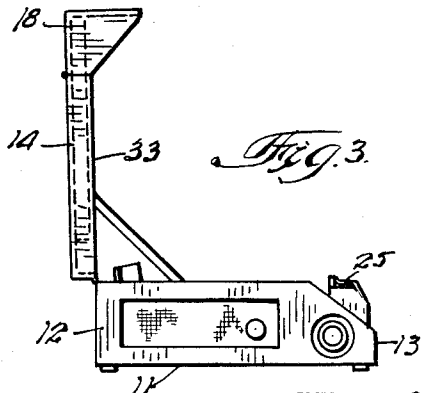


Fig. 3.

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Fig. 4.

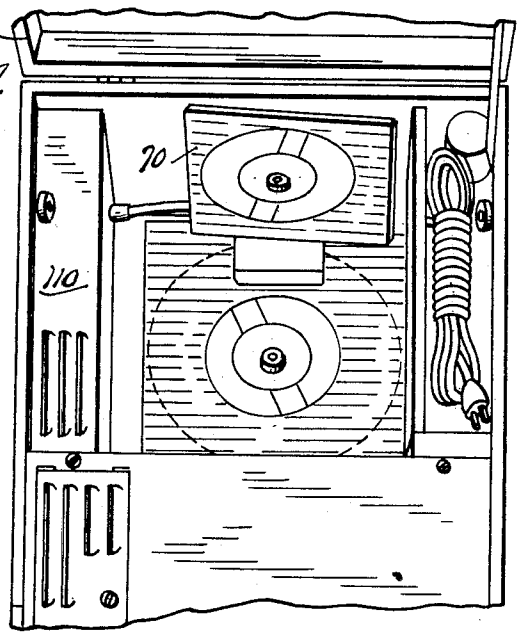
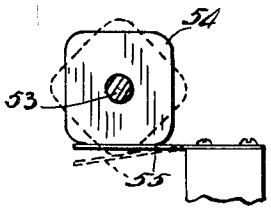


Fig. 5A.



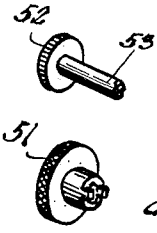


Fig. 5.

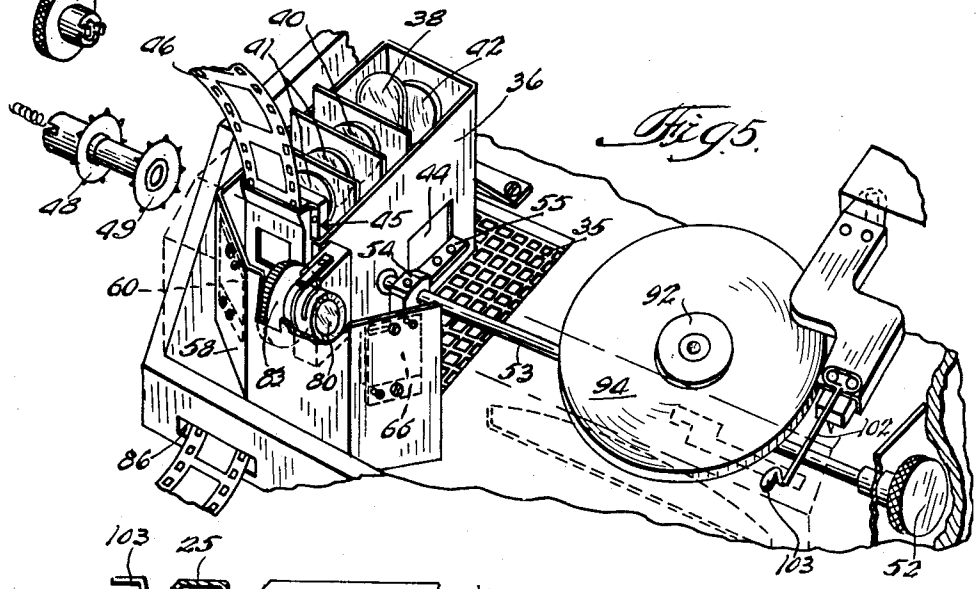
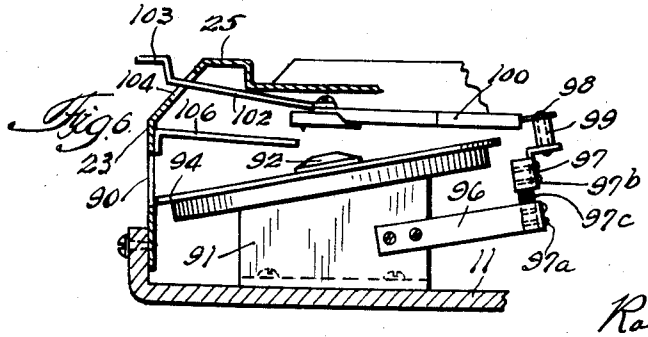


Fig. 6.



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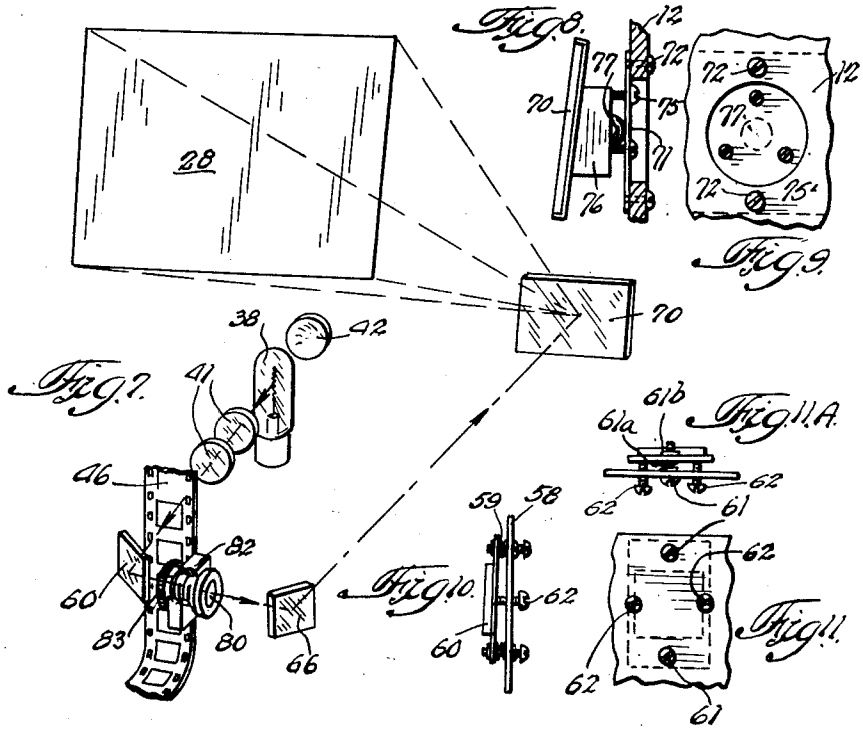


Fig. 8.

Fig. 9.

Fig. 7.

Fig. 11.A.

Fig. 10.

Fig. 11.

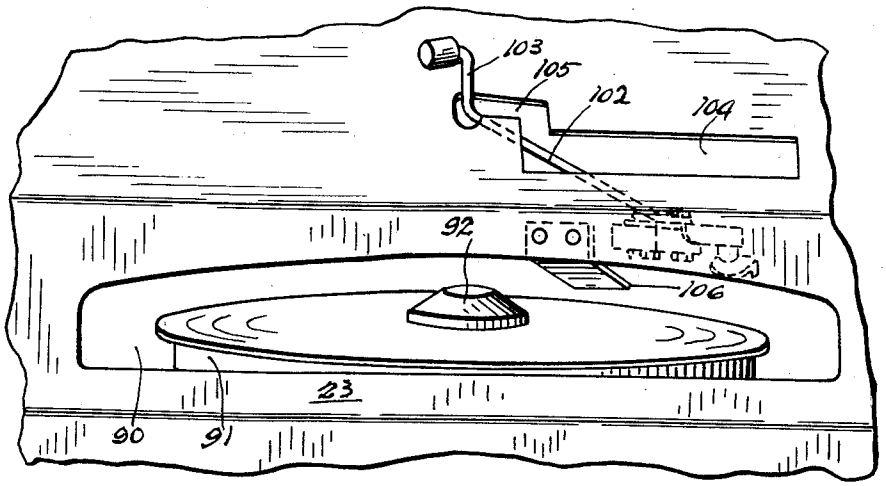


Fig. 12.

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SOUND SLIDE FILM MACHINE

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Application March 7, 1957, Serial No. 644,633

7 Claims. (Cl. 88—28)

This invention relates to a sound slide film machine and more particularly to a compact portable machine which may be used for projecting strip film and for reproducing sound recordings simultaneously. The machine embodying the present invention is simple to manufacture and to operate, is compact and requires a minimum of time and effort to change the machine from its normal shipping condition to a usable condition or vice versa.

Sound slide film machines are widely used as a selling adjunct. In order to use such machines effectively, it is essential that a minimum of time and effort be necessary to put the machine in readiness for use. Many machines require elaborate preparations for setting the machine into operative condition. Most machines require a screen to be disposed at a distance from the machine and thus require a certain minimum room within which to operate.

The new machine embodying the present invention is completely self-contained and may be disposed upon any support such as a chair or desk. The new machine embodying the present invention requires no more room than would normally be occupied by a person at a desk. It is thus particularly desirable for use by salesmen and others where the display is to be made to one person or a few persons forming a small group.

The new sound slide machine embodying the present invention includes a compact optical system which throws an image upon an easel type screen carried in the case housing the entire mechanism. The invention will be best understood by reference to the drawings showing an exemplary embodiment. Variations may be made without departing from the scope of the invention as defined by the appended claims.

Figure 1 is a perspective view of the new sound slide machine in condition for use.

Figure 2 is a perspective view of the sound slide machine in its container packed for shipping or for carrying.

Figure 3 is an end view with the cover of the carrying case elevated.

Figure 4 is a view looking down upon the phonograph turntable and mirror with the screen out of the way.

Figure 5 is a perspective detail illustrating the phonograph and the principal portion of the optical system of the new machine.

Figure 5*a* is a detail of the frame index means forming part of the mechanism shown in Figure 5.

Figure 6 is an end view of the phonograph illustrating the various guides for insuring the correct positioning of a record.

Figure 7 is an exploded view of the projecting portion of the new machine.

Figures 8 and 9 are respectively side and rear views of the mount for the final reflecting mirror in the projecting system.

Figures 10, 11 and 11A are side, rear and top views

respectively of the mounts for the first two mirrors forming parts of the optical system of the projector.

Figure 12 is a front perspective detail of the electric phonograph.

The new sound slide machine is carried in a case generally indicated by **10**, having bottom **11**, rear and front walls **12** and **13**, top **14** and sides **15** and **16**. The carrying case top portion **14** has hingedly attached thereto near the front wall **13** cover portion **18** which extends around toward front wall **13**. Hinged cover portion **18** has handle **20** and has suitable hardware **21** for locking the cover to the case proper when carrying the case and contents.

Extending inwardly and upwardly from front wall **13** is operating panel **23**. Operating panel **23** has top edge portion **25** stepped to provide a stop for bottom **26** of frame **27** supporting display screen **28**. Frame **27** is carried by cover portion **18**, frame **27** having mounting portion **30** attached to cover portion **18** by screws **31**.

The entire screen and screen support is so disposed in cover portion **18** that when cover portion **18** is flat with carrying case **14**, as illustrated in Figure 3, the entire screen and frame are disposed within the inside of top **14**. Top **14** is provided with downwardly extending sides **33** for providing the head room when the cover is closed so that the screen and frame are properly accomodated within the cover.

In order to dispose the screen in proper viewing position, cover portion **18** is tilted back from top **14** after the latter has been opened, as seen in Figure 1. Screen **28** and frame **27** are always disposed in the same position with respect to the viewer, bottom portion **26** of the frame cooperating with top edge **25** of the front panel to position the screen.

Immediately behind front panel **23** and to the left as seen in Figure 1, there is disposed a substantial portion of the optical system for the projector. Referring to Figure 5, bottom **11** is provided with grille **35** to insure an adequate flow of air through the bottom wall into the machine. Disposed over grille **35** is housing **36** supporting a projection lamp **38** and heat ray filter and lenses **40** and **41** positioned forwardly of lamp **38**. Lamp **38** is preferably provided with reflector **42** to direct light on to lenses **40** and **41**. These lenses may be condensers. Housing **36** preferably has opening **44** in the side wall adjacent lamp **38** to permit air to pass through the lamp housing and cool the lenses. The housing is open at the bottom where the lamp is located so air can flow directly past the lamp.

Housing **36** carries film gate **45** adapted to accomodate film strip **46**. Housing **36** supports film framing and advancing means having sprockets **48** and **49**. Figure 5 shows certain portions of the film framing and advance means exploded. Film framing and advance knob **51** and clutch control button **52** cooperate in conjunction with sprockets **48** and **49** for controlling the film. Clutch control button **52** is connected through a clutch to shaft **53** which extends completely through housing **36** to side wall **16** of the case, the shaft carrying a knob at that end also. This last named knob and knob **51** makes film advance possible from either side of the case. Inasmuch as film framing and film advance means are well known in this art, it is unnecessary to describe the construction in detail.

In general however, member **51** controls a clutch for disconnecting sprockets **48** and **49** from shaft **53** so that sprockets may be turned independently of the shaft. The index means includes square block **54** secured to shaft **53**. The index means also includes spring **55** riveted to a piece of the metal from housing **36** turned down to form opening **44**. Once the film has been properly framed,

the index means insures that the film will be advanced by one frame at a time.

Positioned immediately in front of film gate **45** and behind front panel **23** is mirror support **58**. This consists of a rigid support plate fixedly secured in the case at an appropriate angle to the sides of the case so that the support is positioned approximately as illustrated in Figure 5. Support plate **58** carries mirror support strip **59** (Figures 10 and 11) to which is cemented or otherwise firmly attached mirror **60**.

Support strip **59** is attached to plate **58** by means which provide for a limited universal adjustment. This means may assume any one of a number of forms. As illustrated here in Figures 10, 11 and 11A, two support screws **61** are provided along one center line, here the center of support strip **59**. Screws **61** have nuts **61***b* so disposed that support plate **58** and support strip **59** may be pulled together against the front of strip **61***b* by drawing up screws **61**. Each screw **61** has spring **61***a* around it between nut **61***b* and strip **59**. It is clear that screws **61** may be independently adjusted so that the mirror is moved about a horizontal axis as seen in Figures 10 and 11.

A pair of adjusting screws **62** are provided as illustrated in Figure 11. Screws **62** are laterally offset from the center line extending between screws **61**. It is clear that by adjustment of screws **62**, the mirrors may be moved with respect to a vertical center line as seen in Figure 11.

Disposed to the right of the first mirror and outside of housing **36** is second mirror **66**. The second mirror may be mounted in a manner generally resembling the first mirror and the two mirror supports and mirrors are so secured that a light beam passing through the film gate strikes the first mirror and is reflected to the second.

The second mirror is disposed from the first mirror a distance approximately ⅓ to ½ of the width of the case, this being the dimension between sides **15** and **16**. This permits an off-center location of the film gate and lamp. The light beam from second mirror **66** is reflected to final or third mirror **70** mounted upon rear wall **12** of the carrying case.

It is preferred to have third mirror **70** mounted for universal movement in all directions through a limited angle. While any universal mounting may be used, a simple construction is illustrated in Figures 8 and 9. Rear wall **12** is apertured at a portion thereof and has mirror support plate **71** rigidly secured by screws **72** to wall **12**. Plate **71** carries a number of screws **75**, shown here as three, going into mirror support block **76**. Support block **76** is recessed and accommodates ball bearing **77** which is adapted to press against plate **71**. The tightness of mirror support **76** on plate **71** may be controlled or adjusted to permit mirror adjustment.

It is understood that mirror **70** will be adjusted to the position where light received from second mirror **66** will in turn be reflected to screen **28**. As a rule, once mirror **70** has been properly adjusted, no further changes are necessary.

Means are provided for focusing the image. This means consists of lens **80** disposed in the light path between mirrors **60** and **66**. Lens **80** is carried in a suitable barrel threadedly supported on bracket **82** at the front of housing **36**. Adjusting knob **83** is coupled to the lens so that by turning knob **83**, the position of the lens in the barrel may be adjusted and the image on the film may be properly focused. Knob **83** has a sufficiently large diameter so that a portion thereof is accessible through an opening in front panel **23**.

Front panel **23** is provided with slot **86** through which film **46** may feed after projection. Front panel **23** has opening **87** which gives access to the film entrance to gate **45**. Opening **87** is provided with film roll support **88**. This may consist of a wire clip to hold the roll in position. It is understood that the leading portion of the film is fed through the gate manually and when the forward end has passed sprockets **48** and **49**, the film may be pulled or fed through and properly framed for operation.

Front panel **23** is provided with opening **90** giving access to a phonograph turntable. Suitably supported on base **11** is a phonograph driving motor and turntable **91**. Turntable **91** has dome shaped centering member **92** so that disc record **94** may be easily passed through opening **90** and disposed in proper position upon the turntable. Supported from suitable bracket **96** (Figure 6) is fixture **97** carrying pivot pin **98**. Fixture **97** includes two rigid clamping portions between which extends flexible support strip **97***c*. Sleeve **99** is disposed around the pivot pin and supports tone arm **100**. Tone arm **100** is provided with extension **102** having offset handle portion **103** which projects through window **104** in the panel. Window **104** is so shaped as to provide offset portion **105** for locking the tone arm in an elevated position. Finger piece **103** may be moved to the main portion of window **104**, this permitting the tone arm to drop into playing position.

In order to prevent record **94** from being pushed against the elevated stylus and damaging the stylus, strip **106** may be disposed upon the inside of panel **23** and so shaped as to guide the disc record into correct playing position.

It is understood that the cabinet contains suitable amplifiers and speaker for reproducing a record. The amplifiers and speaker may be housed in a suitable portion of the cabinet and may for example be disposed within housing **100**.

It will be seen that a compact and convenient strip film projector and record reproducing means have been provided. It is possible to provide magnetic record reproducing means instead of the disc record reproducing means. However the machine illustrated is easy to set up and use and may be repacked after use with minimum time and effort.

What is claimed is:

1. A portable self-contained projector comprising a carrying case having bottom, sides and rear walls and front panel in the normal position of use, a cover for closing the case and extending between the rear wall and front panel, a viewing screen, said screen and cover interlocking when in viewing position to provide a generally inverted V with the screen extending upwardly from above the front panel, the inverted V being firmly positioned along the rear wall and front panel of the case, a lamp housing between the front panel and rear wall on said bottom adjacent one side wall, said bottom having a ventilating grille below said lamp housing so that air can pass upwardly through the grille into said housing, said lamp housing being open at the top, said lamp housing containing a projection lamp therein, a film gate supported in said case behind the front panel of said case and disposed adjacent said one side wall, a condensing lens system disposed between said lamp and said gate for directing light upon said gate, said light path extending from the lamp within said housing adjacent to and parallel to said one side wall toward the front panel of said case, a pair of mirrors carried by said case for laterally offsetting and reversing the direction of travel of the light, one mirror being located in a corner adjacent the junction of the front panel and said one side wall, the other mirror being located behind the front panel and laterally offset from the one side wall less than half the distance between the opposing side walls of the case, a focusing lens system disposed behind the front panel between the two mirrors, said two mirrors being so arranged that light emerging from the film gate falls upon the first mirror and is reflected in a path generally parallel to the front panel, the second mirror reflecting the light along a path extending generally toward the center part of the rear wall of the case, a third mirror carried by said rear wall at the central portion

thereof for receiving the light beam from the second mirror, said third mirror reflecting the light along an upwardly tilted path which is generally equidistant from the side walls to strike the viewing screen, when said cover and screen are in normal position of use for projection, said second mirror being substantially closer to the exit end of the focusing lens system than to the third mirror, said first and second mirrors being substantially smaller than the third mirror, said projector system as a whole having a short direct ventilating path for air from the grille up through the lamp housing and out of the case adjacent the one side wall, this ventilating air path being remote from the path of the light beam after said light leaves the lamp housing, the arrangement of parts in the case providing a substantially clear space in the case behind the front panel extending from the other side wall toward the second mirror and extending along said other side wall and also providing clear space at the rear of the lamp housing adjacent the one side wall, such clear spaces being usable for accessories such as sound reproducing means whereby said case may be compact.

2. The construction according to claim 1 wherein a unitary metal housing is provided for the lamp, the condensing lens system and the film gate, said housing having a wall portion adjacent the one side wall of the case extending toward the front panel and being shaped to provide a support for said first mirror.

3. The construction according to claim 2 wherein means are provided for supporting the focusing lens system from said housing.

4. The construction according to claim 1 wherein said focusing lens system includes a rotatable member supporting the lenses, said rotatable member having a portion projecting through a slot in the front panel for ready adjustment.

5. The construction according to claim 1 wherein said film gate has the end portions for receiving and discharging film in vertically spaced relation, said case having

slots for accommodating the film from both gate ends, said slots being at the front panel near the one side wall, said slots and film gate permitting handling of the film completely from the front panel.

6. The construction according to claim 1 wherein film advance means are provided adjacent the film gate, said film advance means including a framing adjustment, said framing adjustment including an elongated rod extending behind the front panel from one side wall to the other and having knobs accessible at each side wall for framing.

7. The construction according to claim 1 wherein a metallic housing including the lamp housing is provided, said metallic housing having means for supporting the condensing lens system and for supporting the film gate, a frame advance means carried in said housing adjacent said film gate, a side wall of said housing adjacent the one side wall of the case extending forwardly toward the front panel and providing a support for the first mirror, the opposing side wall of the housing carrying a bracket for supporting the focusing lens system, said focusing lens system support including a coarse screw thread for moving said focusing lens system along a line between the first two mirrors, said focusing lens system including a member having a part projecting through a slot in the front panel so that said lens system may be moved from outside of the front panel.

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