June 9, 1931. G. J. BADGLEY 1,809,327

MOTION PICTURE PROJECTOR

Filed July 23, 1924 2 Sheets-Sheet 1

Fig. 1.

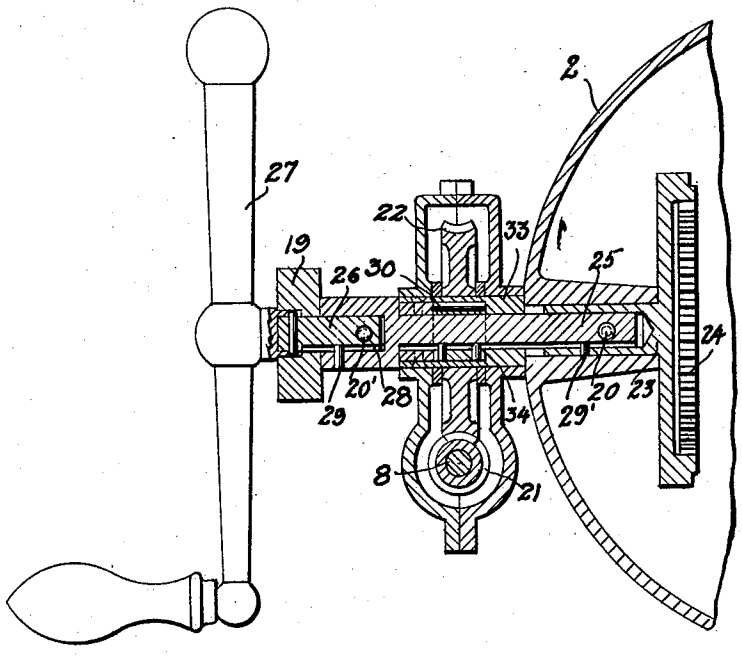


Fig. 2.

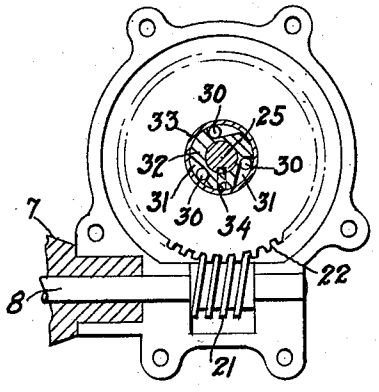
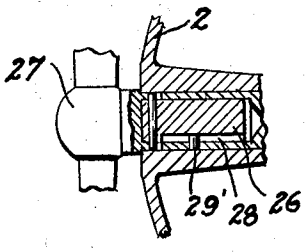


Fig. 3.



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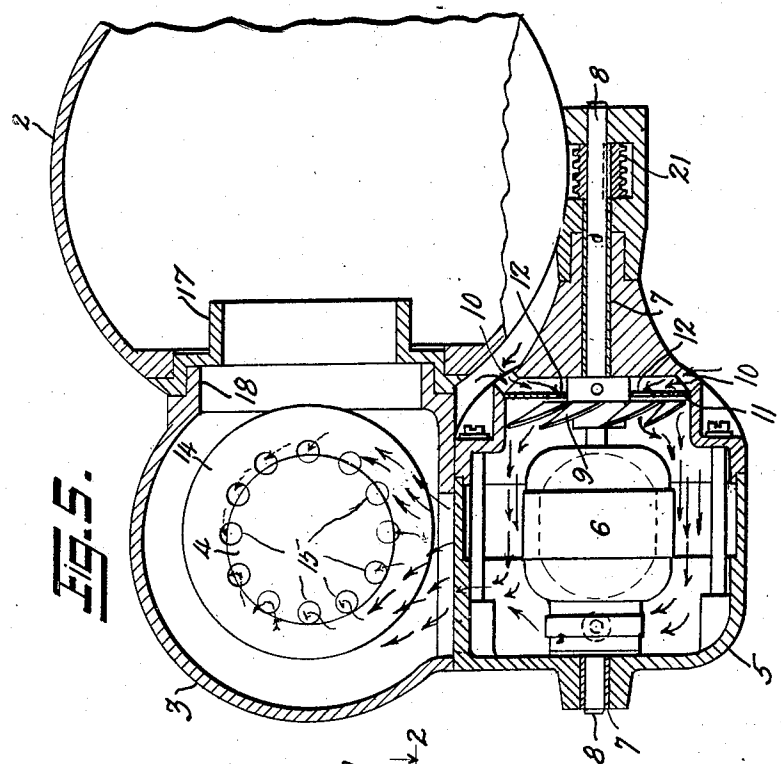

Fig. 5.

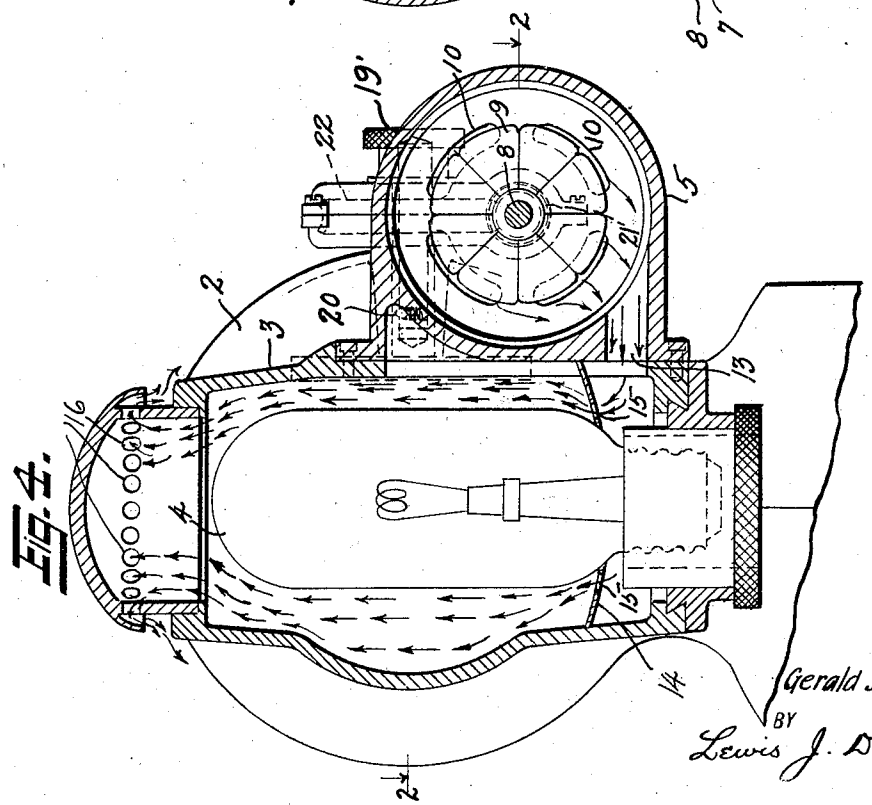

Fig. 4.

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UNITED STATES PATENT OFFICE

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MOTION PICTURE PROJECTOR

Application filed July 23, 1924. Serial No. 727,678.

This invention relates to picture projecting apparatus, and particularly to such an apparatus having means for permitting either motor or manual drive of the mechanism thereof, means whereby the motor driving means is held idle when manual operation is effected, and means for ventilating the illuminant of the apparatus and its housing at such times as the apparatus is being driven by motor.

A main object of the invention is the provision of motor driving means for a picture projecting apparatus adapted for rotating the drive spindle of the apparatus and also adapted to remain on said apparatus without rotation upon manipulation of manual driving means therefor.

Another object of the invention is the provision of manual operating means for such an apparatus so constructed as to permit attachment to or detachment from the motor driven shaft, or attachment directly to the driving spindle of the apparatus when the motor driving means has been detached therefrom.

One of the features of the construction is the provision of means whereby the housings for the lighting means and for the motor and ventilating fan may be removed readily from the main body of the projecting apparatus or attached thereto, thus permitting change of lighting means to accommodate the apparatus to the various requirements of service.

Another feature is the provision of latching means preferably in the form of ball-pressed snap-latches adapted to effect positive holding and ready removal of the lighting and ventilating housings from the main body of the projecting apparatus.

These and other features of the invention not hereinbefore referred to will be hereinafter described and claimed and are illustrated in the accompanying drawings, in which:

Figure 1 is a vertical section showing portions of motor and manual driving means for a projecting apparatus, the manual driving means shown being adapted to operate the mechanism of said apparatus when the motor driving means is idle;

Fig. 2 is a detail showing gearing between the motor and the driving spindle of the apparatus for effecting rotation of the mechanism of said apparatus when motor driving means is employed;

Fig. 3 is a detail, in section, of the drive spindle of the apparatus and of a handle adapted for cooperation therewith to effect manual operation of said apparatus when the motor driving means has been detached therefrom.

Fig. 4 is a vertical section showing motor driving means and lighting and ventilating means for a projecting apparatus, together with the housings therefor, and means for removing said motor, lighting, ventilating and housing means from the apparatus as a unit, and

Fig. 5 is a horizontal section of the same, the section being taken on the line 2—2, Fig. 4.

Similar characters designate like parts in all the figures of the drawings.

Referring to the drawings, 2 designates the upper portion of the casing for the driving gears and other enclosed parts of a picture projecting apparatus, and 3 a housing for an illuminant 4 therefor, said illuminant being illustrated herein as an incandescent lamp, though it will be understood that any suitable type of lighting means may be employed. As shown the housing 3 has attached thereto a housing 5 adapted to enclose a power driving means for the projecting apparatus, said means being shown as a motor 6, the bearings for the shaft of said motor being shown at 7 and the shaft at 8. On said shaft 8 and within the housing 5 a fan 9 is secured. This fan 9 may be of any type adapted to effect ventilation of the motor housing 5 and of the illuminant 4 and its housing 3.

In the device as shown motor operated driving means are provided for a projecting apparatus so connected thereto that it may be removed readily from said apparatus whenever desired, to permit the employment of manual operating means therefor; or the motor driving means may remain attached to the apparatus and yet permit the employment of the manual operating means before re-

ferred to in order to effect driving of the mechanism of the projector or to adjust the position of the film and to bring any desired portion thereof into position for projection, at which time the motor will be idle. To accomplish the motor driven operation referred to, a drive spindle 23 for the gearing 24 of the projecting apparatus is recessed to receive a shaft 25 actuated from a motor-shaft 8, through worm 21, worm-gear 22 to shaft 25 adapted to be inserted in the drive spindle 23 and to be locked therein. At 20 is shown a ball latch having a knurled head portion 19′ adapted to permit ready manipulation when it is desired to withdraw said latch to permit removal of the motor driving means and resort to manual operation of the apparatus. As shown said motor driving means with its housing 5, and the illuminant 4 and its housing 3 may be removed from the projecting apparatus by an outward pull on said knurled head 19′, this action serving to release the latch-pin 20 and permit such removal of the parts named as a unit.

It may be desirable at times to operate the projecting mechanism manually but without detaching the motor and associated parts from the apparatus. The knurled head 19, as shown in Fig. 1, and the shaft 25 are shown as adapted to receive the shaft 26 of manual operating means 27, said shaft 26 being provided with a runway 28 adapted to receive the pin 29 to effect positive latching of the parts 26 and 25 to prevent relative turning thereof. To latch the shaft 26 against withdrawal from the shaft 25 during manual operation, a ball-latch 20′ is employed similar to the ball-latch 20 of the motor driving means. When desired, the motor and the illuminating means and the housings therefor may be detached readily, as a single unit, and the shaft 26 of the manual operating means 27 may then be inserted and seated in the driving opening in the casing 2, as shown in Fig. 3, the runway 28 coacting with the pin 29′ in the same manner as the pin 29 coacts with the runway 28 when the motor and housings are attached to the apparatus.

When it is desired to operate the mechanism of the projecting apparatus manually but without removal of the motor and associated parts, it will be necessary to provide means adapted to cause said motor and associated parts to remain idle during such manual operation, and this I accomplish herein by the use of an over-riding clutch, whose action is to permit manual turning of the shaft 25, thereby causing rollers 30 to coact with depressions 31 in a clutch member 32 to effect turning of the shaft 25 and the member 32, with the rollers carried loosely in the depressions 31, thus causing the worm-gear 22 and the worm 21 to stand idle. When, however, the motor driving means is in operation, the drive is from the motor 6 to shaft 8, worm 21, worm-gear 22, causing a wedging action between the parts 32 and 33, the shaft 25 and the clutch member 32 being held against relative rotation by the pins 34. At such time, with the motor driving means in operation, the handle 27 will be removed from the shaft 25.

While ventilation of the housings 3 and 5 and of the illuminant 4 may be effected by the rotation of the fan 9 only, I have shown, in addition thereto, improved means for more effectively ventilating such spaces and cooling such members, such improved means comprising devices adapted to direct currents of air in close proximity to such parts. To effect this there are shown in Figs. 4 and 5 herein inlets to the motor housing 5, and to the housing 3 for the lighting means, so placed as to cause intake of air to said housings and direct the currents therethrough and over the surface of the motor and lighting means in the most effective manner. The means shown for this purpose include openings 10 in the housing 5 contiguous to the fan 9, a baffle-plate 11 interposed between said openings 10 and said fan, and directing or feed openings 12 in the plate 11 so positioned as to effect intake of air contiguous to the fan shaft 8, said currents entering through the openings 12 and being directed around the motor 6 to air-outlets 13 leading into the lamp-housing 3 near the base of the lighting means 4. Interposed between the lighting means 4 and the incoming currents of air is a baffle-plate 14 surrouding said lamp, and extending preferably to the sides of the housing 3. Openings 15 in said baffle-plate are so positioned as to cause currents of air entering the lamp-housing through said openings to follow a course substantially parallel to and against the surface of the lamp 4, from which it passes upward to, and through the outlet openings 16 and to the outside air. The direction of the intake, circulation and egress of air currents is indicated by arrows in Figs. 4 and 5 of the drawings.

The housing 3 for the illuminating means and the housing 5 for the motor and fan are shown herein as a unitary structure adapted for ready at achment to or removal from the main body of the projecting apparatus. A bushing 17 is shown (Fig. 4) fitted to the main casing 2 of the projecting apparatus, within which bushing 17 the friction-ring or flange 18 on the housing 3 is adapted to fit.

What I claim is:

1. In a picture projecting apparatus, the combination with driving gear therefor, and motor-operated driving means for said driving gear, of means for permitting manual operation of said driving gear to adjust the position of the film and to bring any desired portion thereof into position for projection, said manual operating means embodying a

removable crank having a shaft provided with a runway adapted for coaction with a stop carried by a bushing surrounding said shaft to lock said shaft and bushing together to permit rotary movement in unison.

2. In picture projecting apparatus, the combination with driving gearing therefor, of motor operated driving means operatively connected to said driving gearing, said driving means including gearing, a shaft, and a clutch operatively connecting said shaft and gearing, and of a crank having a crank shaft operatively and detachably connected with one end of the first mentioned shaft for the manual operation and driving of said gearing to adjust the position of the film and to bring any desired portion thereof into position for projection, said clutch permitting the motor driving means to remain idle during the manual operation of the gearing.

3. In a picture projecting apparatus, the combination with driving gearing therefor, of motor operated driving means for said gearing including an over-riding clutch adapted to be brought into operation to drive said gearing upon rotation of said motor and to be thrown out of operation when the motor is idle to permit the position of the film to be adjusted and to bring any desired portion thereof into position for projection by manual operation of the apparatus, said motor operating and manual operating means each embodying a driving shaft having a runway therein adapted for coaction with a stop on an encasing bushing attached to the driving gear of the apparatus and adapted to effect rotary movement of said driving gear, and a spring-pressed ball carried by each of said shafts and each adapted to cooperate with a seat in said bushing to prevent movement of said shafts in and out in said bushing.

4. In a picture projecting apparatus, the combination of driving gearing having a spindle, motor operated driving means including an over-riding clutch and shaft, the latter detachably connected with the spindle and adapted when attached thereto to operate the driving gearing, a crank having a crank shaft fitting into one end of the first-mentioned shaft and detachably connected therewith, said crank by the intermediary of the first-mentioned shaft being adapted to independently drive the driving gearing with the motor attached and in idle position to adjust the position of the film and to bring any desired portion thereof into position for projection.

5. In picture projecting apparatus, the combination with driving gearing mounted in a casing and having a spindle recessed to receive one end of a driving shaft, of driving means for said gearing including a shaft removably secured to said spindle, latching means interposed between said shaft and spindle for effecting a positive connection therebetween while permitting said shaft to be readily disconnected from said spindle, a housing in which said driving means is positioned removably mounted upon said casing, a manually manipulated latching device normally holding said housing in position on said casing while permitting the removal thereof with the driving means as a unit.

Signed at New York, in the county of New York, and State of New York, this 17th day of July, A. D. 1924.

GERALD J. BADGLEY.