

March 4, 1930.

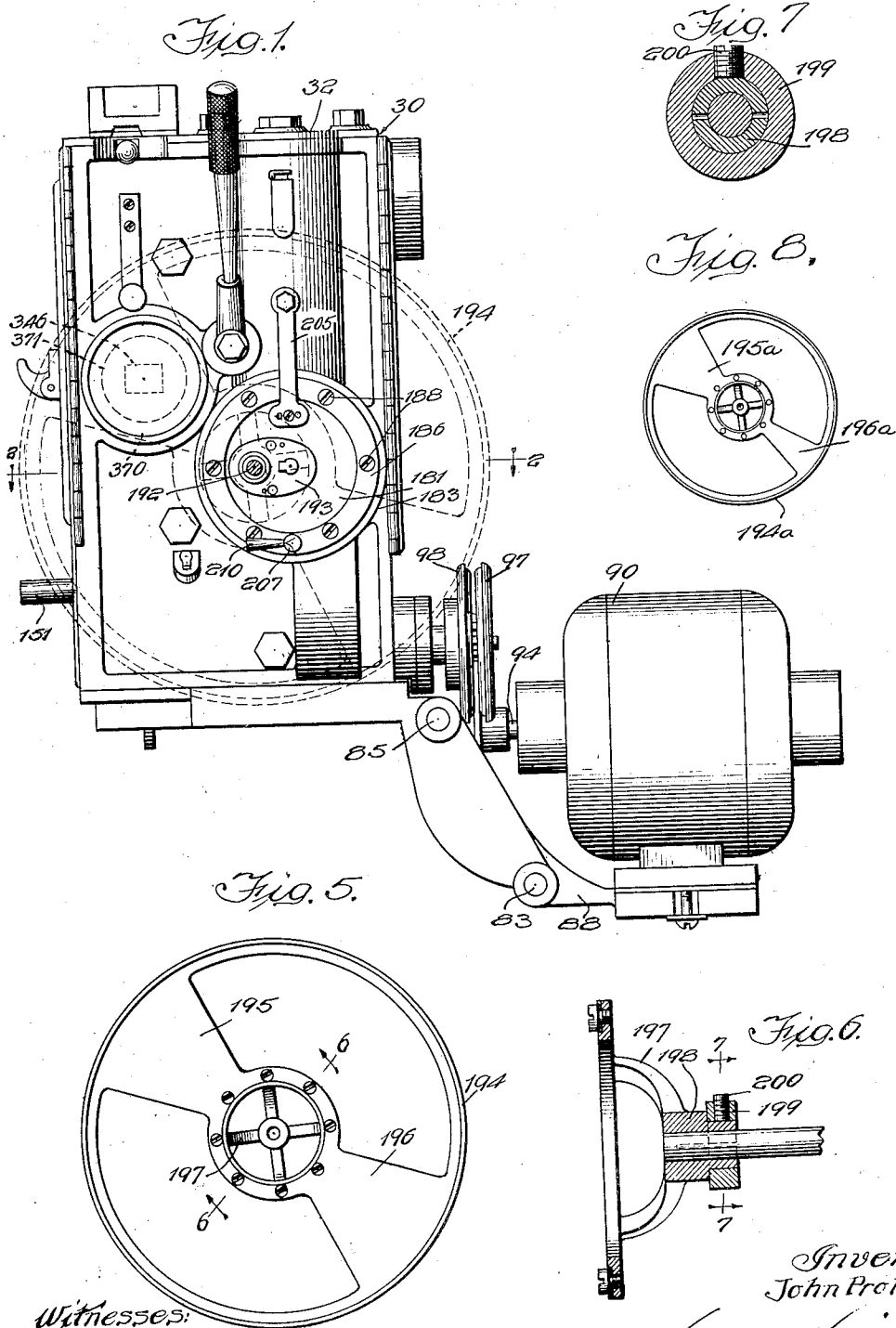
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1,749,394

MOTION PICTURE PROJECTING APPARATUS

Filed March 21, 1925

3 Sheets-Sheet 1



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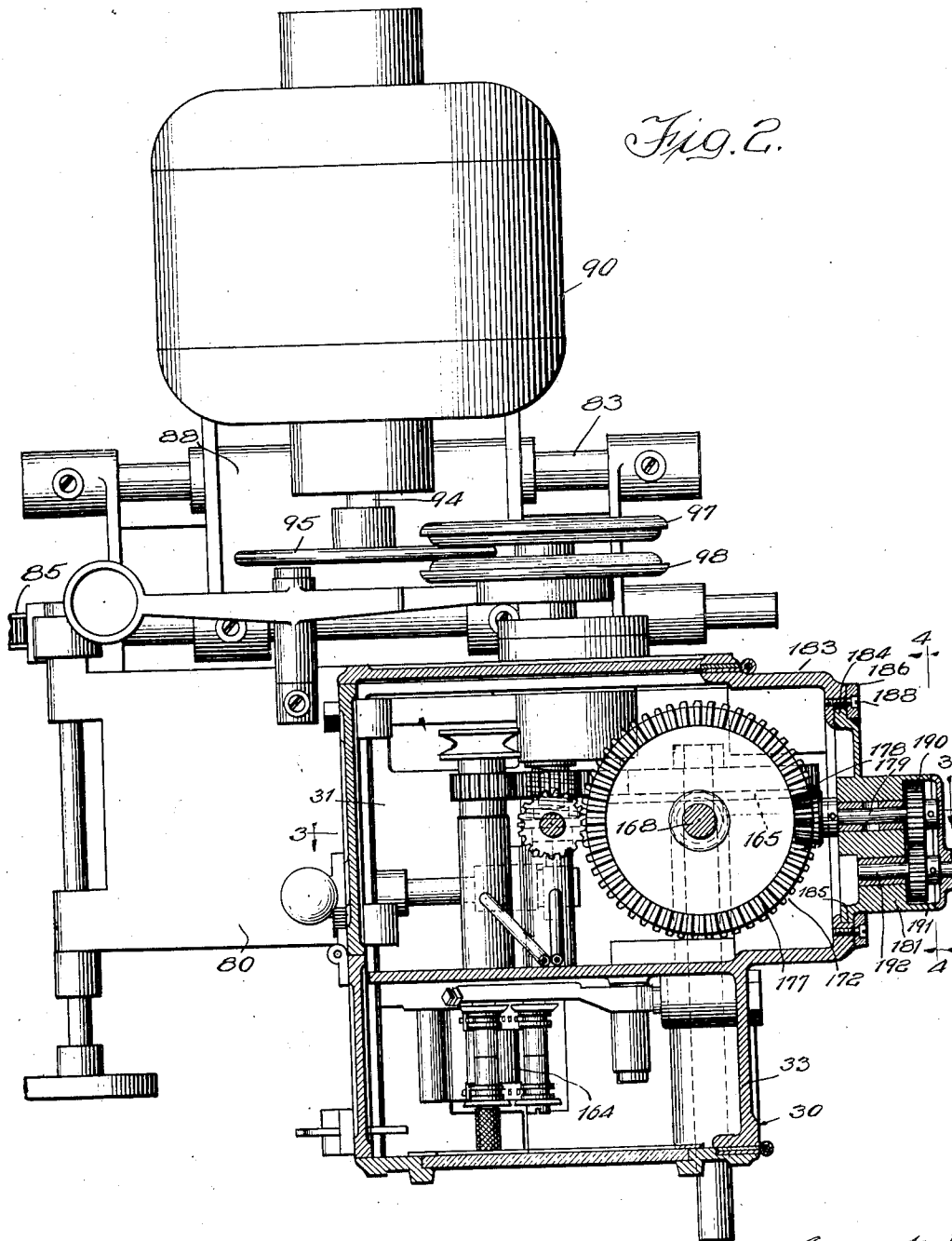
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MOTION PICTURE PROJECTING APPARATUS

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3 Sheets-Sheet 2



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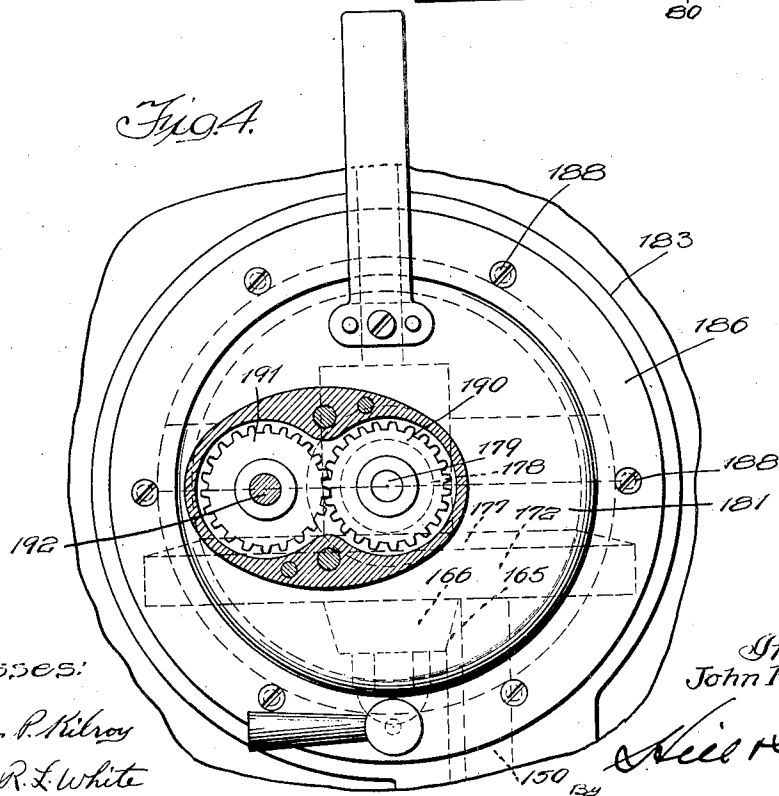
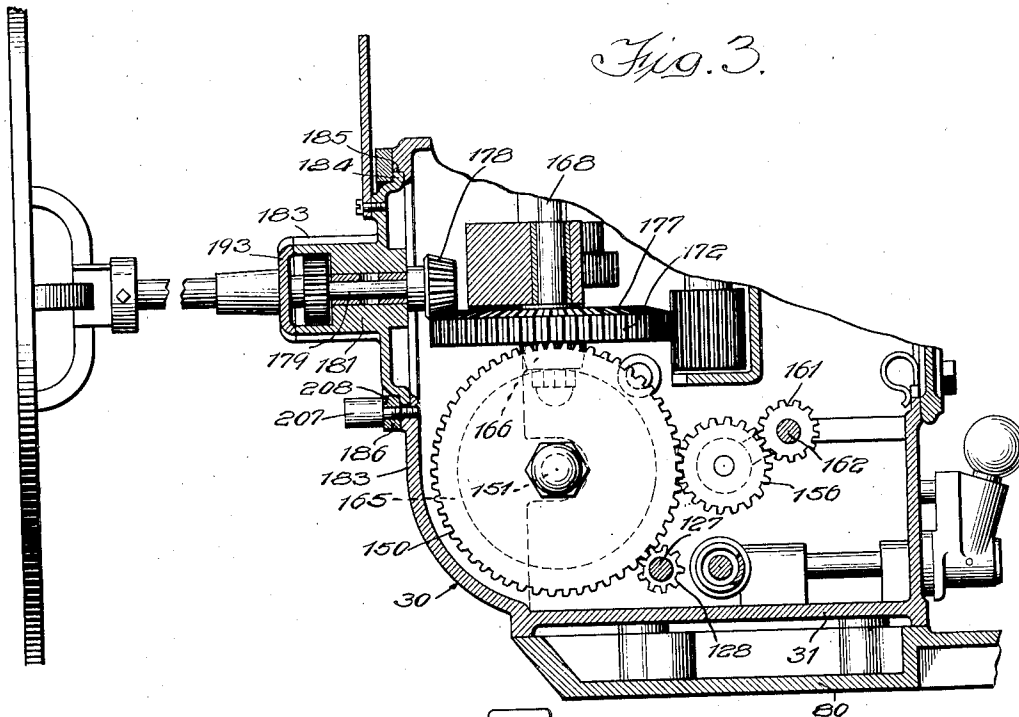
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MOTION PICTURE PROJECTING APPARATUS

Filed March 21, 1925

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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MOTION-PICTURE-PROJECTING APPARATUS

Application filed March 21, 1925. Serial No. 17,337.

My invention relates to improvements in motion picture projecting apparatus, and particularly to shutter mechanism for intermittently intercepting the beam of light when the apparatus is in operation. The invention has among its other objects the production of a mechanism of the kind described, which is extremely neat and attractive in appearance, simple, convenient, compact, durable, reliable, efficient and satisfactory for use wherever found applicable. A particular object of this invention is the provision of improved mechanism of the kind described, whereby the shutter may be easily synchronized with the film-advancing mechanism when the apparatus is in operation. Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosures herein given. To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a front elevation of apparatus embodying the invention, the shutter being shown in dotted lines;

Fig. 2 is a section taken on line 2—2 of Fig. 1;

Fig. 3 is a section taken on line 3—3 of Fig. 2;

Fig. 4 is a section taken on line 4—4 of Fig. 2;

Fig. 5 is a detail front elevation of the shutter;

Fig. 6 is a section taken on line 6—6 of Fig. 5;

Fig. 7 is a section taken on line 7—7 of Fig. 6; and

Fig. 8 is a detail front elevation of a shutter embodying another form of the invention.

In the drawings, a preferred embodiment of the invention is shown in connection with the motion picture projecting apparatus, which is more clearly shown and described in my co-pending application, Serial No. 17,336 filed March 21, 1925.

This motion picture projecting apparatus includes improved film-feeding mechanism, the major portion of which is enclosed in a housing 30 preferably comprising a bottom plate 31, a top plate 32 and a front wall 33, the front wall being formed integral with the top and bottom plates. The housing is preferably mounted upon and secured to a motor support 80, which is in turn mounted upon a suitable base (not shown). Rigidly secured in the motor support 80 is a shaft 83 upon which a bracket 88 is slidably journaled, the bracket 88 being rigidly secured to a shaft 85 which is slidably journaled in the support 80. An electrical motor 90 mounted upon the bracket 88 has a shaft 94 to which a friction disk 95 is rigidly secured. The friction disk 95 may be brought into and out of driving engagement with friction disks 97 and 98 by means described in the co-pending application in which I have also described and more clearly illustrated means whereby the friction disks 97 and 98 may drive a pinion 128 secured to a shaft 127, which is rotatably journaled in the housing 30 (Fig. 3). The pinion 128 meshes with a spur gear 150 secured upon a shaft 151 rotatably journaled in the housing 30, one end of the shaft 151 being arranged to project from the housing 30 to receive a crank, or the like, whereby the operator may drive the apparatus if, for any reason, he does not desire to use the motor 90, or if the motor is not available.

Meshing with the gear 150 is a gear 156 which meshes with a pinion 161 secured to a shaft 162. Secured to the shaft 162 is a film take-up sprocket drum 164, which, together with a feed sprocket drum (shown in the co-pending application) and intermittently driven sprockets (shown in the co-pending application) is adapted to feed the film past a light projecting aperture 346, formed within the housing 30, the light projecting aperture 346 being aligned with a lens 370 and a lens 371.

While my present invention, hereinafter described in detail, is shown in connection with the above described apparatus, it is not limited to this combination but may be em-

played wherever it is found applicable, without departing from the spirit thereof.

Formed integral with the spur gear 150 is a bevel gear 165 meshing with a bevel gear 166 rigidly secured upon the lower end of a vertically disposed shaft 168, the shaft 168 being rotatably journaled in the housing 30. Also secured to the lower end of the vertically disposed shaft is a spur gear 172 formed integral with a bevel gear 177, which meshes with a bevel gear 178 secured to a shaft 179. The shaft 179 is rotatably journaled in a bracket 181 mounted in a hollow boss 183 projecting from the front wall 33. The bracket 181 is rotatably journaled in the hollow boss 183, the bracket 181 being provided with an annular flange 184 seated in a recess 185 turned in the outer end of the hollow boss. A collar 186 secured to the hollow boss 183 by screws 188 engages the annular flange 184 and prevents withdrawal of the bracket 181 from the boss. It will be noted that the axis of rotation of the bracket 181 is coincident with the axis of rotation of the shaft 179. Pinned to the outer end of the shaft 179 is a pinion 190, which meshes with a pinion 191 pinned to a shaft 192 rotatably journaled in the bracket 181 and in a cap 193 fixed to the bracket, the axis of the shaft 192 being eccentrically disposed with respect to the axis of rotation of the bracket. The shaft 192 may be rotated bodily around the common axis of the shaft 179 and the bracket 181 while the shaft 192 is being rotated around its longitudinal axis, the pinion 191 rolling upon the pinion 190 in a well known manner during such movement of the shaft 192. Carried by the outer end of the shaft 192 is a shutter 194 which preferably comprises two diametrically disposed fan-shaped blades 195 and 196 (Fig. 5), the shutter being mounted upon a spider 197 having a split hub 198. In the preferred embodiment of the invention, the blades 195 and 196 are both imperforate, but the invention is limited to this construction only in so far as defined in the appended claims. A collar 199 seated upon the hub 198 is provided with a set screw 200, whereby the split hub 198 may be clamped to the shaft 192 as shown in Fig. 6. The narrow portions of the fan-shaped blades 195 and 196 are disposed adjacent the axis of rotation of the shutter so that the blades increase in width toward the outer ends thereof. When the apparatus is in operation the blades 195 and 196 will alternately intercept the beam of light projected upon the screen in a manner well known to those skilled in the art, one of the blades being adapted to intercept the beam of light when the film is being advanced and the other blade being adapted to intercept the beam of light during that time a picture is being projected upon the screen.

A handle 205, or its equivalent, may be secured to the bracket 181 to provide means

whereby the operator may rotate the bracket 181 into a position wherein the shutter 194 will be synchronized with the film advancing mechanism so that the beam of light will be intercepted during the entire time the film is in motion. This adjustment may be made during the operation of the apparatus.

The bracket 181 may be secured in the adjusted position by a post 207 threaded into the hollow boss 183 and provided with a shoulder 208 adapted to cause the collar 186 to clamp the flanges 184 against the boss, the post 207 being provided with a handle 210 whereby it may be readily manipulated.

In the operation of the apparatus, the blade which intercepts the beam of light during that time a picture is being projected upon a screen negatives the flickering effect produced by the other blade. The rapid changes from dark to light are less pronounced and while the total amount of light projected upon the screen is somewhat less, the strain upon the eyes is lessened.

In Fig. 8 I have shown another form of the invention, wherein a shutter 194^a is provided with diametrically disposed fan-shaped blades 195^a and 196^a, the narrow portions of the fan-shaped blades 195^a and 196^a being disposed adjacent the axis of rotation of the shutter. The shutter 194^a is adapted to be used in place of the shutter 194, the blade 195^a being adapted to intercept the beam of light when the film is being advanced, and the blade 196^a being adapted to intercept the beam of light during that time a picture is being projected upon the screen. As shown, the blade 196^a is of less width than the blade 195^a. This construction permits a maximum amount of light to be projected upon the screen during the operation of the apparatus and yet permits the flickering effect of the blade 195^a to be balanced out.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

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

1. In apparatus of the kind described and in combination, a housing for holding film-advancing means, a bracket member mounted upon said housing to be angularly adjusted around an axis of rotation, a handle projecting from said bracket member whereby it may be brought into angularly adjusted positions around said axis of rotation, screw threaded means including a collar engageable with an annular flange on said bracket member for positively clamping it in said angularly adjusted positions, a shaft rotatably journaled in said bracket member and

having its axis of rotation coincident with said first-mentioned axis of rotation, means for driving said shaft, a second shaft rotatably journaled in said bracket member and
5 having its axis of rotation spaced from the axis of rotation of the first shaft, a gear on said first shaft, a second gear on the second shaft arranged to mesh with the first gear, and a shutter mounted upon said second
10 shaft.

2. In an apparatus of the kind described, a housing for encasing film-projecting mechanism, means for displacing the shutter in a plane normal to its axis of rotation comprising
15 a circular recess in said housing, a bracket having an annular flange, said annular flange seated in said recess, a collar secured to said housing and engaging said annular flange to hold same in said recess, a handle on said
20 bracket for adjustably rotating said bracket in said recess, and means for forcing a portion of said collar firmly against said annular flange for holding said bracket in adjusted position.

3. In an apparatus of the kind described, a housing for encasing film-projecting mechanism, means for displacing the shutter in a plane normal to its axis of rotation comprising
25 a circular recess in said housing, a bracket having an annular flange, said annular flange seated in said recess, a collar secured to said housing and engaging said annular flange to hold same in said recess, a handle on said
30 bracket for adjustably rotating said bracket in said recess, and manually operable means for forcing a portion of said collar firmly against said annular flange for holding said
35 bracket in adjusted position.

In testimony whereof, I have hereunto
40 signed my name.

JOHN PROKSA.

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