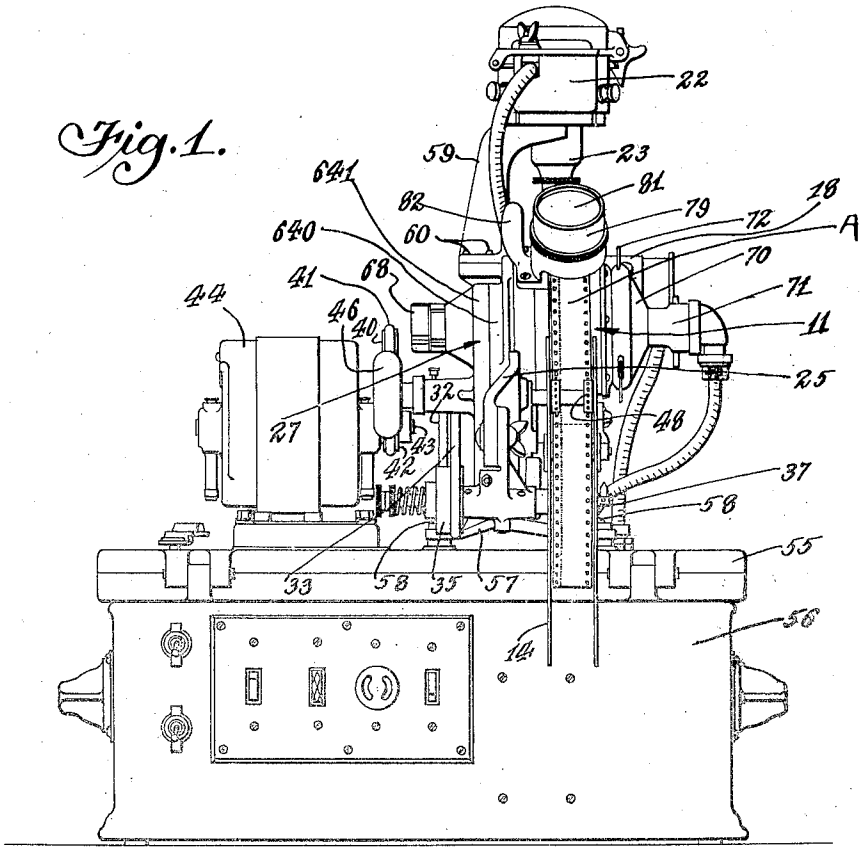
Dec. 19, 1933. I. SERRURIER 1,940,151

SOUND PICTURE MACHINE

Filed April 23, 1930 4 Sheets-Sheet 1

Fig. 1.



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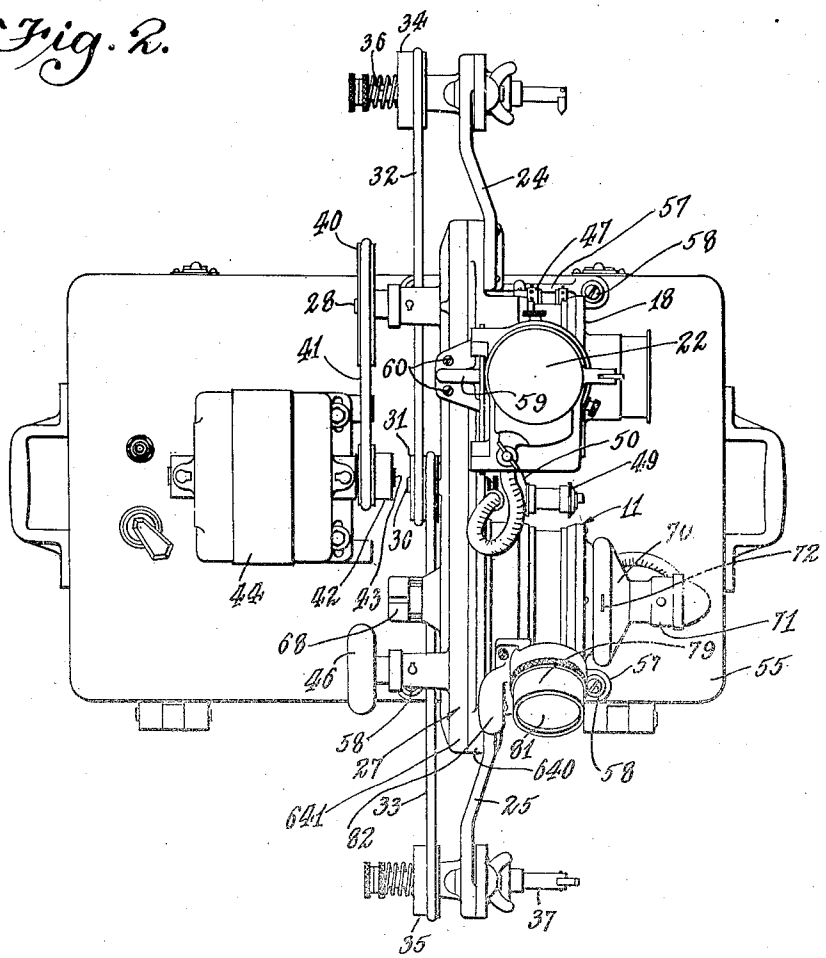
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SOUND PICTURE MACHINE

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Fig. 2.



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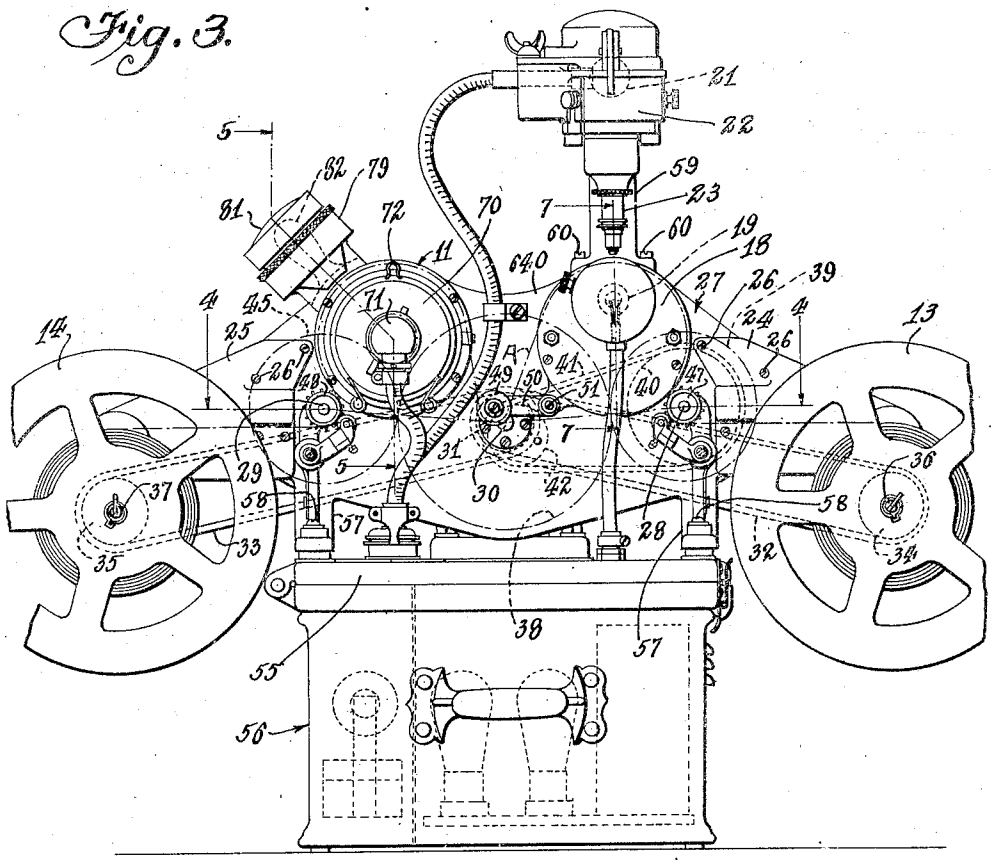
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SOUND PICTURE MACHINE

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Fig. 3.



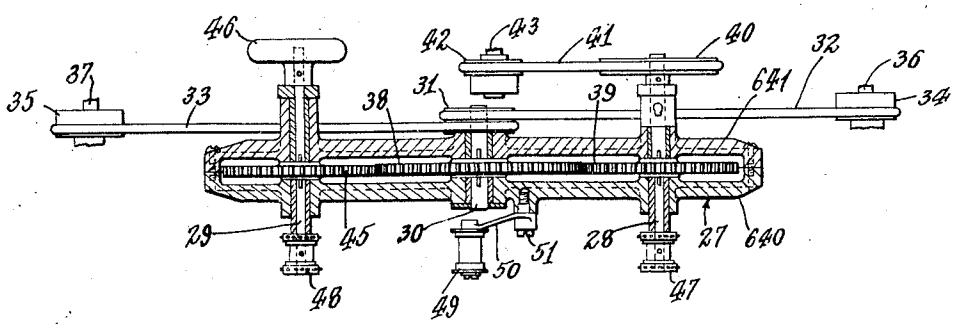


Fig. 4.

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SOUND PICTURE MACHINE

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Fig. 5

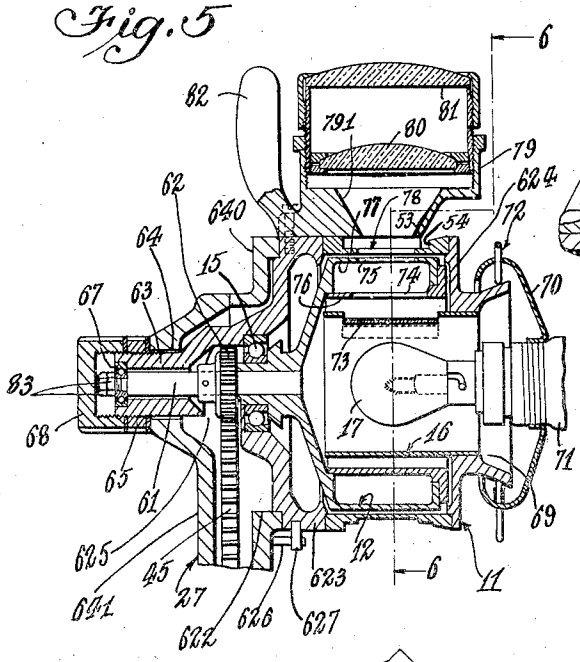


Fig. 7.

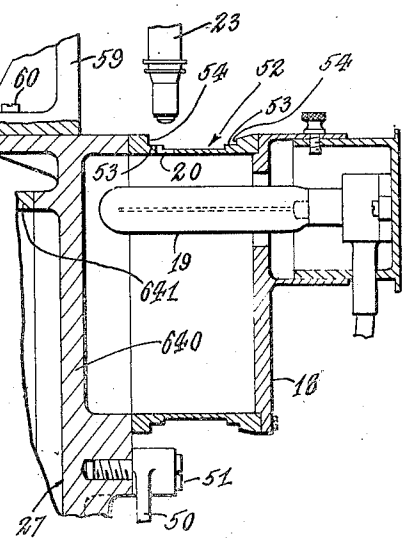
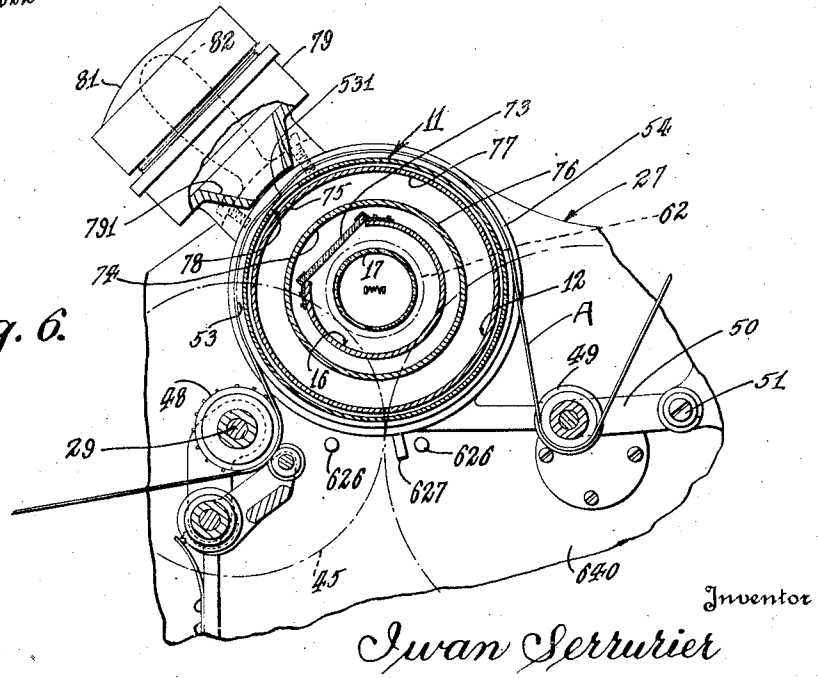


Fig. 6.



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Patented Dec. 19, 1933 1,940,151

UNITED STATES PATENT OFFICE

1,940,151

SOUND PICTURE MACHINE

Iwan Serrurier, Hollywood, Calif.

Application April 23, 1930. Serial No. 446,560

9 Claims. (Cl. 88—14)

This invention relates, in some respects, to picture machines and in other respects to sound picture machines. A machine of this type may be employed, for example, in the cutting of film. The pictures are exhibited and the sound produced so that the cutter, (as the person is termed who views the films and cuts out unwanted portions), is enabled to determine just what portions of the film are to be eliminated. However, use of the machine is not restricted to the cutting operation, as it may be employed by any one desiring to view and/or hear what is recorded on a sound picture film.

An important object of the invention is simplicity of construction.

Another important object is reliability of operation.

Another important object is to improve the construction that facilitates "framing" of the picture while the film is in motion.

Another important object is to provide a novel mounting for the rotary shutter and framing device.

Another important object is compactness.

Other objects and advantages will appear in the subjoined detailed description.

The accompanying drawings illustrate the invention:

Figure 1 is a front elevation of a picture machine constructed in accordance with the provisions of this invention.

Figure 2 is a plan view of Figure 1.

Figure 3 is an enlarged side elevation of Fig. 1 from the right thereof, portions of the spools being broken away to contract the views.

Figure 4 is a horizontal sectional detail on the line indicated by 4—4, Fig. 3.

Figure 5 is an enlarged fragmental section on the line indicated by 5—5, Fig. 3.

Figure 6 is a fragmental view, partly in section, the plane on which the view is taken being represented approximately by the irregular line indicated by 6—6, Figure 5. Besides showing the parts illustrated in Fig. 5, the view shows other parts adjacent thereto.

Figure 7 is an enlarged fragmental vertical section on the line indicated by 7—7, Fig. 3.

Referring to the drawings, there is provided a shutter housing 11 in which is mounted a rotary shutter 12, the film A being adapted to pass around the housing 11 as it is drawn off one of a pair of reels 13, 14, according as to whether the film is being run forward or backward. The shutter 12 is rotatably mounted in bearings 15, 67 and within the shutter is a reflector 16 in which is a lamp 17 that serves to illuminate the film.

Between the housing 11 and the spool 13 is a housing 18 for a photoelectric cell 19, and the housing 18 is provided in its upper side with an opening 20 through which light passes to the photoelectric cell 19 from a lamp 21 mounted in the housing 22. The particular construction of the lamp housing 22 will not be described herein as it has heretofore been described in my Patent 1,873,342 issued August 23, 1932.

The lamp housing 22 is provided with a lens barrel 23 in which is mounted the usual lens system, not shown, but well understood in this art for producing a narrow beam of light. The lower end of the lens barrel 23 is spaced slightly from the opening 20 and is axially alined with said opening so that the light beam passing through the opening 20 will strike the photoelectric cell 19. The film runs over the upper face of the housing 18 so that the sound track on said film passes between the opening 20 and the rays from the lamp 21.

The reels 13, 14 may be of any suitable construction and, for example, they may be mounted in a well known manner to provide for either of the reels operating as a takeup reel or as a feed reel, according to the direction in which the operator desires the film to run. In other words, the reels 13, 14 are operated through clutches, in a manner well understood in this art and, accordingly, not necessary to illustrate or describe in detail herein. This is described and claimed in my Patent 1,873,341, issued August 23, 1932.

The main characteristics of the machine have been described above, and the construction more in detail will be described as follows: The reels 13, 14 are rotatably mounted on the outer ends of arms 24, 25 respectively which, in this instance, are secured by screws 26, or their equivalents, to the opposite ends of a standard 27, a portion 640 of which constitutes one half or section of a gear case of which the other half or section is indicated at 641.

Rotatably mounted in the gear case are shafts 28, 29, 30, the shaft 30 being between the other two and being provided with a double pulley 31 connected by belts 32, 33 to pulleys 34, 35, respectively, on the shafts 36, 37 of the respective reels 13, 14.

On the shaft 30 is a spur gear 38 which is driven by a spur gear 39 on the shaft 28 and the shaft 28 is provided with a pulley 40 driven by a belt 41 from a pulley 42 that is mounted on the shaft 43 of an electric motor 44. The gear 38

drives a spur gear 45 fixed to the shaft 29 and said shaft 29 is provided at one end with a knob 46 so that said shaft 29 can be manually operated by the operator when he desires to view any particular frame of the film. The gears 38, 39 and 45 are positioned within the gear case and said gear case, in this instance, is split lengthwise so as to form halves to enable the gears to be assembled in place.

The shafts 28, 29 are provided with film engaging sprockets 47, 48, respectively, of the usual type and the film passes under said sprockets and also passes beneath an idler tensioning roller 49 that is positioned between the housings 11 and 18. The idler roller 49 is mounted on an arm 50 which is pivotally mounted at 51 on the standard 27. The weight of the roller 49 and arm 50 is relied upon for holding the film taut between the sprockets 47, 48 which are of the same size and the rotation of which is connected by the gears so as to operate with the same speed and in the same direction.

By referring to Fig. 3, it will be seen that the film sprocket 47 is positioned close to the periphery of the housing 18 at the underside of said housing, and that the film sprocket 48 is positioned close to the housing 11 at the underside thereof. The housings 11, 18 are cylindrical so as to form stationary drums around or over which the film is drawn, and the peripheral walls of the housings 11, 18 are provided with annular grooves 52 and with annular shoulders 53 upon which the marginal portions of the film rest, thus holding the greater portion of the film free from contact with the housings 11, 18. The vertical side walls 54 of the grooves 52 hold the film against objectionable lateral motion.

The motor 44 is mounted on a base 55 which, in this instance, constitutes the lid of a box 56 in which is mounted the necessary electrical equipment that cooperates with the photoelectric cell 19 for reproducing the sound waves recorded on the film. This electrical equipment is not illustrated and need not be described in detail herein as it is well understood in this art and constitutes no part of the present invention.

The standard 27 is provided with legs 57 which are secured by screws 58 to the base 55. The lamp housing 22 is mounted on a bracket 59 which is secured by fastenings 60 to the top of the standard 27.

The standard 27 is provided in its outer face with an opening 622 the wall of which forms a bearing for oscillatably supporting the end section 623 of the housing 11. The section 623, in this instance, is provided with a threaded boss 63 that projects through a hole 64 in the gear case section 641 and on the threaded boss 63 is a nut 65 and a locknut 68 by means of which the end section 623 of the housing 11 is held frictionally against its bearing.

The rotary shutter 12 has a shaft 61 supported by the bearings 15 and 67 which are mounted in the end section 623 of the housing 11. The shutter is driven by a spur gear 62 mounted on the shaft 61 and meshing with the gear 45 through an opening 625 in the end section 623. This opening 625 permits of oscillating the housing 11 around its axis, within certain limits, for the purpose explained below. Oscillating movement of the housing 11 is limited by stops 626 on the standard 27 and a stop 627 on the housing 11. See Fig. 6.

The housing 11 is provided with an opening 69 in which is fixed the reflector 16 and said opening 69 is closed by a cap 70 in which is mounted the socket 71 of the lamp 17. The cap 70 is removable, being held in place by any suitable means indicated in general by the character 72. The reflector is provided in its upper side with a light diffusing glass 73 through which light rays pass from the lamp 17 and thence through a pair of shutter slots 74, 75. The shutter has a double peripheral wall, an inner wall 76, in which is the slot 74 and an outer wall 77 in which is the slot 75.

The slots 74, 75 in the double wall have the same illuminating effect on the film as would a single slot in a solid wall having a thickness equal to the distance from the inner face of the inner wall to the outer face of the outer wall, but the double wall construction has the advantage of being of less weight. The object of this construction is to provide a more concentrated light line on the film which is located a short distance away from the revolving shutter.

The housing 11 is provided with an opening 78 through which the light rays pass to the film. From the film the light rays pass through an opening 791 in a lens barrel 79 provided with a lens system which, in this instance, includes a lens 80 and a lens 81.

The lens barrel 79 is fixed by suitable means to the end section 623 of the housing 11 and is provided with a handle 82 by which it may be readily oscillated with the housing 11 about the axis of said housing 11.

Preferably, the shoulders 53 of the housing 11 are flattened, as indicated at 531, adjacent to the opening 78 so as to cause the film, as it passes across the opening 78, to approach nearer to the shutter and so that the portion of the film being viewed lies in a flat plane.

An understanding of the construction and operation of the invention may be had from the foregoing and, in brief, the operation is as follows: The operator takes his station in front of the lens barrel 79, sets the motor into operation by turning on the electric current, and thus causes the film to run through the machine. The direction of movement of the film is governed in a manner well understood in this art, as previously mentioned. The lineal distance between that portion of the film that is beneath the lens barrel 23 and that portion of the film that at the same moment passes the aperture 78 in the housing 11, may be adjusted within certain limits by changing the length of that portion of the film extending between the sprockets 47 and 48, the idler roller 49 automatically adjusting itself to the lengthened or shortened portion. The spacing between the pictures and sound waves belonging to them varies in different films and by means of this adjustment perfect synchronization may be obtained.

The revolving shutter is positively connected with the sprockets 47 and 48 through the gearing so that one revolution of the shutter corresponds with a motion of the film through a distance equal to that of one picture (frame) on the film. It is well understood in this art how, in this manner, the impression of a motion picture is obtained on the eye of the observer. This motion picture may be or may not be in the frame with the aperture 78 in the housing 11 over which the viewing lenses in the barrel 79 are centered. If it is not in frame, it may be brought in frame by moving the handle 82 and thereby turning the housing 11.

As there are more positions than one in which the picture is in frame, this arrangement permits the observer to choose the most comfortable position of the lenses for his observation or it permits him to change slightly the distance along the film between the viewed picture and the sound record that is being reproduced without going to the trouble of stopping the machine and changing the length of that portion of the extending film between the sprockets 47 and 48, as explained above.

If the operator desires to closely inspect any particular frame of the film, he will switch off the motor and turn the knob 46 in the appropriate direction to bring to view and illuminate the particular frame wanted.

It is to be particularly noted that when adjustment or repair of the machine becomes advisable, the shutter, together with the entire housing 11, may be quickly demounted by simply removing the nuts 65, 68 and pulling the housing 11 away from the frame 27. The shutter may be removed from the housing 11 by first detaching the cover section 624 of the housing 11 and then removing the nuts 83 which hold the shaft 61 in the ball bearings 15, 67.

I claim:

1. A picture machine comprising an oscillatably mounted shutter housing, a shaft rotatably mounted in the housing, a cylindrical shutter secured to said shaft and provided with a slot, a light source inside of the shutter, a lens barrel fixed to the shutter housing, means to turn the shaft, and a reflector fixed to the shutter housing and projecting into the shutter in position to reflect light rays from the source through the slot.

2. A picture machine comprising an oscillatably mounted shutter housing, a shaft rotatably mounted in the housing, a cylindrical shutter secured to said shaft and provided with a slot, a light source inside of the shutter, a lens barrel fixed to the shutter housing, means to turn the shaft, and a cylindrical reflector fixed to the shutter housing and projecting into the shutter around the light source and provided with a light-diffusing glass in line with the lens barrel.

3. A sound picture machine comprising a gear case, drums mounted on the gear case, each drum provided with an opening and one of the drums being oscillatable, a shutter operably mounted in the oscillatable drum to intermittently obstruct the opening therein, a light source inside of the oscillatable drum, a lens system mounted on the oscillatable drum in line with its opening, means for reproducing sound from a motion picture sound track comprising a photoelectric cell inside of the other drum, a means to project a beam of light into said other drum through its opening onto the photoelectric cell, and means to operate the shutter and move a sound picture film over the drum openings in timed relation.

4. A sound picture machine comprising a gear case having a pair of closely spaced vertical walls, a gear train comprising a plurality of gears aligned in a common plane between said walls and turning on parallel shafts journalled in said walls, two of said shafts being extended through said walls on each side of said case, film engaging sprockets mounted on said shafts on one side of said case, a pair of drums to support a film between said sprockets, one of said drums being oscillatably mounted with respect to said gear case and each of said drums being provided with an opening therein, a shutter comprising a cylindrical member having a slot therein mounted to rotate within said oscillatable drum and having a shaft projecting into said gear case, said shaft having a pinion therein meshing with one of said gears, a photoelectric cell inside of the other drum, and means to project a beam of light into said other drum through its opening onto the photoelectric cell, a pulley on one of said extending shafts on the other side of said case from said film sprockets, and a hand wheel on the other extended shaft.

5. A moving picture machine comprising a gear case having a pair of closely spaced vertical walls, a gear train comprising a plurality of gears aligned in a common plane between said walls and turning on parallel shafts journaled in said walls, one of said shafts being extended through said walls on each side of said case, a film-engaging sprocket mounted on said extended shaft on one side of said case, a drum to support a film adjacent said sprocket, said drum being oscillatably mounted with respect to said gear case and being provided with an opening therein, a shutter comprising a cylindrical member having a slot therein mounted to rotate within said oscillatable drum and having a shaft projecting into said gear case, said shaft having a pinion thereon meshing with one of said gears, a hand wheel on said extended shaft on the other side of said case from said film sprocket, and means on another of said shafts for driving that shaft.

6. A motion picture film viewing machine, comprising a frame, a normally stationary shutter housing oscillatably mounted with respect to said frame having an aperture therein, a shaft mounted for rotation within said housing, a cylindrical shutter secured to said shaft within said housing and having a slot movable past the aperture in said housing, a light source inside said shutter, means for moving a film past said aperture in said housing, means for driving said film moving means and said cylindrical shutter in timed relation, and means for oscillating said housing with respect to said frame to adjust the position of said aperture relative to the film moving therepast.

7. A motion picture film viewing machine, comprising a frame, a normally stationary shutter housing having an aperture therein, a shaft mounted for rotation within said housing, a shutter comprising two concentrically positioned cylindrical walls secured to said shaft within said housing, said walls having juxtaposed slots therein movable past the aperture in said housing, a light source inside said shutter, means for moving a film past said aperture in said housing, and means for driving said film moving means and said cylindrical shutter in timed relation, said two cylindrical walls being immovable with respect to each other and having substantially different diameters whereby the slots therein are always juxtaposed to each other and constitute two distinct frames spaced radially from each other by a substantial distance.

8. A picture machine, comprising a gear case having a pair of closely spaced vertical walls, a gear train comprising a plurality of gears aligned in a common plane between said walls and turning on parallel shafts journaled in said walls, two of said shafts being extended through said walls on each side of said case, film-engaging sprockets mounted on said shafts on one side of said case, a pair of drums to support a film between said sprockets, one of said drums being oscillatably

mounted with respect to said gear case and being provided with an opening therein, a shutter comprising a cylindrical member having a slot therein mounted to rotate within said oscillatable drum and having a shaft projecting into said gear case, said shaft having a pinion thereon meshing with one of said gears, and means for driving said gear train.

9. A moving picture machine, comprising a gear case having a pair of closely spaced vertical walls, a gear train comprising a plurality of gears aligned in a common plane between said end walls and turning on parallel shafts journaled in said walls, two of said shafts being extended through a wall of said case, film engaging sprockets mounted on said extended shafts outside of said case, a weighted idler roller to keep the film taut between said film engaging sprockets, a drum to support a film adjacent said sprocket, said drum being oscillatably mounted with respect to said gear case and being provided with an opening therein, a shutter comprising a cylindrical member having a slot therein mounted to rotate within said oscillatable drum and having a shaft projecting into said gear case, said shaft having a pinion thereon meshing with one of said gears, and means on another of said shafts for driving that shaft.

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