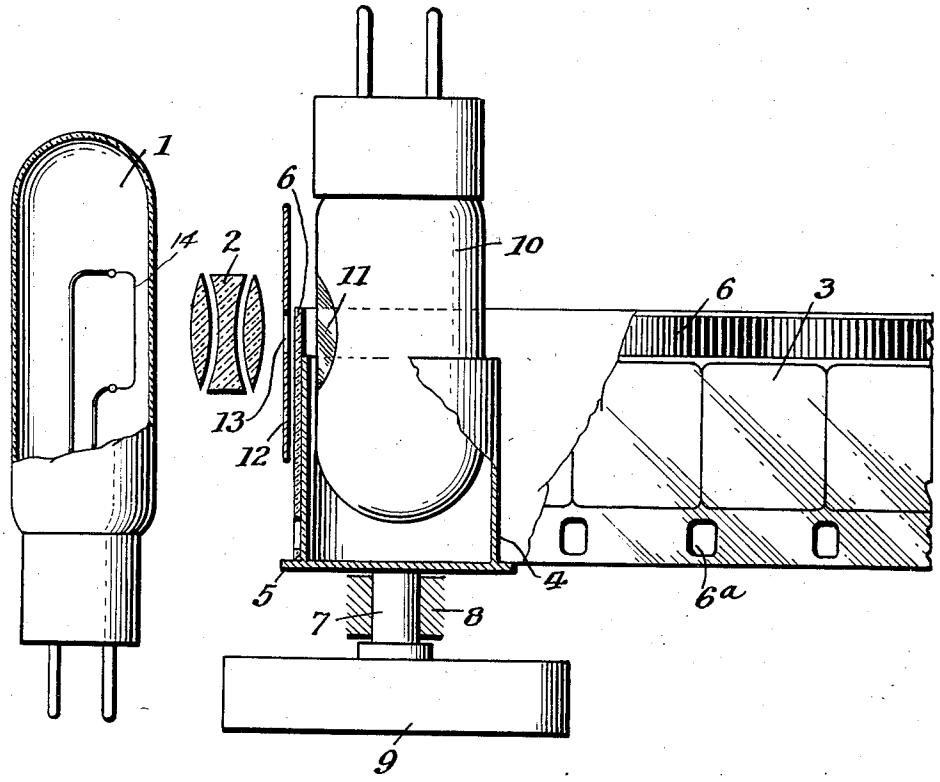
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REPRODUCING SYSTEM FOR SOUND ON FILMS

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## REPRODUCING SYSTEM FOR SOUND ON FILMS

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5 Claims. (Cl. 179—100.3)

This invention relates to new and useful improvements in the art of recording sound on film and more particularly to reproducing apparatus to accomplish these results.

An object of this invention is to produce a sound on film reproducing apparatus which is small, light in weight, and compact.

Another object of the invention is to produce a reproducing apparatus which is provided with means for operating in conjunction with film having a single line of sprocket holes.

A further object of the invention is to provide a sound take-off device which eliminates scratching, stretching and uneven motion of the film.

Still another object of the invention is to provide a sound take-off apparatus in which the distance between exciter lamp and photocell is comparatively very short.

With these and numerous other objects in view, my invention consists in the novel features of construction, combination and arrangement of parts as will be hereinafter referred to and more particularly pointed out in the specification and claims.

In the drawing, forming a part of this application:

The figure represents a side elevation of the device, partly in section, and with parts broken away.

The elements in the drawing and their various arrangements will be more particularly described in the disclosure which follows.

The use of 16 millimeter film for sound recording having a single line of sprocket holes and a wide sound track is desirable because of the greatly improved sound track obtainable. The present invention relates to a simple, reliable and compact reproducing apparatus for this film.

By the use of a straight filament exciter lamp a single, short optical reduction lens system may be used. The method of carrying the film past the exciter light, the method of transmitting said light through the sound record on the film, and the method of picking up the transmitted light by the photocell constitute the subject matter of this invention.

Referring to the drawing the numeral 1 designates the exciter lamp and number 2 the reduction lenses. The film 3 passes around an idler pulley 4 which is of special design. In most sound film reproducers the sound track on the film is exposed to the exciter light while passing over a stationary gate and is held in contact therewith by friction shoes or rollers. This method results in film wear, scratches, stretching, and, most important, uneven motion. In the present apparatus these objectionable features are eliminated by the special pulley 4. This pulley is flanged on the side opposite the sound track, as shown at 5, and is sufficiently narrow to allow the sound track to project beyond the edge of the pulley opposite the flange. The manner in which the film projects beyond the pulley can be seen at 6 on the drawing. Thus it can be seen that no sliding friction is encountered while the film is passing the exciter light, and all wear, scratching, stretching, and uneven motion is eliminated. The pulley 4 is preferably slightly tapered wider toward the flanged edge. This causes the edge of the film carrying the sprocket holes to ride at all times against the inside face of the flange thus preventing any lateral motion of the sound track while passing the exciter light.

The pulley 4 is free to rotate and is frictionally driven by the film. The film driving means (not shown) may be of any standard type except that the drive sprocket must be provided with but a single row of sprocket teeth to accommodate the single row of sprocket openings 6a in said film.

The pulley shaft 7, rotating in the bearing 8 carries on the end opposite the pulley the filtering flywheel 9. This filter wheel serves to smooth out any slight irregularities in the motion of the film. The pulley 4 is hollowed to admit the photocell 10 which projects inside the pulley as cleary shown in the drawing. The photocell is rigidly mounted in any convenient manner so that the cell window 11 is in line with the light beam transmitted through the film sound track. The light screen 12 is provided with the aperture 13 in order to restrict the width of the light beam to the width of the sound track. The complete assembly effects a saving in space and weight not heretofore possible. In addition, due to the use of film having the single row of sprocket holes, smoother and quieter sound pick-up is effected and the advantage of the wide track is obtained.

As shown in the figure, the exciter lamp 1 has a rectilinear filament 14 which is mounted substantially parallel to and in register with the aperture 13 in light screen 12 and to the breadth of sound track 6, and the striations of the record thereon. An incandescent lamp with a rectilinear filament is shown in the Hart Patent No. 1,588,886, but the arrangement shown by Hart is not adapted to be employed for the purpose which I disclose. My rectilinear filament should be distinguished from a cylindrical helix filament as shown for instance in the Hardy Patent Number

2,010,951, which helical filament is not adapted to constitute an efficient light source to attain the results which I have set forth.

Having thus described the invention what is claimed is:

1. In a system for reproducing sound from film, a source of light comprising a rectilinear filament exciter lamp, an idler pulley, a film carrying a sound track on one edge thereof passing over and frictionally engaging said pulley, said pulley being flanged on one end, said film being wider than the face of said pulley by the width of said sound track and being so positioned that said sound track projects beyond the unflanged end of said pulley when the edge of said film not carrying the sound track abuts the flange of said pulley, the diameter of said pulley being tapered slightly larger at the flanged end thereof, an opaque plate disposed between said source and said film and being apertured over the sound track on said film, and a light sensitive cell mounted under the projecting sound track on said film on the side thereof opposite said light source, said rectilinear filament being mounted substantially parallel to and in register with the aperture in said plate and the breadth of said sound track.

2. In a system for reproducing sound from film, a source of light comprising a rectilinear filament exciter lamp, an idler pulley, a film carrying a sound track passing over and frictionally engaging said pulley, said pulley being flanged on one end, the surface of said pulley being slightly conical and being tapered wider at the flanged end, an opaque plate disposed between said source and said film and being apertured over the sound track on said film, and a light sensitive cell mounted adjacent said film on the side thereof opposite said light source and under said sound track, said rectilinear filament being mounted substantially parallel to and in register with the aperture in said plate and the breadth of said sound track.

3. In a system for reproducing sound from film, a light source comprising a rectilinear filament exciter lamp, an idler pulley, a film carrying a sound track on one edge thereof passing over and frictionally engaging said pulley, said pulley being flanged on the end opposite the end carrying the sound track, the surface of said pulley being slightly conical and being tapered wider at the flanged end, the face of said pulley being narrower than said film by the width of said sound track, an opaque plate disposed between said source and said film and being apertured over the portion of said film carrying said sound track and projecting beyond the unflanged end of said pulley, and a light sensitive cell on the side of said film opposite said source and in register with said sound track, said rectilinear filament being mounted substantially parallel to and in register with the aperture in said plate and the breadth of said sound track.

4. In a system for reproducing sound from film, a light source comprising a rectilinear filament exciter lamp, an idler pulley, a film carrying a sound track on one edge thereof passing over and frictionally engaging said idler pulley, said film having sprocket holes only on the edge thereof which does not carry the sound track, said pulley being flanged on the end carrying the sprocket holes in said film, the surface of said pulley being slightly conical and being tapered wider at the flanged end, an independent drive sprocket provided with teeth on only one side to engage the sprocket holes on one edge of said film, the face of said idler pulley being of such width that when the edge of the film carrying sprocket holes abuts the flange of said pulley, the sound track on said film projects beyond the other end of said pulley, an opaque plate disposed between said source and said film, and being apertured over said sound track, and a light sensitive cell on the side of said film opposite said source and in register with said sound track, said rectilinear filament being mounted substantially parallel to and in register with the aperture in said plate and the breadth of said sound track.

5. In a system for reproducing sound from film, a source of light comprising a rectilinear filament exciter lamp, a rotatable shaft, an idler pulley carried on said shaft, a film carrying a sound track passing over and frictionally engaging said pulley, said pulley being flanged on one end, the surface of said pulley being slightly conical and being tapered wider at the flanged end, an opaque plate disposed between said source and said film and being apertured over the sound track on said film, a light sensitive cell mounted adjacent said film on the side thereof opposite said light source and under said sound track, and a separate flywheel mounted on said shaft rotatably therewith adjacent the flanged end of said pulley in spaced relation thereto, said rectilinear filament being mounted substantially parallel to and in register with the aperture in said plate and the breadth of said sound track.

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