Nov. 5, 1940. J. F. WEIN 2,220,504

SOUNDHEAD

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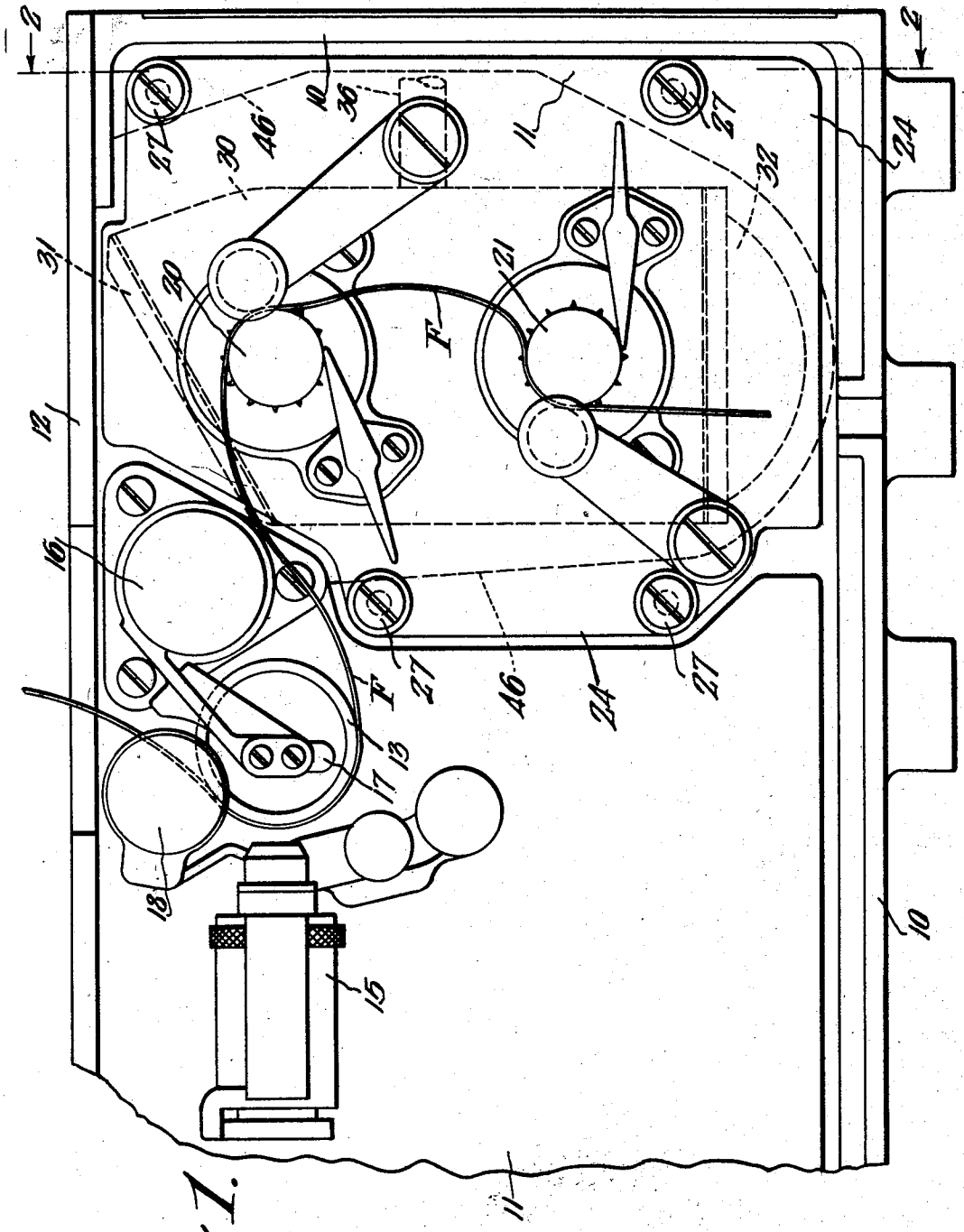


Fig. 1.

Inventor

John F. Wein

By

Attorney

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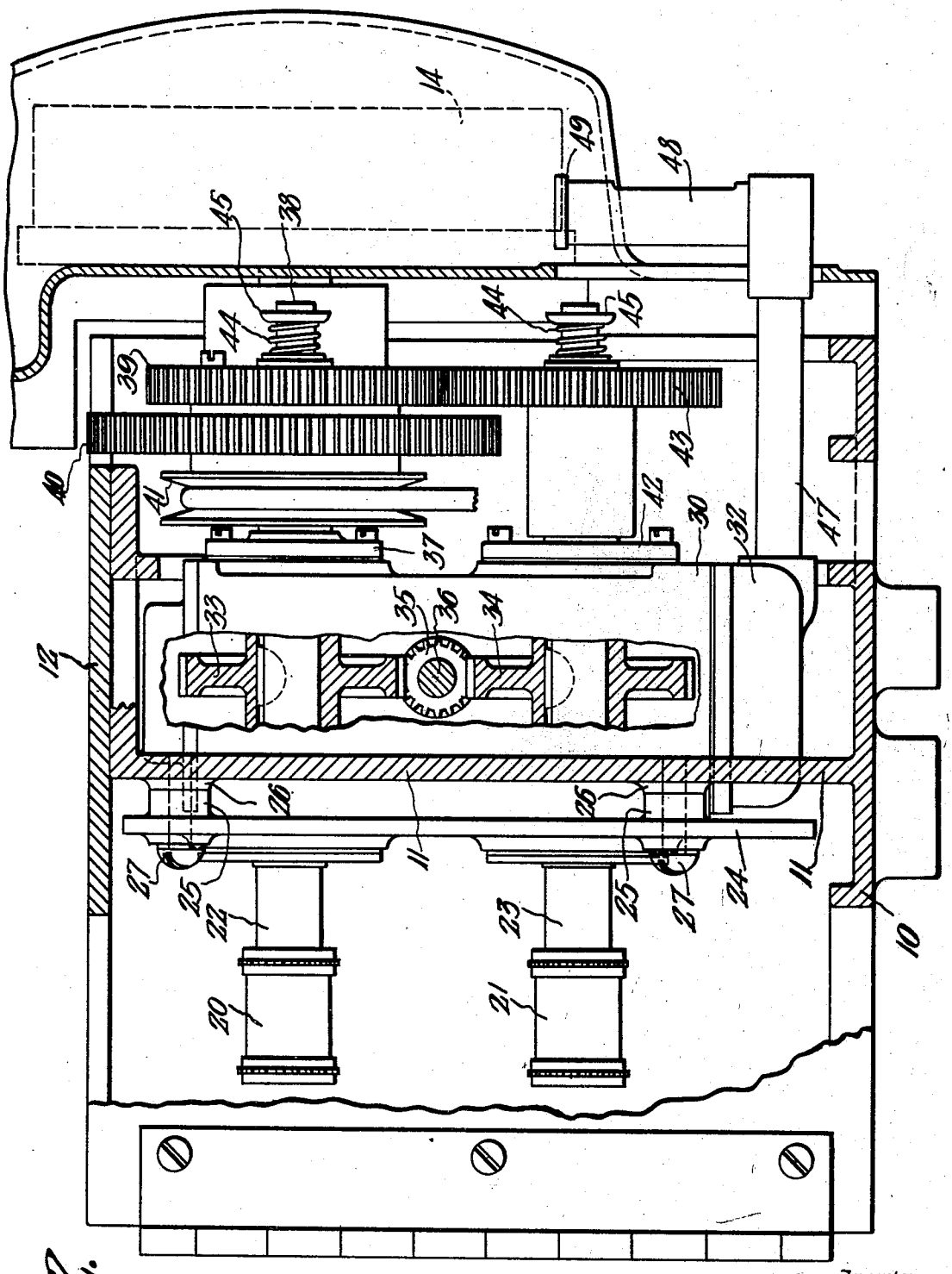


Fig. 2.

Inventor

John F. Wein

By

Attorney

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2,220,504

SOUNDHEAD

John F. Wein, Indianapolis, Ind., assignor to Radio Corporation of America, a corporation of Delaware

Application March 31, 1939, Serial No. 265,132

3 Claims. (Cl. 74—428)

This invention relates to soundheads for reproducing sound from photographic film sound records, and more particularly it relates to an improvement on the construction shown and described in Loomis and Reynolds Patent No. 2,019,147.

The construction shown in the said Loomis et al. patent has been improved by the provision of a separable and independently removable gear box containing the drive shaft and gear from the motor and supporting the constant speed sprocket, shaft and gear, and the holdback sprocket, shaft and gear. The gear box assembly also carries the gearing for driving the picture projector and the take-up mechanism.

In the prior art soundheads, such as those made in accordance with the said Loomis et al. patent, the only portion of the mechanism which was constantly driven and carried at an appreciable load on wearing surfaces was the gear mechanism. The film drum and rotary stabilizer suffered practically nowhere, as the load thereon is negligible and the film drum, shaft and bearings are readily removable. The gearing, however, has been heretofore enclosed in an oil-tight compartment in the soundhead and since the gearing and the soundhead are called on, not only to drive film through the soundhead, but to drive the entire picture projector mechanism, the gears would show wear after a period of years of continuous service and would have to be replaced. The replacement of the gears in apparatus at its permanent location requires the disassembly of a large portion of the soundhead with the subsequent replacement of new parts, which is sometimes a difficult job in the cramped quarters in which the apparatus is usually installed. Likewise, in the original assembly of the soundhead, the machine, as a whole, could not be moved around easily due to its weight, and the assembly of the gearing became a correspondingly complicated proceeding.

In the present invention the entire gear unit is assembled in a comparatively small oil-tight casing which, after assembly, is bodily inserted into the soundhead and attached to the center plate thereof by means of a few machine screws, making the operation of assembling the gears with the rest of the soundhead comparatively simple. Likewise, in case the gearing requires replacement in service, the screws are removed and the entire gear box may be bodily removed and replaced by a complete new gear box in the course of only a few minutes.

One object of the invention is to provide an improved soundhead.

Another object of the invention is to provide a soundhead which is more readily assembled than those of the prior art.

Another object of the invention is to provide a soundhead which can be more readily repaired than those of the prior art.

Another object of the invention is to provide a sound reproducing mechanism which may be readily built to a higher degree of precision than has been customary in the prior art.

Other and incidental objects of the invention will be apparent to those skilled in the art from a reading of the following specification and an inspection of the accompanying drawings in which:

Figure 1 is a side view of the major portion of a soundhead showing the face of my improved gear box with the sprockets, pad rollers and film strippers mounted thereon, and

Figure 2 is a view, partly in section, taken along the line 2—2 of Fig. 1 and looking in the direction indicated by the arrows.

Referring first to Fig. 1, the soundhead casting is generally indicated at 10. This casting is more or less box-like in shape and is provided with a center plate 11, the general position of which is shown in Fig. 2, and on which the mechanism of the soundhead is mounted. On the top of the soundhead there is mounted a removable plate 12 which serves to support the picture projector. The film F, as it comes from the picture projector, passes around the drum 13, overhanging the edge thereof, as described in the said Loomis et al. patent and it is drawn from the drum by the constant speed sprocket 20, whence it passes around the hold-back sprocket 21 and thence to the take-up reel. The film passing on to the drum 13 is held in contact therewith by an appropriate pressure roller generally indicated at 18. Light is directed in the form of a fine line upon the film by means of the optical system 15 and, after passing through the film, the light is directed by a prismatic lens 17 to the photocell 16, all substantially as described in the said Loomis et al. patent.

The sprockets 20 and 21 are mounted upon the shafts 22 and 23, respectively, and these shafts carry the helical gears 33 and 34 which are driven by the helical gear 35 on the shaft 36, which is coupled to the motor.

The front plate 24 of the gear box is provided with bosses 25 surrounding each of the holes for the screws 27, and these bosses are adapted to

fit against corresponding bosses 26 provided on the center plate 11. It will be apparent that the bosses 25 can be readily faced off in a plane to which the axes of the shafts 22 and 23 are perpendicular and, likewise, the mating bosses 26 may be readily faced off parallel to the center plate, thereby insuring accurate alignment of the sprockets 20 and 21 with the other elements of the apparatus.

The shaft 22 stops at the rear face of the gear box 30 where it runs in an appropriate bearing. Over the bearing there is secured the cover plate 37 which carries a stub shaft 38. This stub shaft 38 is stationary, and on it runs an assembly consisting of the gear 39, the projector drive gear 40 and the take-up drive pulley 41. The reason for mounting these gears on a stationary shaft instead of mounting them directly on the shaft 22 is that the sprocket 20 must be driven at a very uniform speed to pull the film around the drum 13, the movement of which is rendered even more uniform by the rotary stabilizer 14. Any reactions from the projector gear, if it were carried by the shaft 22, would tend to be impressed on the sprocket 20, and such a result is avoided by the construction here described. The shaft 23 passes through the cover 42 on the rear of the housing 30 and carries the gear 43 which meshes with the gear 39 and drives the projector drive gear 40 and the take-up drive gear 41. Since the sprocket 21 merely serves as a holdback to provide a free loop in the film F between the sprockets 20 and 21, any slight irregularities imparted to this sprocket through reaction from the projector are immaterial.

The gear 43 is held on the shaft 23 and the gear unit 39, 40, 41 is held on the shaft 38 by similar springs 44 and similar C-shaped washers 45. By merely spreading the washers 45 from their annular grooves in their respective shafts, the springs 44 may be removed and the gear units may be slid from the shafts, thereby permitting bodily removement of the gear box from the front of the soundhead through the hole indicated in dashed line at 46 which is provided in the center plate 11.

The body 30 of the gear box is provided with a bottom cover 32 and with a top cover 31. The bottom cover 32 is provided with an appropriate oil pipe 47 which carries an oil indicator 48. Oil may be introduced into the casing 30 through the cap 49 to the proper level on the indicator 48.

It will be apparent from the foregoing description that the entire unit, consisting of the front plate 24, the gear box 30 and the mechanism contained in the gear box, may be removed as a unit from the soundhead by removing only the screws 27 securing the plate 24 to the center plate, and when the unit is replaced in the soundhead it will necessarily be properly positioned and accurately aligned, thereby attaining the objects before stated.

Having now described my invention, I claim:

1. In a soundhead having a center plate carrying sound reproducing mechanism, a drive unit comprising a plate adapted to be secured to said center plate, a gear box integral with said drive unit plate and carrying shafts extending through said drive unit plate supporting film driving sprockets, gears on said shafts within said gear box, and removable gearing carried externally by said gear box for driving a picture projector.

2. In a soundhead having a center plate carrying sound reproducing mechanism, a drive unit comprising a plate adapted to be secured to said center plate, a gear box carried by said drive unit plate and carrying shafts extending through said drive unit plate to support film driving sprockets, gears on said shafts within said gear box, and gearing carried by said gear box for driving a picture projector consisting of a gear carried on and driven by one of said sprocket shafts, and driving gearing in alignment with, but independent of, the second of said sprocket shafts for driving the picture projector and film take-up mechanism.

3. In a soundhead having a center plate carrying sound reproducing mechanism, a drive unit comprising a plate adapted to be secured to said center plate, a gear box carried by said drive unit plate and carrying shafts extending through said drive unit plate to support film driving sprockets, gears on said shafts within said gear box, a driving gear within said gear box in cooperative relation with both of said gears, a gear carried on and driven by one of said sprocket shafts, and driving gearing in alignment with, but independent of, the second of said sprocket shafts for driving a picture projector and film take-up mechanism.

JOHN F. WEIN.