Dec. 23, 1941. B. STECHBART 2,267,478

REEL DRIVE MECHANISM

Filed July 26, 1940

Fig. 1

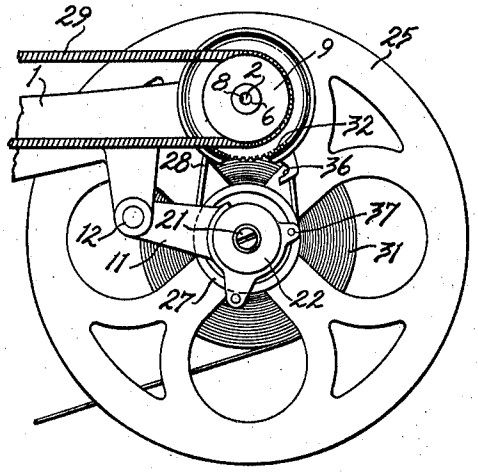



Fig. 2

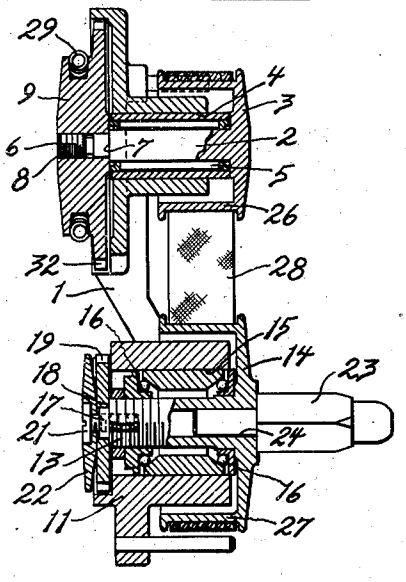



Fig. 3

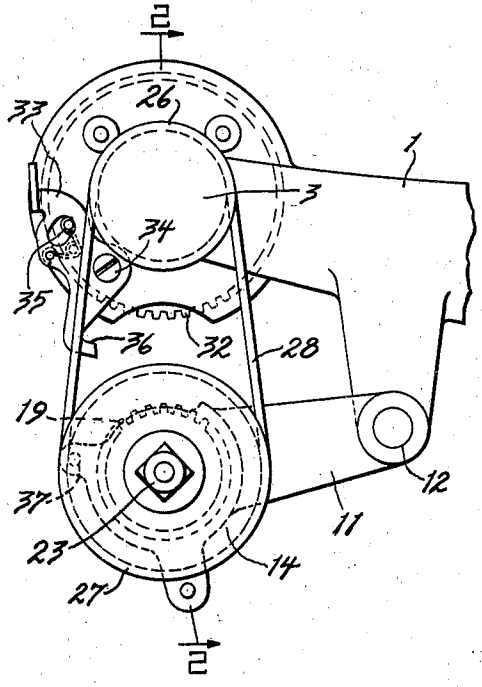
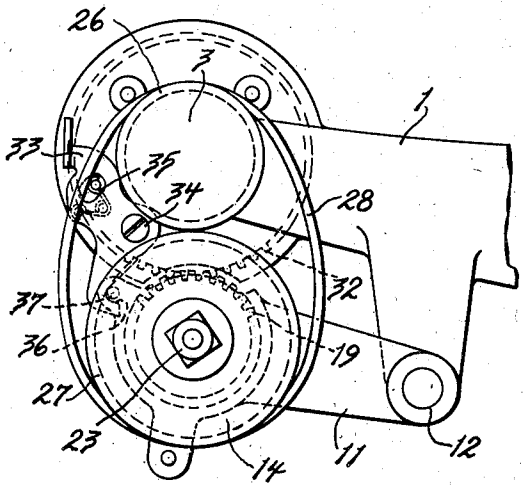



Fig. 4




INVENTOR
BRUNO STECHBART
BY Robert O. Mickle, Jr.
ATTY.

Patented Dec. 23, 1941 2,267,478

# UNITED STATES PATENT OFFICE

2,267,478

## REEL DRIVE MECHANISM

Bruno Stechbart, Chicago, Ill., assignor to The Bell & Howell Company, Chicago, Ill., a corporation of Illinois

Application July 26, 1940, Serial No. 347,801

2 Claims. (Cl. 242—55)

My invention relates to take up reel drives for motion picture projecting machines, although not limited to this use alone.

It is usual to drive the take up reel of a motion picture projecting machine by means of a constant power yielding drive device permitting the slowing up of rotation of the reel to accommodate the increasing diameter of the film roll on the reel to the constant rate of feed of the film by the film feed mechanism of the machine. Such drive devices are limited in such accommodation in that, if their power is increased to accommodate greater ranges of take up film roll diameters, undesirably excessive strain is exerted on the film at small take up film roll diameters.

One object of the present invention resides in the provision of a novel, simple and effective yielding reel drive which automatically increases the power exerted on the take up reel as the diameter of the film roll thereon increases to the end of increasing the range of film roll diameter which may be accommodated without exerting excessive strain on the film.

Another object of the invention resides in the provision in combination with such a variable power yielding reel drive of a novel, simple and effective additional reel drive device functioning in alternation therewith for the instant purpose of providing a film "rewind" reel drive.

With these objects in view, my invention consists in certain features of novelty in the construction, combination and arrangement of parts by which the said objects and certain other objects, hereinafter appearing, are effected all as fully described with reference to the accompanying drawing and more particularly pointed out in the appended claims.

In the said drawing—

Figure 1 is a side elevation of a reel drive mechanism embodying my invention;

Figure 2 is a sectional view substantially on the line 2—2 of Figure 3;

Figure 3 is a side elevation taken oppositely with respect to Figure 1; and

Figure 4 is a view similar to Figure 3, showing parts in different positions than those in which they are shown in Figures 1, 2 and 3.

Referring to the drawing, 1 designates a frame member or reel arm such as is usually attached to a motion picture projecting machine, a drive member assembly is rotatably mounted on the extending end of the arm 1 on a horizontal axis transverse to the arm and consists as follows:

A horizontal spindle 2 is provided with a head 3 at one end thereof and extends through and is rotatably mounted in a horizontal transverse bore 4 through the arm 1 by means of a roller bearing 5. See Figure 2. The other end of the spindle 2 is reduced, as designated at 6, forming a shoulder 7, and is screwthreaded into an axial bore 8 of a grooved belt pulley member 9 to clamp the pulley member against the shoulder 7, thus securing the spindle and pulley member in assembly.

A carrier arm 11 is pivotally mounted at one end, as designated at 12, on the arm 1 on a horizontal axis parallel to the axis of the drive member assembly, and a reeling spindle assembly is rotatably mounted on the free end of the carrier arm below the drive member assembly on a horizontal axis parallel to the axis of the drive member assembly and consists as follows:

A horizontal spindle 13 is provided with a head 14 at one end and extends through and is rotatably mounted in a horizontal transverse bore 15 through the free end of the carrier arm 11 by means of ball bearings 16. The other end of the spindle 13 is reduced, as designated at 17, forming a shoulder 18, and an axially bored spur gear 19 is engaged on the reduced end 17 and is clamped against the shoulder 18 to secure the gear with the spindle 13 by means of a headed screw 21 axially screwthreaded into the spindle 13 and passing through a washer 22. A reel mount spindle element 23 is secured in an axial bore 24 of the spindle 13 and projects from the headed end of this spindle for the detachable mounting thereon of a film reel 25, shown in Figure 1, in driven engagement therewith as is usual in motion picture machines.

A flat flanged belt pulley 26 is formed on the head 3 of the spindle 2, a flat flanged belt pulley 27 is formed on the head 14 of the spindle 13 in alinement with the pulley 26, and a flat belt 28 is trained about these pulleys, thus forming a frictional belt and pulley driving device between the driving member assembly and the reeling member assembly.

The driving member assembly is driven from a suitable source, such as the mechanism of a motion picture projecting machine, by means of a belt 29 trained over the pulley member 9.

The reeling member assembly being disposed below the driving member assembly, and the reeling member assembly being vertically movable by reason of it being carried on the pivotally mounted carrier arm 11, the weight of the reeling member assembly and elements carried therewith including a roll of film 31 on the reel 25 mounted on the reeling member assembly serves

to move the reeling member assembly downwardly, so that the belt 28 on the pulleys 26 and 27, operating upwardly on the reeling member assembly, suspends the same against downward movement.

Accordingly, the tension of the belt 28 and the resultant tractive friction thereof on the pulleys 27 and 28 automatically increases as the film roll 31 increases in diameter and weight, so that the power exerted on the reel increases as the film roll diameter increases and exerts adequate power on the reel at large film roll diameters without exerting excessive power on the reel at small film roll diameters, thus increasing the range of film roll diameter in "taking up" the film.

For the purpose of "rewinding," the following is provided in addition to the gear 19. The pulley member 9 is provided with a spur gear 32 which is alined with the gear 19 for meshing therewith. These gears are disengaged when the reeling member assembly is suspended by the belt 28 for "take up" as shown in Figures 1, 2 and 3. When the reeling member assembly is positioned upwardly from its said suspended position, the gears 19 and 32 are meshed, as shown in Figure 4, for driving the reeling member assembly, the belt 28 being loose in this position.

A manually actuated latch member 33 is pivotally mounted on the arm 1, as designated at 34, and is yieldably urged into latching position by a spring 35. When the reeling member assembly is in said upper position, an upwardly facing latch formation 36 on the latch member engages under a latch stud 37 on the carrier arm 11 to releasably position the reeling member assembly in such position with the gears 19 and 32 meshed.

As shown, the pulley 26 is smaller than the pulley 27 for the desired driving ratio in "taking up," and the gear 19 is smaller than the gear 32 for a desired high speed "rewind" driving ratio, it being also noted that the two drives for the reeling member assembly drive the same oppositely, which is desirable on motion picture projecting machines.

While I have thus described my invention, I do not wish to be limited to the precise details described, as changes may be readily made without departing from the spirit of my invention, but having thus described my invention, I claim as new and desire to secure by Letters Patent the following:

1. In a reel drive mechanism, the combination with a rotatable driving member and a rotatable reel member operative for reeling a strip thereon in the form of a roll increasing in diameter as the strip is reeled thereon, of means carrying said reel member for vertical movement with reference to said driving member, a frictional drive device operative between said driving and reel members and operative upwardly to support said reel member and a roll of the strip thereon whereby to increase the driving friction as the diameter of the roll of the strip on the reel increases, a second driving device operative between said driving and reel members and comprising elements engaged in an upper position of said reel member, and releasable means for positioning said reel member in said upper position.

2. In a reel drive mechanism, the combination with a frame member, of a rotatable driving member carried thereby on a horizontal axis, a carrier member pivotally mounted on said frame member on an axis parallel to that of said driving member, a rotatable reel member operative for reeling a strip thereon in the form of a roll increasing in diameter as the strip is reeled thereon and carried on said carrier member below said driving member on an axis parallel to that of said driving member for vertical movement with reference to said driving member, a frictional belt and pulley driving device operative between said driving and reel members and suspending said reel member to support said reel member and a roll of the strip thereon whereby to increase the driving friction as the diameter of the roll of the strip on the reel increases, a gear driving device operative between said driving and reel members comprising two spur gears carried respectively with said driving and reel members and meshing in an upper position of said reel member and disengaged in a lower position thereof, and a releasable latch operative between said frame and carrier members for positioning said carrier member with said reel member in said upper position.

BRUNO STECHBART.