Nov. 28, 1950 H. A. BRIGGS 2,531,668

HOIST

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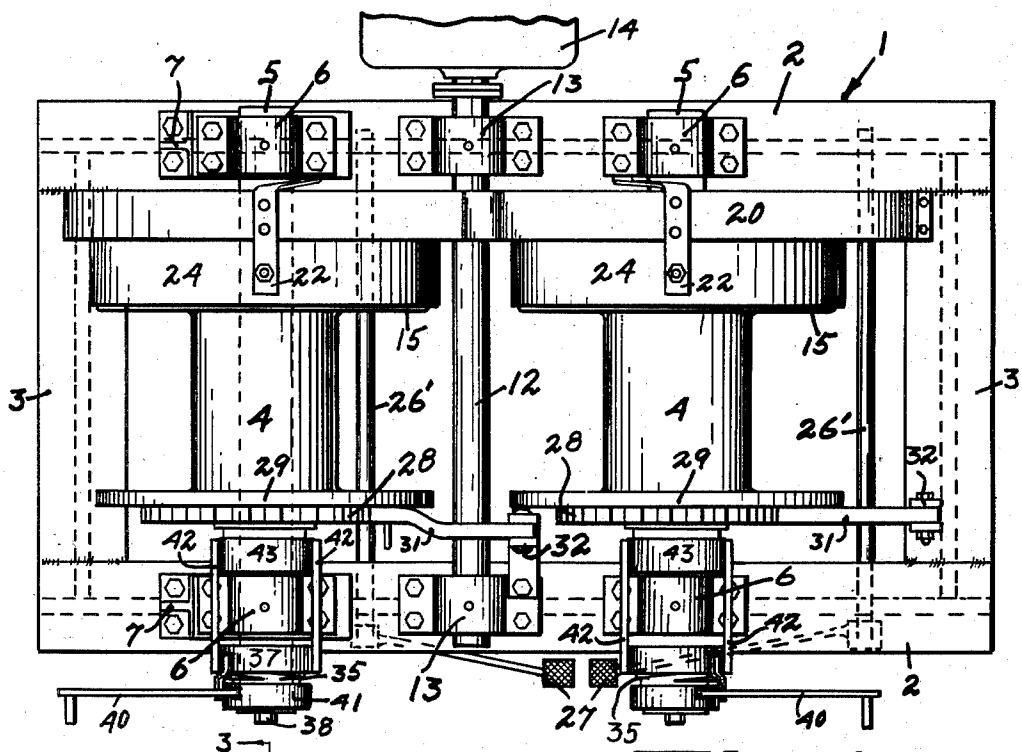


Fig_1

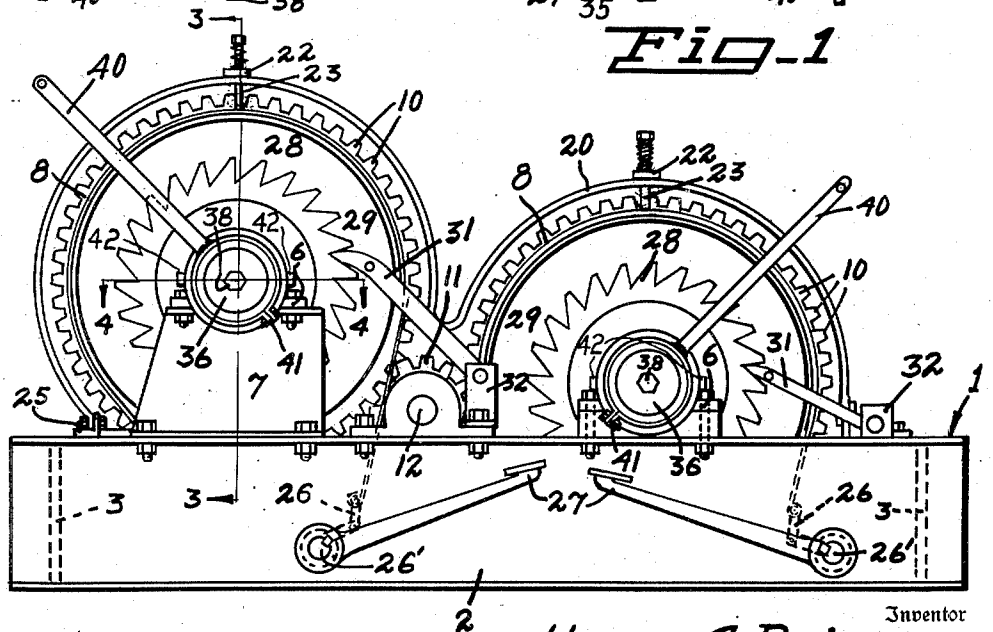


Fig_2

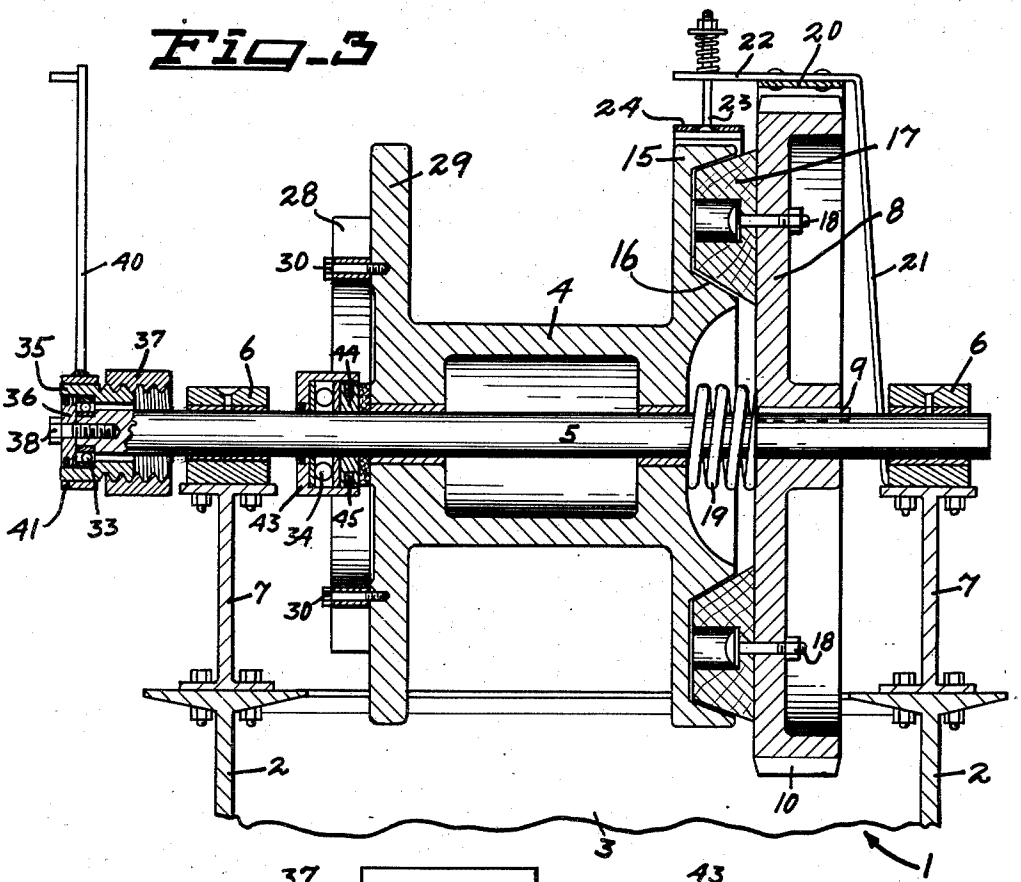
Inventor
Henry A. Briggs
By Glenn L. Fish
Attorney

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Fig. 3



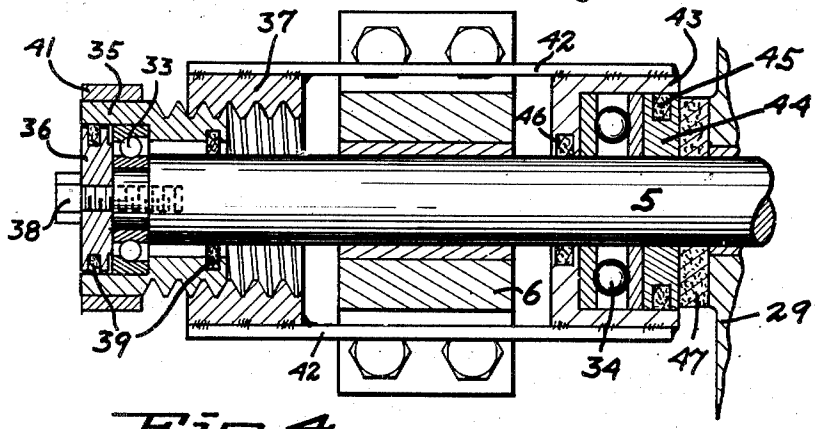


Fig. 4

Inventor

Henry A. Briggs

By

Glenn L. Fish

Attorney

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HOIST

Henry A. Briggs, Spokane, Wash.

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3 Claims. (Cl. 254—185)

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This invention relates to a hoist and while it has been illustrated as a hoist of the double drum type it will be understood that a single drum, or additional drums, may be provided if so desired.

One object of the invention is to provide a hoist having improved means for imparting rotary motion to the drums and also improved means for applying braking force to the drums.

Another object of the invention is to provide a hoist having drums and drive wheels mounted upon shafts, the drums being loose upon the shafts and the drive wheels keyed thereto, and each drive wheel carrying a clutch member for gripping the companion drum when the shaft is shifted longitudinally in one direction and causing turning of the drum with the companion drive wheel.

Another object of the invention is to provide improved means for rotatably and slidably mounting the shafts carrying the drums and the drive wheels and permitting longitudinal movement of the shafts when clutch members of the drive wheels are to be moved into and out of engagement with the companion drums.

Another object of the invention is to provide a hoist of this character wherein the drive wheels are normally held out of gripping engagement with the drums and allowed to turn with the shafts without turning the drums.

Another object of the invention is to provide a double drum hoist having a single power shaft from which the drive wheels of the two drums are both turned, the two drums being independently controlled and one allowed to be set in motion while the other remains idle.

Another object of the invention is to provide a hoist which is very strong, easy to operate, and not liable to get out of working order.

The invention is illustrated in the accompanying drawings wherein:

Fig. 1 is a top plan view of the improved hoist.

Fig. 2 is a side elevation thereof.

Fig. 3 is a transverse sectional view taken vertically through the hoist along the line 3—3 of Figure 2.

Fig. 4 is a horizontal sectional view taken along the line 4—4 of Figure 2.

This improved hoist has a frame 1 which is of greater length than width and has side bars 2 and cross bars 3 at its ends, the bars being preferably of I-beam formation so that they will be strong and capable of supporting the weight of the drums and drive mechanism carried by the frame.

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Drums 4 extend transversely of the frame and these drums are loosely mounted about shafts 5, which are rotatably and slidably mounted through bearings 6, the bearings for one shaft being mounted upon saddles 7, and the bearing for the other shaft being mounted directly upon the side bars 2. The shafts also carry drive wheels 8 secured to turn with the shafts by keys 9 and about the peripheral edge faces of the drive wheels are gear teeth 10, which mesh with the teeth of a pinion 11 carried by a power shaft 12. The shaft 12 extends transversely of the frame between the drums and is rotatably mounted through bearings 13 carried by the side bars 2 and this power shaft is connected with a motor 14 or other suitable source of power. One end flange 15 or head of each drum is formed in its outer side face with an annular groove or recess 16 having inwardly converging side walls and into this groove fits a clutch ring 17, secured to the confronting side face of the companion drive wheel 8 by bolts 18. A spring 19 coiled about the drive shaft 5 between the hub portions of the drum and the drive wheel urges the shaft longitudinally in a direction to normally hold the clutch ring out of gripping engagement with walls of the groove 16, but when the shaft is shifted longitudinally in the opposite direction the clutch ring will be forced into the groove so that it has binding engagement with the walls thereof, and the drum will be turned with its drive shaft.

A metal strip 20 which serves as a shield for the drive wheels and the gear or pinion 13 extends longitudinally of the frame at its side, adjacent, which the drive wheels are located and this strip is shaped to conform to the contours of the wheels, as shown in Figure 2. At points over the centers of the drive wheels this strip has secured to it supporting strips or props 21 which have their upper portions extended beyond the inner side edge of the shield to provide arms 22 which overhang the flanges 15 of the drums. Openings are formed through the arms to slidably receive rods or stems 23 projecting upwardly from brake bands 24. The brake bands are each secured at one end to a bracket 25 and the other end portions of these bands are secured to arms 26 projecting laterally from brake shafts 26' extending transversely of the frame and rotatably mounted through the side bars thereof. Treadles 27 are mounted upon ends of the brake shafts outwardly of the frame and when a foot is applied to a treadle, the brake band connected with the brake shaft to which it is fixed will be drawn downwardly and tightened about the companion

brake shoe and the drum with which this brake band cooperates will be brought to a stop and held against rotation after the clutch ring 17 of the companion drive wheel has been moved out of gripping engagement with the drum.

In order to prevent retrograde rotation of the drums after cables have been wound upon them, each drum is provided with a ratchet wheel 28, which is secured against its head or flange 29 by screws 30 and engaged by a pawl 31. The pawls or dogs 31 are pivoted to brackets 32 carried by the frame and normally are in position to engage teeth of the ratchet wheels, but when cables are to be unwound from the drums the dogs are swung away from the ratchet wheels and the drums will then be free to rotate in an unwinding direction until the brakes are applied.

The shafts 5 not only pass through the bearings 6, but each also pass through bearings 33 and 34. The bearing 33 is a thrust bearing and mounted in a sleeve 35 closed at its outer end by a cap or disc 36. The sleeve 35 is screwed into a collar 37 and since the disc 36 is connected with the end of the shaft 5 by a screw 38, the shaft will be shifted longitudinally as the sleeve is turned in a direction to move it outwardly and pull will be exerted upon the shaft to move the drive wheel carried thereby towards the companion drum and force the clutch ring into the groove 16 of the drum, so that, the drum will turn with the drive wheel. When the sleeve is turned in an opposite direction the shaft will be shifted inwardly by action of the sleeve, and the spring 19 and the drive wheel will be freed from the drum. Packings 39 hold grease in the sleeve. A lever 40 is carried by a clamping ring 41 which is tightened about the sleeve 35, and this lever is of such length that it projects outwardly from the drum a sufficient distance to allow its outer end to be readily grasped and the lever moved to rotate the sleeve. Bars 42 at opposite sides of the outer bearing 6, connect the collar 37 with a bearing cup or sleeve 43 in which the bearing 34 is mounted, and this bearing sleeve also encloses a disc 44, carrying a grease retainer 45, which cooperates with the grease retainer 46, to prevent leakage of grease from about the bearing 34. A friction washer 47 fits about the shaft 5 between the sleeve 43 and the outer end of the drum. Since the bars 42 extend between the sleeves 34 and 43 these sleeves will be prevented from turning and when the lever 40 is grasped and moved the sleeve 35 will be turned and cause the shaft 5 to be shifted longitudinally in a direction to cause rotation of the drum in a winding or unwinding direction.

Having thus described the invention, what is claimed is:

1. A hoist comprising a frame, a power shaft rotatably mounted across said frame, a supporting shaft rotatably and slidably mounted across the frame, a drum rotatably carried by said supporting shaft, a pinion carried by said power shaft, a gear keyed to the supporting shaft and meshing with said pinion, a clutch carried by said gear for engaging the drum and causing turning of the drum with the gear, a spring about the shaft having its ends abutting the drum and the gear and applying pressure longitudinally of the shaft for urging the supporting shaft and its gear to a position releasing the clutch from the drum, bars at opposite sides of the supporting shaft, an internally threaded collar carried by said bars, a sleeve screwed into said collar, a thrust bearing for said supporting shaft in said sleeve, a disc in the sleeve secured to the supporting shaft, and means for rotating the sleeve and thereby move it through the collar and shift the supporting shaft longitudinally and move the gear towards and away from the drum.

2. A hoist comprising a frame, a shaft rotatably and slidably mounted across said frame, a drum loose upon said shaft, a driving member carried by said shaft and having a clutch for gripping one end of the drum, a spring about the shaft between the drum and the driving member having its ends engaging the drum and the driving member and exerting pressure longitudinally of the shaft for urging the shaft longitudinally in one direction and normally holding the driving member out of clutched engagement with the drum, a packed bearing for the other end of the drum, a collar, bars connecting the collar with the packed bearing and preventing rotation thereof, a sleeve screwed into said collar and disposed about the outer end portion of said shaft, a thrust bearing for said shaft mounted in said sleeve, a closure disk in the outer end portion of said sleeve, a fastener passing through said closure disk and screwed into a socket formed in said shaft and serving to hold the closure disk in the sleeve and against the thrust bearing and means for turning the sleeve to move it through the collar and shift the shaft longitudinally and move the drive member into position for clutched engagement with the drum.

3. A hoist comprising a frame, a shaft rotatably and slidably mounted across said frame, a drum loose upon said shaft, a drive member carried by said shaft in fixed position thereon and moved into and out of driving engagement with one end of the drum by longitudinal shifting of the shaft, a packed bearing for the other end of the drum, a collar connected with said packed bearing and held against turning, a sleeve threaded in the collar, a thrust bearing in said sleeve connected with the shaft, a disk fitting within the outer end of said sleeve against an annular shoulder therein and engaging the outer end of the thrust bearing, a screw passing through said disk and into said shaft and holding the disk against the thrust bearing, and a lever for turning the sleeve and thereby shifting the shaft longitudinally to move the drive member into and out of position for gripping the drum.

HENRY A. BRIGGS.

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