

May 1, 1923.

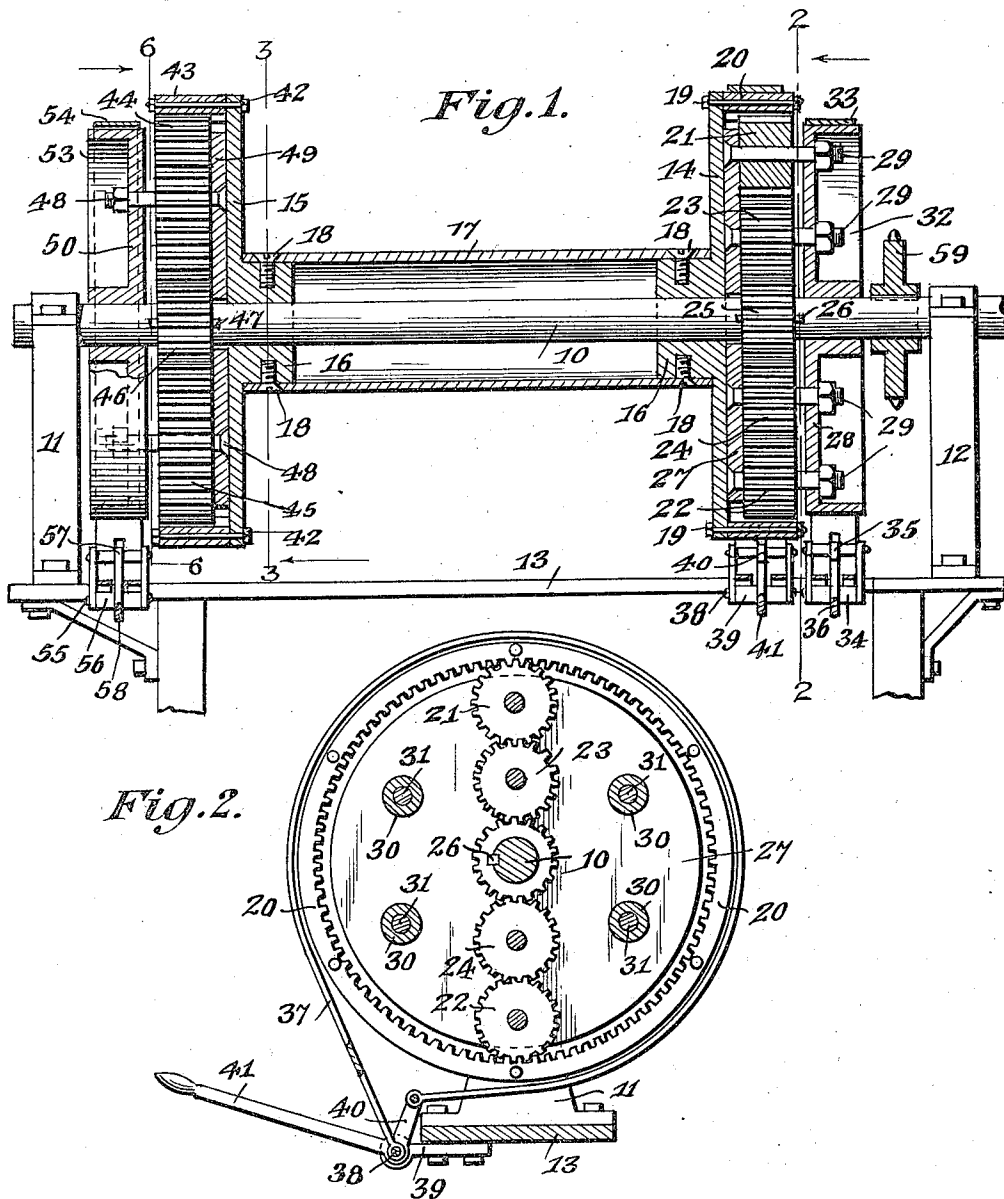
1,453,559

B. F. WEBB

WINCH

Filed Feb. 14, 1922

2 Sheets-Sheet 1



Benjamin F. Webb, INVENTOR.

BY
Geo. Kimmel

ATTORNEY.

May 1, 1923.

1,453,559

B. F. WEBB

WINCH

Filed Feb. 14, 1922

2 Sheets-Sheet 2

Fig. 3.

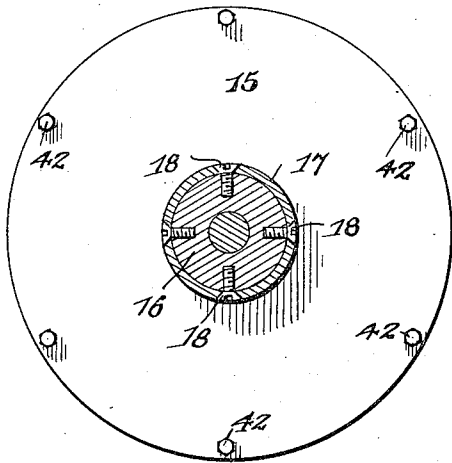


Fig. 4.

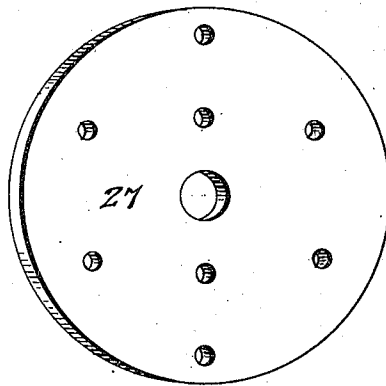


Fig. 5.

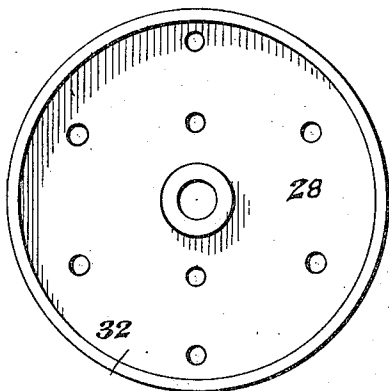
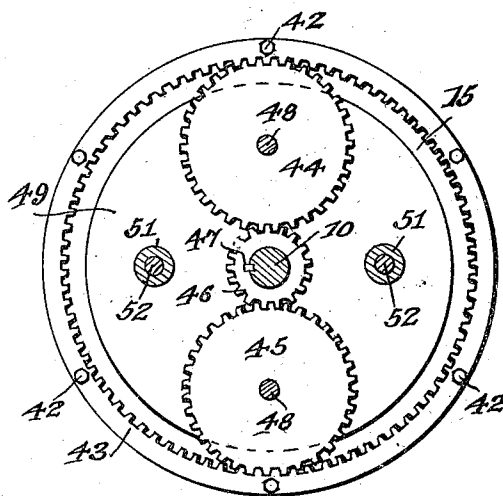


Fig. 6.



Benjamin F. Webb, INVENTOR.

BY
Geo. Kimmel

ATTORNEY.

UNITED STATES PATENT OFFICE.

BENJAMIN F. WEBB, OF SISTERSVILLE, WEST VIRGINIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO WEBB MULTISPEED WINCH MANUFACTURING COMPANY, OF SISTERSVILLE, WEST VIRGINIA, A CORPORATION OF WEST VIRGINIA.

WINCH.

Application filed February 14, 1922. Serial No. 536,435.

To all whom it may concern:

Be it known that I, BENJAMIN F. WEBB, a citizen of the United States, residing at Sistersville, in the county of Tyler and State of West Virginia, have invented certain new and useful Improvements in Winches, of which the following is a specification.

This invention relates to hoisting and winding mechanisms generally, and more particularly to a power driven reeling and winding drum type of winch capable of being positively operated in both directions of its rotative movements.

The principal object of the invention is to provide for a mechanism of the class mentioned, and one involving the use of planetary gear trains arranged to be alternately used for driving the hoisting or winding drum in its reversed directions of rotation without necessitating the reversal of the direction of rotation of the driving or power shaft, or the stopping and starting up of the power agent applied to the latter for its operation.

Another object of the invention is to provide for a mechanism as hereinbefore characterized, and one of an extremely simple and durable construction and arrangement of parts, giving maximum efficiency in operation, and affording great ease in control.

With the foregoing and other objects in view, the invention resides in the certain new and useful construction, arrangements and operation of parts, as will be hereinafter more fully described, set forth in the appended claims, and illustrated in the accompanying drawings, in which:—

Figure 1 is a vertical longitudinal section through a preferred embodiment of the winch mechanism,

Fig. 2 is a vertical transverse section taken on the line 2—2 of Fig. 1,

Fig. 3 is a similar section taken on the line 3—3 of Fig. 1,

Fig. 4 is a perspective view of the inner gear plate of the planetary gear train arranged for effecting the drive of the hoisting or winding drum in the forward direction of rotation and correspondingly with direction of rotation of the power or driving shaft,

Fig. 5 is a front elevation of the outer of the gear plates of the above mentioned planetary gear train, and,

Fig. 6 is a vertical transverse section taken on the line 6—6 of Fig. 1, illustrating the second planetary gear train for effecting the rotation of the hoisting or winding drum in a direction reversed to that of the other planetary gear train and the power or driving shaft.

Referring to the drawings, wherein similar characters of reference designate corresponding parts throughout the several views thereof, the numeral 10 indicates a power or driven shaft suitably journaled at its opposite ends in standards 11 and 12 rising from a base or bed frame 13. Mounted for free rotation on the shaft 10, is a hoisting or winding drum or winch consisting of a pair of spaced circular plates 14 and 15, having their opposed faces formed to provide cylindrical hub portions 16, over which are fitted the opposite ends of a cylindrical sleeve 17, the engaged ends of the latter being secured to the hub portions 16, by means of machine screws or the like 18, substantially as is shown in Figs. 1 and 3.

Secured to the outer face of the drum plate 14, by means of bolts or the like 19, is an annular ring or internal gear 20, which is flush with the edge of the plate 14 and meshes with the outer gears or pinions 21 and 22, of a planetary gear train which further includes an intermediate pair of oppositely arranged gears 23 and 24, in mesh with the outer gears 21 and 22, and also meshing with a central gear or pinion 25 keyed, as at 26, directly on the power or driving shaft 10. The gears or pinions 21, 22, 23, 24 and 25 are disposed in line diametrically of and between an inner disk or plate 27 and an outer gear plate 28, and the gears or pinions 21, 22, 23 and 24 are loosely journaled on stub shafts 29, the latter being in the form of bolts or the like acting to secure the plates 27 and 28 together for rotation one with the other. These plates 27 and 28 are spaced apart for the proper distance to receive the gears or pinions therebetween by means of a set of spacing sleeves 30 engaged on bolts 31 which are also employed for securing said plates together in addition to the stub shafts or bolts 29.

The outer gear plate 28 is provided with an annular flanged portion 32, around which is trained a brake band 33, having one of its ends secured to a pivot pin carried in a

2

bracket 34 supported in position on the base or bed plate 13, and the other of its ends attached to an angularly disposed portion 35, formed at the inner end of a hand lever 36, pivotally mounted on the pivot pin aforesaid. Similarly, a brake band 37 is trained around the outer periphery of the internal gear 20, and has one of its ends made fast to a pivot pin 38, carried in a bracket 39, which is supported in proper position on the base or bed plate 13, while its other end is secured to an angularly disposed portion 40, arranged at the inner end of a hand lever 41 pivotally mounted on the pivot pin 38. It is to be here noted that the gear plate 27 and the planetary gears 21, 22, 23, 24 and 25 are housed within the confines of the internal gear 20, and the circular end plate 14 of the drum and that the open side of the internal gear 20 may be closed in a known manner to admit of the inclosed space being filled with oil for the thorough lubrication of the said planetary gears.

The circular plate 15, at the opposite end of the hoisting or winding drum, has secured on its outer face at the peripheral edge thereof, by means of bolts or the like 42, an annular ring in the form of an internal gear 43, with which meshes a pair of oppositely disposed planetary gears 44 and 45, which are driven from a spur gear or pinion 46 keyed, as at 47, on the power or driven shaft 10. The planet gears 44 and 45 are loosely journaled on stub shafts or spindles 48, preferably in the form of bolts passed through inner and outer circular gear plates 49 and 50, which are loosely journaled on the power or driven shaft 10. The planetary gears 44, 45 and 46, together with the inner gear plate 49, are housed within the internal gear 43, and the outer open side of the latter may be closed in the usual or known manner, so that the space enclosed thereby may be filled with oil for the thorough and continuous lubrication of the said planet gears. The inner and outer gear plates 49 and 50, are preferably spaced apart by means of spacing sleeves 51, through which are passed suitable fastenings or bolts 52. The outer gear plate 50, has formed on its outer face, and flush with the peripheral edge thereof, an annular flanged portion 53, around which is trained a brake band 54, having one of its ends connected to a pivot pin 55, carried in a bracket 56, supported on the base or bed plate 13. The other end of this brake band 54, is secured to an angularly disposed portion 57, arranged at the inner end of a hand lever 58, pivotally mounted on the pivot pin 55.

In the operation of the mechanism as thus constructed and arranged, and with power applied to the driving shaft 10 by a sprocket 59, and all brake bands 33, 37 and 54 in

normally inoperative position, the power shaft will run idle without effecting either of the planetary gear trains or the rotation of the drum or winch. By now manipulating the hand lever 36 in a manner to tighten the brake band 33, on the gear plate flange 32, the latter together with the planet gears 21, 22, 23 and 24, will be held against bodily rotation, so that the gear 25 will drive the intermediate planet gears 23 and 24 in a direction reversed in its own rotation, or to the direction of rotation of the power shaft 10, while these latter gears 23 and 24 will, in turn, drive the outer planet gears 21 and 22, and consequently the internal gear 20 and the drum or winch in the same direction as that of the gear 25, and the power or driving shaft 10. This forward rotation of the drum or winch may be halted when desired by the loosening up of the brake band 33, and, if desired, the momentum of the same be checked by the manipulation of the hand lever 41, for the application of the brake band 37, on the outer periphery of the internal gear 20. To reverse the direction of rotation of the drum or winch, and with both of the brake bands 33 and 37 in normally inoperative position, the hand lever 58 is manipulated to tighten the brake 54 on the flanged portion 53, of the gear plate 50, when the latter, together with the gear plate 49 and the planet gears 44 and 45, will be held against bodily rotation, so that the gears 44 and 45 will be driven by the gear 46, and in a reversed direction with respect thereto and to the power shaft 10, and, in turn, the internal gear 43, together with the drum or winch, will be driven by the gears 44 and 45 in the same direction of rotation thereof, and reversed with respect to the gear 46 and the power shaft 10. This reversed direction of operation of the drum or winch may be halted by the loosening up of the brake band 54, and its momentum stopped by the subsequent manipulation of the hand lever 41 to again tighten the brake band 37 of the internal gear 20.

From the foregoing, it will be readily apparent that, while a preferred embodiment of the hoisting, winding or winch mechanism has been described and illustrated herein in specific terms and details of construction, arrangement, and operation, various changes in and modifications of the same may be resorted to without departing from the spirit of the invention, or the scope of the claims appended hereto.

Having thus fully described the invention, what is claimed, is:—

1. In a mechanism as characterized, a driving shaft, a winding drum loosely mounted on said driving shaft, a planetary gearing interposed between said driving shaft and one end of said drum for

effecting the rotation of the latter correspondingly with the rotation of the shaft, and a second planetary gearing interposed between said driving shaft and
 5 the other end of said drum for effecting the rotation of the latter in a direction reversed to the direction of rotation of the shaft.

2. In a mechanism as characterized, a
 10 driving shaft, a winding drum loosely mounted on said driving shaft, a planetary gearing carried on said driving shaft and cooperative with one end of said drum for
 15 rotating the same correspondingly with the direction of rotation of said shaft, a second planetary gearing carried on said shaft and cooperative with the other end of said drum
 20 for rotating the same in a direction reversed with respect to said shaft, and means cooperative with said planetary gearings whereby to render the same operable one
 25 independently of the other.

3. In a mechanism as characterized, a
 30 driving shaft, a winding drum loosely mounted on said driving shaft, a planetary gearing carried on said driving shaft and cooperative with one end of said drum for

rotating the same correspondingly with the direction of rotation of said shaft, a second
 30 planetary gearing carried on said shaft and cooperative with the other end of said drum for rotating the same in a direction reversed with respect to said shaft, and a braking
 35 mechanism for controlling the operation of each of said planetary gearings.

4. In a mechanism as characterized, a
 35 driving shaft, a winding drum loosely mounted on said driving shaft, a planetary gearing carried on said driving shaft and cooperative with one end of said drum for
 40 rotating the same correspondingly with the direction of rotation of said shaft, a second planetary gearing carried on said shaft and cooperative with the other end of said drum
 45 for rotating the same in a direction reversed with respect to said shaft, independent means for controlling the operation of said
 50 planetary gearings, and means for effecting a braking action on said drum when said planetary gearings have been rendered in-
 operative.

In testimony whereof, I affix my signature hereto.

BENJAMIN F. WEBB.