F. N. WHITCOMB.

FRICTION CLUTCH FOR HOISTING DRUMS.

APPLICATION FILED JUNE 25, 1908.

906,841. **Patented Dec. 15, 1908.**

2 SHEETS—SHEET 1.

Fig. 1

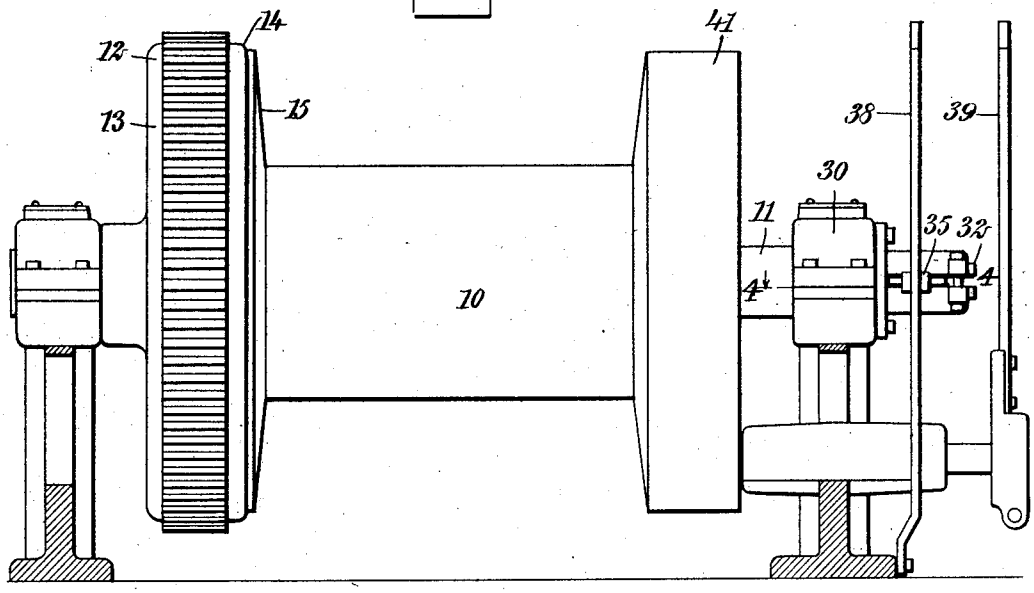
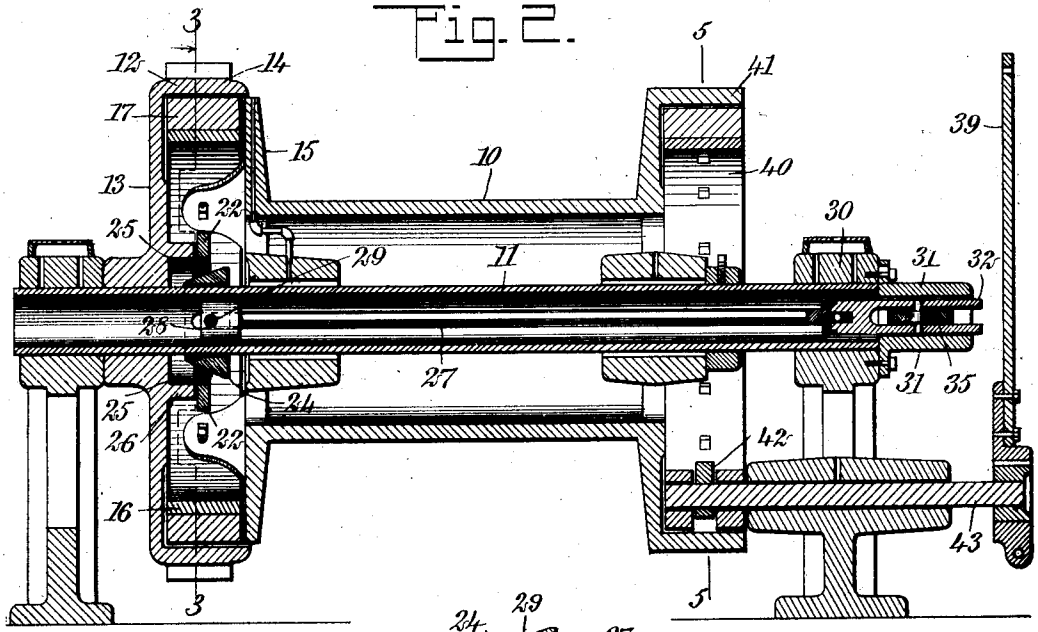
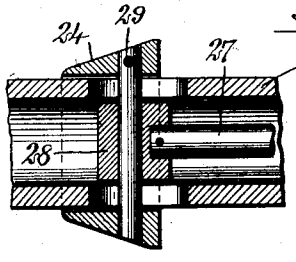


Fig. 2.





WITNESSES

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Fig. 6.

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2 SHEETS—SHEET 2.

Fig. 4.

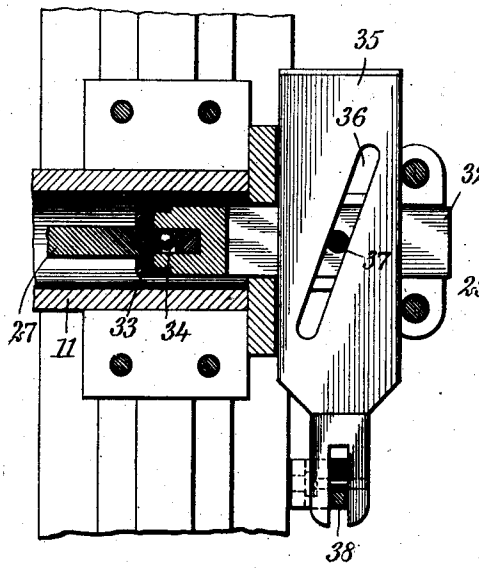


Fig. 3.

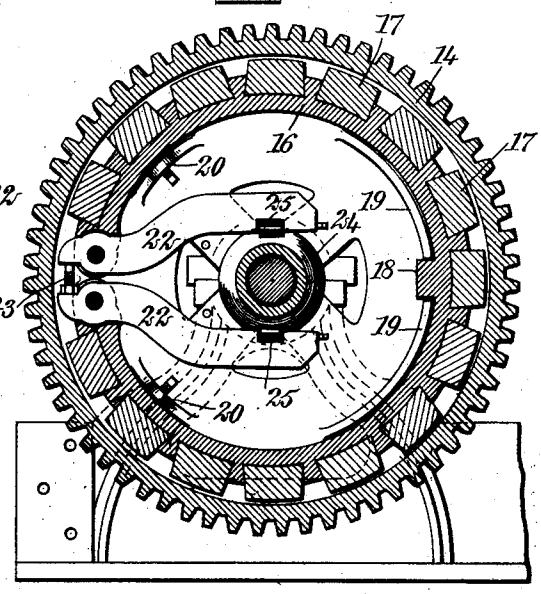
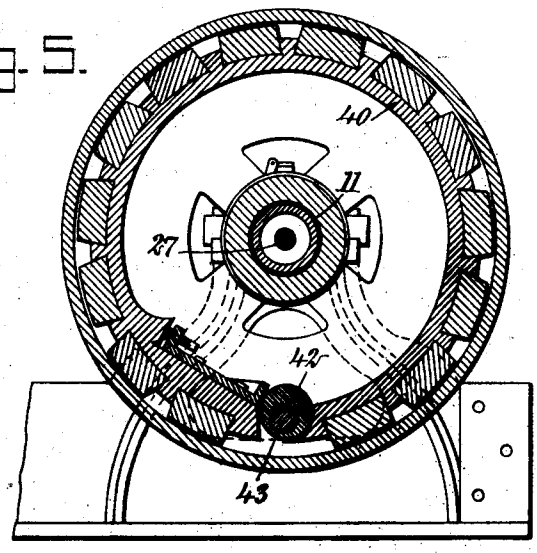


Fig. 5.



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FRICTION-CLUTCH FOR HOISTING-DRUMS.

No. 906,841. Specification of Letters Patent. Patented Dec. 15, 1908.

Application filed June 25, 1908. Serial No. 440,278.

To all whom it may concern:

Be it known that I, FRIEND N. WHITCOMB, a citizen of the United States, and a resident of the city of Barre, in the county of Washington and State of Vermont, have invented a new and Improved Friction-Clutch for Hoisting-Drums, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in hoisting drums, and more particularly to the means for operating the clutch thereof. The invention involves the structural details of this operating member and the means for controlling the same.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which—

Figure 1 is a side elevation of a drum constructed in accordance with my invention; Fig. 2 is a longitudinal section therethrough; Fig. 3 is a transverse section on the line 3—3 of Fig. 2; Fig. 4 is a transverse section on the line 4—4 of Fig. 1; Fig. 5 is a transverse section on the line 5—5 of Fig. 2; and Fig. 6 is a detail section through a portion of the clutch-controlling means.

In the specific construction illustrated in the accompanying drawings, I provide a winding drum 10, rotatably mounted upon a hollow shaft 11 and provided with clutching mechanism by which the drum may be caused to rotate simultaneously with the driving gear 12, keyed or otherwise rigidly secured to the shaft 11. The driving gear 12 is provided with a hollow chamber therein, that is, it includes an end wall 13 and an annular toothed flange 14 extending outwardly at substantially right angles thereto. The body of the drum 10 carries an annular flange 15 which extends outwardly to adjacent the free edge of the flange 14 and forms a second end wall for the chamber within the driving gear. The inner surface of the flange 14 constitutes a friction surface against which the clutching member carried by the drum engages. This clutching member is in the form of an expansible ring 16 supported from the end wall or flange 15 and having inserts 17 of wood or other similar material in its outer surface and adjacent the friction surface of the driving gear. The expansible ring 16 is not rigidly secured to the flange 15 but is held in engagement therewith and substantially concentric with the friction surface by means of certain lugs on the flange and the clutch member. The ends of the section forming the ring terminate adjacent each other, and diametrically opposite these ends is a lug 18 extending inwardly from the inner surface of the expansible ring. This lug is disposed between two lugs 19, 19 extending outwardly from the surface of the flange 15, and prevents rotation of the clutching member and the flange 15 in respect to said flange.

At points approximately one hundred and twenty degrees from the lug 18, the flange 15 of the drum carries two lugs 20, 20, the outer surfaces of which lie adjacent the inner surface of the clutch member, and through these extend set screws, by means of which the clutch member may be prevented from moving away from the friction surface more than a predetermined extent. At the free ends of the clutch member, there are pivotally mounted two levers 22 extending inwardly substantially radially. The ends of the levers extend outwardly a short distance beyond the pivots, and between these outwardly-extending ends I provide a stop 23 for limiting their movement toward each other. This stop is preferably in the form of a bolt carried by one lever, and having a nut thereon adapted for engagement with the other lever. By moving the inner ends of the levers apart and by preventing the outer ends of the levers from moving toward each other, the two pivots at the ends of the clutch member are spread apart and the diameter of said clutch member increased so that it engages with the friction surface of the driving gear.

For separating the inner ends of the lever 22 to operate the clutch as above described, there is provided a cone 24 longitudinally movable upon the hollow shaft 11. The cone comes adjacent the inner ends of the lever 22, and the latter may, if desired, be provided with small rollers 25 for engaging with the surface of the cone, as well as moved longitudinally to spread apart the ends of the levers. The end wall 13 of the driving gear preferably presents a flange 26 for preventing lateral movement of the levers during the spreading action.

Within the hollow shaft 11, there extends an operating rod 27, having one end thereof provided with an enlargement or head 28 for holding the end of the rod concentric

with the shaft, and this enlargement is connected to the cone by a transverse pin 29 extending through slots in the sides of the hollow shaft 11. By moving the operating rod 27 longitudinally of the shaft, the cone is manipulated in any desired manner.

The outer end of the shaft 11 is mounted in a suitable bearing 30, and secured to this bearing there are provided means for operating the rod 27. This means includes two substantially parallel plates 31, 31, held rigid in respect to each other and having extending through between them, a bar 32 held from lateral movement but free to move longitudinally. This bar is in alinement with the operating rod 27 within the shaft, and is so connected to the latter that a longitudinal movement of the bar causes the rod 27 to move longitudinally simultaneously. Any suitable mechanism may be provided for connecting the two, but there is preferably provided the mechanism shown in Fig. 4, which includes a collar 33 carried by the bar and engaging with a flange on the rod, and a ball 34 intermediate the end of the bar and the end of the rod to constitute a bearing and relieve the friction due to end thrust.

The bar is moved longitudinally by the action of a plate 35 movable transversely between the two plates 31 and 32, and having a cam slot 36 therein through which extends a pin 37 carried by the bar 32. Preferably, the bar 32 is split at the end to form two separate parallel sections into which the ends of the pin extend and between which the plate 35 slides. The inclination of the slot 36 is such that as the plate 35 is moved longitudinally in a direction substantially at right angles to the axis of the drum, the bar 32 and the rod 27 are moved along the axis of the drum to operate the clutch. The plate 35 is operated and controlled by a suitable lever 38 pivoted to the frame which supports the bearing 30, and having connections with the plate 35 at the end of the latter and intermediate the ends of the lever.

Adjacent the lever 38, I provide a lever 39 also swinging in a plane at right angles to the axis of the drum and serving to operate a brake for holding the drum against rotation. I preferably employ substantially the same brake covered by Letters Patent Number 659,115, granted October 2, 1900, to myself and H. W. Whitcomb. This brake mechanism includes an expansible ring 40 adapted when expanded to frictionally engage with the inner surface of an annular flange 41 carried by the drum opposite to the driving gear. The two ends of the ring are connected by an eccentric 42 carried by an oscillatory shaft 43 extending through a sleeve in the supporting frame of the drum and having the lever 39 connected to the outer end thereof adjacent the lever 38. The two levers coming adjacent each other and both movable in the same plane, permit of a ready control of the drum.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In combination, a hollow shaft, a winding drum rotatably mounted thereon, a driving gear secured to said shaft, clutching mechanism within said gear for connecting said drum and said gear to rotate the former, a rod extending through said shaft for operating said clutching mechanism, a non-rotatable bar in alinement with said rod and operatively connected thereto, and a plate movable in a direction substantially at right angles to the axis of the drum and operatively connected to said bar for moving the same longitudinally to operate the clutching mechanism.

2. In combination, a hollow shaft, a winding drum rotatably mounted thereon, a driving gear secured to said shaft, clutching mechanism within said gear for connecting said drum and said gear to rotate the former, a rod extending through said shaft for operating said clutching mechanism, a non-rotatable bar in alinement with said rod and operatively connected thereto, and a plate movable in a direction substantially at right angles to the axis of the drum and having a cam slot therein for engagement with said bar to reciprocate the latter and operate the clutching mechanism.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRIEND NOYES WHITCOMB.

Witnesses:

RICHARD HOAR,

HARRY W. WHITCOMB.