J. L. PILLING.

PORTABLE HOIST.

APPLICATION FILED JULY 10, 1908.

917,356. Patented Apr. 6, 1909.

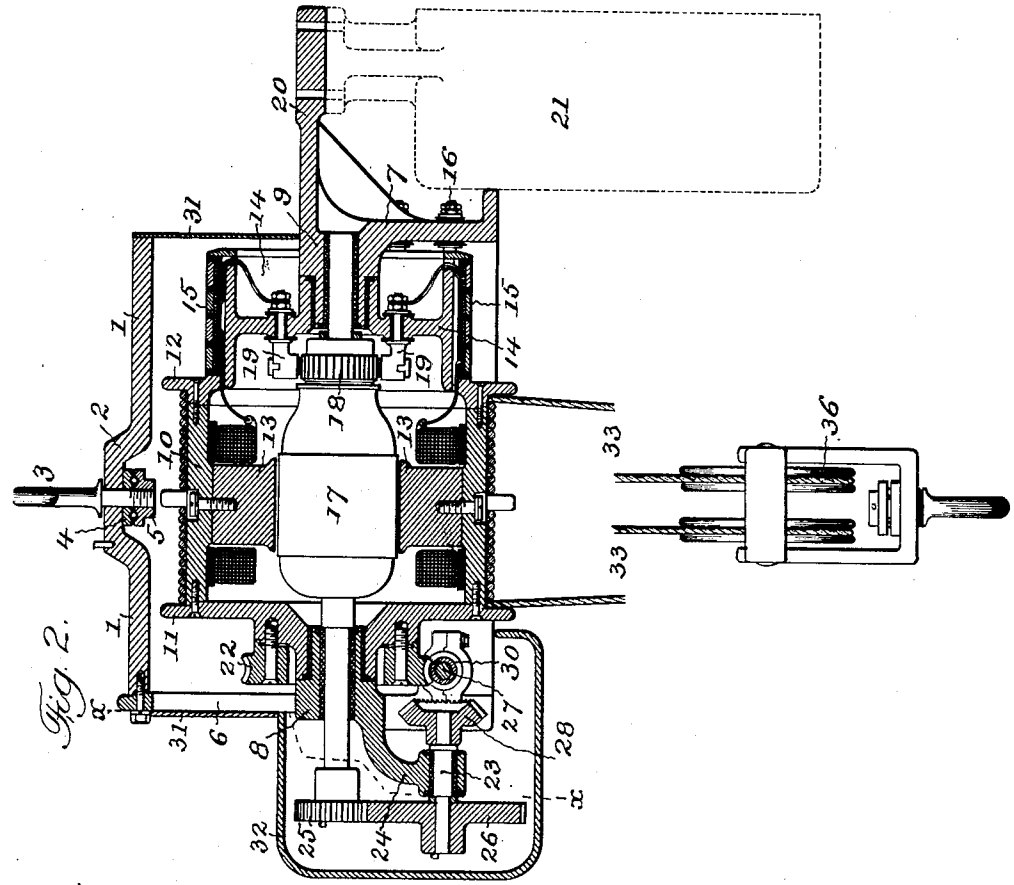


Fig. 2.

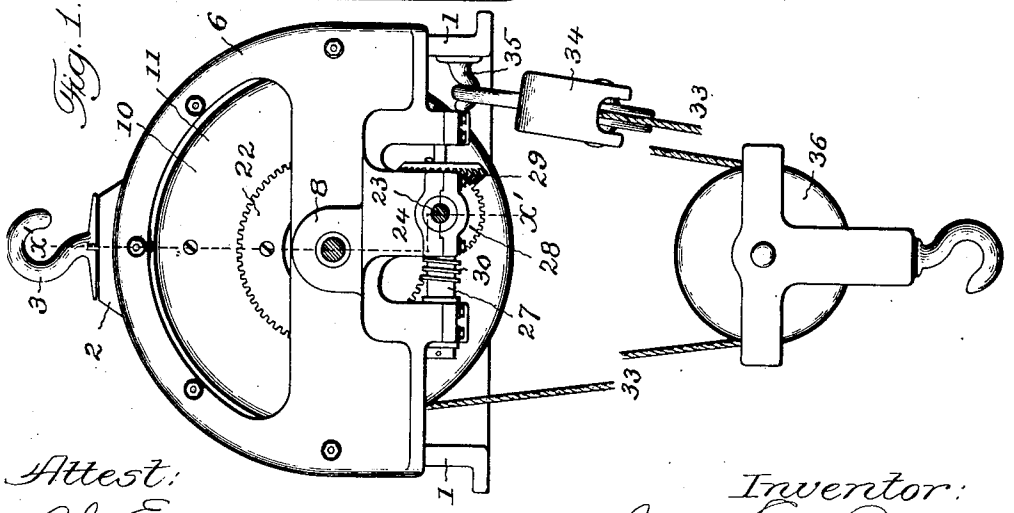


Fig. 1.

Attest:
John Enders
Henry Mott.

Inventor:
James Lowe Pilling
by Robert Burns
Attorney.

UNITED STATES PATENT OFFICE.

JAMES LOWE PILLING, OF CHICAGO, ILLINOIS.

PORTABLE HOIST.

No. 917,356. Specification of Letters Patent. Patented April 6, 1909.

Application filed July 10, 1908. Serial No. 442,858.

To all whom it may concern:

Be it known that I, JAMES LOWE PILLING, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Portable Hoists, of which the following is a specification.

This invention relates to that type of portable electric hoists in which the motor field is carried by the hoisting drum and is geared with the motor armature to receive a slow rotation as compared with the speed of such armature, an example of which constitutes the subject matter of my prior patent No. 864,798 of September 3, 1907. And the present improvement has for its object to provide a simple and efficient structural formation and arrangement of the intermediate connections between said field and armature to attain the desired differential rotation of said parts.

A still further object is to provide a simple and efficient combination of the housing in which the motor, hoisting drum and their accessories are mounted, all as will hereinafter more fully appear.

In the accompanying drawings: Figure 1, is an end elevation, with parts in section on line *x*—*x* Fig. 2. Fig. 2 is a longitudinal section on line *x'*—*x'* Fig. 1.

Similar numerals of reference indicate like parts in both views.

Referring to the drawings, 1 represents an inverted U shaped housing within which the working parts of the hoist are arranged and protected from the wet. At the middle portion of its crest said housing is formed with a cup projection 2 having a central orifice for the passage of the suspension hook 3 of the hoist.

4 and 5 are opposed ball races, one of which is secured to the lower end of the suspension hook 3, and the other to the underside of the cup projection 2; such races in connection with a series of interposed balls constitute a ball bearing between the housing and the suspension hook.

6 and 7 are end pieces which connect the lower depending portions of the housing together. One of said pieces is made removable, while the other is preferably of an integral formation with said housing, and both are provided with alined hubs 8 and 9 which form bearings for the armature of the motor, and for the hollow winding drum of the hoist and the field of the motor carried by said drum, as hereinafter more fully set forth.

10 is the winding drum of the hoist, having end heads 11 and 12 by which the drum is journaled on inwardly extending sleeve portions of the aforesaid hubs, as shown in Fig. 2.

13 is an electric motor field of any usual construction secured to the interior of the winding drum 10, in concentric relation to the axis of the same and adapted to rotate with said drum.

14 is a lateral hub on the drum 10, upon which are mounted in the usual insulated manner a series of collector rings 15 having the usual individual brushes (not shown) carried by holders 16 on the hoist housing, and through which the electric current is introduced into the windings of the field 13, and to the commutator of the motor armature as hereinafter described.

17 is the motor armature journaled by means of its shaft in the bore of the hubs 8 and 9, and provided with a commutator 18, the brushes 19 of which are connected to a pair of the collector rings 15 aforesaid.

20 is a shaft or bracket on the end piece 7 of the hoist housing and to which the usual motor controller 21 is attached.

22 is an annular worm wheel secured to the end head 11 of the winding drum 10 in concentric relation to the axis thereof.

23 is a primary countershaft journaled in a bracket portion 24 of the end piece 6 of the hoist housing, in parallel relation to the shaft of the armature 17. 25 is a gear wheel carried by said armature shaft, and 26 is a gear wheel carried by the countershaft 23, and meshing with the gear wheel 25 to form an operative connection between the two shafts.

27 is a secondary countershaft journaled in suitable boxes on the end piece 6 aforesaid in right angle relation to the armature shaft and the primary shaft aforesaid.

28 is a bevel gear carried by the primary countershaft 23; and 29 is a companion bevel gear carried by the secondary countershaft 27 and meshing with the bevel gear 28 to form an operative connection between the two countershafts.

30 is a screw or worm hub carried by the secondary countershaft 27 and meshing with the annular worm wheel 22 of the winding drum to form an operative connection between said shaft and drum.

31 are removable end plates closing the ends of the housing 1 above the end pieces 6 and 7.

32 is a box or casing secured to the end piece 6, and inclosing the intermediate gearing connections between the armature and hoisting drum above described.

33 is the lifting cable attached at its respective ends to the opposite ends of the winding drum 10, with the intermediate portion of said cable passing around a sheave block 34 hung from a lateral hook 35 attached to an inner wall of the hoist housing 1, so as to be protected from the weather. As so arranged a pair of depending loops are formed in the lifting cable, and from such loops the sheave block 36 which engages the load is suspended.

Having thus fully described my said invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a portable hoist, the combination of an inverted U shaped housing, a hoisting drum journaled in said housing, a motor field attached to the interior of said drum, a motor armature having a shaft by which it is journaled in the housing in axial relation to the field and drum, a primary countershaft journaled in said housing in parallel relation to the armature shaft, gears connecting said shafts together, a secondary countershaft journaled in right angle relation to said primary and armature shafts, and gearing connections between said secondary shaft and the primary and armature shafts, substantially as set forth.

2. In a portable hoist, the combination of an inverted U shaped housing, a hoisting drum journaled in said housing, a motor field attached to the interior of said drum, a motor armature having a shaft by which it is journaled in the housing in axial relation to the field and drum, a primary countershaft journaled in said housing in parallel relation to the armature shaft, gears connecting said shafts together, a secondary countershaft journaled in right angle relation to said primary and armature shafts, a pair of bevel gears forming an operative connection between the primary and secondary countershafts, and a worm hub and a worm wheel forming an operative connection between the secondary countershaft and the winding drum, such worm wheel being attached to the winding drum, substantially as set forth.

3. In a portable hoist, the combination of an inverted U shaped housing having a fixed end piece at one end and a removable end piece at the other end, said end pieces having journal hubs and bearing sleeve extensions in alined relation, a hoisting drum journaled on the sleeve extensions aforesaid, a motor field attached to the interior of said drum, a motor armature having a shaft by which it is journaled in the journal hubs aforesaid, a primary countershaft journaled in the removable end piece aforesaid in parallel relation to the armature shaft, gears connecting said shafts together, a secondary countershaft journaled in said removable end piece in right angle relation to said primary and armature shafts and gearing connections between said secondary shaft and the primary and armature shafts, substantially as set forth

Signed at Chicago, Illinois, this 13th day of June 1908.

JAMES LOWE PILLING.

Witnesses:
ROBT. E. BEECHER,
ROBERT BURNS.