W. A. BOX.

HOISTING MACHINE.

APPLICATION FILED JAN. 14, 1914.

1,113,951.

Patented Oct. 20, 1914.

2 SHEETS—SHEET 1.

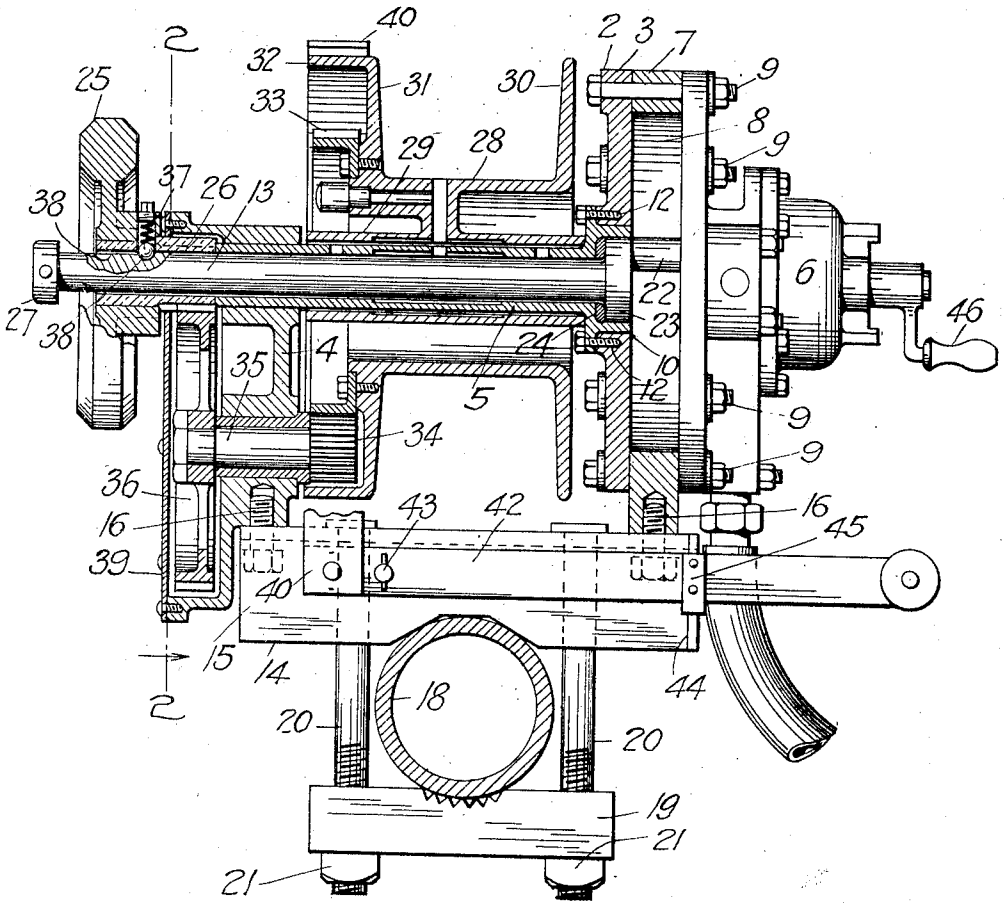


FIG. 1

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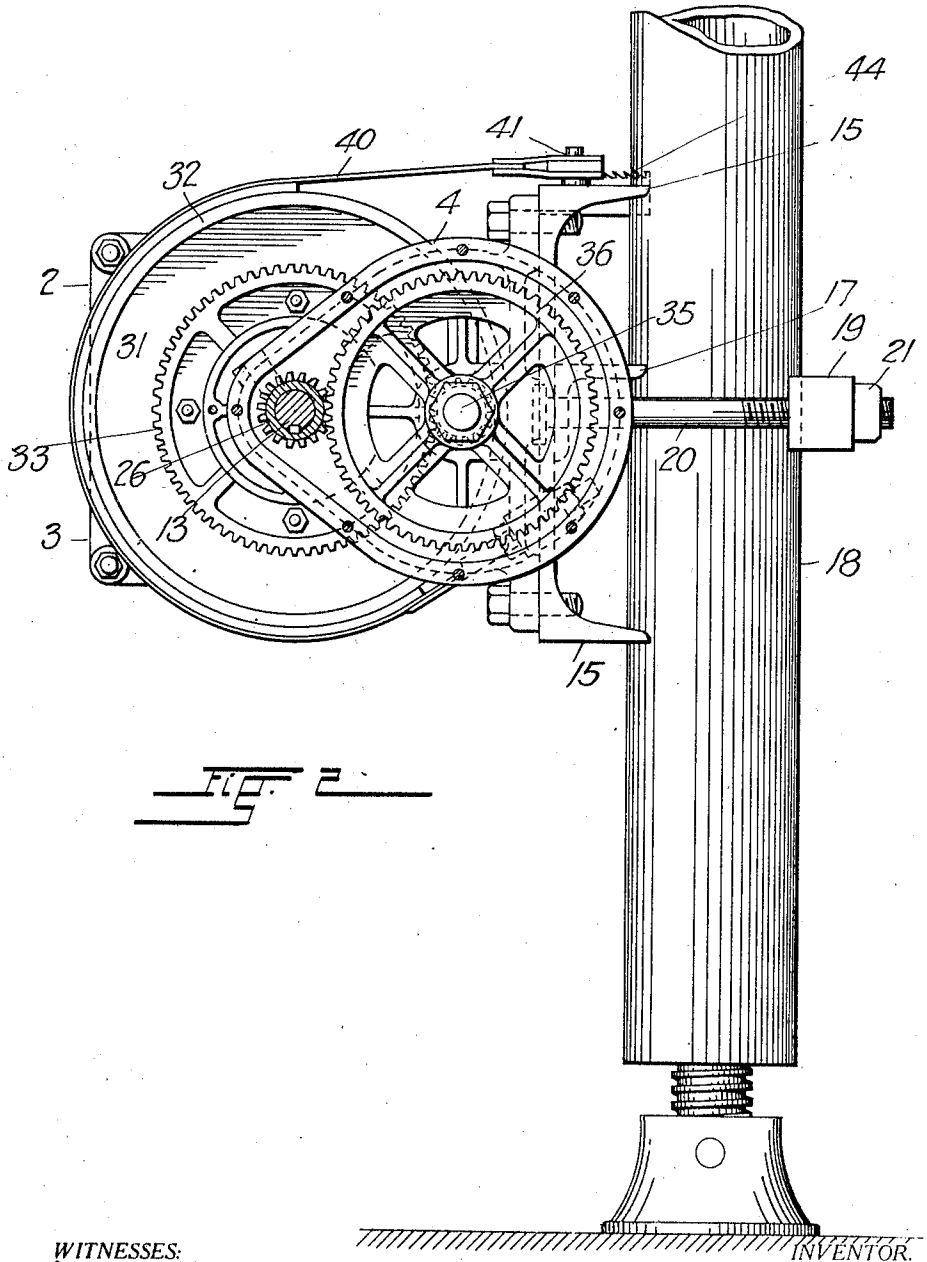


FIG. 2.

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WILLIAM A. BOX, OF DENVER, COLORADO.

HOISTING-MACHINE.

1,113,951. Specification of Letters Patent. Patented Oct. 20, 1914.

Application filed January 14, 1914. Serial No. 812,052.

To whom it may concern:

Be it known that I, WILLIAM A. BOX, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Hoisting-Machines, of which the following is a specification.

My invention relates to hoisting machines and its primary object resides in the provision of a portable yet powerful hoist which being of compact and simple construction, is in practice, clamped on a column of the character commonly used in mines for securing rock drills.

My improved hoist by reason of its small proportions may be used in stopes and other parts of a mine too small to accommodate a hoisting machine of ordinary construction, it may be readily raised or lowered to any desired height on the column on which it is mounted, and the simplicity of its construction and ready accessibility of its operative parts, permit of its being used without the employment of skilled engineers as is necessary in the operation of the ordinary hoisting machines at present in common use.

In the accompanying drawings in the various views of which like parts are similarly designated, Figure 1 represents a horizontal, axial section through my improved hoist in its operative position on a column, and Fig. 2, a vertical section taken along the line 2—2, Fig. 1, looking in the direction of the arrow drawn across said line.

Referring more specifically to the drawings, the reference numeral 2 designates the frame on which the operating parts of the hoist are assembled and which is composed of a plate 3 and a gear case 4 which are connected by means of a tubular bearing sleeve 5 and a clamping element 14. The part 3 of the frame serves for the attachment of the motor 6 from which it is spaced by means of an annular member 7 to provide a crank-chamber 8, the several parts being rigidly connected by the use of bolts 9. The motor 6 may be of any desired construction, that which is shown in the drawings being of the reversible type to be operated by compressed air, and preferable by reason of its simplicity, compactness and comparatively great power. The bearing sleeve 5 which connects the parts 3 and 4 of the supporting frame, has at one of its ends, a recessed, exteriorly flanged head 10 which is fitted in a central opening in the part 3 to which it is rigidly secured by means of cap screws 12. The opposite end of the sleeve is fitted in an opening of the gear case 4 and it has interiorly, two bearing surfaces for the support of the crank-shaft 13. The clamping element 14 consists of a body member 15 composed of channel iron to which the parts 4 and 7 of the supporting frame are rigidly secured by means of cap screws 16.

Secured to the body member of the clamp intermediate of its flanges, is a bar 17 of angle section and the corresponding flanges of the member and the bar are recessed to provide three distinct and separate seats for the upright column 18 to which the hoist is attached. The adjustable member 19 of the clamping element, consists of a bar which is slidingly mounted on two bolts 20 which at one of their ends are secured to the body member in parallel relation to each other. A serrated recess formed in the inner surface of the member 19 engages the surface of the column, and nuts 21 screwed onto the threaded, outer extremities of the bolts are provided to firmly drive the member against the column and thereby clamp the hoist rigidly in its adjusted position on the same.

The shaft 13 which is rotatably mounted in the sleeve 5 of the supporting frame has at one of its ends, a crank connection 22 with a rotary driving part of the motor 6, and adjacent the same end it has an integral collar 23 which fits in the before-mentioned recess of the sleeve and bears against a fiber packing 24 placed inside the same. This construction prevents undue leaking of motive fluid into the interior of the sleeve inasmuch as the pressure of fluid in the crank chamber will hold the collar 23 in engagement with the packing ring. The little fluid that leaks into the sleeve will carry sufficient oil to lubricate the bearing surfaces of the same. The outer end of the shaft projects beyond the frame 2 to receive a fly-wheel 25 and a driving pinion 26 which are rigidly fastened together, and a cap 27 secured at the extreme end of the shaft, provides a stop which limits the outward movement of the said connected parts.

The winding drum 28 of the hoist is rotatably mounted on the bearing sleeve 5 between the flange on the head of the latter, and the gear case 4. The drum includes in its construction, an integral, concentric hub 29, a flange 30 at its end adjacent the motor-side of the machine, and a flange 31 at its

opposite end, which has an outwardly projecting concentric rim 32 which provides a housing for part of the gearing by which the movement of the shaft is transmitted to the drum and which furthermore provides a surface for the application of a band-brake used to control the rotary motion of the drum.

The gearing above referred to comprises a gear wheel 33 which is rigidly secured to the drum within the recess formed by the rim on its flange 31. A pinion 34 likewise disposed within the said recess in mesh with the gear wheel, is mounted at the end of a short shaft 35 which is rotatably supported in a bearing formed in the wall of the gear case, and which carries at its opposite end a gear wheel 36 which meshes with the beforementioned pinion 26 on the fly-wheel 25. The fly-wheel and the pinion 26 which are rigidly connected to each other, are slidably mounted on the outer portion of the crank-shaft, a spring-held ball-catch 37 being provided to secure them for rotation with the shaft and hold them in either of two determinate positions by its placement in indentations 38 of the circumferential surface of the shaft. The gear-wheel 36 at the end of the shaft 35 and the pinion 26 on the fly-wheel are disposed in a chamber of the gear-case normally closed by means of a removable cover plate 39. The brake-band 40 which is placed around the rim 32 of the drum to frictionally engage the outer surface thereof, is rigidly connected at one of its ends to the body member of the clamping element as at 41 and its opposite extremity is secured to the end of a hand-lever 42 which at 43 is fulcrumed on the same member and which is held in its adjusted positions on a ratchet rack 44 by means of a detent 45.

By the provision of the sliding pinion and fly-wheel, the rotative continuity between the crank-shaft and the drum may be instantly secured or broken while the engine is in operation; by adjustment of the controller-handle 46 of the motor, the movement of the drum can be reversed or the supply of motive fluid discontinued; and the band brake is as usual employed to discontinue the rotary movement of the drum and to hold its load at any desired point in the operation of the machine.

It will be observed that the different parts of my improved hoist are evenly distributed with relation to the clamping element and that the bearing sleeve is axially disposed in a plane passing through the center of the same. This arrangement assures the balanced condition of the machine in handling and operation and effectively prevents distortion of the frame when subjected to more than ordinary stress. The provision of the tubular bearing which supports the drum and the crank shaft for rotation about a common axis, relieves the shaft from the weight of the load and in case of wear or breakage it may be readily renewed.

Having thus described my invention what I claim and desire to secure by Letters-Patent is:

1. A hoist comprising a supporting frame including an element for clamping it on a column, a motor-driven winding drum mounted on said frame, and having a brake-surface, a brake-band disposed to frictionally engage said surface, and a lever adjustably mounted on said element, the ends of the said band being attached respectively to the said lever and to the said element.

2. A hoist comprising a supporting frame including an element for clamping it on a column, a winding drum rotatably mounted on said frame, a rotary shaft, a motor secured on the frame in driving connection with said shaft, gearing for transmitting the movement of said shaft to said drum, including a driving member composed of a pinion and a fly-wheel rigidly connected together and slidably mounted on the shaft, and means for holding said member for rotation with the shaft, at different points of the same.

3. A hoist comprising a supporting frame including an element for clamping it on a column, a winding drum rotatably mounted on said frame, a rotary shaft, a motor secured on the frame in driving connection with said shaft, gearing for transmitting the movement of said shaft to said drum, including a driving member slidably mounted on the shaft, and means for holding said member for rotation with the shaft, at different points of the same.

4. A hoist comprising a supporting frame including an element for clamping it on a column, a winding drum rotatably mounted on said frame, a rotary shaft, a motor secured on the frame in driving connection with said shaft, gearing for transmitting the movement of said shaft to said drum, including a driving member slidably mounted on the shaft, and a spring-held catch for holding said member for rotation with the shaft at different points thereof, by its position in indentations in the circumferential surface of the same.

5. A hoist comprising a supporting frame composed of two separate parts, a tubular bearing connecting the same, an annular member secured to one of said parts, and a clamping element secured to the said member and to the other part, a motor mounted on the frame in engagement with the outer surface of said member, a shaft supported in said bearing and having a crank-connection with the motor, which extends in the inner space of said annular member, a winding drum mounted for rotation on said bear-

ing, and gearing on the other frame-part, for transmitting the movement of the shaft to the said drum.

6. A hoist comprising a supporting frame including a tubular bearing having a recessed head, a shaft rotatably mounted in said bearing and having at one of its ends, a collar fitted in said recess, packing in said recess to be engaged by said collar, a motor secured to said frame and having a driving connection with said shaft at the collar-end thereof, a winding drum mounted for rotation on said bearing, and gearing for transmitting the movement of said shaft to said drum.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM A. BOX.

Witnesses:
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