July 6, 1926.

1,591,884

A. E. PETERS

HOIST

Filed March 19, 1926

2 Sheets-Sheet 1

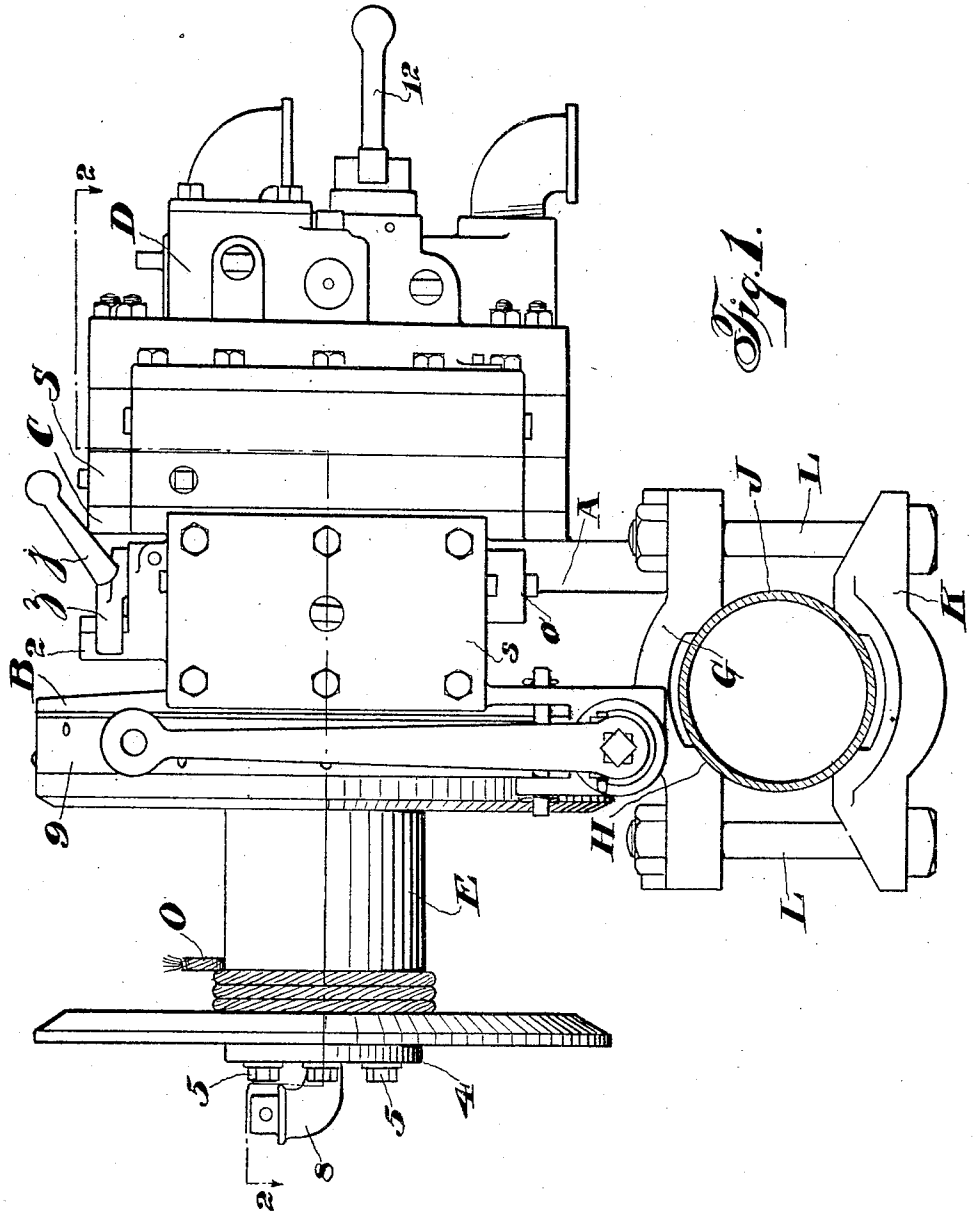

Fig. 1.

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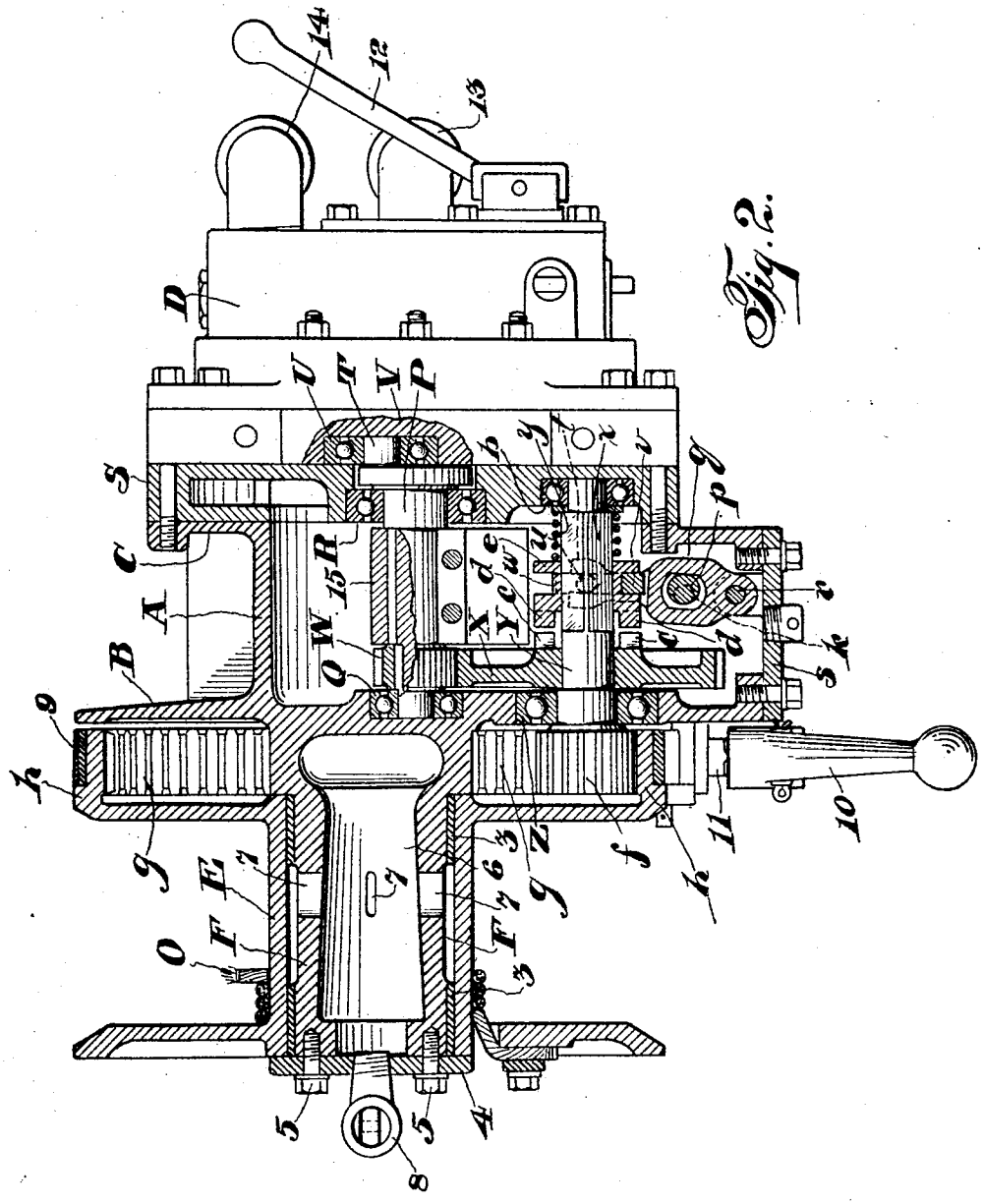

Fig. 2.

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UNITED STATES PATENT OFFICE.

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HOIST.

Application filed March 19, 1926. Serial No. 95,940.

This invention relates to hoists, but more particularly to a portable type of hoist which may be mounted on suitable bars or columns for use in mining operation or other more general applications.

An object of the invention is to simplify the construction of this type of hoist whereby the weight may be partially reduced and also to compactly arrange the operative elements.

Other objects and advantages will be in part obvious and in part pointed out hereinafter.

In the accompanying drawings forming part of the specification and in which similar reference characters refer to similar parts,

Figure 1 is a side elevation of a hoist constructed in accordance with the practice of the invention, and

Figure 2 is a horizontal section along the line 2—2 looking in the direction of the arrows.

Referring to the drawings, the hoist comprises a centrally disposed gear case A provided with a pair of oppositely disposed flanges B and C at opposite ends of the case A, a motor D being mounted on the flange C and a rope drum E being rotatably mounted on a cylindrical extension F at the flange B and formed integrally with the gear case A.

A base G for the hoist is preferably formed integrally with the gear case A and may be provided with a cylindrically shaped groove H to receive a column J or other round support as a mounting for the hoist. Another groove (not shown) at 90° to groove H allows supporting the hoist at right angles. A clamping jaw K provided with suitable bolts L is adapted to grip the column or support J in conjunction with the base G. Preferably the base G is located toward the rope drum E and away from the gear case A so that the pull of the rope O on the drum E does not provide too great a moment about the support J.

The motor D may be of the square piston type as disclosed in application, Serial No. 71,807 of Hyman Levine, filed November 27, 1925, and is provided with a crank shaft P rotatably mounted in one side of the gear case A by means of a suitable journal Q. The motor end of the shaft P is journaled as by means of an anti-friction bearing R in the back head S of the motor D. The crank pin T of the shaft P is journaled by means of a ball bearing U in a piston V of the motor D. A gear W is suitably keyed to the shaft P adjacent the bearing U and is adapted to mesh with a larger gear X rotatably mounted on a countershaft Y journaled at one end in the side wall of the gear case A by means of a bearing Z and at the other end in the bearing *b* supported by the motor back head S. The gear X is provided with a crown clutch face having jaws *c* which are adapted to be engaged by jaws *d* of a movable clutch member *e*. On the opposite face of the flange or wall B of the gear case A the counter shaft Y extending through the wall B is provided with a pinion *f* meshing with gear teeth *g* internally cut in a flange *h* of the rope drum E.

The movable clutch member *e* is adapted to be moved into and out of engagement with the clutch face of the gear X by means of a manually operable lever *j* mounted on a shaft *k* passing through the gear case A and journaled at the bottom in a boss *o*. A cam or eccentric *p* is provided on the shaft *k* to actuate a lever *q* pivotally mounted by means of a pin *r* on a gear case cover plate *s* and provided at its free end with a yoke *t* engaging pins *u* of a trunnion *v* engaging the movable clutch member *e* at an annular groove *w*.

The clutch member *e* is adapted to slide upon a squared portion *x* of the countershaft Y and is provided with a coil spring *y* about the shaft Y tending to engage the movable clutch member *e* with the clutch face of the gear X. The handle *j* is provided with a projection *z* cooperating with a stop 2 to prevent turning of the handle *j* beyond the dead center position of the cam *p* as shown in Figure 2. Thus, when the handle *j* is turned to the disengaged position of the movable clutch member *e* the stop 2 prevents the spring *y* from pressing the movable clutch member *e* into engagement with the gear X.

In this position of the clutch, the rope drum E may be rotated without turning the motor D. When the handle *j* is turned to release the movable clutch member *e*, the spring *y* is adapted to force the clutch into engagement with the gear X so that the motor D may be used to rotate the rope drum E through the train of gears comprising the gear W on the crankshaft P, the gear X on the countershaft Y engaged by the mov-

able clutch member *e* and the pinion *f* on the countershaft Y engaging the internal teeth *g* on the flange *h*.

The rope drum E is adapted to rotate on suitable bearing bushings 3 fitted on the cylindrical extension F at the flange B. The rope drum is held on the cylindrical extension F by means of an end plate 4 attached by means of suitable screws 5 to the cylindrical extension and adapted also to enclose a chamber 6 within the cylindrical extension F for oil or other lubricant. Suitable apertures 7 extend through the cylindrical extension F from the chamber 6 to communicate with the bearing bushings 3. Oil may be introduced into the chamber 6 through an elbow pipe connection 8 passing through the end plate 4.

The rope drum E is preferably provided with a brake comprising a band 9 on the exterior of the flange *h* adapted to be tightened in a suitable manner by means of a hand lever 10 on a screw shaft 11 mounted on the base G.

The motor D is provided with a suitable throttle (not shown) operated by a throttle lever 12 for controlling the flow of motive fluid from a source adapted to be connected with an inlet pipe connection 13. The exhaust fluid from the motor is adapted to escape through a pipe connection 14 to atmosphere.

The above described construction provides an arrangement which is very simply assembled and disassembled. All portions of the clutch and its associating operating mechanism are easily reached or removed by removing the cover plate *s* of the gear case A. The gears within the case A and the shafts to which they are attached may be removed by removing the screws 14 attaching the motor D and its back head S to the flange C. One of the most important advantages in convenience is the ease with which the drum E may be removed. This is accomplished by merely removing the end thrust plate 4 and slipping the drum endwise from the cylindrical extension F. It is thus seen that any portion of the hoist may be removed without disarranging the major part of the remaining construction.

The gear case A also provides a convenient housing for a counterbalance weight 15 which may be keyed to the crank shaft P. The counterbalance 15 is adapted to counteract the unbalance of all rotative portions of the motor D.

Thus are accomplished among others, the objects hereinbefore referred to.

I claim:

A hoist comprising in combination a gear case flanged at opposite ends and provided with a cylindrical extension at one of said flanges, a rope drum rotatably mounted on said cylindrical extension and having an internally toothed flange adjacent a flange of said gear case, a removable thrust member for said rope drum at the free end of said cylindrical extension, a motor mounted on the opposite flange of said gear case, a drive shaft for said motor extending into said gear case and journaled therein, a counterbalance on said shaft adapted to rotate within the gear case, a countershaft journaled in the gear case and extending through a flange of said gear case, reduction gearing on said drive shaft and countershaft, a pinion on said countershaft in engagement with the internally toothed flange of said rope drum, and an externally operable clutch on said countershaft to connect said gearing with said countershaft.

In testimony whereof I have signed this specification.

ARTHUR E. PETERS.