No. 833,994. PATENTED OCT. 23, 1906.

W. S. BRADSHAW.

HOISTING APPARATUS.

APPLICATION FILED JAN. 19, 1906.

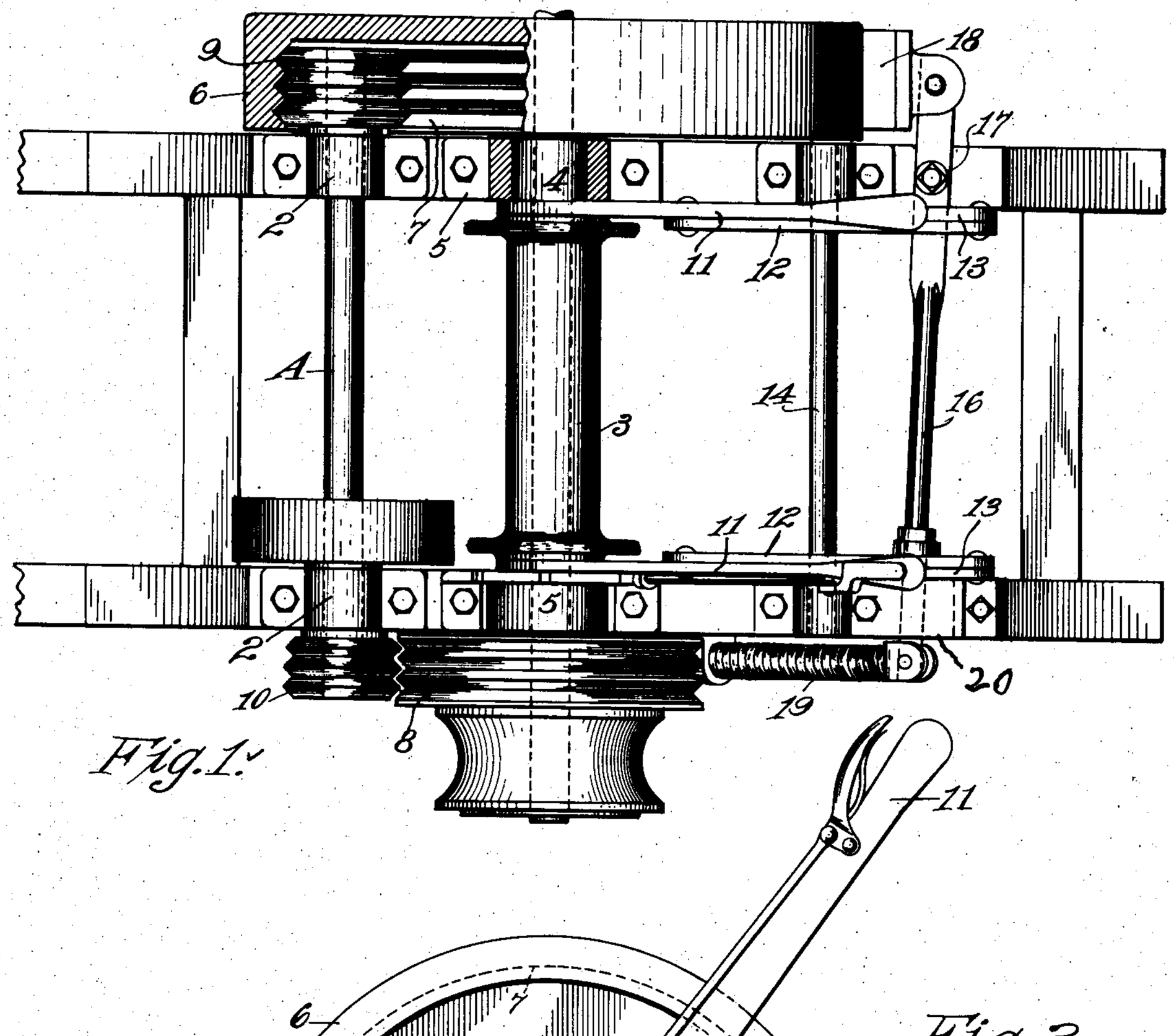

Fig. 1.

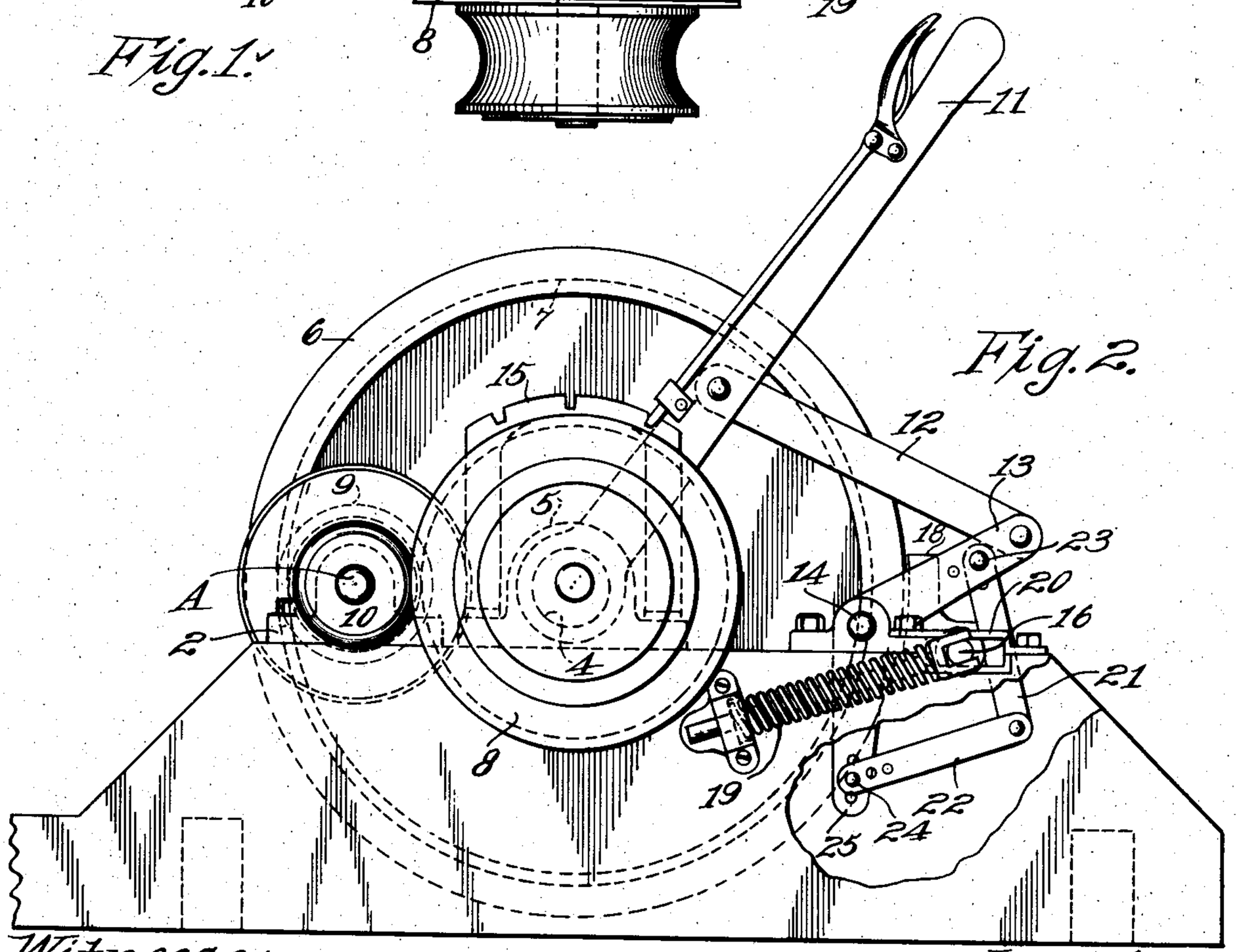

Fig. 2.

Witnesses:
F. C. Maynard.
J. R. Bruce

Inventor:
William S. Bradshaw
By Geo. H. Strong. Atty

UNITED STATES PATENT OFFICE.

WILLIAM S. BRADSHAW, OF SAN JOSE, CALIFORNIA.

HOISTING APPARATUS.

No. 833,994. Specification of Letters Patent. Patented Oct. 23, 1906.

Application filed January 19, 1906. Serial No. 296,746.

To all whom it may concern:

Be it known that I, WILLIAM S. BRADSHAW, a citizen of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented new and useful Improvements in Hoisting Apparatus, of which the following is a specification.

My invention relates to hoisting apparatus. Its object is to provide a simple practical gasolene-hoist especially for use in building construction for hoisting mortar and the like, but capable of general application, wherein a single lever will operate to run the hoisting-drum in either direction and also apply the brake.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a plan view, in partial section, of my improved hoist. Fig. 2 is a side elevation of the same.

A represents a drive-shaft receiving constant motion in one direction from any suitable source of power. In practice I employ a gasolene-engine; but I may use steam, electric, or water power. This shaft is journaled in the fixed blocks 2.

3 represents a drum having its shaft turning in the eccentrics 4, which are turnable in the bearings 5. One end of the drum or drum-shaft carries the annular flange or rim 6, having the internal friction-grooves 7. The opposite end of the drum-shaft carries the fixed grooved pulley 8.

The drive-shaft A carries the corresponding grooved pulleys 9 10, which are adapted to engage, respectively, the internal grooves 7 and pulley 8, according as the eccentrics 4 are rocked in their bearings 5 to carry the drum-shaft toward or away from the drive-shaft A.

The mounting of the drum and its movement relative to shaft A and the sizes of the pulleys 9 10 relative to their complementary friction-surfaces 7 8 are such that the drum may be engaged with one of the pulleys 9 10 to drive the drum in one direction and with the other of said pulleys to drive the drum in the reverse direction, or the drum may be thrown into intermediate position, leaving it to be entirely supported against rotation or to have its movements controlled independent of the connections with the drive-shaft A by suitable brake mechanism hereinafter to be explained. The relative sizes of the pulleys 9 10 and their complementary friction members 7 8 may be varied to run the hoist at any desired speed in either direction.

The rocking of the eccentrics 4 in unison to carry the drum into or out of operative connection with the pulleys 9 10 may be accomplished by any suitable means. In the present instance I have shown each eccentric as having an operating-lever 11 fast to it, so that the hoist may be manipulated from either side. Each lever 11 connects by a link 12 with a respective arm 13 on a rock-shaft 14, whereby the operation of one lever acts through the several connections to move both ends of the drum simultaneously and in unison.

Since both levers 11 perform the same function exactly as an operating-lever, they may be considered as one, since it is the use of a single lever to perform several functions that constitutes a main feature of my invention.

The levers 11 may be locked in any desired position by suitable means, as the pawl-and-rack mechanism 15. With a lever 11 thrown to its limit of movement in one direction, as indicated in Fig. 2, the internal grooves 7 will be brought into operative engagement with the pulley 9 to run the drum one way. With the lever 11 thrown to its limit of movement in the other direction the pulleys 8 10 would be in operative engagement and the rotative movement of the drum would be reversed. With the lever in intermediate position the drum and shaft A would be in relatively inoperative position.

Any suitable form of brake mechanism may be employed to control the movements of the drum independent of the shaft A. I have here shown a simple form of brake, and I prefer to operate the brake by and coördinately with the movements of one or the other of the levers 11. This brake comprises a bar 16, fulcrumed, as shown at 17, and provided with a brake-shoe 18 to engage the periphery of the rim 6 of the drum. A spring 19 acts on the opposite end of the brake-bar 16 to throw the brake normally on, the tension-spring 19 and the relative lengths of the portions of the bar on each side of fulcrum 17 being proportioned to the load, so as to insure a perfect control of the hoist by the brake. Obviously I might employ supplementary or emergency brakes;

but in practice I have found that for certain classes of work the brake herein shown and described is sufficient for all purposes. The end of the brake-bar opposite the shoe is supported in suitable guides 20.

The brake-bar is operated coördinately with an operating-lever 11 by means of two pivoted links 21 22, one of which is adjustably pivoted, as at 23, to an arm 13 adjacent to the outer end of the bar. The other link is adjustably pivoted at 24 to a corresponding downwardly-extending arm 25 rigid with rock-shaft 14. The links embrace the bar in such fashion and the adjustment of the parts is such that with lever 11 thrown over full in one direction, as in Fig. 2, to connect the drum with shaft A one link, as 21, will engage the bar 16 to turn it to release the brake. When the operating-lever is thrown over full in the opposite direction to reverse the drum, the other link 22 will operate similarly to release the brake; but when the operating-lever is in neutral position and the drum is disconnected from shaft A then the bar 16 will stand in the angle between the links 21 22 and free from engagement with the links, so that the full force of spring 19 may act to put on the brake and hold the drum. A limited movement of the operating-lever is permitted to let up on the brake and allow the drum to turn by reason of the weight of its load, but still not throw the drum into connection with either of pulleys 9 10. In other words, the links 21 22 operate after the manner of cams or wedges to draw in on the bar to release the brake when the operating-lever is rocked in either direction from a neutral position.

The adustable connections 23 24 of the respective links 21 22 admit of necessary take-up, as wear occurs on the brake on any of its parts.

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

1. In hoisting apparatus, the combination of a drum having a plurality of frictional surfaces, a drive-shaft having a plurality of frictional surfaces, and means for shifting the drum relative to the shaft whereby one of the frictional surfaces thereof will engage one of the frictional surfaces of the drive-shaft and the other frictional surface of the drum will simultaneously disengage the like surface of the shaft.

2. In hoisting apparatus, the combination of a drum having independent frictional surfaces, a drive-shaft having independent frictional surfaces, means for shifting the drum relative to the shaft to cause one of the frictional surfaces thereof to engage a companion surface on the shaft, and to cause the other frictional surface to disengage a companion surface on the shaft whereby the drum may be driven in either direction, a brake, and a single lever controlling the brake and also controlling the movements of the drum in either direction.

3. In a hoist, the combination of a drive-shaft having two friction-pulleys, a drum having a friction-surface to engage one side of one pulley to turn the drum in one direction, and having a second friction-surface to engage the opposite side of the other pulley to operate the drum in a reverse direction, and means for moving the drum relative to the shaft to engage one or the other of said pulleys.

4. In a hoist, the combination of a drive-shaft having two friction-pulleys, a drum having a friction-surface to engage one side of one pulley to turn the drum in one direction and having a second friction-surface to engage the opposite side of the other pulley to operate the drum in a reverse direction, means for moving the drum relative to the shaft to engage one or the other of said pulleys, a brake which is normally on, and means to operate the brake synchronously with the movements of the drum into and out of engagement with said pulleys.

5. In a hoist, the combination of a drive-shaft having two friction-pulleys, a drum having a friction-surface to engage one side of one pulley to turn the drum in one direction and having a second friction-surface to engage the opposite side of the other pulley to operate the drum in a reverse direction, means for moving the drum relative to the shaft to engage one or the other of said pulleys, a brake, and connections between the brake and drum to operate the brake coördinately with the engagement of the drum with one or the other of said pulleys.

6. In a hoist, the combination of a drive-shaft having two friction-pulleys, a drum having a friction-surface to engage one side of one pulley to turn the drum in one direction and having a second friction-surface to engage the opposite side of the other pulley to operate the drum in the opposite direction, means including an operating-lever for moving the drum relative to the shaft to engage one or the other of said pulleys, a brake, and connections between the brake and said operating-lever to actuate the brake coördinately with the movements of said lever.

7. In a hoist, the combination of a drive-shaft having constant motion in one direction, a drum mounted parallel to the shaft, said shaft and drum having coacting pairs of friction-pulleys, means including an operating-lever for moving a member of each pair of pulleys toward or from the other member of the same pair to operate the drum, drive connections between the shaft and drum to drive the latter in either direction, a brake, and connections between the brake and said lever.

8. In a hoist, the combination of a drive-

shaft, friction-pulleys thereon, a drum having internal and external friction-surfaces corresponding with said drive-pulleys, eccentrics in which the shaft of said drum are journaled, and means for operating said eccentrics to move the drum into engagement with one or the other of said drive-pulleys.

9. The combination of a drive-shaft, a counter-shaft, eccentric turnable bearings for the counter-shaft, friction-pulleys on the drive-shaft, said counter-shaft supporting internal and external frictional surfaces corresponding with said drive-pulleys, connections between said eccentrics and an operating-lever for turning said eccentrics to carry one or the other of said frictional surfaces into engagement with the corresponding friction-pulley to operate the drum in one direction or the other.

10. The combination of a drive-shaft, a counter-shaft, eccentric turnable bearings for the counter-shaft, friction-pulleys on the drive-shaft, said counter-shaft supporting internal and external frictional surfaces corresponding with said drive-pulleys, connections between said eccentrics, an operating-lever for turning said eccentrics to carry one or the other of said friction-surfaces into engagement with the corresponding friction-pulley to operate the drum in one direction or the other, a brake normally applied to prevent the rotation of said counter-shaft, and means to operate the brake synchronously with the movement of said eccentrics.

11. The combination of a drive-shaft, a counter-shaft, eccentric turnable bearings for the counter-shaft, friction-pulleys on the drive-shaft, said counter-shaft supporting internal and external frictional surfaces corresponding with said drive-pulleys, connections between said eccentrics, an operating-lever for turning said eccentrics to carry one or the other of said frictional surfaces into engagement with a corresponding pulley to operate the drum in one direction or the other, a brake normally applied to prevent rotation of said counter-shaft, and connections between the brake and said operating-lever to release the brake.

12. The combination of a drive-shaft, a counter-shaft parallel therewith, means for moving one of said shafts toward or from the other, said counter-shaft carrying internal and external frictional surfaces, corresponding friction-pulleys on the drive-shaft to engage said friction-surfaces to operate the drum in either direction.

13. The combination of a drive-shaft, a counter-shaft parallel therewith, means for moving one of said shafts toward or from the other, said counter-shaft carrying internal and external frictional surfaces, corresponding friction-pulleys on the drive-shaft to engage said friction-surfaces to operate the drum in either direction, a brake normally applied to prevent rotation of the counter-shaft, and connections between the brake and that shaft which has a to-and-fro movement relative to the other shaft, to operate the brake.

14. In a hoist, the combination of a drive-shaft, friction-pulleys thereon, a drum, rotatable eccentric members in which the drum-shaft is journaled for rotation, said drum carrying internal and external frictional surfaces corresponding with the pulleys on the drive-shaft, connections between the eccentric members, an operating-lever for turning said members to carry the drum into engagement with one or the other of the drive-pulleys, a brake, and articulated connections between the brake and lever to actuate the brake.

15. In a hoist, the combination of a drive-shaft, friction-pulleys thereon, a drum, rotatable eccentric members in which the drum-shaft is journaled for rotation, said drum carrying internal and external frictional surfaces corresponding with the pulleys on the drive-shaft, connections between the eccentric members, an operating-lever for turning said members to carry the drum into engagement with one or the other of the drive-pulleys, a spring-actuated brake normally applied to prevent rotation of the drum, and adjustable articulated connections between the brake and said lever for releasing the brake on the operative engagement of the drum with one or the other of said drive-pulleys.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM S. BRADSHAW.

Witnesses:
W. H. CHRISTMAS,
H. T. KELLEY.