M. B. MOYER.

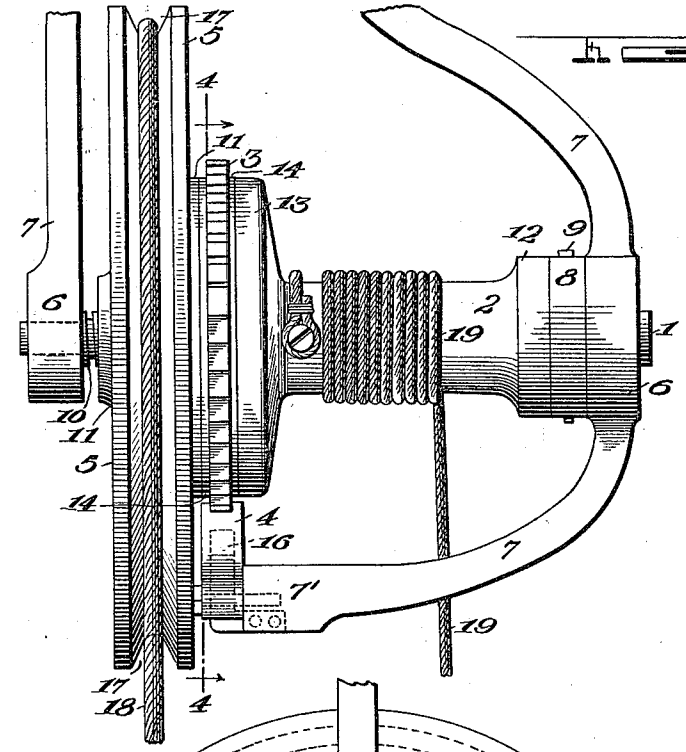
HOISTING DRUM AND CLUTCH.

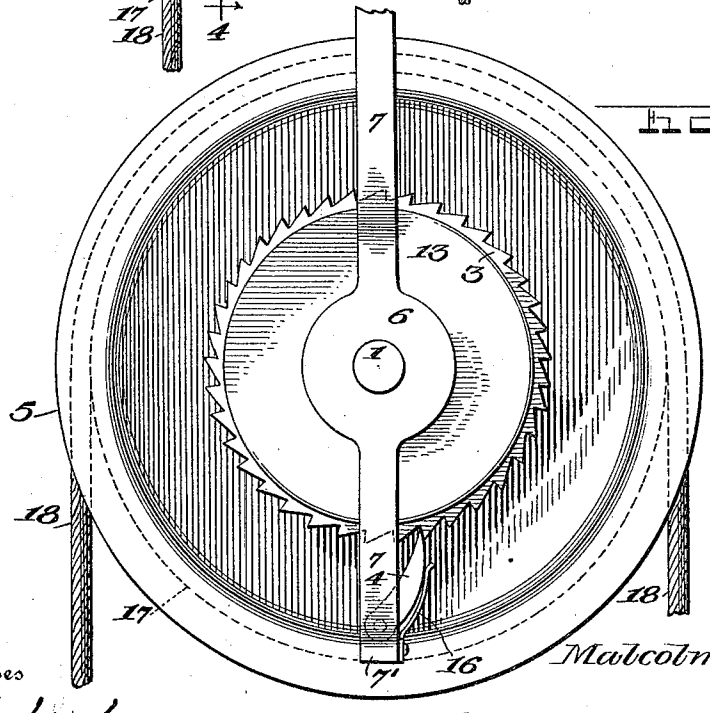
APPLICATION FILED FEB. 9, 1914.

1,141,819.

Patented June 1, 1915.

2 SHEETS—SHEET 1.





Witnesses

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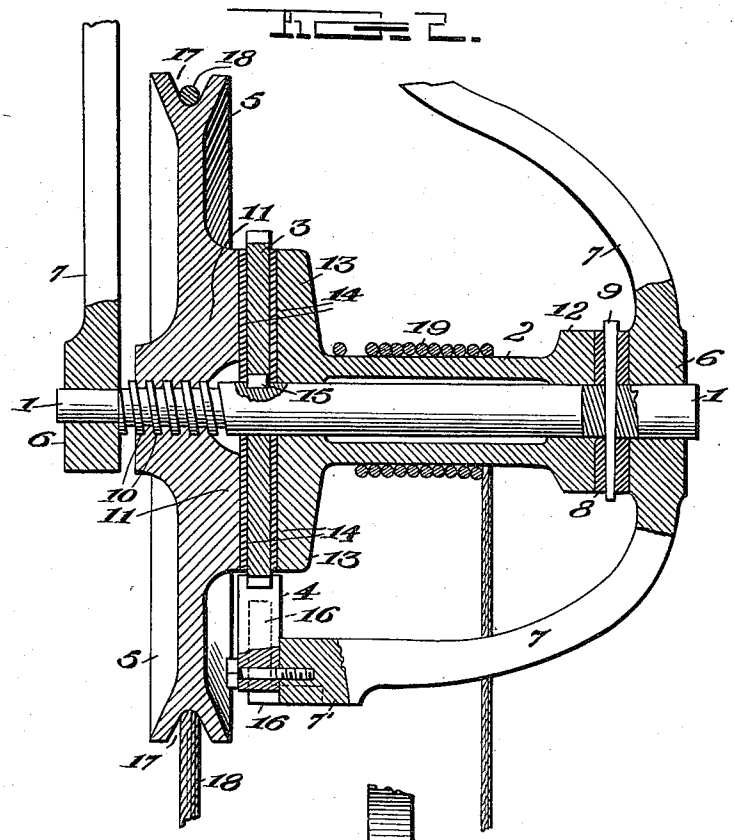
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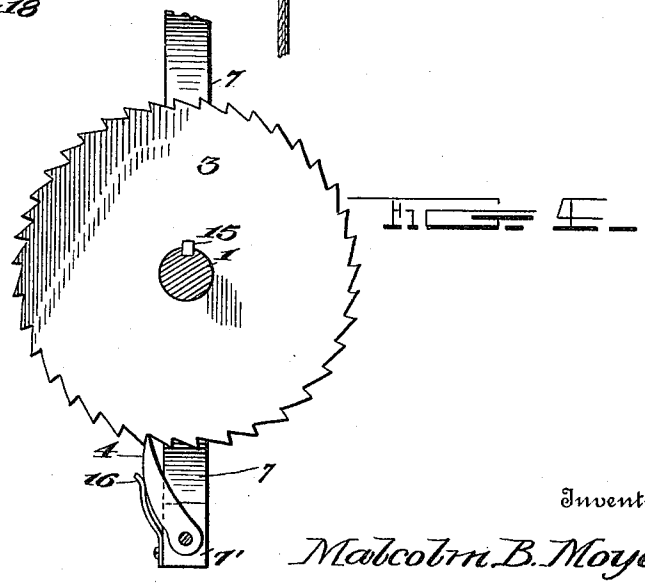
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2 SHEETS—SHEET 2.





Witnesses

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UNITED STATES PATENT OFFICE.

MALCOLM B. MOYER, OF MONTEVIDEO, MINNESOTA.

HOISTING-DRUM AND CLUTCH.

1,141,819. Specification of Letters Patent. Patented June 1, 1915.

Application filed February 9, 1914. Serial No. 817,642.

To all whom it may concern:

Be it known that I, MALCOLM B. MOYER, a citizen of the United States, residing at Montevideo, in the county of Chippewa and State of Minnesota, have invented certain new and useful Improvements in Hoisting-Drums and Clutches; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in hoisting drums and the primary object of the same is to provide a drum of the character described having a simple and efficient operating means whereby it may be readily employed for raising a litter carrier, although its use is not confined to this application.

A secondary object is to construct the drum clutch in such a manner as to allow the weight lifted to be quickly lowered.

Still another object is to construct the device in such a manner as to permit its operating wheel to remain in a comparatively motionless position while said drum is unwinding to lower the weight.

With the above objects in view, the invention resides in certain novel features of construction and combination herein described and claimed and shown in the drawings, wherein:

Figure 1 is a side elevation of my improved hoist and clutch; Fig. 2 is a central vertical longitudinal section thereof; Fig. 3 is an end view; and Fig. 4 is a transverse section on the line 4—4 of Fig. 1.

In the accompanying drawings, I have shown my invention as comprising a revolubly supported shaft 1, a drum 2 rotatably mounted on said shaft, a ratchet wheel 3 slidably keyed to said shaft, a dog 4 for coaction with said ratchet wheel, and an operating wheel 5 which has its hub coarsely threaded on its interior and provided on its inner face with a flat friction surface.

The shaft 1 is revolubly supported in bearing eyes 6 which are formed integrally with depending arms 7 which may carry a suitable overhead pulley (not shown) which is adapted to run on the usual track when the device is used in connection with a litter carrier. The shaft 1 is provided with a stop collar 8 near one end, said collar being rigidly secured thereto by means of a transverse pin 9 which passes through said collar and said shaft, while its opposite end is provided with a plurality of coarsely pitched screw threads 10 upon which the internally threaded hub 11 of the operating wheel 5 is threaded.

The drum 2 is of suitable length and diameter, and is provided on one end with a rather small flange 12 while its opposite end is provided with a flange 13 of approximately the same diameter as the hub 11 of the wheel 5.

The inner end of the hub 11 and the outer surface of the flange 13 are adapted to frictionally engage fiber washers 14 which contact with said hub and said flange and with the opposite sides of the ratchet wheel 3, which is disposed between said hub and flange and is keyed at 15 to the shaft 1 in such a manner as to cause it to revolve with said shaft and yet to allow it a slight amount of longitudinal movement thereon. The dog 4 co-acts with the teeth of the ratchet wheel 3 as above stated, and said dog is here shown as pivotally supported on the downwardly and laterally curved end 7′ of one of the supporting arms 7, said dog being normally held in engagement with the teeth of said ratchet by a leaf spring 16.

The operating wheel 5 is preferably grooved on its periphery as shown at 17 for the reception of a continuous operating cable or chain 18 which depends from said wheel a suitable distance to be conveniently operated by the person manipulating the device.

With the parts as above described, and assuming that the arms 7 are supported by an overhead track while the cable 19 which is adapted to be wound around the drum 2, is connected at its lower end to a litter carrier, the operation of the device is as follows: The chain or cable is moved in the proper direction to cause the hub 11 of the wheel 5 to travel inwardly upon the threads 10 on the shaft 1, which operation will force one of the friction disks or washers 14 into contact with the outer surface of the ratchet wheel 3, which wheel will then be forced inwardly and will force the other friction disk or washer 14 into contact with the flange 13 of the drum 2. This operation will force the drum 2 into contact with the collar 8 and consequently, said drum will be frictionally held in such position as to cause it to travel with the shaft 1 when the chain or cable 18 is given a continued motion in the above

mentioned direction, thus causing said shaft 1 and the drum 2 to be driven by the wheel 5 and thus wind up the cable 19 on said drum. When the cable 19 has been wound on said drum and the load has been raised to the desired height, the entire device and said load may be moved along the overhead track to the point where it is desired to deposit the contents of the carrier, when the wheel 5 may be rotated in a reverse direction through the action of the cable 18 which movement will cause said wheel to travel outwardly and will allow the friction disks 14 and the ratchet wheel 3 to disengage, thereby releasing the drum 2 and allowing the weight of the load to turn the drum on the shaft 1, and unwind the cable 19.

It is to be understood that when the cable is being wound upon the drum, the dog 4 will engage the teeth of the ratchet wheel 3 and will prevent any retrograde movement on the part of said drum. When, however, the frictional engagement of the various parts is released in the above mentioned manner, the ratchet wheel 3, being keyed to the shaft 1, will prevent said shaft from rotating while the drum is allowed to freely revolve thereon. This is a very important feature of the invention, since the operating wheel 5 and the cable 18 will not travel during this downward movement of the load unless the operator desires to check the movement of said load. To accomplish the checking of the velocity with which the load is lowered, it is simply necessary to move the cable 18 in a direction to cause the hub 11 of the wheel 5 to travel inwardly upon the threads 10 which will cause the above mentioned parts to again frictionally contact and will thus exert a braking action on the drum 2, and thus check its motion to the degree desired by the operator.

By reference more particularly to Fig. 2, it will be seen that the screw threads on the left end of the shaft 1 terminate adjacent the inner side of the left hand bearing 6, and that the collar 8 contacts with the inner side of the other bearing 6. This is important, since when the drum 2 is allowed to rotate at a high rate of speed to unwind the chain or cable thereon, considerable vibration takes place. This vibration often jars the dog or pawl 4 out of engagement with the teeth of the ratchet disk 3, thereby causing the shaft 1 to rotate with the drum. This is very undesirable, since it would cause the chain or cable 18 to be thrown, by centrifugal force, out of the groove of the wheel 5. By the construction above set forth, however, should the pawl be jarred from its engagement with the ratchet, thereby allowing the shaft 1 to rotate, it is simply necessary to actuate the cable 18 in a manner to cause the outer end of the hub of the wheel 5, to contact with the inner end of the adjacent bearing 6. This may be quickly and easily accomplished and will positively prevent the shaft 1 from rotating, since the frictional contact existing between the bearings 6, the collar 8 and the hub, is greater than the friction between the drum and the shaft. With the shaft 1 locked in the manner just described, a downward pull on the cable 18 will steady the hoist thereby preventing excessive vibration and allowing the pawl 16 to again engage the teeth of the ratchet disk. A sudden rotation of the wheel toward the right, will now prevent movement of the drum or will check the movement thereof.

In view of the foregoing it will be seen that the provision of the screw threads terminating adjacent the inner end of one of the bearings is an important feature.

The terms "chain or cable" appear several places in the above description and are used for the purpose of including either a chain or a cable for the purpose of drawing the operating wheel 5, as either one would operate to equal advantage.

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

1. A hoist comprising a horizontal shaft, bearings revolubly supporting the opposite ends thereof, screw threads on one end portion of the shaft and terminating at the inner side of the adjacent bearing, a stop collar secured on the other end portion of the shaft and contacting with the other bearing, a drum revolubly mounted on the shaft and contacting at one end with said collar, a ratchet wheel keyed to but slidable on the shaft and contacting with the other end of the drum, a pawl for preventing movement of said ratchet wheel, in one direction, an operating wheel having an internally threaded hub mounted on the threads of the shaft, the inner end of the hub contacting with the ratchet wheel and the outer end thereof being spaced from the adjacent bearing, and means whereby said wheel may be rotated in one direction to rotate the drum, and in the opposite direction to cause its hub to contact with the adjacent bearing for the purpose set forth.

2. A hoist comprising a horizontal shaft mounted to rotate, one end of said shaft having screw threads, a stop collar secured to the other end of the shaft, a drum revolubly mounted in the shaft and contacting at one end with the collar, a friction disk keyed to but slidable on the shaft, said disk contacting on one side, with the other end of the drum and having ratchet teeth on its outer edge, an operating wheel having an internally threaded hub mounted to revolve on the threaded end of the shaft, said hub contacting with the other side of said ratchet disk, means for rotating said wheel in either direction, bearings in which the ends of the

shaft are revolubly mounted, a downwardly and inwardly curved arm depending from the bearing adjacent the collar, and a pawl pivoted to said downwardly and inwardly curved arm and coacting with the ratchet, whereby rotation of the shaft in one direction is prevented.

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

MALCOLM B. MOYER.

Witnesses:
OLGA E. JOHNSON,
OPHY LOVE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."