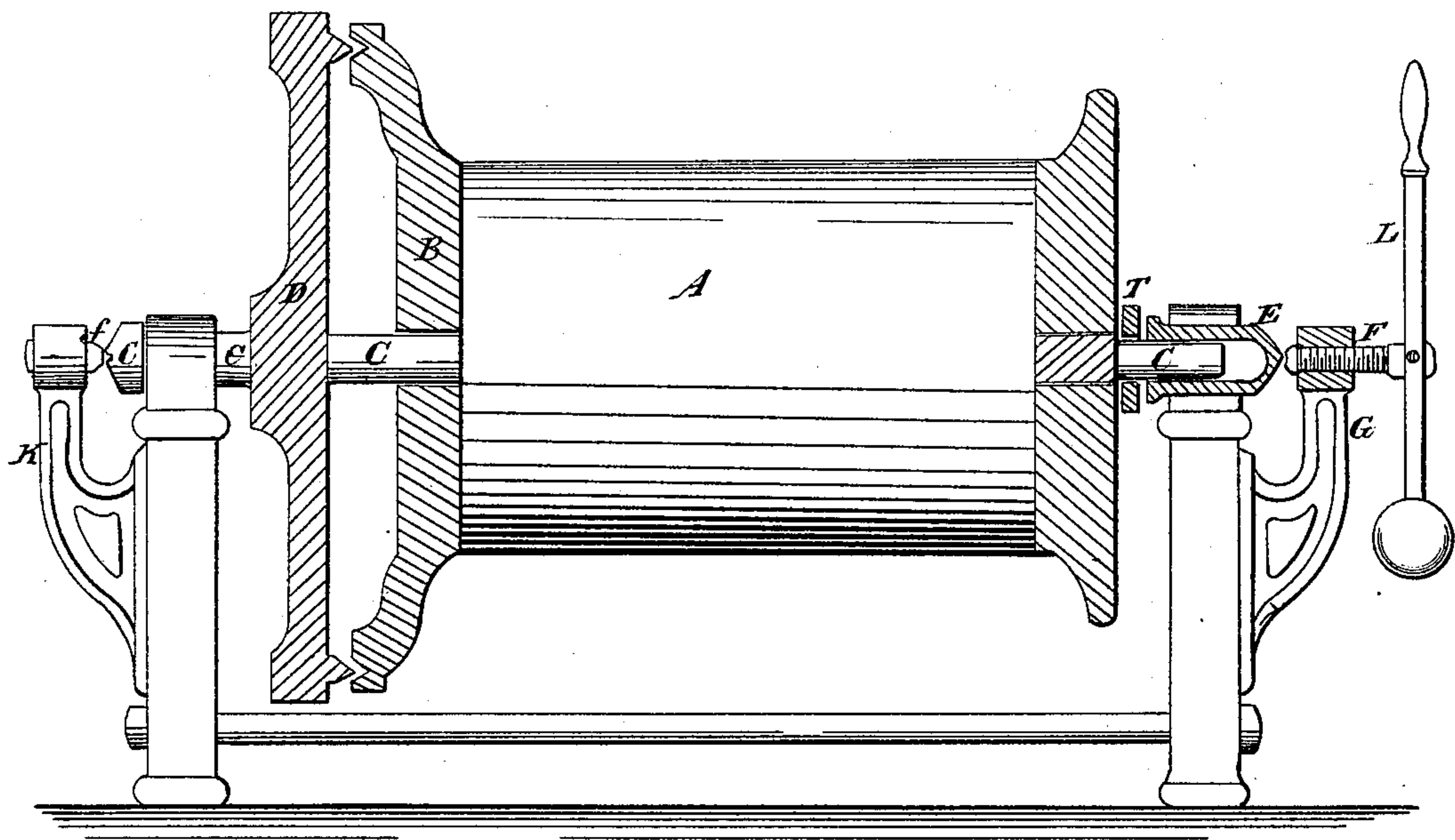


*E. B. Requa,*  
*Winallap.*  
*N<sup>o</sup> 39,068.* *Patented June 30, 1863.*



*Witnesses.*  
*R. J. Allen*  
*Jos. B. Barnum*

*Inventor.*  
*E. B. Requa.*

# UNITED STATES PATENT OFFICE.

E. B. REQUA, OF JERSEY CITY, NEW JERSEY.

## IMPROVEMENT IN POWER-WINDLASS.

Specification forming part of Letters Patent No. 39,068, dated June 30, 1863.

*To all whom it may concern:*

Be it known that I, E. B. REQUA, of Jersey City, county of Hudson, and State of New Jersey, have invented certain Improvements in the Power-Windlass; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawing, which forms part of this specification.

My said improvements are designed to be applied to a description of windlass in common use, consisting, essentially, of two disks arranged so as to revolve in close contiguity, one of which is fixed on a shaft and has motion imparted to it from a steam or other motor, and the other of which is fixed to a drum whereon the rope or chain is wound to which the weight to be moved is attached, (the drum revolving loosely on said shaft,) and the faces of which disks, or a part thereof, are by a proper device alternately thrown into and out of contact with each other so as to act as a clutch to connect or disconnect the drum, as required, from the said motor in raising and lowering a weight. Said windlass is used for the most part to raise and lower the hammer in pile-driving machines, but is applicable to the purposes of hoisting in general. During the lifting action of such apparatus or windlass a powerful force is necessary to hold the disks in contact, in maintaining the connection of the motor with the drum, and a great amount of friction is entailed in consequence of the force thus used, unless suitable means are made use of to avoid it—absorbing power and enhancing wear.

The object of my invention is to combine the greatest amount of force, in maintaining the connection of the drum and motor, with the least possible friction; and my said invention consists in the use of certain devices (consisting essentially of a screw and lever) so arranged and combined with the drum and sustaining-frame of the apparatus as to facilitate the application of the said required force, and in the use of certain devices (consisting essentially of fixed and moving center bearings and a loose sleeve and collar) arranged and combined with the stationary and moving parts of the apparatus, for the purpose of diminishing the friction, substantially as hereinafter specified.

To enable others to make and use my inven-

tion, I will proceed to describe the same as applied to and combined with the apparatus or windlass aforesaid.

A, in the drawing, is the sustaining-frame, supporting all the parts. A' is the drum. B is a disk permanently fixed thereto, and both revolve freely on a shaft, C. Said shaft has permanently fixed thereon, near one end, the disk D. Both disks are shown in section. The said disks are fixed on the corresponding ends of the said shaft and drum, respectively, so that they may revolve in close proximity. They have V-form friction-surfaces turned upon and in their faces, respectively, the one fitting in the other, as seen in the drawing.

Motion is imparted to the apparatus by acting on the disk D with a pinion or band, and said disk is rotated continuously in the direction required to wind the rope or chain around the drum. When the drum is not to move with the driving-disk D, it is commonly held away by a spring introduced between the disks, and when the drum is to partake of the motion of the driving-disk it is crowded over, with its own disk, B, toward the driving-disk, by any suitable contrivance operated by an attendant, thrusting the friction or clutch surfaces of the two disks together, where they are forcibly held by the operator during the hoisting action. The means I employ to produce and maintain this thrust consists of a lever, L, combined with a screw, F, fitted in a suitable nut or female screw fixed to some part of the sustaining-frame of the machine. The force required to maintain the connection of the disks reacts on some part of the frame, inducing great friction between the frame and the moving parts adjacent. To avoid such friction, I provide two center-bearings—one at each end of the shaft—arranged in line with the center thereof, that at the end where the force is applied being movable and the other stationary. The movable bearing is formed on one end of a screw, F, fitted in a nut making part of a bracket, G, permanently fixed to the frame A. On the other end of the said screw F is attached the lever L, usually by a set-screw. The lever has a balance-weight on one end and a handle at the other end.

f is the fixed central bearing, and is set in the bracket k, also fixed to the frame.

To communicate the pressure exerted by the screw and lever to the drum, I employ a



sleeve or cap, E, intervened between the drum and the screw and lever, or its equivalent. This sleeve is nicely fitted on the end of the shaft so as to revolve thereon, and the exterior is fitted in suitable boxes in the frame A. The outer end of said cap E has the form of a cone, the apex of which is in line with the center of the shaft and of the movable bearing on F, and receives the pressure of said bearing as exerted by the screw and lever or other device. The cap E is sufficiently long to leave a space between the interior end thereof and that of the shaft. The screw and lever do not require to be combined with the sleeve or cap aforesaid, but may be used in connection with any device, intervened as aforesaid, that is competent to transmit the pressure of the screw and lever to the drum. The lever L has a balance-weight at one end, and is so adjusted on the screw that when such balance holds the lever in a perpendicular position, as it is seen in the drawing, the pressure is removed from the sleeve.

When the clutching or V surfaces of the disks are to be thrown together, the attendant grasps the lever and draws it forward, turning in the screw and lifting the balance-weight; and when the operator desires to disconnect the surfaces of the disks, he has only to let go the handle, when the balance-weight drops and turns out the screw, withdrawing the pressure. When the pressure is withdrawn, the drum is allowed to be revolved freely by the fall of the hammer or weight, lifted or otherwise.

To make the friction as light as possible between the sleeve and the end of the drum while the latter is freed from the motion of the driving-disk D and revolving in the opposite direction in lowering, &c., I have introduced a collar, T, between the sleeve and drum. Said collar is not, however, necessary to the successful use of the sleeve or cap.

If desired, a brake may be applied to the

periphery of the disk B to control or arrest the fall of the hammer, or other weight, during the descent thereof.

From the above description it will be apparent that the thrust required to maintain the clutching or V surfaces of the disks in contact in the connection of the drum with the motor is received and resisted wholly by the fixed and movable center bearings, and, therefore, during all the laboring or lifting action of the apparatus the entire revolving mechanism directly associated with the drum is practically, running between "centers," thus rendering the friction resulting from end-thrust merely nominal, and completely removing all disadvantages usually associated therewith.

In the above invention, I do not confine myself to the precise detail specified, but shall vary the parts as circumstances and occasion require, while retaining substantially the features herein described.

What I claim as new in the above, and as my invention, and desire to secure by Letters Patent, is—

1. The combination of fixed and movable centers or center-bearings with a drum and the friction-surface of fast and loose disks or their equivalents, substantially as described.

2. The construction and use of the sleeve or cap, as arranged on the shaft, and intervened between the center bearing and drum, for the purposes set forth.

3. Imparting the end-thrust required to effect and maintain the contact of the friction or clutching surfaces by means of the screw fixed in the lever, or its equivalent, in combination with the sleeve or other competent device, arranged and used substantially in the manner and for the purposes specified.

E. B. REQUA.

Witnesses:

R. S. ALLEN,  
JOS. B. BARNUM.