W. NOBLE.

WINCH OR WINDLASS.

APPLICATION FILED SEPT. 14, 1917.

1,249,809. Patented Dec. 11, 1917.

Fig. 2.

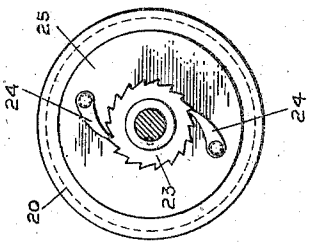
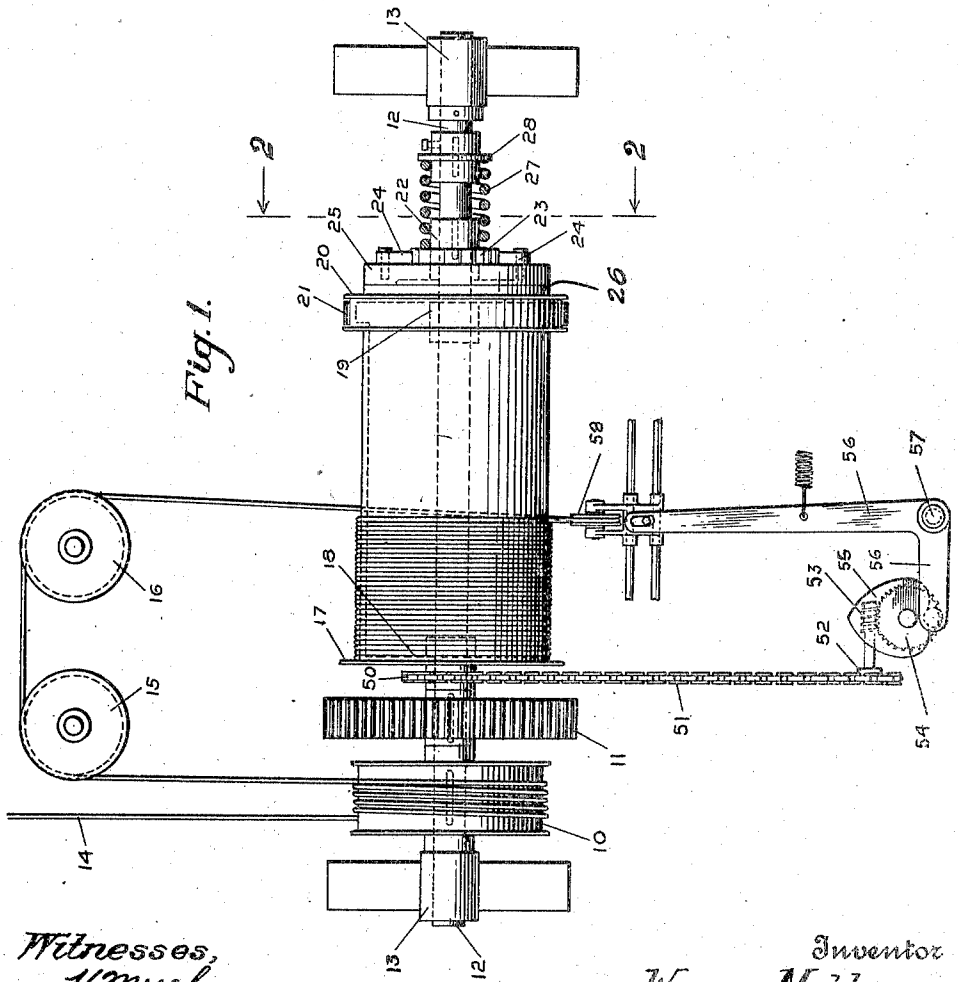


Fig. 1.



Witnesses,
H. Muchmore
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UNITED STATES PATENT OFFICE.

WARREN NOBLE, OF NEW YORK, N. Y.

WINCH OR WINDLASS.

1,249,809. Specification of Letters Patent. Patented Dec. 11, 1917.

Application filed September 14, 1917. Serial No. 191,363.

To all whom it may concern:

Be it known that I, WARREN NOBLE, a subject of the King of Great Britain, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Winches or Windlasses, of which the following is a specification, reference being had to the accompanying drawings, illustrative of and showing one particular form of my invention.

My invention relates to winches and windlasses to be employed for handling cable subject to varying strains, and of considerable length necessitating the spooling of the cable in layers on a storage drum of the winch and is particularly directed toward simple mechanism whereby a tension decreasing by layers may be impressed upon the cable as wound on the storage drum, and to make this tension independent of the tension of the cable due to the primary load. Among the objects are to produce such a structure simple and reliable and automatic in its operation, and with various advantages as will appear from the specification and the drawings showing one form of embodiment of my invention, in which—

Figure 1 is a plan view of a winch, and

Fig. 2 is a section of the same at 2—2.

In Fig. 1, 10 is the capstan drum driven by suitable power applied to gear wheel 11. Both drum and wheel are keyed to shaft 12 supported by bearings 13—13. The incoming or outgoing cable 14 is wrapped about the capstan drum passing about sheave-wheels 15 and 16 and the spooling mechanism, and led to the storage drum 17, rotatably mounted on shaft 12 by the bearings 18—19. At one end of this drum is formed the brake-drum 20, coördinated with it being the brake-band 21. A flat friction face for clutch abutment is formed by the end of drum 17.

Slidably mounted upon the shaft 12 and keyed to it is the clutch-hub 22, having ratchet teeth 23 engaging with pawls 24—24 pivoted to the clutch disk 25, of which 26 is the frictional material. Spring 27 reacting against abutment 28 keeps the clutch faces in contact.

The storage drum 17 is geared to the spooling device by sprocket 50, chain 51 and sprocket 52 in turn driving worm 53 and worm wheel 54. This latter being integral with the heart shaped cam 55, operating bell crank 56, pivoted at 57 and controlling the lead wheel 58 carried on suitable guides. This combination of gearing and leverages is so proportioned and positioned as to impart the correct travel to lead wheel 58 for spooling cable of the desired size evenly and closely on drum 17, and as shown is only illustrative.

By the positive relation of the storage drum to the spooling device the interposition of the slipping clutch device in no way interferes with the proper laying of the cable on the storage drum, no matter what the relative movement between the storage drum and capstan drum may be.

It will thus be seen in the particular form shown and herein specifically described, the mechanism employed comprises a capstan-drum driven by gearing from a suitable source of power by which the cable is reeled in or paid out. This capstan-drum is fastened to a shaft on which is rotatably mounted the storage drum or reel on which the cable is to be spooled. Between the capstan drive and this drum is a friction clutch tensioned by a spring. This clutch causes the storage drum to tend to rotate at the same speed as the capstan. The minimum diameter of the storage drum is slightly greater than the capstan diameter. The capstan is rotated from the motor. The cable is passed over suitably placed guide pulleys and reconducted to the storage drum which, tending to rotate at the same speed as the capstan, but being of greater periphery is constrained to slip against the torque necessary to slip the friction clutch, thereby tensioning the cable as spooled in a degree controlled by the friction of the clutch.

The couple turning the storage drum relative to the capstan is provided by the tension in the rope applied at the radius of its winding circle, which radius is increased with each superposed layer on the storage drum. Hence, if the torque necessary to slip the clutch is constant, the increase of the arm or radius of succeeding layers as laid, will decrease the tension in the rope in corresponding proportion,—the condition desired.

In order that unreeling may be properly accomplished, a brake is applied to the storage drum, and in this way a reversal of conditions is created. The major diameter being that of the storage drum and the cable passing about the capstan, it is obvious that if the cable be kept taut, the capstan must rotate

at greater speed than the storage drum, in which case the interposed friction clutch must slip in the opposite direction. If, however, the tension of unreeling became less than that required to slip the clutch, looping of the cable might occur unless the cable coils on the capstan released sufficiently to themselves act as a freeing clutch.

All such difficulties are, however, eliminated by mounting the clutch face upon a ratchet or one-way positive clutch of any preferred form, in which case the capstan-drum is entirely freed from constraint in the direction necessary for unreeling.

While I have described a particular embodiment of my invention, many and various modifications are within the scope of my invention, but what I claim and desire to secure by Letters Patent is:

1. In a winch, a hauling drum, a storage drum in axial alinement with it and frictional means interposed between the hauling drum and the storage drum whereby the degree of tension in the cable between the hauling drum and the storage drum may be controlled.

2. In a winch, a hauling drum, a storage drum of greater diameter than the hauling drum, a friction clutch interposed between the hauling drum and the storage drum for tensioning the cable between the hauling drum and the storage drum during the reeling in operation and means whereby the hauling drum is released from the constraint of the friction clutch during the paying out operation.

3. In a winch, a positively driven hauling drum, a storage drum coaxial with the hauling drum and frictionally driven therefrom, a brake on said storage drum and means between the storage drum and the hauling drum whereby during the unreeling process the cable is entirely subjected to the control of said brake.

4. In a winch, a storage drum and a coaxial hauling drum, means of securing tension decreasing by layers in cable stored on said storage drum by interposing between said storage drum and said hauling drum of smaller diameter of a friction clutch of constant resistance to slip.

5. In a winch, a hauling drum, a coaxial storage drum of greater diameter, sheave pulleys directing the cable handled from the hauling drum to the storage drum, a reversible spooling device positively geared to the storage drum, means for interposing frictional connection between the hauling drum and the storage drum during motion in one direction and means for releasing connection between the hauling drum and the storage drum during motion in the reverse direction.

6. In a winch, a positively driven hauling drum, a storage drum and means to effect a tendency to greater peripheral speed thereof than the hauling drum, means between the drums whereby the difference in angular speed set up by the passage over the drums of a unit length of cable creates a predetermined tension in the cable between the drums, said tension decreasing in magnitude with each successive superimposed layer and independent of the tension between the hauling drum and the load, and means whereby the hauling drum is released from the storage drum when its angular speed becomes greater than the angular speed of the storage drum in the opposite direction to that in which the tensioning occurs.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses, this 12th day of September, 1917.

WARREN NOBLE.

Witnesses:
HERMANN F. CUNTZ,
WILLIAM B. WALDO.

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