

B. D. THAYER.
WINDLASS.

No. 178,887.

Patented June 20, 1876.

Fig:1.

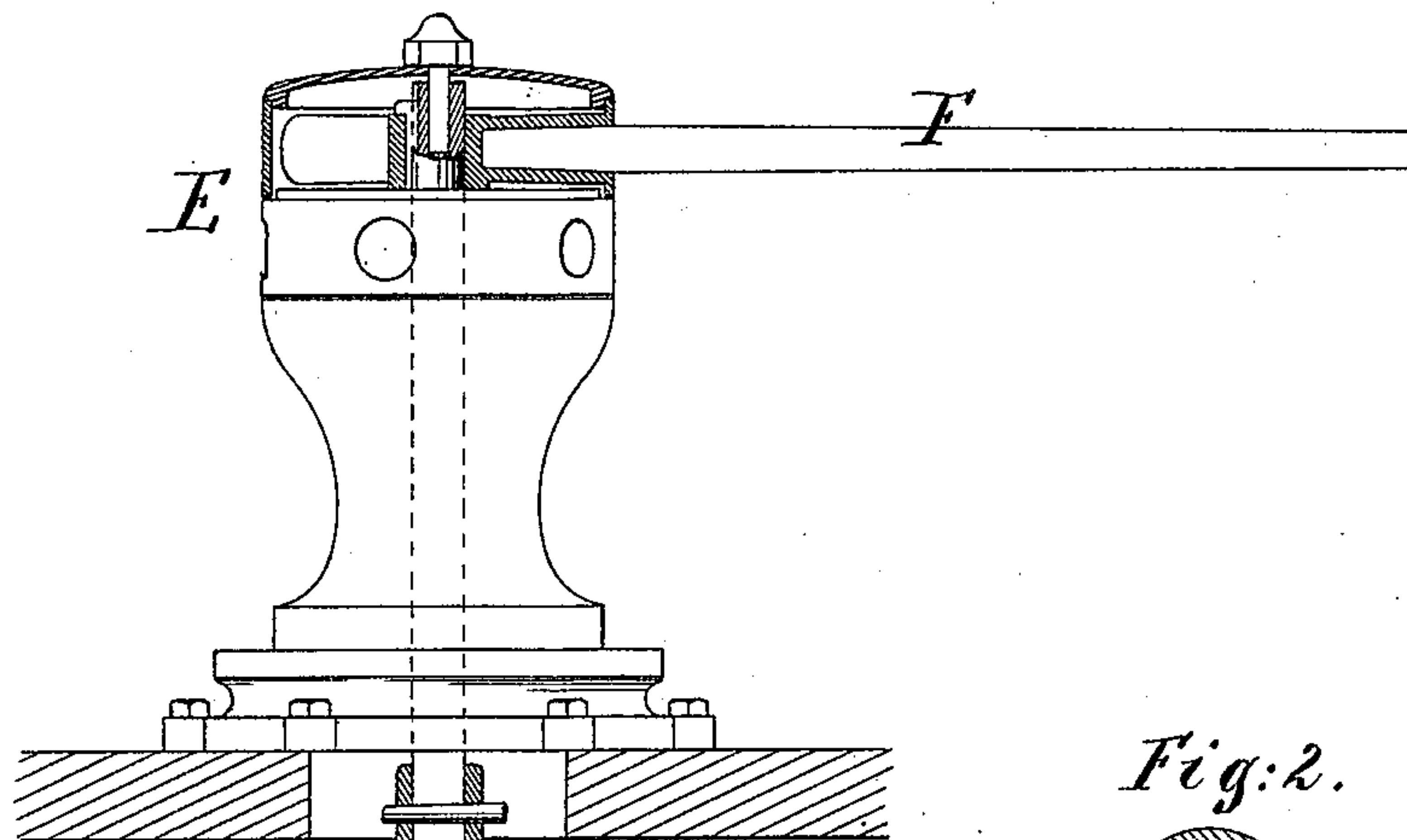


Fig:2.

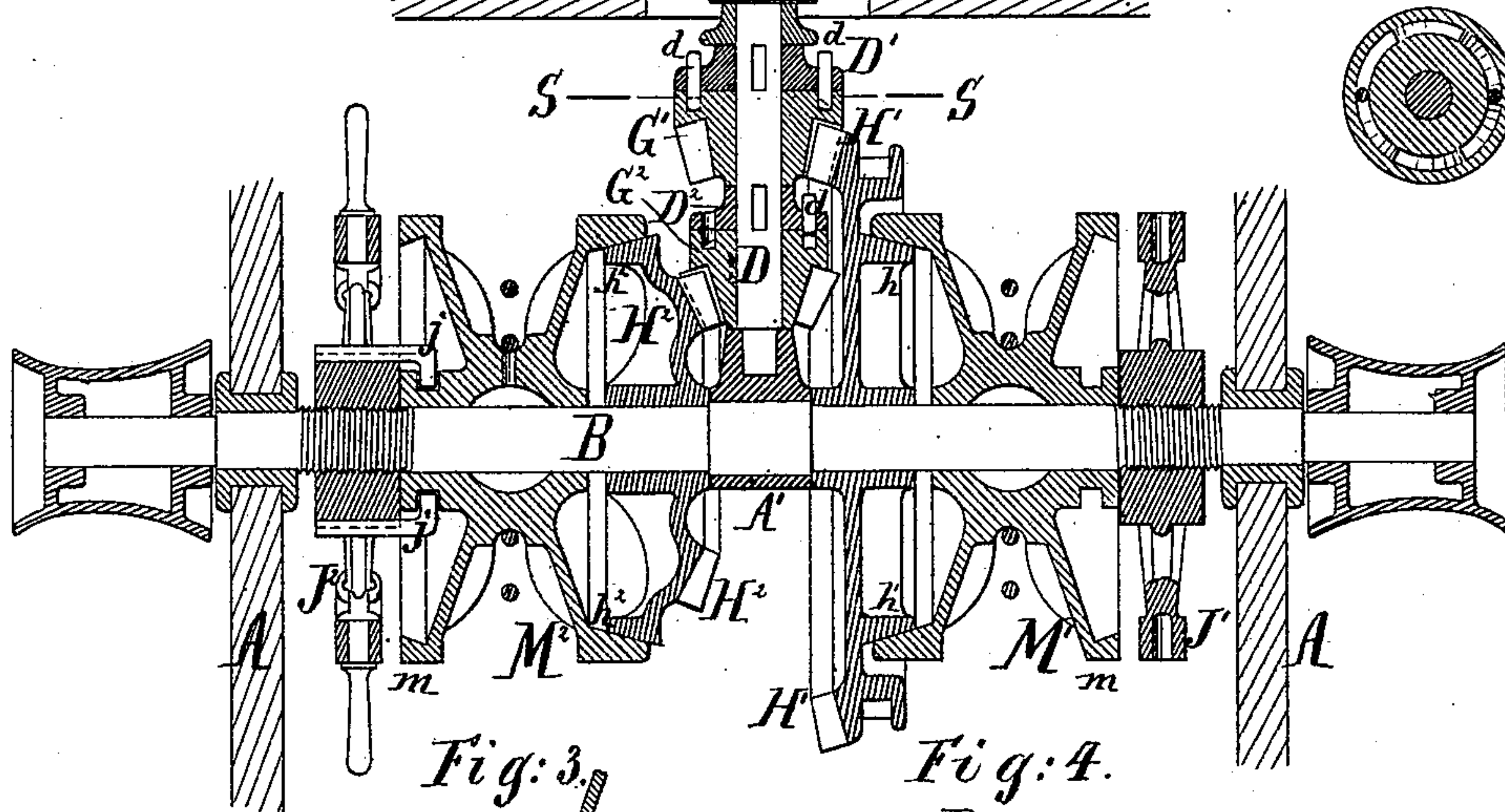
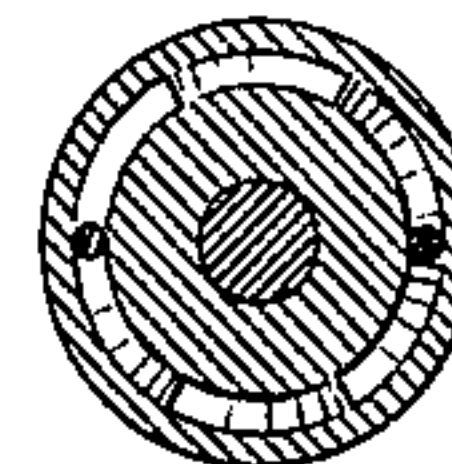


Fig:3.

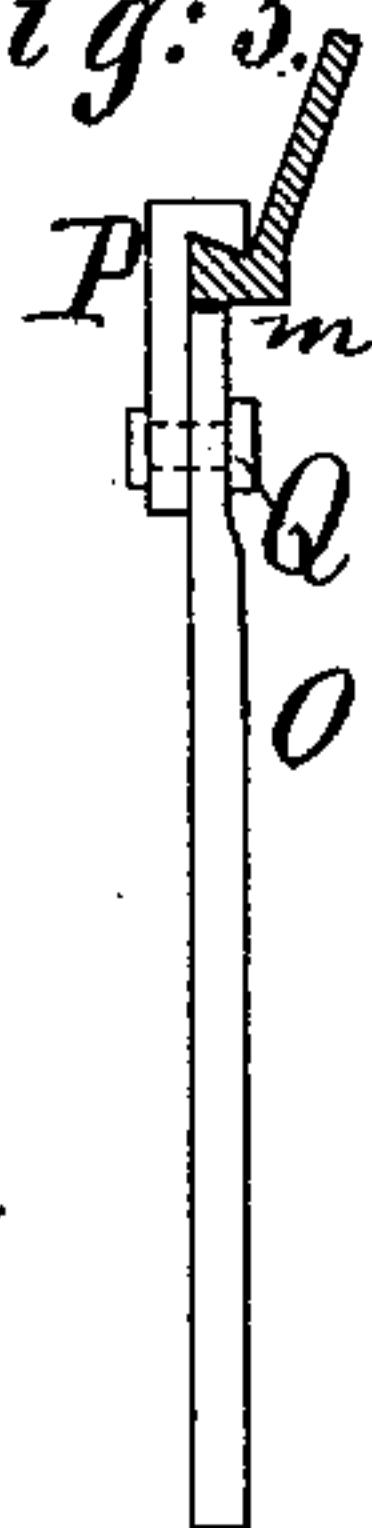
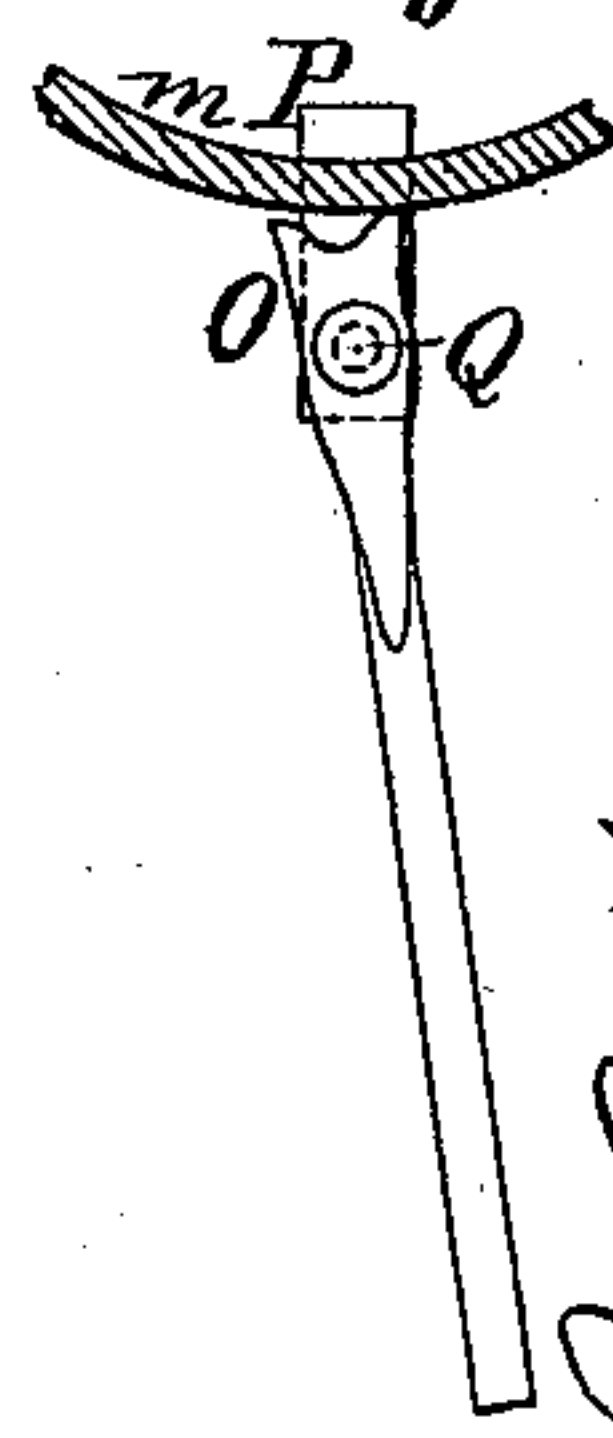


Fig:4.



Witnesses:

Geo L Dibble
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Inventor:

B. D. Thayer
by his attorney
J. L. Nelson

UNITED STATES PATENT OFFICE.

BARTON D. THAYER, OF NEW YORK, N. Y.

IMPROVEMENT IN WINDLASSES.

Specification forming part of Letters Patent No. 178,887, dated June 20, 1876; application filed May 8, 1876.

To all whom it may concern:

Be it known that I, BARTON D. THAYER, of New York city, in the State of New York, have invented certain Improvements relating to Windlasses for Ship use, of which the following is a specification:

I will describe the invention as applied with the windlass operated by a vertical shaft, turned by men working on a device like a capstan on the deck above. It will be obvious, however, that such operating-shaft may, instead of being vertical, be horizontal, or variously inclined, and, instead of being turned by hand, may be operated by a steam-engine or other suitable power. I employ friction-couplings peculiarly applied, and controlled by hand-wheels, in connection with such operating-shaft, and with gearing connected therewith, for giving two different degrees of purchase or mechanical advantage, and also suitable means for forcibly drawing the wild-cats out of frictional contact.

The accompanying drawings form a part of this specification, and represent what I consider the best means for carrying out the invention.

Figure 1 is a central vertical section. Fig. 2 is a horizontal section on the line S S. Figs. 3 and 4 represent a part which is capable of being detached, and is only used in turning the windlass a little way under peculiar conditions.

Fig. 3 is an edge view, and Fig. 4 is a side view. In each of these figures, 3 and 4, a portion of the adjacent mechanism is shown in section.

Similar letters of reference indicate corresponding parts in all the figures.

A A are fixed supporting-bits. B is the stout shaft of the windlass supported therein, and A' is a central bearing, loosely inclosing the shaft, and steadied thereby, forming the fixed step for the upright shaft D, through which motion is received from the capstan E, through the force of men through capstan-bars F. The overhanging ends of the shaft B receive small hollowed drums, to operate ropes in the ordinary manner. The novelty lies in the mechanism lying between and within the bearings or bits. The shaft D carries stout fixed wheels D¹ D², which, by means of

loose pins *d*, serving as pawls, engage with peculiar ratchets in the tops of the loose bevel-gear wheels G¹ G². The ratchets are so formed that they engage in opposite directions. When the shaft D is turned by the men in one direction the upper wheel G¹ is effective, and the pawl-pins *d* rattle idly over the ratchet in the lower wheel G². So, when the shaft D is turned in the opposite direction, the lower wheel G² becomes effective, and the upper set of pawl-pins *d* rattle idly over the ratchet in the upper wheel G¹. The upper wheel G¹ gears into a large bevel-gear wheel, H¹, keyed on the shaft D. The lower wheel G² gears into a smaller bevel-gear wheel, H², keyed or otherwise fixed firmly on the same shaft D. So far as yet described the mechanism is well known. On the outer face of each of the wheels H¹ H² are cones *h*¹ *h*², adapted to engage frictionally within a corresponding cavity in the adjacent face of a loose wild-cat or sprocket-wheel. These wheels are marked, respectively, M¹ M². They are free to move endwise a little on the shaft B, and are also free, except for the friction-coupling described, to turn independently thereof. J¹ J² are hand-wheels, the centers or hubs of which are strongly-threaded nuts, fitting on corresponding threads on the shaft B. These hubs are provided with hooks *j*, each of which engages in a groove in the adjacent wild-cat.

When my windlass is operated the shaft D and the two wheels H¹ H², which are firmly fixed thereto, turn together. They turn always in the direction adapted to take in the chain, and with a rate which is slow or fast, according as the shaft D is turned in one direction or the other. Being thus turned in either direction—say, for example, with the slowest rate of speed, and, therefore, with the greatest purchase, by making the wheels G¹ H¹ effective—either of the chains may be taken in or let out at will, by turning the hand-wheel J¹ or J² in one direction or the other. Directing attention to the wheel M² and its connections, (turning the hand-wheel J² in the direction to force it against M²,) the latter is driven into such tight union with its conical bearing on H² that it is compelled to turn therewith. Thus conditioned, the chain will be taken in; but when it is desired to pay out it is only

necessary to turn the hand-wheel J^2 in the direction to move it away from the adjacent wild-cat, in order to not only cease to press the latter upon its frictional cone, but to forcibly draw it away by means of the hooks j . When the wild-cat is out of contact with its conical bearing it turns freely, and allows the chain to pay out.

Either wild-cat may be operated by its corresponding hand-wheel independently, and thus both chains may be taken in together, if there is power enough in the turning-force applied to the shaft D ; or either may be taken in, and the other held by a cable-stopper, (not represented,) or otherwise.

The conical bearings, by which the wild-cats $M^1 M^2$ engage with the gear-wheels $H^1 H^2$, may be tapered more or less than is here shown. In the one case the force with which the parts will engage will be increased, and in the other case diminished. An increase in the frictional power involves a necessity for drawing the hand-wheel farther away, in order to disengage it, and it is possible to make the force of the friction greater than is desirable.

I esteem it an important advantage in the use of my windlass that, by screwing up the hand-wheel to engage its corresponding friction-coupling with just sufficient force, the cable may be taken in reliably under all ordinary strains, but will yield a little to an extraordinary movement of the vessel by the slipping of the friction-coupling, and thus a fracture of any part be avoided. Ordinarily, my improved windlass may be said to have that advantage that it will yield and slip rather than break when, in heaving short with the anchor fast in a rocky bottom, or under any other circumstances, the strain is greater than the anchor or connected parts can bear.

Provisions for different degrees of purchase

corresponding to mine have been before applied in combination with other kinds of mechanism in windlasses. So, also, friction-couplings have been used, and friction-couplings controlled in a manner analogous to mine, by pressing the wild-cats endwise, have been used in windlasses; but I am not aware that my combination, or any other capable of attaining the same useful ends, has been before known or proposed.

My entire combination forms a windlass that fulfills all requirements without putting in and taking out block-keys, or necessitating any loss of time in making any changes in cases of emergency. My windlass is ready, under any and all circumstances, to pay out chain instantly, which cannot be done by any other windlass known to me.

I claim as my invention and desire to secure by Letters Patent—

1. The double-gear friction-windlass described, having one or more loose sprocket-wheels or wild-cats coupled frictionally to the main shaft B , in combination with the operating-shaft D , wheels $G^1 G^2$, the corresponding wheels $H^1 H^2$, and the hand-wheels $J^1 J^2$ and hook j , adapted to give different degrees of purchase.

2. The wild-cats $M^1 M^2$, coupled frictionally and controlled by the hand-wheels $J^1 J^2$ and hook j , and adapted to not only press the wheels into the desired frictional contact, but also to forcibly draw the wild-cats out of contact, as and for the purposes herein specified.

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

BARTON D. THAYER.

Witnesses:

C. C. STETSON,

PHILLIPS ABBOTT.