M. G. IMBACH.

Windlass.

No. 160,675. Patented March 9, 1875.

Fig. 1.

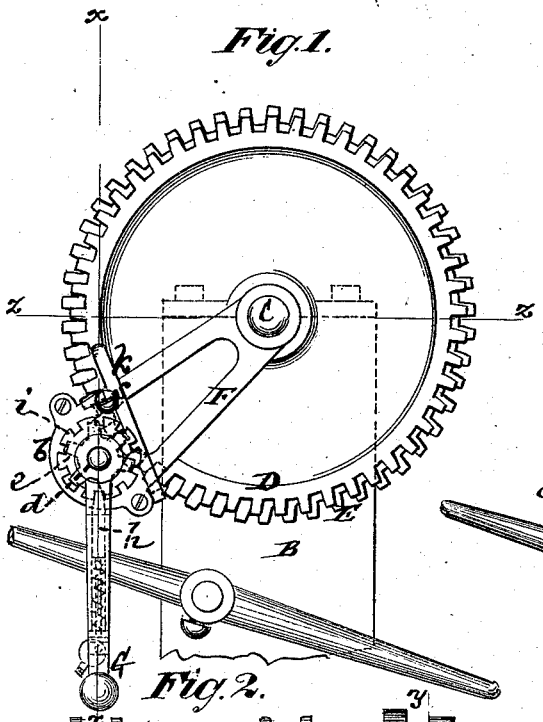


Fig. 3.

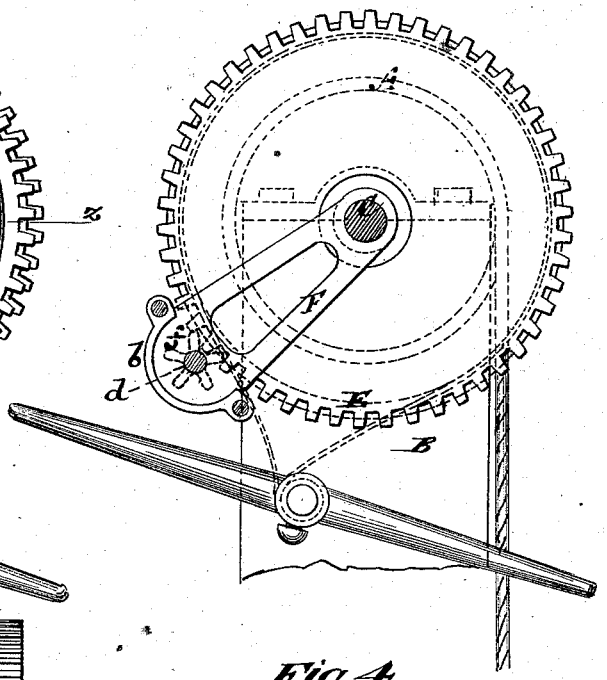


Fig. 2.

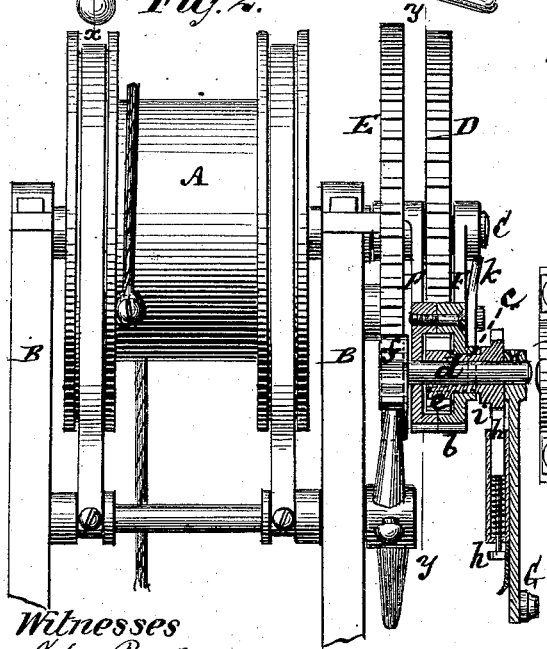
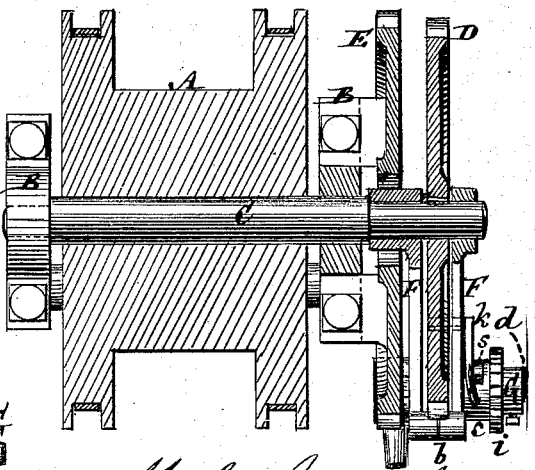


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

MARTIN G. IMBACH, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN WINDLASSES.

Specification forming part of Letters Patent No. **160,675**, dated March 9, 1875; application filed February 4, 1875.

To all whom it may concern:

Be it known that I, MARTIN G. IMBACH, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Windlasses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figure 1 represents a side elevation of a windlass constructed in accordance with my invention; Fig. 2, a sectional elevation in direction of the length of the axis of the windlass on the line *x x;* Fig. 3, a sectional elevation transversely to said axis on the line *y y*, and Fig. 4 a horizontal section on the line *z z.*

This invention relates to windlasses, or apparatus for raising and lowering purposes, in which the hoisting-barrel is actuated by differential gear. The invention consists in a novel combination of devices, constituting a differential gear for operating the windlass-barrel, whereby great simplicity of parts and efficiency is obtained. It also consists in a combination, with said devices, of a loose pinion-sleeve and stop or catch for releasing the barrel when required, so that it may run free; and it furthermore consists in a combination, with said devices, of an independent stop or catch for actuating the barrel at a quick speed, in a direct manner, as it were, or without the interposition of the differential gear.

A represents an ordinary windlass-barrel, constructed to turn in cheeks or standards B B. Fast to the axle or shaft C of said barrel is a wheel, D, and concentric with said wheel, but stationary or fast to the main frame, is a wheel or circular rack, E. F is a revolving yoke, arranged to turn loosely on the shaft C, and carrying, or being constructed to form, at its outer end, a box, *b*, in which is fitted to turn a sleeve, *c*, that is loose on a shaft, *d*. This sleeve *c* has fast on it a pinion, *e*, which gears with the wheel D, and the shaft *d* has fast on it a pinion, *f*, which gears with the circular rack E. The pinion *e* has one or more teeth in it than the pinion *f*, and the wheel D one or more less teeth in it than the stationary wheel or circular rack E; or these several wheels and pinions may be otherwise proportioned to give the necessary differential movement. Secured to the outer end of the shaft *d* is an operating crank or handle, G, and connected with said crank is a stop or catch, *h*, of any suitable construction, and which may either be adjusted to lock with a toothed disk, *i*, fast on the sleeve *c*, or to be disconnected therefrom.

When the catch *h* is in gear or lock with the toothed disk *i*, then the shaft *d*, which is operated by the crank G, and which not only rotates on its own axis, but also, by the yoke F, around the axis of the windlass-barrel, is geared or connected with the sleeve *c*, so that the pinions *e f* are made to rotate in common with or round their respective wheels, or wheel and rack, D and E, and, on the crank G being rotated, a slow but powerful movement is communicated to the barrel A by the action of the differential gear *e f* D E. When thus operating the sleeve *c* ceases to be loose, and the pinions *e f* are both virtually fast to the shaft *d*, the catch *h* in such case only being a convenient means of making the pinion *e* fast to turn in common with the shaft *d* and its pinion *f*.

When it is required to run the windlass-barrel A loose, then the catch *h* is released from the toothed disk *i*, which leaves the sleeve *c*, with its pinion *e*, free to be turned by the wheel D in common with the barrel. When, again, it is necessary to operate the barrel A by the crank G at a quick velocity, or without the aid of the differential movement—as, for instance, in taking up slack or lifting light weights—then not only is the catch *h* thrown out of lock with the toothed disk *i*, but the revolving yoke F is put into gear with the wheel D by a stop or catch, *k*, pivoted at *s*, or otherwise connected with the yoke, so that on turning the crank G the barrel A is rotated at a velocity corresponding with the travel of the pinion *f* around the circular rack E. These several combinations obtain for the windlass, in a simple and efficient manner, all the necessary changes as regards a quick or loose speed, and free run of the barrel when required.

The barrel A may, as represented, be provided with a brake of any suitable construction.

When it is desired to work the windlass by steam-power instead of by hand, then there may be substituted for the crank G any other suitable device for rotating the shaft *d*, and

the stop or catch *h* be connected with said operating device. Thus, there may be a pulley loose on the shaft C outside of the yoke F, and another pulley fast on the shaft *d*, driven by chain, belt, or otherwise from the former pulley, and forming a substitute for the crank G. Or, again, when driving the windlass by horse-power, with the axis of its barrel arranged vertically instead of horizontally, any suitable lever or bar may be made the operating device of the shaft *d* instead of the crank.

I claim—

1. The combination, with the barrel A and its shaft or axle C, of the revolving yoke F, the shaft *d*, the pinions *e f*, the wheel D, fast on the barrel-shaft, and the fixed wheel or circular rack E concentric therewith, substantially as specified.

2. The combination of the loose sleeve *c* on the shaft *d*, the stop or catch *h*, for connecting the sleeve with said shaft, the revolving yoke F, the pinions *e f*, the rotating wheel D, the fixed wheel or circular rack E, and the barrel A, essentially as described.

3. The stop or catch *k*, in combination with the revolving yoke F, loose on the barrel-shaft C, the shaft *d*, the pinion *f*, the fixed wheel or circular rack E, and the wheel D, with which the catch locks, substantially as specified.

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Witnesses:
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