

W. H. HARFIELD.
Windlasses.

No. 156,461.

Patented Nov. 3, 1874.

Fig. 1.

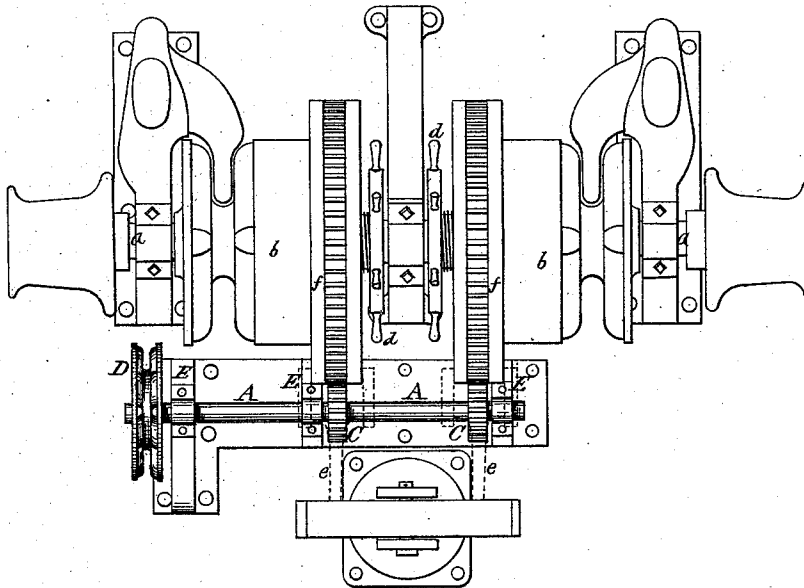
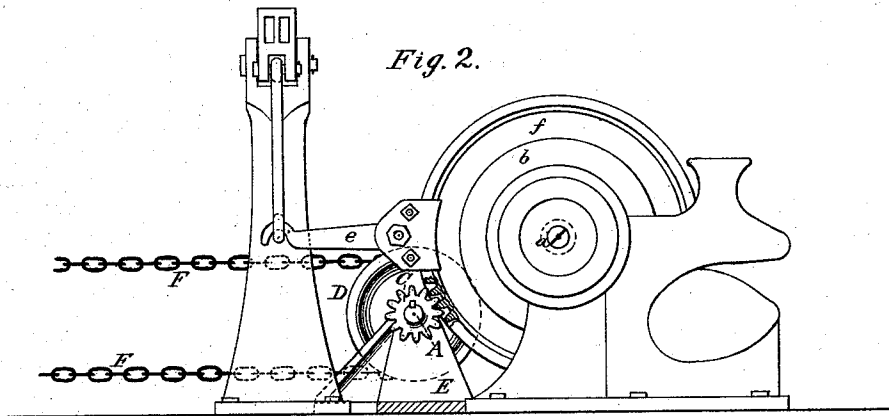


Fig. 2.



Witnesses:

Sam. Fro. Smith
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UNITED STATES PATENT OFFICE.

WILLIAM HORATIO HARFIELD, OF LONDON, ENGLAND.

IMPROVEMENT IN WINDLASSES.

Specification forming part of Letters Patent No. **156,461**, dated November 3, 1874; application filed October 9, 1874.

To all whom it may concern:

Be it known that I, WILLIAM HORATIO HARFIELD, of Mansion House Buildings, London, England, have invented a new and useful Improvement in Steam-Gearing for Ships' Windlasses, of which the following is a specification:

The object of my invention is to enable steam-power to be applied, at any time required, to a ship's windlass, without necessitating the use of a special steam-engine, or, when such engine is used, to enable steam-power to be applied should the engine be deranged, or its power deficient. To this end my invention consists in a driving-shaft, arranged on one side of the windlass, provided with pinions which gear with the toothed purchase-wheels of the windlass-barrel, and having fixed on its outer or free end a chain gear-wheel, which is geared when desired with an endless chain engaged with one of the steam-winchies or hoisting-engines on deck, or with some other of the ship's engines, and steam-power thereby applied to the windlass on required occasions.

In the accompanying drawings, Figure 1 is a plan view of a ship's windlass, provided with my improvement; and Fig. 2 is an end elevation thereof, the bearing of the driving-shaft nearest the observer being removed.

The general construction of the windlass-barrel is similar to that described in my previous patents, dated August 17, 1869, and December 23, 1873. *a* is the main shaft, to which are keyed the large toothed purchase-wheels *f f*. *b b* are the chain-wheels with which the anchor-chains (not shown) engage, which wheels are loose upon the axle *a*, but engaged therewith when required by a friction-clutch, which also acts as a brake, actuated by the hand-wheels *d d*, which operate through the centers of the purchase-wheels *c c*. The foregoing, however, may be of any suitable or preferred construction, as my present invention does not relate to such parts. Aft the windlass-barrel, preferably, is arranged the driving-shaft *A* journaled in suitable bearings *E*, and provided with fixed pinions *C C*, which gear with the toothed purchase-wheels *f f*. On the free or outer end of the shaft *A* beyond the bearing is fixed a chain gear-driving wheel, *D*,

preferably of small diameter, as shown. When it is desired to apply steam-power to the windlass, the driving-wheel *D* is engaged, by means of an endless chain, *F*, Fig. 2, slipped over its periphery, with one of the steam-winchies or hoisting-engines on deck, or with one of the ship's engines below, and power thus applied to revolve the windlass on occasions when the manual labor usually employed is not sufficient, or is not available. The driving-wheel *D* being on the free end of the shaft, outside the bearing, the endless chain may be slipped on or off with ease, or be entirely removed when required. Chains of different lengths may be provided, so that in case one of the steam-winchies is deranged, or not available, another may be used, or, in case none of them are available, one of the ship's engines below may be geared with the driving-wheel, and thus, in almost any emergency, steam-power may be applied to the windlass. The usual nipping-levers *e e*, shown in dotted lines in Fig. 1, by which the windlass is worked by manual power, are engaged with the purchase-wheels *f f*, either on the same side as the shaft *A*, or on the opposite side, and they also act as pawls to prevent the reverse motion of the windlass. The driving-pinions *C C* being also engaged with the purchase-wheels, the nipping-levers act to divide the strain, caused by any tendency to reverse motion between themselves and the pinions, and thus prevent any greater strain bearing on the pinions than the pinions when in action bring to bear upon the purchase-wheels, thereby preventing injury to the parts, which would not occur were the pinions geared with any other part of the windlass-barrel. This arrangement also enables manual power to be used to assist the steam without danger to the men, which is a result of importance.

When a special steam-engine is employed for the operation of the windlass, my invention will also be valuable, for in such case it will enable steam-power to be applied should the engine become deranged, or enable additional power to be used should some emergency require it.

It will be seen that but a moment's time is required to engage the driving-wheel and endless chain with one of the steam-winchies,

and steam-power thereby applied to the windlass at any time required in a convenient and effective manner. It will be thus observed that my invention enables a special steam-engine to be dispensed with, and saves thereby an important item of expense, and also valuable space which otherwise would be occupied, while at the same time it admits of the application of steam-power with almost as much convenience, and fully as good effect, as if a special engine were used, which results constitute my invention an improvement of great utility.

I claim as my invention—

In a ship's windlass, the driving-shaft A provided with the pinions C C in gear with

the windlass-barrel, and having fixed thereon a chain gear-wheel, D, with which an endless chain, driven by a separate engine, may be engaged to communicate motion to the windlass, substantially as herein set forth.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM HORATIO HARFIELD.

Witnesses:

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