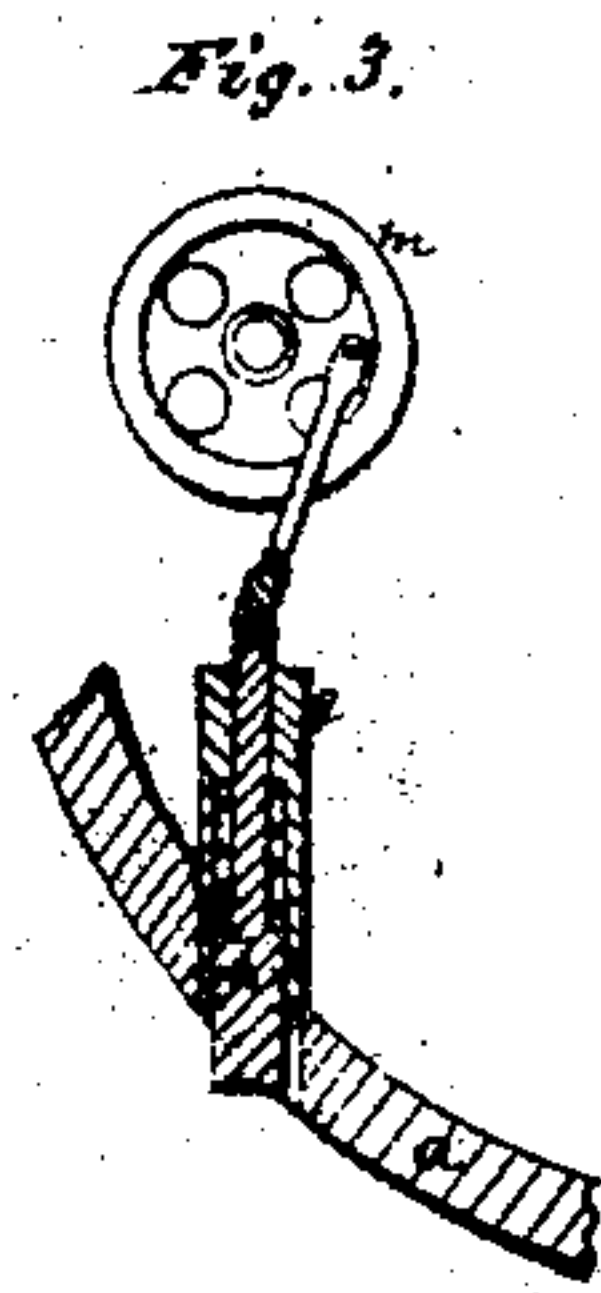
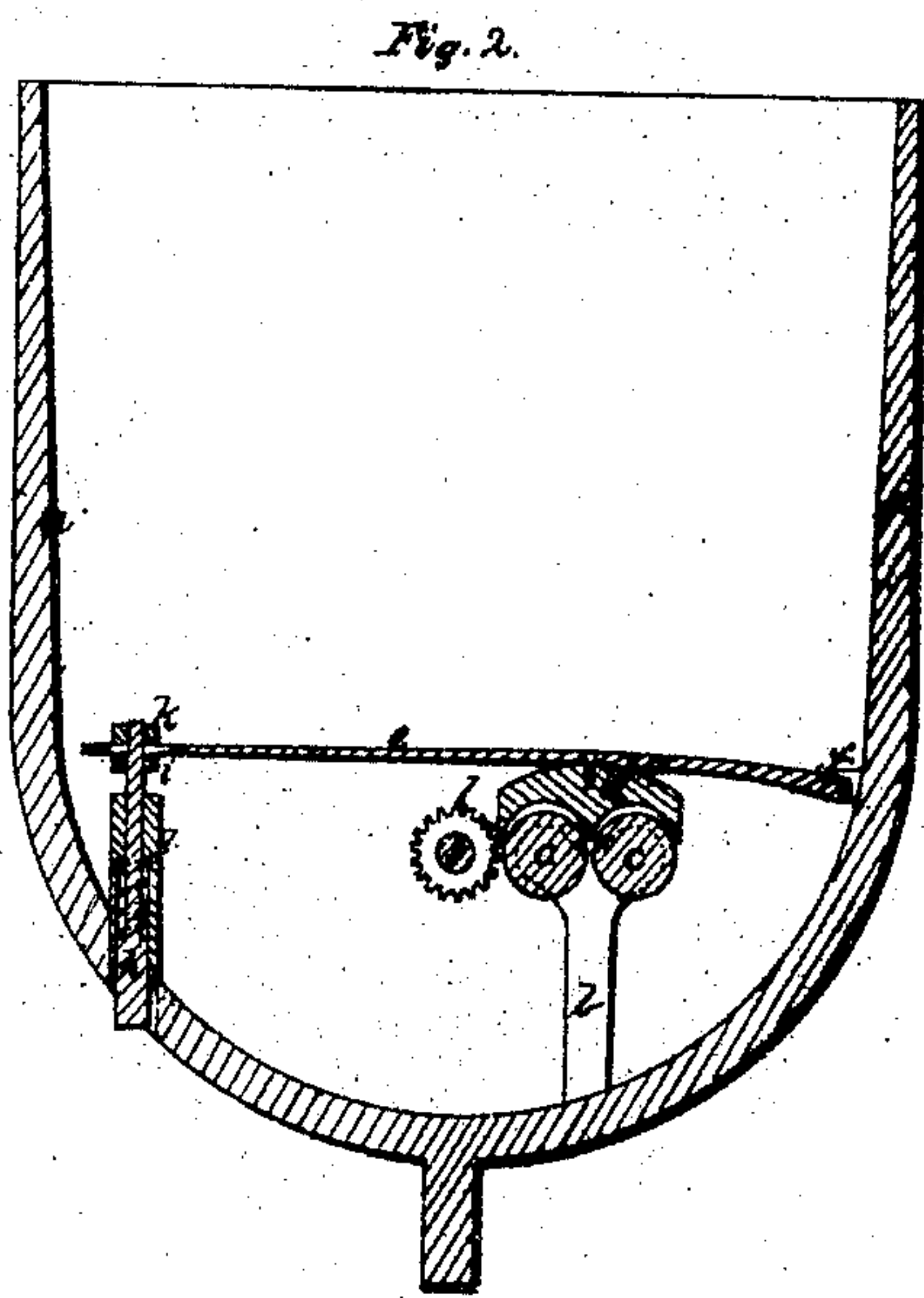
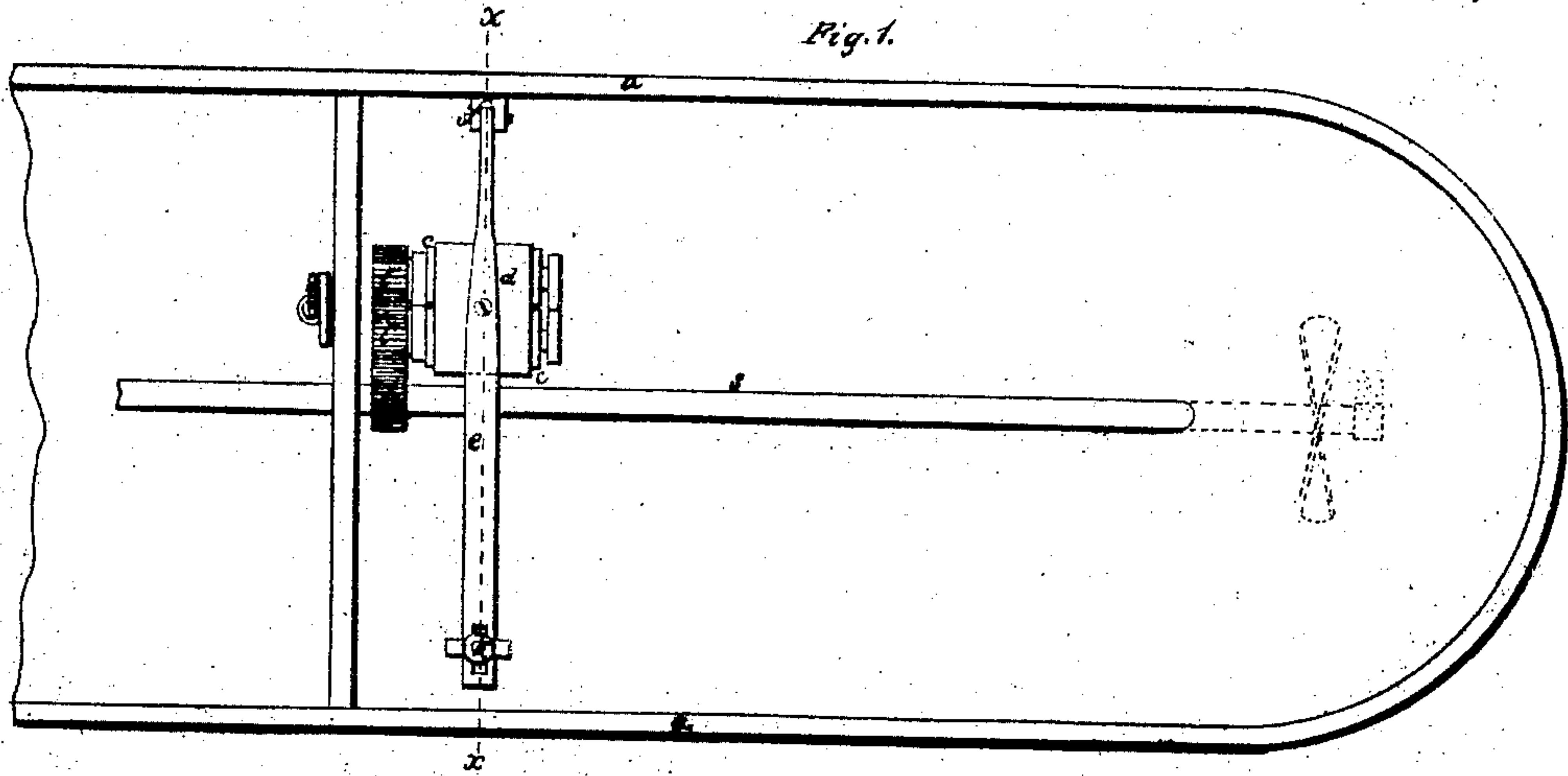


H. Dale.
Screw Propeller
No 62,399.
Patented Feb. 26, 1867



Witnesses:
J. A. Adams
E. H. Smith.

Inventor.
Henry Dale

United States Patent Office.

HENRY DALE, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 62,399, dated February 26, 1867.

IMPROVED DEVICE FOR REGULATING THE REVOLUTION OF PROPELLERS OF STEAM VESSELS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, HENRY DALE, of Boston, in the county of Suffolk, and State of Massachusetts, have invented a new and useful improvement in the Method of Regulating the Revolution of the Propelling Shafts of Steam Vessels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a plan view of the apparatus used in carrying out my invention.

Figure 2, a transverse section of the same on the line *x x* of fig. 1; and

Figure 3 is a modification of a device used in carrying out my invention.

Similar letters of reference indicate like parts in the several figures.

The object of my invention is to prevent the too rapid revolution of the propeller shaft or "racing" of the engine, as it is termed, occasioned by the propelling screw being raised out of the water in an uneven sea; and the invention consists in the employment of a means for preventing such "racing" by the application of friction to the propeller shaft, by means of the resistance or varying pressure of the water acting upon an elastic substance or a piston, or other equivalent device attached to the hull of the vessel, the said spring or equivalent device being connected in any suitable manner with the propeller shaft.

The invention is based upon the principle of the pressure of the water being greater upon an object the deeper the latter is submerged, while the said pressure decreases as the object rises to the surface.

Referring to the drawings, *a* represents the hull of a vessel. *b* represents an upright or standard (there being two of the same) securely attached to the inner sides of the hull, and supporting the two friction-rollers or cylinders *C C*. These rollers are each provided with gear-wheels, *l l*, at one end, engaging with each other, and on the shaft *S* is also a gear-wheel, *k*, which may be thrown at pleasure in or out of gear with one of the aforesaid gear-wheels. Over the friction-rollers *C C* is arranged a brake-block, *d*, formed, as shown in fig. 2, so as to cover a large portion of the surface of each roller. The friction-block *d* is attached to a bar, *e*, which is hinged or pivoted to a projecting piece, *f*, secured to the inner side of the hull. The bar *e* extends across the vessel transversely, and to the other or free end of the same is attached a rod bearing a piston, *h*, at its lower end. The piston *h* is placed within a tube or cylinder, *g*, secured to the inner side of the vessel's hull, and extending through the same, with an opening at its outer end. The piston *h* is adjusted and held in proper position by means of a coiled spring, arranged as shown, or a rubber or other suitable spring may be used. The piston-rod is attached to the transverse bar *e* in such a manner as to admit of the said rod and piston moving freely in the tube *g*.

The operation is as follows: When the vessel is in a smooth sea and in proper trim, the piston *h* will be so adjusted as to cause the brake *d* to be free from the friction-rollers *C C*. When in a rough and uneven sea, the stern of the vessel will alternately rise and fall, causing the propeller to be at times nearly out of water and again deeply submerged in the same. When out of water, and free from the resistance of the same, the unchecked action of the engine will cause the propeller to revolve very rapidly. In the operation of my invention, as the portion of the vessel in which the cylinder and piston are placed rises, the resistance of the water will be diminished upon the piston, causing the latter to descend, and thus bringing the brake *d* to bear upon the rolls *C C*, which, by their connection through the gears *f f' f''* with the shaft *S*, will offer a sufficient resistance to overcome the increased action of the engine usually termed the "racing." As the said portion of the vessel descends, the piston will rise by the increased pressure of the water and the brake *d* will rise from the rollers *C C*, and thus an automatic action will be established to operate as circumstances require.

I have described my invention as applied to the shaft of a propeller in the stern of a vessel. It is obvious, however, that the same principle may be applied to the shafts of side-wheel steamers.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The automatic regulation of the motion of the propeller shaft of a steam vessel by means of devices operated by the resistance or varying pressure of the water.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY DALE.

Witnesses:

J. H. ADAMS,

G. A. C. SMITH.