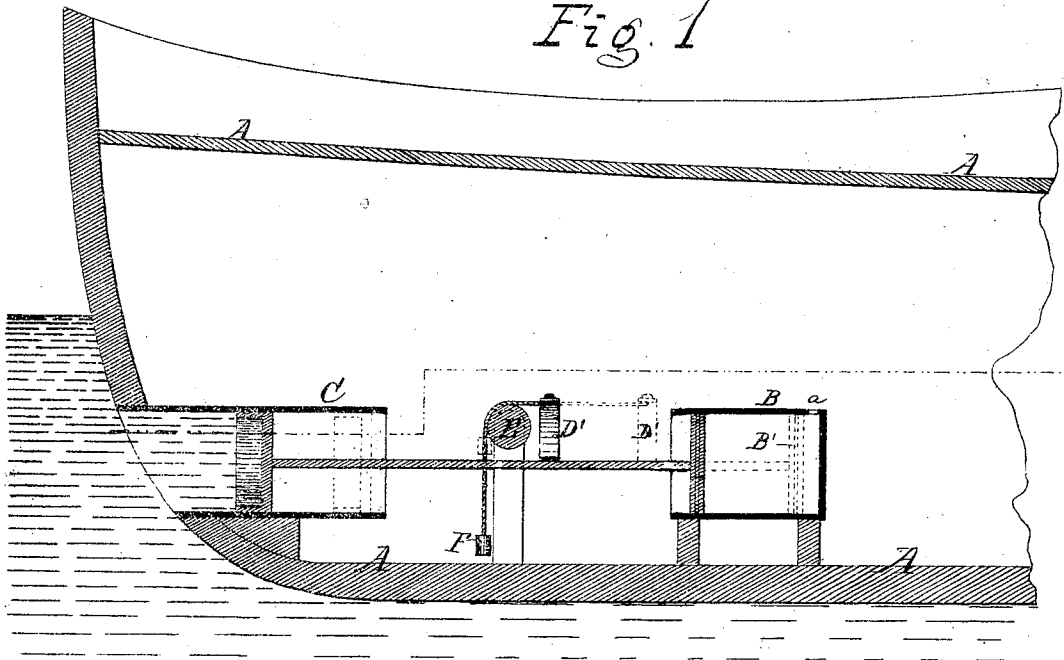


118151

E Raynale *Propelling Vessels.*

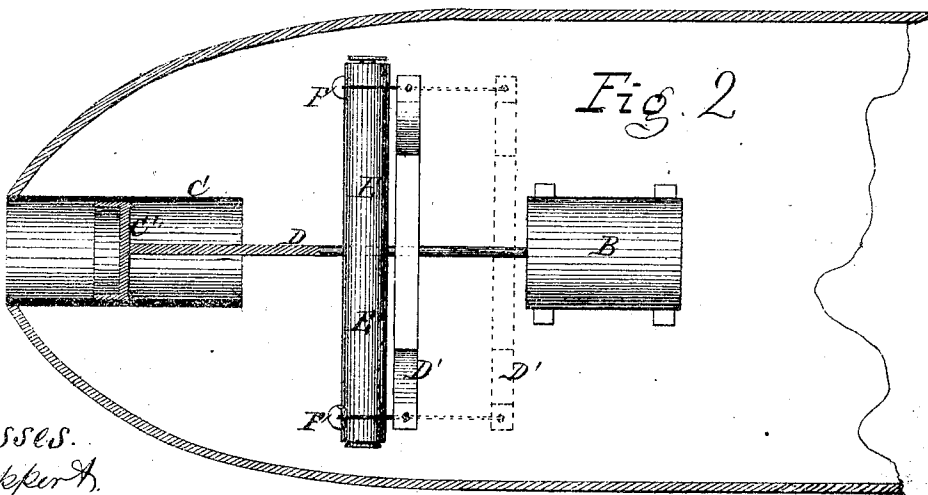
PATENTED AUG 15 1871

Fig. 1



E. Raynale
Inventor.
D. P. Holloway & Co.
Attys

Fig. 2



Witnesses.
A. Ruppert &
C. H. Clausen

UNITED STATES PATENT OFFICE.

EBENEZER RAYNALE, OF BIRMINGHAM, MICHIGAN.

IMPROVEMENT IN PROPELLING MECHANISMS FOR VESSELS.

Specification forming part of Letters Patent No. 118,151, dated August 15, 1871.

To all whom it may concern:

Be it known that I, EBENEZER RAYNALE, of Birmingham, in the county of Oakland and State of Michigan, have invented certain Improvements in Machinery for Propelling Vessels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawing making part of this specification, in which—

Figure 1 is a sectional elevation of my improved machinery as it appears when placed in a vessel, the steam and water-cylinders being shown, and also the weights and rollers used as auxiliaries to the steam. Fig. 2 is a plan view, partly in section, showing the same parts.

Corresponding letters refer to corresponding parts in both figures.

This invention relates to machines for propelling vessels by steam, it being designed principally for use upon canals, but it is applicable to other and large vessels when used upon rivers or other large collections of water; and it consists in the combination and arrangement of some of the parts of which it is composed, as will be more fully explained hereinafter. The importance of some simple and effective means for propelling canal-boats by steam or other gases under pressure is well known, and is acknowledged by all persons acquainted with this method of transportation; and the object of this invention is to provide such means, they being simple in construction, and so cheap as to place them within the reach of all who may be desirous of using them.

In constructing machines of this character, to be applied to canal-boats or other vessels, I employ two cylinders—one for steam and the other for water—and connect them or combine them by means of a connecting-rod, which has a piston upon each of its ends. The cylinder which is designated by the letter B is used as a single-acting steam-engine, it being provided with any suitable valve and valve-gear which will admit steam to its inner closed end and permit it to be exhausted therefrom. When the piston in this cylinder is in the position indicated by dotted lines in Fig. 1, steam is admitted between it and the cylinder-head through the aperture *a* in the cylinder, which will force the piston to the position shown in full lines in the same figure. The end of the cylinder toward which the piston has

been described as moving being open, it follows that no compression of air will take place therein. The cylinder designated by the letter C consists of a plain open-ended tube of the required diameter, both of its ends being open. It is supplied with a piston, C', which is fitted to work water-tight therein, and is attached firmly to the piston-rod D, which extends into the cylinder B, and has upon its opposite end a piston, B', also fitted to work tight in the steam-cylinder. About midway between the two cylinders, or in some other convenient location, there is placed a roller or a pair of rollers, E, over which cords or chains pass, such cords or chains being attached by one of their ends to an arm or arms, D', which is secured to the piston-rod and moves with it. From this arm or arms the cords pass over or around the roller or rollers E, and have upon their opposite ends weights F F, as shown in the drawing.

The operation of this improved machinery is as follows: The parts having been constructed and arranged, substantially as shown and described, they are placed in the boat A, as shown in the drawing, and firmly secured in position; and when the pistons are in the positions shown by the full lines in Fig. 1 the water will press against the piston C' of the water-cylinder and force it toward the inner end of its cylinder, and into the position shown by the dotted lines in Fig. 1, which action of the water and movement of the piston will cause the rod D and piston B' to be moved an equal distance and to be brought into the position indicated by the dotted lines in the cylinder B. The above-described movement of the parts will also cause the arm or arms D' to change their or its position, which will have the effect to raise the weights F F, the doing of which will offer some resistance to the movement of the pistons and rod; but it is apparent that the power required to lift this weight and to move the pistons in this direction will be furnished by the water through which the vessel floats, and, consequently, that it will not cost the operator or owner anything, but will nevertheless be available for aiding the movement of the pistons in the opposite direction. When the pistons have arrived at the position shown in dotted lines in Fig. 1, steam is admitted through the aperture *a* in the steam-cylinder, and the pistons will be driven to the position shown by the full lines, in which movement they will be aided by the weights F

F, and as the piston in the water-cylinder will press directly against the water it follows that the boat or vessel will be propelled in a direction the opposite to the one in which the piston is moving.

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

In an engine for propelling canal-boats and other vessels, the combination of a water-cylinder, C, open at both ends, a steam-cylinder, B, open at one end, and the mechanism for aiding

the steam in forcing the piston in the proper direction for propelling the boat, the parts being constructed and arranged substantially as set forth.

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

EBENEZER RAYNALE.

Witnesses:

B. EDW. J. ELLS,
A. RUPPERT.