

J. B. Cullen.

Marine Steam-Governor.

N^o 75868

Patented Mar. 24, 1868

Fig. 1.

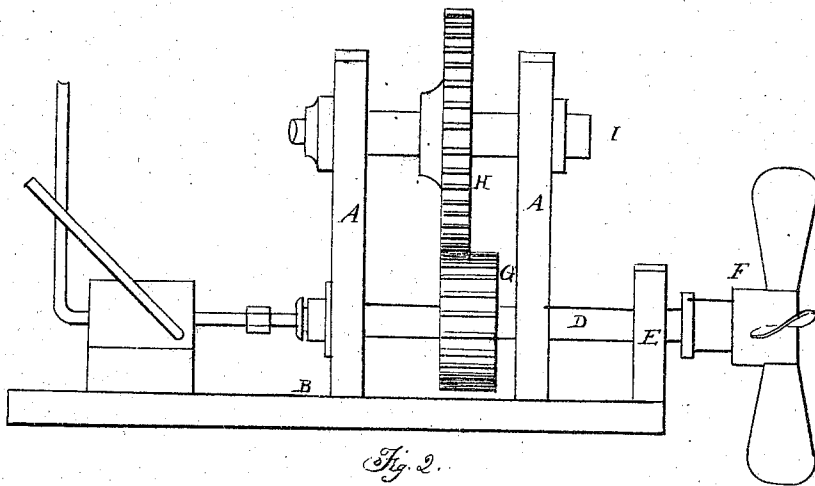


Fig. 2.

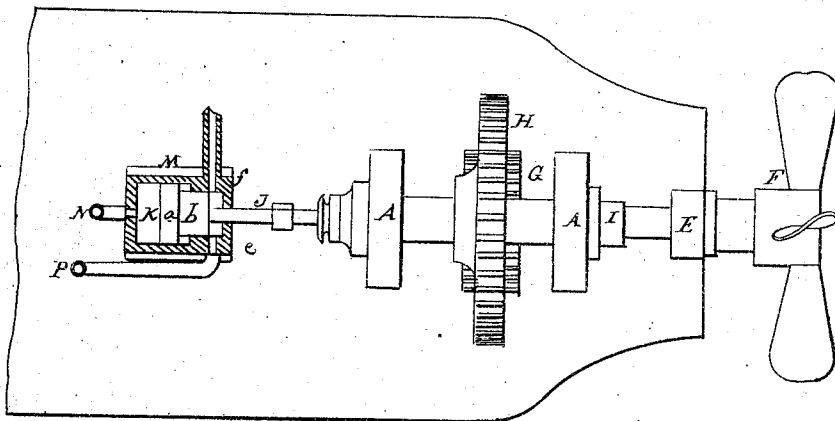
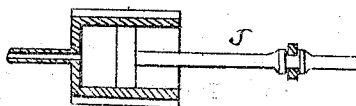


Fig. 3.



Witnesses
Wm. Albert Steel
J. Parker.

Inventor
J. B. Cullen
By J. M. Allen
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JOHN B. CULLEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND JOHN P. CHESTON, OF SAME PLACE, ASSIGNORS TO THEMSELVES AND JOHN A. FULTON.

Letters Patent No. 75,868, dated March 24, 1868.

IMPROVEMENT IN MARINE STEAM-GOVERNORS.

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, JOHN B. CULLEN, of Philadelphia, Pennsylvania, have invented an Improvement in Regulating the Speed of Propeller-Engines; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists of a steam-cylinder and piston, arranged in respect to a propeller-shaft so as to force the same rearwards as the propeller leaves the water, but yielding as the propeller sinks, in combination with the valve, to which the movement of the shaft is so imparted as to regulate the passage of steam to, and consequently the speed of, the engine, in conformity with the dip of the propeller, thereby preventing the sudden variation in the speed of propeller-engines during the pitching and tossing of the vessel.

In order to enable others skilled in the art to make and apply my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a side view of a propeller, driving-gear, and regulating-apparatus; and

Figure 2 a plan view.

A A represent part of the frames of a steam-engine, secured to the foundation B, and D the propeller-shaft, turning in suitable boxes on the frames, and in the outside bearing E, which may be secured to the stern-post of the vessel, as usual. F is the propeller, and G a pinion driven by but somewhat broader than a cog-wheel, H, on the crank-shaft I of the engine. Collars on the propeller-shaft permit the latter to have a limited end-play, and to the inner end of this shaft is secured a rod, J, passing into a cylinder, M, within which it is provided with a double piston, K, the front portion *a* of which is larger in diameter than the rear portion *b*, a portion of the cylinder having a bore adapted to the smaller part of the piston, and another portion of the cylinder a bore adapted to the larger part of the piston, as shown in fig. 2. N is a steam-pipe, forming a communication between the boiler, and so communicating with the cylinder that the steam shall act directly on the larger portion *a* of the piston, and P is a steam-pipe communicating through an opening, *e*, in the cylinder, with the space between the rear end of the latter and smaller portion of the piston, the steam passing through a similar opening, *f*, to the engine.

The larger portion of the piston is of such an area, compared with that of the smaller portion, that when the propeller is out of water the excess of pressure of steam against the larger portion of the piston over that against the smaller portion, will force the propeller-shaft rearward, and cause the smaller portion of the piston to cover more or less of the openings *e* and *f*, through which the steam must pass to the engine, but when the blades of the propeller are deep in water, the resistance of the latter will force the propeller-shaft forward, overcoming the excess of pressure on the larger portion of the piston, and causing the smaller portion to recede from the openings *e* and *f*, so as to permit the full supply of steam to pass to the engine; hence it will be seen that the amount of steam passing to the engine will be in proportion to the extent of the immersion of the propeller-blades in the water; the supply of steam, and consequently the speed of the engine, decreasing as the propeller leaves the water; and increasing as the depth of the propeller in the water increases.

It will be seen, therefore, that during the pitching and tossing of the vessel, and the constant variations in the dip of the propeller, the speed of the engine will relax or increase according to the duty which it has to perform, and the wear and tear to which propeller-engines are subjected by sudden variations in speed will be obviated.

It is not essential that a duplex piston and corresponding duplex cylinder should be employed in carrying out my invention. A plain cylinder, as shown in fig. 3, may be used, and the varying movements imparted to the rod J by the varying differences between the pressure of steam against the piston, and the tendency of the propeller from time to time to overcome this pressure, may be imparted to any arrangement of valves connected with the pipe which conveys the steam from the boiler to the engine.

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

A propeller-shaft, arranged within a vessel as set forth, in combination with a steam-cylinder and piston,

and with the devices described, or equivalent devices, whereby the movements of the shaft are communicated to a valve regulating the passage of steam to the engine, all substantially as specified.

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

JOHN B. CULLEN.

Witnesses:

J. B. COLLIER,

W. J. R. DELANY.