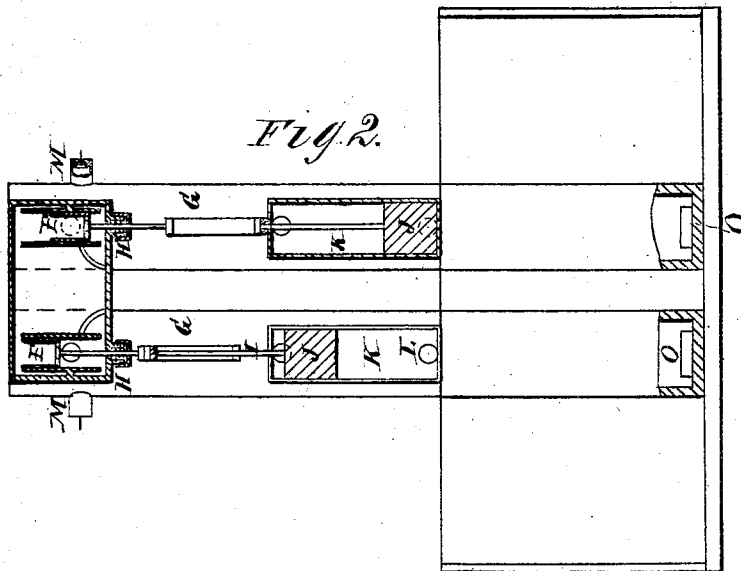
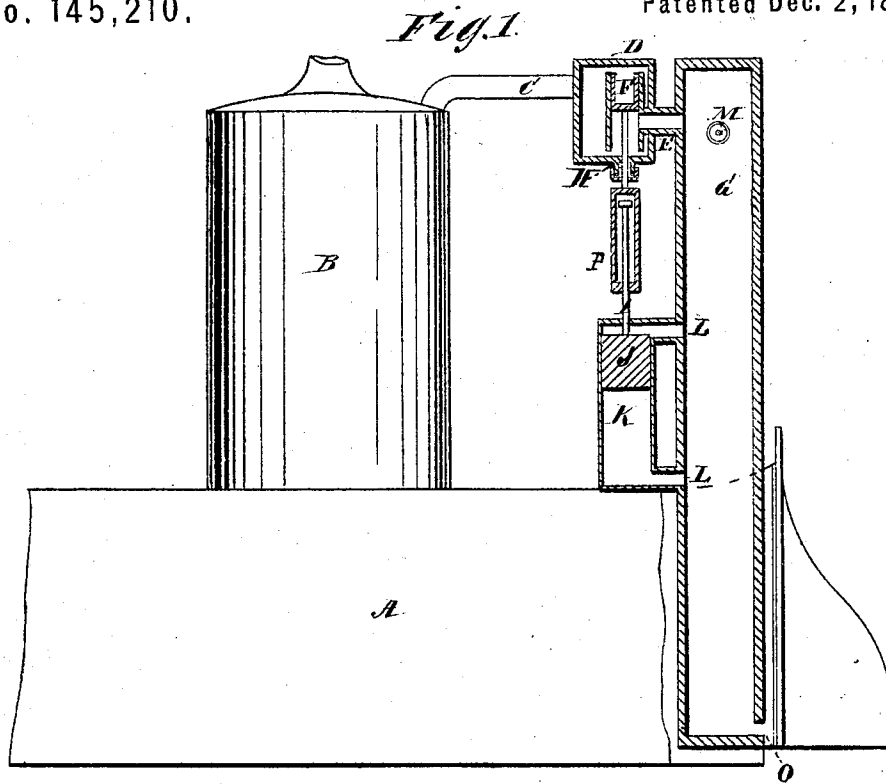


G. W. JONES.

Propulsion of Vessels by direct action of Steam.

No. 145,210.

Patented Dec. 2, 1873.



Witnesses:
Solon C. Kemmon.
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UNITED STATES PATENT OFFICE.

GEORGE W. JONES, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN THE PROPULSION OF VESSELS BY DIRECT ACTION OF STEAM.

Specification forming part of Letters Patent No. **145,210**, dated December 2, 1873; application filed November 4, 1873.

To all whom it may concern:

Be it known that I, GEORGE W. JONES, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Direct-Acting Steam and Water Propellers; 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 a part of this specification.

The invention relates to an improvement in modes of propelling canal-boats or other vessels by steam-pressure exerted upon a body of water which is contained in a suitable cylinder or chamber having an orifice, through which the water is ejected, thus causing it to act upon the water surrounding the stern of the vessel, the cylinder or chamber being refilled by the water supplied through a pipe or tube leading to the bow. The improvement consists in propelling vessels by the alternate action of steam-pressure and a vacuum, respectively operating and formed in a cylinder having a single orifice, which is in communication with the water wherein the vessel floats, whereby the quantity of water in the cylinder is expelled, and the same, or an equivalent quantity, readmitted, in continuous succession, through the aforesaid orifice. Thus no supplementary tube or passage is required to supply the steam-and-vacuum cylinder with the water to be expelled, but the inflow and outflow occur at the same point. The invention further consists in a valve-and-float mechanism connected with the cylinder, whereby the admission of steam is automatically regulated as the water is expelled and admitted, thereby securing a proper and efficient action, and allowing the steam-pressure to be regularly applied.

In the drawing, Figure 1 represents the stern of a boat provided with propelling apparatus constructed upon my plan, the cylinder, &c., being in section. Fig. 2 is a rear view of the same, partly in section.

A is the boat or vessel; B, the steam-generator, and C the pipe for conducting steam to the chest or chamber D, which is connected with the working cylinders G G by pipes E. F F are valves working in guides in said chest, and so constructed and arranged as to cut off

steam from pipes E as they alternately rise and fall. K K are small cylinders containing floats J, and communicating at each end with the large cylinders G G by small tubes L. The float J works in each of the small cylinders K, and has a headed stem, I, which works in a stirrup, P, that is attached to the lower end of the stem H of valve F. The stems or rods of the valves and floats will, of course, be arranged to work in stuffing-boxes of suitable construction. Each cylinder G has an orifice, O, at the bottom, opening rearward.

When the boat A is placed in the water, the height of the latter within the cylinders will naturally correspond to the general level of the water in which the vessel floats. In such case the float J will stand at a corresponding height in the cylinder K, thus uncovering the port or tube E, through which the steam, when admitted to the chest D, will pass into the cylinder G, and force the water out through the orifice O. The steam then partly escapes, and in part condenses, and a vacuum being formed, and the float J having fallen and the valve F having closed the tube E and cut off the steam, the water enters the cylinder again through the same orifice, and thus the action goes on with alternate inflow and outflow of water. This being the operation as to one cylinder, it is evident the operation of the other will correspond, it being only necessary, or at least essential, that the action be alternate—i. e., that the water be expelled from one as it is entering the other; and it will be observed that the floats J and valves F are set for such alternation of movement as will effect this result.

I have thus far described the main elements of my invention. I also provide for securing the co-operating effect of the expansion of air, caused by mingling with the steam within the cylinders, by locating a puppet-valve, M, in the upper portion of each cylinder G, the same opening inward, so as to allow admission of air when the vacuum is created, and to exclude it by closing when steam enters the cylinder. The valve-orifice is, however, so small, relative to the orifice O, that but a small quantity of air can enter during the time the vacuum exists. By this means I provide a stratum or cushion of air above the body of water within

or entering the cylinder, into and with which the steam is discharged and mingled. The effect is to prevent, more or less, the condensation of the steam, and to cause a great expansion of the air, whose force is then utilized in the expulsion of the water from the cylinder, aiding thus in the propulsion of the vessel.

It should be stated that, if the water is admitted into the cylinder only to a height correspondent to the general level externally, the cylinder should extend at least six inches above that level; but if the full atmospheric pressure is to be utilized, the cylinder requires to be extended about twenty-six feet higher. In either case, when the vacuum is created, the water rushes in with a force equal to the head of water and atmospheric pressure added, minus what little friction is incidental. Therefore, if the draft of the boat or other vessel be sixteen feet, and the vacuum aid (atmospheric pressure) be equal to about twelve and a half pounds, say twenty-six feet, there will be a head of water practically equal to forty-two feet. Thus there is a gain of twenty-six feet head and fall in the cylinder to aid in making the next stroke. This gives an average pressure of six pounds. Now, by using steam of one atmosphere, (fifteen pounds,) we have twenty-one pounds for the stroke, and the water will be forced out with corresponding pressure.

I have demonstrated satisfactorily that the plan, generally much commended, of taking water from the bow of the vessel, secures no advantage; besides the tubes necessary to conduct the water backward to the vacuum-chamber occupy valuable space, and, because

of their length, add largely to friction, and that obstruction or injury is likely to occur from encountering (or taking in) floating or fixed objects. By admission and expulsion of water through a single orifice, not only these results are avoided, but advantages are super-added in several ways.

I prefer to construct the cylinders of metal with a wood lining, but do not restrict myself to any specific material.

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

1. As the improvement in the propulsion of vessels hereinbefore described, in combination with a navigable vessel, the cylinder or chamber G, having a single orifice, through which the water is alternately received and discharged at the stern, a valve mechanism, substantially as herein described, for controlling admission of steam, and a steam-generator, all combined and operating as specified, whereby the steam, acting upon the water within the cylinder as a piston, forces the same out, and then, condensing, causes the entrance of a like quantity of water, and so on alternately, as set forth.

2. The combination of the cylinder G, having orifice O, the small cylinder K, float J, valve-chest D, valve F, and tube E, with a steam-generator and a vessel, as shown and described.

To the above specification of my invention I have signed my hand this 28th day of October, 1873.

GEO. W. JONES.

Witnesses:

SOLON C. KEMON,
CHAS. A. PETTIT.