

W. J. McIntire.
Pneumatic Propeller.

Patented Aug. 27 1855.

No. 13,394.

Fig. 1.

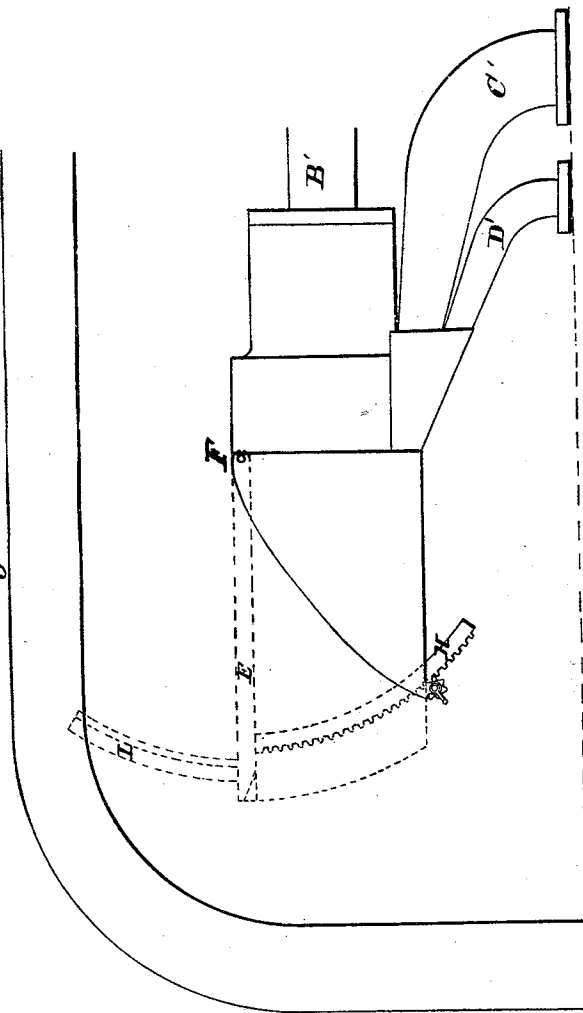
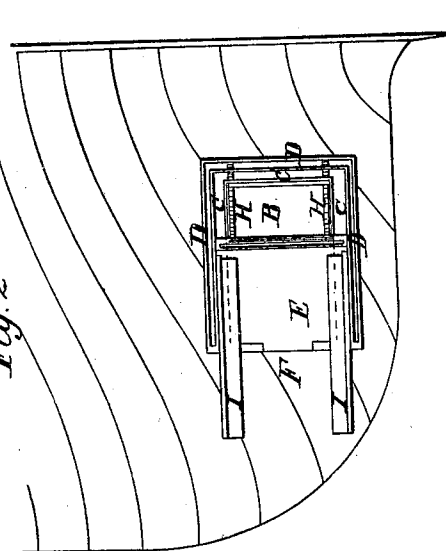
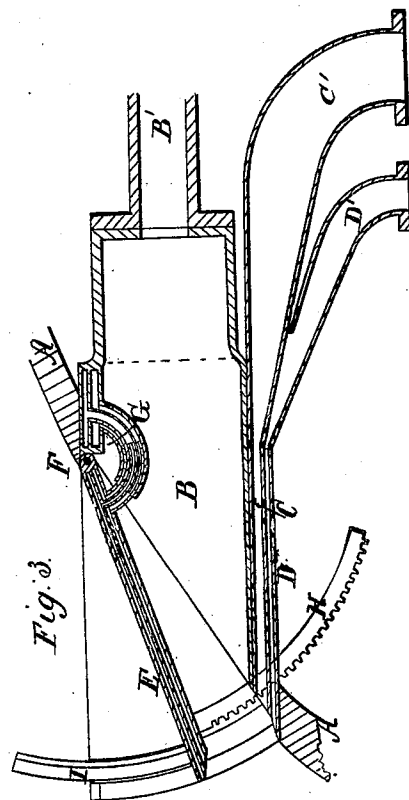


Fig. 2.



UNITED STATES PATENT OFFICE.

WM. J. MCINTIRE, OF NEW YORK, N. Y.

PROPELLING VESSELS BY THE DIRECT ACTION OF STEAM UPON THE WATER.

Specification of Letters Patent No. 13,394, dated August 7, 1855.

To all whom it may concern:

Be it known that I, WILLIAM J. MCINTIRE, of the city, county, and State of New York, have invented certain new and useful Improvements in Propelling Vessels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawing, making a part of this specification, in which the several figures are fully described, and similar letters indicate similar parts throughout.

The object sought to be accomplished by my invention is the employment of the force derived from the discharge of gases and fluids below the surface of the water for the propulsion of vessels, having principally in view the making of the direct action of steam available for this purpose. It is evident that if the steam from a boiler could be discharged directly against the water in such manner as to insure its full dynamical effect its employment in this way as a motive force for the propulsion of vessels would be far more economical than as at present. This however has not hitherto been done for the reason, as well known, that the moment the water and steam come into contact, the latter is at once condensed, and the space occupied reduced to that due to the quantity of water it contains. To make this or any other fluid available it is clear that it should be able to effect the displacement of a body of water equal in section to the area of the aperture of discharge. And of course in order to do this with steam it should for a certain period of time suffer no condensation, after its discharge from the jet pipe in the after part of the vessel.

This is what I principally accomplish by my invention which consists in enveloping the jet of steam within a gaseous or fluid envelop, or both, of some non-condensable gases or fluids having at the time of discharge such a temperature as will keep the steam from condensation by preventing its contact with the water, until its full dynamical force has been expended. To obtain this result I construct a discharge tube, of a peculiar form, consisting of a service of tubes one within the other and of such difference in their sizes as to leave clear annular spaces between each according to the number of fluids to be discharged. The central tube has the largest clear aperture

and is intended for the steam; the second tube leaves a narrow passage all around this, through which I discharge the hot non-condensable gases. This I propose shall be the heated products of combustion taken from the flues of the boiler at the place of final discharge. The next annular space is to discharge around these heated products some still further protection matter, which I propose shall be oil, delivered in a very thin stratum. If from such a tube or pipe, three streams, in the order above named were discharged with equal velocity below the water, they would issue as a solid column. The steam would be protected from immediate condensation by its covering of heated gases, and this latter would be still further protected by the stratum of oil, although I do not think this latter will in all cases be necessary. The steam will discharge itself, but the hot air and oil must be forced out by mechanical aid. I prefer to construct a square tube having one of its sides formed into a valve so as to be able to regulate the size of the stream discharge, and also to close up the opening entirely when the ship is at rest, or under sail alone. The tube is shown as projected on one side of the stern-post and near the keelson, the line A, Fig. III representing a section of a portion of the ship at this place. The tube is formed in three compartments, of which the central is much the largest for the passage of the steam and is as represented in Figs. II, at B. Over this, so as to leave a narrow space between, is the division forming the second tube, as seen at C. Beyond this is yet another covering leaving a like narrow clear space all around the outside of the last named tube C. This last space is more contracted still, and is as shown at D. Distinct supply pipes connect with each. Of these B', leads to and is connected with the steam portion of the boiler. C' leads to an engine or other apparatus for drawing off and discharging the hot gases, and D' leads to a pump or other means for discharging the oil. The valve before mentioned is shown at E. This consists of that portion of one of the sides of the tube which lies outward; it is hinged at the point where the center of the vessel and the tube meet, as seen at F. And inasmuch as the joint stops the channel, ways for the hot air and for the oil, provision is here made for keeping up the connection through

the inner part of the tube and that part composing the valve. This is accomplished by means of a semi-circular channel divided into two parts, the one part being
 5 fitted so as to play within the other and as very plainly represented at G, Fig. III, where the half of the curved channel attached to the valve E is shown as playing within the other or fixed part. The valve
 10 is further fitted at the opposite end with rack work segments for opening and closing it as seen at H, and worked by a pinion on the inside of the vessel suitably geared. As the valve plays between the upper and
 15 lower sides of the tube, the closing it would only effect the central or steam tube, leaving the hot air and oil channels open. These are covered by attaching two arched bands I, to the back of the valve, one at the top
 20 and the other at the bottom, in such position as to drop below the end of said valve on the lower corner, and project above it on the upper one, by this means as the valve is closed these pieces slide over the ends of
 25 the tubes (which it should be mentioned have the same curve or sweep as the valve) and thus close them up in whole or in part according to the position as only acting upon the air aperture C, as the oil passage
 30 may be conveniently cut off from the inside by a cock on D'.

The operation will be as follows: Steam being raised it will be well in the first instance to commence by setting the machinery in motion by which the hot air is taken
 35 from the funnel or discharge place from the boilers and forced through the tube by its appropriate channel C of the tube, and at the same time also open the oil passage D' and let the pumps force the necessary quantity of that fluid to surround the hot air, the valve E being thrown open to the necessary width to allow of the passage of so much steam as is to be discharged; the intent of
 40 the operation being to cause the several strata composing the jet to be discharged in an unbroken column. For this purpose the speed of the several streams will have to be regulated separately or as experience shall
 45 suggest. Steam now being discharged through B' is to effect the distention of the elastic and non-condensable fluids by which it is surrounded and these latter to act upon the water until the full mechanical effect
 50 due to the force by which the several streams are projected is obtained and the vessel propelled accordingly.

I have described the operation as performed by a continuous blast but the several products may also be ejected by jets. In
 60 this latter case the displacement would be by forming vast vesicles, as it were, or bubbles of the oil and hot air which would be filled with steam, the bubbles gradually expanding as they rose to the surface when
 65 they would burst. In either case the force produced would be proportional to the cubic feet of water displaced at the given depth. I also propose to still further increase the mechanical effect of the steam by mixing
 70 atmospheric air with it previous to its discharge, according to a known principle, whereby its volume will be increased without other expense of power than is necessary to overcome the pressure at the moment
 75 of its injection.

I have described the jet tubes as made square or oblong in their transverse section, and this construction affords the facilities for a regulating valve at the discharge end, but other forms may be substituted without
 80 altering the character of my invention, such forms I have contemplated, such as cylindrical and elliptical tubes, &c. The number also which may be applied in the same vessel may be found to be various, as experience or the different kinds of service for which the vessels may be required, will suggest modifications in these respects. Therefore I do not confine myself either to any
 85 particular shaped or sized tubes, or the number which may be used at one time. Neither do I confine myself to the precise products nor to the number of those which shall be discharged at the same time, provided, that there is discharged along with the steam, in such manner as to envelope it, some non-condensable fluid to protect the said steam and prevent its condensation by the water until it has had time to exert its
 90 force mechanically as described.

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

Projecting the steam from condensation by discharging at the same time with it
 105 some non-condensable gas, or gases, or fluids, or both in combination, in such manner as to form an envelop for the steam for the purposes as herein described.

WILLIAM J. McINTIRE.

Witnesses:

S. H. MAYNARD,
 CHAS. G. HAYES.