J.E. Smith.

Screw Propeller.

No. 5,468. Patented Mar. 14. 1848.

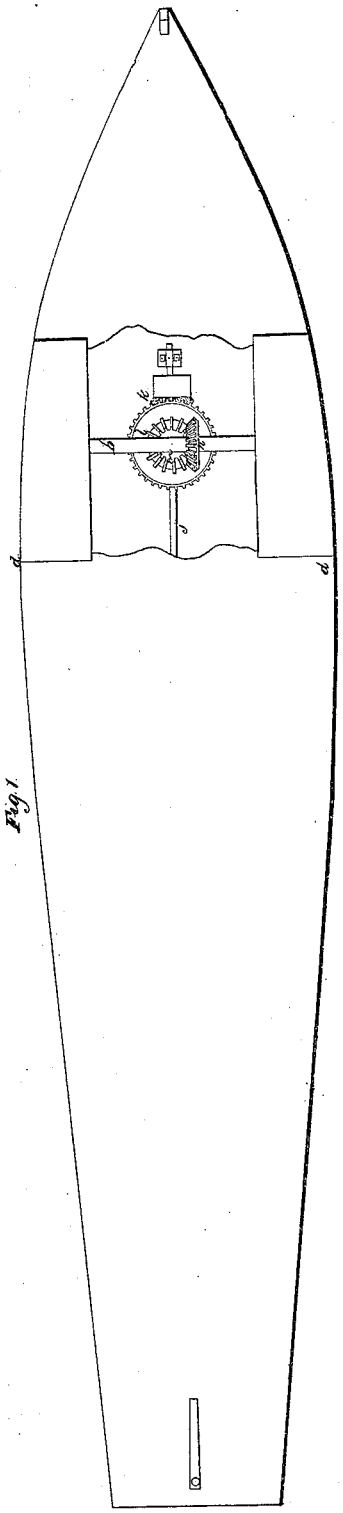

Fig. 1.

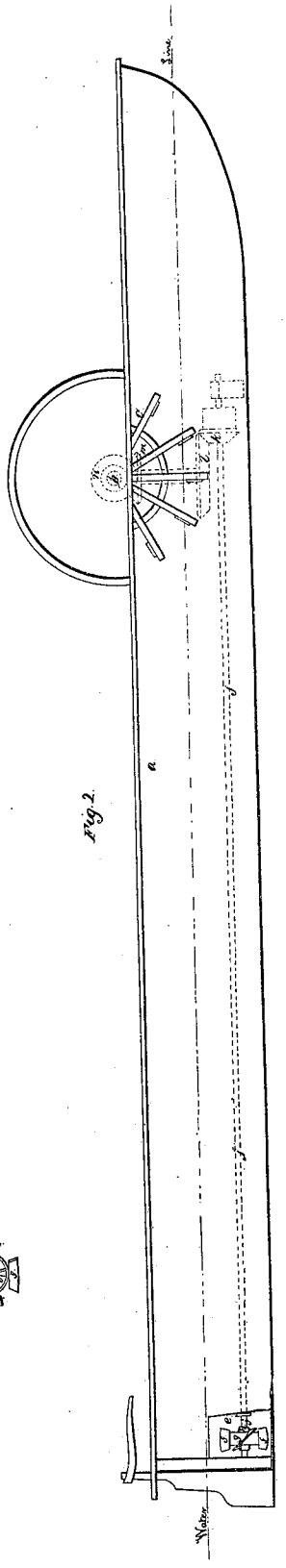

Fig. 2.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

J. ELNATHAN SMITH, OF NEW YORK, N. Y.

IMPROVEMENT IN PROPELLERS FOR VESSELS.

Specification forming part of Letters Patent No. **5,468**, dated March 14, 1848.

To all whom it may concern:

Be it known that I, J. ELNATHAN SMITH, of the city, county, and State of New York, have invented new and useful Improvements in the Method of Propelling Vessels; and I do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of a vessel with my improved mode of propulsion, and Fig. 2 a longitudinal elevation thereof.

The same letters indicate like parts in all the figures.

The nature of the first part of my invention consists in combining with the paddle-wheels, constructed in any desired manner and placed at the sides of the vessel, a propeller or propellers placed at the stern of the vessel, the axis of which to be parallel (or nearly so) with the keel of the vessel, so that the vessel shall be impelled by the joint action of the propeller or propellers at the stern and the paddle-wheels at the sides, such joint action having the effect, as shown by experiment, to impel the vessel with greater velocity and more steadily with a given force than by the action of the paddle-wheels or the propeller or propellers separately.

The second part of my invention consists in placing the paddle-wheels, when used in combination with the propeller or propellers at the stern, forward of the center of gravity of the vessel, so that a portion of the action of the paddle-wheels thus placed may have the effect to partly lift the bow of the vessel, while the propeller (or propellers) at the stern exerts all its action to impel the vessel forward.

The paddle-wheels for the sides and the propeller or propellers for the stern may be constructed in any of the known or approved forms, as this makes no part of my invention.

In the accompanying drawings, *a* represents the hull of the vessel, and *b* the main paddle-wheel shaft, which should be arranged in reference to the engine as may be deemed most advantageous, as this makes no part of my invention, and the ends of this shaft are affixed to the paddle-wheels *c c*, provided with guards *d d* in the usual manner.

To the stern of the vessel I adapt the propeller *e*, made with the wings or paddles *f*, attached to the periphery of a hoop *g*, connected with the hub *h* by means of spiral or twisted arms *i*, or the paddles or wings may be attached to arms radiating from the hub or shaft, and the propeller thus or otherwise constructed is attached to the end of a shaft *j*, which passes through a stuffing-box in the stern-post of the vessel in manner well known to engineers. This shaft passes along through the vessel, to be connected with the driving-power—that is, to be connected with the engine or engines which actuate the paddle-wheels, or with a separate engine or engines, as may be deemed most expedient, according to the class of vessels to which my improvements may be applied; and, as all competent engineers know how to form the connections between the engine or engines and the paddle-wheel shaft and the shaft of the propeller, I deem it unnecessary to represent these connections; but when the shaft of the propeller is to be connected with and receive motion from the shaft of the paddle-wheels then there may be a bevel cog-wheel *k* on the inner end of the shaft of the propeller, the cogs of which take into the cogs of a wheel *l* on the lower end of a vertical shaft, the upper end of which is provided with another cog-wheel *m*, that engages with and receives motion from a like wheel *n* on the paddle-wheel shaft. It will be obvious that these two shafts can receive motion one from the other in any desired manner known to engineers, or that separate engines can be used for each to act independently.

When it is desired to employ two propellers at the stern instead of one, then they must be placed on each side of the stern-post in the usual manner of applying two propellers; but I deem the use of one better than two, and have simply referred to the use of two to show that my invention is susceptible of variation.

I deem it highly important to place the paddle-wheels forward of the center of gravity of the vessel; but it will be obvious that they may be placed at the center of gravity, or even back of it, and still attain some of the advantages due to my invention; but I prefer to place them forward of the center of gravity, as when thus placed the effect will be greater.

I do not claim as my invention the use of the propeller at the stern of the vessel separately, nor the use of the paddle-wheels at the

sides of the vessel; nor do I claim as my invention the placing of the paddle-wheels forward of the center of gravity of the vessel independently of the combination of this with the propeller or propellers at the stern; but

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

1. Propelling vessels by the combined action of the paddle-wheels at the sides of the vessel and the propeller or propellers at the stern, substantially as described, whether this be done with the paddle-wheels placed with with their axis passing through the center of gravity of the vessel or forward or back of it, as described.

2. Placing the paddle-wheels forward of a line passing transversely through the center of gravity of the vessel, as described, when this is combined with the propeller or propellers at the stern of the vessel, as described.

J. ELNATHAN SMITH.

Witnesses:

T. BAILEY MYERS,

CHAS. J. GILBERT.