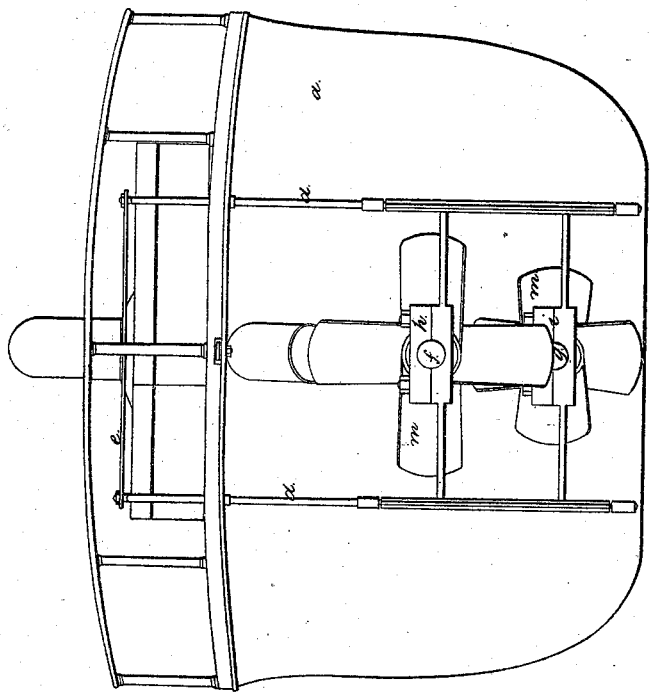
Sheet 1. 3 Sheets.

B. M. Smith.

Screw Propeller.

No. 7,310. Patented Apr. 23, 1850.

Fig. 1.



Sheet 2. 3 Sheets.

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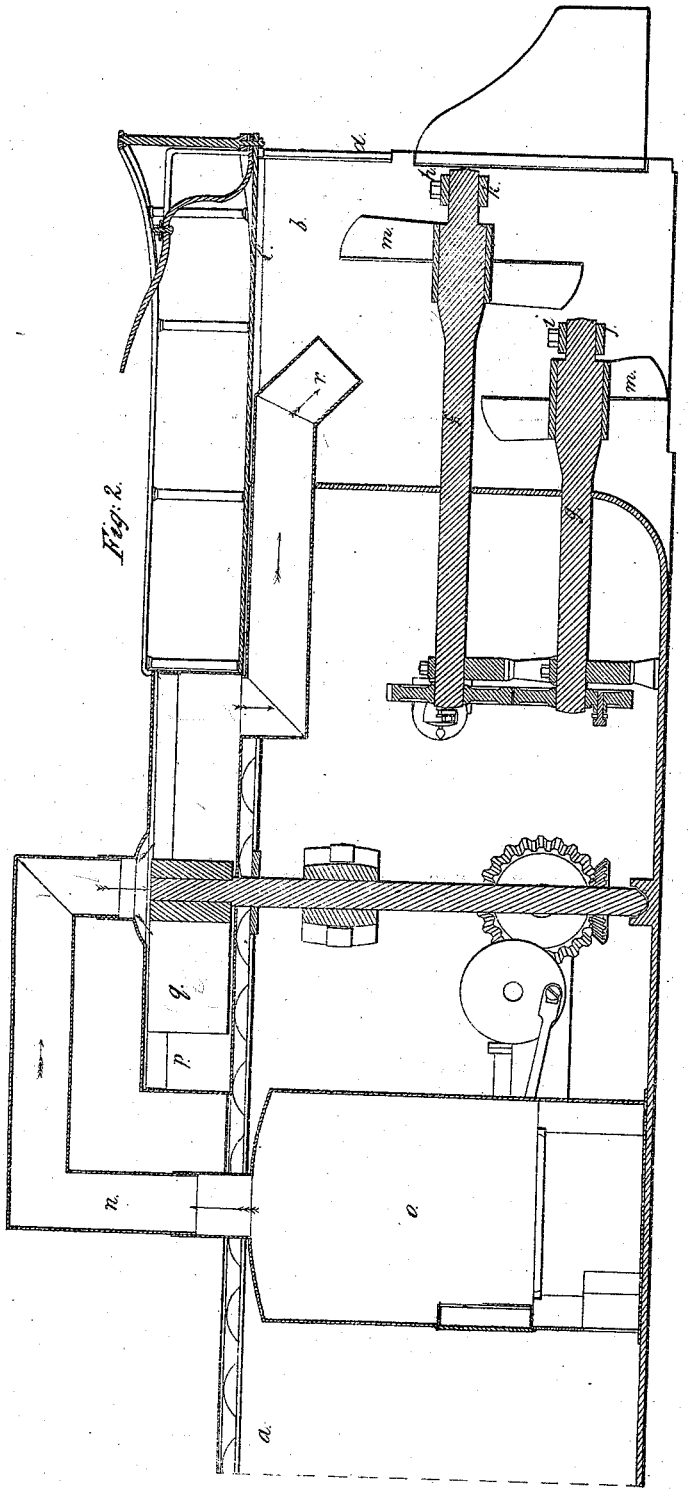
Patented Apr. 23, 1850.



Sheet 3.3 Sheets.

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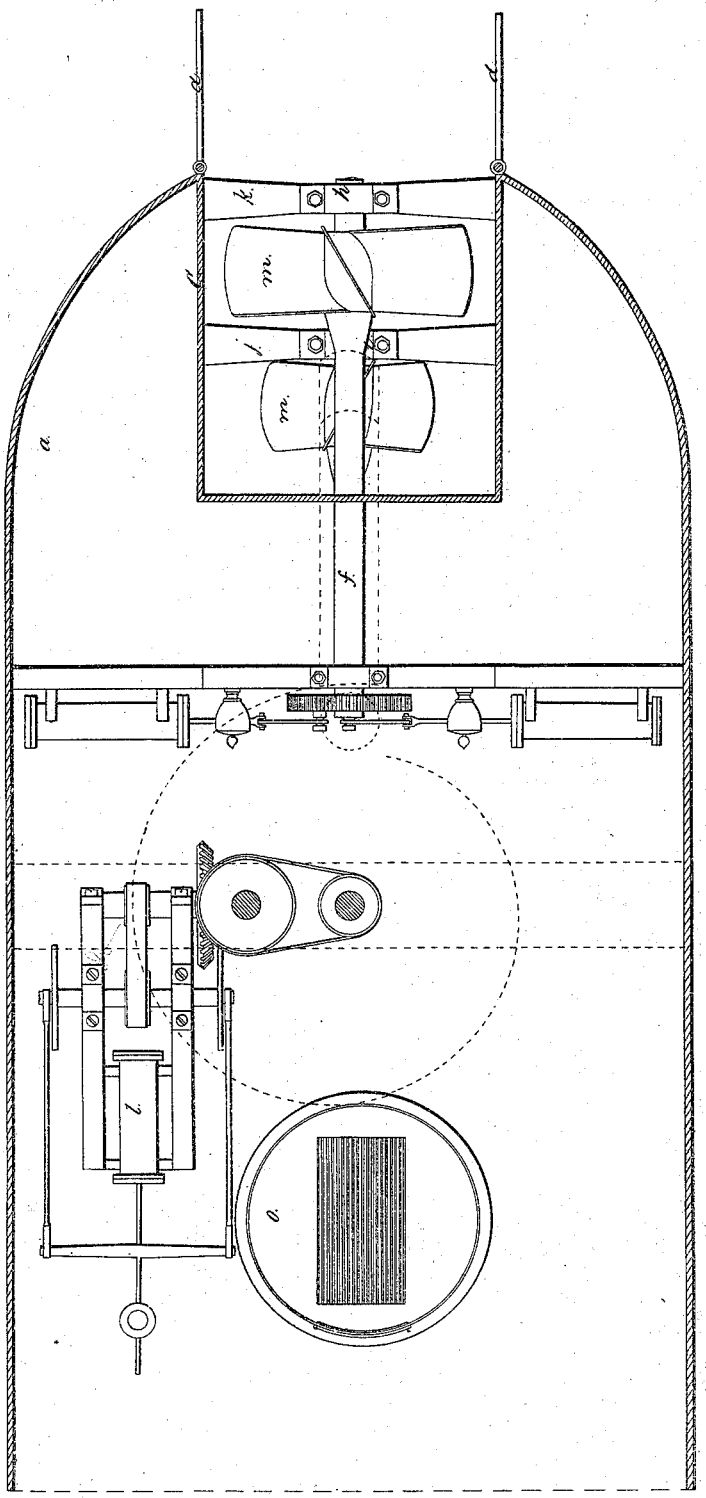

Fig: 3.

UNITED STATES PATENT OFFICE.

BENJAMIN M. SMITH, OF RIDGEWAY, NEW YORK.

IMPROVED ARRANGEMENT OF PROPELLERS AND CHIMNEYS FOR CANAL-BOATS.

Specification forming part of Letters Patent No. **7,310**, dated April 23, 1850.

To all whom it may concern:

Be it known that I, BENJAMIN M. SMITH, of Ridgeway, in the county of Orleans and State of New York, have invented certain new and useful Improvements in the Method of Propelling Boats for Canals, but which are applicable to the navigation of other waters; 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 an elevation of the stern of a boat; Fig. 2, a longitudinal vertical section, and Fig. 3 a horizontal section taken at a plane just above the propellers.

The same letters indicate like parts in all the figures.

My improvements relate to the propulsion of boats by means of what are termed "propellers"—that is, oblique or twisted paddles placed on a shaft or shafts at the stern of the boat and parallel with the keel.

The principle or character of the first part of my invention consists in the use of two propellers in a recess at the stern of a boat, one of the said propellers being vertically above and back of the other, whereby a greater amount of paddle-surface can be obtained within a case and in a vessel having a narrow stern than by any other known plan, and by which also the propellers are adapted to different drafts of water, the lower one of said propellers being at all times entirely submerged and the other only in part; and the second part of my invention consists in combining with the propellers, located and arranged as herein described, a suction or exhausting fan (which is located between the furnace and the end of the flue or chimney at which the combustion is discharged) for exhausting the flues of the steam-boiler furnace, so as to produce the required draft. When the said exhausting-fan is connected by a pipe with the recess in which the propellers are located, so that the gaseous products of the combustion shall be discharged in the said recess to avoid the use of a chimney, that part of the upper propeller which is above the water has the effect to force the said gaseous products of the combustion out of the said recess, and thus prevent them from passing over onto the deck of the boat.

In the accompanying drawings, *a* represents a boat of any desired construction, except at the stern, which is formed with a recess *b*, extending from the deck *c* all the way down and open at the bottom, the sides thereof being parallel.

For the purpose of steering there are two rudders *d d* at the rear end of and one for each side of the recess, the two helms being connected together by means of a jointed connecting-rod *e*. Two horizontal and parallel shafts *f g*, one above the other and in the plane of the keel, pass out through appropriate stuffing-boxes in the stern of the boat with their rear journals hung in boxes *h i* on bearers *j k*, extending across the recess, and the inner ends of these two shafts are properly sustained in boxes and are connected in any desired manner with an engine or engines *l*, by which they are rotated with the required velocity in opposite directions.

As the construction of the engines and their connections with the shafts make no part of my invention, it is deemed unnecessary to describe them. On the rear end of each of the shafts there is a propeller *m*, consisting of four oblique paddles projecting from a hub or from the shaft. As no claim is made to any peculiarity in the construction of the propeller, any of the known kinds of this class may be employed. The one on the upper shaft is placed back of the rear end of the lower shaft and rotates clear of it, and may be of any desired size within the capacity of the recess; but the one on the lower shaft must be of such diameter as to rotate clear of the upper shaft, below which it is placed. These propellers should be so proportioned that the lower one will be entirely submerged and the upper one about half-submerged, that the upper half of the latter may rotate in the open air to act on the discharged products of the combustion. The chimney *n* of steam-furnace *o* at the required height runs horizontally and then down vertically to form a communication with and discharge the products of the combustion into the center of the case *p* of a rotating fan (before named as

a suction or exhausting fan) *q*, the outer periphery of the said case being provided with a delivery spout or pipe *r*, which runs down obliquely to and discharges the products of the combustion into the recess at the stern of the boat and above the water-line, so that when the apparatus is in action the rotation of the fan will exhaust the chimney of the furnace to induce the required draft and by centrifugal action discharge the products of the combustion into the recess above the water and forward of the upper propellers, the rotation of which will induce an outward current from the stern of the boat, and thus prevent the noxious gases from floating over onto the deck of the boat. In this way I not only obtain an efficient mode of propulsion adapted to the varying drafts of water to which boats are subject without injury to the banks of canals; but at the same time I am enabled to dispense with a chimney which, for the required draft and for safety, would require to be of such height as to be impracticable for passing under bridges such as are usually met on canals.

I do not wish to limit myself to the use of any particular kind of exhausting-fan or to its location, so long as it is connected with the chimney and with the recess at the stern, in which the propellers operate; nor do I wish to limit myself to the extent of the recess, which may commence as far forward of the stern as may be thought best for the purpose of increasing the paddle-surface.

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

1. The employment, in combination, of two propellers arranged in a recess at the stern of a boat, each being on a separate shaft, one above the other, and one of the propellers being placed back of the other, substantially as herein described, whereby a greater amount of paddle-surface can be obtained within a case and with a given width of stern than by any other known plan.

2. In combination with the propellers arranged with a part of one of them above the water-line and inclosed in the recess at the stern of the boat, substantially as herein specified, the employment of a fan for exhausting the chimney of the steam-boiler furnace and for discharging the products of the combustion into the recess in which the propellers work, substantially in the manner and for the purpose specified.

BENJAMIN M. SMITH.

Witnesses:
WM. MOORE,
H. GAY.