C. T. Smith.

Vibrating Propeller.

No. 87,375. Patented Mar. 2, 1869.

Fig. 3.

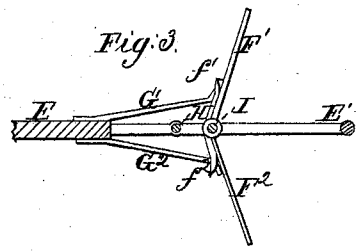


Fig. 5.

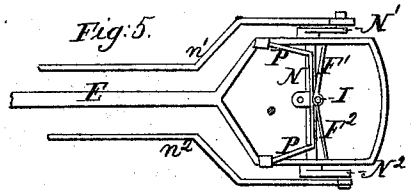


Fig. 6.

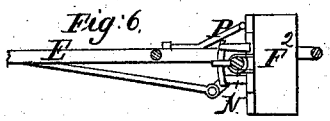


Fig. 4.

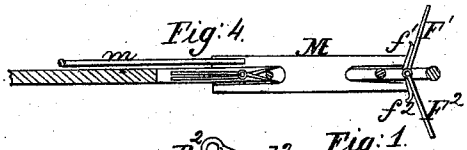


Fig. 1.

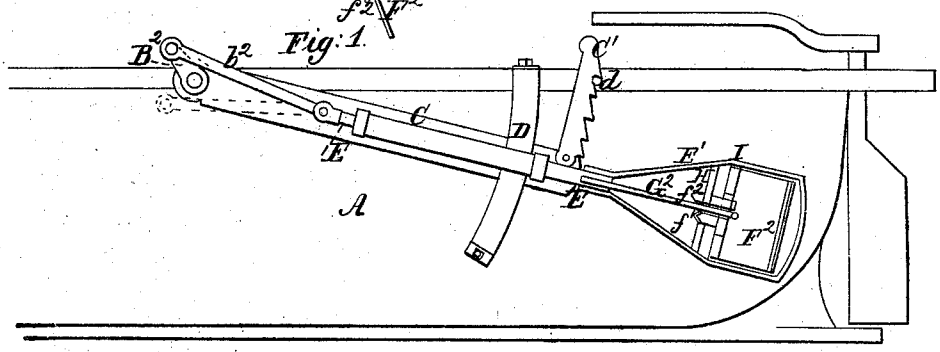
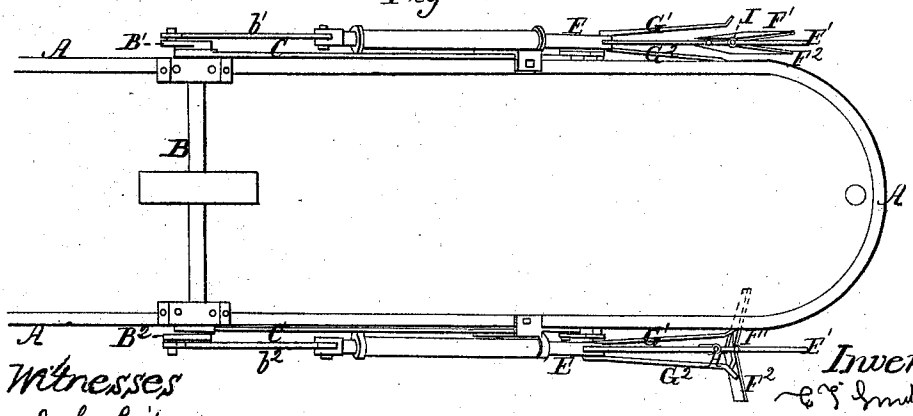


Fig. 2.



Witnesses

L. L. Livingston

W. C. Dept.

Inventor

C. T. Smith

by his Attorney F. A. Hobson

United States Patent Office.

CORNELIUS T. SMITH, OF NYACK, NEW YORK.

Letters Patent No. 87,375, dated March 2, 1869.

IMPROVEMENT IN PROPELLING-APPARATUS.

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, CORNELIUS T. SMITH, of Nyack, in the county of Rockland, State of New York, have invented certain new and useful Improvements in the Machinery or Apparatus for Propelling Vessels, intended more particularly for use in propelling canal-boats; and I do hereby declare that the following is a full and exact description thereof.

My invention consists in an arrangement of guards and adjustable frames, in connection with reciprocating parts, operated by cranks, and performing in the manner and with the advantages hereinafter set forth.

I will proceed to describe my invention with the aid of the accompanying drawings, which form a part of this specification.

Figure 1 is a side view of the mechanism applied to a canal-boat.

Figure 2 is a plan view of the same.

Figure 3 is a horizontal section of some of the parts on a larger scale.

Figure 4 is a horizontal section of another modification, adapted for reversing.

Figure 5 is a plan view of another modification.

Figure 6 is a vertical section of the same.

Similar letters of reference indicate corresponding parts in all the figures.

Tints are employed merely to aid in distinguishing parts; they do not indicate the materials.

The material of all the novel parts may be iron and steel. They may be coated or protected in any approved manner against oxidation.

A is the body of the boat;

B is the shaft, turned by the engine in any approved manner; and

B^1 B^2 are cranks, placed quartering to each other.

C are frames, extending rearward from the bearings of the shaft B, and adapted to be raised and lowered within the guides D.

C^1 are notched links, which are connected to the rear end of the frame C, and by means of which, in connection with the pin *d*, the frame C may be elevated and lowered, and adjusted at different inclinations, and retained there.

E E are smooth rods, guided, as represented, on the inclined frames C C, and adapted to slide endwise thereon, and in line therewith, being operated by the cranks B^1 B^2, through the medium of the connecting-rods b^1 b^2.

The rear and projecting ends of the rods E E carry folding floats or paddles F^1 F^2, hung on the common cross-shaft or axis I, and supported in the yoke E^1, as represented.

Arms or stops, G^1 G^2, are fixed, as represented, on the rear of the rods E, and receive the force of the floats F^1 F^2, when in their opened position.

A rod, H, extending across each of the frames E^1, in rear of and parallel to the shaft I, receives the arms f^1 f^2, fixed on the paddles F^1 F^2, in the manner represented.

The revolutions of the shaft B cause the sliding bars E E to reciprocate backwards and forwards, at heights and in directions which are adjustable through the agency of the adjustment C^1. At each forward movement, the paddles F^1 F^2 close together, and at each backward movement they open and act upon the water, driving the water backward, and propelling the boat forward.

The yokes E^1 extend quite around in the rear of the folding paddles F^1 F^2, and serve to guard them from injury.

In case the surface of the water is encumbered with ice, floating timber, or other obstruction, the frames C C and their connections are lowered, so that the propelling-devices strike deep in the water.

In case, on the contrary, the water is very shallow and especially if it is rocky, or otherwise liable to injure the propelling-device, the latter is lifted.

Ordinarily, the great change in the conditions due to loading and unloading the canal-boat, makes it desirable to adjust the elevation at which the thrusts are effected, so as to strike in the water at the proper depth.

The importance of propelling canal-boats and other vessels by means of reciprocating and folding devices analogous to mine, has been long appreciated, and I am aware that many efforts have been made to apply such in practice, but such have failed to come into general use.

My invention, so far as already explained, is superior to any before known to me, in the fact that the propelling-devices are protected from injury in case of striking the bottom or other object, the yoke E^1, in each case, encircling the propelling-devices, and offering a round front, which is well adapted to slide over or under the obstacles.

Another point in which my invention is superior to any before known to me, lies in the means for hoisting and lowering the propelling-devices, and adjusting them to operate at different elevations, at will.

The notched links C^1 may be replaced by other devices of analogous character, it being not essential that this precise form of the device be adopted, so long as the adjustment is convenient and easy, and so long as liberty is allowed, as by my adjustment, for the propelling-devices to rise higher, whenever required, in consequence of the guards E^1 striking the bottom, or any other object.

It will be observed that in case my propelling-devices are adjusted to strike so low that the guards E^1 shall touch a rock or other hard object, the entire apparatus may yield upward, the notches in the links C^1 being adapted to allow of this movement.

Fig. 6 represents a provision for reversing the action of my paddles, or, rather, for confining one set and bringing into play another, at will.

The yoke E^1 is enlarged, and there are two sets of paddles precisely alike, and operated in opposite directions, as represented.

M is a double fork, adapted to be moved longitudinally by means of the rod *m*. When it is drawn in, into its ordinary position, the rearmost paddles are allowed to act. When, on the contrary, it is moved out, it locks together the ordinary propelling-paddles, and allows another set to come into action, which act in an opposite direction. Thus by sliding the rod *m* by the hand or mechanism, (not represented,) the action of the propeller is reversed.

Figs. 5 and 6 represent another plan for reversing. Here the yoke E is turned horizontally, and a single set of paddles is made to operate, either to propel the boat forward or backward, as may be desired, by reversing the position of the paddles themselves.

The shaft I is hung on a stout transverse shaft, N, which is provided with arms N^1 N^2 at right angles, which are operated by means of the rods n^1 n^2, as shown.

In the ordinary position, as represented in fig. 5, the paddles propel the boat forward; but when, for any reason, it is desired to reverse the action, the rods N^1 N^2 are operated by hand or suitable mechanism, so as to turn the shaft N a half revolution. When this is done, the paddles are brought into the reverse position and operated in the opposite direction, propelling the boat rearward.

The guard P, in this form of the device, serves to assure the operator when he has completely reversed the position of the paddles.

A chain and pulley may be employed, instead of rods, if preferred, working through the centre of the paddles.

Having now fully described my invention,

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. I claim, in combination, the linear reciprocating-thrust propeller, the guard-frame, raising and lowering-guides, and means for adjusting to operate at different levels, all constructed and arranged for joint operation, as and for the purposes herein set forth.

2. I claim the within-described specific construction of the linear reciprocating folding paddles F^1 f^1 and F^2 f^2, and their stops G^1 G^2, and cross-bar or back-stop H, all arranged relatively to each other and to the frame C, and means for reciprocating the same backward and forward in line, as and for the purposes herein set forth.

CORNELIUS T. SMITH.

Witnesses:

THOMAS D. STETSON,

W. E. RUTTAN.