

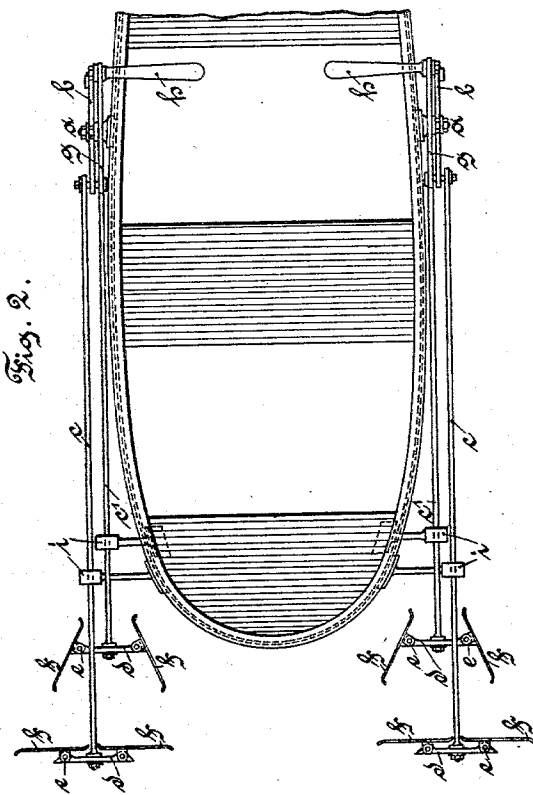
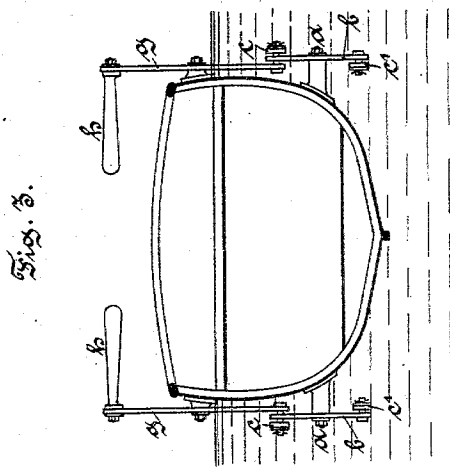
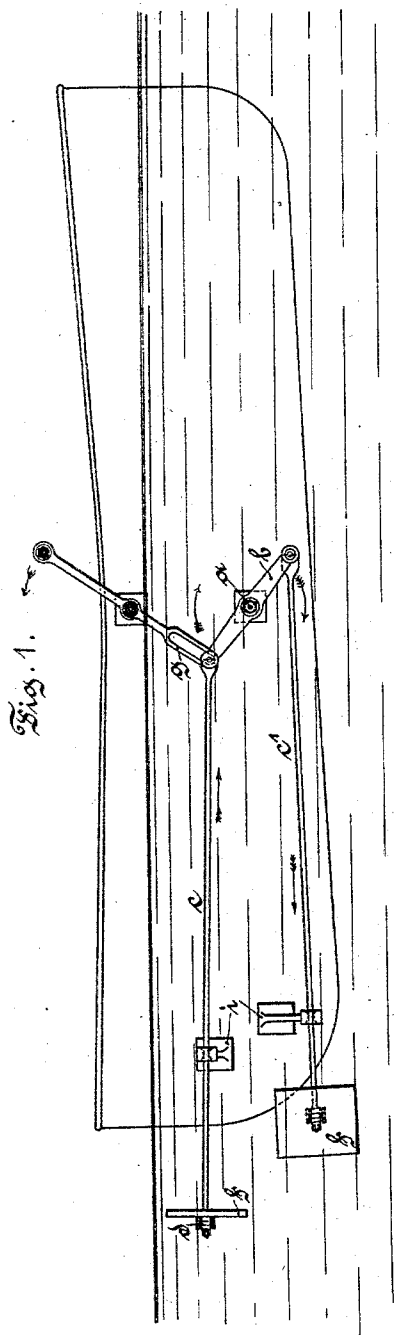
(No Model.)

E. F. H. DEMNITZ.

MECHANISM FOR PROPELLING AND STEERING VESSELS.

No. 546,309.

Patented Sept. 17, 1895.



Witnesses:

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UNITED STATES PATENT OFFICE.

ERNST FRIEDRICH HERRMANN DEMNITZ, OF NIEDER-SEDLITZ, GERMANY.

MECHANISM FOR PROPELLING AND STEERING VESSELS.

SPECIFICATION forming part of Letters Patent No. 546,309, dated September 17, 1895.

Application filed December 19, 1894. Serial No. 532,362. (No model.) Patented in Germany February 4, 1895, No. 79,331.

To all whom it may concern:

Be it known that I, ERNST FRIEDRICH HERRMANN DEMNITZ, a subject of the King of Saxony, residing at Nieder-Sedlitz, near Dresden, in the Kingdom of Saxony, German Empire, have invented certain new and useful Improvements in or Relating to the Propulsion and Steering of Navigable Vessels, (for which Letters Patent have been obtained in Germany, No. 79,331, dated February 4, 1895,) of which the following is a specification.

This invention relates to the propulsion of ships and in particular of small craft (boats, &c.), as a substitute for the ordinary oars. It operates with several devices which the inventor designates as "thrust-blades," consisting of rods provided with pivoted flaps which are moved to and fro in the longitudinal direction of the vessel in such manner that on the return stroke the entire surface of the flap is opposed to the water through which it passes, whereas on the forward stroke it is pushed through the water idly or with little or no resistance. The apparatus comprises two such sets of thrust-blades.

On each side of the ship's hull is arranged a lever, to which are connected two rods with flaps, as above named, in such manner that while the one rod is making a working stroke backward, the other is making its forward or idle stroke. In whichever direction the lever is moved, on one side of the hull or on the other, there is always one such device in active work on each side, so that the vessel progresses steadily onward without deviation from its course. With this arrangement it would be possible to dispense with the steering-gear and rudder, as by operating one of the systems more than the other the boat or vessel may be caused to take any desired course.

By the aid of this propelling apparatus I obtain a much greater useful effect in the propulsion of the craft than by the use of ordinary oars, which moreover require skillful management; furthermore the person operating it can turn his face forward in the direction of motion.

In the accompanying drawings, Figure 1 is a side elevation of the craft, showing one set

of thrust-blades. Fig. 2 is a part plan showing the stern end of the boat, and Fig. 3 is a vertical cross-section of the same.

A lever *b* on each side of the hull is pivoted on a projecting bolt *a*, and has pivoted to its two ends the rods *c* and *c'*, terminating at their free ends in cross-bars *d* on vertical bolts *e*, in which the flaps *f* are pivoted. The pivoting of the flaps *f* on vertical bolts or pivots is more suitable and advantageous than on horizontal bolts, because with the latter the weight of the flaps would prejudicially affect their action in the manner hereinafter described. Suitable stops or abutment-surfaces on the cross-bars *d* prevent the flaps from swinging beyond the positions indicated in Fig. 1.

Engaging with the upper arms of the levers *b* are arranged the motor-levers *g*, which can be oscillated by means of the handles *h*. This oscillating motion, by means of slots in said levers *g* and pivot-bolts at the joint connecting the two levers *b* and *g* and rod *c* at each side of the boat, causes the rods *c* and *c'* to be reciprocated to and fro in a direction parallel with the longitudinal axis of the boat. Eyes *i* are secured to the hull to serve as guides for the movement of the rods *c c'*.

When the rods *c c'* or carriers *c d c' d* are thrust forward, the flaps swing backward until they form to each other an acute angle with its apex directed forward. At the end of this idle stroke the motion is reversed and the rods are moved backward, the pressure of the water acting against the rear surfaces of the flaps, which, by reason of their articulation or hinged joint, at once assume a position, as shown, at right angles to the rods. In this position a thrust is exerted against the water, while a propelling impulse is imparted to the boat. At the next change in the direction of motion of the rods the flaps resume their previous angular position, and as the rods move forward are drawn edgewise through the water with little or no resistance. The angular position of the flaps to each other is necessary to enable the water in its effort to thrust the flaps into the position at right angles to the rods to have a purchase on their surfaces; nevertheless the angle between the

flaps during their non-effective stroke may actually be more acute than is for the sake of clearness represented in Fig. 2.

It is a matter of indifference whether the levers are simultaneously moved in the same direction or in opposite directions relatively to each other, inasmuch as on each side of the hull in either case there will always be one operative thrust-blade, the other making an idle stroke. On the other hand the operation of one lever only will change the direction of the boat without the co-operating aid of the steering-gear and rudder.

Although I have designed this propelling device for use by hand-power, there is nothing to prevent the employment of a motor in connection therewith. In this case the motor may be applied either directly to the lever *b* or to a shaft on which said lever is secured with the aid of any known kinematic means.

Instead of the levers *b* other alternating devices may be employed for insuring the before-described alternately-reciprocating movement of the carriers and flaps.

Should the driving means be of such kind that both the sets of operative devices can only be worked together and not separately, steering mechanism must obviously be provided.

I claim—

1. The combination with a boat, of a pair of rods arranged upon each side of the same and parallel to the longitudinal axis thereof, and in different horizontal planes, the rods of each pair adapted to be reciprocated in opposite directions, a pair of thrust blades or wings pivotally connected to the rear ends of the latter and each adapted to swing in opposite directions in horizontal planes in the manner described, a lever arranged upon each side of the boat and pivotally connected thereto and adapted to oscillate in a vertical plane, each of said levers being pivotally con-

nected at its ends to the forward ends of the respective pair of rods, all as and for the purpose specified.

2. The combination with a boat, of a pair of rods arranged longitudinally upon each side of the boat, the rods of each pair adapted to be reciprocated in opposite directions, a cross bar carried by the rear end of each of the rods, a pair of thrust blades or wings pivoted upon vertical pivots carried by each of the cross bars and each pair of blades being adapted to swing in opposite directions in the manner described, a lever pivotally connected to each side of the boat and similarly connected at its ends to the forward ends of the respective pair of rods, all arranged as and for the purpose specified.

3. The combination with a boat, of a pair of rods arranged longitudinally upon each side of the boat, the rods of each pair adapted to be reciprocated in opposite directions, a pair of thrust blades or wings pivotally connected with each of the said rods at the rear ends of the latter and each adapted to swing in opposite directions in the manner described, a lever pivotally connected to each side of the boat and similarly connected at its ends to the forward ends of the respective pair of rods, and a second lever pivotally connected to the boat upon each side thereof, the latter levers having pivotal connection at their lower ends with the upper ends of the first levers and provided with handles at their upper ends, all as and for the purpose specified.

In testimony whereof I have hereto set my hand in the presence of the two subscribing witnesses.

ERNST FRIEDRICH HERRMANN DEMNITZ.

Witnesses:

OTTO WOLFF,
HUGO DUMMEY.