

L. ALVORD.
ENDLESS-CHAIN PROPELLER.

No. 174,178.

Patented Feb. 29, 1876.

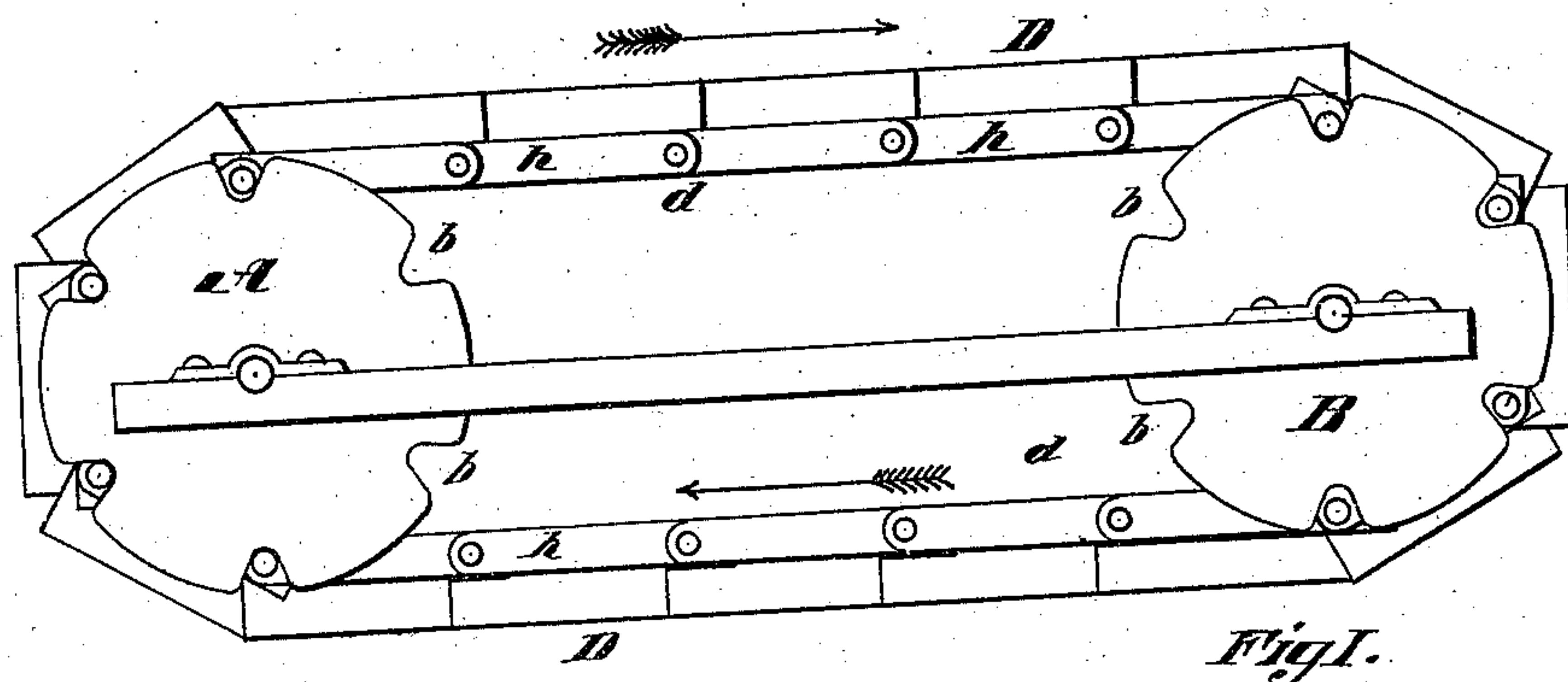


Fig I.

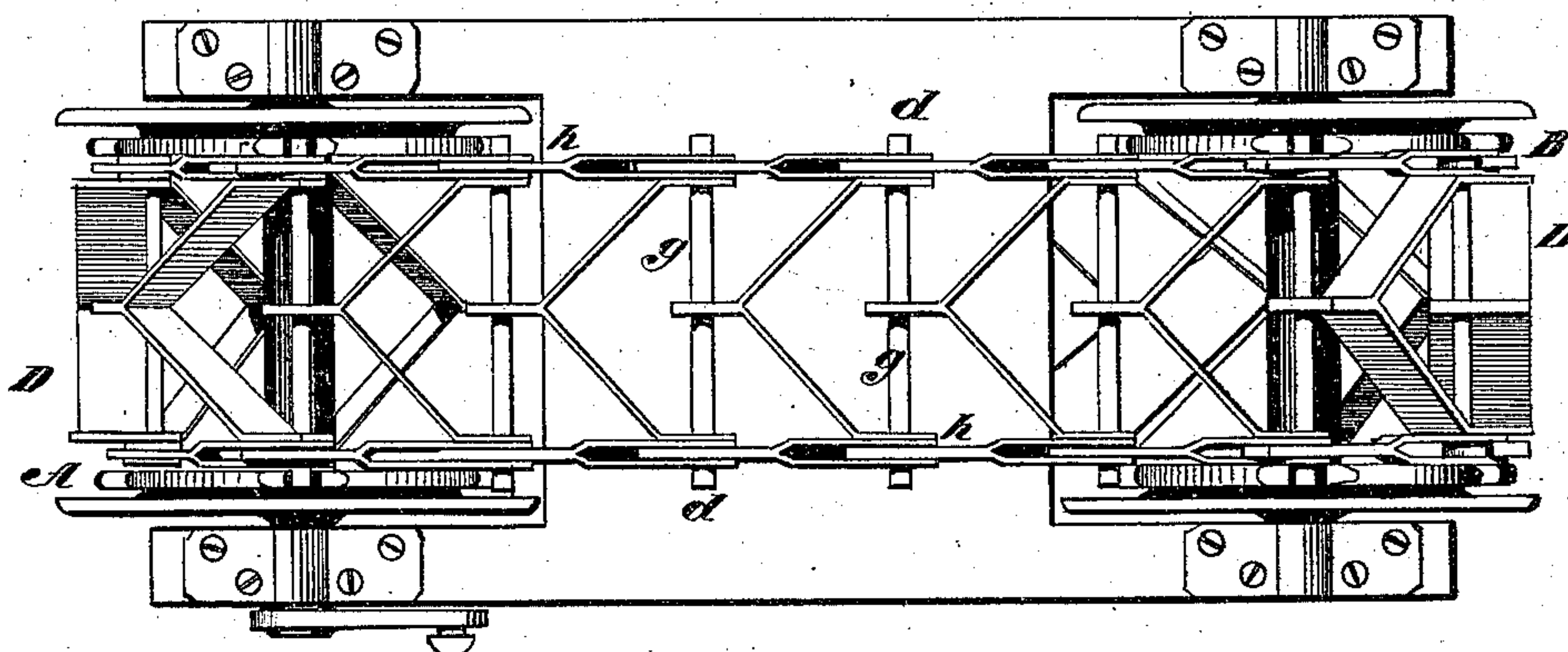


Fig II,

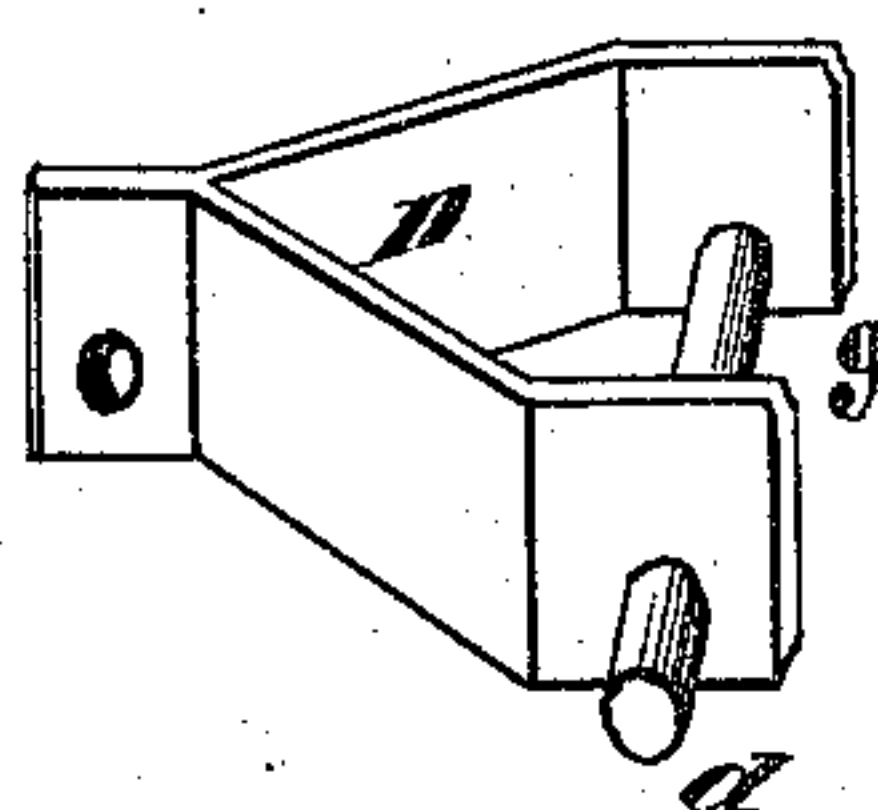


Fig III,

Witnesses
Stockwell Bettes

Inventor,
Luther Alvord.
by his attorney
R. F. Hyde

UNITED STATES PATENT OFFICE.

LUTHER ALVORD, OF SOUTH HADLEY FALLS, MASSACHUSETTS.

IMPROVEMENT IN ENDLESS-CHAIN PROPELLERS.

Specification forming part of Letters Patent No. 174,178, dated February 29, 1876; application filed August 30, 1875.

To all whom it may concern:

Be it known that I, LUTHER ALVORD, of South Hadley Falls, State of Massachusetts, have invented a new Device for Propelling Vessels, of which the following is a specification:

The nature and objects of my invention are illustrated in the following drawings and description:

Figure I is a side view, Fig. II a plan view, and Fig. III a detailed view, of my invention.

This invention consists, generally, of a series of blades connected to form an endless apron or railway, which, moving over rollers at both of its ends attached to the bottom of the boat, acts directly upon the water to produce the desired propulsion.

These blades are connected through side links by rods, which form hinges to permit them to change their direction over the rollers, while projecting ends of said rods engage with depressions in the perimeters of the rolls and cause the series of blades to be moved by the revolution of the driving-roll.

In Fig. I the flanges of rolls A B are shown, provided upon their perimeters with the recesses *b* at distances apart corresponding to that between the projecting ends *d* of hinge-rods *g*, so that said ends *d* will drop into their places in the recesses *b*; and to insure this, while at the same time permitting a slack in the belt of blades, I flare the mouths of the recesses, so that the ends *d* will always find a bearing within the recesses.

It will be seen that when the power is applied through a crank or other well-known way to the driving-roll A, the series of blades is set in motion through said driving-roll, while following upon the roll B with little friction.

In Fig. II it is seen that the links *h*, which give the required flexibility to the series of blades D, are united to each other and to the blades by the transverse rods *g*, which, besides forming these hinges, and affording the ends *d* to engage with the rolls A B, serve to brace the apron of blades laterally, and by passing through the apex of each blade, when constructed as shown in Fig. III, to hold each in its proper relative position.

In practice, I form upon the outside of rolls A B outside flanges, which, being of equal diameter with the rolls containing the recesses *b*, cover the sides of said recesses and form

sockets to protect the ends *d* and the recesses themselves from being obstructed by foreign matter.

If the entire railway of blades was suspended below the keel-line or bottom of a boat, its motion would impart movement to the vessel, from the reason that the lower half of the blades would be acting upon water of superior density to that containing the upper half; but in practice I propose to recess the upper half within the vessel, so that the water acted upon by its blades will be in effect confined, though if desired the blades may be made to feather in one direction.

In arranging this device upon the bottoms of boats, the railway may be inclined in a vertical plane, so that each blade will be acting upon a different stratum of water from the one next to it, to thus avoid any disadvantage from acting upon water already in motion.

The water escaping behind a boat employing this device for propulsion will not make a wash that could effect a canal-bank, and it will be effective upon extensible supports, from a boat when designed to deepen bars and channels, either by direct contact with the bottom or by creating a scour from close vicinity thereto.

I am aware that various propellers have been constructed upon the principle of an endless chain of buckets or floats, and make no claim to such principle; but by my special construction and arrangement of parts the chain of floats, while flexible in the required direction is, by the union of the transverse rods, links, and floats, having their sides united to the rods in the form of braces, so trussed as to, while confining the water within the floats, resist to the greatest extent in proportion to its weight all strain, lateral or direct, from the resistance of the water or of any obstruction of any sand or mud it may be designedly brought in contact with when used to deepen channels.

Having now described my invention, what I claim is—

The propeller for boats, consisting of the blades D, rods *g*, links *h*, and rolls A B, when all constructed and arranged as set forth.

LUTHER ALVORD.

Witnesses:

R. F. HYDE,
T. M. BROWN.