No. 30,057. PATENTED SEPT. 18, 1860.

L. B. FLANDERS.

MARINE PROPULSION.

Fig. 1.

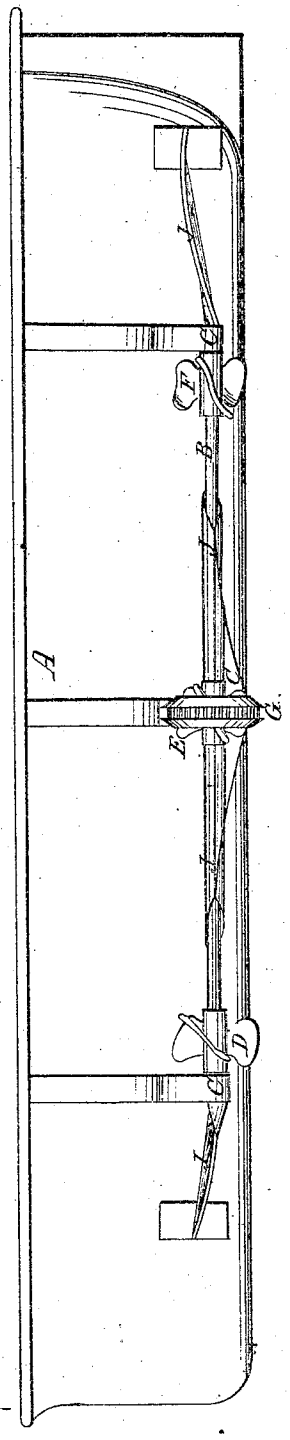


Fig. 4.

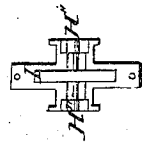


Fig. 3.

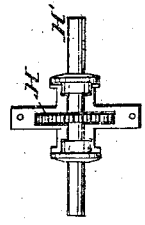
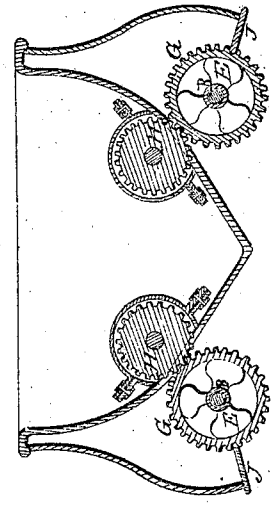


Fig. 2.



Witnesses

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J. Brannan

Inventor

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UNITED STATES PATENT OFFICE.

L. B. FLANDERS, OF CLEVELAND, OHIO.

MARINE PROPULSION.

Specification of Letters Patent No. 30,057, dated September 18, 1860.

To all whom it may concern:

Be it known that I, L. B. FLANDERS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Propelling Vessels; and I do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a perspective view, with my improvement attached, and Fig. 2 is a transverse section through the center of the gear wheels. Figs. 3 and 4 are sections.

Like letters refer to like parts.

My improvement relates to a certain arrangement of propellers upon shafts, to the bearings of the shafts, and to the means for operating the shaft.

A, is the hull of the vessel, which may be of the ordinary construction.

B, represents the shafts upon which the propellers are placed. These shafts, may be of one entire piece, or they may be coupled in the middle.

C, represents the bearings of the shafts B, which are attached to the sides of the vessel and braced above and below, to give them strength. These bearings are tubular in form, extending from the sides of the vessel nearly horizontally, and perform other functions hereinafter specified.

Two or more propellers, D, E, F, are placed upon the shaft B. The propeller D, is placed between midships and the bow. The propeller E is placed about midships. The propeller F is placed between midships and the stern. The blades of the propeller D, stand obliquely to the line of the shaft B, at an angle of about 40°. The blades of the propeller E, have an obliquity of about 30° to the line of the shaft. The blades of the propeller F, have an obliquity to the line of the shaft, of about 20°. Thus, it will be seen, that each succeeding propeller, has a greater pitch or lead than that one preceding it, for the following named reasons. The propeller D acts upon water while in a state of rest, and a momentum is necessarily given to it astern. The propeller E, being upon the shaft B (which is parallel to the sides of the vessel) being necessarily upon a line with the propeller D, acts upon the water, not in a state of rest, but motion astern, given to it by the propeller D; a greater obliquity of the blades of the propeller E, must prevail in order that the blades may act as effectively in propelling the vessel, as do the blades of the propeller D, for it will be observed, that the velocity of all the propellers are the same, upon each shaft. The obliquity of the blades of the propeller F, being nearest the stern, where the momentum of the water is still increased by the action of propeller E, must be greater than in E, for the reasons above given. The approximate obliquity of the blades of the three propellers are 40°, 30° and 20°, but they may be varied.

G, represents a cog, or spur wheel. This may be placed directly upon the shaft B, at any point, or it may encircle the blades of either of the propellers. I prefer to place it upon the periphery of the middle propeller, as seen in the drawings, for the reasons that the shaft B has a firm support at this point, and also, the blades of the propeller serve the purpose of arms to the wheel. The segment of the wheel G, penetrates the side of the vessel sufficiently to allow the blades to sweep around close to the hull.

H, is the driving wheel. This is placed upon the inside of the hull, and is incased in water tight boxes, as seen at I, the journals H′ passing through stuffing boxes H″. The periphery of the wheel H, must necessarily pass through the sides of the vessel in order to gear into the wheel G. The power from the engine, is applied directly to the shaft of the wheel H. For vessels of heavy burden I propose to have two or four engines, so that the propeller wheels on either side of the vessel, can be worked independently of each other, with one or two engines each, and in the same or in opposite directions, at the same time.

Along the line of the shafts B, projecting from the sides of the vessel, and forming the bearings of the shaft, as seen at C, these bearings expand into a tubular form as seen at J, the same forming a kind of horizontal cut water. This structure serves, besides forming the bearings of the shaft, B, two important purposes: First, it divides the current of water horizontally at the center line of the shaft, and thus breaks up that whirling motion the water receives from the propeller blades; second, being entirely submerged, it gives greater steadiness to the vessel by preventing it from rolling, for should the vessel from any cause, careen suf-

ficiently to raise the structure C, J, and with it the shaft B, out of the water, the sudden increase of the relative specific gravity of the iron composing it and the shaft, in leaving the water, would tend to arrest its further motion; and besides, the tubular structure C, J, must necessarily displace a large quantity of water, which would also tend to retard the rolling of the vessel.

I wish it to be distinctly understood, that in placing the cog wheel G, upon the periphery of the blades of either of the propellers, these blades serve as arms to the cog wheel. If I place the wheel G, directly upon the shaft, B, I construct the arms of such a form, that they act as a propelling power, that is, I form the arms, of the same obliquity to the shaft as are the blades of the propellers. Should I desire to place a bevel gear upon the shaft B, instead of the cog wheel G, I should construct the arms in the form of propellers.

To provide against the influx of water into the hold of the vessel, should it become necessary to remove the wheel H, I provide a sliding valve that closes the opening through the side of the vessel, through which the wheel H gears into the wheel G.

The wheel G may be protected from sticks floating in the water, by a band encircling the wheel.

If the vessel is designed for river navigation, the propellers should so revolve as to throw the water under the vessel in order to aid in buoying it up in shoal water.

I may, on small vessels, use but one propeller upon the shaft B. I do not therefore limit myself to a particular number.

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

1. When two or more propellers are upon the same shaft, and rotated in the same direction, arranging the blades of said propellers, upon their respective shafts so that the blades of the propeller nearest the bow, shall be at a greater angle from the line of the shaft, and the blades of each propeller in the rear of it, at a lesser angle from the line of the shaft, as herein set forth.

2. Constructing the bearings of the propeller shaft, of tables or plates, attached to, and projecting from the sides of the vessel, as described, so that said bearings constitute cut water surfaces as well as supporting surfaces as set forth.

3. Operating the propeller shaft by toothed or beveled wheels projecting through the sides of the vessel, and gearing into toothed or beveled surfaces, encircling or upon a band around the propeller as herein described.

L. B. FLANDERS.

Witnesses:
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