

(No Model.)

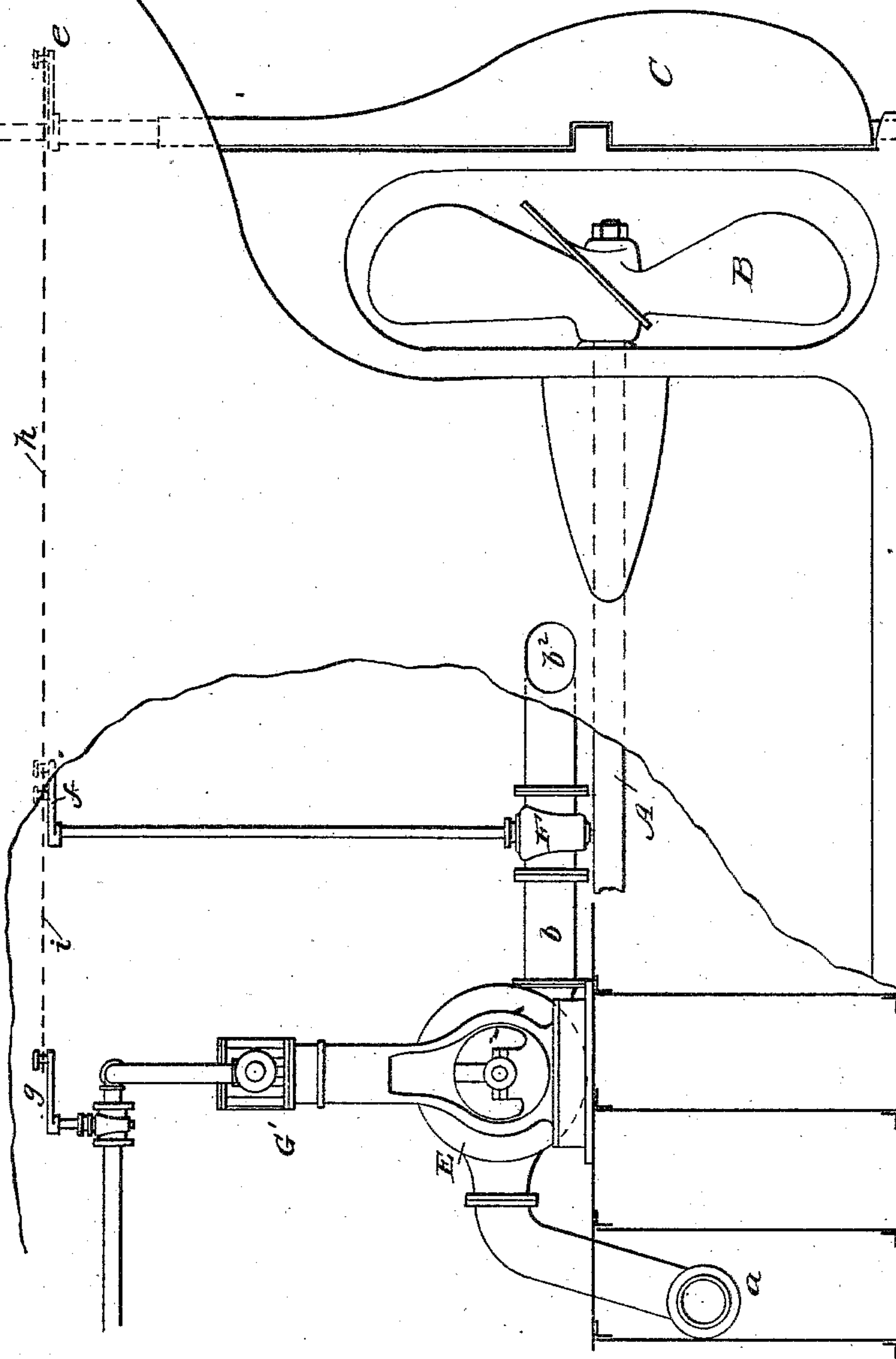
2 Sheets—Sheet 1.

R. M. G. BROWN.  
STEERING APPARATUS.

No. 295,106.

Patented Mar. 11, 1884.

Fig. 1.



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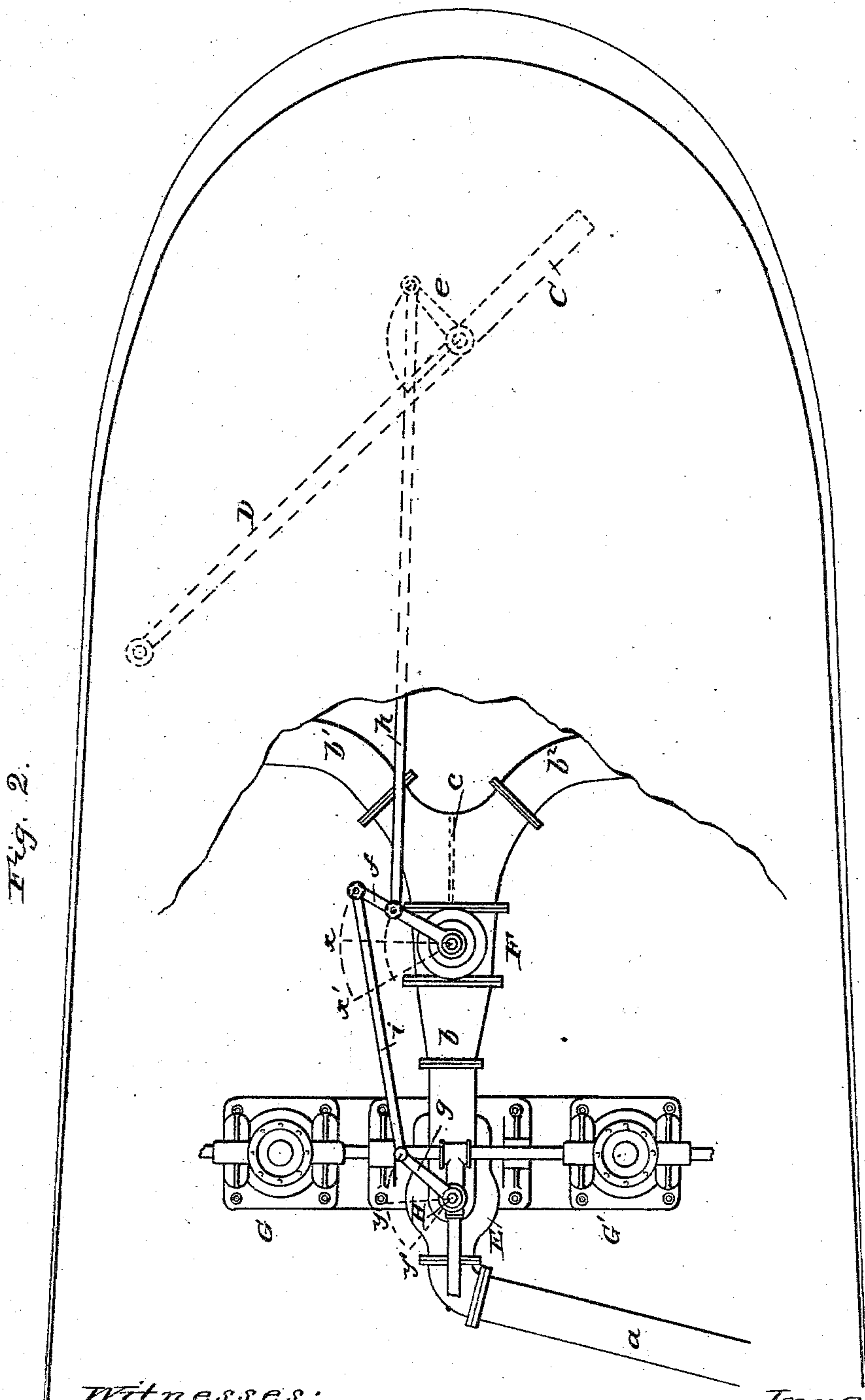
(No Model.)

2 Sheets—Sheet 2.

R. M. G. BROWN.  
STEERING APPARATUS.

No. 295,106.

Patented Mar. 11, 1884.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

ROBERT M. G. BROWN, OF THE UNITED STATES NAVY.

## STEERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 295,106, dated March 11, 1884.

Application filed December 21, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT M. G. BROWN, Lieutenant United States Navy, have invented certain new and useful Improvements in Machinery or Apparatus for Steering Vessels, of which the following is a specification.

It has before this been proposed to steer a vessel by means of water ejected from one side or the other at the stern. In some cases, also, it has been proposed to use this hydraulic steering mechanism in conjunction with the ordinary steering apparatus; but in all such cases of which I have knowledge the hydraulic apparatus has been independent of the ordinary steering apparatus, and each, in order to act, has required separate and independent manipulation. The characteristic feature of my improvement resides in so combining these two apparatuses or mechanisms that they shall both be operated through the instrumentality of one and the same wheel or tiller; and I prefer to so organize and arrange the elements which compose said combination that the hydraulic steering apparatus shall be called into action not by slight movements of the tiller or wheel—such as required ordinarily when steering a course—but only by extensive movements—such as, for instance, as take place in putting the tiller “hard over.”

The nature of my improvement and the manner in which the same is or may be carried into effect will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of so much of a steam-vessel of the propeller type provided with my improvement as needed for the purpose of explanation. Fig. 2 is a plan of the same.

A represents the propeller-shaft; B, the propeller; C, the rudder, and D the tiller, the latter to be connected, in the usual way, by chains, rods, &c., to a wheel for governing the position of the rudder. These parts are of ordinary construction and arrangement, and require no further explanation.

E is a pump—in this instance a rotary pump—located at a suitable point in the hold of the vessel. This pump takes in water through an inlet, *a*, which preferably starts from a point on the under side of the vessel near the keel, and it discharges the water

which it takes through an outlet, *b*, which is branched or forked, the one branch, *b'*, leading out to one side of the vessel near the stern, and the other branch, *b''*, leading to a corresponding point on the opposite side. The water taken in by the pump is discharged through one or the other of these branch outlets, and the point of discharge preferably is located about midway between the water-line and keel of the vessel. At the point where the outlet-pipe is branched or forked there is located a two-way cock, F. The branch outlets *b'* *b''* are separated at this point by a partition, *c*, (indicated by dotted lines in Fig. 2,) and the cock, according as its water-way is turned to one side or the other of the partition, directs the water into one or the other of the branches *b'* *b''*. The pump is operated by any suitable motor. In this instance it is worked by two small steam-engines, G G', whose steam-piston rods, by suitable connecting-rods and cranks, (set quartering to one another,) are connected to and arranged to rotate the pump-shaft. This connecting-gearing is of ordinary well-known type, and constitutes no part of my present invention, and I therefore do not represent it in the drawings. Steam is supplied to these pump-engines through a branched steam-pipe, *d*, provided with a throttle-valve, H, for controlling the steam-supply.

Thus far there is no particular novelty in the apparatus. The pump, with its inlets and outlets and operating mechanism, forms the hydraulic steering apparatus, and the tiller and rudder the ordinary steering apparatus. I now proceed to a description of the parts by means of which I combine the two, so that both may be operated through the instrumentality of one and the same tiller or wheel.

Upon the rudder-post is fixed a crank-arm, *e*. The two-way cock has a crank-handle, *f*, and the throttle-valve has a crank-handle, *g*. *e* and *f* are connected by a connecting-rod, *h*, and the two crank-handles *f* and *g* are connected by a connecting-rod, *i*. Under this arrangement it will be seen that the tiller, when moved, will operate not only the rudder, but also the two-way cock and the throttle-valve. When the tiller is midships, the handles *f* *g* are brought to a position indicated by the lines *x* *y*, respectively, in which position both the throttle-valve and the two-way cock



are closed. The throw of the cranks *e f g* is such that by the time the tiller is put hard over either to port or starboard both the throttle and the cock will be fully open. The arrangement of the cock is such that when the tiller or rudder is in the position shown in Fig. 2 the pump will communicate with the branch discharge-outlet *b*<sup>2</sup>. When, on the contrary, the tiller is put hard over in the opposite direction, the handle *f* will be brought to the position indicated by the line *x'*, in which position the pump will be thrown into communication with outlet *b'*. By the same movement the handle *g* will have been thrown to the position indicated by the dotted line *y'*, in which position the throttle-valve will admit steam to the engines just as it does when in the position shown in full lines in the drawings.

It is preferred, as hereinbefore said, not to call into action the hydraulic steering apparatus when but slight movement of the tiller from its midships position is required. For this purpose the imperforate portion of the seat in which the throttle-valve works is made of such extent as to permit the tiller to be moved through the range usually required in merely steering a course without opening the steam ports or passages in the valve. As soon, however, as the tiller is moved beyond this point in either direction, the throttle-valve opens, the pump at once is put in operation, and through the instrumentality of the two-way cock it discharges water through the appropriate outlet, *b'* or *b*<sup>2</sup>.

I have described one way in which my improvements can be carried into practical effect, but do not wish to be understood as restricting myself to the particular mechanical in-

strumentalities herein described, inasmuch as it is manifest that the same can be widely varied without departure from the principle of my invention.

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

1. The combination, with the rudder and rudder-operating mechanism, of a hydraulic steering apparatus independent of the rudder, but connected with and operated by the same mechanism through the instrumentality of which the rudder is operated.

2. The combination, with the rudder and tiller for operating the same, of a hydraulic steering apparatus connected with and operated by said tiller, said parts being organized and arranged substantially as hereinbefore set forth, so that the hydraulic apparatus shall be called into action only when the tiller moves beyond a predetermined distance to one side or the other of its amidships position.

3. The combination of the pump, its operating mechanism, and inlet and outlet branches, the throttle-valve, the two-way cock for diverting the discharge into one or the other of said outlet branches, the rudder, and the tiller connected to and adapted to operate simultaneously the throttle-valve, the two-way cock, and the rudder—claiming none of these elements separately, but only the combination of all of them when arranged to co-operate in substantially the manner hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 14th day of December, 1883.

ROBERT M. G. BROWN.

Witnesses:

EWELL A. DICK,

J. WALTER BLANDFORD.