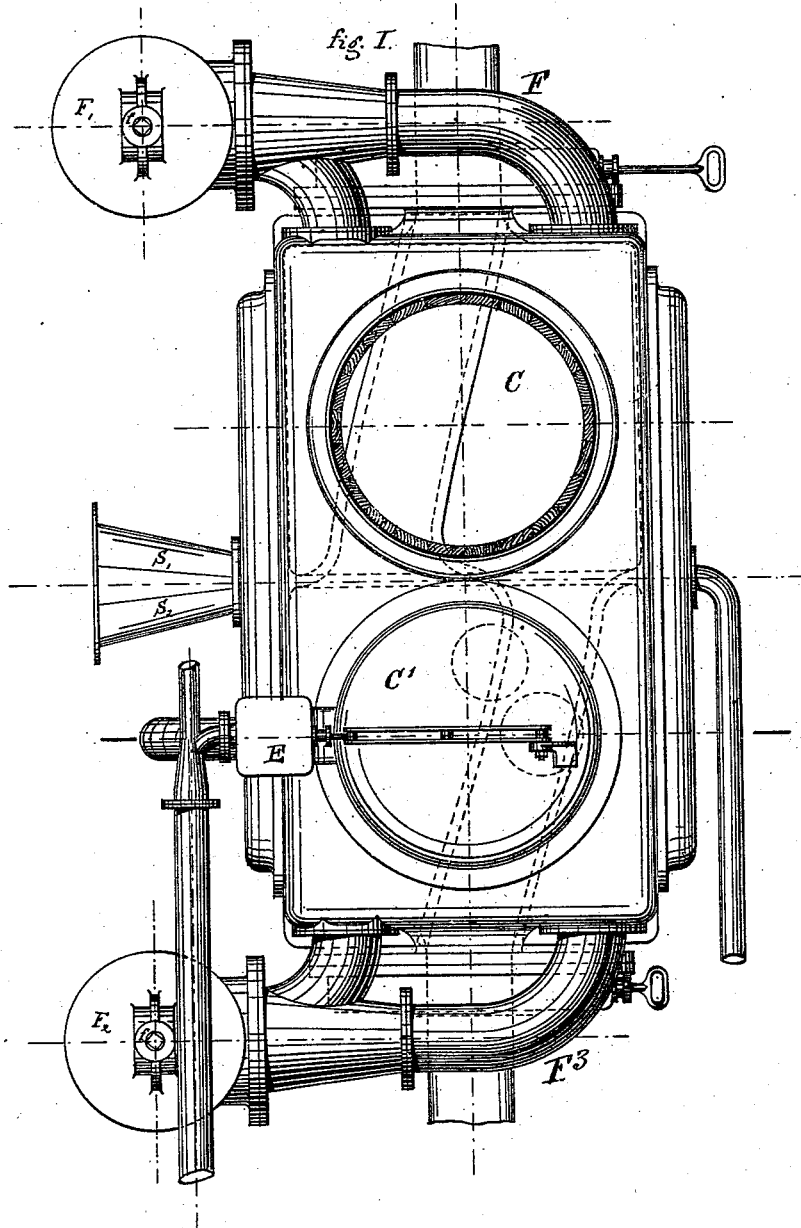


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No. 213,101.

Patented Mar. 11, 1879.



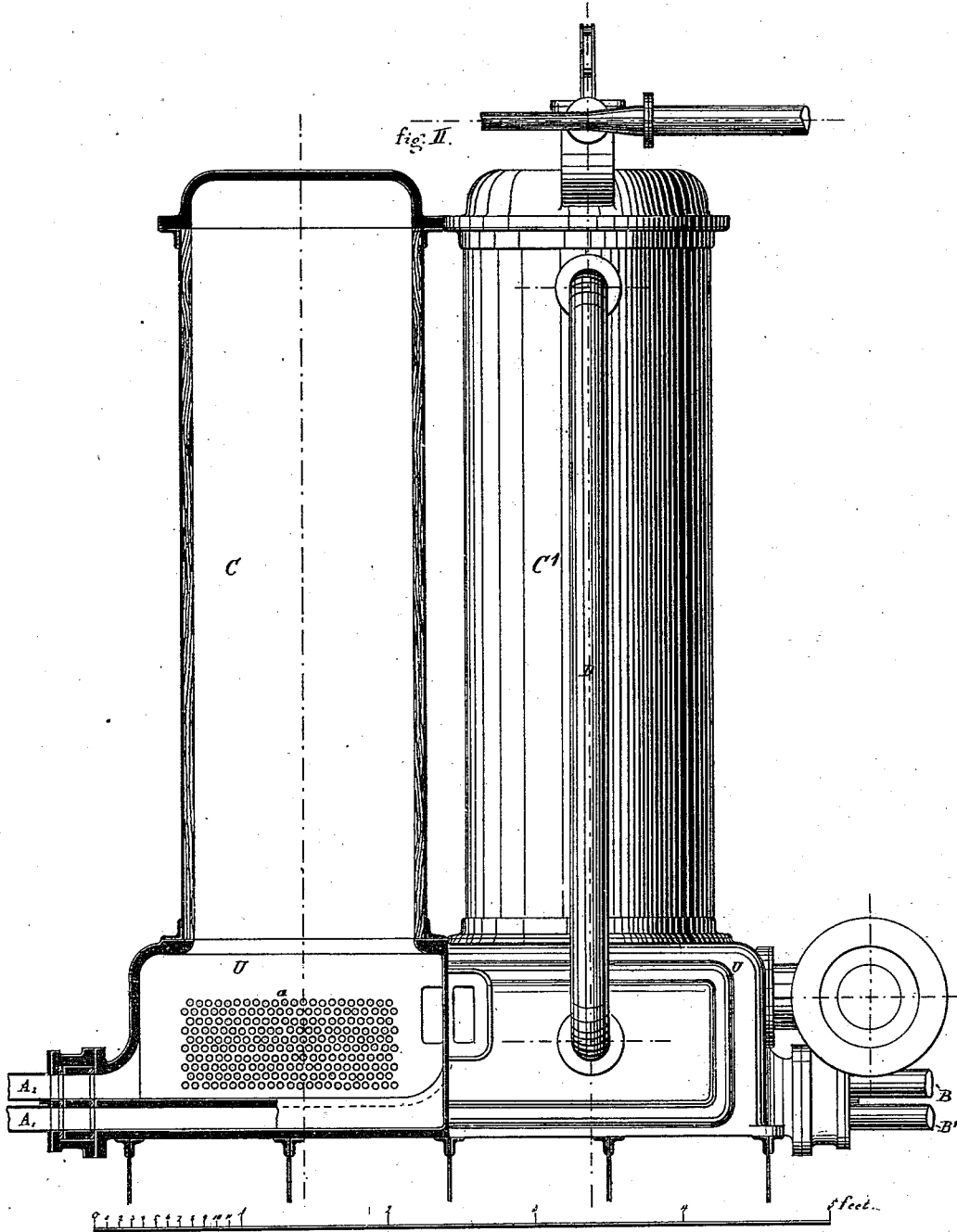
Witnesses -
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Inventor
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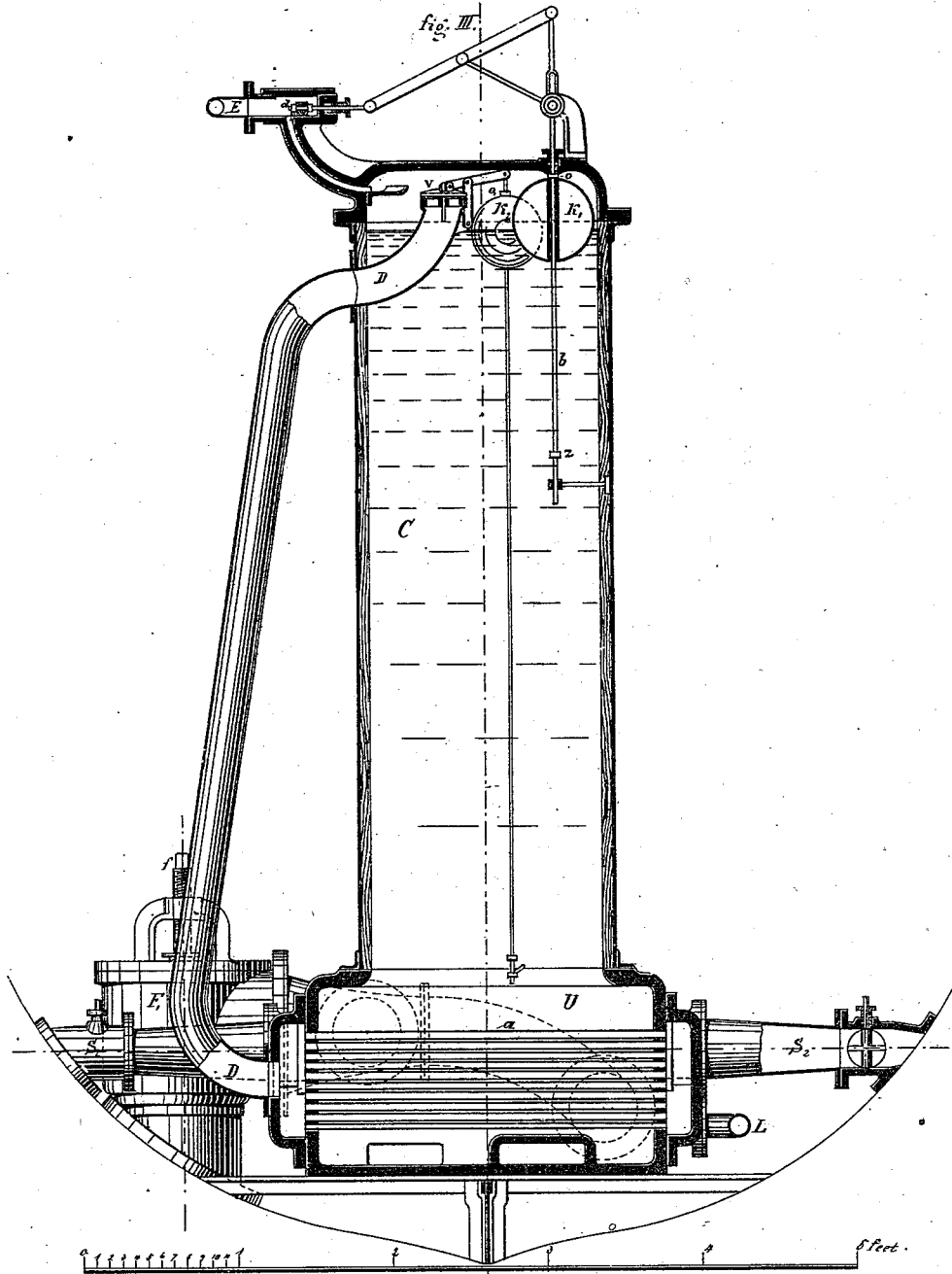
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UNITED STATES PATENT OFFICE.

EMIL FLEISCHER, OF DESSAU, GERMANY.

IMPROVEMENT IN HYDRO-MOTORS.

Specification forming part of Letters Patent No. **213,101**, dated March 11, 1879; application filed December 7, 1878.

To all whom it may concern:

Be it known that I, Dr. EMIL FLEISCHER, a citizen and resident of the city of Dessau, Duchy of Anhalt, German Empire, have invented an Apparatus called Hydro-Motor, for propelling and steering vessels and other floating objects by means of hydraulic reaction produced through direct action of steam upon water; of which the following is a specification:

My invention relates to improvements in propelling and steering vessels, in which paddle-wheels and screws are dispensed with, and steam and water are brought in contact in suitably-arranged chambers or cylinders, having openings at their lower ends, through which the water is alternately admitted and expelled by the corresponding alternate steam-pressure and vacuum therein.

In all previous methods of propulsion by hydraulic reaction, the steam used for forcing out the water is mixed with the latter, and is ejected with the same into the "floatative" body of water. In ocean or salt-water navigation fresh water must necessarily be resorted to in the generation of steam, and when this steam is expelled it, of course, causes the consumption of a large quantity of fresh feed-water.

The main object of the present invention is to expel the water used for the propulsion of the vessel by steam-pressure, and to conduct the steam after it has exerted its effective force into a condenser, where it is condensed and again made available as feed-water. The means for conducting the steam into the condenser and the general construction of the devices hereinafter described form the subject-matter of the present invention.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan or top view of a hydro-motor constructed according to the present invention, one of the water-chambers being shown in cross-section. Fig. 2 is a longitudinal elevation with one of the water chambers or cylinders in vertical section. Fig. 3 is a transverse section of the apparatus.

The letters C C' denote two vertical cylinders, which are arranged parallel to each other,

and secured to a rectangular bottom casing, U. The latter is divided by a transverse partition-plate into two chambers, which communicate with the cylinders C C', and make the latter independent of each other. The water enters each chamber alternately, and is expelled therefrom in a like manner, so as to render the action of the apparatus continuous.

The water-inlet tube for one of the chambers is designated by the letter F, said tube communicating with a valve-casing, F¹, which receives the water directly from the external body of water, and conveys it in two streams through the branched inlet-pipe F. The inlet-tube F² and the valve-casing F² of the other casing or cylinder are of a like construction and similar in action. The water enters each cylinder when a vacuum is formed therein, and as soon as the water has reached a certain height steam is admitted to expel the water. The steam does not pass out with the water, but acts expansively upon the latter, and when the water has been expelled from the cylinder by the action of the steam the latter is conducted into a condenser.

The cylinders alternate in their action—that is, when one is receiving water the other is discharging its contents. This operation is effected in the following manner, viz: Each cylinder is provided with a steam-chest, E, containing a slide-valve, *d*, which is connected by means of a lever and link with a vertically-movable rod, *b*, arranged inside the cylinder. Said rod is guided by a bottom support and the cylinder-top, and has a movable bottom collar, Z, and a top collar, *o*. A float, K¹, is fitted on the rod, between the collars, and is free to slide on said rod.

When the water in the cylinder has risen to the level indicated in Fig. 3 the float will strike against the collar *o* on the rod, thus raising the latter, and opening the communication between the valve-chamber and the cylinder. Steam is then permitted to enter the cylinder, the pressure whereof will cause the expulsion of the water. The float will descend with the fall of the water-level, and in doing so it comes in contact with the collar Z on the rod *b*, and depresses the latter for closing the steam-inlet opening. The steam

remaining in the cylinder after the supply is shut off acts expansively and forces out the water.

The steam, after it has performed its function of expelling the water, is conducted into a condenser in the following manner: A float, K^2 , is fitted to slide on a rod, o' , having top and bottom projections, and connected by a lever with a valve or lid, r , of a steam-escape tube, D , opening into the cylinder at the top thereof.

When the water has fallen in the cylinder, so as to cause the float K^2 to come in contact with the bottom projection of the rod o' , the latter will move slightly in a downward direction, and will cause the removal of the valve from the mouth of the tube D . This having been done, the steam present in the cylinder is permitted to escape through said tube into a suitable condenser.

I preferably use a condenser of the following construction: A series of tubes traverse the water-inlet chamber V of the cylinder or cylinders, and communicate with longitudinal passages at the sides of the water-inlet chamber. The passage at one side receives the steam, and the opposite passage receives the condensed steam, or the water resulting from the condensation of the steam. This latter passage has a discharge-tube, L , which is in communication with an air-pump or a feed-water mechanism. As the steam escapes from the cylinder through the above-mentioned tube D , a vacuum is created in the cylinder, which is filled by the incoming water.

When the water rises in the cylinder the float K^2 also ascends, and in doing so it strikes the upper projection of the rod o' , and closes the steam-escape valve.

The water-escape tubes for conducting the propelling jet or current of water to the stern or bow of the vessel, for propelling the latter in opposite directions are designated by the letters A^1 , A^2 , and B . (See Fig. 2.) The tube A^2 communicates with one chamber, and the tube A^1 with the second chamber, for propelling the vessel in one direction. The tubes B B' are arranged in a similar manner for propelling the vessel in an opposite direction.

For steering purposes transverse tubes S^1 S^2 are provided, which communicate with the two cylinder-chambers, and are provided with suitable valves.

It may be stated that the different tubes and water-passages are provided with valves for shutting off the flow of water.

In order to lessen the loss of steam by condensation on the walls of the water-cylinders, the latter may be lined or covered with wood or any other poor non-conductor of heat. The floats may also be given a flat form, so that they will cover nearly the entire surface of the water.

I also propose to cover the water with a layer of oil or petroleum, which will always float on the surface of the water, as the cylinder is never completely emptied. The oil will lessen the agitation of the water when the vessel is in motion, and will serve to saturate the walls of the cylinder, so that the latter will not act to condense the steam to any but a slight extent.

The steam acting upon the layer of oil is not so liable to condense as when it comes in direct contact with water, and for this reason it can be utilized again by passing it through the condenser.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a hydro-propeller for navigable vessels, a water-cylinder operating without a piston, communicating with the floatative body of water, a steam-inlet valve, a steam-outlet valve, and a condenser, as and for the purpose set forth.

2. The combination of a condenser, the steam-escape tube D , valve V , rod o' , having top and bottom projections, and float K^2 , with the water-cylinder of a hydro-propeller, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMIL FLEISCHER.

Witnesses:

GERARD NAWROCKI, Esq.,
HERMANN KREISMANN.