(No Model.)

T. NORDENFELT.

PROPULSION OF VESSELS AND RENDERING INVISIBLE THE SMOKE DISCHARGED THEREFROM.

No. 344,054. Patented June 22, 1886.

Fig. 1.

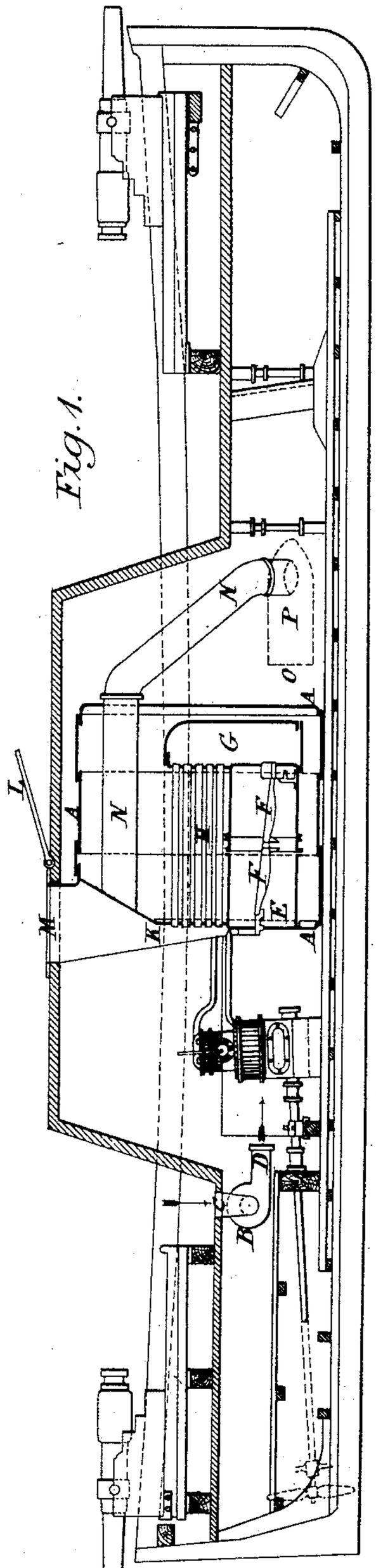


Fig. 2.

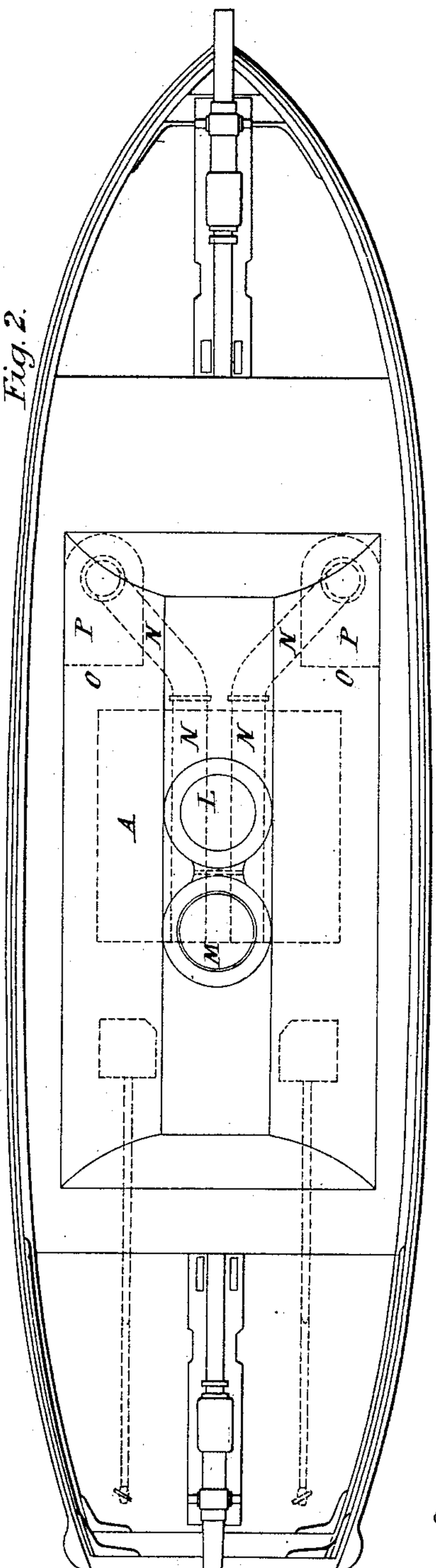
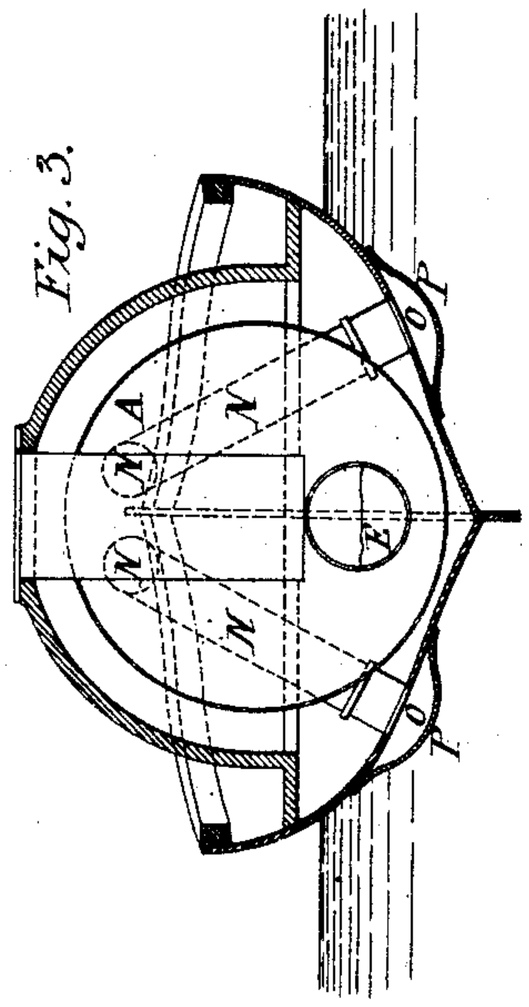


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

THORSTEN NORDENFELT, OF WESTMINSTER, ENGLAND.

PROPULSION OF VESSELS AND RENDERING INVISIBLE THE SMOKE DISCHARGED THEREFROM.

SPECIFICATION forming part of Letters Patent No. 344,054, dated June 22, 1886.

Application filed October 26, 1885. Serial No. 180,978. (No model.)

To all whom it may concern:

Be it known that I, THORSTEN NORDENFELT, a subject of the King of Sweden, residing at 53 Parliament Street, in the city of Westminster, England, civil engineer, have invented certain new and useful Improvements in the Propulsion of Vessels and Rendering Invisible the Smoke Discharged Therefrom, of which the following is a specification.

The object of this invention is the propulsion of torpedo-launches and other boats or vessels without the production of visible smoke. This is effected by placing the smoke-outlet or outlets beneath the water-line, and forcing air at a sufficient pressure into the stoke-hold, which is practically air-tight, or by forcing the air directly into the boiler or by sucking air through the boiler and forcing it into the sea. The smoke in its passage upward through the water being sufficiently subdivided becomes washed, its solid particles are precipitated, and it is rendered invisible, or nearly so.

In order that my said invention may be most fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

In the drawings, Figure 1 is a longitudinal section, Fig. 2 is a plan, and Fig. 3 is a transverse section, showing a steam boat or vessel, in which provision is made for the discharge of smoke into the sea, thereby rendering it invisible. The arrangements here shown are those which I prefer.

The boat or vessel is fitted with a boiler, A, and a fan, B. The fan B is driven either by a small engine for itself or by gearing from the main axle, or otherwise. The duty of the fan B is to suck air through the pipe C and discharge it through the pipe D into the engine-room, which is practically air-tight. The only escape for the air thus forced into the engine-room is through the ash-pit door E, whence, after passing the fire-bars F and the combustion-chamber G and the tubes H, it enters the smoke-box K. From the smoke-box K there are two directions in which the smoke may escape. If the valve L be open, then the smoke will escape into the atmosphere through the opening or chimney M; but if the valve L be shut, then the smoke must escape through the tubes N into the sea through the openings O, which have shields P. The object of these shields is, that their openings, being aft when the boat or vessel has a forward motion, there is a suction produced in them by the rapidly-passing water, and then the fact of their being submerged assists, not retards, the draft in the boiler A. It is found, also, that the gases which are discharged under the bottom of the boat or vessel diminish the resistance to the forward motion of the boat or vessel by skin-friction, and this is a matter of considerable importance and one of the main objects I have in view. The smoke which is delivered under water is washed, and so by the time it escapes into the air is invisible.

It is obvious that in place of having the engine-room under air-pressure the boiler alone need be connected with the fan, and this may be applied to force air into the ash-pit or to withdraw air from the smoke-box and deliver it into the pipe or pipes N. Practically, however, the arrangements shown by the drawings are preferable.

The invention is applicable to steam boats or vessels of any dimensions.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is—

1. A boat or vessel propelled by a steam-engine driving a propeller, in which the furnace is connected by a flue with an orifice below the water, and in which the smoke is by a fan or blower expelled through such orifice into the water and is so rendered invisible, substantially as set forth.

2. The combination, with a boat or vessel, of a steam-engine and boiler driving a propeller, a flue passing from the boiler-furnace to an orifice below the water-line, and a fan or blower maintaining an outdraft through such flue, substantially as set forth.

THORSTEN NORDENFELT.

Witnesses:
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