(No Model.)

F. A. KNAPP.

MARINE VESSEL.

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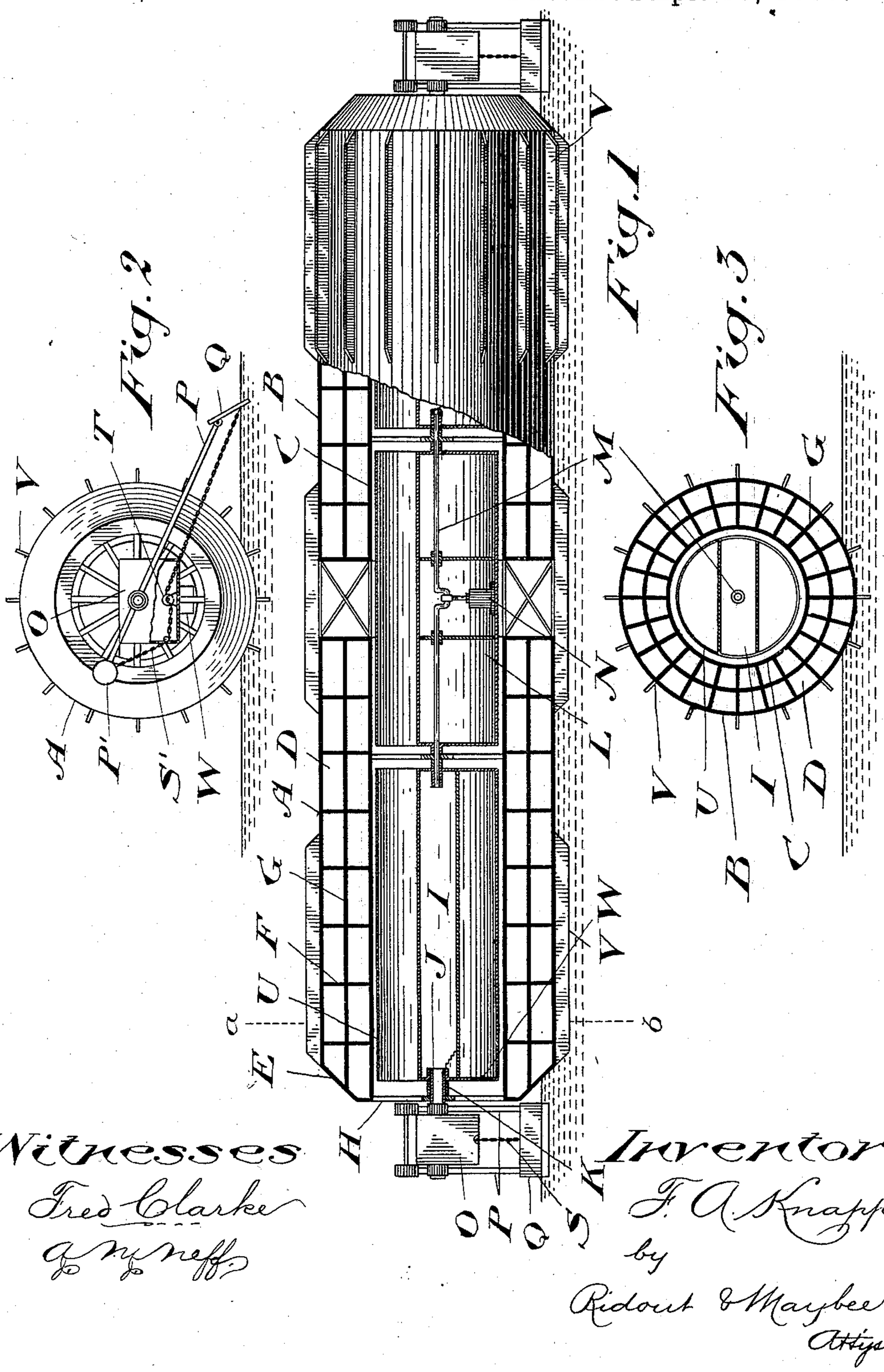

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MARINE VESSEL.

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To all whom it may concern:

Be it known that I, FREDERICK AUGUSTUS KNAPP, of the town of Prescott, in the county of Grenville, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Marine Vessels, of which the following is a specification.

The object of my invention is to devise a vessel capable of attaining a high rate of speed with absolute safety and great economy of power; and it consists, essentially, of a rotatable double outer hull within which are suspended stationary hulls or compartments containing the freight or passengers and the motive power, suitable steering apparatus being provided, and the whole constructed in detail substantially as hereinafter more particularly specified and then definitely claimed.

In the accompanying drawings, Figure 1 is a partial longitudinal section of my improved vessel. Fig. 2 is an end elevation of the same, showing the pilot-house in section. Fig. 3 is a cross-section through *a b* in Fig. 1.

In the drawings like letters of reference indicate similar parts in the different figures.

A is the hull of the vessel, preferably about one hundred and fifty feet in diameter and about seven hundred and fifty feet long. This is formed by two cylinders B and C, inclosing an annular air-space D. The diameter of the inner cylinder is preferably about eighty feet, so that the inner and outer walls of the air-space D are about thirty-five feet apart. The air-space D is closed at the ends by the annular bulkheads E. A series of annular bulkheads F are preferably provided at intervals from end to end of the air-space D, dividing the latter into water-tight compartments.

G are a series of longitudinal bulkheads further dividing the air-space D into water-tight compartments.

From this construction it follows that the hull of the vessel is exceedingly strong and very light, and also that the lower edge of the inner cylinder of the hull is raised well above the surface of the water, insuring dryness in a seaway.

H are spiders connected to the hull A.

I are stationary compartments for passengers or freight.

J are hollow shafts rigidly connected to these compartments at their outer ends. The shafts J pass through bearings K, carried by the outer spiders H.

L is the stationary compartment carrying the machinery.

M is the driving-shaft, suitably journaled in the stationary compartment L and rigidly connected to the inner spiders H. Upon the ends of this shaft M the stationary compartments I are journaled, though of course the bearings for the compartments I might be arranged in different ways without departing from the spirit of my invention. From this construction it follows that if a rotary motion be given to the shaft M it will be imparted to the hull A.

The driving mechanism is shown at N, where a single cylinder is shown with its piston connected to a crank on the shaft. The mechanism shown at N is simply for the purpose of indicating how power is applied to the shaft. In practice suitable triple or quadruple expansion-engines would preferably be employed.

In Fig. 1 the hull A is shown divided in the middle, and the two halves suitably connected by open trusswork. By this means light and air are admitted to the center of the vessel and an exit afforded for the products of combustion from the furnaces.

The hollow shaft J projects some distance beyond the hull A at either end, and pilot-houses O are swung thereon.

P are arms journaled on the hollow shaft and pivoted at their lower ends near the upper edge of a drag Q.

S is a chain connected to the drag Q near its lower edge.

T is a windlass contained within the pilot-house and arranged to wind up the chain S, so as to cause the drag Q to enter the water to a greater or less extent, as might be desired.

The arms P are preferably provided with counterbalances P′, connected by a cross-bar to which a chain S′ is connected, operated by

the windlass T. By reversing the motion of the windlass T the drags P may be raised clear of the water when so desired.

U are arched canopies covering the stationary compartments, so as to shield the passengers and crew from water which may have entered the inner cylinder C and carried up over the stationary compartments by centrifugal force.

As indicated in the drawings, the hollow shafts J furnish a means of communication between the stationary compartments I and the pilot-houses O, and thence outside the vessel when in dock. An entrance-door W is also provided in each stationary compartment I, as shown in Figs. 1 and 2.

V are a series of flanges running from end to end of the hull A, so that it will take the necessary grip of the water when revolved by the action of the machinery at N. This rolling action admits of a high rate of speed being given to the hull with a comparatively small expenditure of power.

If it be desired to turn the vessel to starboard, the windlass T in the starboard pilot-house is set in motion, and the drag Q caused to assume a more vertical position by means of the chain S. The drag then takes a strong grip of the water, and that end of the vessel is retarded so as to cause it to slowly swing to starboard. If it be desired to swing to port, the port-drag Q is operated. If it be desired to stop the vessel without reversing the engines, both drags are put in operation at once.

The points of construction of my device which I claim as being of particular importance are the double-skinned cylindrical hull, of which the inner skin or cylinder is of such diameter that its lower side is raised sufficiently high above the surface of the water to keep its interior dry in all ordinary weather, (as the draft of water is only about ten or eleven feet, a vessel with dimensions such as described would have about twenty-five feet of free board;) second, in the use of drag-rudders at each end of the hull; third, in the use of the hollow axles rigidly connected to the inner stationary compartments so as to afford ready access to the pilot-houses outside the vessel; fourth, in the direct application of the power to a central shaft, and thence to the outer hull; fifth, in the construction of the hull in two sections connected together by trusswork, so as to leave an opening for the admission of air and light and for the emission of smoke, (although the hull might also be made without this central division.)

Telephone and signal communication will of course be provided between all parts of the vessel.

What I claim as my invention is—

1. In a vessel of the class described, a rotatable outer hull comprising two cylinders substantially concentric to each other and having an annular air-space between them, bulkheads subdividing said air-space into water-tight compartments, the inner cylinder being of such a size that its lower side is above the water-line, stationary compartments inside of said rotatable hull, and mechanism for rotating the rotatable hull around said stationary compartments, substantially as described.

2. In a vessel of the class described, a rotatable outer hull comprising two substantially concentric cylinders confining an air-space between them, the air-space inclosed by the outer cylinder entirely surrounding and protecting the inner cylinder bulkheads subdividing said air-space into water-tight compartments, in combination with stationary compartments suitably supported inside of said rotatable hull, and mechanism constructed and arranged to rotate said rotatable hull around the stationary compartments, substantially as described.

3. In a vessel of the class described, a series of stationary compartments, one of which has a driving-shaft therein and suitable mechanism for driving said shaft, a rotatable outer hull surrounding said stationary compartments, means as the spiders connecting said outer hull with said driving-shaft, a hollow shaft at the outer end of each of the outer stationary compartments, and means as the spiders forming connections between said rotatable hull and said hollow shafts, whereby the outer hull is rotated around the stationary compartments when the driving-shaft is rotated, substantially as described.

4. In a vessel of the class described, a rotatable outer hull, comprising two substantially concentric cylinders inclosing an air-space between them, the air-space inclosed by the outer cylinder entirely surrounding and protecting the inner cylinder stationary compartments inside of said outer hull and spiders connecting said compartments and the outer hull, the outer bearing of each of said compartments being formed by a hollow shaft journaled in said spiders, a central stationary compartment also located inside of said rotatable hull, a central driving-shaft connected to the outer hull by one or more of said spiders and located in one of said stationary compartments, and means for operating said shaft and thereby rotating the outer hull around the stationary compartments, substantially as described.

5. In a vessel of the class described a rotatable flanged outer hull made in two sections connected by open trusswork in combination with two stationary compartments located inside of said outer hull from swinging spiders connected to the rotatable hull, the outer bearing of each compartment being formed by a hollow shaft rigidly connected to the said hull and journaled in the end spider; a central stationary compartment also swinging from spiders connected to the rotatable hull; a central shaft in one of said compartments rigidly connected to one or more of the said

spiders, and means located in the said central compartment for rotating the said shaft, thereby rotating the outer hull around the stationary compartments substantially as and for the purpose specified.

6. In a vessel of the class described, a rotatable outer hull made in two sections connected together by open trusswork, each section comprising two cylinders inclosing an annular air-space, the inner cylinder being of such a diameter that its lower side is above the water-line, bulkheads dividing the air-space into water-tight compartments, a series of longitudinal flanges connected to the outside of the hull, interior stationary compartments and mechanism in one of said compartments for driving said rotatable outer hull around said stationary compartments substantially as and for the purpose specified.

7. In a vessel of the class described, the combination of a hull comprising cylinders B and C inclosing an air-space between them, flanges V connected to the outer of said cylinders, bulkheads E, F and G dividing the space between said cylinders into water-tight compartments, stationary compartments I and L, shafts J and M, spiders connecting said shafts and the hull, and means for driving one of said shafts, with pilot-houses O, drags Q, and means as the windlasses and chains for operating said drags, substantially as described.

8. In a vessel of the class described, the hull A, made in two sections connected together by open trusswork each section comprising two cylinders inclosing an air-space D, the cylinder C, being of such a diameter that its lower side is above the water-line, bulkheads E, closing the ends of the air-space; bulkheads F and G subdividing the air-space, and a series of longitudinal flanges connected to the outside of the hull, substantially as and for the purpose specified.

9. In a vessel of the class described, a rotatable outer hull comprising two cylinders having an air-space inclosed between them, bulkheads dividing said air-space into water-tight compartments, a series of stationary compartments inside of said rotatable hull, a driving-shaft in one of said stationary compartments and mechanism for operating the same, spiders connecting said shaft with the outer hull, a pilot-house suitably supported at the outer end of each of the outer stationary compartments, drag-rudders supported by said pilot-houses, and mechanism for operating said drag-rudders, substantially as described.

Prescott, February 26, 1895.

FREDERICK A. KNAPP.

In presence of—
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GEO. MCCREA.