Feb. 20, 1923.

1,445,839.

T. J. MAHONEY.

ART OF NAVIGATION.

FILED NOV. 30, 1921.

Fig. 1

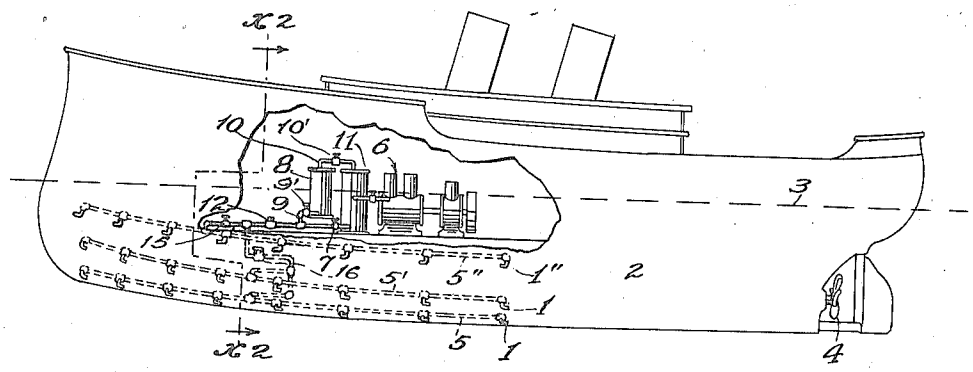


Fig. 3

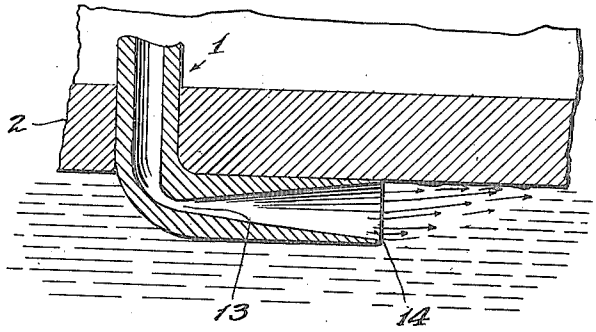


Fig. 2

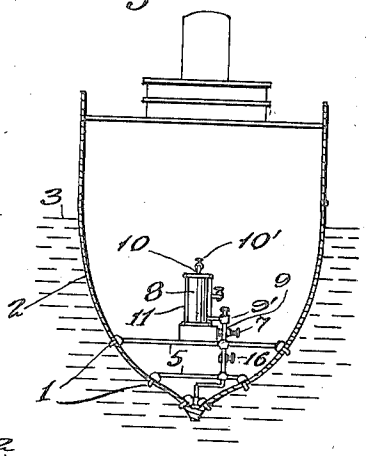
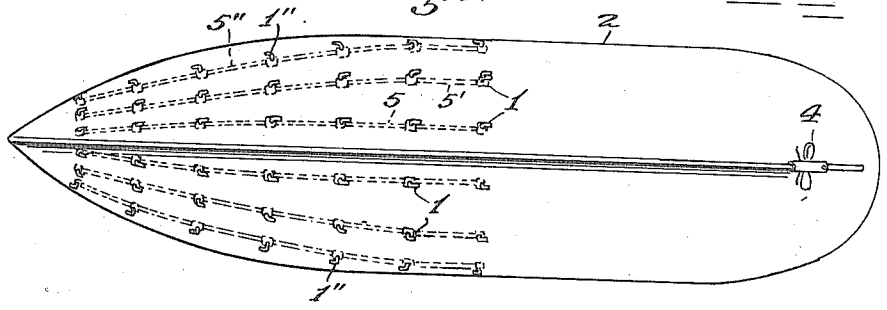


Fig. 4



Inventor,
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by
James R. Townsend
his atty.

Witness:
Robert S. Wuff

Patented Feb. 20, 1923. 1,445,839

UNITED STATES PATENT OFFICE.

TIMOTHY JOSEPH MAHONEY, OF LOS ANGELES, CALIFORNIA.

ART OF NAVIGATION.

Application filed November 30, 1921. Serial No. 518,829.

To all whom it may concern:

Be it known that I, TIMOTHY JOSEPH MAHONEY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have discovered and invented new and useful Improvements in the Art of Navigation, of which the following is a specification.

This invention more particularly relates to a method for facilitating the travel of a vessel through the water; and includes means whereby power is effectively applied to propel the vessel and to prevent skin friction between the vessel and the water.

In carrying out this invention propulsive jets of compressed air having vaporized oil mingled therewith are driven against the water at requisite depths along the hull of the vessel.

I also make provision whereby oil is supplied to said compressed air, thus to supply lubricating coating to the submerged portions of the hull of a vessel.

The invention also includes means whereby my newly invented method may be put into practical operation.

Objects of the invention are reduction of skin friction, the effective application of propulsive power, and the elimination and prevention of marine growth upon the submerged portions of the hull of a vessel.

Objects are to increase the speed of vessels, to diminish the power required to propel vessels, and to reduce the strain, and the wear and tear on the hull of the vessel; and also to lessen the vibration of the vessel due to such strain.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detail description and the appended claims.

The invention may be understood by reference to the accompanying drawing.

Figure 1 is a side elevation of a vessel equipped with means adapted to carry out this invention and discovery.

Fig. 2 is a vertical section on the plane indicated by line x^2, Fig. 1.

Fig. 3 is an enlarged detail of one of the propelling nozzles in place on the hull of the vessel, a fragment of which is shown. The view indicates the practical operation of the invention.

Fig. 4 indicates the application of the invention looking up at the bottom of the hull, shown in Fig. 1.

The air nozzles 1 are arranged along the hull 2 of the vessel below the water line 3 and are directed toward the stern of the vessel which may be supplied as usual with one or more screw propellers as indicated at 4. Any desired number of nozzles may be provided and each nozzle is connected through an appropriate pipe as at 5 to a source 6 of compressed air, the application of which air is controlled by a valve 7. An oil tank 8 is connected by a valved pipe 9 with the pipe 5, and by a valved pipe 10 with the air tank 11; so that when the valves 7, 9′ and 10′ are open, air and oil will be supplied through the nozzle.

In practical operation the compressed air and also the oil, when it is turned on will keep the marine growth off the submerged portion of the boat. The air may be supplied by any suitable means as a blower or an air compressor 6 having sufficient capacity to supply the air under the requisite pressure, and as the air issues from the nozzles the force of its compression is exerted directly against the water in which the nozzle is submerged. The reaction drives the vessel forward and at the same time the air rises from the numerous nozzles, providing an air cushion to support the vessel.

Any suitable number of nozzles may be applied and their sizes and diameters may be determined mathematically as also their locations beneath the hull.

The nozzles are preferably expanded nozzles so that the area of the orifice where the air pressure is applied to the water will be as large as possible within the limits of the nozzle diameter.

The cross-sectional form of nozzle may be determined by the constructor as either oblong or circular. The circular form is indicated in the drawings.

The connection between the air tank 11 and the nozzles may be through a check valve 12 so that water will not flow into the compressors.

It is to be understood that the compression of the air need not be excessive as the greatest depths to which the nozzles would be submerged in present marine construction would only be sixty-four feet and therefore air compression of forty pounds would give free flow of air from the nozzle and would exceed the water pressure by ten pounds in even the deepest sea-going vessels of the present day.

With higher pressure of compressed air, the immediate discharge outlet 13 of each nozzle might be advantageously made only a quarter to one-half inch diameter and the orifice 14 leading therefrom could expand to the end of the nozzle as indicated to a diameter of two inches more or less at its mouth so that constant flow of air through the nozzles would constantly relieve the air pressure upon the compression and storage tank and avoid loss of pressure. The nozzles are spaced apart at such distances along the hull as will allow the water pressing in between the nozzles to afford such resistance to the outflow of the air as will give the most effective pressure on the abutment formed by the nozzle.

The vessel may be provided not only with a set of propelling air nozzles 1 directed toward the stern of the vessel for direct propulsion, but also with a set of propelling air nozzles 1'' directed toward the stem of the vessel for reverse propulsion; and means, as the valves 7, 9', 10' and 15, and the pipes which they control are provided for supplying compressed air to said sets respectively according to the adjustment of said valves.

In the drawing the lower pipe-lines 5, 5' are arranged for direct propulsion while a third line 5'' is arranged for reverse. The pipe 5'' and its nozzles 1'' are at less depth than the pipes 5 and 5' and their nozzles 1 for the reason that the rearward propulsion is less frequent and less continuous than the forward propulsion and therefore the air will be more effectively applied by nozzles for forward propulsion, than for reverse.

Pipes 5 and 5' are controlled by valve 16.

From the foregoing it will be seen that air pressure is supplied to the top of the oil in the oil tank 8 by means of the pipe 10 and valve 10', By opening the valve 9' a regulated supply of oil will be furnished to the compressed air by means of the air pressure on the top of oil in tank 8 forcing the oil through pipe 9 into the main stream of air flowing to the air nozzles 1. By applying pressure to the top of the oil such oil will be forced out of the oil tank instead of being held therein as would be the case if the valve 9' were opened and air pressure had access to the oil only through the pipe 9 and valve 9'.

In practice the compressor 6 compresses air into the tank 11 from which it is delivered by means of the pipe connections and valve 7 to the nozzles 1. By opening the valves 10' and 9' oil may be constantly supplied in regulated quantities to the propelling air and during the passage of the air and oil in the pipes before being emitted from the nozzles 1, such oil will become thoroughly vaporized and intermingled with the air; and when oil is thus supplied to the compressed air the air will be ejected with a fine spray of thoroughly atomized oil which will coat or grease the hull of the vessel and prevent marine growth thereon.

An advantage is that finely vaporized oil may be continuously supplied to the hull of the vessel in such regulated quantities as may be necessary to keep the hull constantly oiled.

Another advantage is that by finely vaporizing or atomizing the oil and intermingling the same with the air, such oil will not come to the surface of the water in blotches or in noticeable quantities and thereby violate existing marine laws; thus permitting continuous oiling of the hull whether in the harbor or out at sea.

I claim.

1. The improvement in the art of navigation set forth which consists in applying at numerous places under and alongside the submerged portions of the hull of a vessel, compressed air having vaporized oil mixed therewith directed in the direction opposite to that in which the boat is to be propelled.

2. The improvement in the art of navigation set forth which consists in the projection, at numerous places beneath and alongside the submerged parts of the hull of a vessel, of compressed air having oil mingled therewith and projected in a direction opposite to that in which the vessel is to be propelled.

3. A vessel provided below its water line with propelling air nozzles opening rearwardly; means to supply compressed air through said nozzles, and means to supply a regulated quantity of oil to said compressed air.

4. The combination with the hull of a vessel, of nozzles opening rearwardly through said hull below the water line; and means for simultaneously forcing compressed air and oil mingled therewith to the water for simultaneous lubrication and propulsion.

5. The combination with a vessel, of nozzles opening alongside said vessel below the water line; an air tank; means to supply compressed air to said tank; pipes connecting said nozzles and said tank; an oil tank; means connecting said oil tank with said air tank; means connecting said oil tank with said pipes; and means to regulate the supply of oil forced from said oil tank into said pipes.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 19th day of November, 1921.

TIMOTHY JOSEPH MAHONEY.

Witness:
JAMES R. TOWNSEND.