

No. 661,303.

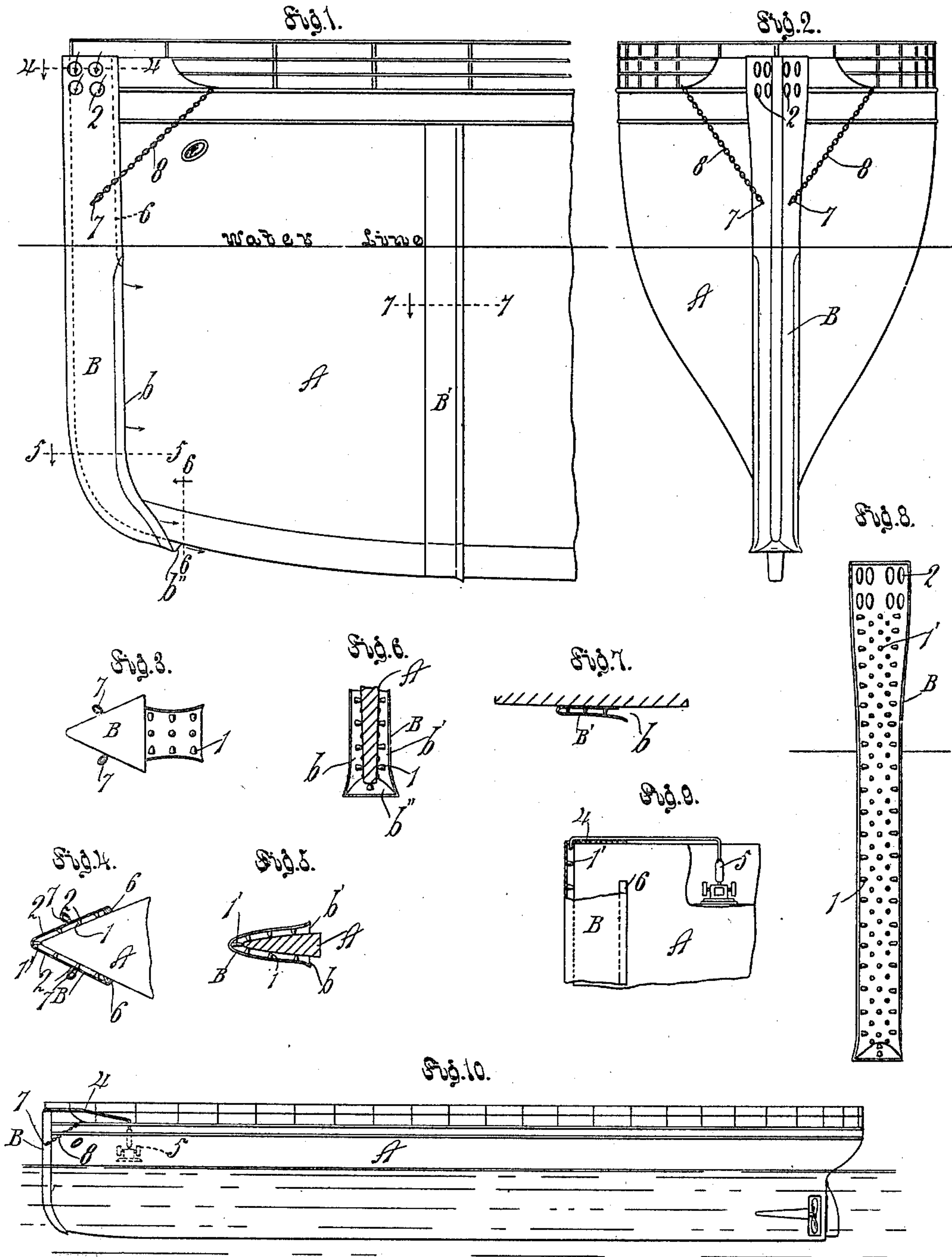
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J. S. BRIGGS.

AIR INJECTING DEVICE FOR LESSENING SKIN FRICTION OF VESSELS.

(Application filed May 3, 1898. Renewed Apr. 10, 1900.)

(No Model.)



Witnesses
Secretaryman.
Geo A Johnson

John Smith Briggs
by Townsend Bros
his Atty.

UNITED STATES PATENT OFFICE.

JOHN SMITH BRIGGS, OF LOS ANGELES, CALIFORNIA.

AIR-INJECTING DEVICE FOR LESSENING SKIN FRICTION OF VESSELS.

SPECIFICATION forming part of Letters Patent No. 661,303, dated November 6, 1900.

Application filed May 3, 1898. Renewed April 10, 1900. Serial No. 12,378. (No model.)

To all whom it may concern:

Be it known that I, JOHN SMITH BRIGGS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Air-Injecting Device for Lessening Skin Friction of Vessels, of which the following is a specification.

The object of my invention is to increase the speed of vessels and economize fuel and power by lessening the skin friction. An incidental object is the removal of barnacles and other shell-fish from the vessel's bottom.

In my invention I provide the vessel at its side with a conduit open above the water-line to admit air and provided below the water-line with a rearward opening close to the vessel's side, whereby the friction of the water when the vessel is moving forward will operate to draw air from the conduit to be distributed alongside and beneath the keel and hull of the vessel underneath the water.

My invention may be applied in numerous ways. It may be a permanent part of the vessel or may be applied as a detachable attachment.

In the accompanying drawings I have illustrated the invention as embodied in an attachment of that construction which I believe to be the most efficient and the most convenient for application to any vessel.

In the drawings I have shown a false bow-piece, which extends from the top of the vessel to below the bottom of the keel. This bow-piece is preferably made of sheet-steel of any desired thickness—say, for example, from one-eighth to a half-inch in thickness, more or less—and forming a trough or groove in which the prow of the vessel sits, with a space between the plate and the vessel from top to bottom, holes being provided at the top or at some suitable part above the water-line to admit air and the edges of the plate at each side of the bow and beneath the keel being free from the vessel to provide an open space or outlet up and down the side of the vessel, through which the air will be drawn and will be introduced underneath the vessel to lubricate between the vessel and water, as hereinafter specified. The width of the plate from the prow to rear edge will be greater or less, as found most desirable in

various applications. For example, it may be desirable to make it from one to three feet wide in large vessels, and it may be less or greater without departing from the spirit of my invention.

My invention includes the several parts, features, and combinations hereinafter described and claimed.

The accompanying drawings illustrate my invention.

Figure 1 is a view of a fragment of a vessel, showing my invention applied as a false bow at the prow and applied in another form at the side of the vessel some distance rearward from the prow of the vessel. Fig. 2 is an elevation looking at the prow of the vessel. It is to be understood that the contour of the false bow may be modified within the judgment of the constructor. Fig. 3 is a plan view of the false bow detached, as shown in Fig. 8. Fig. 4 is a fragmental plan section on line 4 4, Fig. 1. Fig. 5 is a fragmental plan section on line 5 5, Fig. 1. Fig. 6 is a fragmental sectional elevation on line 6 6, Fig. 1. Fig. 7 is a fragmental plan section on line 7 7, Fig. 1. Fig. 8 is an inner view of the false bow or prow attachment detached. Fig. 9 is a fragmental view indicating the use of compressed air for deep-draft and slow-speed vessels. Fig. 10 is a side view of a vessel provided at the prow with my invention.

A indicates any vessel.

B indicates the false bow-piece or prow attachment which extends from any suitable point above the water-line down to the bottom of the vessel and embraces the cutter of the prow and is closed above the water-line to prevent the accidental ingress of water or spray or any rubbish or anything that might obstruct the conduit through which the air is to pass and also to prevent the air from escaping alongside the boat until it is below the water; but below the water-line at any suitable place openings, such as *b b' b''*, are provided between the rear edges of the false bow and the bow of the boat, so that when the vessel moves forward the water in the conduit will be drawn out by the frictional drag of the water and by atmospheric pressure and will be followed down by the air, and the air will then be drawn under the

keel, hull, and sides of the vessel beneath the water-line to form a lubricating-sheet between the hull of the vessel and the water in which it floats, thereby greatly reducing the friction upon the vessel and entirely doing away with the adhesion of the water upon the vessel wherever the air interposes between the vessel and water.

In the false bow which I have shown the same is held away from the vessel by inwardly-projecting knobs, which may be formed of long rivet-heads, as *l l'*, projecting inward from the plate which forms the false bow or prow B, thus supporting the plate and at the same time leaving a free passage for the air between the plate and the vessel.

The dimensions and form of the plate, air-space, air-inlet, and air-outlet will vary within the judgment of the constructor. Good results in some instances may be obtained by an air-space of, say, one-eighth to one inch, more or less, in thickness; but I believe that from one-eighth to a quarter of an inch will ordinarily be found sufficient. The dimensions of the air-conduit will be determined by the size and speed of the boat.

2 indicates openings at the top of the conduit to admit air. It is to be understood that any suitable means, such as a cowl or blower, may be arranged to assist in forcing air into the conduit. I have indicated such means by the pipe 4 and air-compressor 5 in Figs. 9 and 10. The forward movement of the vessel through the water, together with the atmospheric pressure through the openings 2, operates to put the air under the vessel.

In Figs. 1 and 7 the plate B' indicates means fastened to the vessel's side for applying the air farther back on the side of the vessel. In this form and also in the form B the plate is bent outward at its rear edge below the water, so as to produce suction behind the edge of the plate when the vessel moves forward through the water.

6 indicates rubber packing along the edge of the false bow above the water-line to form, with the plate, a closed conduit for the air from

the inlet to below the water-line, so that none of the air will escape from the conduit above the line where it will be effective for the purposes of this invention.

Oils or other materials may be readily distributed under the bottom of the vessel by introducing them into the conduit of the false bow and allowing them to be drawn out by the operation above described with relation to air.

7 indicates ring-bolts or cockeyes on the plate B, and 8 indicates chains leading therefrom to the vessel to hold the false bow in place.

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

1. The combination with a vessel; of a false bow-piece which extends from above the water-line to below the water-line and is provided above the water-line with openings to admit air and is provided below the water-line with rearwardly-directed openings, one on each side of the bow whereby the frictional action of the water will operate to introduce air beneath the vessel, the inner surface of said bow-piece being provided with points which engage with the vessel and hold the bow-piece away from the same to form a conduit.

2. The combination with the vessel, of a false bow; means to hold the same away from the vessel side; packing at the rear edges of the false bow to close the space between such edges and the vessel above the water-line; an open space being provided below the water-line between the vessel and the rear edges of the bow.

3. A vessel having at its side an up-and-down plate provided with points interposed between the plate and the vessel side with air-inlet above water-line, and rearwardly-opening outlet below water-line.

JOHN SMITH BRIGGS.

Witnesses:

JAMES R. TOWNSEND,
ALFRED I. TOWNSEND.