

UNITED STATES PATENT OFFICE.

DANIEL E. SOMES, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVED MODE OF COOLING AND VENTILATING SHIPS AND OTHER VESSELS.

Specification forming part of Letters Patent No. 48,457, dated June 27, 1865.

To all whom it may concern:

Be it known that I, DANIEL E. SOMES, of Washington, in the District of Columbia, have invented a new and valuable Improvement in Means for Cooling and Ventilating Ships, Steamboats, and other Vessels; and I hereby declare that the following is a full, clear, and exact description of my said improvement.

The object of my invention is to cool and ventilate ships and other vessels by means of air-tubes placed perpendicularly and diagonally with the sides and decks, and also with water-tubes running from the bows to the stern of such vessels and through the same.

To effect this object I construct air-tubes of any proper material in a bell or funnel shape, and I arrange them in rows or groups, as may be most convenient, and running from the decks to near the bottom of the vessel. On one side of the vessel I arrange these air-tubes with the small end upward, and on the opposite side I place the large ends upward, whereby a constant draft of air is secured through the bottom part of the vessel, and corn, grain, or other substances placed in the hold are ventilated and cooled. This is accomplished as follows, namely: The air which enters the tubes whose small ends are placed upward becomes cooled as it reaches a point below the water-surface, for the reason of the water being colder than the air above the water, the cooling-surface being increased and enlarged more and more as the tubes increase in size toward the bottom of the vessel, and as the air condenses by coolness it continues to fall and draws the warm air after it. Now, as the small ends of the tubes on the opposite side of the vessel are placed downward, the cooling-surface thereof is lessened as they approach the bottom, and the warming-surface increased toward their upper ends. As the air in the vessels becomes warm it finds a ready outlet through the latter, and a constant circulation is thus secured through the hold of the vessel. I sometimes make these air-tubes whose large ends are placed upward much shorter than the others, in order to direct the current of air above the bottom of the hold or cabin. I may only allow them to run a few feet below the deck, or I may have a portion of them long and the remainder short, as may be best calculated to give thorough ventilation through the contents of the hold or

cabin. In canal-boats and other vessels, when such an arrangement would not be objectionable, I place these tubes in the timbers or planks flush with the outside of the vessel, or on the outside of the vessel altogether.

In canal-boats and other vessels for carrying corn, grain, and the like, I make a false bottom to the same, raised above the bottom of the hold, and perforated with air-holes, thus securing an air-chamber between the said perforated false bottom and the bottom of the hold of the vessel; or I may, if desirable, construct a bin with perforated walls and air-chambers around the bottom and sides thereof, substantially as described in Letters Patent heretofore granted to me under date of February 28, 1865.

I also cool the air in vessels by placing tubes horizontally with the vessel extending through the bow and stern of the vessel, and running from end to end of the same, or they may open out through the sides of the vessel, through or near the corn, grain, or other substances designed to be cooled. These pipes are open at each end, so that the water shall circulate through them as the vessel moves, and aid in cooling such commodities. The ends of these water-pipes in the bow should be smaller than in the stern, and should be gradually enlarged, in order to give free passage to the water; or I cover the bow ends thereof with a strainer, to prevent them from becoming choked. I consider a bell or funnel shape the best form for these water-pipes; but I do not wish to be confined to that particular form of construction. I may pack these water-pipes with vulcanized rubber, or its equivalent, at the points where they are inserted in the ends of the vessel, to prevent leakage in rough seas by the action of the vessel. To prevent the bad effects from moisture by the condensation of air on these water-pipes, I construct second pipes or boxes, in which the water-tubes are placed, which said second tubes or boxes are perforated with air-holes on the tops and sides thereof; to allow the cooled air to escape into the hold or cabin, and also with channels in their bottoms, for carrying off such condensation to a trap or tank placed in any convenient place. I also construct air-tubes, running down into said water-pipes, through which the air is conducted and cooled. Both ends of such

air-tubes may be open in the hold or cabin of the vessel, or one end may reach the air above the deck and the other open in the hold or cabin of the vessel, after passing through the water-pipe; or I may allow one end to remain within the said second tube or box above described.

I also propose to propel vessels by means of a screw or screws inserted in one or more water-pipes that extend from end to end of the vessel, as above described, and which are made sufficiently large for that purpose, the screws being made to revolve by steam or other power. This mode of propulsion will be found valuable in canal-boats, since the water which is disturbed by the action of the screw is confined within narrow limits and forced a considerable distance through the stern of the vessel, at or near its center, in a steady column. This will obviate the objection to using steam-power for propelling canal-boats, as the motion of the water will not necessarily wash the banks of the canal. Instead of a screw I may use a piston-pump or its equivalent.

In all the air-tubes herein described I may use valves, registers, or stop-cocks to direct and regulate the current of air, and I may also use air-channels in conjunction with such air-tubes, running at right angles therewith along or near the bottom of the hold or cabin, with suitable valves and perforations for the egress of cooled air at such points as may be most desirable.

I also cool and ventilate the hold and cabins of vessels by constructing suitable tubes or air-ducts, passing through the deck and into the hold or cabin thereof, and placed diagonally with said deck. A portion of these tubes or air-ducts lean toward the bow of the vessel and the others lean toward the stern thereof. As the vessel moves forward the air is forced into the tubes that lean forward, and finds an outlet through the tubes that lean backward, thus creating a current of air in the hold or cabin of the vessel.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Constructing canal-boats and other vessels with tubes or air-ducts extending below the deck and in a diagonal position with it.
2. Air-ducts made in a funnel-form and used substantially as described.
3. Using water pipes or channels, substantially as and for the purpose set forth.
4. Using water-pipes and air-tubes in combination, substantially as set forth and described.
5. Incasing water-pipes and conducting off water from condensed air, substantially as set forth.

D. E. SOMES.

Witnesses:

J. C. SMITH,
WM. ELLIOTT.