

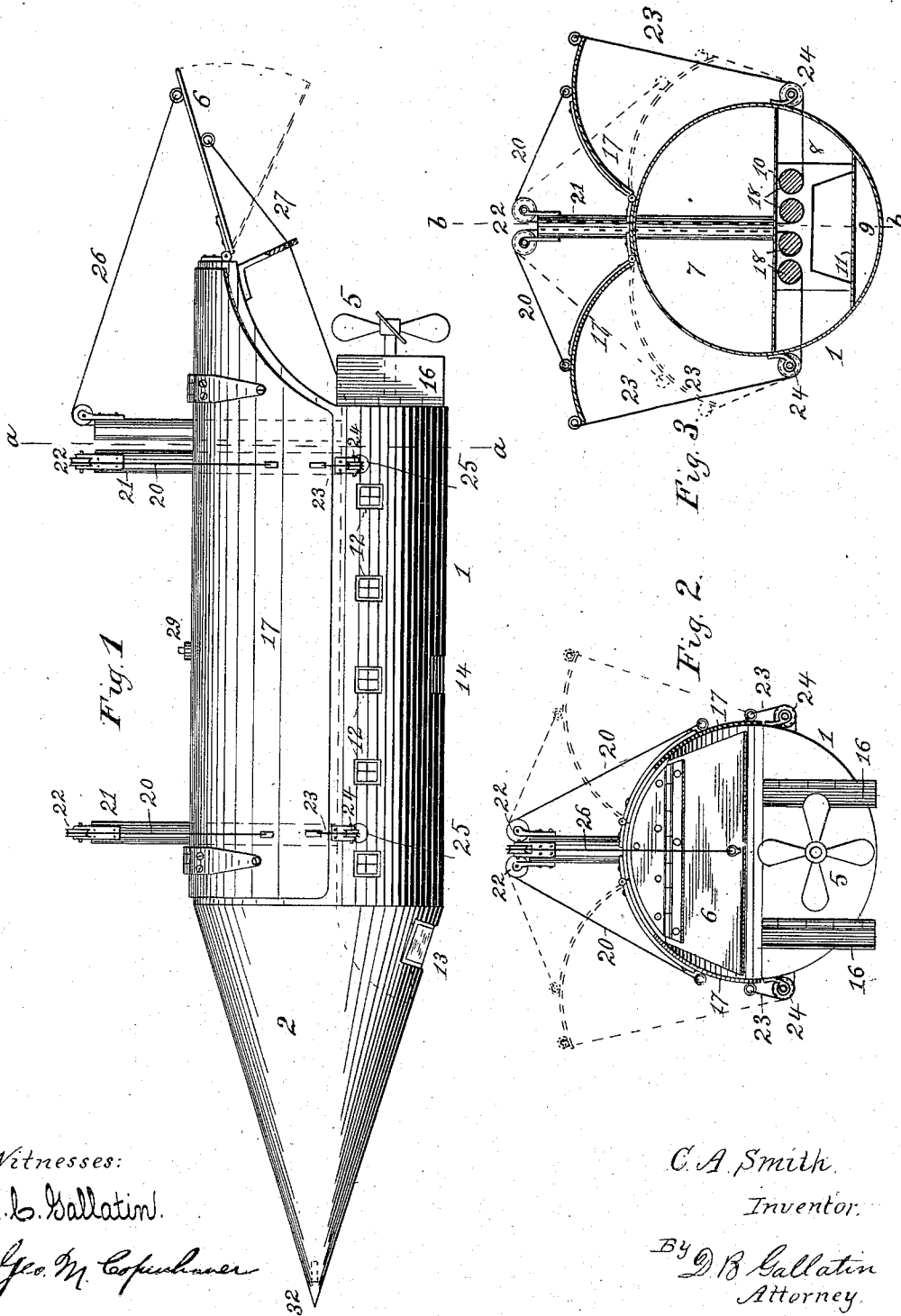
(No Model.)

2 Sheets—Sheet 1.

C. A. SMITH.  
AIR SHIP.

No. 565,805.

Patented Aug. 11, 1896.



Witnesses:  
 H. B. Gallatin.  
 Geo. M. Cooper.

C. A. Smith.  
 Inventor.  
 By D. B. Gallatin  
 Attorney.

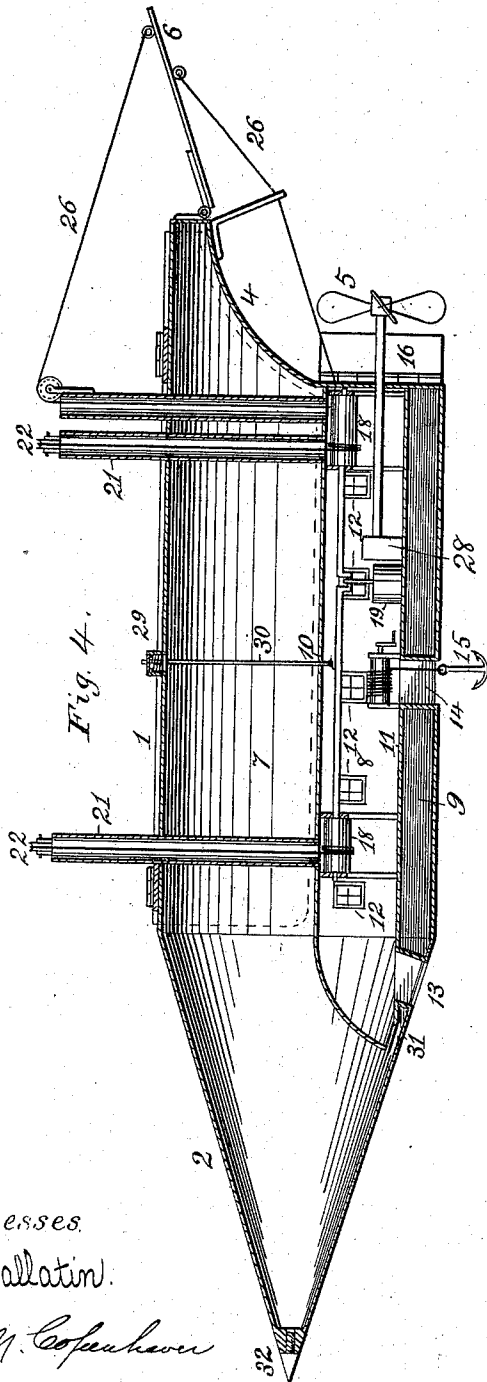
(No Model.)

2 Sheets—Sheet 2.

C. A. SMITH.  
AIR SHIP.

No. 565,805.

Patented Aug. 11, 1896.



Witnesses  
H. B. Gallatin.  
Geo. M. Copenhagen

C. A. Smith,  
Inventor.  
By D. B. Gallatin  
Attorney

# UNITED STATES PATENT OFFICE.

CHARLES ABBOTT SMITH, OF SAN FRANCISCO, CALIFORNIA.

## AIR-SHIP.

SPECIFICATION forming part of Letters Patent No. 565,805, dated August 11, 1896.

Application filed April 2, 1896. Serial No. 585,893. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES ABBOTT SMITH, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Aeronautics; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to the construction of air-ships and to the means for guiding and controlling the same, the object being to provide a navigable vessel having large carrying capacity and adapted to be manipulated and controlled with ease and facility.

In the accompanying drawings, which illustrate my invention and form a part of this specification, Figure 1 represents a side view of the ship; Fig. 2, a rear end view; Fig. 3, a vertical transverse section on the line *a a* in Fig. 1; Fig. 4, a vertical longitudinal section on the line *b b* in Fig. 3.

I propose to construct the hull or body of the ship of thin sheet metal—preferably of aluminium or of aluminium alloy on account of the lightness of this material—and to render the same buoyant by charging it with hydrogen or other light gas. The vessel so constructed and charged is propelled by a screw-propeller of usual or preferred construction and is guided or steered by horizontal and vertical rudders, by the manipulation of which it is directed upward, downward, or laterally, and direction changed at will. I propose also to augment the buoyancy and carrying capacity by means of hinged vibrating wings operated from within, all as hereinafter fully described.

The hull or body comprises a cylindrical portion 1 and a pointed or cone-shaped bow 2, the body portion having at the rear end an overhang 4, which projects back over the screw 5, and to which is hinged the horizontal rudder 6, whereby the vessel is guided in a vertical direction.

The hull is divided into compartments 7 8 9 by horizontal partitions 10 11, (see Figs. 3 and 4,) extending longitudinally through the body portion 1 and somewhat into the

cone-shaped bow 2, the middle compartment 8 being intended for passengers, freight, &c., and for the reception of the necessary driving machinery, while the upper and lower compartments 7 9 are intended to be charged with gas. The middle compartment, which may be denominated the "cabin" or "saloon," is provided at the sides with windows 12 for the admission of light, and in the bottom with openings or wells 13 14, which extend through the lower compartment 9 and through the bottom of the hull, as shown in Fig. 4. The first of these openings, which is in the pointed bow 2, is intended as a lookout in a forward direction, while the other, 14, which is approximately amidships, is provided for the purpose of permitting an anchor or grapple 15 to be lowered and hoisted there-through.

16 16 designate two vertical rudders mounted at the stern at opposite sides of the screw 5, the latter being in rear of the rudders, so as not to interfere therewith. These rudders may be operated by hand or by machinery in the usual manner, and therefore no connections are shown in the drawings.

17 17 are two wings hinged at the upper part of the vessel, extending approximately the whole length of the cylindrical body portion 1 and curved into concavo-convex form, so as to lie, when folded, snugly against the sides of the body. (See Fig. 2.) These wings are adapted to be vibrated, and are intended by their action on the air to assist in buoying and sustaining the vessel, their action being similar to that of a bird in flying, and it will be understood that when vibrated regularly and in unison they will exert a lifting force, their convex upper surfaces offering less resistance to the air in their rising movements than is offered by their concave surfaces in the falling movements, the difference being the measure of their lifting force at each vibration.

As a means for operating the wings I show a series of drums 18, geared with and adapted to be rotated back and forth by an engine 19, of any suitable or preferred style or construction; but other mechanisms and motive power may be employed if found expedient, these features forming no part of my invention, which is independent of the driving mechanism, it being only necessary that suitable machinery and connections be employed for op-

erating the wings. In practice I propose to employ either a naphtha-engine or a small electric motor, according to the purposes for which the ship is to be used and the distances to be traversed. Cords or ropes 20, attached to the wings, extend to the drums 18, passing through vertical tubes 21, which project above the vessel, and over pulleys or rollers 22, mounted at the tops of said tubes, said rollers being employed for the purpose of preventing friction. By rotating the drums 18 in one direction the wings are raised and by rotating in the opposite direction they are allowed to fall. Other cords 23, also attached to the wings, pass over pulleys or rollers 24, mounted at the sides of the vessel, and thence through openings 25 in the walls thereof to the drums 18, the arrangement being such that the cords 20 23 are alternately wound up and unwound to impart the required vibratory movements to the wings.

While I show separate drums for the cords 20 23, it is to be understood that they may be manipulated by a single drum, it being only required in such case that they be connected with the wings at equal distances from the hinges or axes of vibration in order that they may be kept taut while being wound up and unwound. The horizontal rudder 4 is operated also by means of cords 26 and 27, attached, respectively, to the upper and lower sides thereof and running also to the interior of the vessel, where they may be manipulated in the same manner as the cords 20 23 to raise or depress the rudder, or they may be manipulated by hand, as may be found most expedient.

For purposes of illustration I show a separate motor 28 applied to the shaft of the propeller 5, but it is to be understood that in practice I propose to use a single engine or motor, one having the least possible weight, and to drive all the operating machinery thereby.

29 designates a safety-valve of any preferred style or construction applied to the gas-chamber to prevent overcharging. As represented in Fig. 4, this valve has a stem 30, which projects down through the chamber or compartment 7 and the partition 10 into the passenger-compartment 8, whereby it is adapted to be opened at pleasure to permit the gas to escape. In this connection it is proper to state that the two gas-chambers are in communication with each other, so that a single charging-opening and a single safety-valve will answer for both. A communicating passage is shown at 31 in Fig. 4.

The gas-chambers are charged with gas through a valve 32 of any suitable construction, which valve, after the charge has been introduced, is to be tightly closed.

Having now described my invention, I claim—

1. The aerial vessel shown and described, the same comprising a cylindrical shell or body having a pointed or cone-shaped front

end, longitudinally-extending concavo-convex wings hinged to the body at the top thereof and having a curvature corresponding with that of the body so as to fold closely against the sides thereof, in combination with machinery located within the body at, or near, the bottom for operating said wings.

2. In an aerial vessel of the character described having a hollow cylindrical body and a pointed or cone-shaped front end, the whole adapted to be charged with gas, in combination with longitudinally-extending concavo-convex wings having a curvature corresponding with that of the body and adapted to fold closely against the sides thereof, said wings being hinged to the top of the body, machinery located within the body for operating the wings, and devices also operated by said machinery for propelling and steering the vessel.

3. In an aerial vessel of the character described, a hollow cylindrical body having a pointed or cone-shaped front end, the body being divided by suitable partitions into an upper compartment for gas and a lower compartment for machinery, passengers, &c. in combination with devices for propelling and steering, longitudinally-extending concavo-convex wings hinged to the body at the top thereof and adapted to fold against the sides, and driving machinery located in said lower compartment for operating said wings and the propelling and steering devices.

4. In an air-ship the combination of a hollow cylindrical body divided longitudinally by a horizontal partition into an upper compartment adapted to be charged with gas, and a compartment below the gas-compartment for the reception of machinery, passengers, &c., longitudinally-extending concavo-convex wings hinged to the top of the body and extending outward in opposite directions, and suitable machinery within the ship connected with said wings to operate the same.

5. An air-ship having a cylindrical body, longitudinally-extending concavo-convex wings hinged to the body at the top thereof, and mechanism within the body connected with said wings to operate the same positively in both directions.

6. An air-ship having a hollow cylindrical body, a compartment for machinery, passengers &c. located wholly within the cylindrical body, the latter, outside of said compartment being adapted to be charged with gas, longitudinally-extending concavo-convex wings hinged to the top of the body, driving machinery located within said compartment, and cords or similar connections leading from said driving machinery both to the upper and lower sides of said wings for operating the same positively in both directions.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES ABBOTT SMITH.

Witnesses:

WM. A. DEANE,  
CHAS. E. COREY.