(No Model.) 2 Sheets—Sheet 1.

C. P. FEST.

AIR SHIP.

No. 263,397. Patented Aug. 29, 1882.

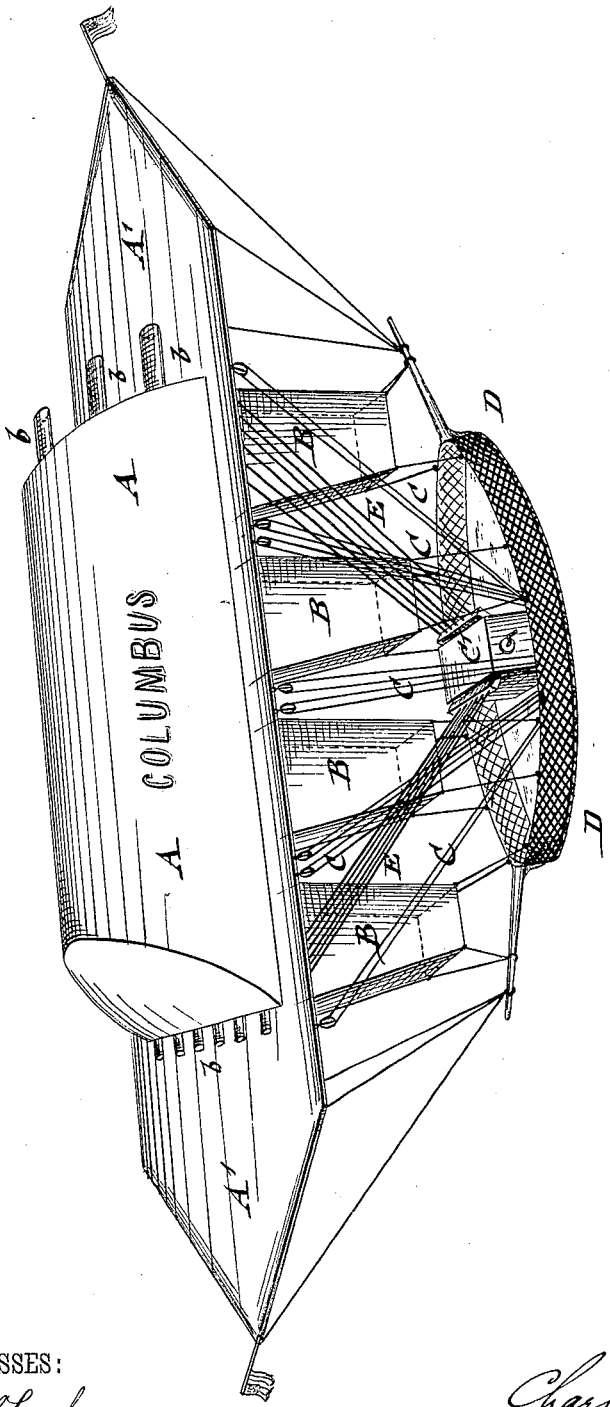

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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AIR SHIP.

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fig. 2.

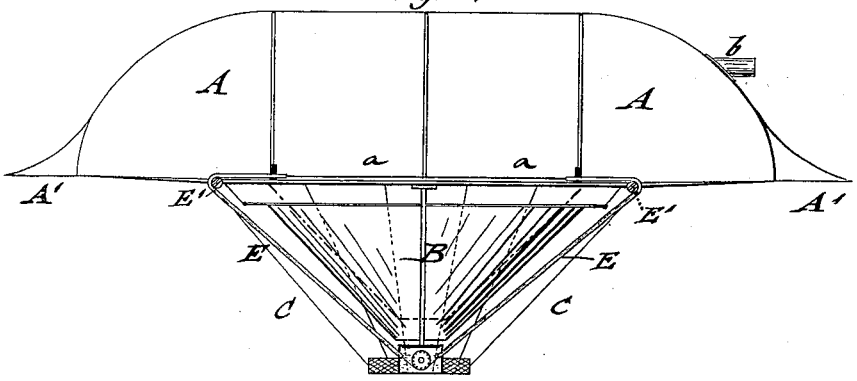


fig. 3.

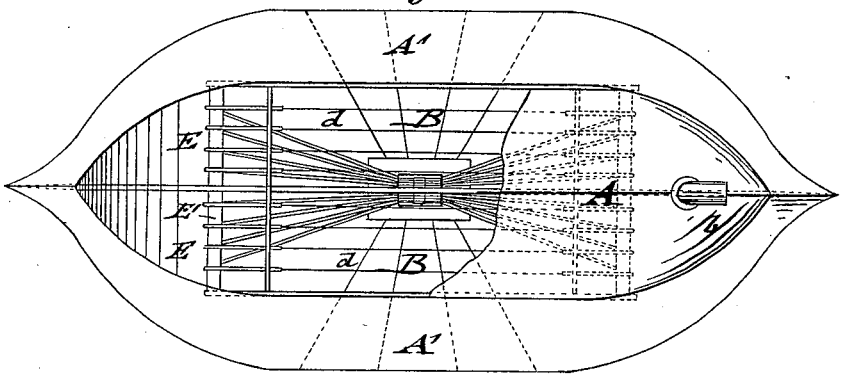


fig. 5.

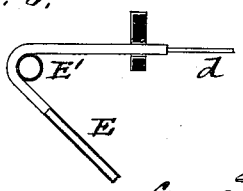


fig. 4.

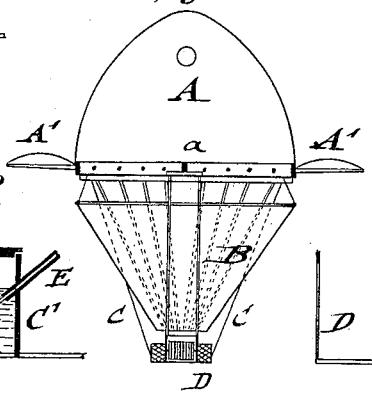


fig. 7.

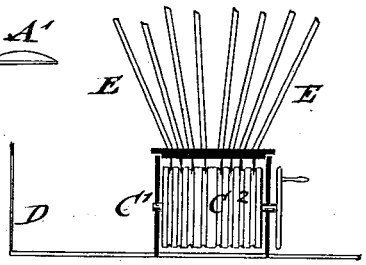
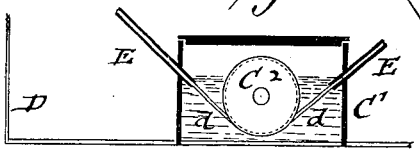


fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES P. FEST, OF PHILADELPHIA, PENNSYLVANIA.

AIR-SHIP.

SPECIFICATION forming part of Letters Patent No. 263,397, dated August 29, 1882.

Application filed June 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. FEST, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Air-Ships, of which the following is a specification.

This invention has reference to an improved construction of air-ships of that class in which the lifting-power is obtained by heating the air in the interior of the body of the air-ship, on the principle invented by Montgolfier, and keeping then the air-ship afloat by its own buoyancy, and by regulating the access of exterior air to the interior of its body; and the invention consists of an air-ship having an elongated body, the air in which is heated by a suitable burning-fluid supplied by traversing endless wick-cords which are guided in fixed inclined wick-tubes extending from a receptacle in the car to the body of the ship. The elongated body of the ship is provided with one or more bottom openings and with one or more tapering bottom extensions that can be raised or lowered by suitable mechanism, so as to regulate the greater or less specific gravity of the air in the body of the air-ship. The body of the main part of the air-ship is horizontally extended to facilitate the floating in the air. The burning-fluid is supplied to the endless wick-cords from a receptacle in the car, in which receptacle a grooved cylinder is revolved, around which the wick-cords are passed.

In the accompanying drawings, Figure 1 represents a perspective view of my improved air-ship. Fig. 2 is a side view of the same. Fig. 3 is a plan view with a part broken away. Fig. 4 is an end view, and Figs. 5, 6, and 7 are details showing the method of supplying the burning-fluid to the interior of the air-ship.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the elongated body of my improved air-ship, which body is made tapering or inclined at the front and rear ends, so as to offer but little resistance to the air. The elongated body A consists of a light supporting-frame and of a light covering fabric that is rendered fire and water proof by treatment with chemical substances suited for this purpose. The bottom of the body A is made flat and provided either with one large or several smaller openings, *a a*, said openings being closed by one or more truncated bottom extensions, B B, which are open at the lower ends and capable of being raised or lowered, so as to tightly close the opening or openings *a a* in the bottom of the body A, or be carried away from the same by means of suitable hoisting and lowering tackle, C, as shown clearly in Fig. 1. When the bottom extensions, B, are lowered to some distance from the bottom of the body A a larger body of exterior air is admitted to the interior of the body A than when they are raised, in which latter case only a limited quantity of air is drawn in through the open lower ends of the extensions, so as to be heated up and then discharged through tubes *b b* off the front and rear end of the body A. The flat bottom A′ of the body A is extended in the same horizontal plane at the front, sides, and rear of the body A, the front and rear extensions, A′, being made tapering or pointed, so as to offer less resistance to the air, they being intended to keep the air-ship afloat when the same has reached a certain altitude.

The lifting-power of the air-ship is obtained by burning at the interior of the body A continuously a suitable combustible liquid which is supplied by endless wick-cords *d* from a receptacle, C, arranged in the body of the car D. The wick-cords *d* pass over a grooved cylinder, C^2, in the receptacle C and through fixed guide-tubes E, which extend from opposite sides of the receptacle C, at a suitable inclination to the front and rear ends of the body A, where they are bent inwardly and supported on suitable transverse stays, E′, as shown clearly in Figs. 2 and 5. The wick-tubes E stop short at some distance from the stays E′, so that the endless wick-cords are stretched clear across the space between the inwardly-bent ends of the wick-tubes E at the lower part of the body A. All that part of the wick-cords which is not inclosed by the wick-tubes is capable of being used for heating up the air in the interior of the body of the air-ship, the burning-fluid of which is lighted by any suitable means when it is desired to raise the air-ship from the ground. The absorptive strands of the wick-cords are preferably twisted together with strands of wire and with strands of asbestus or similar non-combustible mate-

rial, the former for imparting the required strength, the latter to render them more durable. Owing to the fact that only those sections of the wick-cords not inclosed by the wick-tubes at the interior of the body A can burn with a flame, the heat of the same is conducted at the lower part of the air-ship and cannot exert any destructive influence upon the body A. As the air in the body is heated up by the burning wick-cords *d d* its specific gravity is reduced sufficiently so that the entire air-ship may be lifted up to any height required, after which the vertically-adjustable bottom extensions, B, are somewhat lowered, whereby a larger quantity of atmospheric air is supplied to the interior of the body and the specific gravity of the interior air increased and the upward motion of the air-ship interrupted, it being then floated in the air by the resistance of the air exerted on the extended bottom A′. The tubes *b b* at the front and rear ends of the body A admit the escape of the heated air and vapors, the force of which may also be employed for steering the air-ship by means of any suitable mechanism—such as, for instance, the steering mechanism described in the Letters Patent granted to me April 4, 1882, and numbered 255,963.

To give the balloon a forward motion suitable paddle-wheels or screw-propellers may be arranged at both sides of the car and set in motion from the inside of the same by hand or power, as desired.

Whenever it is desired to pass from a lower stratum of air into a higher one the bottom extensions, B, are raised again, whereby the supply of exterior air is reduced and the air in the body and the extensions heated up again, so that the air-ship, by the decreased specific gravity of the body of air in its body and extensions, will be raised again. When it is desired to descend the bottom extensions are more or less lowered, and thereby the descent regulated in connection with the horizontal bottom A′.

The burning-liquid is supplied continuously to the wick-cords by means of the fluid-receptacle C′ and the cylinder C^2, which is revolved slowly by hand or power.

In place of the heating apparatus described, the air in the body A may also be heated up by gas, which is generated by the burning liquid in the car, or by any other equivalent heating mechanism to be used in connection therewith.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, in an air-ship, of an elongated body, A, having a bottom opening or openings, *a a*, with one or more truncated extensions, B, that are fitted to the bottom openings, and with hoisting appliances C, whereby the extensions B are raised or lowered, so as to close or open said bottom openings, substantially as and for the purpose set forth.

2. The combination, in an air-ship, of an elongated body having a flat extended bottom, A′, arranged in the plane of the bottom, with truncated bottom extensions, B, arranged below the body and fitted to the bottom openings of the same, and with hoisting appliances C, for raising or lowering the extensions B, substantially as set forth.

3. In an air-ship, the combination, with an elongated body, A, having bottom openings, *a a*, of truncated bottom extensions, B, hoisting appliances C, and means whereby the air at the interior of the body A and in the extensions B is heated up, substantially as set forth.

4. In an air-ship, the combination, with the body A and vertically-adjustable bottom extensions, B, of a receptacle, C′, for a suitable burning-fluid, of fixed inclined wick-tubes E, extending from the receptacle C′ to the inside of the body A, of endless wick-cords *d*, and of a grooved cylinder, C^2, by which the wick-cords are continuously moved through the wick-tubes and the receptacle, so as to furnish a continuous supply of burning-fluid to the unexposed parts of the wick-cords at the interior of the body A, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in pres-presence of two subscribing witnesses.

CHARLES P. FEST.

Witnesses:
JAS. E. KELLY,
WILH. KOHNCKE.