NAVIGABLE TRAINS OF AIR SHIPS.

Two very complete and interesting models of an air ship—one designed to be used as a war vessel and the other for the carriage of passengers and merchandise—invented and patented by Captain Carl W. Petersen, an experienced master mariner, are now on exhibition at 231 Broadway, this city. The inventor states that he now has seventy-eight improvements in air ships protected by the patent laws of this country, and will soon present to the Patent Office about two hundred and fifty more. His genius in this line is apparently boundless.

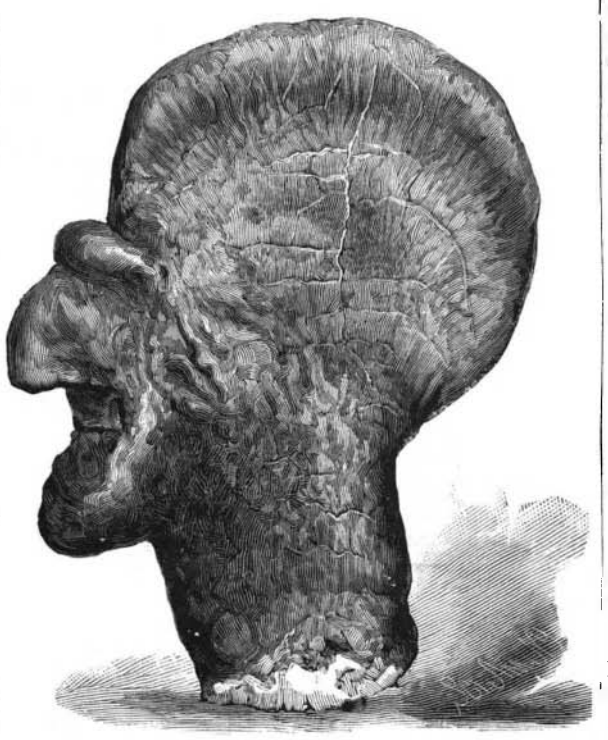
The framing is so arranged as to strengthen the structure, and as the car suspension gear is connected to the lateral framing, no suspension netting or covering is needed, thus doing away with the dangerous chafing and rubbing on the upper surface of the balloon. The weight saved by this method of construction may be applied to strengthening the outer surface of the gas vessel, so as to enable it to easily withstand the pressure of the air caused when the train travels with great velocity. One of the most important features of this invention is the coupling or uniting of separate balloons into a row or train of balloons, thereby increasing the length and lifting capacity to any desired extent without adding to the transverse sectional surface presented to the air. Wire cables are used in the car suspension gear, which is not only fireproof, but much lighter than any heretofore employed. The cables pass through the cars—the openings being made watertight—between the car frame and sides, so as to show a smooth outside surface. The cars are shaped so that a cross section is a true circle; this form presents less resistance to the air, and can be given maximum strength with the minimum weight of material. By means of the central row of rudders, the train may be turned in a very small circle by setting the front and rear rudders properly. The central rudders serve as centerboards, and when all the rudders are set at the same angle to the center line, the train of ships will be moved to the right or left without altering the real course; or in other words, the ship can be held head to the storm while moving to either side. The various parts of the train are so constructed and arranged that either end may be used as the head, the speed being the same in both directions.

To allow the train to ascend or descend at pleasure, one or more rows of adjustable screws are provided. This obviates the necessity of allowing gas to escape from the balloons, or of throwing ballast from the cars. Gas lost from any cause can be replaced at any one of the stations designed for the air ship trains. Waste of gas is prevented, and as the rows of screws allow the train to travel through the air at an elevation of only a few feet from the ground, the danger to life and property is reduced.

When rows of stationary screw propellers are used in place of adjustable screws, rows of guiding sails or wings are pivoted on each side, below the balloons; by these the train may be steered in vertical planes. The row or rows of electric or other motors forms a valuable part of the apparatus, since if one should be disabled there would still be ample power to insure good working.

A disabled air ship could be disconnected at any station, and a perfect one easily and quickly put in its place. In case of storm, the air ships composing a train could be increased in number, so as to furnish sufficient power to overcome the force of the wind.

The inventor claims that the train principle of air navigation insures great carrying capacity, much motive power, great velocity, complete navigability, and the greatest safety to life and property. It is also claimed that as the end ships are tapered like a cigar, the train will easily penetrate the air, and the opening made by it will permit the other vessels in the train to follow without causing any resistance to the air. The vessel is expected to make from 20 to 80 miles an hour. The lifting power of hydrogen is about 68 pounds for every 1,000 cubic feet; from this it is easy to calculate the load the train will bear, but in addition to this load,



A REMARKABLE FUNGOID GROWTH.

it is stated that about 55 pounds more can be carried at an upward inclination of the train of about 2 degrees from the true horizontal line for every indicated horse power of the motors; and also that the real horizontal pull of each indicated horse power of the air propeller has been ascertained to be about 100 pounds. The general construction of the war ship is shown in the accompanying engraving.

To carry out the designs of Captain Petersen and build navigable trains of air ships, a company has been incorporated, under the laws of this State, with a capital of $100,000. Captain Petersen is president, and Mr. Henry Stevens secretary. The offices are at 231 Broadway, this city.

The Arlberg Railway.

This new avenue of communication between Switzerland and Austria and Hungary, and which makes now the air line route between Vienna and Paris, was opened with an imposing ceremonial in August last. Its building has shown remarkable engineering skill. The Arlberg tunnel under the Vorarlberg mountain is eleven kilometers (5·8 miles) long, being next in length of the Alps tunnels to the Mont Cenis, which is 7½ miles long, while the St. Gothard is 9 miles long. The Mont Cenis tunnel, however, required 14 years to build, and the St. Gothard 8 years, while the Arlberg tunnel has been built in about 3 years. A considerable portion of the line besides the tunneling proper was very difficult to build, winding along precipitous mountains and over deep gorges and ravines, but disclosing grand and beautiful views of the Alps hitherto rarely seen.

A REMARKABLE FUNGOID GROWTH.

The illustration herewith given is a drawing, exact size, of a mushroom or toadstool sent us by Mr. Geo. B. Gordon, of Wellsville, N. Y. Its likeness to a profile view of the Duke of Wellington is striking. It was found growing from the side of a partially decayed hemlock log, with the face side up, which now has the seamed and wrinkled appearance shown in the illustration, and which may well pass for a fair illustration of the face of the Iron Duke in his later years. The shrunken mouth and lips and the prominent nose are all plainly indicated, and our correspondent suggests whether Darwin might not, from this specimen, be inclined to accept the idea that the toadstool, rather than the ape, was the real father of mankind.

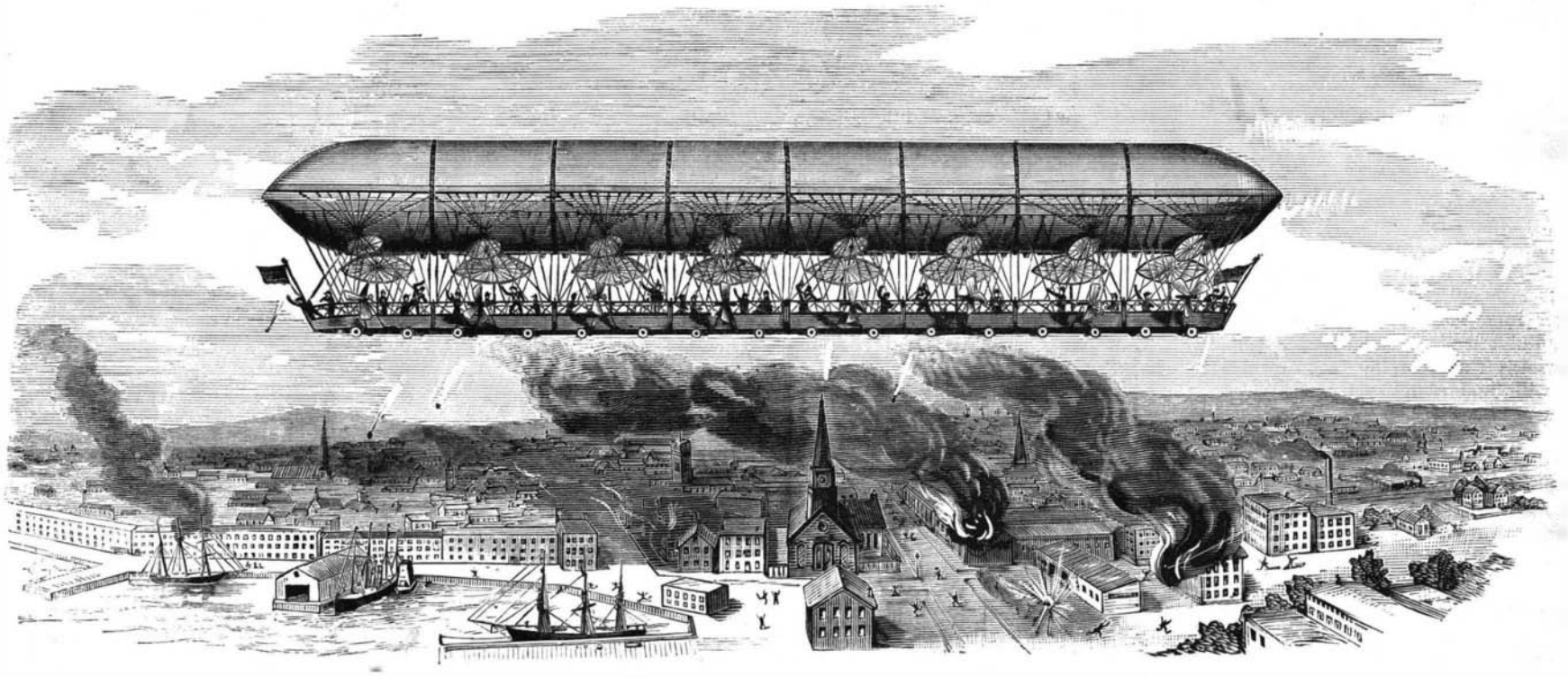
Mushrooms embrace a large number of species, of which several are edible. Those untested, or known to be poisonous, together with other fungi of similar appearance, are popularly called toadstools. Mushrooms are largely cultivated abroad, especially in France, whence most of those used here are imported. In Paris their cultivation forms a large business, and they are grown in large caves, in some of which are over 20,000 beds growing at one time.

Exudations on Brickwork.

According to the *American Architect*, the simplest and least expensive method for removing saltpeter exudations from brickwork, when the efflorescences are in positions where the sun and wind do not have free access, is to wash it off with diluted hydrochloric or common muriatic acid of commerce. This acid is very inexpensive; twenty-five cents' worth would be sufficient to clean a front of twenty feet wide by sixty feet in height, if such a front was totally covered with the objectionable exudation. About one-half pound of the acid is used with an ordinary pailful of water, the application being made with a sponge, which can be held in the naked hand or attached to a stick to reach the spots, as may be desired. When the efflorescences have been thus removed, it is perfectly useless, in the present state of knowledge, to attempt to stop a reappearance, for when circumstances are again favorable, the saltpeter exudations will promptly spread themselves over the walls.

Smoke Testing of Drains.

Cosmo Innes, the Secretary of the London Sanitary Protection Association, writes to the *Journal of the Society of Arts* suggesting a smoke test, instead of that of some strong volatile liquid, for detecting defects in sewer pipes, as the smoke test will be apparent to the eye as well as the nose. That such testing may be done cheaply, he has devised a style of smoke rocket, charged so as to burn for ten minutes; the fuse is to be lighted and the rocket inserted in the drain with a plug behind it, when the observer is to walk through the house to see if any smoke escapes, finishing on the roof, where the smoke will come in volumes from the ventilating pipe. If it is desired to increase the severity of the test, a wet blacket may be thrown over the top of the ventilating pipe, giving a slight pressure of smoke inside. As sanitary inspectors everywhere have especial reasons for being extremely vigilant during the coming year, this method of testing pipes and drains may prove valuable in many instances where it is not convenient to apply other tests.



PETERSEN'S AERIAL WAR VESSEL.

EIGHT parts of black tin, two of antimony, and one of copper, if melted and mixed over a hot fire, form Babbitt metal. If made with care, it is one of the best materials for fast running machinery there is.