ALLAN'S FLOATING BATTERIES AND SALOONS.

Mr. Alexander Allan, of Scarborough, well known to the world as the inventor of the straight link valve motion, has recently invented and patented certain modifications of the Bessemer steady cabin idea. Mr. Allan does not attempt to deal with the subject of sea sickness further than trying to show that the arrangements he suggests will reduce the movements which authorities state are the principal causes of it. These are given as (1st) pitching, (2d) rolling, (3d) angular pitching, (4th) angular rolling, (5th) vibration from waves striking the ship, (6th) tremor from engines, (7th) longitudinal advance of ship, (8th) upward and downward motion of translation, (9th) seeing swinging or moving objects, and smells of burnt grease, engine room, and bilge water.

The first four motions are overcome by Fig. 1. The float is guided as a large pendulum, on its center ball and pillar, ballasted in the bottom, and floats freely in the water surrounding in its dock. If the ship takes all the four movements given above, the dock would do the same; but the water in the dock would keep its atmospheric level, and the pendulous spherical float would keep pace with it and maintain its level also, whatever point of the compass the movement came from.

As regards vibrations from waves striking the ship: The dock in which the cabins float is of about the least vibratory shape; it is away from the ship's side or skin; the medium in which the cabins float is free to take the reduced vibrations to its surface and liberate them in smaller waves, and would not affect the convex surface of the floating cabin.

As respecting the tremor from engines, this would be reduced in the same way by the non-vibratory shape of the dock, the floating medium carrying vibratory waves to its surface, and the strong shape of the floating body. Then for the longitudinal advance of the ship: While the ship remains on an evenkeel, we do not see any cause of disturbance more than in the advance of a railway train or carriage of any kind.

As to the upward and downward motion of translation. This, Mr. Allan fears, cannot be entirely neutralized, and some speakers at the Society of Arts' discussion did not consider it the worst movement or a serious one. Should the ship plunge or lurch suddenly into the trough of a sea, the floating cabin would acquire momentum, which would be checked or buffeted, and the effect or shock would be reduced in the cabins by the float dipping lower (say by one eighth inch to one fourth inch), raising the water in the dock somewhat.

As to the subject of swinging or moving objects: In the lower cabin passengers would not see any article in motion. In the saloon, to prevent the passengers seeing the roof approaching and receding as the ship rolled, an awning could be arranged to cover a large area of the roof, supported on the float like a huge umbrella; and should the roof touch the wires of support, by an extreme roll they would regain position as the ship righted. These cabins will be without the usual smells of engine room and bilge water.

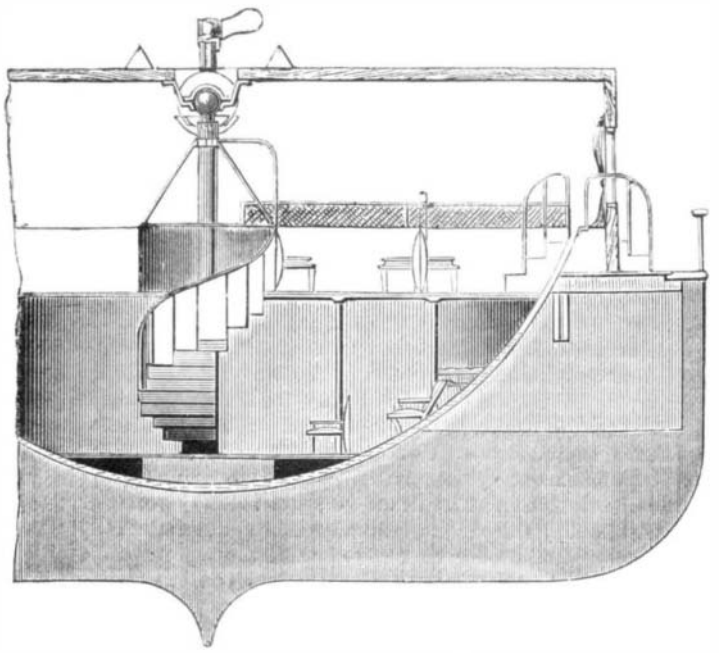

Fig. 1.—ALLAN'S FLOATING SALOON.

Fig. 2 shows a modification of the arrangement in which the ball socket is fixed on a spindle fitted to a spider frame, secured to armored shields erected on deck. This keeps the caisson steady.

Mr. Allan's specification includes a number of ingenious modifications of the main principle, for which we have not space. We have said enough to show that Mr. Bessemer is not alone in the field of invention as a producer of steady platforms, and we have no doubt that Mr. Allan's consummate knowledge as a mechanical engineer would enable him to command a great element of success in putting his invention in practice.—*The Engineer.*

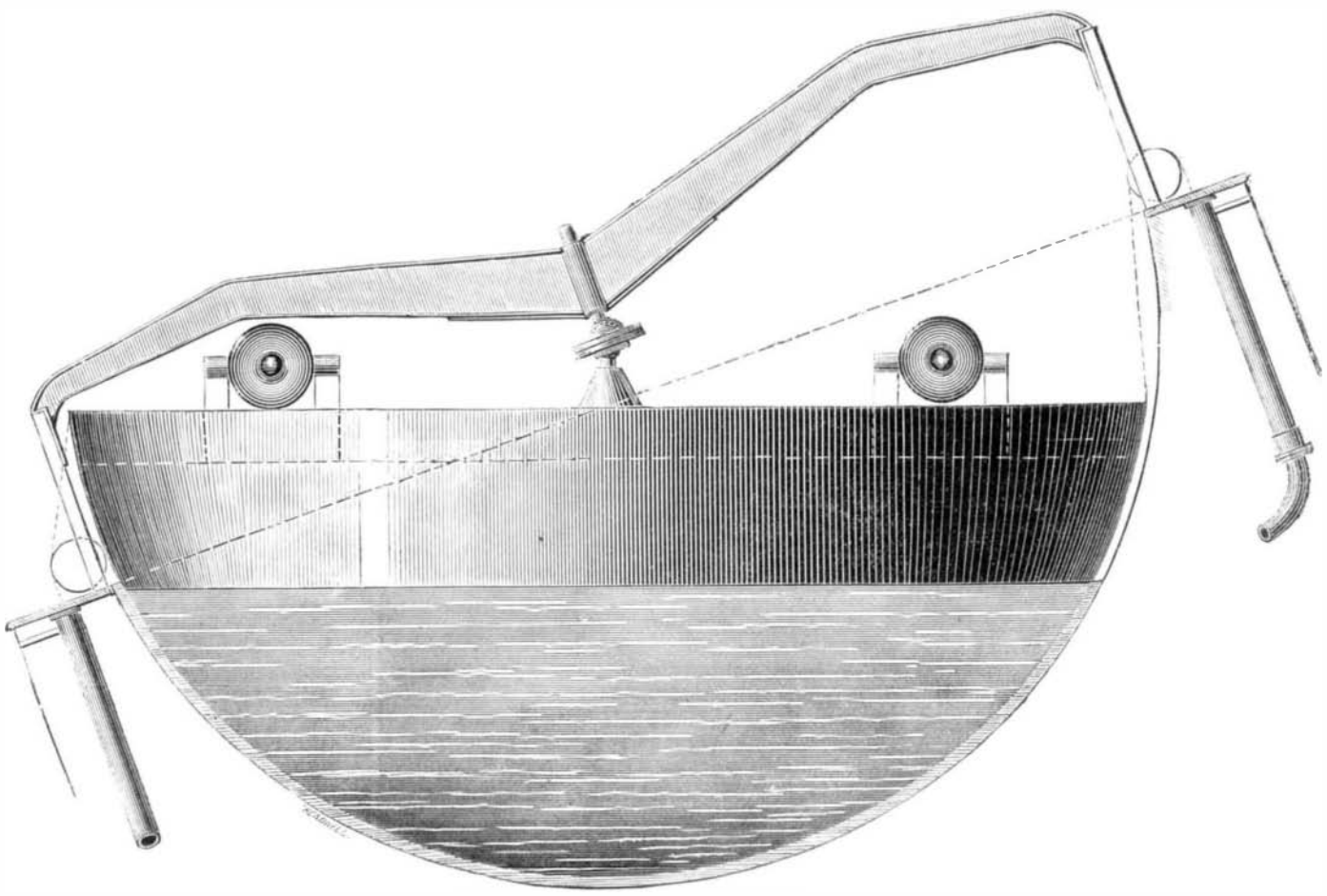

Fig. 2.—ALLAN'S FLOATING BATTERY.

Influence of the Winds on Vegetation.

A writer in the *American Exchange and Review* has recently called attention to the extent to which vegetation is dependent for its life and growth on the winds, by which alone vapor and rain are conveyed from the place of formation and distributed over the earth. While animal life is able, by its powers of locomotion, to seek the necessary moisture, the vegetable world, were it not for the air currents, would perish from the earth. This destruction would obviously be very rapid as the quantity of the solid matter in a plant is small compared to that of the water. And therefore the moisture of the soil is more necessary to vegetable growth than are the mineral constituents; and the water not only provides the means of growth of the plant, but also accelerates the decay by which the solid constituents are returned to the earth, to rise anew in the plant life of another generation.

For the evaporation by which water is raised into vapors, for the subsequent distribution of that vapor and for its condensation in the falling rain, Nature has provided the ceaseless, omnipresent aerial currents. The magnitude of this process of exhaustion and restitution may be estimated from the fact that the total daily discharge of all the rivers in the world into all the oceans is but the quantity of rain which has fallen in a single day. The sun's heat falling on a water surface converts a part of it into a vapor, which rises into and is diffused through the atmosphere, in obedience to the laws that govern the mingling of gases. Within a certain limit this vapor remains invisible, and cannot be distinguished from the main bulk of the air. At every temperature the air is capable of holding in an invisible condition a definite quantity of vapor. The warmer the air, the more it can hold. But for every temperature there is a point, beyond which it is impossible for more vapor to pass it. This point is called the point of saturation, or the dew point. When the air has reached its dew point, and its temperature is increased, no visible effect is produced—its capacity for moisture is simply increased; but if its temperature be lowered, then it is no longer capable of holding all its moisture and the surplus becomes visible in some form or other of precipitation, namely, as fog, cloud, dew, rain, hail, or snow. In order to account, then, for any precipitation of moisture, it is necessary first that a sufficient quantity of vapor pass into the air to bring it to its dew point, and then that the temperature be lowered. The quantity of moisture thus precipitated will clearly depend upon two circumstances, namely, the temperature of the air when the dew point is reached, and the temperature to which it was subsequently lowered. The higher the one and the lower the other, the greater will be the precipitation.

The means by which the lowering of the temperature can be accomplished are varied. A warm vapor-laden air may blow into a cold region, and thus have its temperature lowered sufficiently below the dew point to give a considerable rainfall. A cold wind may mingle with a warm one, and thus produce a moderate shower; or powerful ascending currents may carry the moisture of the lower strata into the upper regions of the atmosphere, where the temperature is very low.

The deposition of the moisture of the air is, then, in all the cases we have considered, referable to atmospheric motion: for upon it will depend the presence or the absence of moisture in any region, and consequently the presence or absence of vegetable life. The ocean of aqueous vapor partakes perfectly of the movements of the atmosphere. It in fact derives its movements mainly from those of its bulkier neighbor. It is to the motion of the winds, then, that we must look for the explanation of the peculiarities that attend the distribution of moisture.

Car Coupling Slaughters.

During the eleven months ending December 1, 1873 four hundred persons were killed while coupling cars on the Pennsylvania railroad. "Is it the fault of the inventions, or is it the fault of the railway companies, that some of the improved devices be not more widely used, and the slaughter of employees stopped?" asks a correspondent of the *Commercial Advertiser.*

Several devices have been fully described and illustrated in our columns, and many have, when practically used, proved valuable inventions. We think there is little room for argument on the point that if a railroad company chooses to ignore modern improvements, and persists in retaining on its cars the old fashioned connection, saving perhaps the few dollars otherwise invested in experimenting at the cost of the lives of hundreds of its employees, the blame falls fairly and squarely on their shoulders and the public should fully appreciate the fact.

The Stability and Reciprocal Metamorphoses of the Oxides of Nitrogen.

The above subject, already studied by many chemists, has recently been investigated by M. Berthelot, and many new facts have been adduced. Hyponitric acid, until the present considered to be most stable of the oxides of nitrogen, has been, by the above chemist, decomposed into oxygen and nitrogen. The gas, hermetically sealed up in a glass tube, was submitted to the action of series of electric sparks. In an hour and a quarter the acid was decomposed; and after eighteen hours, but 14 per cent of the primitive volume remained. As this limit could not be passed, total decomposition was believed to have taken place.

M. Berthelot also notes a curious anomaly which is presented by the combination of nitrous acid with oxygen, in order to produce hyponitric acid. Contrary to the usual result, a dilatation takes place. Two volumes of nitrous acid unite with one of oxygen, and the result is four volumes of hyponitric acid.

Passing to protoxide of nitrogen, the author finds that it is at about 1060° Fah. that the gas is decomposed by heat. The electric spark decomposes it very rapidly; in one minute one third of the gas is decomposed; and at the end of three minutes, two thirds or three quarters. The deutoxide of nitrogen, under the action of the spark, resolves itself, one part into nitrogen and oxygen and the other into protoxide of nitrogen and oxygen. The protoxide at the limit forms two thirds of the decomposed portion. Under the influence of prolonged contact (cold) with the binoxide, many mineral and organic substances undergo slow and partial oxidation.

"A MASS. MAN" points out that Massachusetts stand next to Connecticut on the roll of inventive genius, as show by the table on page 65 of our current volume.