

THE BINARY ABSORPTION SYSTEM OF REFRIGERATION.

A new competitor in the field of artificial refrigeration appears in the binary absorption system invented by Messrs. C. M. Tessié du Motay and Leonard F. Beckwith on the one hand, and Messrs. C. M. Tessié du Motay and Aug. J. Rossi on the other. The accompanying illustration of the apparatus will remind our readers of the Pictet system, an engraving of which appeared in our issue of December 1, 1877.

The aim of the inventors has been to substitute the chemical affinity of two or more volatile substances for each other in place of compression, to effect the liquefaction of the refrigerating agent; and to discover a compound which should possess the refrigerating power of anhydrous sulphurous acid without its objectionable qualities.

Such a liquid they claim to have found in ethyl-sulphurous dioxide, a bland compound of the appearance of water, liquid at ordinary temperatures, non-inflammable, and without corrosive action upon metals even when mixed with water. Under the gas pump the liquid is volatilized, with a great reduction of temperature, the refrigerator being surrounded by a non-congealable liquid, which is used as a freezing mixture.

The least volatile constituent of the ethyl-sulphurous dioxide is liquefied at a few pounds above atmospheric pressure, and then by natural affinity the more volatile element is absorbed. The heat of liquefaction, which is comparatively low, is carried off by water. A marked economy is, therefore, claimed for this process, compared with the use of sulphurous acid alone. When the machine is working the pressure ranges from 13 to 15 pounds, and the water for cooling the combined liquid runs from 1 to 2 gallons a minute for each ton of ice produced in 24 hours. When the machine is at rest the pressure is from 0 to 2 pounds; and when the water for cooling is turned off the pressure is not likely to rise to a dangerous point.

Working as it does at low pressure the new machine is easily kept from leaking without the expensive cocks required in machines working at high pressures. As the liquid has no action on metals, is not explosive, and requires no greasing of the gas pump for lubrication, it is claimed that the more serious difficulties experienced in other processes are practically obviated. There is the further advantage that the liquid is safe to handle and can be transported in ordinary vessels of glass, wood, or sheet iron.

These advantages presented by the binary system are certified by Messrs. C. H. Delamater & Co. as the result of experimental tests made at their establishment.

The ice is formed in large galvanized cans set vertically in a tank containing the non-congealing brine, which is circulated back and forth through the refrigerator of the machine. The cost of fuel and labor in running a 50 ton ma-

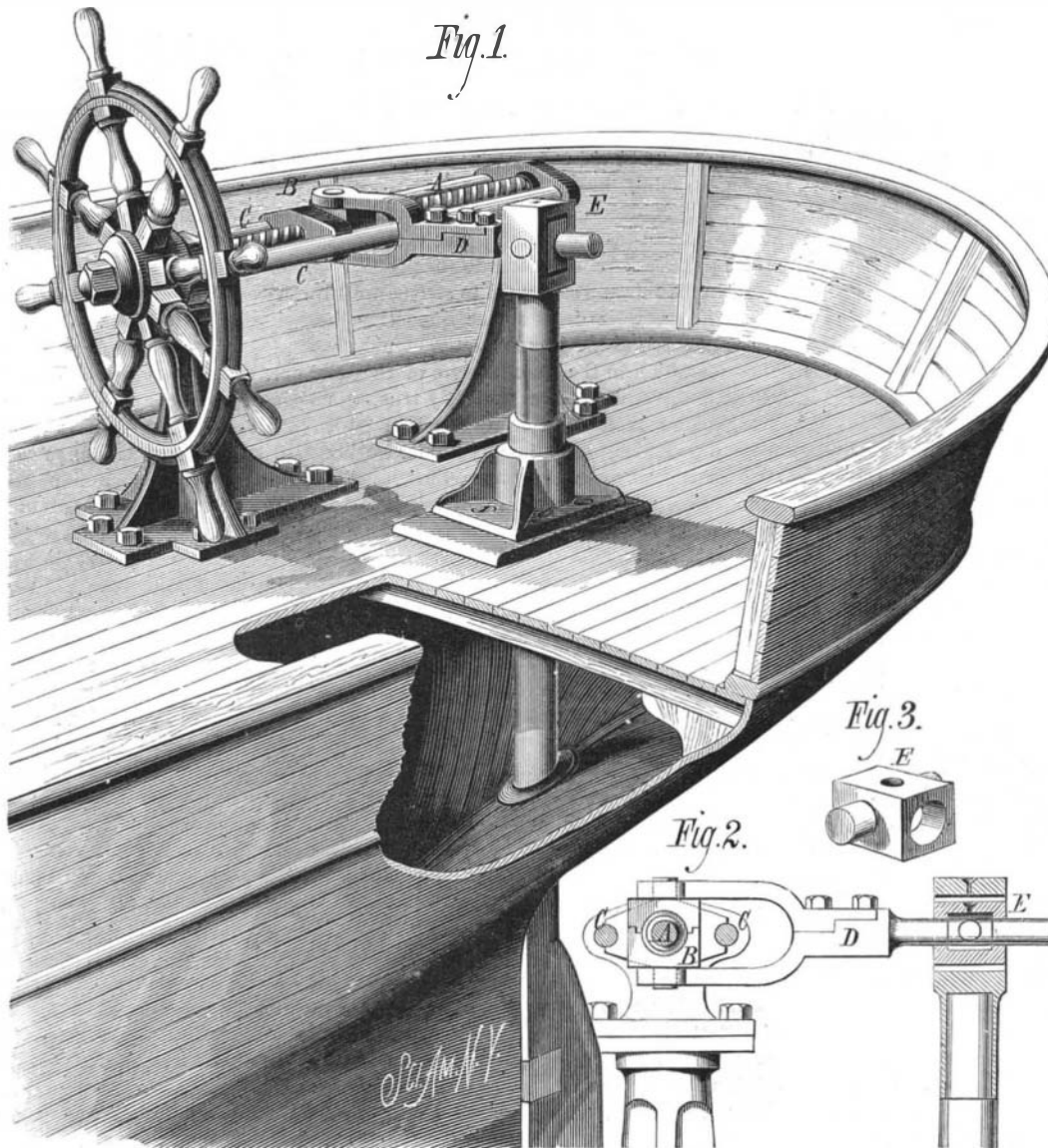
NEW STEERING APPARATUS.

The attention of inventors has been drawn to the need of a reliable steering gear by the alarming frequency of marine disasters attributable to the breakage of steering apparatus, and we are able to present our readers with an engraving of a device that seems capable of fulfilling the requirements, which are really more arbitrary than is generally supposed.

This steering apparatus is the invention of Mr. Pablo Perez Seoane, of Havana, Cuba, Inspecting Engineer of the Spanish Navy. The large perspective view shows the application of the mechanism, while the smaller views represent details not shown in the larger view.

The screw, A, which is provided with a tiller wheel at one end, is journaled in two standards arranged at the side of and equidistant from the rudder post. A traversing nut is placed on the screw, A, and provided with grooved arms capable of sliding on guides, C, arranged parallel to the screw, A, and supported by the posts in which the screw is journaled. The nut is embraced by a box, B, which is split longitudinally and provided with trunnions, which are journaled in the forked end of the lever, D. The upper end of the rudder post is provided with a strong socket, in which is pivoted a box, E, adapted to receive the cylindrical end of the lever, D.

As the tiller wheel is turned in one direction or the other the nut on the screw is moved, carrying with it the forked end of the lever, D, which moves the rudder. As the rudder post turns the lever, D, slides in the box, E, to compensate for the angular motion of the nut. It often happens that the bearings of the rudder post are not perfect, and that every wave that strikes the rudder moves it laterally in its bearings besides tending to turn it. With this arrangement a sudden shock on the rudder post when the rudder is struck by a heavy sea, simply exerts its force in moving the rudder head along the lever, D, and has no tendency to bend or twist any part of the mechanism, nor to put any undue labor on the man at the wheel. It will be seen that any vertical motion of the rudder is provided for in the pivoted connections of the lever, D, with the head of the rudder post and with the traveling nut, so that if the rudder should strike bottom, as in case of running ashore, the steering gear would receive no injury. This device is shown in the engraving as adapted to hand steering, but it may be worked with steam with the same advantages.

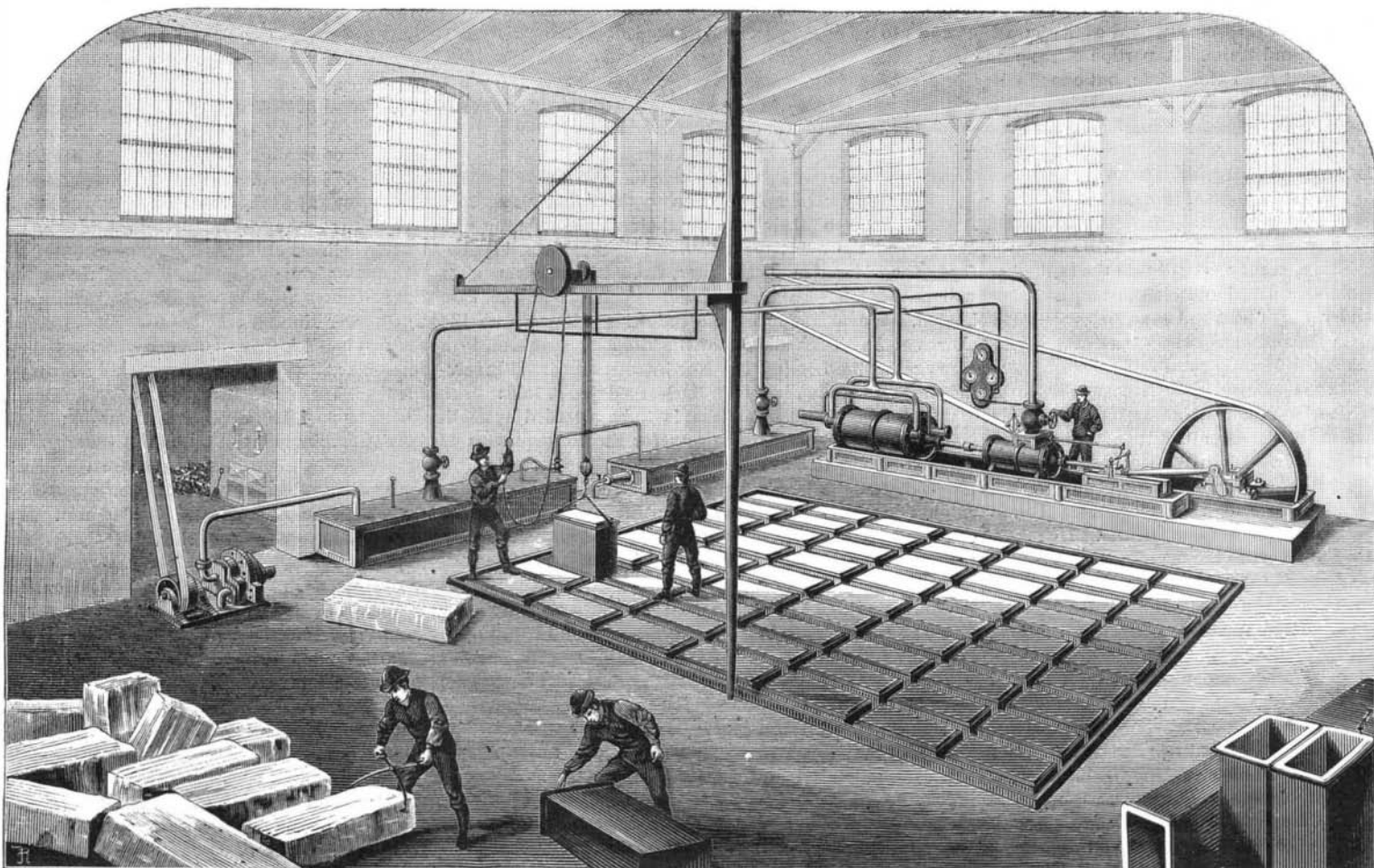


SEOANE'S STEERING APPARATUS.

chine is set down at 78 cents for each ton of ice produced.

The machines are intended for refrigerating breweries, warehouses, dairies, ships' holds, etc., and for cooling hospitals and other buildings, as well as for making ice.

The business development of the invention has been undertaken by the New York Ice Machine Co., whose office is in room 54, Coal and Iron Exchange, 21 Cortlandt street, New York.



THE NEW ABSORPTION PROCESS ICE MACHINE.