

THE ORAM SYSTEM OF MARINE PROPULSION.

The Oram System of Marine Propulsion is designed to procure higher speed in steamships with an increased carrying capacity, and to avoid some of the risks of accident incident to propulsion by stern screws.

It consists of an improved form and construction of hull, in which provision is made for a novel location and operation of screw propellers in cavities or recesses on both sides of the vessel.

The propellers are located about one-fifth of the length of the vessel aft of the bow. The cavities in which they are placed are so shaped as to guide the water to and from the propellers with the least possible friction or resistance, and at the same time avoid dangerous protrusion of the propellers beyond the hull.

The propellers are susceptible of rotating independently and are attached directly to the shafts of the engines, having angles of divergence, causing a downward, outward and rearward discharge of the water, attended with a corresponding reaction propelling the vessel.

The recesses are formed of curved surfaces, proportioned and arranged in relation to the propellers so as to guide by the forward curves the incoming water directly to the propellers. The after curves direct the disengaged water in diverging lines, relieving the pressure at the bow and greatly reducing the skin friction of the vessel.

The propellers are susceptible of running at higher speed, require shafts of less diameter than the larger stern screws, and are so short as to be really the engine shafts themselves.

A saving of weight and cost is the immediate result of this form of construction, which not only occurs in the propellers and shafts, but in the engines themselves, which being higher speeded, are of much less weight for the same piston displacement and power.

The long shaft of great weight and the alley to contain and protect it are avoided, and the transverse bulk-heads are unimpaired, thus promoting safety, and the space is available for useful and remunerative storage.

The necessity for longitudinal stiffness in the hull, to sustain

the bearings of the long shaft in proper alignment, does not exist, and the danger from flexure and straining of the hull disabling the shaft and propeller is avoided, so that a degree of elasticity and flexibility of hull construction becomes admissible, which in stern-screw propelled vessels could not be tolerated.

In the event of collision bending or straining the hull the increased security of the machinery against interruption of running is important and valuable, and under some conditions may save the vessel from total loss.

The facility afforded by leaving the hold clear of machinery, to place the cargo or stores of the vessel in compartments separated by bulkheads, is obvious, and for purposes of warfare is important, as permitting constructions not practicable where the shaft alley and shaft divide the lower hold through nearly its entire available length.

The shafts and all of their bearings are constantly under inspection of the engineers on duty, and from their lightness and short length are not so liable to accident as shafts of great weight and length, and couplings being unnecessary accidents thereto are avoided. The danger of racing and breaking, consequent therefrom, is avoided by the location of the propellers.

Economy of fuel in running, of space required for machinery, and in first cost of construction, together with augmented speed and immunity from accident, are claimed for this system.

The accompanying illustration shows a yacht of sixty feet in length, now in course of construction, embodying this invention.

Plans of such a vessel have been submitted to the U. S. Naval Board, having in charge building of the new cruisers authorized by Congress, and are now under consideration by them.

S. L. W.

Philadelphia, April 15, 1886.

DISTRIBUTION OF EARTHY MATTER IN PLANTS.—Berthelot and André have published their second, third and fourth memoirs on the general march of vegetation in an annual plant. They find that the mineral matters which become insoluble by incineration have a marked tendency to accumulate in the leaves. In plants with a languishing vegetation, however, they sometimes seem to be arrested in the roots, probably in consequence of the insufficient action of the agents which render them soluble, and enable them thus to reach the leaves through the circulation of the sap.—*Ann. de Chim. et de Phys.*, Aug., 1885.