

THE TORPEDO-BOAT DESTROYER "PERRY."

We present illustrations of the "Perry," one of the three destroyers built at San Francisco at the Union Iron Works. Two other boats, named the "Paul Jones" and "Preble," sisters to the "Perry," were built at the same yard. The three vessels are named after well-known commodores of our early navy, and they are in dimensions and workmanship identical in every respect.

The "Perry" has a length on the water line of 245 feet, an extreme breadth of 23 feet 7¼ inches, and mean draft of 7 feet 2½ inches. The displacement is 480 tons, and the speed 28.3 knots; gross tonnage 508.93 and net tonnage 83.14 tons. The normal coal supply is 25 tons; maximum draft when ready for sea, 7 feet 6¼ inches.

The armament consists of two long 18-inch Whitehead torpedo tubes, two 3-inch rapid-fire, and five 6-pounder rapid-fire guns. A complement of four officers and 69 men is required when in commission. All the wood used in construction is fire-proofed. The cost without armament was \$281,000. The engines of these torpedo-boat destroyers are in every respect identical. They are of the vertical, inverted-cylinder, direct-acting, triple-expansion type, with four cylinders, 20½, 32, 38, and 38 inches respectively, with stroke of 22 inches, and running 327 revolutions at 250 pounds pressure at an indicated horse power of 8,000. The cylinders are placed as follows, beginning forward: For the starboard engines, second low-pressure, intermediate, high, and first low-pressure, and for the port engine, first low-pressure, high, intermediate, and second low-pressure. Cranks are at 90 degrees, the high and first low-pressure being opposite, as are also the intermediate and second low-pressure. The second pair is at right angles with the first pair.

The two condensers are of composition and sheet brass with cooling surfaces of 3,470 square feet. The circulating pumps are of centrifugal type.

Each boat is provided with four water-tube boilers constructed for a pressure of 300 pounds. They are placed in pairs forward and aft in watertight compartments. The boilers aft are each provided with 80.5 square feet of grate surface, those forward having but 73.5 square feet. The four aggregate 308 square feet of grate surface. The total heating surface is 17,768 square feet.

According to the Anglo-Indian Review, it having been calculated that the energy stored up in one gramme of radium is sufficient to raise 500 tons weight a mile high, an ounce would, therefore, suffice to drive a 56-horsepower motor car at the rate of thirty miles an hour around the world. The calculator evidently confused intrinsic energy with capacity for transforming energy.

Preparation of Pure Hydrogen for Airships by Liquid Air.

A series of experiments has been carried out recently at the government aerostatic establishment near Paris by M. Georges Claude, a well-known scientist. An account of these experiments, which are of great interest as relating to the preparation of pure hydrogen for balloons and airships, has been lately presented to the Academie des Sciences by Col. Renard, who is in charge of the establishment. It is well known, since the experiments of M. D'Arsonval, that hydrogen can be easily separated from all the other gases that are

ments on a small scale, to what temperature the hydrogen must be lowered in order to free it from the most deleterious gases and especially from hydrogen arsenide. These preliminary experiments were carried out at the aerostatic establishment under the direction of M. Claude, who furnished a sufficient provision of liquid air for the purpose. The experimental device consisted simply in a cylindrical glass vessel 5 inches in diameter half filled with gasoline, through which the impure hydrogen produced from commercial acid and zinc was passed by means of a tube dipping into the liquid. In the center of the vessel was placed a

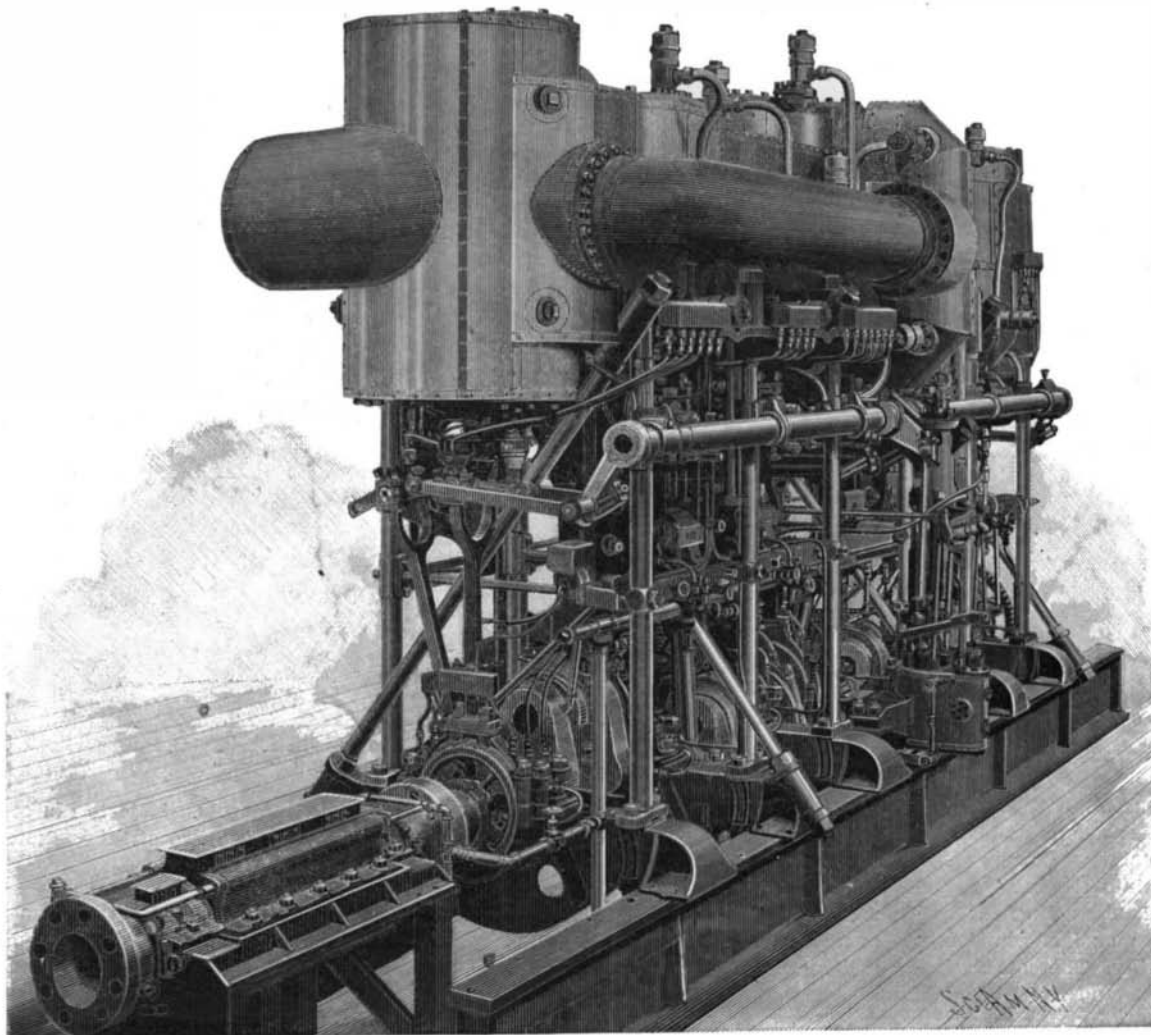
test-tube first of glass and afterward of copper in which was poured the liquid air. The gasoline bath could thus be given a temperature of -130 deg. C. without difficulty. Each sample of the hydrogen to be purified contained about 1 gallon, and it passed over at the rate of ¼ or ½ gallon per second. The qualitative analysis of the specimens of gas had been made at the laboratory of the Artillery Section by Capt. Ducru with great care. The results of the experiments on cooling the hydrogen show that the arsenic was practically eliminated below -110 deg. C. and it may be considered as certain that by cooling the gas to -130 deg. the arsenic will be totally removed. These results are to be completed in the near future, but it seems certain from what has been already done that the process brought out by M. D'Arsonval and developed by M. Georges Claude can be applied on a large scale for purifying the gas which is used in balloons.

Wild Forms of Chrysanthemums.

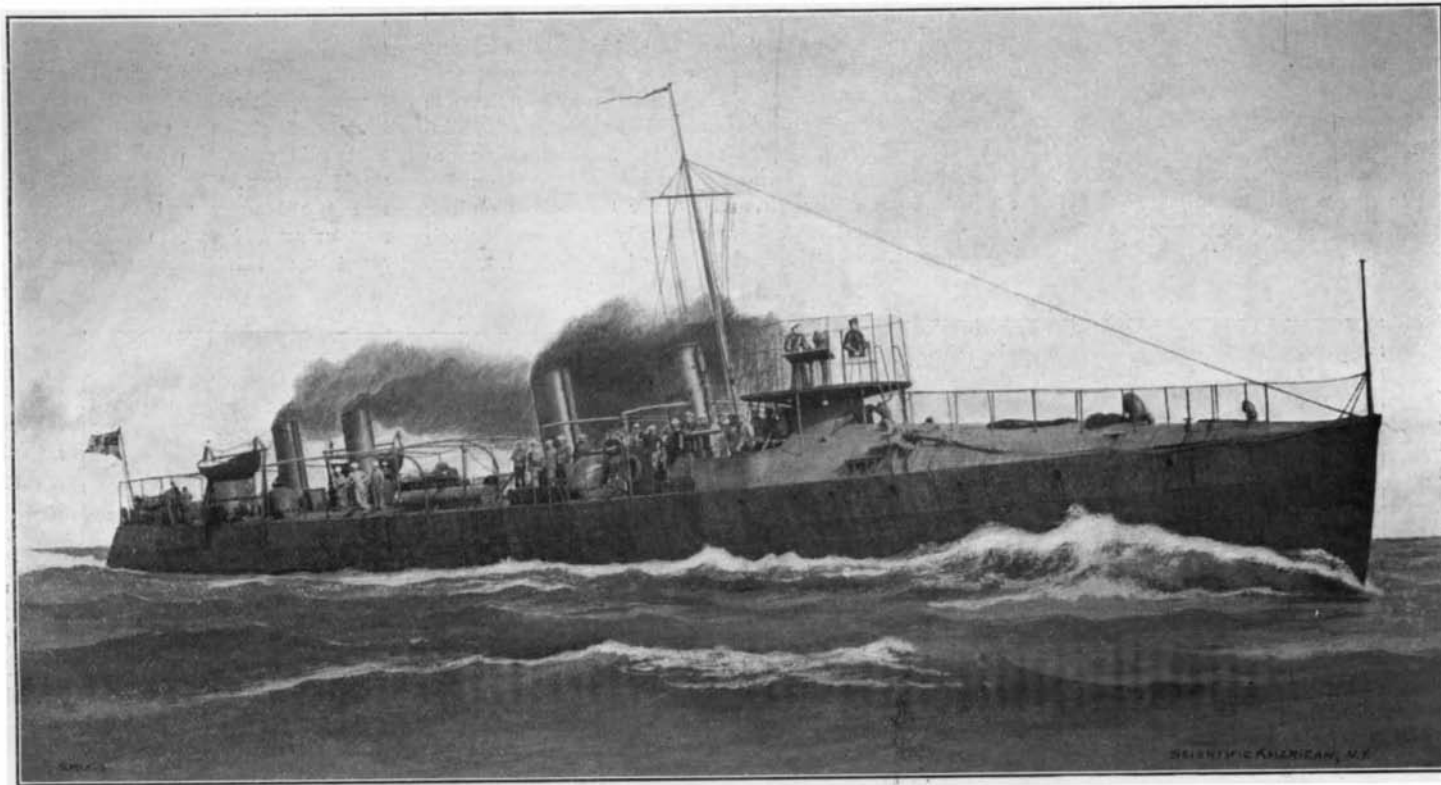
The cultivation of the chrysanthemum in China may be traced back to a very early date, and already in the eleventh century two strains were evidently cultivated, the one bearing yellow ray flowers, and the other white. Dr. Henry, who has collected specimens now in the Kew herbarium, considers that there are two wild plants which may be the progenitors of the cultivated strains. Throughout China and Japan the form known as *Chrysanthemum indicum*, which has a yellow ray, is widely spread, while in the mountains of Hupeh there

occurs a form with white or pink ray, which has been named *Chrysanthemum morifolium*. Another series of plants obtained in North China and Japan has been considered to show merely a variation of the second form, and this view is accepted by Dr. Henry, who points out the possibility of finding intermediate varieties in the unexplored districts in the interior of China.—Gard. Chron.

The Louisiana cotton growers are taking energetic steps to prevent the Mexican boll weevil from entering the State. No cotton seed from the affected district of Texas will be admitted into Louisiana.



ENGINES OF THE TORPEDO BOAT "PERRY."



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mixed with it, and even from illuminating gas, by cooling the mixture by means of liquid air. The remarkable improvements which M. Georges Claude has brought about in the production of liquid air on a large scale lead to the hope that this process may be applied to purify the hydrogen which is produced in the modern forms of generator. This will be of great value as concerns the question of balloons and airships. M. Claude has designed an apparatus for purifying hydrogen on a large scale by the use of liquid air and the Aerostatic Service is now considering the question. Before going into the construction of the apparatus it seemed useful to determine, by experi-