THE "TYPHONOID"—A NEW TYPE OF MOTOR BOAT.

BY M. J. PELTIER.

The racing motor boat herewith illustrated was launched on July 27, 1907, at the Beilvaire shipyard, near Nantes, France. The boat is the invention of M. André Gambin. Its principal dimensions are: Length over all, 59 feet; length on water line, 52½ feet; greatest width over all, 5¼ feet; greatest width at water line, 4 feet 7 inches; molded depth, 4 feet 4½ inches; mean draft, 2 feet 7½ inches; area of amidship section, 7.14 square feet.

When afloat the boat presents a very trim appearance, with no suggestion of the very peculiar apparatus by which it is propelled. M. Chauvalon, the assistant constructor of the little vessel, claims that it cannot be capsized, except possibly in making a short turn at high speed, when great skill on the part of the steersman will be required.

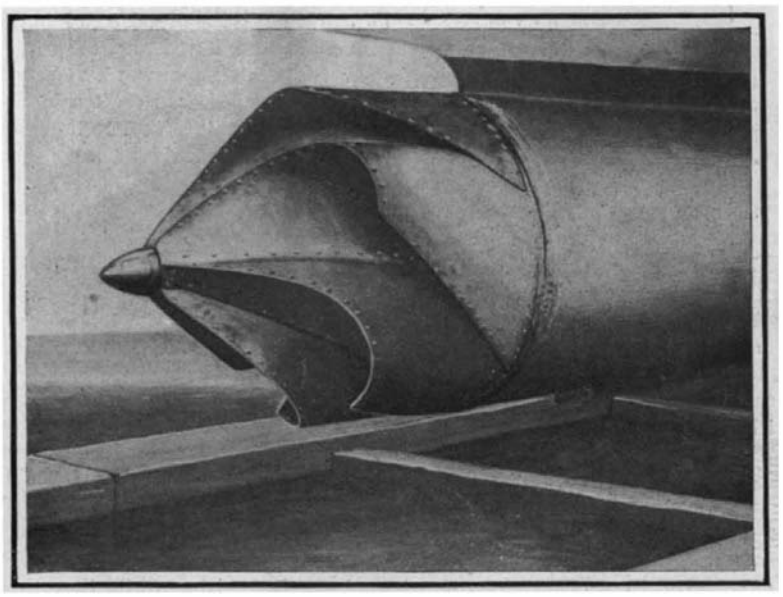
The motive power consists of two 4-cylinder V-type motors of 60 horse-power each, coupled together and to the propeller shaft. Double ignition, by magneto and by accumulators, is provided, to lessen the chance of failure. The boat is propelled by a "typhonoid" screw, 31½ inches in diameter, which is placed at the bow, as shown in the illustrations. The inventor has guaranteed a speed of 100 kilometers, or more than 62 miles, per hour.

NOVEL MOTOR BOAT FITTED WITH A NEW FORM OF PROPELLER KNOWN AS A "TYPHONOID."

M. Gambin, after fifteen years of fruitless attempts to improve the action of the ordinary screw propeller, conceived the idea of converting the defects of that apparatus into advantages by the adoption of the "typhonoid," placed at the bow, instead of at the stern of the vessel. Without going into theoretical details it may suffice to point out that the injurious effects of centrifugal displacement and the central void are thus converted into beneficial effects and the limit to the advantageous increase in the velocity of rotation of the propeller is removed. The name *typhonoid* is derived from a Greek word which means a whirlwind, and the apparatus is designed to act by suction, in the manner of a waterspout.

Very curious experiments were made by the inventor two years ago with models about 8 feet long, driven by clockwork, and velocities exceeding 40 miles per hour were obtained. Last May another series of experiments was made with a typhonoid 2 inches in diameter, for the purpose of determining the tractive effort and the energy expended in moving large and measured volumes and weights. The results were not only satisfactory, but surprising. From these two series of experiments it seems fair to infer that the typhonoid will produce the maximum speed for a given expenditure of power. Furthermore, as the typhonoid presents no projecting edges, it is manifestly superior to the ordinary screw propeller for the navigation of shallow waters containing vegetable growths. The typhonoid propeller consists of a number of blades—six in this instance—symmetrically distributed around an axis and terminating in a cylindrical tube. Each blade is composed of two sheets or surfaces. One sheet is spiral-cylindrical, like a loosely-rolled sheet of paper, with its inner edge at the axis and its outer portion forming part of the enveloping tube. The other sheet is smaller, inclined and helicoidal, like the blade of an ordinary screw-propeller. It extends from the front edge of the cylindrical sheet to a spiral line traced some distance behind the front of the cylindrical sheet of the preceding blade. The front edges of the two sheets of each blade are riveted together and form a salient cutting edge which slopes backward from the apex to the circumference at an angle of 45 deg. to the axis.

A French naval engineer, after making a minute examination of the inventor's plans and calculations, has asserted that the Gambin typhonoid far surpasses all other propellers in efficiency and has expressed his confidence in the ability of the new boat to develop a speed of much more than 62 miles an hour, with an expenditure of energy of 100 horse-power.



SIDE VIEW OF THE NEW PROPELLER, SHOWING ITS LOCATION AT FORWARD END OF TUBE.

Cement Telegraph Poles.

BY C. M. GINTHER.

Telephone, telegraph, and electric railway managers and investors will be interested in a new concrete pole, invented by Mr. William M. Bailey, of Richmond, Ind.

In a general way the poles are built on the plan of all armored concrete work, though the construction is quite distinctive in character. In the body of the pole and near its circumference, equally spaced, are continuous rods of twisted electro-carbon steel especially prepared for this purpose. These rods are tied together and held in position by continuous spiral binding wires. These form the skeleton work of the pole, or the reinforcement, which is then inclosed in a form into which cement is poured. After a number of days the form is removed, and the result is a concrete pole.

Extreme climatic conditions of summer and winter or heavy demands upon the strength and elasticity of a heavy pole line leave the poles made by this process absolutely unimpaired. One of the features of the poles is their remarkable elasticity. A 30-foot pole will deflect 31 inches at the top without cracking the concrete. The breaking strain of the pole is figured at 5,000 pounds—three times the strength of the common wooden pole.

Carefully calculated accounts of all expenditures for labor and material in the construction show that under average conditions the first cost is slightly more than that of cedar poles. While the average life of a cedar pole is about twelve years, that of a concrete pole is practically unlimited. When a cedar pole decays, the labor cost of removing it and attaching the wires to a new pole is far greater than the cost of the pole itself. Such cost is by far the greatest item of depreciation in both telephone and telegraph properties. Indeed, this very item is perhaps the only one that has made telephone securities less desirable than railroad stocks. With cement poles this renewal cost is eliminated.

A further important saving in depreciation is the protection these poles afford against lightning. Each pole becomes a lightning rod, being lightning-proof itself, thus protecting wires, instruments, and electrical machinery.

Another risk to be considered from the investors' standpoint is the destruction of pole lines in sleet and wind storms. The ruin thus wrought is often a fearful loss. But no storm of wind or sleet, or both combined, is likely to affect a line of cement poles, so great is their strength.

The poles are graceful in form and outline, fresh and new in appearance, never need painting, and can be aligned to mathematical exactness. In point of appearance and safety there is another factor in their favor, they being constructed in such a way as to make the pole self-supporting, thus taking care of all strains without the necessity of dangerous and unsightly anchorage.

Our forests are disappearing rapidly, and good cedar poles are almost unobtainable, and the price of those of even moderate quality is fast advancing.

It is estimated that there are forty million poles in the ground in the United States, worth two hundred million dollars. These poles have an average life of twelve years. More than 3,200,000 poles are required every year to replace those decayed, at a cost of from fifteen million to seventeen million dollars per annum. When it is considered that much of this may be saved by the use of concrete poles, their enormous value to the public service corporations of the country may be appreciated.

A table of road resistances in pounds per ton (of 2,240 pounds), has recently been published in England. The figure given railroads is 10. Asphalt has second place with 15, 22 and 29 pounds for good, medium, and poor, respectively. Tramways and wood paving are each placed at 30. The best macadam is from 43 to 46; ordinary quality from 50 to 60; and soft macadam as high as 97 pounds per ton. The best gravel and cobbles are given as 57 and 60 respectively, while ordinary and very bad cobbles are placed at 130 and 240 pounds. Dry, hard clay is said to offer a resistance of 100 pounds per ton; a sand road, 360 pounds; and loose sand, no less than 560 pounds, or 25 per cent of the weight to be moved over it.—Iron Age.

THE "TYPHONOID" VIEWED FROM THE FRONT.