

tween them and her being that they were driven by reciprocating engines and the "Cobra" by steam turbines of nearly double the power. Although no satisfactory reason was assigned for the disaster, Mr. Gibson believes that the additional stresses caused by the gyroscopic action of the rotors were mainly responsible for the disaster. Assuming that the two high-pressure turbines weighed 8 tons each and the two low-pressure 14 tons each, and that the speed of revolution was about 1,100 per minute, he finds that under certain conditions a couple might be called into play of 48 foot-tons, which would have to be resisted by the framing and shell of the vessel.

LONG-DISTANCE MOTOR-BOAT RACES FOR 1907.

There are at present but two important power-boat races scheduled for the coming season. Both of these are for cruising craft, and it is noteworthy that no contestant is eligible to entry in both races. These are known as the Marblehead and Bermuda contests.

The Marblehead race is the third annual race of a series which has been pulled off between New York and Marblehead, Mass., while that to Bermuda is an entirely new venture in the long-distance cruiser field. Both these races are laudatory, since such contests tend to develop a seaworthy, convenient, comfortable, and sensible type of cruising craft. If the results this year do not prove this to be true, indications are certainly misleading.

The first long-distance race for cruising power boats was conceived by Mr. Thomas Fleming Day, of "The Rudder," who offered a \$250 trophy, to be known as "The Rudder Cup," to the Knickerbocker Yacht Club of College Point, with absolutely no restrictions as to conditions except that it was to be raced for by cruising power boats. This was late in 1904. The Knickerbocker Yacht Club accepted this cup, but, as there had been no previous contests of a similar nature, the club fully realized the amount of strenuous work such an enterprise would entail.

After several meetings the regatta committee presented to Mr. Day, for his approval, a draft of the conditions for the first race in 1905. These rules provided for a race for *bona fide* cruising power boats, not exceeding 40 feet length over all, and for the exclusion of any craft not having living and cruising accommodations for a crew of at least four persons. Paid navigators were also barred. American Power Boat Association rules were to govern. As a result there were sixteen entries, with twelve starters, as follows:

Boat.	Owner.	Engine.
"Blink".....	C. W. Estabrook.....	Buffalo.
"Aquila".....	A. H. Chase.....	Chase.
"May".....	A. A. Low.....	Fulton.
"High Ball".....	Richard Hutchison..	Essex.
"Woodpile".....	A. L. Lincoln.....	Barber.
"Glissando".....	F. L. Andrews.....	Standard.
"Yeddo".....	S. M. Smith.....	Twentieth Century.
"Em Bee".....	Louis Neumann.....	Buffalo.
"General Bumps".....	P. D. Irwin.....	Giant.
"Igniter".....	C. A. Mezger.....	Buffalo.
"Aranca".....	Arnold Schlaet.....	Standard.
"Talisman".....	William Saville.....	Murray & Tregartha

Of these, all but six, viz., "Yeddo," "General Bumps," "Aranca," "Glissando," "Em Bee," and "Talisman," were new boats, built to conform to the conditions of the race.

The weather was the worst of the season, and after a hard trip across Nantucket Shoals, but five were able to finish and in the following order: "Talisman," "Blink," "Aquila," "Glissando," "Woodpile."

As "Talisman" was entitled to an allowance of nearly seventeen hours, there was no question of her winning the cup.

"Glissando" received second prize, and the other three handsome souvenirs.

In this race, as in that of the year following, the Eastern Yacht Club, of Marblehead, rendered valuable assistance, not only to the Regatta Committee of the Knickerbocker, but to the contestants themselves, the other two yacht clubs, the Boston and Corinthian, each vying with the Eastern as to which could do the most in that line.

Before the close of the year 1905, the Knickerbocker Yacht Club decided on a race for 1906. This was to be run in the opposite direction, i. e., from Marblehead to College Point. As a result, four prizes were offered, with fourteen entries and the following twelve starters:

Boat.	Owner.	Engine.
"Davy Jones".....	Richard Hutchison.	Jager.
"Unome".....	Alfred L. Lincoln....	Barber.
"May".....	A. A. Low.....	N. Y. Kerosene Oil.
"Yo-Ho".....	R. R. Curry & Sons.	Ideal.
"Whew".....	F. C. Webb.....	Murray & Tregartha
"Aranca".....	Arnold Schlaet.....	Standard.
"Sis".....	Eben Stevens.....	Craig.
"Susie".....	J. B. Schmelzel.....	Fulton.
"Gertrude".....	J. J. Tobin.....	Murray & Tregartha
"Shawna".....	George C. Sutton.....	Lamb.
"Alice J".....	Sidney Williams.....	Hasbrouck.
"Sarapa".....	Swasey, Raymond & Page.....	Buffalo.

In 1905 "Talisman" took nearly 54 hours and 25 minutes to cover the course.

"Unome" finished first in 1906 in 33 hours, 45 minutes, and 40 seconds, with "Whew" second, "May" third, and "Sis" fourth. The last boat of nine to finish, "Susie," completed the 280 nautical miles in 39 hours, 5 minutes, and 29 seconds elapsed time.

Time allowance was figured on a modification of the 1905 American Power Boat Association rules, using 60 per cent of the table, with arrivals corrected so that the winners in their order were as follows: "Sis," "May," "Susie," and "Davy Jones."

The owner of "Sis," Mr. Eben Stevens, promptly offered a cup for a race in 1907. The Knickerbocker Yacht Club could not see its way clear to undertake the management of another race. Consequently, the New Rochelle Yacht Club will this year have supervision over the third Marblehead race.

Very slight modifications in the rules governing the 1906 contest have been made, the two principal ones being to limit the minimum length to 30 feet over all, instead of on the waterline, and the use of 50 per cent of the table of time allowance of the American Power Boat Association rules, rather than 60 per cent. The race this year will be from New Rochelle to Marblehead and will probably start on July 4.

The other race is from Gravesend Bay, off the Brooklyn Yacht Club, to Bermuda, a distance of about 700 statute miles. The minimum length of boats eligible for this race is placed at 39 feet, and the maximum at 60 feet.

This race is for a valuable trophy offered by Mr. James Gordon Bennett, the well-known yachtsman. It will be run under the joint auspices of the Brooklyn and Royal Bermuda Yacht Clubs. Careful conditions have been formulated, to avoid probability of disaster to any competing craft, each one being compelled to carry 6 square feet of sail for every foot of over-all length, and one and one-half times the quantity of fuel necessary to cover the distance under favorable weather conditions; while several other important salutary regulations are embodied in the requirements for eligibility for entrance. The conditions under which entries are to be made were published in the SCIENTIFIC AMERICAN of December 22, 1906.

This race is scheduled to start from the club house of the Motor Boat Club of America on June 1, and with good weather the run should not consume more than two and a half or three days.

It is reported that several boats are already under construction for each race, and it is likewise probable that boats already built, and eligible for the Marblehead race, will compete, while slight modifications, consisting in the main of the addition of auxiliary sail equipment, will allow several well-known boats to enter in the Bermuda trial, which will test the best points of such craft, such as their seaworthiness and endurance.

POWER BOAT NOTES.

You cannot "throttle" a four-stroke cycle engine to slow speed, unless the exhaust valve springs are sufficiently strong to prevent ingress of the spent gases through the exhaust valves, when there is a partial vacuum in the cylinder formed by the descent of the piston during its induction or drawing-in stroke. Weak exhaust-valve springs are sometimes encountered on marine gasoline engines.

There is an island near Marblehead, Mass., which is often mentioned in print. It is sometimes called Thatcher's and often Thatcher. It could not be Thatcher's, for in all geographical names now the apostrophe is omitted. What used to be called Riker's Island is now Rikers Island, while Fisher's Island has become Fishers Island. In the particular case mentioned, the latter is and has always been correct. It is Thatcher Island.

Conditions may necessitate installing propellers with excessive pitch, but such an installation should be avoided if possible. It must be remembered that the flywheel of the engine must be kept out of the water in the boat's "run," or space below the floor. This is sometimes accomplished by using a copper or galvanized pan under the lower part of the flywheel. Two-cycle engines give more trouble usually than four-cycle, when thus installed, and two-port engines more than three-port, if supplied with float-feed carbureters, the usual tendency being to get too rich a mixture in the after cylinder and too poor a mixture in the forward cylinder. Too much lubricating oil is quite likely to interfere with the ignition in the after cylinder if the engine is of the four-cycle type.

If you are in a power or sail-driven boat, and some other craft, steam or gasoline driven, willfully violates well-known "rules of the road," you should, at your earliest convenience, report the occurrence to the nearest United States inspector of steamboats, giving a full account of the occurrence, with names and addresses of eye-witnesses. A few cases of this sort would give many of our licensed masters and pilots what they richly deserve—suspension of their licenses—even although they are often goaded to desperation, as no doubt many of them claim, owing to the wanton

disregard of the usual rules by many of our power-boatmen. Moral: Learn the "rules of the road" yourself, and do not take any chances, giving the other party plenty of leeway.

A sailing yacht shows the same lights as any sailing craft, the regulation red and green side lights, when under sail, and the white riding light when at anchor. A light is sometimes suspended from the end of the main, or spanker boom, to reduce liability of fouling, and while of great utility, and in a measure considered necessary, is not demanded by federal law or regulation. Small sailing craft are allowed to show a combination red and green light displayed in front of the mast, in place of the usual separate side lights. Small power craft, when using combination lights, should have a white light showing between the red and green. When showing separate side lights they should display a white masthead light. Towboats or any power craft when towing another craft alongside, should show two white masthead lights, one above the other, and when towing astern there should be three of these lights vertically arranged. The regulations governing lights on all craft are the same, no matter whether used for pleasure or business purposes, and are in force from sunset to sunrise.

Galvanized sheet-iron gasoline tanks are unsafe, and their use should be prohibited in all boats. Copper is very much better than any other material for fuel receptacles, although high-grade house boilers, galvanized after they are made up, on account of their cheapness, are permissible. The electric-welded, pressed-steel tank, however, is preferable to the riveted style. A precaution to be observed in the use of galvanized-iron or steel tanks is to see that salt water does not collect on them, or that they are not partially submerged in the boat. More important it is that no oak, or any wood carrying tannic acid, comes in contact with galvanized-iron tanks, else their life, owing to corrosive or galvanic action, is materially shortened. Galvanized-iron "swash" plates are preferable to those made of copper, owing to their greater rigidity, and such plates should be used in copper tanks. Soft, or hot-rolled, copper makes safer tanks than cold-rolled, and even this should be "tinned" on the inside, to insure the solder holding. All copper tanks should be protected against any possibility of fracture or puncture, by means of suitable bulkheads.

Rarely does a power-boat owner aspire to own the second craft with the propeller unprotected. Speed maniacs have set the custom. Floating debris, rocks, shallows, etc., make bad work with the unprotected propeller. It has been abundantly proven that high speed, with its allurements, is not all that is claimed or desired, that a comfortable, safe, good sea boat is a much more merchantable article and one less often offered for sale than so-called semi-speed or racing craft. It is possible so to design power boats that a good, satisfactory type with sufficient speed for comfort, may be produced rather than "freaks." Boats of abnormally high speed are decidedly dangerous playthings, not only for their own occupants, but those of other craft, who have equally as good rights to navigate crowded harbors and other constricted bodies of water. Power-boat racing, except for sensible cruising craft, died naturally something over a year ago. There is but one really good power-boat racer, and that is the very fastest one afloat. When such a craft is once beaten, her value is considerably decreased. In designing a boat to get the very highest speed possible, it is usually necessary to have the propeller project below the keel.

A jump-spark coil may be put out of commission easier by too high voltage than from any other cause. Adjusting the trembler, or vibrator, until there is very little play between the core and the small button or armature, is quite likely, especially with cheap coils, to fuse or burn up the metal contacts, between which a small spark shows when the primary, or low-tension, circuit is closed at the timer or distributor. Some coils are wound for but six volts, because they can be produced more cheaply than if wound to stand nine or twelve. Such coils should never be used with more than four dry cells, or six cells of so-called oil battery. A very frequent source of trouble with coils may be traced to their use in connection with sparking dynamos or generators. It is not safe to use them in the jump-spark system, without using an accumulator or storage battery, and a cut-out, either by means of a switch or an automatic device to prevent short circuiting the storage battery through the generator, when the engine stops. If the governor on the generator could be depended upon to maintain just the proper speed to produce the correct voltage, there would be no trouble, but around salt water particularly the governor is liable to "stick," with disastrous results. This is one of the bad features incidental to the use of jump-spark ignition. In the make and break system an increase of voltage to even twelve volts has no bad effect other than a tendency to burn out the igniter points, unless it runs so high as to break down the generator itself.