JULY
1915

MOTOR BOATING

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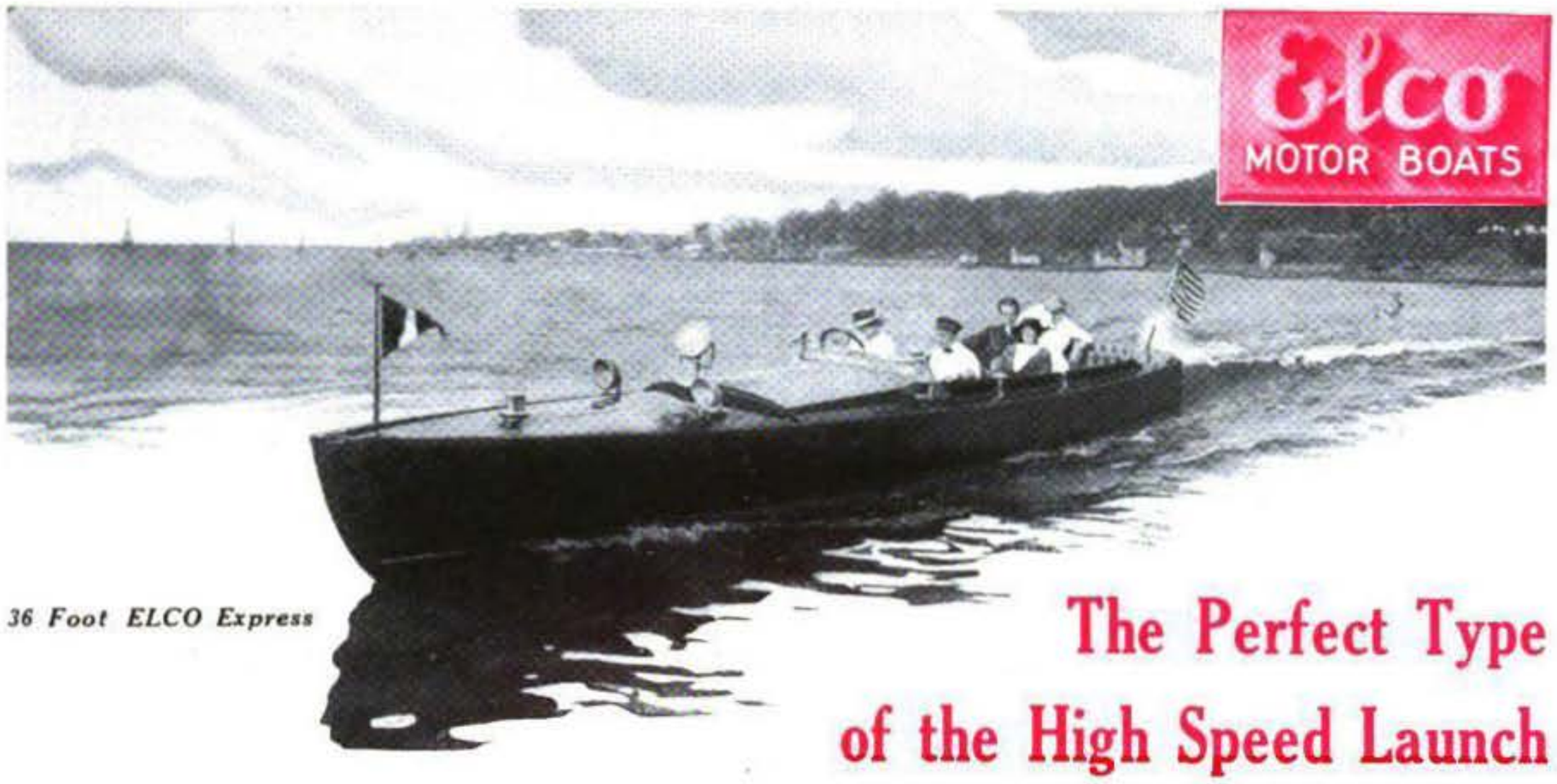
THE SEASON'S NEWEST BOATS
AND THEIR DESIGN In this Issue



36 Foot ELCO Express

The Perfect Type of the High Speed Launch

The ELCO Express has achieved the greatest success of any launch ever produced—and with good reason.

It is a type brought up to today's automobile standards of simplicity, power, reliability and beauty. It "serves you on the water as the automobile does on land."

There is grace and speed in every line of these Expresses—there is a comfort in their ample accommodations which appeal to an owner's very heart—there is the certain performance of their new model Elco Engine which marks all Elco Boats.

The Cruisette is a 32-footer that sleeps 6 in comfort—the greatest little boat man ever designed.

30 foot Elco Express
36 foot Elco Express
32 foot Elco Cruisette
38 foot Elco Cruiser
45 foot Elco Cruiser

Full information about ELCO Standardized Models on request. Write for a copy of "Marine Views."

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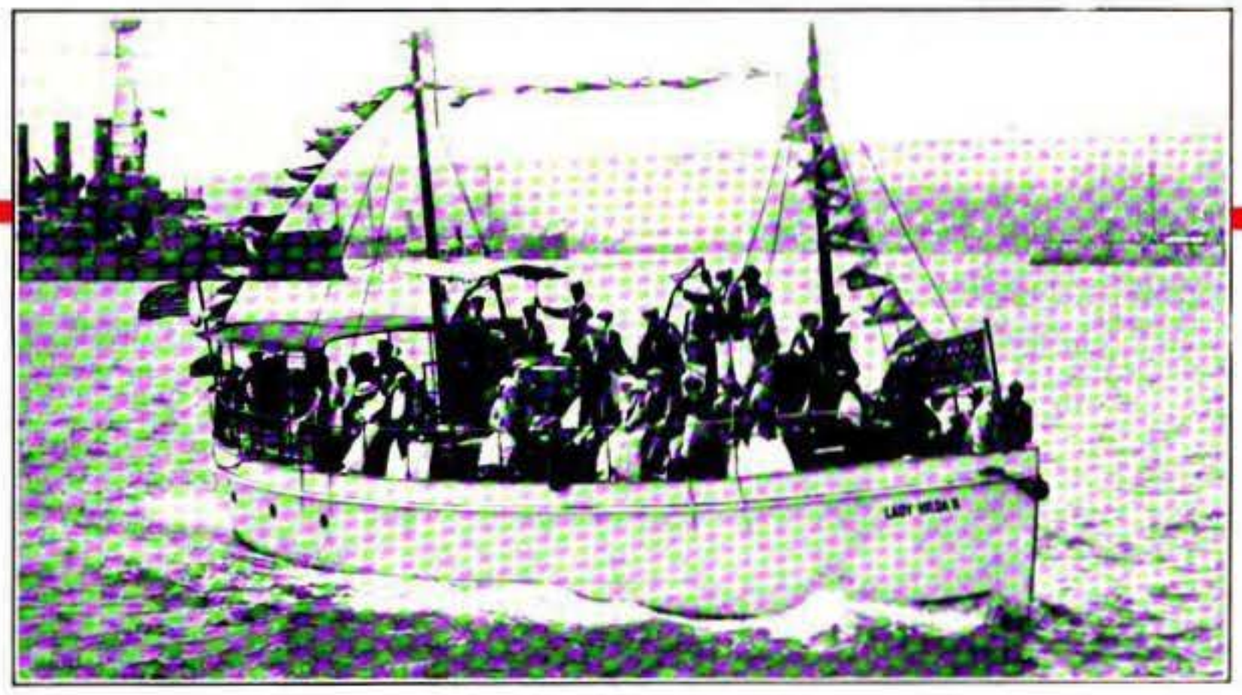


Party Boat
Lady Hilda,
32-37 H.P.
Standard Engine

Mr. A. Simpson
New York
Owner

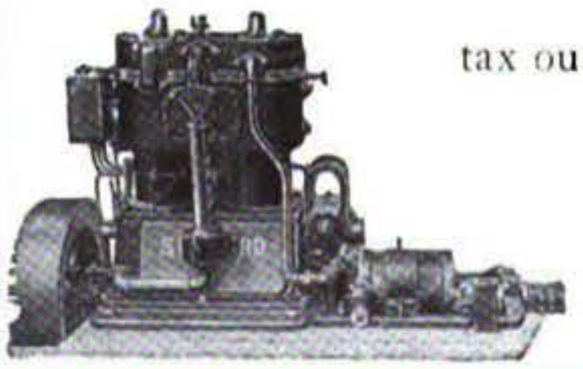
STABILITY is that quality which is hardest to buy and most necessary to have.

Lack of it in the engine or in the organization back of the engine is why the service of either or both falls short.

Stability is what gives you that economical condition of highly developed quality which makes the real bargain.

This is what makes the ever-increasing demands for

THE STANDARD ENGINE



tax our factory's capacity for deliveries. We must urge your prompt ordering now.

Back of the STANDARD Guarantee is the

Standard Motor Construction Company

178 Whiton Street, Jersey City, N. J.

"Buffalo" The Engine of Constant Service

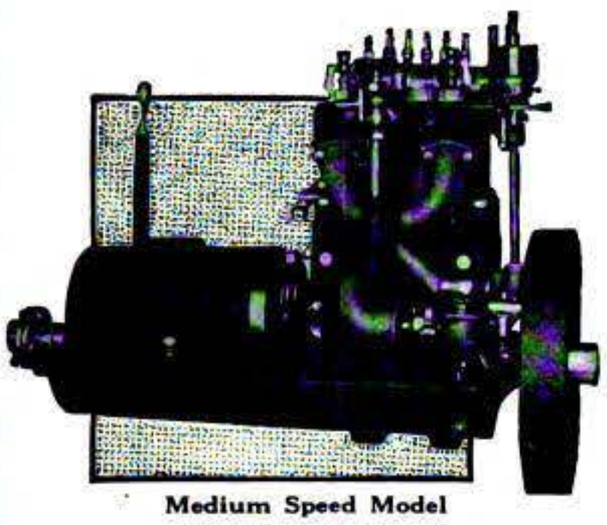
An Engine for Any Sort or Size of Boat

IF ALL boats were alike engine buying would be easy. But they are not. Each boat has its special requirements and the engine must conform to these requirements or it is a failure.

That is why the builders of Buffalo engines manufacture so many models—they must have an engine to suit any sort or size of boat.

If the Buffalo line consisted of from two to a half dozen models this would not be possible. It would be necessary to sell the engine which *came nearest* to meeting the boat's requirements, and that is not the Buffalo way.

So the Buffalo line is large and Buffalo installations are satisfactory.

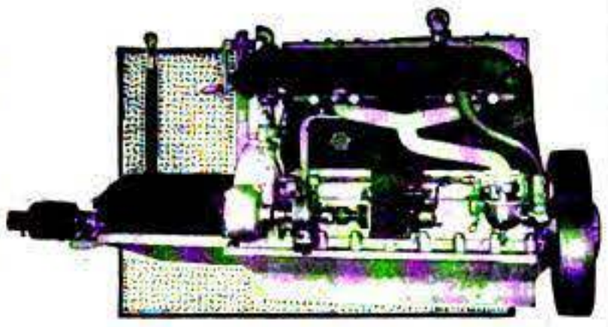


Medium Speed Model

For the Tiny Tender

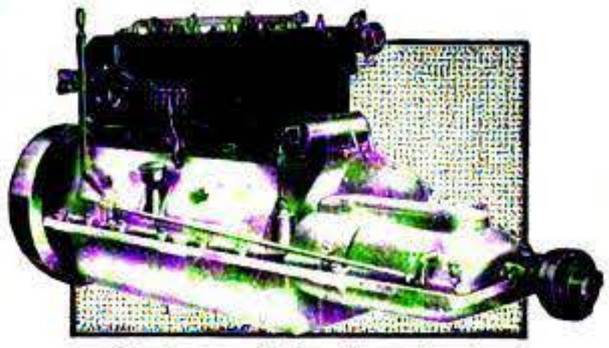
For tenders and small open boats there are two two-cylinder medium speed models rated at 3-4 H.P. and 5-6 H.P. These are little engines but they embody the best Buffalo qualities.

What the Runabout Needs—



Auto Marine Model

Then there are the far-famed Buffalo Auto Marine models—the engines which combine speed and fairly light weight with reliability—just the thing for the runabout. This type is built in four cylinders and in two sizes—16-20 H.P. and 25-30 H.P. As the picture shows these engines have aluminum base and are completely enclosed except for the flywheel.

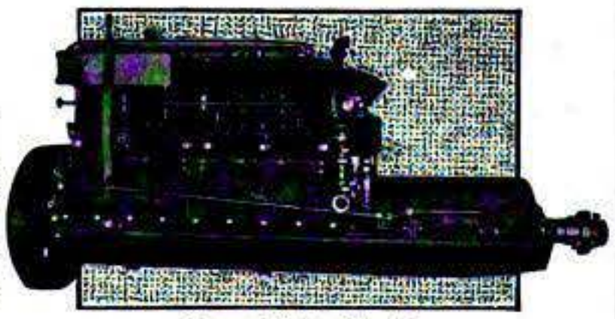


Cruiser and Runabout Engine

Consider the Cruiser

Because of the recent rise in popular favor of the fast day cruiser the Buffalo builders have this year added another type to their line designed specially to meet the peculiar requirements of this class of boats and also of the larger type of open runabouts. It is built in two four-cylinder models rated at 40-60 H.P. and 50-80 H.P.

For the Sturdy Work Boat



Heavy Duty Model

And last but not least comes the Buffalo Heavy Duty engines—the slow speed, steady service kind—designed for work boats, yachts and cruising boats. There are three two-cylinder models rated at 10-12 H.P., 13-15 H.P. and 20-22 H.P.; three four-cylinder models rated at 20-24 H.P., 26-30 H.P. and 40-45 H.P.; a six-cylinder model rated at 60-70 H.P.; and also two big engines with 10-inch bore and 12-inch stroke, built in four and six-cylinders; the four-cylinder being rated at 85-100 H.P. and the six-cylinder at 125-150 H.P.

All this is but an outline. Shall we send you the Buffalo Book which tells the whole story?

BUFFALO GASOLENE MOTOR CO.

1274-1286 Niagara Street **Buffalo, N. Y.**

"Buffalo" The Engine of Constant Service

LOEW-VICTOR ENGINES

Consistent Compact Power Plants

THE St. Louis Yacht & Boat Co., designers and builders of "Saint Louis Craft", recently designed and built a 31 foot Hunting Cabin Cruiser with more real accommodations than usually found in a 45 footer.

The power plant of this boat had to develop real horse-power. It had to be quiet, clean and vibrationless AND it had to be mighty compact, because every *inch* of space in this boat *works*.

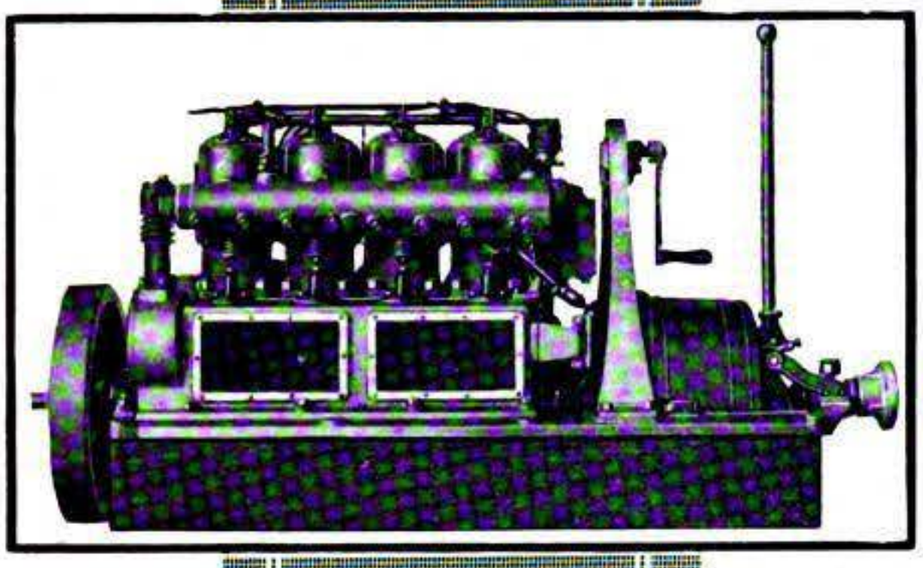
That the power plant finally selected by the designers was a Model 13-40 H. P. LOEW-VICTOR is but further evidence of the confidence placed in LOEW-VICTOR Engines by the leading designers and boat builders of the country.

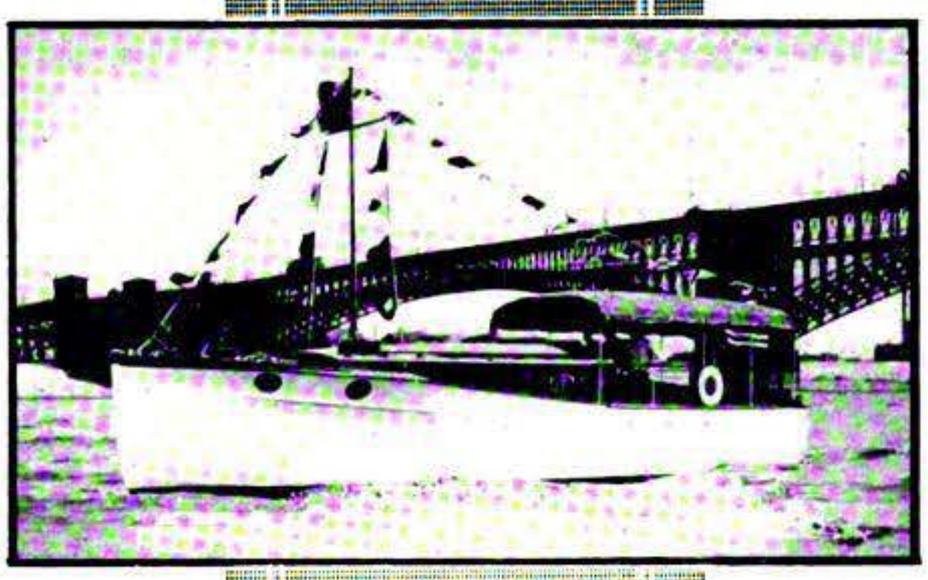
This four cylinder, 4¾ in. x 5½ in. 40 H. P. motor drives the 31 ft. x 8 ft. 3 in. x 2 ft. hunting cabin cruiser at a steady cruising speed of 12 M. P. H., without noise, vibration or trouble.

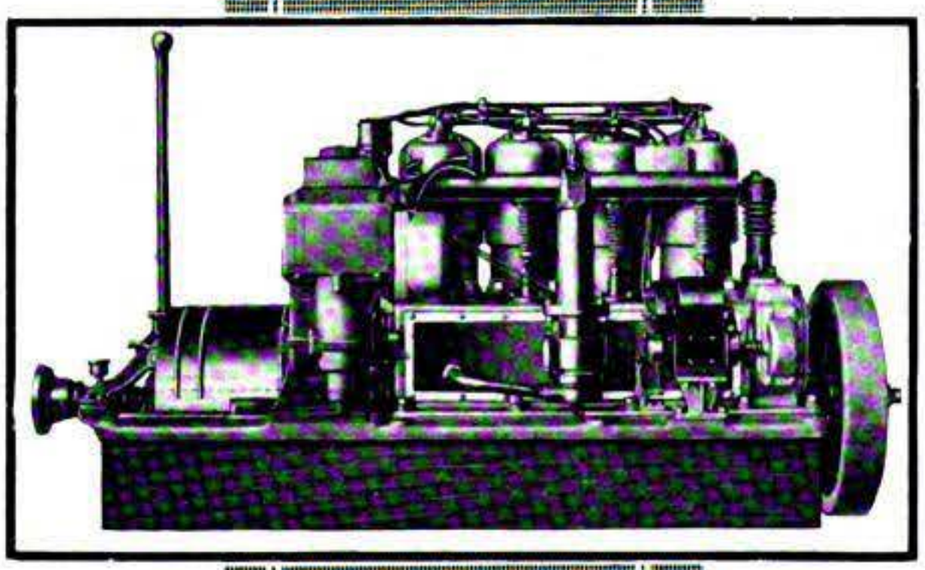
The boat is of the popular V-Bottom type, of construction suitable for rough waters, and it has proved itself to be an able sea boat and very comfortable to ride in.

The power plant is the regular stock Model 13-40 LOEW-VICTOR, a compact, rugged, serviceable motor that has built up a reputation for delivering downright good service to its owner under all working conditions.

A full description of this motor is given in the LOEW-VICTOR catalog-de-luxe which will gladly be forwarded to you free of charge on receipt of your request. This same catalog contains a full description of all LOEW-VICTOR products and also contains data of considerable interest to everybody interested in the cleanest and healthiest sport in the world—Motor Boating.



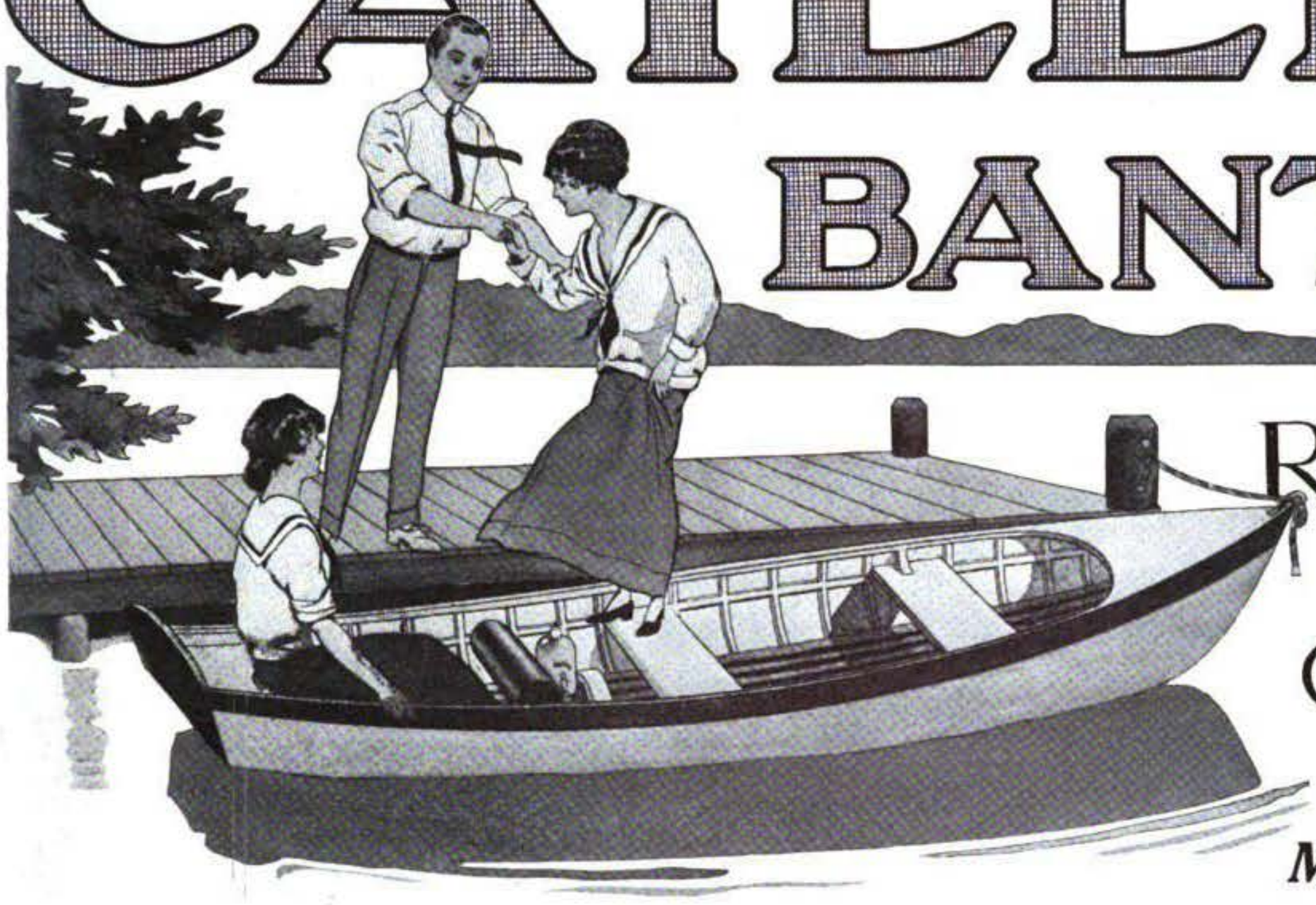




LOEW-VICTOR ENGINE COMPANY

Oakley and Oakdale Avenues, Chicago, U.S.A.

CAILLE'S BANTAM *for* Rowboats and Canoes



The "Ford" of the Marine Engine Field

You have so often asked us to build a light, reliable and substantial motor, suitable for installation in rowboats, dories and canoes, that we have finally produced the Caille Bantam Motor, shown below—a supreme achievement representing the good points of both the inboard and outboard types of machines.

This motor weighs but 40 lbs. It develops 2 H.P., and drives rowboats 7 to 9 miles an hour. Its dimensions are: 14" in height; bed plate, 3¾x3½"; length, 12"; width, 9¼".

It can be easily installed by simply bolting it down to a flat piece of hard wood, drilling a hole through the keel for the propeller shaft and attaching the stuffing box. Detailed instructions accompany each motor.

By substituting wing nuts in place of lag screws in installing the motor, it can be quickly attached or detached from the boat, as desired.

The Caille Bantam is the only inboard type marine motor on the market with built-in flywheel magneto. It insures a waterproof ignition system that is always dependable, and without adding weight, gears or complicated parts to the motor.

Another of the Bantam's exclusive features is the detachable fuel tank. By loosening one bolt, the tank can be removed and taken where desired for filling. No need of sacrificing room in your boat to a dirty gasoline can. A tankful of fuel is sufficient for 5 hours' continuous running.

The Bantam is equipped with the famous Caille Silencer with cut-out. This makes the motor practically noiseless and yet it does not cause back pressure or check the power or speed of the motor.

The control lever is equipped with a push-button cut-out. Pressing this button cuts off the spark and stops the motor immediately. The lever gives a wide range of speed, from 2 to 9 miles an hour.

The design, materials and workmanship are positively of the highest grade and fully guaranteed by the world's largest builders of two-cycle marine motors.

Send for special literature No. 50, giving details.

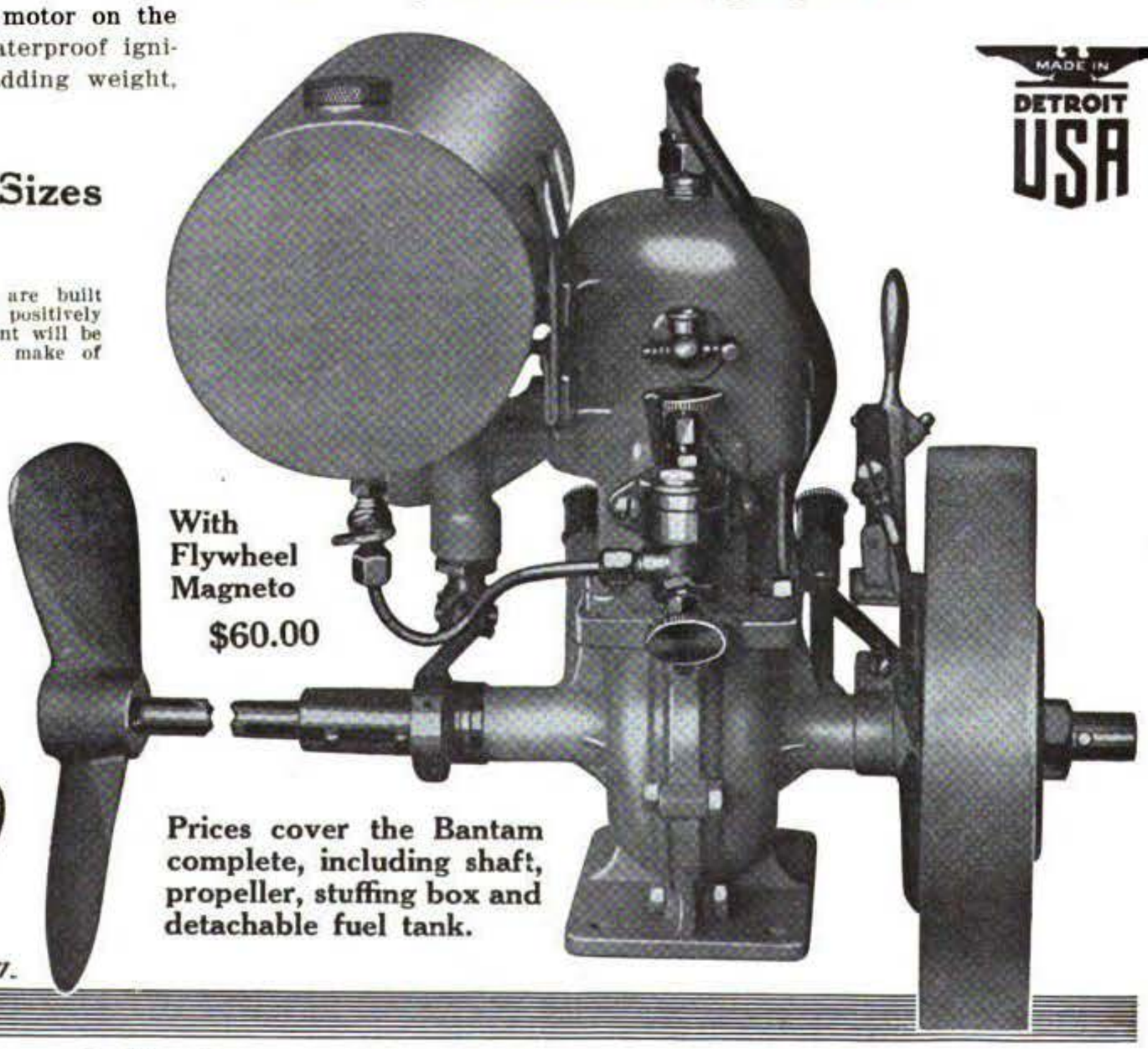
Other Caille Perfection Types and Sizes Range from 2 to 30 H. P.

Special models are designed for various classes of service and are built with one to four cylinders. All are fully guaranteed and embody positively the best in design, materials and workmanship. Our 8 H.P. Unit Plant will be found in more pleasure boats of the average size than any other make of motor. Send for Catalog No. 24, giving complete details.

Bantam Dealers Wanted

The Caille Bantam is the only motor in the marine world that can compare with the Ford Automobile from the quick sales point of view.

The Caille Perfection Motor Co.
1540 Caille Street Detroit, Mich.



With Flywheel Magneto $60.00

Prices cover the Bantam complete, including shaft, propeller, stuffing box and detachable fuel tank.

$50.00 *With Battery Ignition.*

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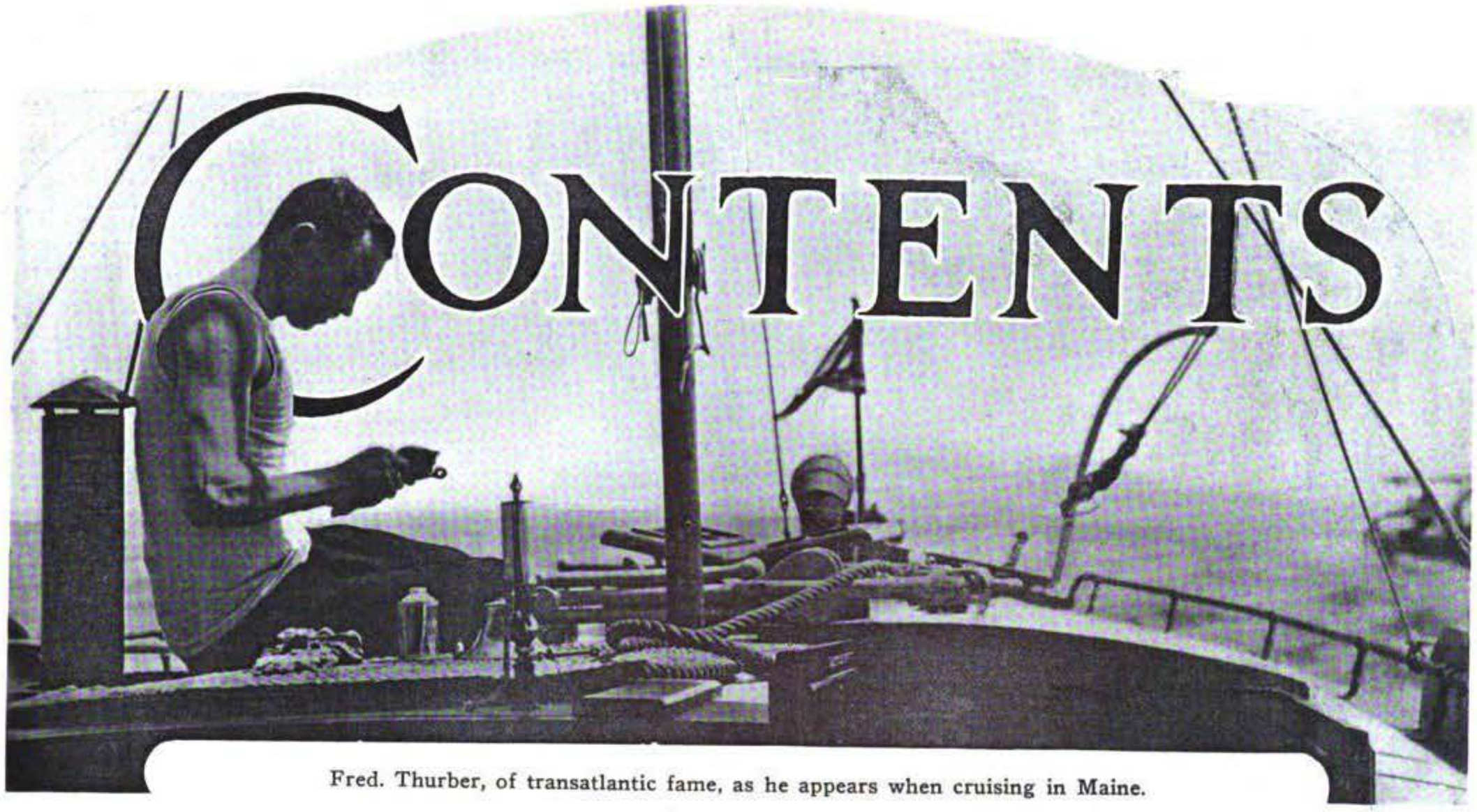

Fred. Thurber, of transatlantic fame, as he appears when cruising in Maine.

July, 1915.

July, 1915 — MOTOR BOATING — Vol. XVI, No. 1

THE NATIONAL MAGAZINE OF MOTOR BOATING

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15 cents a copy. Subscription, $1.00 a year. Extra Canadian postage, 50 cents. Extra foreign postage, $1.00.

New 26-foot Cinderella type runabout, owned by Herman L. Oelrichs, originally built by the Reliance Motor Boat Co. for James Simpson, and powered with a 90 h. p. Sterling motor. This boat averaged 37½ miles an hour over a measured course in the Hudson River, and recently made a run from New York City to Newport, R. I., in 5 hours.

—JULY 1915—

MOTOR BOATING

THE NATIONAL - MAGAZINE - OF MOTOR - BOATING

Uncle Sam Aids Motor Boatmen

How the United States Government Through Its Department of Commerce Co-operates A Conference at Washington Tending to Benefit Both the Trade and the Sport.

By Charles F. Chapman.

ONE definition of the scope of the Department of Commerce limits its field "to the heavens above, to the earth beneath and to the waters under the earth," and this definition appears none too broad, especially in light of events which are happening in rapid succession these last few days.

Naturally, in view of the above we must associate the motor boat with the work of the Department of Commerce, for today we find the many types of flying boats navigating the heavens above, the deadly submarine (which is a motor boat in every sense) feeling its way cautiously through the waters under the earth, and between two extreme types we have many which, although perhaps they cannot literally be recognized as belonging to the "earth beneath," yet one's imagination would not have to be stretched to classify many of them as such.

Therefore, the god or guardian angel of the motor boatmen must be one William C. Redfield, who occupies the chair of secretaryship of the Department of Commerce at Washington, and truly thankful can all of us be that this one William C. Redfield is in this chair at the present time. Why? many may be asking, but the answer is easy—simply because Secretary Redfield himself is a motor boatman of the most enthusiastic kind. He has served his time, as many of us have or are doing—before the mast and below decks and has taken his trick at the wheel and kept the good ship on a true course with due regard to all deviation and variation of the compass. He has made a balky engine balk no more when others have tried without success; he has guided his own motor boats and later his own motor yachts through the narrow channels between the islands off our rocky Maine coast and has had to figure how each adverse current must be met for the greatest advantage. He has watched others do the same thing; he has gone down to the docks in our New England towns and talked with the illiterate fisherman who depends upon the motor boat for his livelihood. He has observed the motor boats carrying passengers for hire, perhaps at only ten cents a head, yet boats carrying whole families out to sea for a day's outing because they could not afford to pay more for another kind of recreation. These and many other qualifications make Secretary Redfield especially adapted to pass upon questions germane to the motor boatman's interests.

His corps of able assistants makes the whole department abound with efficiency from the motor boatman's point of view. We find Assistant Secretary Sweet with us, a man long interested in the motor boatman's welfare. also the Hon. Eugene Tyler Chamberlain, the Commissioner of Navigation, the official whom many of us remember in connection with former friendly legislation for the motor boatman's safety. Then we have Deputy Commissioner A. J. Tyrer, who has made a life-long study of our needs and has put many of his practical ideas into operation within the past few years. Most of us have seen the motor boat Tarragon, and those who have not have surely read or seen pictures of her and heard all about the good work she is doing along our great Atlantic seaboard. Many of us have had the pleasure of hearing her blow a warning blast to us and having her hail us to "Come alongside" as we slipped our mooring for some week-end cruise. Perhaps a life-preserver, our whistle or fire extinguisher, two copies of the pilot rules, our lights or fog bell were not in position where they should be when Tarragon's officers came aboard our craft, and then we had the pleasure of receiving from Washington or our custom house, in the course of the following days, a long white envelope with no stamp on it to carry it to its destination, with the simple explanation that we were fined a two-hundred-spot for not complying with the regulations as to proper equipment, but suggesting that we make application to have the fine remitted. We hasten to make the application, and it is not many days before the good word comes back that the fine is remitted and offering much good advice for our benefit, which, considering the state of mind we are in at the time, just about hits the spot. We cannot but feel that these big men down in Washington must have our interests at heart, or else they would not be doing all that they are for the motor boatmen these days. Even when they find one of us guilty of a breach of one of the requirements which they have drawn up for our own good, instead of taking advantage of it they simply turn the other cheek and give us another trial.

The work of Tarragon has proven so far-reaching and successful that Commissioner Tyrer has just succeeded in having the department purchase another boat for the same purpose, and now they have the good ship Dixie, which will help out in our northern waters this summer. It may be of some interest to know that Tarragon has proven self-supporting, not only as regards interest on the investment and maintenance, but has entirely paid for her first cost in addition.

There is one other official who should not be overlooked in the summary of those names of men in the Department of Commerce who have special jurisdiction over the field which we motor boatmen proudly feel belongs to us and to us alone. This official probably has received more hard knocks and more adverse criticism than any other person in the department, yet we are strongly of the opinion that much of it has been unjust. It is true that the Super-

(Continued on page 50)

MARINE MOTORS and their DESIGN

By W. S. Howard

[This is the third and concluding instalment of Mr. Howard's interesting articles which have outlined an ideal motor for medium-duty and high-speed work. We think this series has shown itself invaluable to the motor boatman in giving him a more intimate conception of the problems of marine motor design, and in showing him where to look for points in existing motors.]

WE shall favor two bolts in place of four in our connecting rod which was partly described in the June issue. First, because it is not a large rod; second, because the service is not severe, and, third, since there is less danger in using a wrench of stripping the thread on two ½-inch bolts than when four ⅜-inch are used. We should insist on nickel steel bolts, with S. A. E. threads, the bolts being a good fit in reamed holes. They should have a round head, with one side milled flat to engage a similar flat on the cap.

The bolts are to be put in with the head down so that the castellated nut will be in a very accessible place. The cotter pin hole should be drilled in line with the flat side to avoid having to hunt for the hole.

After the upper end is bushed and reamed, the lower end is scraped until it has a good bearing and is quite tight—not a swinging fit, but one that takes four or five pounds to move it. With proper material and oil, such a bearing is good for at least two seasons without taking up. When all four rods are in place on the shaft, with the shaft turned flat, a test bar of exact diameter and long enough, should pass freely through all the upper ends at one time, proving perfect alignment.

The only change we shall make on the rod for our higher speed motor is to mill off the crown of the wrist pin end of the rod, making it the same thickness all over, and thus reducing the weight of the reciprocating parts. The rods should all have the same weight and the position of the center of gravity must be the same in all. To test this suspend one end on a string and make the other ends weigh the same.

All bearings should be in as perfect alignment as that described for the connecting rods. Bearings that are in this perfect condition can be fitted quite closely and will hold out for a long time, with little wear. When bearings are not machined perfectly in line, or where they get out of line, due to springing of the frame or shaft, they soon relieve themselves in an attempt to get in line. Taking up the lost motion under these conditions is only a temporary cure, and in a short time they are ready for more attention.

We shall next consider valves, that we may arrive at the volume of our compression space. Our cruiser engine, with cast-iron base, is to run at low speed from 400 to 600 r.p.m., and as our stroke is 6 inches, our revolutions in this particular engine are equal to our piston feet per minute.

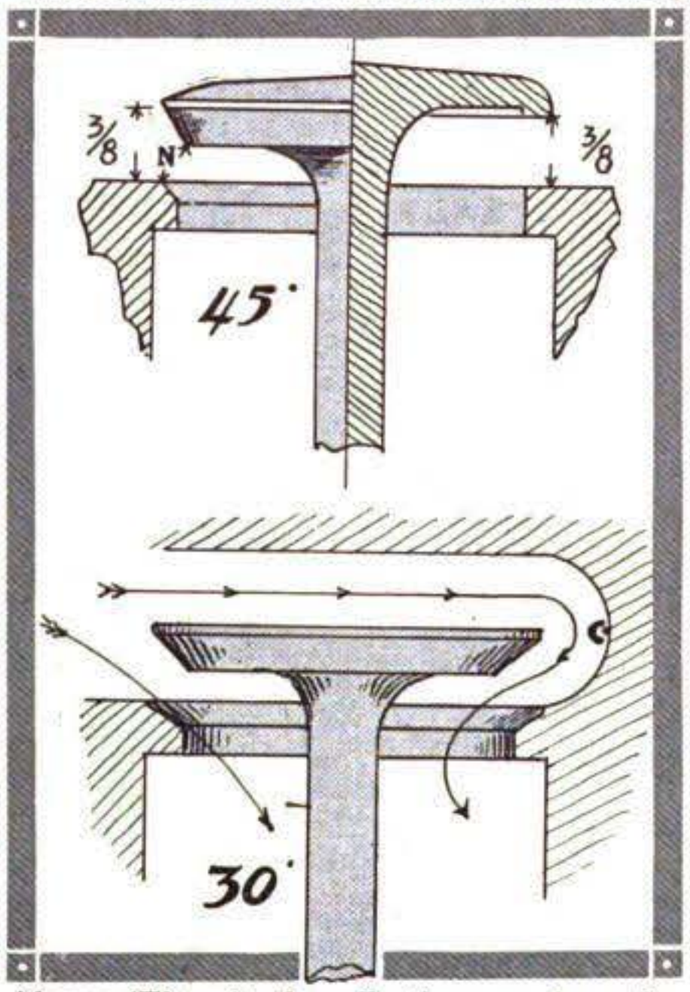
For very high speed engines, it is well to keep the gas velocity at about 8,000 feet per minute for 2,000 feet per minute of piston travel. This proportion requires a liberal size valve, but for the present we are going to consider piston speeds of 600 and 1,000 feet, corresponding to 600 and 1,000 r.p.m. It is better, if we are making a slow-speed motor, to proportion our valves for slow speed and not run a high-speed motor with large valves at a low speed.

By using a filling ring in the core box that forms the port, we cast the cylinders so that they will accommodate a 2-inch or a 2¼-inch valve. The two-inch valve we shall use in our slow-speed motor. It would have a free opening of 1¾ inches and at 600 r.p.m. the gas velocity would approximate 4,000 feet velocity. At 400 r.p.m. the gas velocity would be just under 3,000, which is as low as we would care to have it for good results.

With an aluminum base and higher revolutions for our fast runabout, we shall use the 2¼-inch valve, with 2-inch free opening. having a 1 to 5 ratio with the piston. At 900, 1,000 and 1,200 r.p.m. our approximate gas velocities would be 4,500, 5,000 and 6,000 feet per minute.

As these valves are a reasonable size for their respective revolutions, we shall make the lifts 5/16 inch for the inlets and ⅜ inch for the exhausts, for both sizes. The larger valves could have a 1/16 inch more lift on exhaust and inlet both, without any great gain or loss, but as there is little to be gained changing lifts, we shall in this respect keep them alike.

We show on this page (Fig. 1) a valve drawn one side with a 45° seat, and the other with a flat seat. We have shown these with ⅜-inch lift. It will be noticed that the flat seat has an effective opening equal to its lift, while the 45° has less (*N*). Now the flat seat has the greater opening, but, on the other hand, the 45° seat remains tight and does not



Above (Fig. 1), the effective opening of a 45° valve compared with that of a flat seat valve. Below (Fig. 2), the 36° valve used in the Ideal Utility motor, which combines advantages of both types. C shows the clearance, which is equal to the lift, ⅜ inch.

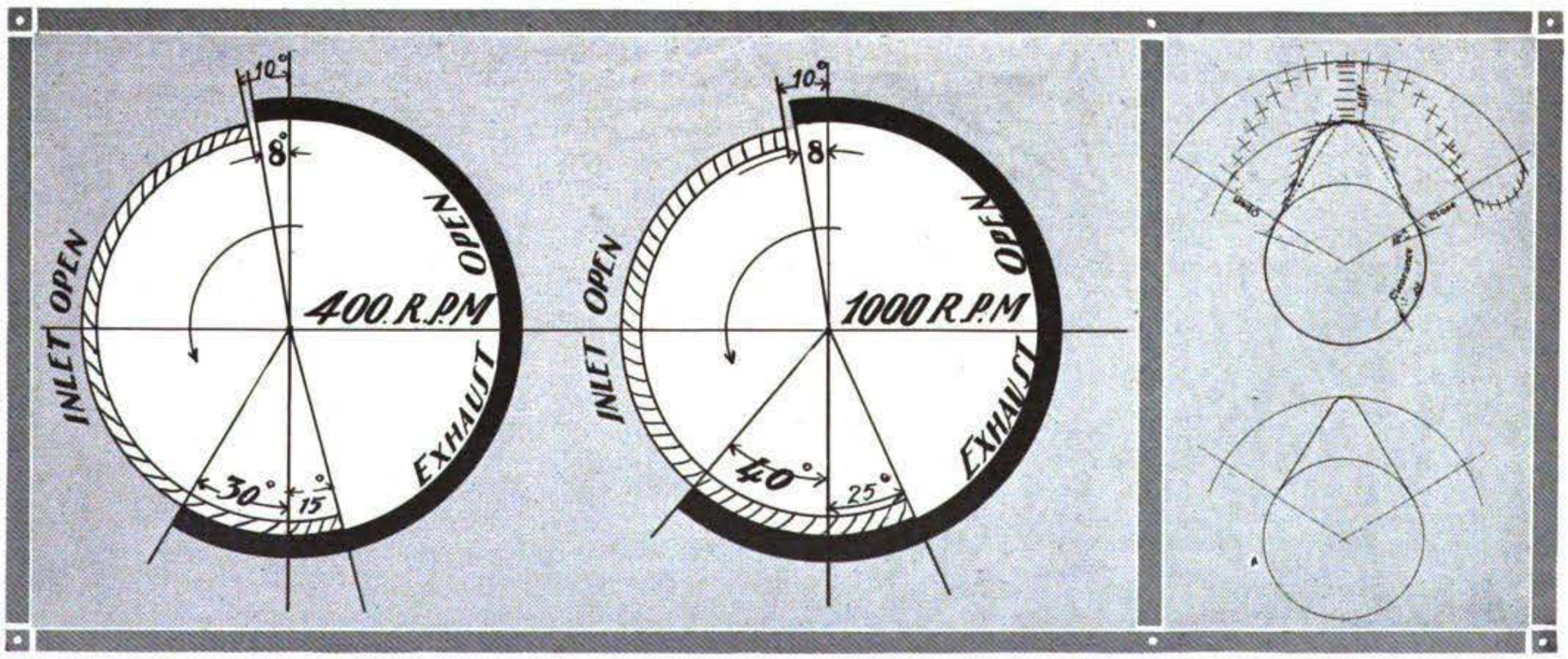
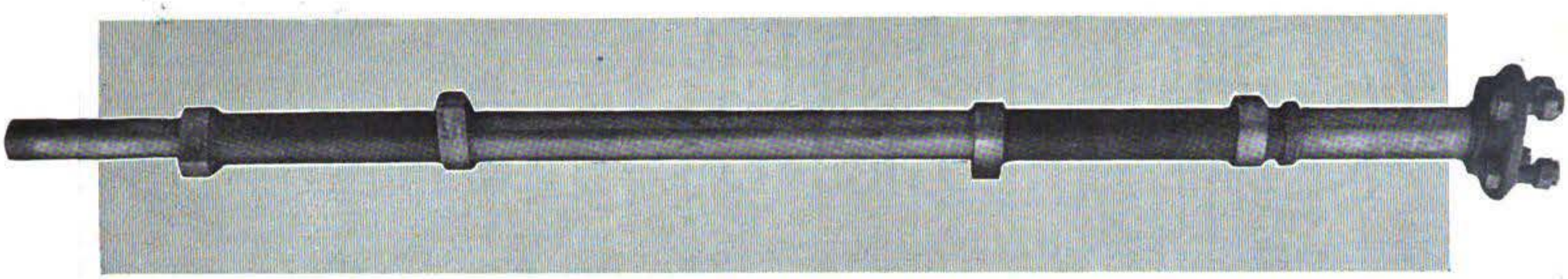


Fig. 3. Timing circles for the two types of Ideal Utility motor. It will be noticed that while the inlet opening and exhaust closing is the same for both types, the inlet valves of the slower motor close 10° earlier than in the high-speed type, while the exhaust valves of the latter motor open 40° before lower dead center, or 10° earlier than in the slow-speed type.

Above (Fig. 4), an accelerated cam generated from a crank circle. Below (Fig. 5), a tangent cam.



get in bad shape as quickly as the flat seat. Beneath this (Fig. 2) is shown a valve with 30° seat, which has an opening nearly equal to the flat seat, and still has angle enough to equal the grinding and tight retaining qualities of the 45°. This is the form of valve we shall use.

The actual opening being determined, we shall guard against the common mistake of too little room around the valve, where the flow has to reverse itself. In the case of the 2-inch valve, at 400 to 600 r.p.m., we make the clearance *C* equal to the lift, 3/8 inch, or slightly more than the actual annular valve opening. With the 2¼-inch valve accommodating a speed of from 600 to 1,200 r.p.m., we increase this clearance to 7/16 inch.

In our slow-speed motor we shall have our compression at four and one-half atmospheres and the higher-speed engine at five atmospheres, or 66 and 73 lbs., respectively. These pressures are well suited to the speeds and service we require. In each case the change would not be too sensitive to change of mixture, and the throttle could be opened and closed quickly with a load on, without manipulating the spark. Premature ignition would not be a source of annoyance and the bearings would be subject to smooth, soft action.

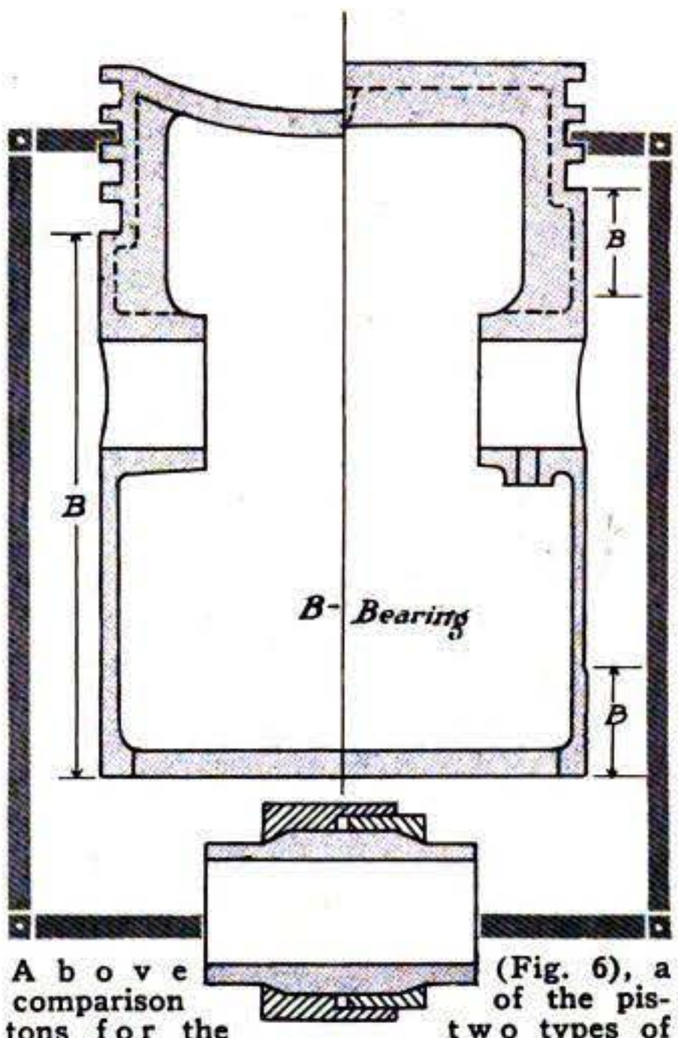
Now to arrive at this, we must get our piston displacement (stroke times area); to this we add the clearance volume, which includes all space above piston, valves, etc., as shown by the double-shaded portion of Fig. 8. If our piston displacement is, say, 100 cubic inches and our clearance 25 cubic inches, our total volume will be 125 cubic inches, when the piston is down.

Suppose now that we have sucked this space full of gas. That would give us 125 cubic inches at one atmosphere. If the piston is then forced to the top, our 125 inches are compressed to 25 cubic inches, or five times our single atmosphere at the lower position. This maximum compression pressure is subject to a slight correction for the change in volume, due to a rise in temperature, which accompanies the compression, and it is subject to a greater allowance, due to revolutions, gas velocity and timing.

We shall now take up timing, and in plotting our cams should give due consideration to the revolutions in each case. Two timing circles are shown (Fig. 3), one from 400 to 600 r.p.m. and one from 800 to 1,200 r.p.m. The lift of our exhaust valves is limited to 3/8 inch, which, with the compression space to which we are confined, will give a full passage way over the top of the valve to the far side.

Having our lift, we next pass on to the time of opening and closing. Engines would run if the inlet opened on top and closed at the bottom, and the exhaust opened at end of stroke and closed exactly on center. Gases, however, have weight, and parts have friction, and engineers soon learn to take advantage of the inertia of the gas, giving time for it to get under headway and easing passages as much as possible.

It will be noticed by an inspection of the two timing circles (Fig. 3) that the exhaust of the slow-speed motor opens at 30°, and the higher speed motor at 40° before lower center or end of stroke. At the lower speed 30° represents more actual time than the 40° at higher revolutions, as the pressure in the case of the 40° opening is somewhat higher and practically equalizes the two conditions. There is very little rotative effect lost in opening the valves early, while there is a considerable gain in freedom from back pressure, heating of cylinders, and easing up on bearings.



Above comparison (Fig. 6), a of the pistons for the two types of motors. That for the low-speed engine has concave top to reduce compression, and four rings. The high-speed piston has three rings to cut down the bearing surface, and a flat top for the necessarily higher compression. Below (Fig. 7), camshaft bearing split in three sections.

On the inlet side we find that if we keep the valve open after the piston has come to the end of the stroke the velocity of the gas will force itself in after the piston has started on its return stroke. As speed is a great factor in this case, we have to refer to our actual tests to arrive at a practical range and from these determine to close our inlet at 15° and 25° past center in the two cases.

The object is to close the valve just as the flow has come to rest. If kept open too long for the particular speed designed for the motor there is a backward flow. If closed too early the engine is denied a full charge. Either condition results in less horsepower.

From the foregoing it is apparent that there should be no fixed rule for setting the valves, each case being governed by its speed and requirements. At 2,000 r.p.m., we would expect to open our exhaust at 45° before and hold our inlet open 35° past center.

In the case of some of the Vanderbilt Cup racers, the inlet valves were held open from 45° to 55° past center, corresponding to speeds up to 3,000 r.p.m. These engines do not pull well at very low speed and would make poor hill climbers on direct drive, this being because the compression automatically varies with the revolutions, while the late closing of the inlet valves, being just right for the maximum high-speed output, allows a considerable portion of the charge to escape at slow speed.

The closing of the exhaust is from 8° to 10° past center, allowing this period for the valve to become seated after the piston has reached the end of the exhaust stroke. At the speeds we have in mind (400 to 1,200 r.p.m.), the inlet can open just as the exhaust closes, or one or two degrees later.

If we use mushroom lifters, it would require our making one set of cams for our low speed and another for our faster model. By using roller lifts we could make one form of camshaft answer for both fast and slow types, and get the results required in our two timing circles by using a slightly larger roller on our faster speed engines. Enlarging the roller is equivalent to widening the cam.

Fig. 4 shows an accelerated cam generated from a crank circle. This is the most powerful form of roller cam. It will be noticed that the valve is given a very rapid movement at the central part of its lift, starting and stopping at each end of its movement with a uniformly accelerated and retarded movement. The angular thrust of this form of cam is considerable and has proven noisy and difficult to follow and maintain at high speeds.

There has been such a demand for smooth, quiet action in engines that considerable time has been spend on different cams in an attempt to get a form that was as quiet as the tangent cam (Fig. 5) and as powerful as the generated cam. The valve we have designed being light, the revolutions not excessive, and the size being under 2½ inches (above which

(*Continued on page 49*)

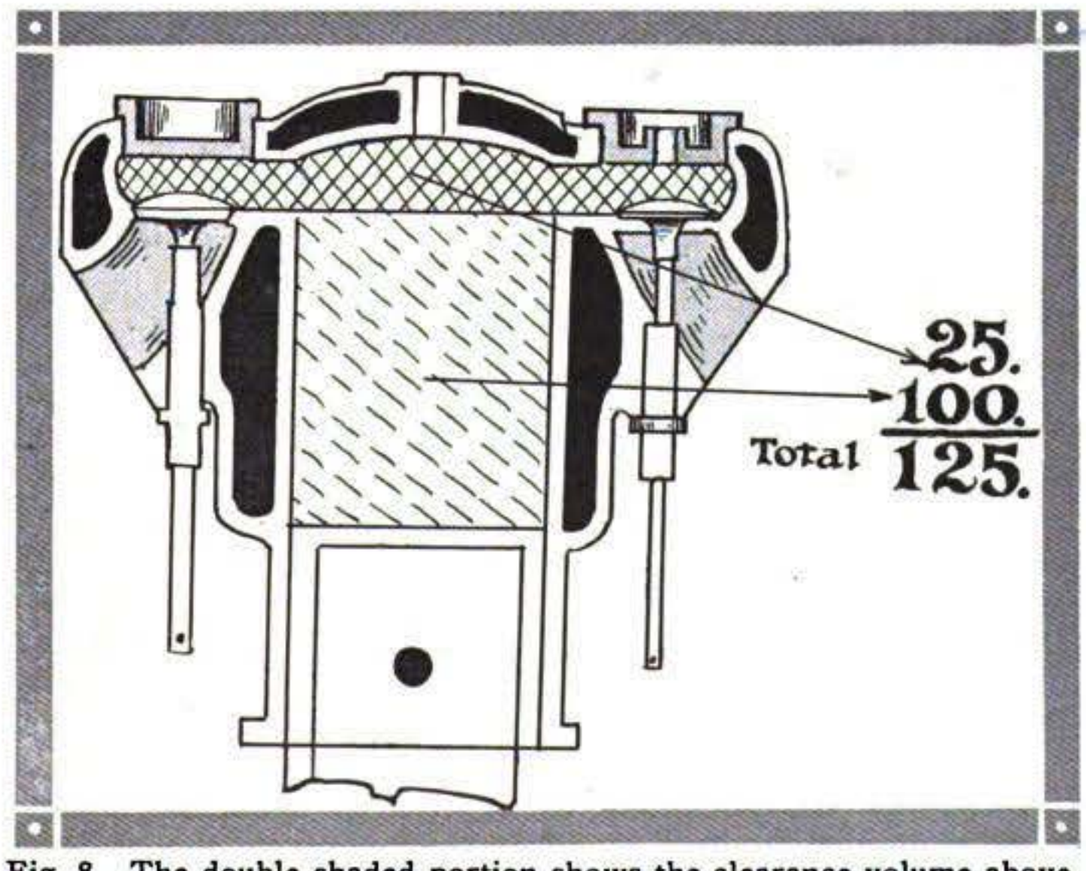
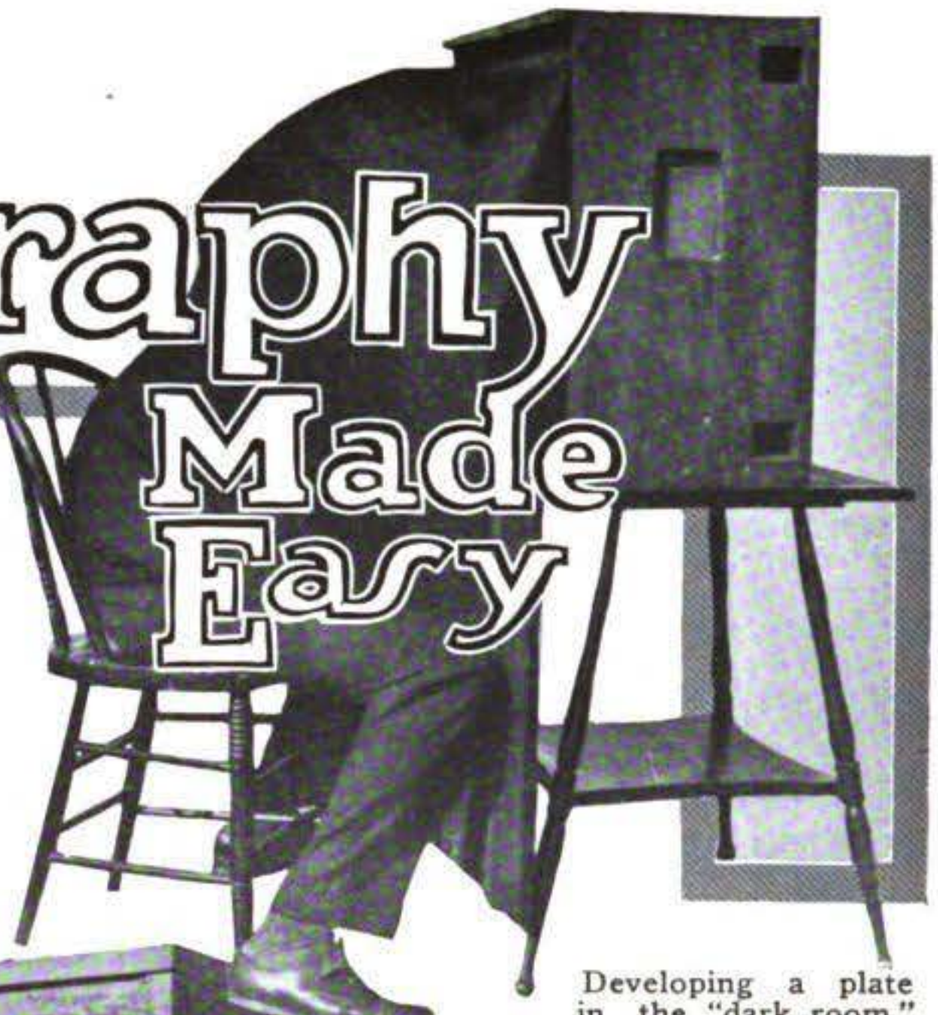


Fig. 8. The double shaded portion shows the clearance volume above the piston, or 25 cubic inches; the piston displacement is 100 cubic inches. This space, sucked full of gas, gives a total volume of 125 cubic inches at one atmosphere. With the piston up, a pressure of 5 atmospheres, or 73 pounds compression, is obtained.

Cruiser Photography Made Easy

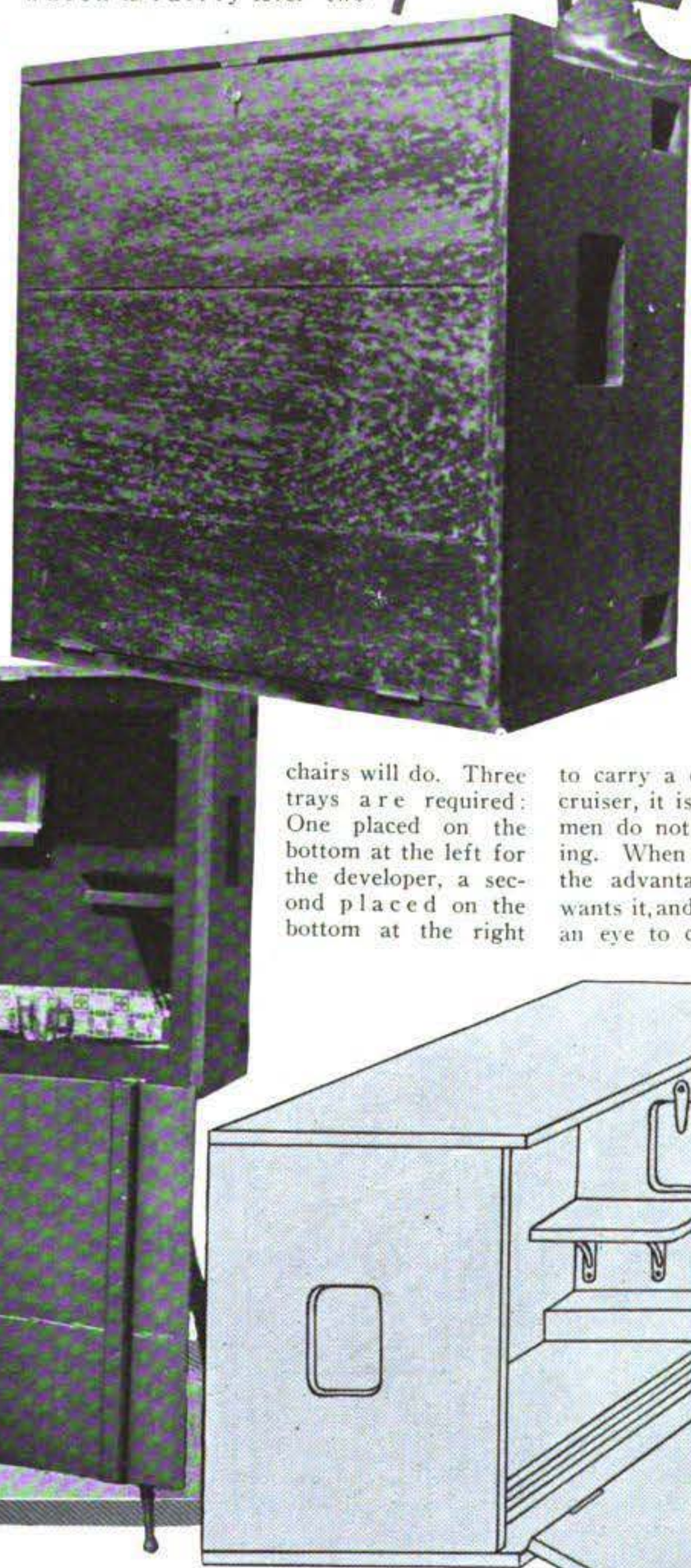


Something Which Any Amateur Can Build to Increase the Pleasure of Cruising. A Portable Outfit Which Can Be Used for Several Purposes.

By Oscar R. Foster

THE difficulties which present themselves when one develops photographs on shipboard are numerous; this is especially true in the case of small cruisers where space is at a premium. The portable "dark room," here described, overcomes some of these difficulties. It was originally designed by the author for the development of autochrome plates; it has also proved useful for general photographic purposes.

The "dark room" is a wooden box (15 x 27 x 26 inches), made of ⅞-inch white pine. The front is hinged and fitted with a lock. Inside the box near the edge of the front is a strip recessed to receive snugly a square frame. To this frame is tacked a somewhat conical bag made of felt; the bag is about five feet long and has a draw string at one end. Square holes are cut through the sides of the box (4 x 6 inches), so that ruby glass (5 x 7 inches) can be held against their edges by brass spring clips. Inside, at the left, a small shelf is provided to hold a watch; on the right is a larger shelf for the fixing tray or box. Another shelf, fastened to the back, is for stowing the plate holder when developing plates. At the top and bottom of the right hand side of the box are small square holes (2½ x 2 inches) for ventilation: ingress of light is prevented by two U-shaped channels. The entire inside of the box is painted flat black. When the apparatus is to be carried about frequently it will be advantageous to screw handles to the sides.



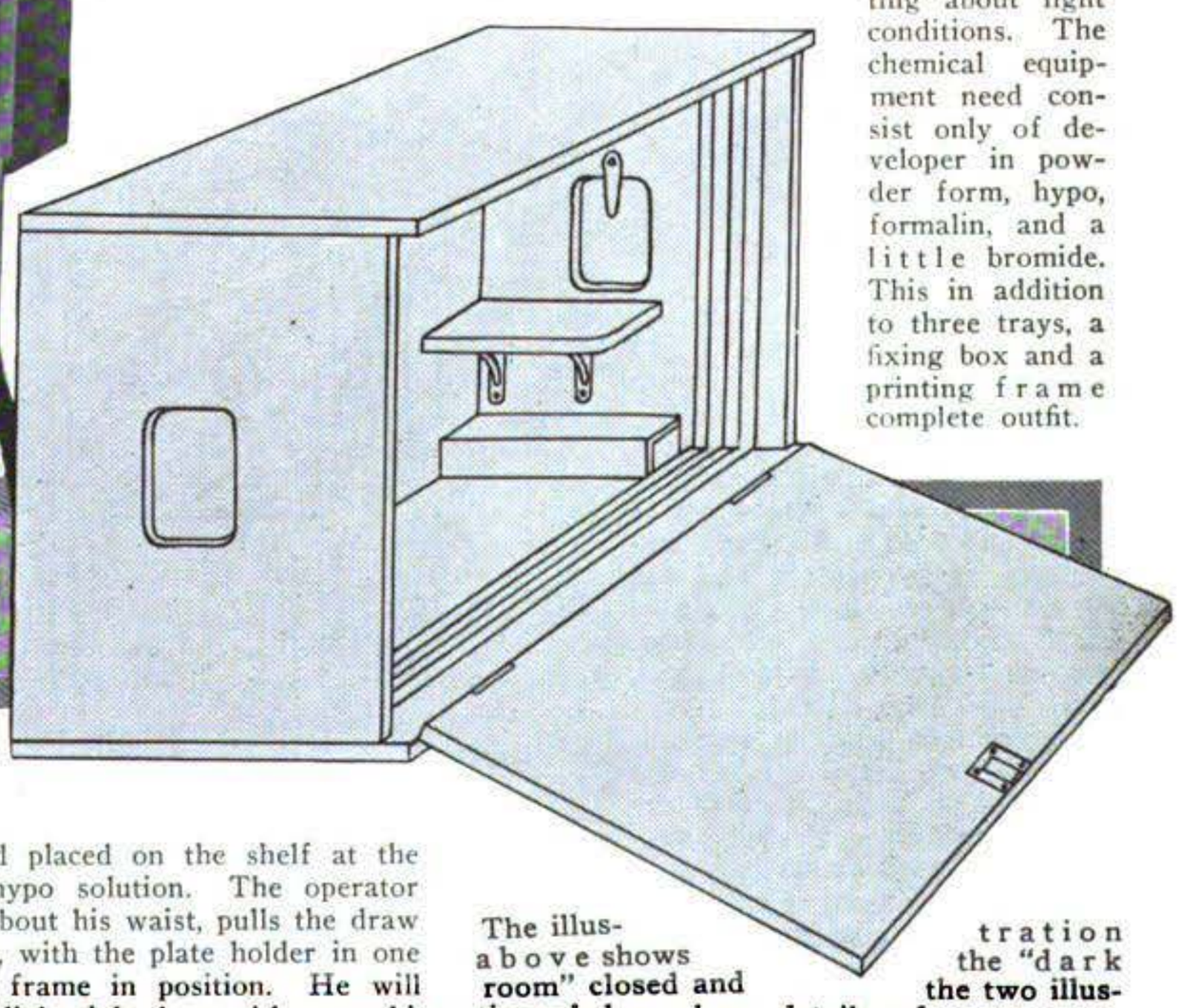
The sketch will make the construction clear.

When in use the "dark room" is placed on anything which is fairly level—two chairs will do. Three trays are required: One placed on the bottom at the left for the developer, a second placed on the bottom at the right for rinsing water, and a third placed on the shelf at the right for the hypo solution. The operator places the bag about his waist, pulls the draw string tight and, with the plate holder in one hand, puts the frame in position. He will then be in a light-tight box with everything which is necessary for development within easy reach. The final washing is done outside of the box.

Because the development proceeds at the bottom of the box away from the direct ruby light it is possible to develop isochromatic plates successfully. The photographs accompanying this article were made from isochromatic plates which were developed and fixed in the "dark room" which they illustrate.

This box is not only a dark room, but is also a convenient stowage place for photographic chemicals, plates, trays, balance, etc. It may be shipped from place to place like a trunk when it is securely packed. Placed in the cockpit of a cruiser, it serves as a seat; the top may be used as a low table.

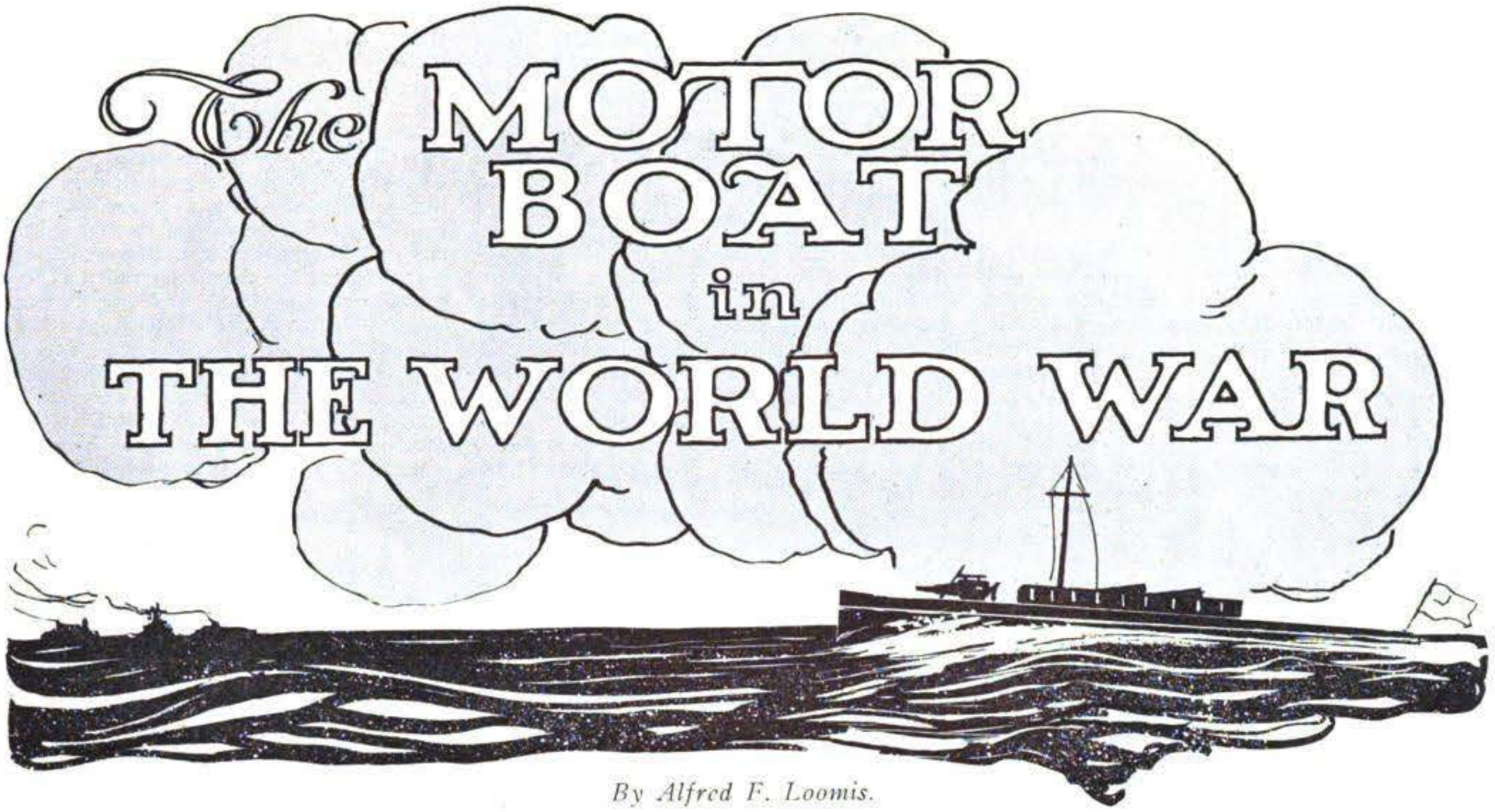
As it is not a difficult matter to carry a complete photographic outfit on a cruiser, it is surprising that more motor boatmen do not combine photography with cruising. When the work is done aboard, one has the advantage of having it done when he wants it, and of checking up his exposures with an eye to correcting mistakes before forgetting about light conditions. The chemical equipment need consist only of developer in powder form, hypo, formalin, and a little bromide. This in addition to three trays, a fixing box and a printing frame complete outfit.



Developing a plate in the "dark room."

The illustration above shows the "dark room" closed and the two illustrations below show details of same open.

The MOTOR BOAT in THE WORLD WAR



By Alfred F. Loomis.

LAUGHTER and ridicule would have been the portion of any enthusiast who, at the close of the Spanish-American war, had dared to suggest that in the world war the internal combustion motor would prove the most important factor. Seventeen years ago there were plenty who believed or professed to believe that a world war was inevitable, but it is to be seriously doubted if there were any, with the possible exception of Dr. Diesel himself, who foresaw the mighty part which the marine motor, then in its relatively helpless infancy, would have in that war. Yet today we have the spectacle of craft propelled when above water by internal combustion engines and when below by the electric power stored by these engines, sending to destruction the mightiest floating forts, harrying belligerent and neutral shipping until the world cries out in amazement, and diving beneath mine fields to sink troopships plying to and fro in the fancied security of an inland sea.

Propelled by hand power, the submarine was a novelty; driven by steam it was a hazardous experiment, but, forced through or under the water by the Diesel motor and electricity, it seems to be the most effective weapon of modern naval warfare. Its effectiveness is due in some degree to the accuracy with which torpedoes may be fired, but the torpedoes would be worthless without the motors which drive the undersea boats hundreds of miles to the point of vantage.

If Dr. Diesel were alive today he could say, with what measure of satisfaction it is impossible to conjecture, "My oil-burning internal combustion motor, scoffed at at first, has become the means whereby a blockaded nation may attack its foes on the high seas, may endanger their supplies of arms and ammunition, and may threaten a complete reversal of the naval policy of the world's nations." From a one-cylinder machine popularly supposed to be an instrument of torture interposed between the cranking handle and the propeller, the marine motor of Spanish war days has in a decade and a half become a power which is now working a very considerable influence on the future history of the world.

The use of the marine motor in warfare is not confined to the submarine, however, for there are motor tankships for carrying fuel oil to the battleships, motor vessels for submarine tenders, motor gunboats for use on inland waterways, motor yachts in use as dispatch ships, and motor cruisers and launches serving on patrol duty, while Queen Elizabeth, one of the newest super-dreadnoughts which has come into the public eye, is fitted with two six-cylinder Diesels for generating purposes. Prior to the outbreak of hostilities the German government was known to be experimenting with mammoth Diesel motors of 12,000 h.p., which, if successful, would be used to drive triple-screw battleships.

Most of the combatant nations are fairly well provided with river motor gunboats, Austria, for example, having two or three in service on the Danube, while belonging to the Russian navy there are upwards of a dozen, some of which were made right here in this country. These latter are not in any sense converted pleasure boats, for the length of certain ones among them is 230 feet by a beam of 42 feet, and they are powered with twin engines of 1,000 h.p. each. They are equipped in some instances with electric motors through which the propellers are turned, and they achieve a speed of eleven knots. Two six-inch guns and four twelve-pounders comprise the primary armament.

Although not much news of the actual use of the motor boat in the present war has been allowed to leak past the censors, a fleet of three river motor gunboats has been mentioned in dispatches as performing valuable work for the continental British army. Under fire for considerable intervals, this fleet, in command of the commodore of the famous British Motor Boat Club, had been unharmed up to the time of its mention, and had inflicted damage on the enemy. The strict censorship which has been maintained since the beginning of the war in regard to the activities of motor boats has been a source of much annoyance to those who are interested in these craft, and, as is the rule with censorships, this secrecy is inconsistent, for we are allowed to hear very often of the excellent work done by the land prototype of the war motor boat—the armored motor car.

It is reasonable to suppose, in view of the conditions under which a good deal of the fighting is going on at both fronts, that the armored motor boat, if not the more sizable motor gunboat, has seen a good deal of active service. Belgium and the part of France occupied by the Germans is cut and crossed by a network of canals and rivers navigable to boats with draft of over five feet, and the tendency in up-to-date American practice shows that very imposing vessels can be constructed to float in less water than this. Rivers form natural barriers beyond which retreating armies take their stand, and so it has developed that the severe fighting of the war has been for the possession of waterways quite as much as for towns and commanding hills. Food and ammunition must be carried up to the front and the wounded and prisoners conveyed back, and the difficulty of keeping the roads in shape under the stress of the heavy military traffic makes it desirable to do as much as possible of this work by water. Night sorties and attempts to cross the river in force may sometimes be effected either in armored motor boats or by troops operating under the cover of a squadron of these craft, and one of the few stories which has come through relates to the efforts of the German forces to take a Belgian position by this latter means.

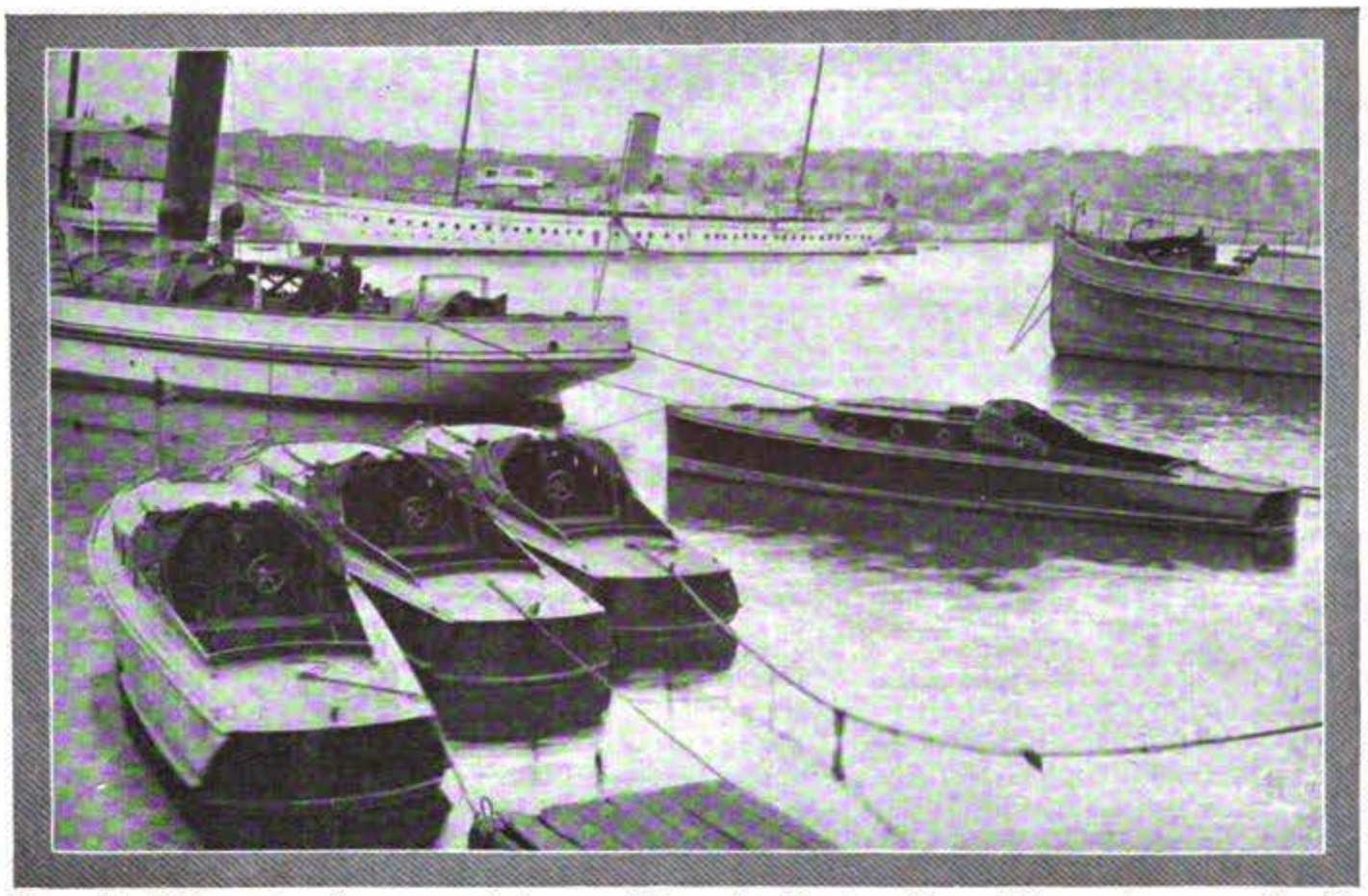
According to the account, the Germans, last fall, had been struggling to overcome the difficulties engendered by the extension of the flooded area near Ramscappelle, and by night launched an attack against the Belgian lines by three powerful armored motor boats having in tow a number of rafts accommodating fifty or sixty men each. Against the glare of the searchlights operated from the motor boats the Belgians were helpless, and the random shots of their machine guns and rifles which happened to strike the protected sides of the attacking boats did no damage. The machine guns on the rafts, however, directed a murderous fire against the enemy, the flotilla drew near and success seemed within the grasp of the attackers when the odds were evened by the bringing into service of a Belgian searchlight and the consequent ability of the defenders to hit the men huddled on the rafts. One of the motor boats went aground at this juncture, and the German soldiers used it as an effective barricade, firing from behind it with great damage to the Belgians, until a French 75 mm. gun got the range and dispersed the attacking force.

Herein can be read both the value, and the shortcomings of the armored motor boat. It is admirable for surprise attacks, and its usefulness is not entirely at an end if it goes aground, for it can be used as a temporary base of operations, but it cannot hope to stand against the destructive fire of the field guns, depending rather for its effectiveness on its ability to strike suddenly at different places, moving on before its range is found.

Another account, quite early in the war, had to do with a converted 35-foot double-skinned steel boat which was put to use on the Dyle river, Belgium. The raised deck had been built over and a revolvable turret mounting a quick-firing gun placed at each end of the

boat, while apertures had been made for rifles. The crew, consisting of an officer and twelve men, successfully stood off an attack by a considerable body of German infantry and cavalry, without itself sustaining any injuries, and the improvised war vessel returned to Antwerp, its home port, unharmed. With the evacuation of this city, the craft was sunk in the Scheldt river to prevent its falling into the hands of the victors.

In the hospital service motor boats and barges towed by motor craft are being used to good advantage by both sides in the fighting on the western front, the German lines in Belgium having direct water communication with Berlin, and some of the outlying French hospitals being similarly connected with Paris. The advantage of the motor boat in this service is apparent when once it is pointed out that the jolting and jouncing of the wheeled motor ambulances over the rough roads is a source of great pain to the wounded men. Some privately-owned boats in England have been placed at the disposal of the hospital authorities for the express purpose of giving Tommy, home on sick leave, opportunity to enjoy the open air from a comfortable deck chair. Motor boats have also done good service in rescuing from the sea the crews of merchant vessels which have been torpedoed by submarines, their owners in notable instances having been rewarded with fat purses for their services.



Four Turkish motor boats used in patrolling the Dardanelles. They are powered with Sterling motors and are capable of a speed of fourteen miles per hour.

The great majority of the motor boats engaged in this war, however, are the craft owned by John Smith or Johann Schmidt, as the case may be, and used during normal times in the peaceful pursuits of the pleasure-seeking boating fraternity. The call has gone out—went out the first week of the war—to these owners to fit their boats for the services of their countries, and it has been surprising to the uninitiated what a large number have been found suitable for this service. Radical alterations have sometimes been found necessary, and, with seeming inconsistency, masts have been chopped from some boats and stepped in others. The color scheme of all has been changed to some neutral tint, and all brass work has been religiously removed or covered over.

The alterations which don't show, however, are perhaps the most important from a military point of view. These, in a forty-footer, to take a typical instance, would be somewhat as follows, it being understood at the beginning that the boat has been selected because of the comparative quietness of her power plant and on account of her speed and seaworthy qualities: The engine, quiet in the first place, is entirely enclosed with a soundproof metal box (which also serves to protect it from stray bullets), and, as it is located below, absolutely no sound is heard from it outboard. The exhaust is silenced by expelling the gases through an underwater outlet.

The gasoline tanks, of the bow or cockpit type, are removed and carried below where they are ranged on either side of the engine, and just below the waterline. If necessary because of the high location of the carbureter, a pressure system is installed, or an auxiliary feed tank is set higher than the motor. This tank is cylindrical in shape, and of heavier metal than the average, as the fuel system, if not the most vital part of a boat's outfit, is, as ordinarily fashioned, the most vulnerable.

Complete protection for the crew from hostile bullets is not altogether practicable if the cruiser is to be used as a dispatch boat—for the added weight of metal to the hull would limit her speed considerably, besides reducing her seaworthiness—but a protective strip of Harveyized steel plating is let into the planking four or five inches above and below the load waterline. This metal strip, backed by hard wood, also furnishes protection for the fuel tanks amidships.

If the rudder is of the outboard type, a spare member is carried, or at least a scull by which the boat may be steered home in safety if her permanent gear is disarranged. More than the usual parts equipment is carried, consisting of extra bearings of the various sizes, a spare piston and connecting rod, water pump, gaskets, an assortment of spark plugs or igniters, and even additional carbureter and magneto. The port lights are furnished with opaque backings, which may be slipped into the glass-retaining rings for night running.

No matter for what employment the boat may originally be intended by the authorities, she will probably be given various other kinds of work, and one of her uses may be to carry soldiers to and from the transports in harbor. For this service she will require extra supports under her decks, as the soldiers show an inclination to drop on them, ten or a dozen at a time, from the wharf. The supports should be either in the nature of central pillars or of heavy knees worked under the deck carlins. An English architect has suggested that the topsides amidships be given extra tumblehome to narrow the deck width and thus give greater strength, and no doubt this suggestion has been acted upon in new boats constructed for the Admiralty.

Maxim guns could be installed on a boat of this length—one on the raised deck forward and one pointing aft in the cockpit—and the hull-strengthening necessary could be done in a short time by any boat builder. Blast plates or sheets of steel are fitted to the deck in an arc beneath the muzzles of the guns to protect the woodwork from fire hazard.

When Italy entered the war in May, one of her first announcements was the acceptance of the services of the motor boats of the country proffered by the yachting associations, but in accepting these she was only following the precedent set by the earlier entrants into the conflict. Germany, early in August, gathered together her Volunteer Motor Boat Corps, and soon reported that units from this force had done admirable work in the fighting in the east, one flotilla of six vessels, armed with machine guns, forming an advance guard on the Weichsel river at the battle of Wloclarvec and engaging a considerable detachment of Russian troops and artillery. One boat was struck sixteen times, and several ran out of the tortuous channel and aground, but it was stated that not a single boat was lost throughout the battle. Several of the boats from this corps have been in use at Antwerp, the owners having previously undergone drill in navigation and marksmanship, and have been used in patrolling mined areas, and in mining bridges and gathering up drifting mines.

In England the Admiralty called to its aid committees from the Royal Motor Yacht Club and the British Motor Boat Club, to assist it in selecting suitable boats for service. The Motor Boat Reserve was then formed, and owners of all classes of boats were invited to present their names for enrollment. Right then the British public got up on its ear. The statement was made that the snobbishness of the members of these famous clubs prevented their making unbiased selections, and it was variously charged that they accepted poor boats belonging to club owners and rejected good ones owned by unattached individuals, and that they rejected good boats hailing from these clubs and accepted poor ones from the bush leaguers. The British, like the American, public is bound to have its little kick.

The Admiralty, however, didn't let itself be disturbed by the fault-finders, but went on doing the best it could under the circumstances. Sometimes it asked for a certain boat, and sometimes it took it: sometimes it ordered changes and refused the boat the next day, because the alterations had been made, but on the whole it whipped this new auxiliary into shape in short order.

As the Motor Boat Reserve developed into a smooth-running organization, its duties became more complex, and now consist in part of patrolling rivers and harbors, guarding prison ships, serving as tenders to the pilot boats, which, in the congested harbors, proved unequal to the task of visiting all incoming and outgoing vessels, transporting soldiers and sailors from shore to ship, and going to the rescue, whenever possible, of ship-wrecked crews. Some of the units have been converted into thoroughly equipped hospital ships, some carry torpedo tubes and quick firers on deck for repelling harbor attacks by submarines, and some, more seaworthy than the average, patrol long stretches of the coast.

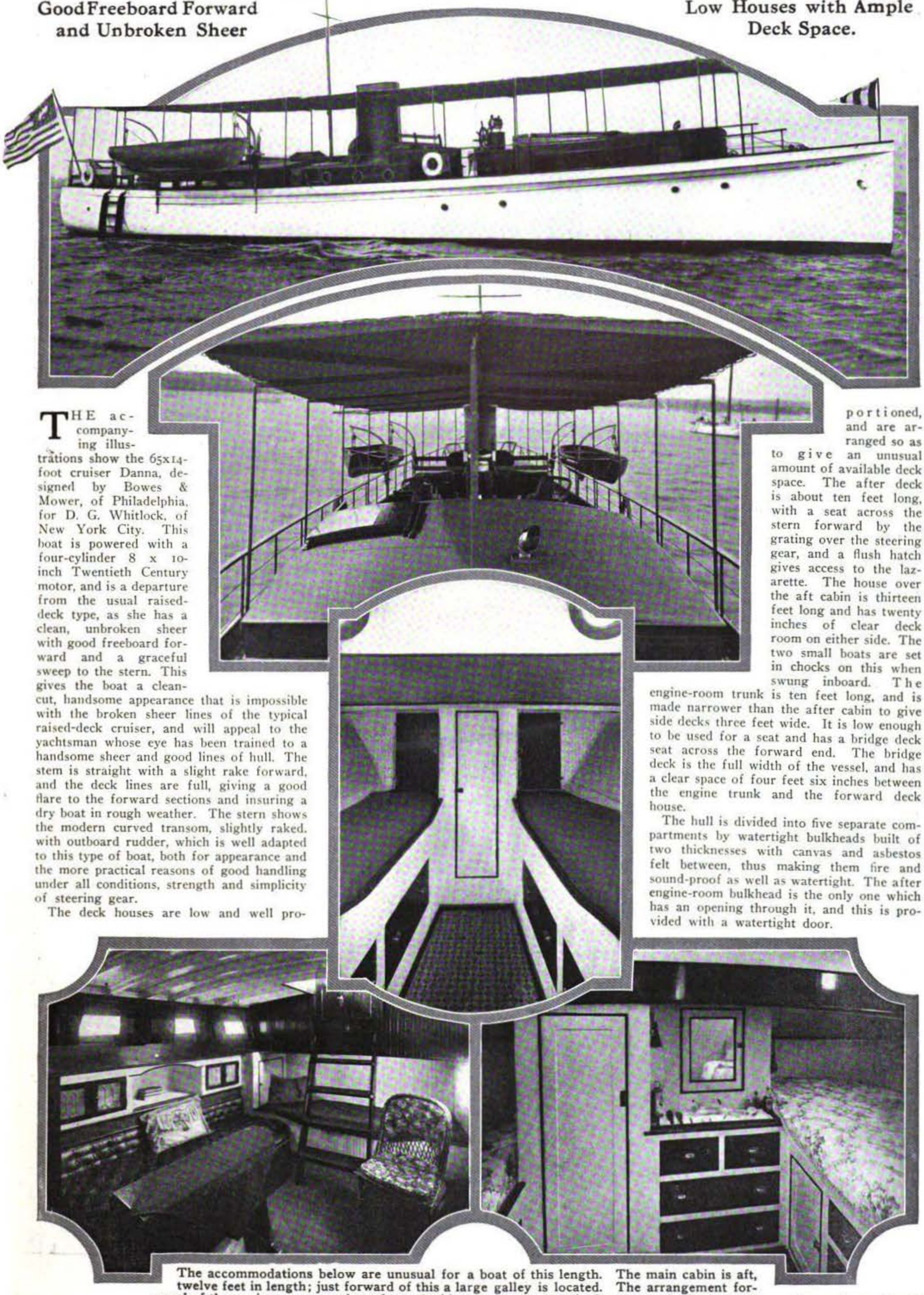
Although the British waited until the actual outbreak of hostilities before availing themselves of this valuable arm of the service, it is gratifying to note that our naval authorities have already taken due cognizance of it. The United States Power Squadrons, which in time of war would form the nucleus of our own motor boat reserve, have not been long in existence, but their growth has been remarkable. If we can keep up this good movement until every motor boat owner is interested in it, and knows his home waters as a Scotch engineer knows his engines, the benefit will be incalculable. For, then, if this country goes to war, there will be a trained, disciplined fleet in every harbor ready to serve the cause, instead of a heterogeneous lot of boats whose owners are anxious to help, but who don't know what to do or where to go to do it.

The European war has taught us the value of the motor boat—may it also teach us the inestimable value of preparedness.

Danna, a Trim 65-Foot Cruiser.

Good Freeboard Forward and Unbroken Sheer

Low Houses with Ample Deck Space.



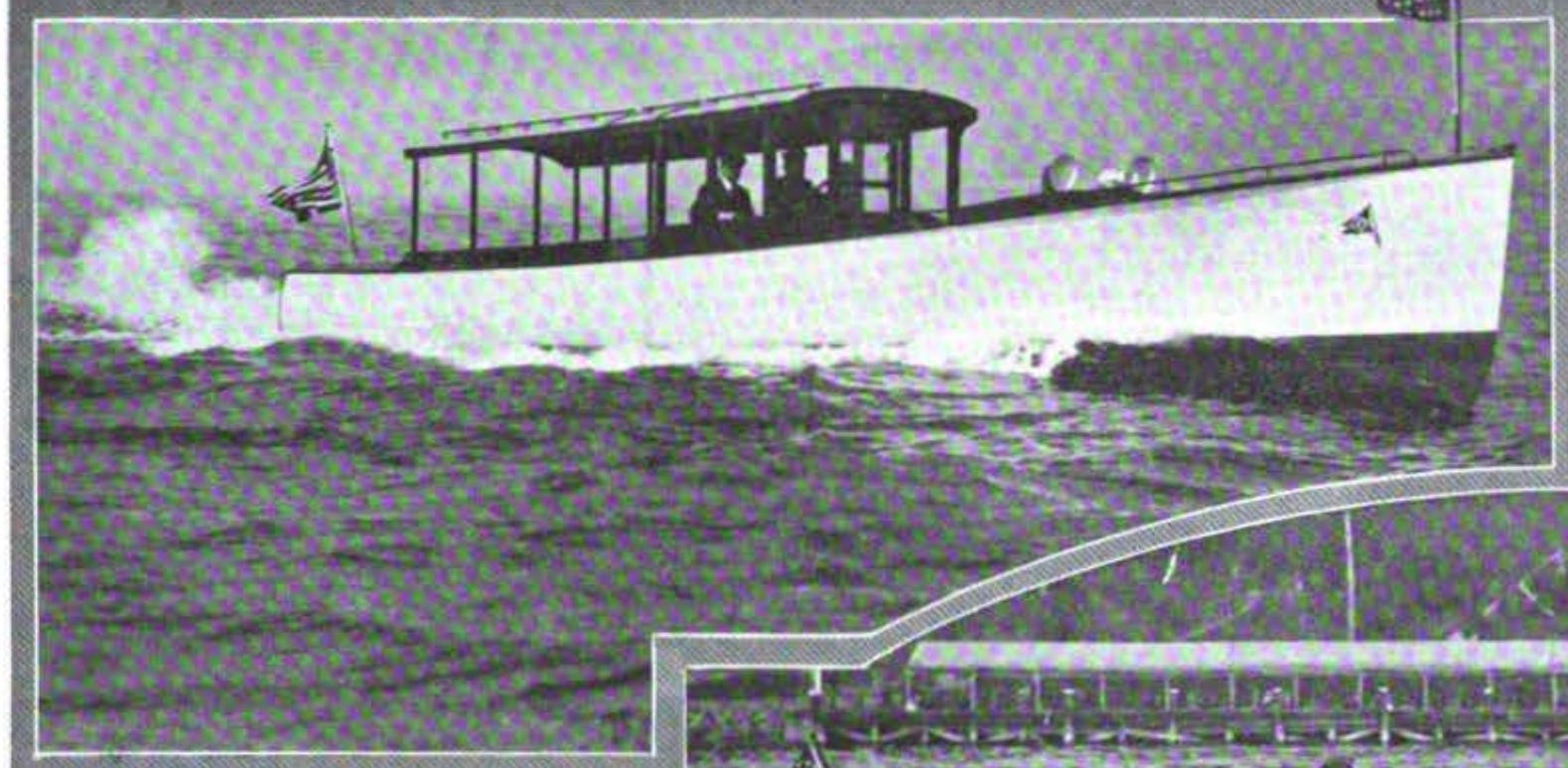
THE accompanying illustrations show the 65x14-foot cruiser Danna, designed by Bowes & Mower, of Philadelphia, for D. G. Whitlock, of New York City. This boat is powered with a four-cylinder 8 x 10-inch Twentieth Century motor, and is a departure from the usual raised-deck type, as she has a clean, unbroken sheer with good freeboard forward and a graceful sweep to the stern. This gives the boat a clean-cut, handsome appearance that is impossible with the broken sheer lines of the typical raised-deck cruiser, and will appeal to the yachtsman whose eye has been trained to a handsome sheer and good lines of hull. The stem is straight with a slight rake forward, and the deck lines are full, giving a good flare to the forward sections and insuring a dry boat in rough weather. The stern shows the modern curved transom, slightly raked, with outboard rudder, which is well adapted to this type of boat, both for appearance and the more practical reasons of good handling under all conditions, strength and simplicity of steering gear.

The deck houses are low and well proportioned, and are arranged so as to give an unusual amount of available deck space. The after deck is about ten feet long, with a seat across the stern forward by the grating over the steering gear, and a flush hatch gives access to the lazarette. The house over the aft cabin is thirteen feet long and has twenty inches of clear deck room on either side. The two small boats are set in chocks on this when swung inboard. The engine-room trunk is ten feet long, and is made narrower than the after cabin to give side decks three feet wide. It is low enough to be used for a seat and has a bridge deck seat across the forward end. The bridge deck is the full width of the vessel, and has a clear space of four feet six inches between the engine trunk and the forward deck house.

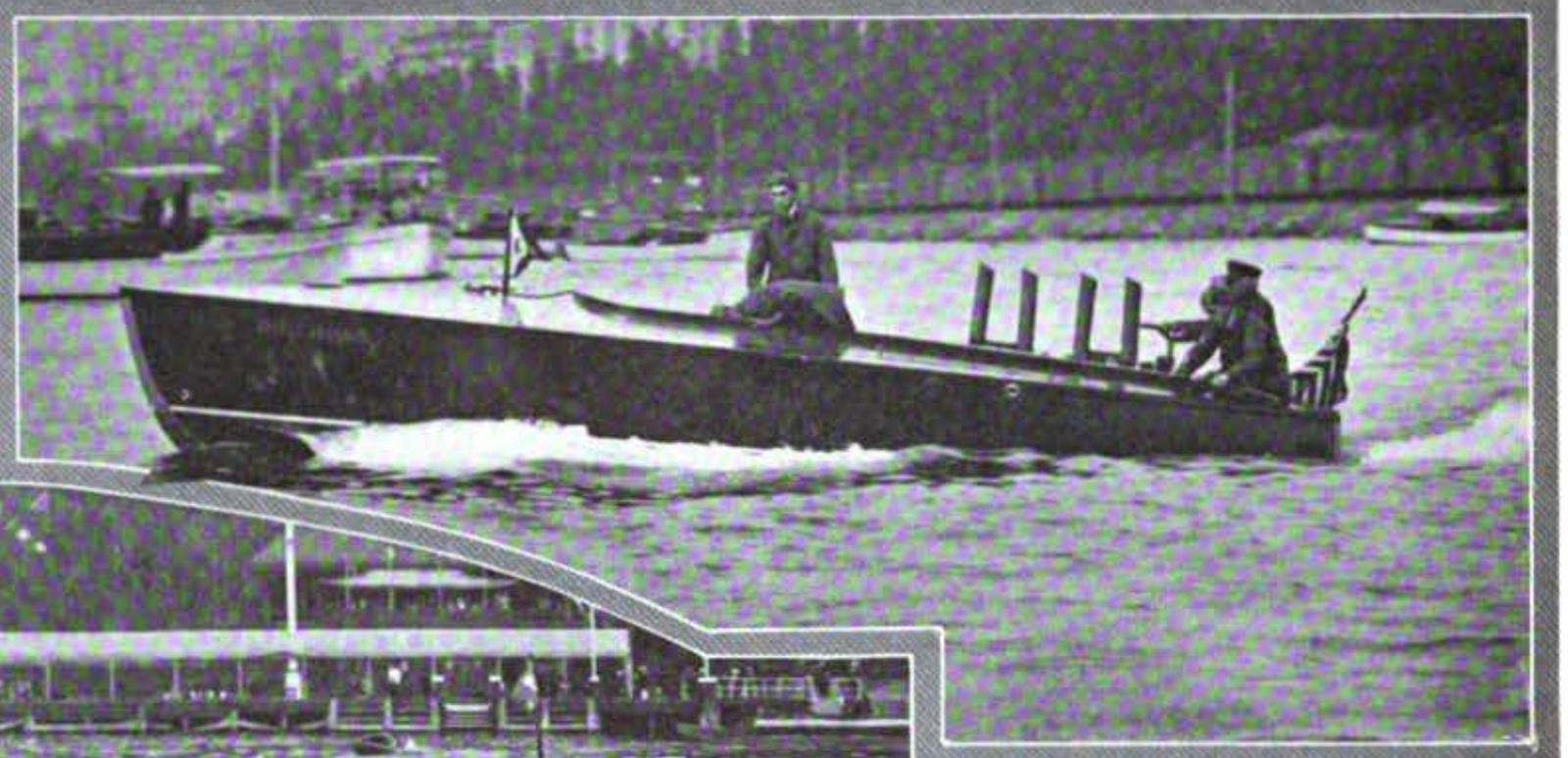
The hull is divided into five separate compartments by watertight bulkheads built of two thicknesses with canvas and asbestos felt between, thus making them fire and sound-proof as well as watertight. The after engine-room bulkhead is the only one which has an opening through it, and this is provided with a watertight door.

The accommodations below are unusual for a boat of this length. The main cabin is aft, twelve feet in length; just forward of this a large galley is located. The arrangement forward of the engine-room consists of two double staterooms, one single room and a bath room. *Photographs by Rosenfeld.*

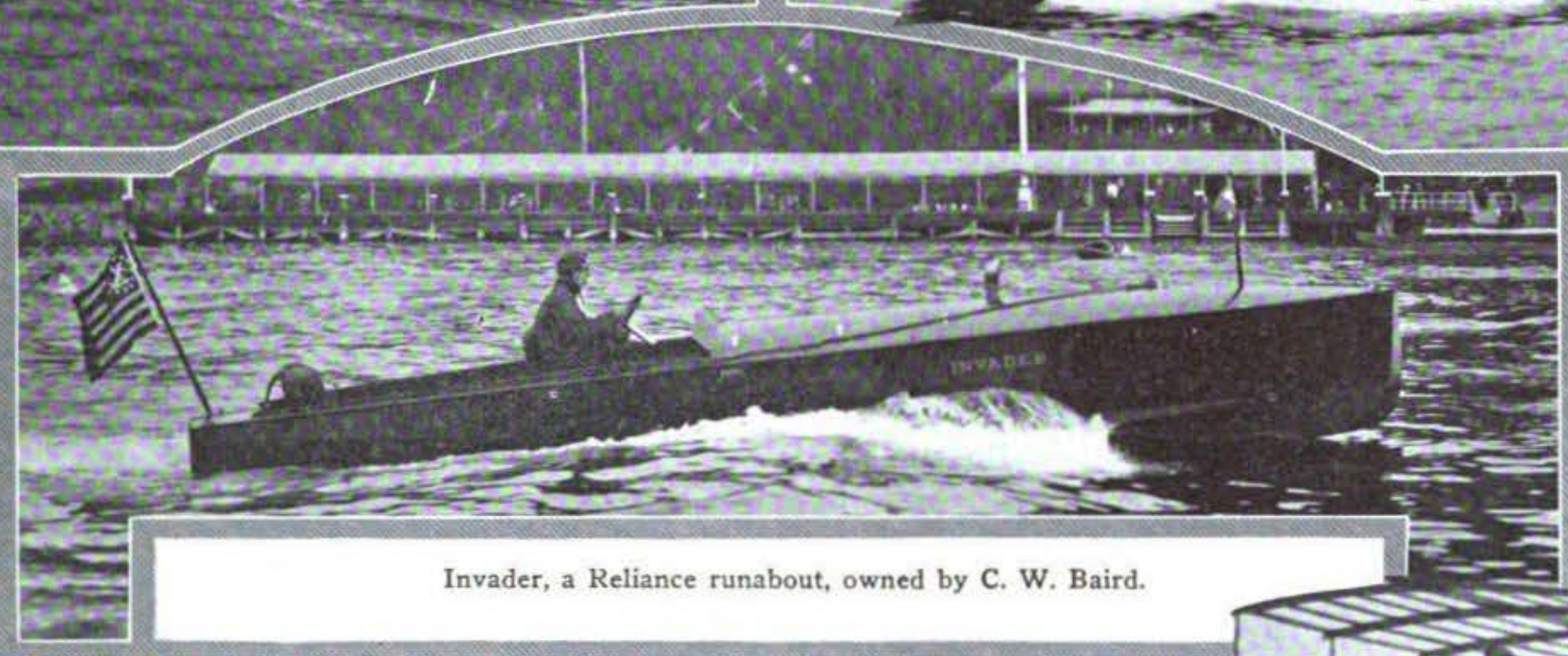
Typical Examples of This Season's New Craft.



Speejacks, owned by Commodore A. Y. Gowen, and built by the Gas Engine & Power Co. and Chas. L. Seabury Co., Cons. She is powered with a four-cycle, eight-cylinder, 8x8-inch Speedway motor.



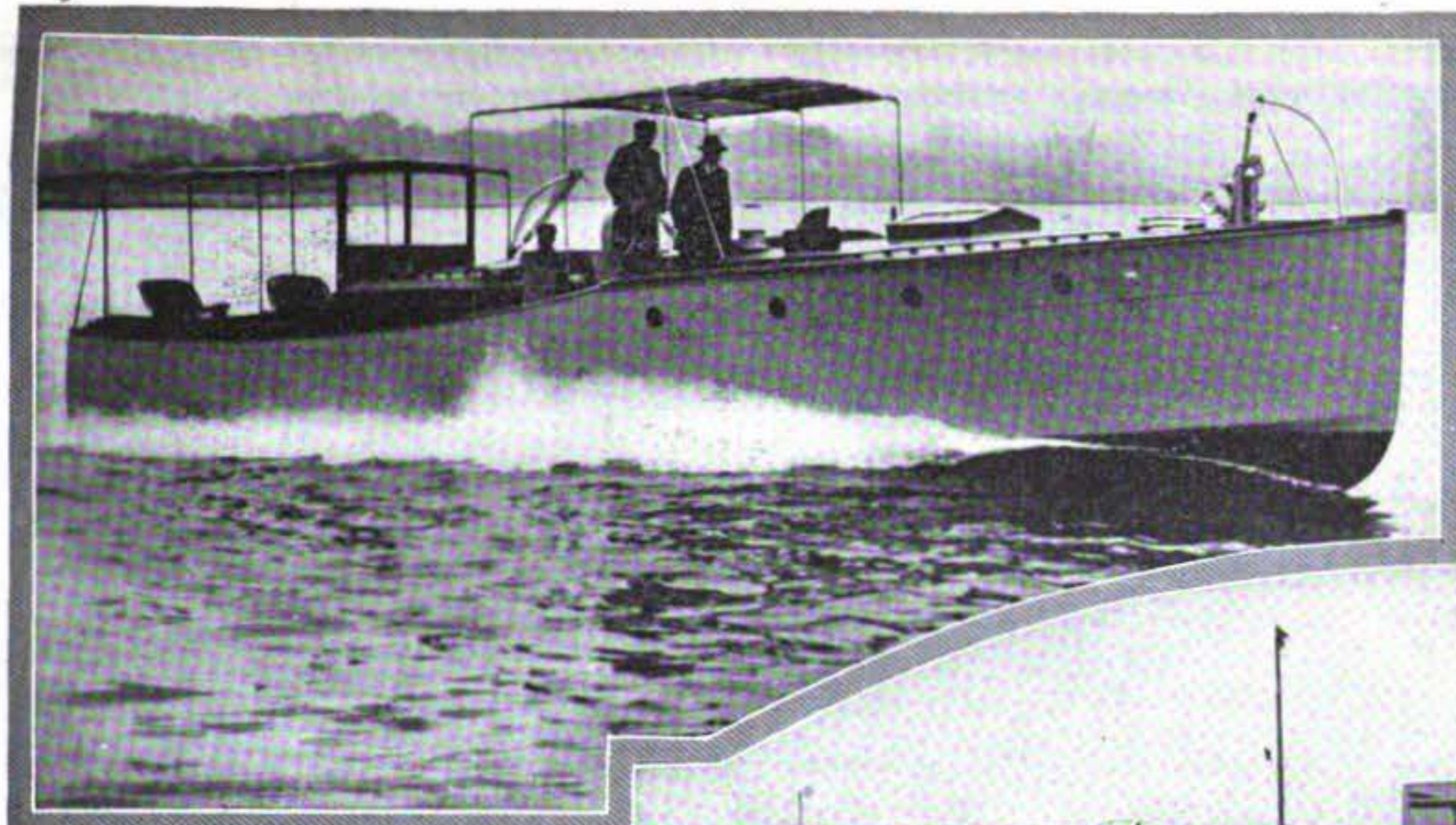
Little Joker III, owned by Commodore H. S. Ford, of the Tappan Zee Yacht Club, and now a notable Sterling powered boat. This boat will be entered in a number of the important races this season.



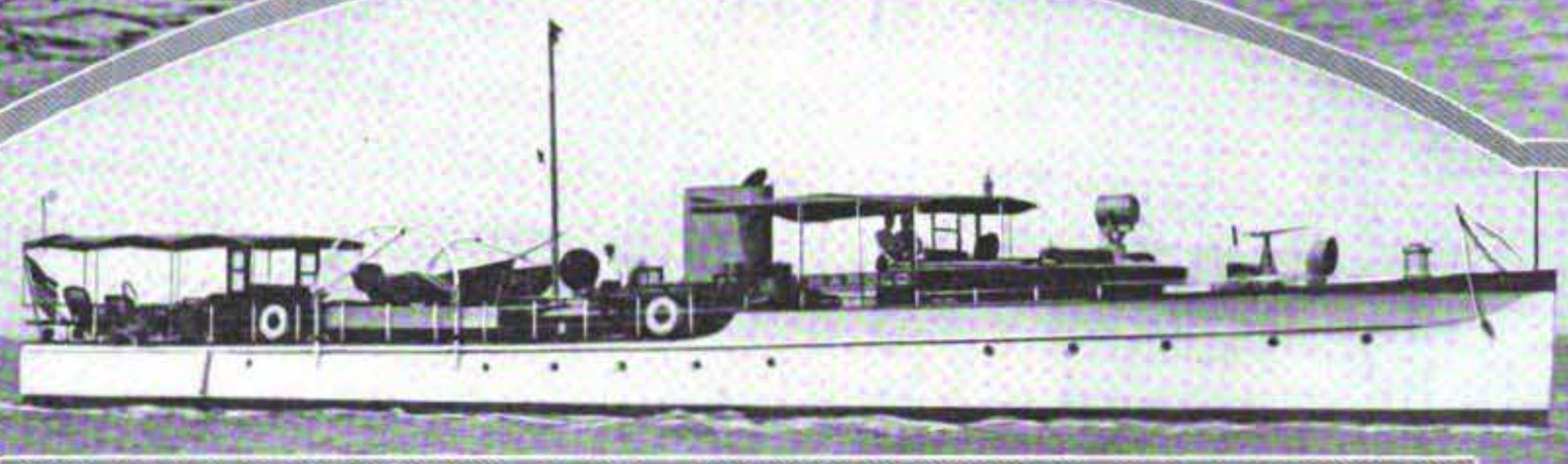
Invader, a Reliance runabout, owned by C. W. Baird.

Cresceus, a 55-footer, recently completed for George Ketcham, of Toledo, O., built by the Matthews Boat Co., and powered with a 5½x8-inch six-cylinder Sterling motor. She is marked by many new electrical features.

Wakonda, a new V-bottom cruiser, designed by Wm. H. Hand, Jr., and built for A. G. Cooper. She is powered with a six-cylinder, 5½ x 6-inch Van Blerck motor, which gives her a cruising speed of 18 miles an hour.

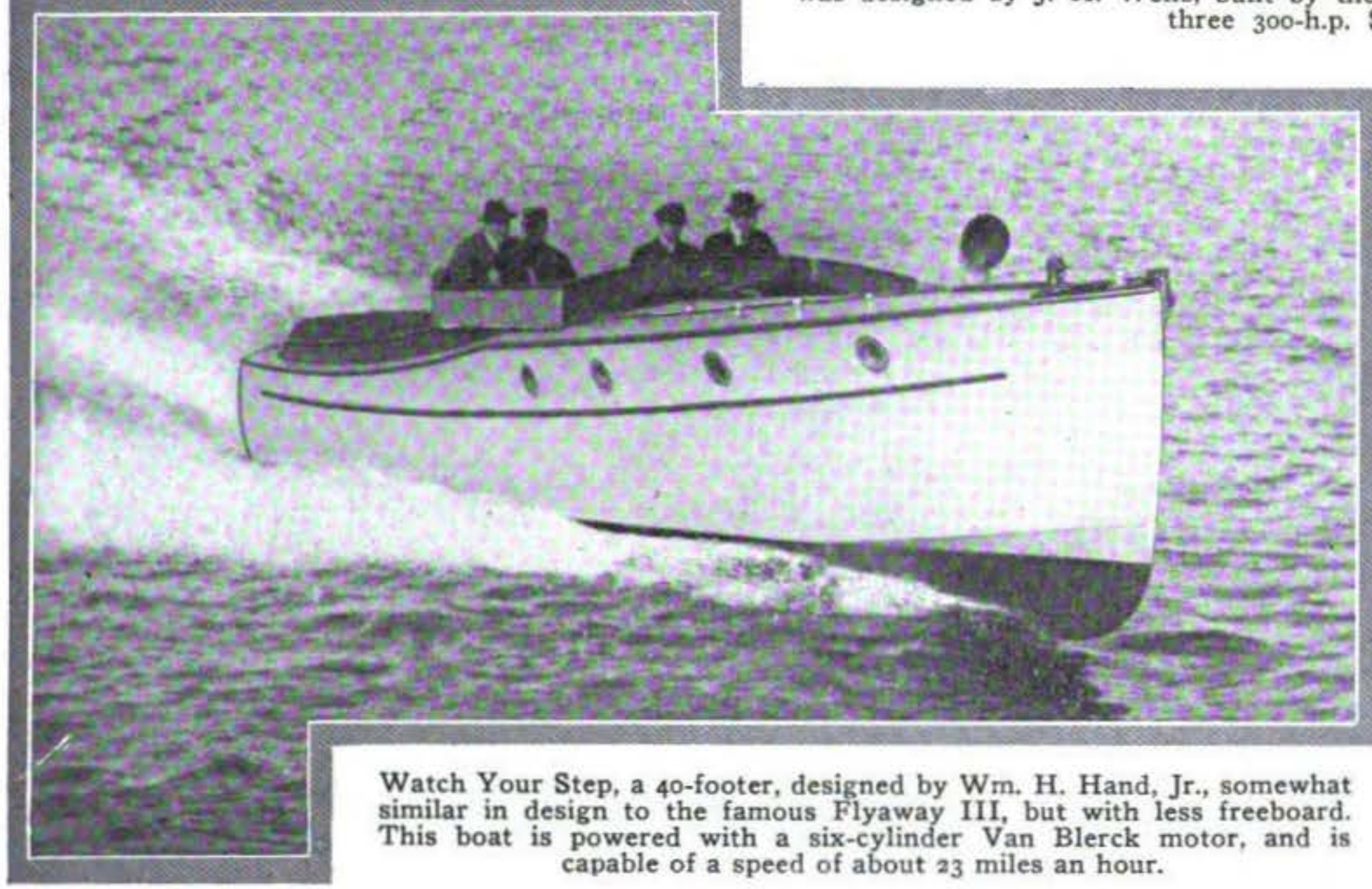


Raccoon, a new Hand V-bottom Lawley-built 50-footer, owned by Chester W. Bliss. This boat is powered with two six-cylinder, 100 h.p. Van Blerck motors, driving twin screws about 1,200 r.p.m. and has shown a speed in excess of 24½ miles an hour.

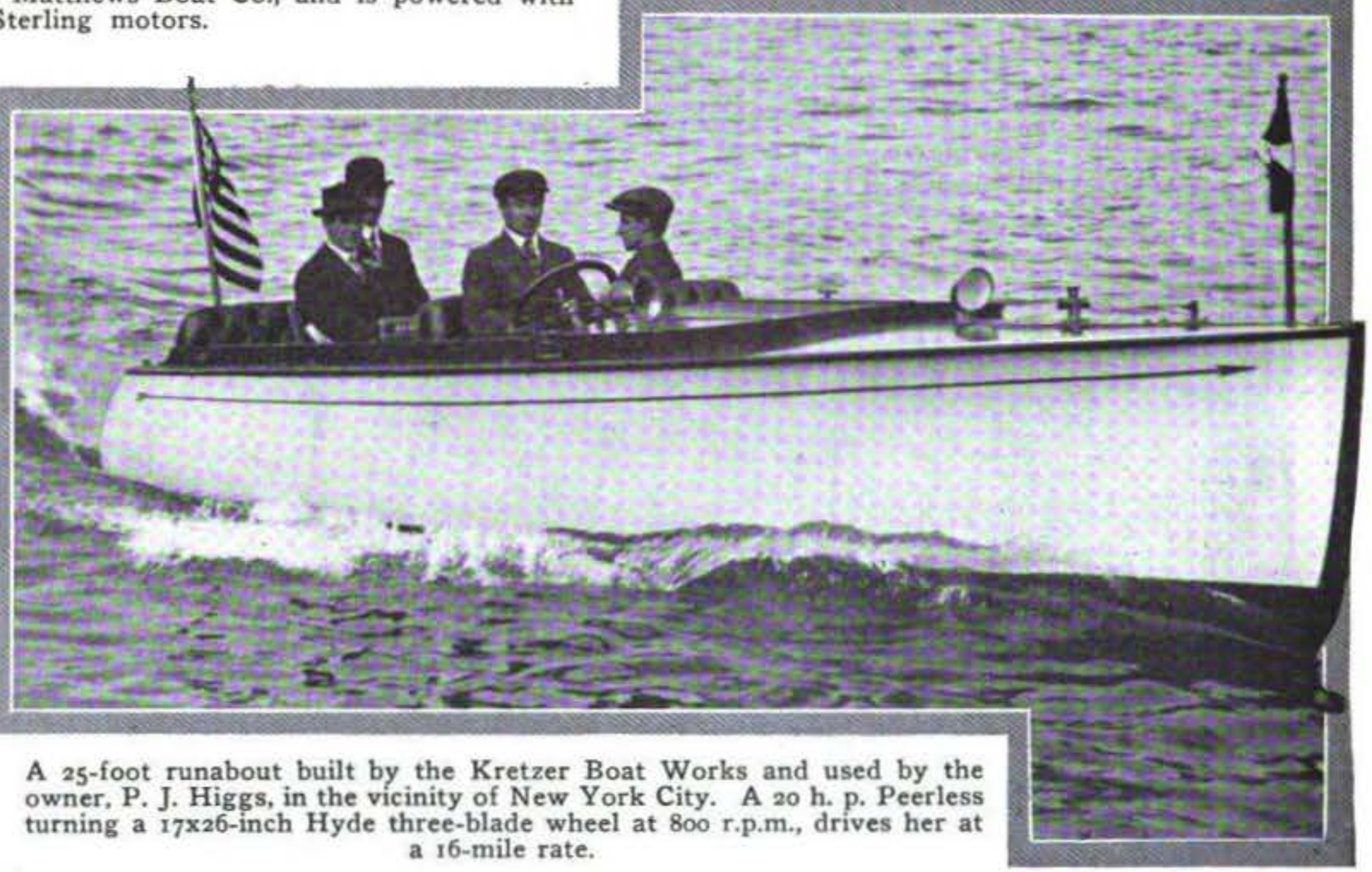


Marold, a new 100-footer, with 900 h.p., owned by C. H. Wills, of Detroit. This boat was designed by J. H. Wells, built by the Matthews Boat Co., and is powered with three 300-h.p. Sterling motors.

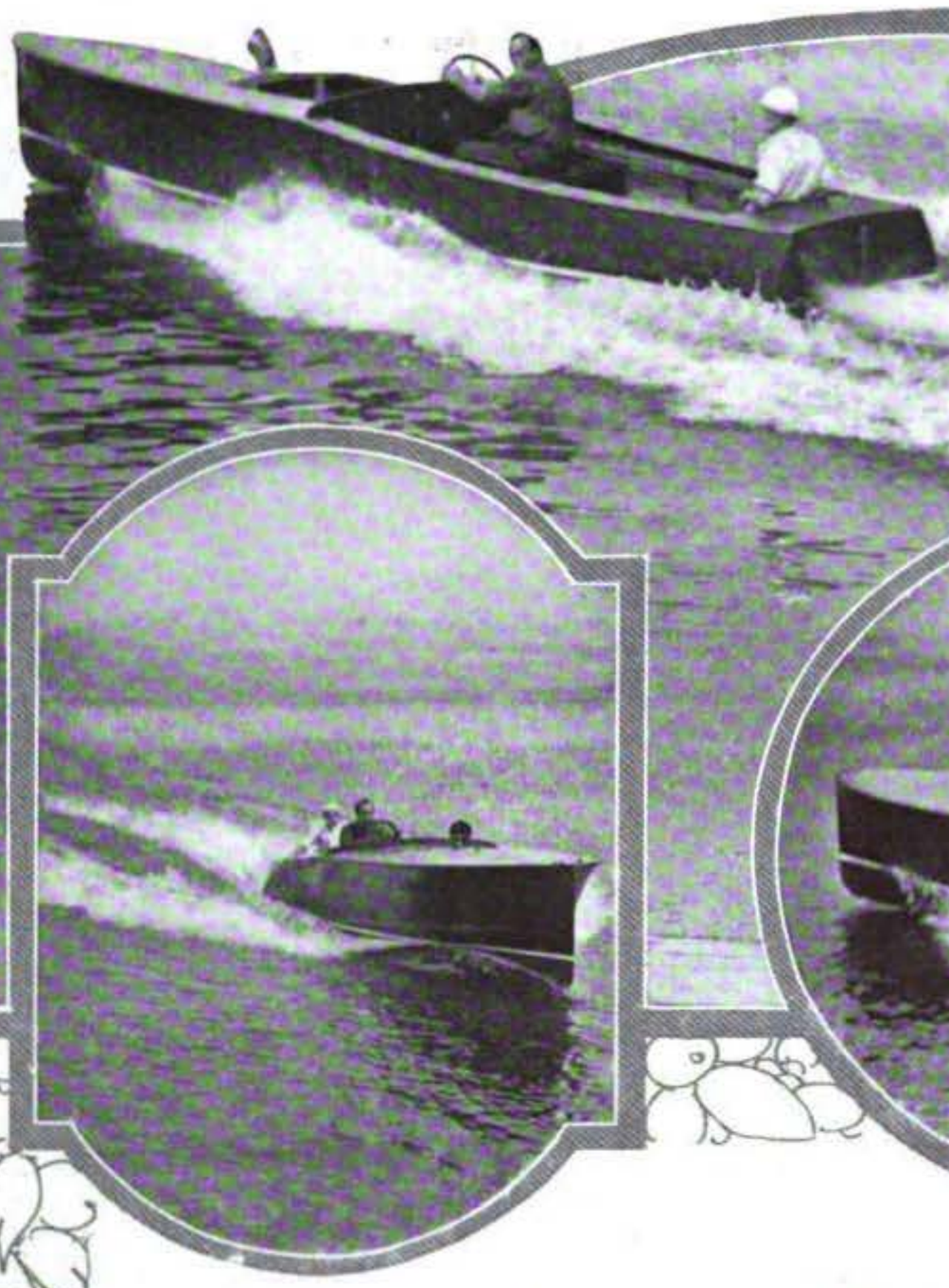
Tech, Jr., designed by Adolph Apel, for Coleman DuPont, which has already shown speeds of nearly 60 miles an hour. This boat will be a challenger for the Gold Cup, and is powered with an eight-cylinder 225 h.p. Sterling motor.



Watch Your Step, a 40-footer, designed by Wm. H. Hand, Jr., somewhat similar in design to the famous Flyaway III, but with less freeboard. This boat is powered with a six-cylinder Van Blerck motor, and is capable of a speed of about 23 miles an hour.



A 25-foot runabout built by the Kretzer Boat Works and used by the owner, P. J. Higgs, in the vicinity of New York City. A 20 h. p. Peerless turning a 17x26-inch Hyde three-blade wheel at 800 r.p.m., drives her at a 16-mile rate.

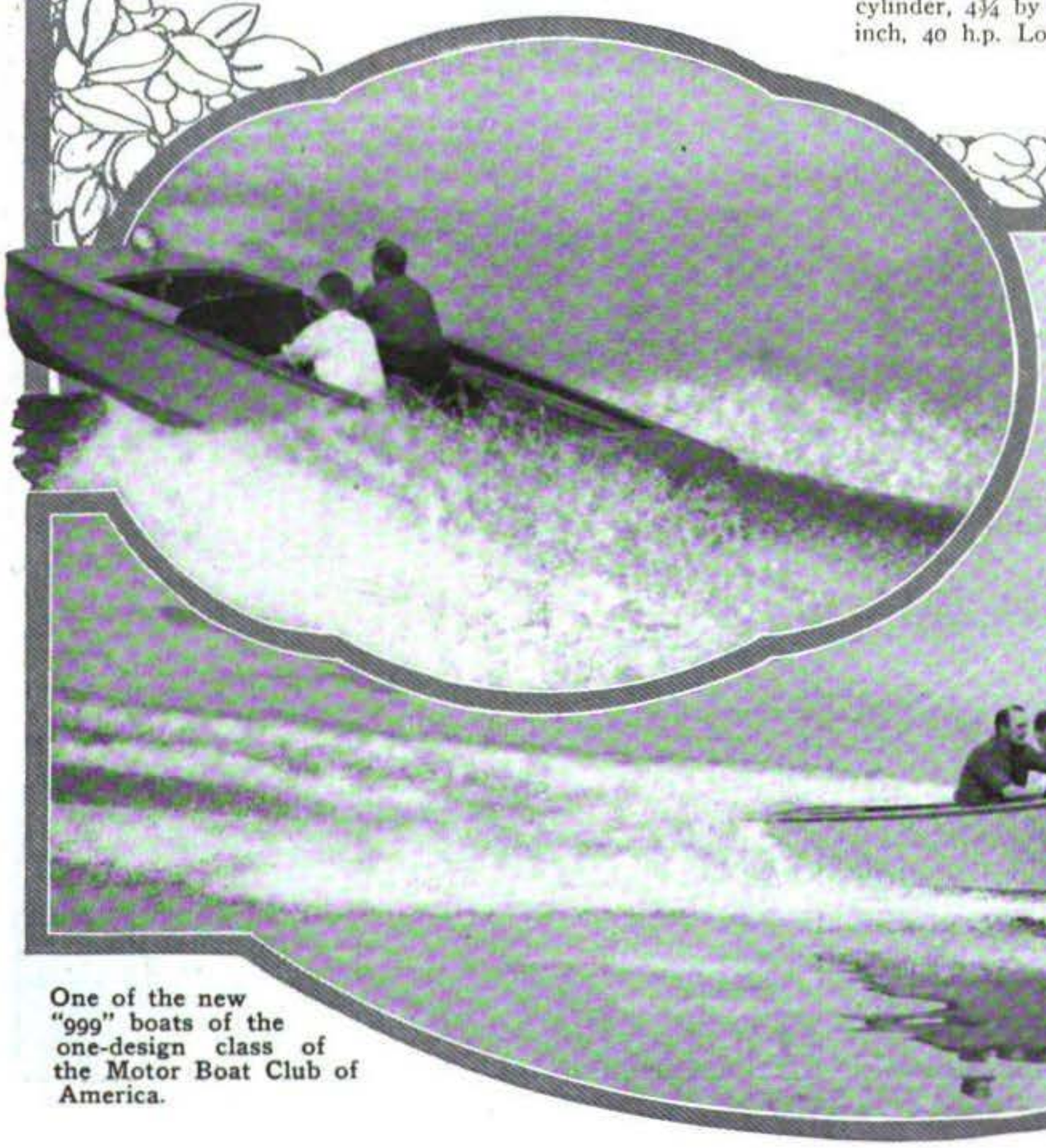


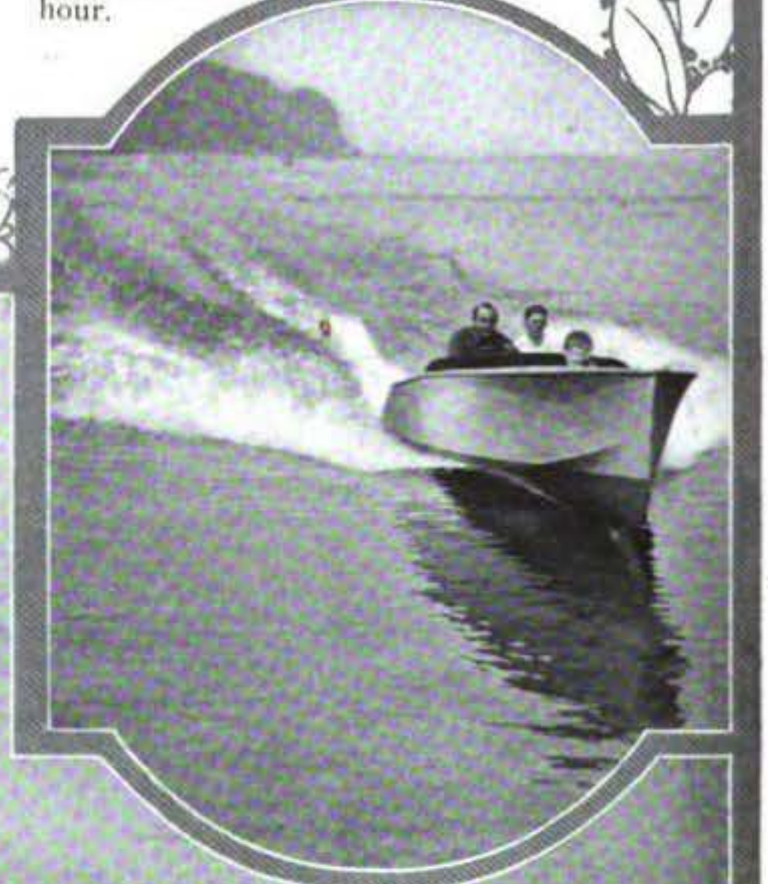
The 25-foot Whizzer which showed a speed of 21.68 miles per hour with 40 horsepower.

Two New Wave Collectors

MORRIS M. WHITAKER, the well-known naval architect, who is the originator of the wave-collecting type of underbody, recently completed two new boats from his plans which more than bear out his theory that this type of underbody is a very efficient one for the familiar light runabout.

The illustrations at the top of this page are of the 25-foot Whizzer, Blackbird, built for F. A. Ward, of Brooklyn, and those below are of one of the "999" one-design class, recently adopted by the Motor Boat Club of America. Blackbird is driven by a four-cylinder, 4¼ by 5½ inch, 40 h.p. Loew-Victor motor, driving a three-blade type E, Columbian propeller. This boat in six trials averaged 21.68 statute miles an hour in a rough sea. The "999" boat powered with a 4½x 5 inch, 40 h.p. Loew-Victor motor driving a two-blade type A, Columbian wheel, averaged 24.17 statute miles an hour.





One of the new "999" boats of the one-design class of the Motor Boat Club of America.

One of the Newest Fast Ones.

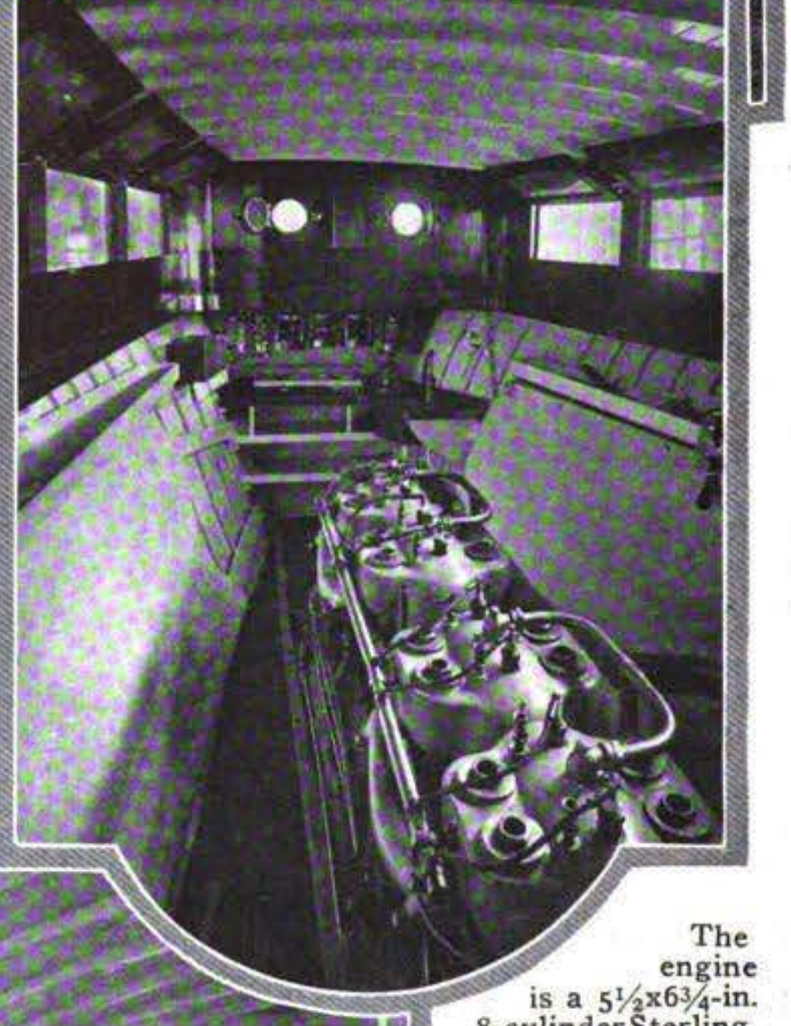
Vira, going and coming at a good clip.

THE accompanying photographs are of the express cruiser Vira, which was designed by the Philadelphia naval architects, Bowes & Mower, and has been recently completed by the Mathis Yacht Building Co. The boat is owned by George Degerberg, of Philadelphia, and will be a prominent addition to the already large fleet of this class on the South Jersey coast where she will be used, sailing under the flag of the Chelsea Yacht Club.

In outboard appearance, the boat shows an unbroken sheer, the cabin being of the trunk type with rectangular windows and good deck space around the house. Vira has a large cockpit aft, the companionway leading into the cabin which contains extension transoms and several lockers. One door opens into a toilet room and the other into the engine-room, which has also galley arrangements for day service.

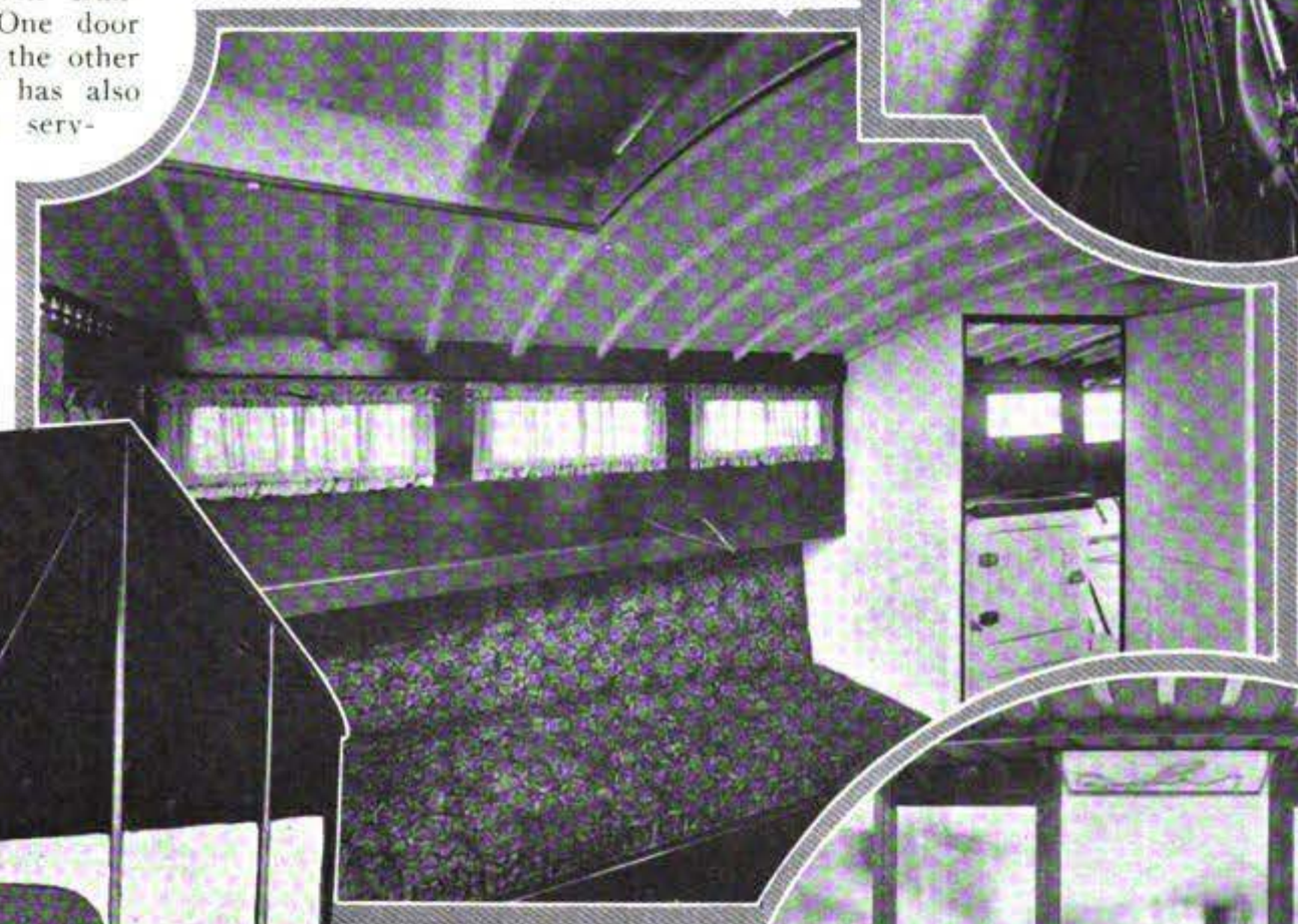
The power plant consists of an eight-cylinder, 5½ x 6¾ inch Sterling engine, which drives the boat at a speed of 23 miles per hour. The engine-room proves to be very cool on account of the large windows and air ports in the sides of the house. The main gasoline tank is aft under the cockpit seat and there is a smaller tank on the engine-room bulkhead which is kept filled by means of a Stewart vacuum pump and feeds by gravity to the engine. A hand pump is also provided for use in case this system fails. To give free water to the propeller, a flat run is given to Vira's underbody, an outboard rudder is used, and the deadwood is cut away.

VIRA.	
Length	37 feet 6 inches
Beam	8 feet 4 inches
Draft	3 feet 2 inches
Motor	8-cylinder Sterling
Speed	23 miles
Designers	Bowes & Mower
Builders, Mathis Yacht Building Company.	
Owner	George Degerburg

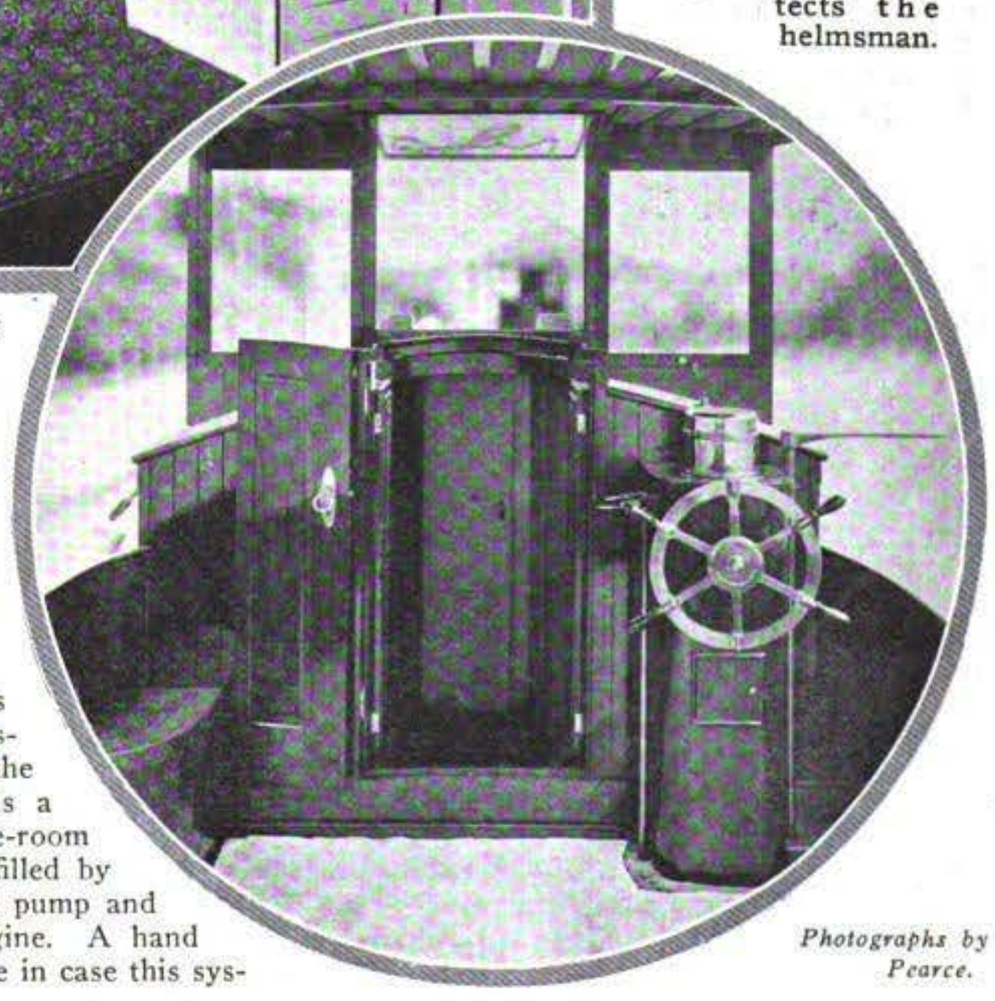


The engine is a 5½x6¾-in. 8-cylinder Sterling.

Note, below, the flat run, giving free water to Vira's wheel.



The saloon, looking forward into the galley.



A glass shield protects the helmsman.

Photographs by Pearce.

A new speedy 52 footer

Madge, a one-man boat, is controlled from the central cockpit.

THE fast day cruiser shown in the accompanying illustrations was designed and built by the Gas Engine & Power Co. and Charles L. Seabury & Co., of Morris Heights, N. Y., for Major W. H. Day, of Mamaroneck, N. Y., for use on Long Island Sound and adjacent waters.

The design was especially worked out to meet the personal requirements of the owner, who wanted an "afternoon boat" for entertaining a party of eight to ten persons with all possible comfort. A large cockpit and a comfortable cabin with conveniences give all and more of the advantages of a modern touring car and limousine combined.

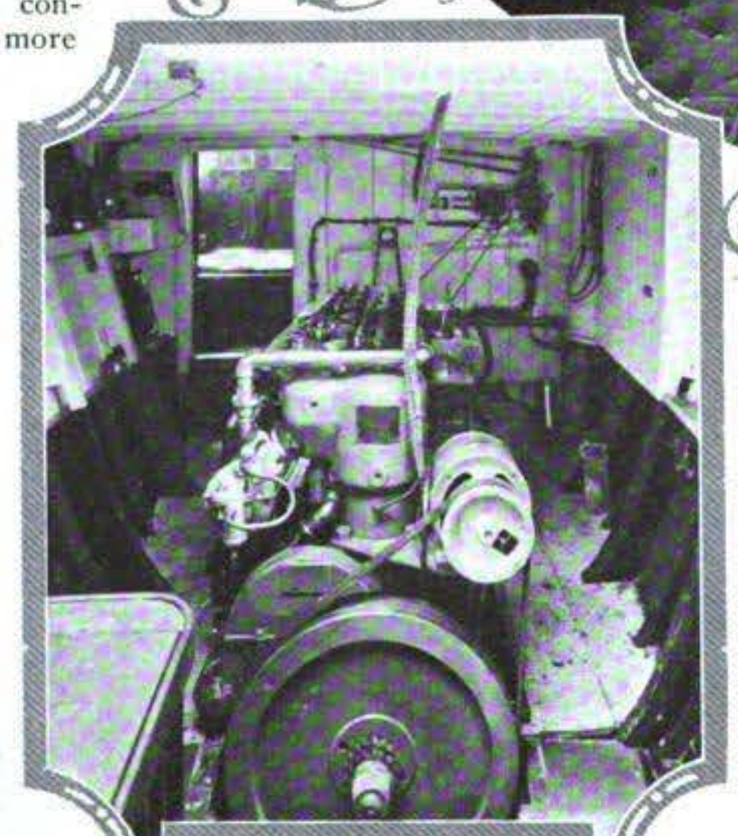
One of the distinctive features of Madge is the absolute separation of the crew from the owner's party. The operator's cockpit amidships is entirely shut off when the doors of the cabin are closed, the only communication being an electric call bell from the cabin and the after cockpit. This arrangement gives the owner's party absolute privacy, and works out also to the benefit of the captain, who thus has undisturbed control of the boat. The roominess of the after cockpit permits a party of any reasonable size to be accommodated, but, if necessary the cabin, entered from the after end by double doors, will handle an overflow.

Madge's beam of 8 feet 3 inches and the 6-foot 3-inch head room make the cabin a commodious compartment.

Any appearance of awkwardness in the glass cabin has been avoided by designing it with a decided crown, which is almost flat on top but breaks sharply well abeam. By this means headroom of 6 feet 3 inches and good sized windows are obtained.

The general arrangement of Madge is as follows: The chain locker forward is followed by the engine-room under the raised deck section. The operator's cockpit is next aft and the kitchenette and toilet, and main cabin, follow in order; the remaining space is taken up by the after cockpit.

The power plant, which drives Madge, at a sustained speed of 8½ m.p.h., consists of a six-cylinder 60-80 h.p. Speedway engine.

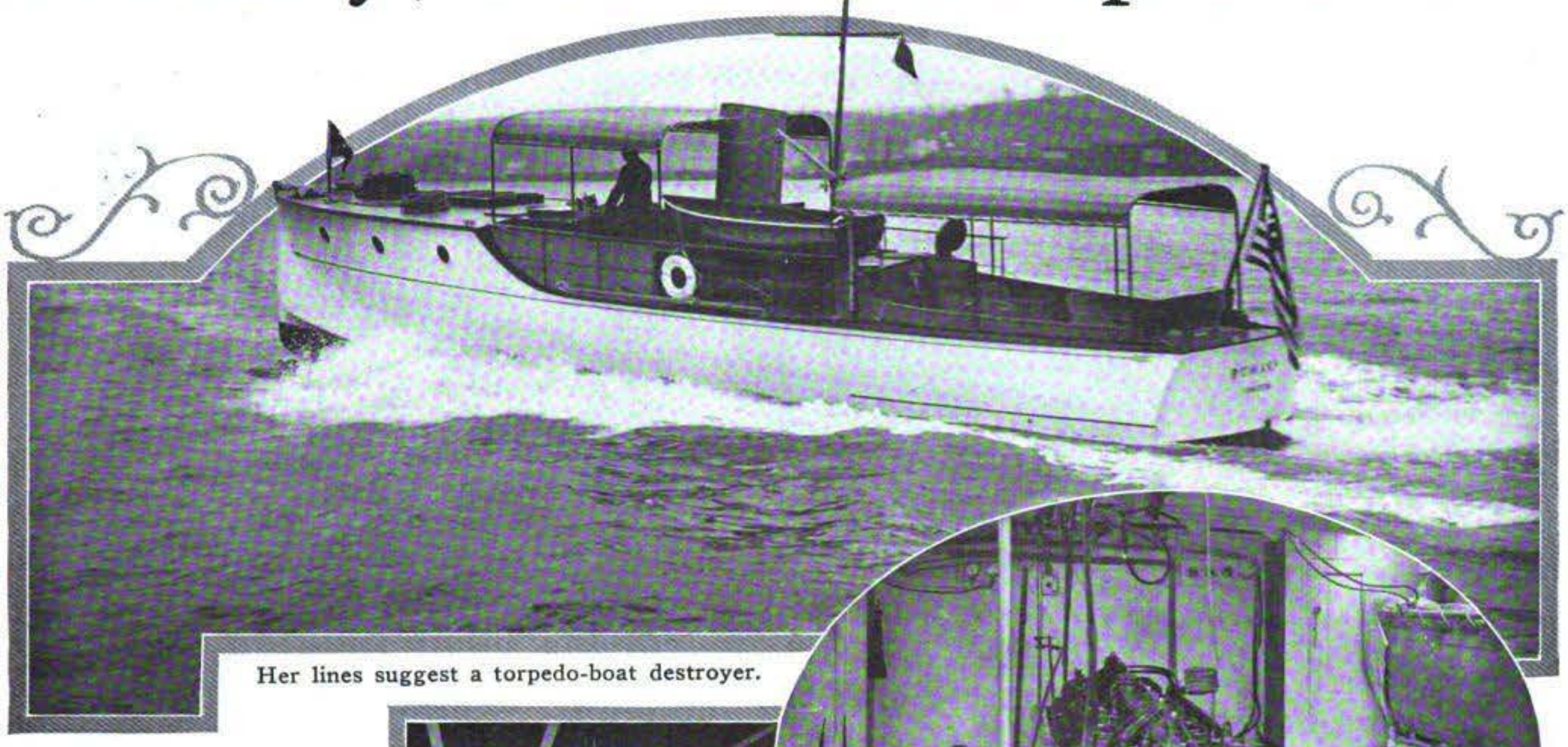


The 80 h.p. Speedway.

One of the chief features of Major Day's "afternoon boat" is the roomy cockpit for the use of the owner and party. It accommodates eight to ten persons.

Photographs by Rosenfeld.

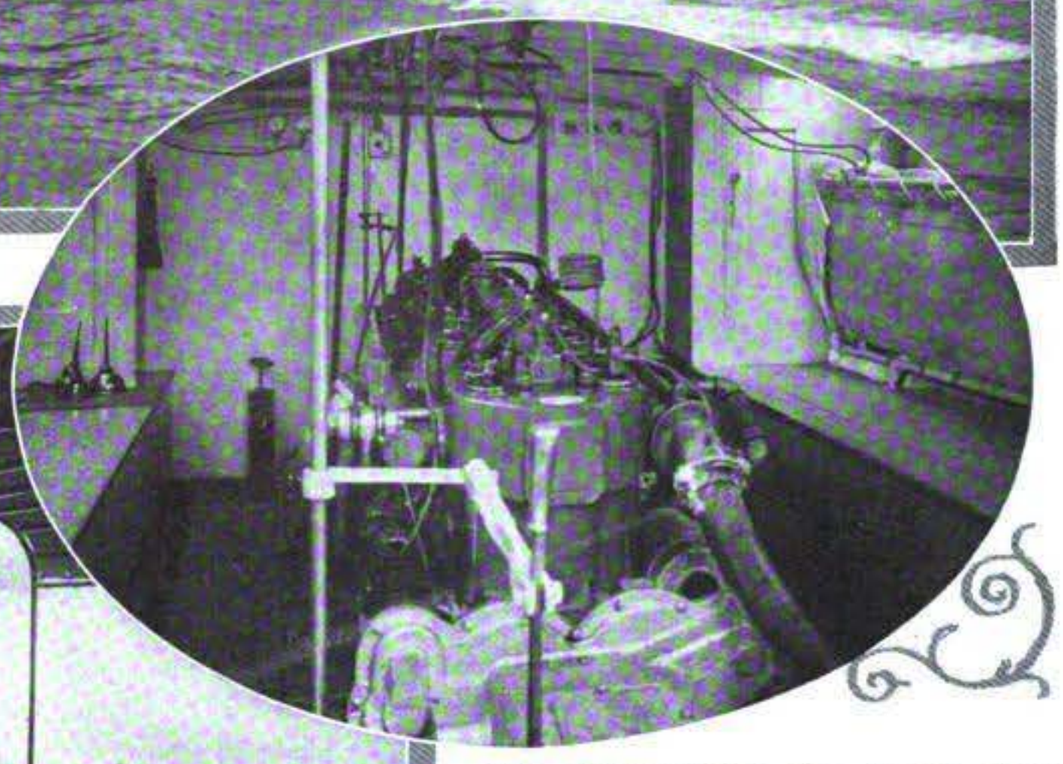
Romany, a 50-Fo ot Speedster.



Her lines suggest a torpedo-boat destroyer.

ROMANY is an interesting boat, with underbody lines very similar to those of the racer, Flyaway III, and with outboard profile suggestive of the modern torpedo boat destroyer. She was built by the Greenport Basin & Construction Co., for H. S. Duell, of New York City, after plans by William H. Hand, Jr., of New Bedford, Mass., and was put in commission in June.

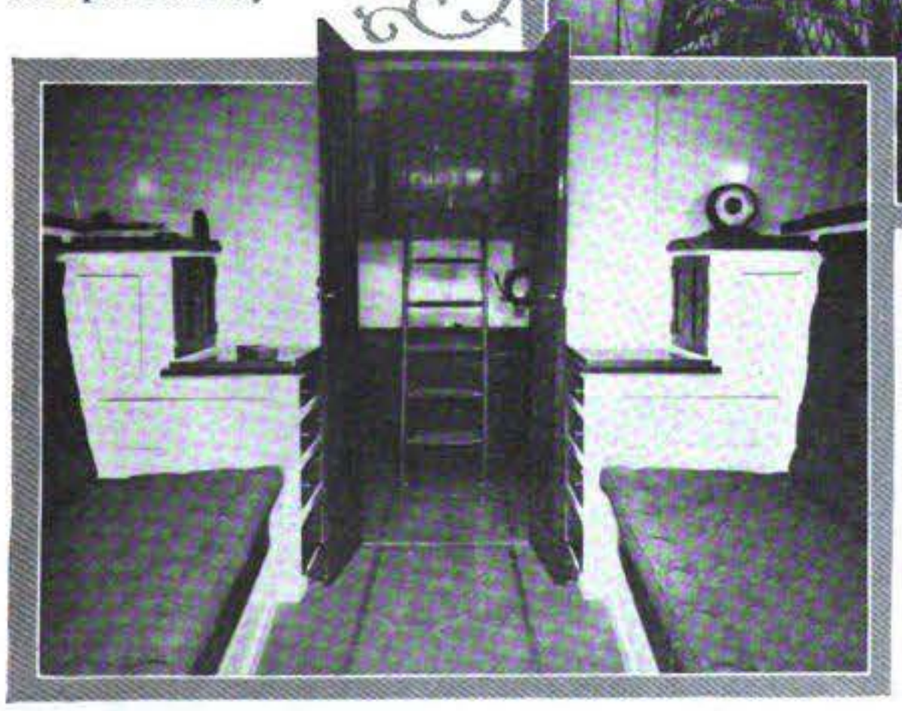
Under the raised deck forward is the main cabin, arranged with two fixed births and two Pullman berths, and supplied with an abundance of locker space. The toilet room is in the eyes of the boat, with linen lockers against the forward bulkhead and shelf space to either side of the toilet. A folding basin is also provided in this compartment. Aft of the cabin comes the galley, which is equipped with ice chest, stove, sink and dish lockers, and a companionway



The eight-cylinder Van Blerck gives a speed of 20 miles per hour.

crowding, and further seating arrangements are afforded by a fixed transom aft. Life preservers are stowed under the seat, and a deck plate in the cockpit floor gives access to large stowage space below.

The general dimensions of Mr. Duell's boat are, length, overall, 50 feet, extreme beam, 10 feet 3 inches, and greatest draft, 2 feet 10½ inches, and a speed of 20 miles is obtained. She is fitted with the latest and most approved equipment details.



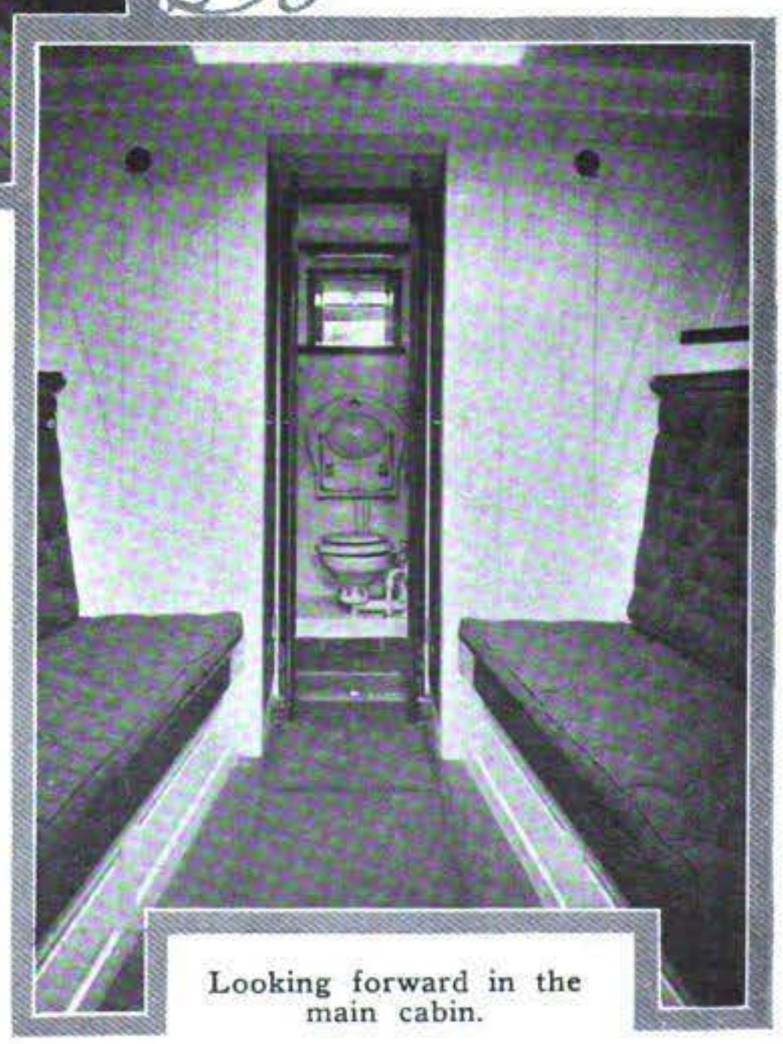
Sleeping accommodations for a party of four are provided in the cabin.

The cockpit is a roomy place, sheltered from the wind.

from this compartment leads up to the bridge deck.

The motor is installed under the bridge deck and after trunk, and in the engine-room are provided sleeping and toilet facilities for the crew of two men. The motor is an eight-cylinder 160 h.p. Van Blerck installed between watertight bulkheads and fitted with an electric lighting and starting system, also full automobile control to the bridge and duplicate control to the forward end of the after cockpit. The fuel is carried in three tanks, one of which is located under the deck seat at the after end of the bridge and feeds by gravity to the carbureter.

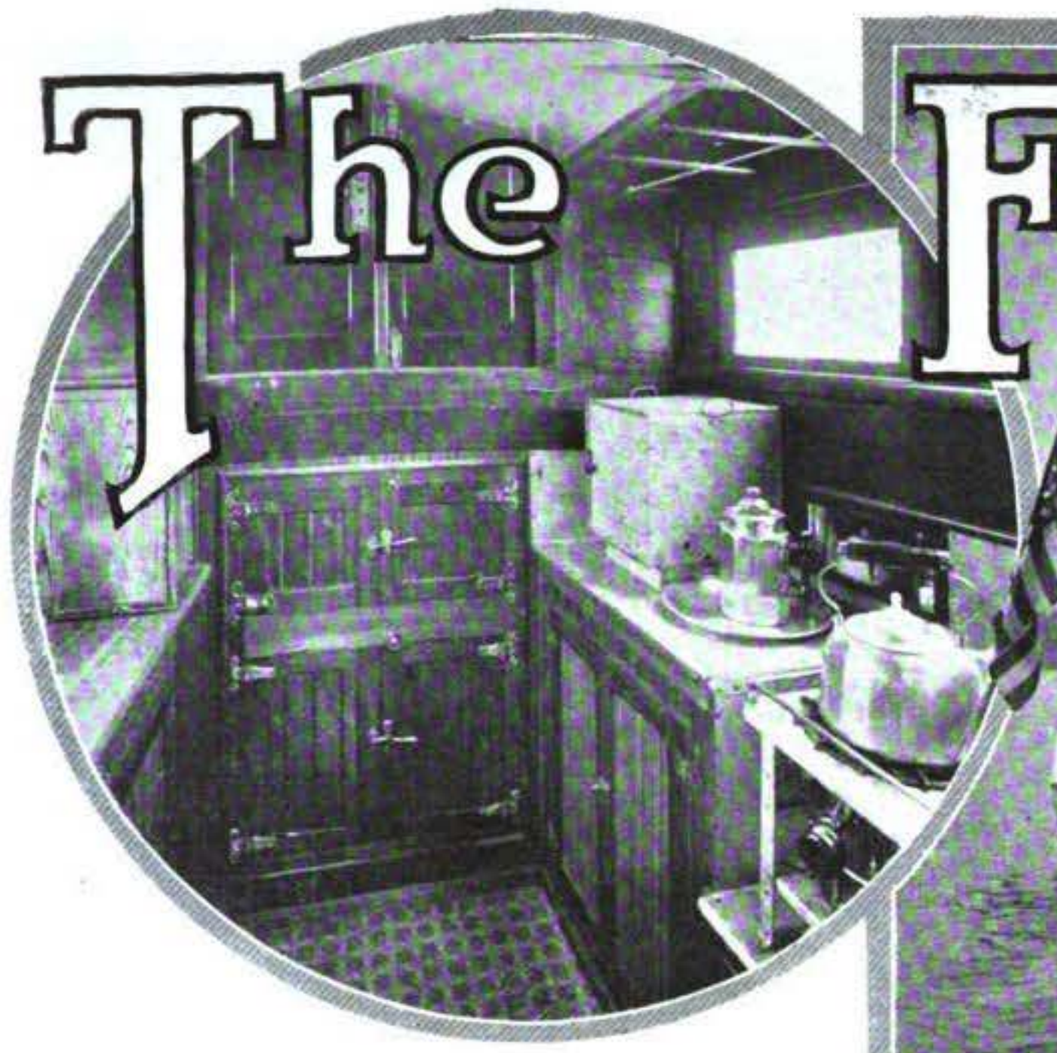
Aft of the engine-room trunk is a cockpit where the owner and his guests may sit out of the wind when traveling at high speed. The space here is large enough to accommodate half a dozen deck chairs without



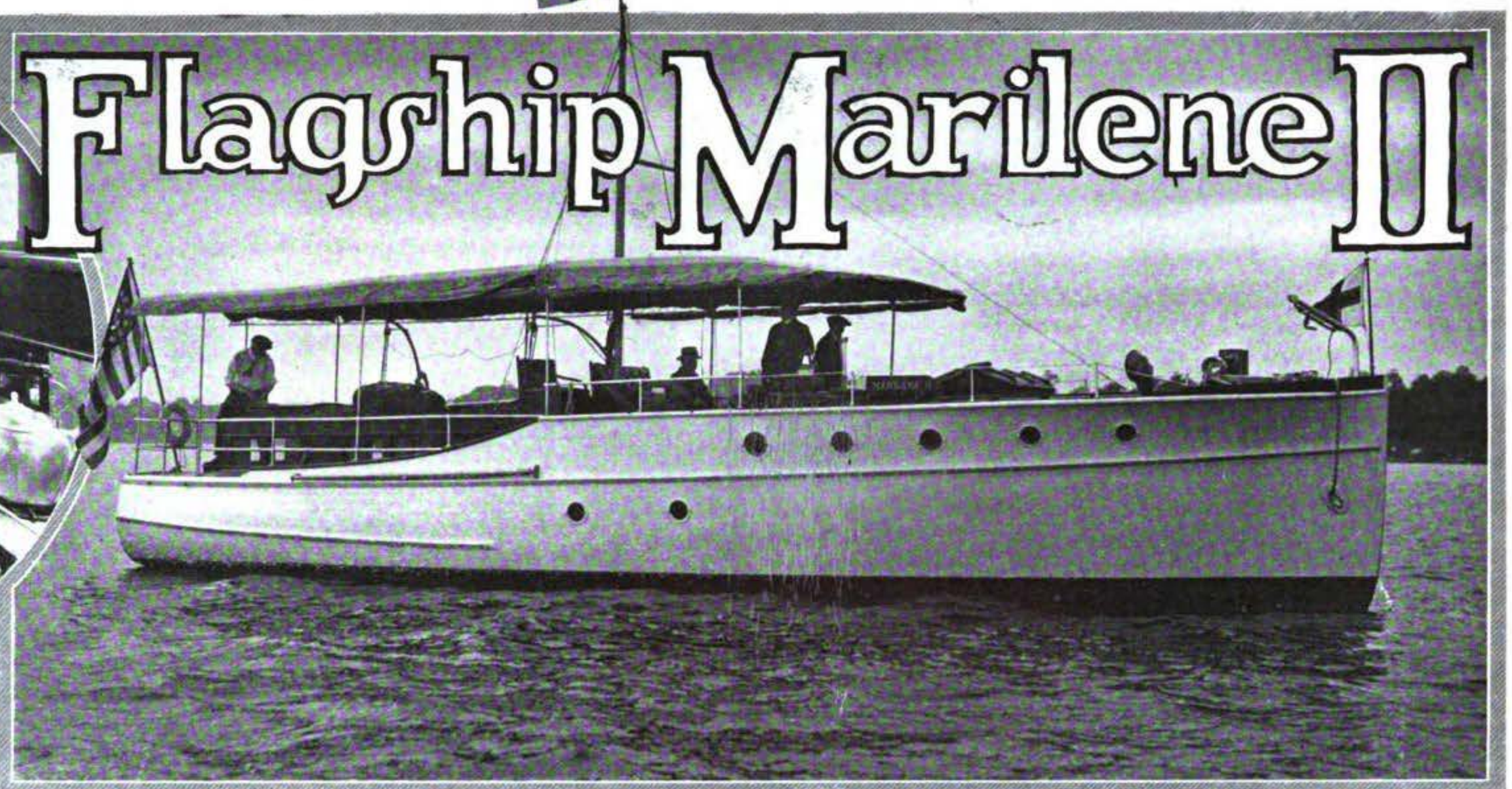
Looking forward in the main cabin.

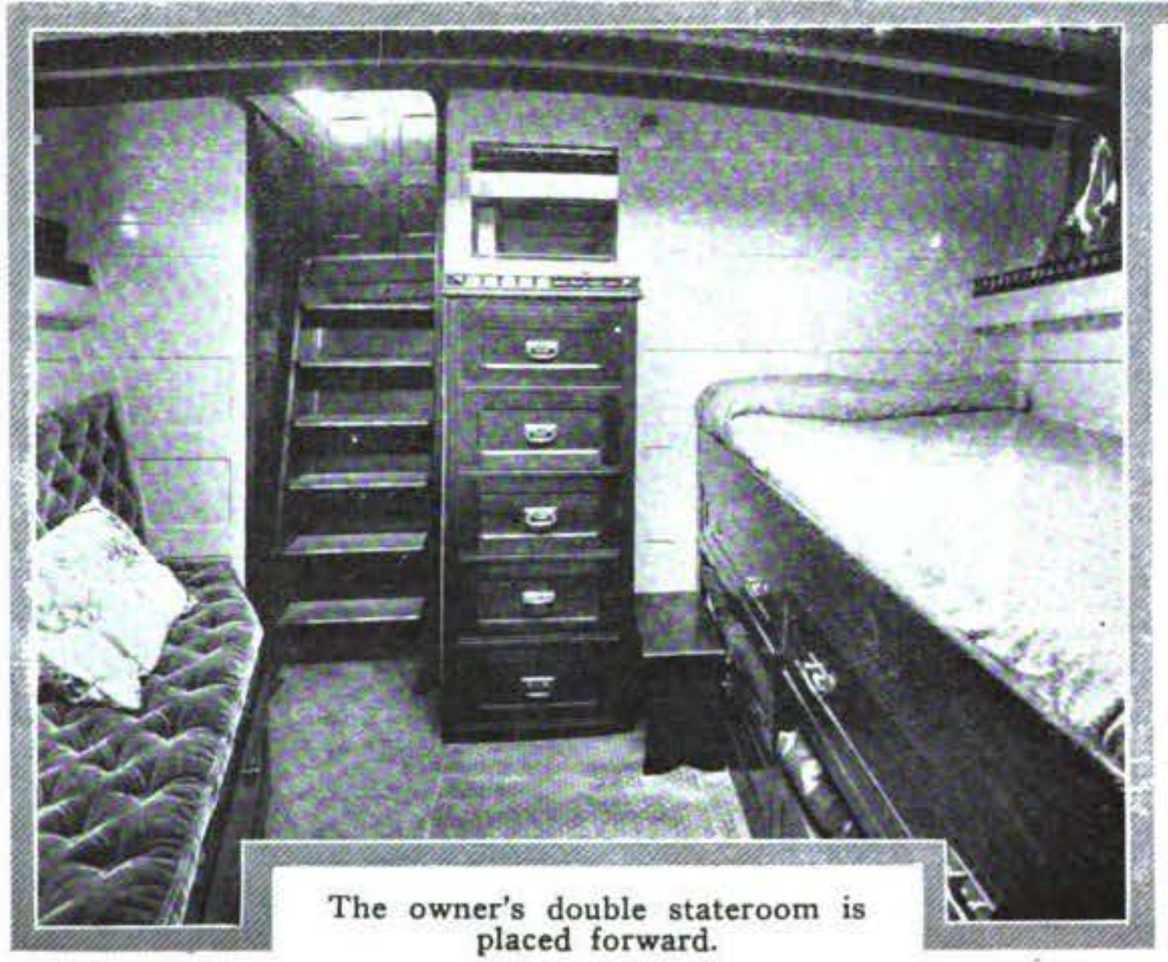
Photographs by Levick.

The Flagship Marilene II



Looking aft in the galley, with the companionway steps removed to show the location of the icebox.



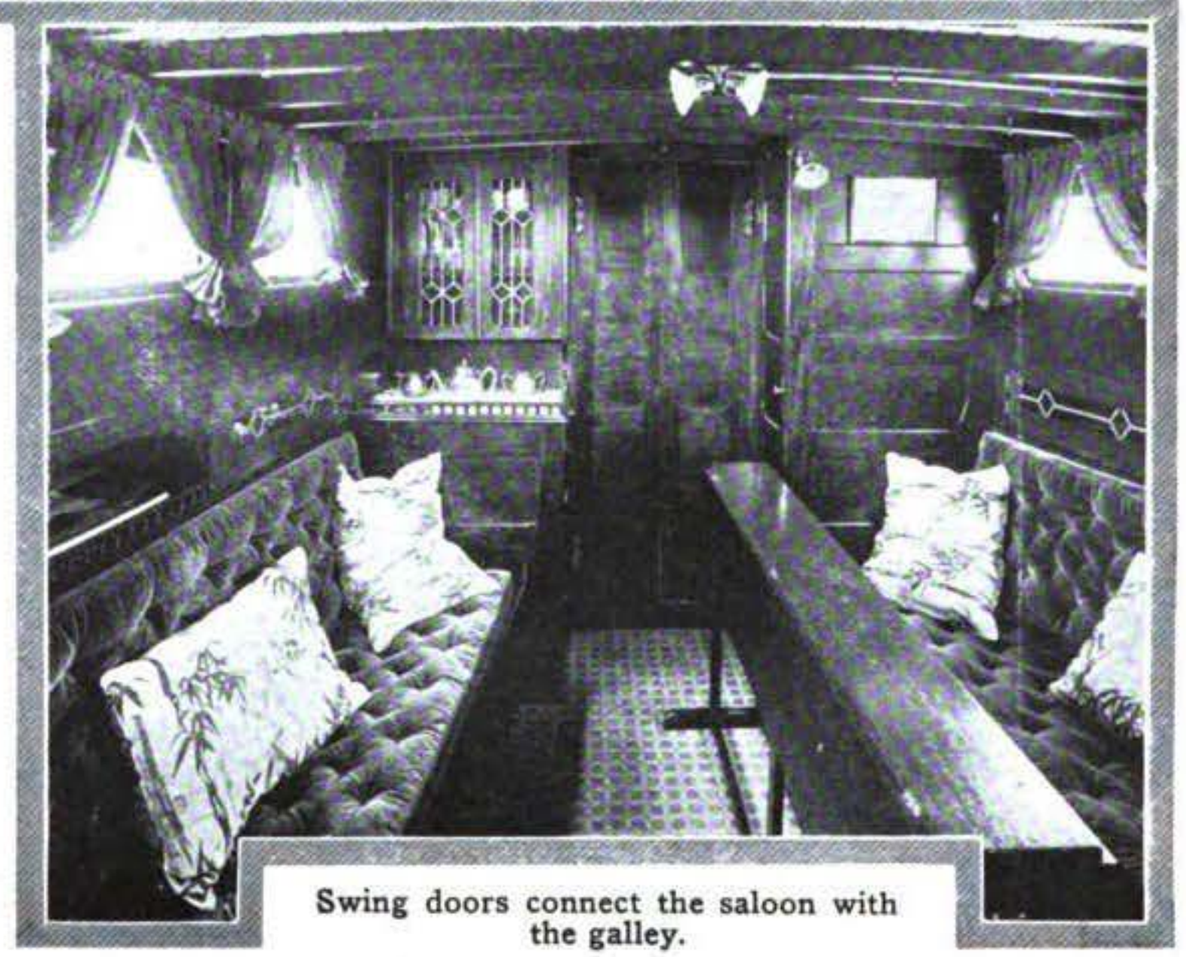


The owner's double stateroom is placed forward.

The two lower port holes in Marilene II admit light and air to the engine-room.

MARILENE II is a handsome raised-deck cruiser which took the water recently and is owned by Commodore H. M. Williams of the Huguenot Yacht Club of New Rochelle. She was designed by Morris M. Whitaker of Nyack, N. Y., and built at the yards of Oscar Anderson of Norwalk, Conn. Her length is 45 feet to a beam of 12 feet and 3½-foot draft, and, powered with a four-cylinder 7½ x 8½-inch Loew-Victor motor, she makes a little better than 13 miles per hour.

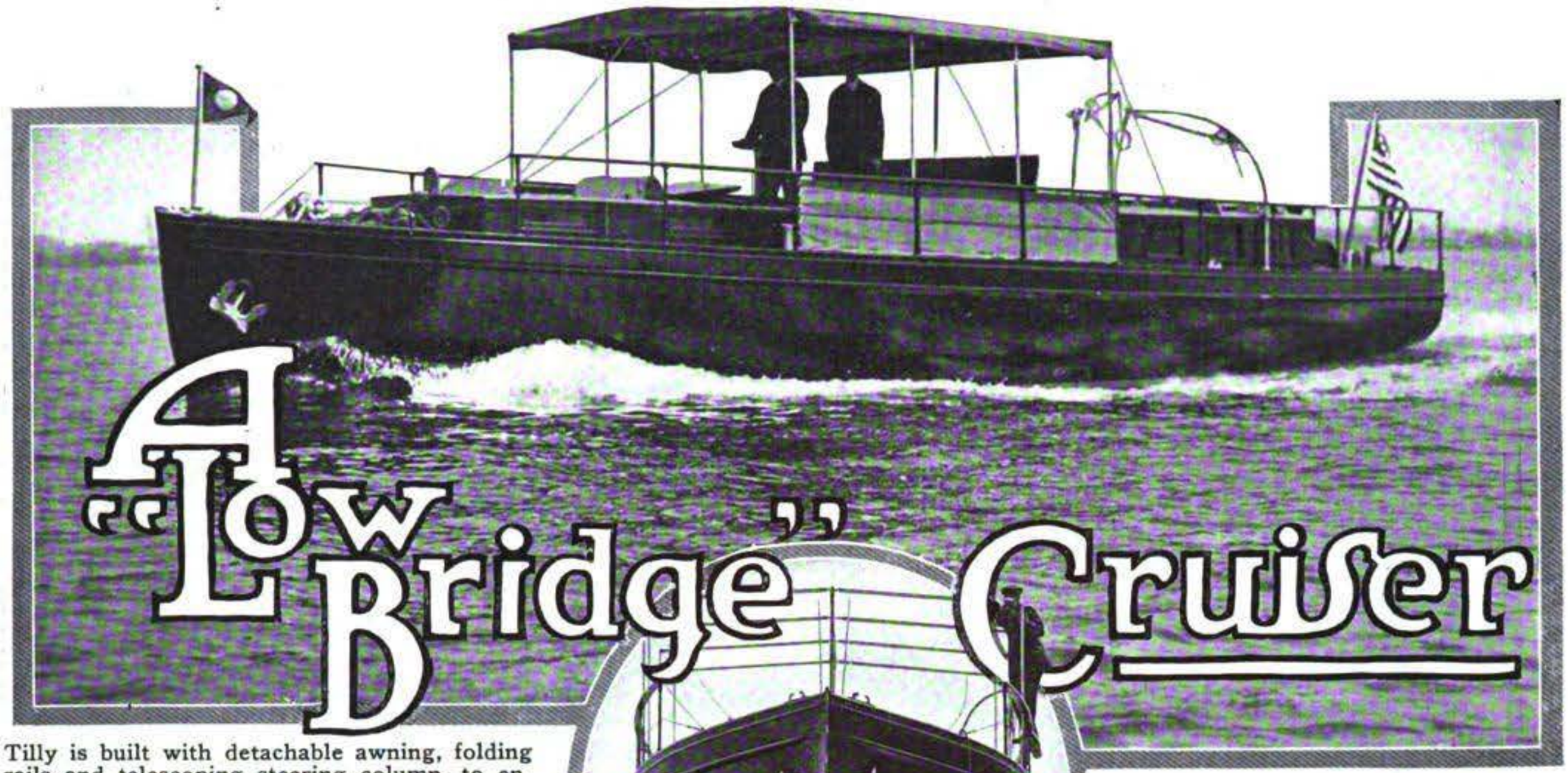
The owner's double stateroom is arranged forward, with a toilet in the bow, and the saloon and guests' quarters are aft of the engine-room, which is placed amidships under the bridge deck. The engine-room, in addition to the usual locker space and two 75-gallon fuel tanks aft, contains berths for sleeping two men. The saloon, aft, has two extension transoms, folding table and buffet, and there is a toilet adjoining. The galley occupies the after end of the boat and opens out into a short after cockpit. Companionways from the bridge deck lead into both cabin and saloon.



Swing doors connect the saloon with the galley.

Photographs by Rosenfeld.

A "Low Bridge" Cruiser

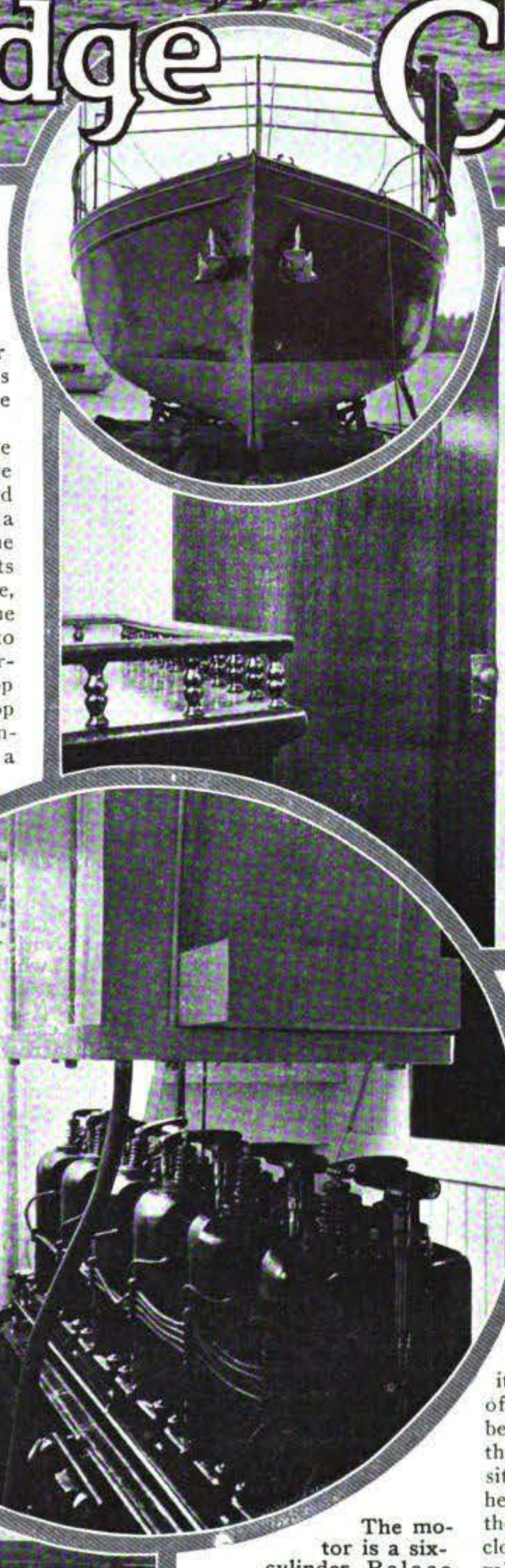


Tilly is built with detachable awning, folding rails and telescoping steering column, to enable her to pass under a certain bridge in Great South Bay.

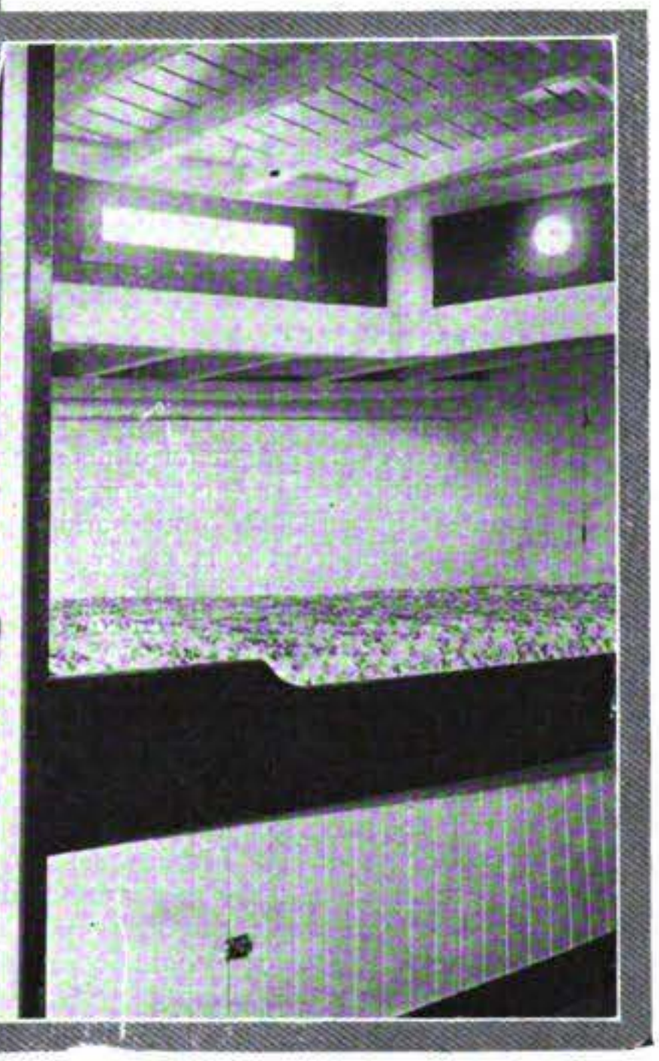
THE accompanying illustrations show the new motorboat Tilly, designed and built by F. S. Nock, at East Greenwich, R. I., for a Long Island yachtsman. The general dimensions of this boat are 48 feet overall, 14 feet extreme breadth, and 34 inches extreme draft.

This boat was designed and built for use on the Great South Bay, and, owing to the fact that there is a certain bridge under which the owner desired to pass, everything on the boat was limited to a certain height above the waterline, and, where the hand rails, seat back and any other fittings or parts set above the line of the center of the deck house, they had to be made removable. The rails drop, the stanchions being hinged at the top and bottom to allow the after part of the rail to drop aft, and forward of each gangway on the after deck to drop forward. The seat back folds down over the top of the seat. The steering column, reverse gear control and other mechanism telescope. There is a sunken pit over the engine in order to permit the man at the helm to be below the given height and to assure him of being able to handle the boat properly when the steering column is at its lowest point. The awning is made so that it can be readily removed.

No effort was made in the building of this boat to obtain speed. In fact, speed was a minor consideration, the idea being to keep the boat well within the prescribed draft and at the same time to try to obtain a model that would be as seaworthy as was consistent with the necessary form of a craft of such shoal draft. The engine is a six-cylinder Ralaco, with an electric starter and all up-to-date equipment. Gasoline is carried in a welded-seam tank placed under the seat on the bridge deck. The plumbing outfit is rather elaborate for a boat of this size, there being three toilets and three lavatories in the boat, besides the sink, etc.



The motor is a six-cylinder Ralaco with electric starter.



Tilly's interior finish is in white enamel and mahogany.

Special attention has been given to the arrangement of the galley, which is placed aft. The owner decided that he wanted a four-burner Seabury alcohol range, with broiler, plate warmer, large size burners, oven, etc. Owing to the limited amount of room, it presented somewhat of a problem to locate such a stove so as to be efficient and yet not take up too much of the cabin space. It was finally decided to situate it on the port side, close to the bulkhead at the forward end of the galley, and on the opposite side, setting into the walls of the clothes press, is a refrigerator, while in the galley proper are a dresser, sink, lockers, etc.

The engine-room, which is aft of the owner's stateroom, is entered through a hatch in the after end of forward cabin house. There is no means of access from this point through to the owner's stateroom, but there is a door in the bulkhead between the salon and engine room, thus allowing a man to go aft without going on deck, if he so desires. Aft is the saloon followed by a toilet room on the port side.

Especial care was taken to obtain a satisfactory galley arrangement.

The Overheated Motor.

A Discussion of the Various Marine Engine Ailments Which Are Likely to Cause Overheating. The Best Steps to Take to Overcome This Troublesome Condition.

Several Causes.

(The Prize-Winning Answer.)

OVERHEATING of a gasoline motor is something to make the motor-wise boatman sit up and take notice and also to sit down and think, for it is a sure sign that something is wrong and that that something should at once be sought and remedied before serious damage results.

The two major causes of overheating are insufficient circulation of the cooling water and a lack of lubrication. A certain quantity of water must flow through the water jackets of a motor to carry off the heat generated by the explosions and if for any reason this quantity of water is lessened, more heat is produced than the water can carry off, with the result that the motor becomes overheated.

Derangement of the cooling system may result from several causes. The pump may be so worn that it hasn't enough "suck" and so does not deliver its full capacity. Obviously the remedy is to install new parts. There may also be a stoppage somewhere in the pipes or water jackets due to some foreign substance having entered the inlet, such as seaweed, paper, rag or anything else that might be floating. A screen should always be placed over the mouth of the inlet to exclude such things. Sometimes if hose is used in the pipe lines, a piece of the rubber lining may become loosened, especially near a connection, and act as a flap valve to obstruct the flow of water.

In localities where there is much mud in the water, a sediment of mud and rust from the water jackets may, after considerable use, settle in the bottom of the water jackets, thus obstructing the flow of water to some extent. This subsance may be removed by forcing water into the water jacket from a hose and by working a wire around through the connection holes.

Failure to supply sufficient lubrication will soon cause overheating. It is a serious matter and, if not corrected, will lead not only to an overheated motor, but to scored cylinder walls and pistons, burnt out bearings and finally to a ruined engine. If the motor is not getting enough oil, the lubricating system should be cleaned out, especially the feed pipes, and the supply regulated and then, before starting the motor again, a small quantity of oil should be put into each cylinder.

The carbureter is also a possible cause for overheating. A mixture that is either too weak or too rich in gasoline will burn slowly, thereby generating more heat than a quick-burning mixture and causing the temperature to rise above normal. The carbureter should be adjusted to give a correct mixture to remedy this. The same effect is noticeable if the motor is run with the spark retarded, for in this case ignition occurs after the piston has started on its down stroke and the mixture, even though correct, being under reduced compression, burns slowly and liberates more heat than if it were fired at the point of highest compression. It is therefore advisable to operate a motor with the spark advanced as it will run more quietly and generate less heat, owing to the fact that more rapid and complete combustion takes place in the cylinders.

The foregoing is based on the assumption that the motor is properly designed and assembled, for it is readily seen that a motor with a pump of insufficient capacity or one with the gears improperly timed or with careless workmanship would be very liable to overheat. But as these conditions are of very rare occurrence they are hardly worth mentioning.

ALFRED L. MEGILL, Blue Point, N. Y.

Questions for the September Issue.

1. Describe a method whereby a boat which steers badly may be made to answer her helm more readily, and hold a course.
Suggested by W. B. M., Newburgh, N. Y.

2. Describe, with drawings, a practical arrangement whereby one man can haul a tender aboard a small cruiser, and discuss the best position aboard for disposal of same while cruising.
Suggested by J. K. B., Brooklyn, N. Y.

3. Discuss and illustrate if necessary the installation of a motor in a rowboat or canoe, including alterations necessary, and the points that need to be taken into consideration.
Suggested by W.K.B., Ann Arbor, Mich

RULES FOR THE CONTEST

Answer to these questions, addressed to the Editor of MoToR BoatinG, 119 West 40th St., New York, must be (*a*) In our hands on or before July 24th, (*b*) about 500 words long, (*c*) written on one side of the paper only, (*d*) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 24th of July.

The prizes are: For each of the best *answers* to the questions above, *any article* advertised in the *current issue* of MoToR BoatinG, of which the advertised price does not exceed $25, or a credit of $25 on *any article advertised* in the *current issue* of MoToR BoatinG, which sells for more than that amount. (*There are three prizes—one for each question—and a contestant need send in an answer to but one if he does not care to answer all three.*)

For each of the questions selected for use in the next contest, *any article* advertised in *this issue* of MoToR BoatinG, of which the advertised price does not exceed $5, or a credit of $5 on *any article* advertised in *this issue* of MoToR BoatinG which sells for more than that amount.

If you win the prize you must allow *us* to do the ordering of the prize you select.

Overheating Often Due to Carelessness.

THE most serious of motor troubles is overheating, because of the excessive wear and the injury to carefully machined and accurately fitted parts. The causes of overheating may, for the sake of convenience, be placed in three classes; defective lubrication, insufficient water circulation and improper carburetion.

Under the heading of lubrication, we need not consider neglect to turn on or fill lubricators, for these are but matters of carelessness, although, by the way, they have sent many a good motor to the repair shop and even to the scrap heap. Trouble may sometimes be experienced with oiling systems that depend for the distribution of oil upon pressure taken from the base, for grit or flakes of carbon may get into the check valve that retains the pressure, and thus put the whole system out of commission. The belt that op-

When you send in your answers you must state what you will take for a prize should you win one.

erates force-feed oilers may slip, and allow the oil pump to stop. In either case, if the trouble is not quickly noticed, a burnt bearing or a scored cylinder may be the minimum damage.

Dirt from impure oil may get into the feed pipes or the feeds, and either completely or partly check the supply to one or more points. It is a very good practice always to strain the oil. The operator should also make it a point to look at the sight feeds of his lubricator at frequent intervals, to make sure that every part of the engine is getting the proper amount of oil. Any alteration in the regular running of the motor, especially if accompanied by squeaks and grating sounds, should be promptly investigated. If it is necessary to change the grade of oil, it will probably be necessary to readjust the lubricator. A heavier oil feeds slower than a light oil, and any considerable change from a thinner to a thicker grade may result in insufficient lubrication unless the feeds are adjusted.

Improper operation of the cooling system is also responsible for much overheating. Sometimes the pump fails to take water when the engine is started, and this is discovered only when the enamel begins to scorch. If a motor is subject to such a failing, see that the water is running each time you start. If it is not, remove the cover of the check valve nearest the intake, and pour in some water. This priming should start the flow. If the engine has become sufficiently heated to scorch the enamel, let it cool before allowing the water to circulate, as there is a possibility of cracking the casting.

This failure of the cooling system may be due to several things. If the motor is equipped with a plunger pump, the packing may need renewing. Worn gear and centrifugal pumps sometimes fail to start the water unless primed. The check valves may be worn, or may not seat properly. Sometimes a motor that has been running smoothly suddenly begins to labor, and knock or pound irregularly, while the cylinders become very hot. In such an event, look for a stoppage of water. On an occasion of this kind, the writer found that a seed of a water plant had been drawn in through the intake, and had lodged between one of the check valves and its seat, with the result that the circulation was stopped.

Mud, sand, decaying plants and other debris are apt to be taken up, clogging the pipes. To prevent such occurrences, a strainer should be attached to the intake. But even then the meshes of the strainer may become partly clogged, and thus interfere more or less seriously with the flow of water.

W. K. BOWEN,
Ann Arbor, Mich.

Auxiliary Sails for Cruisers.

Rigging Up the Most Suitable Sails for Motor Cruisers of the Raised-Deck and Trunk-Cabin Types. Rules and Methods for Determining Mast Location, Centers of Area, etc.

Rig and Center of Area Important.

(The Prize-Winning Answer.)

A MOTOR cruiser with a disabled power plant and no sail rig is at a greater disadvantage than the becalmed sailing boat without auxiliary power, as it has no steerage way if overtaken by a storm.

The first problem in equipping a boat with sails is to determine where the center of sail area should be located. Since different types of boats have different underwater body and the tendency of a sail is to thrust sideways except when sailing before the wind, it is necessary to have the centers of sail area and lateral resistance at the same point.

The center of lateral resistance is the station at which a propeller would have to be placed to drive the boat sideways through the water and may be determined by towing the craft sideways with the tow-line attached at the sheer. Various points should be tried until she tows square with the tow-line.

Most sea-going boats will have this point fairly well aft and therefore for ease of control should have two sails. The sharpie rig, as illustrated in Fig. 1, will give splendid results in boats of this type.

Fast day cruisers, on the other hand, will be found for the most part to require a center farther forward. For this reason and because they can carry smaller sail area with safety, it is advisable to use but one leg-of-mutton sail, as shown in Fig. 2. For very heavy boats, particularly of the whaleboat type, a sloop rig may be used, as illustrated in Fig. 3, but this rig should not be used on cruisers of narrow beam, as their stability is not great enough.

When the most suitable rig has been chosen, it will be necessary to find the center of area for each sail to be used and this may be done as follows, regardless of the shape which has been adopted.

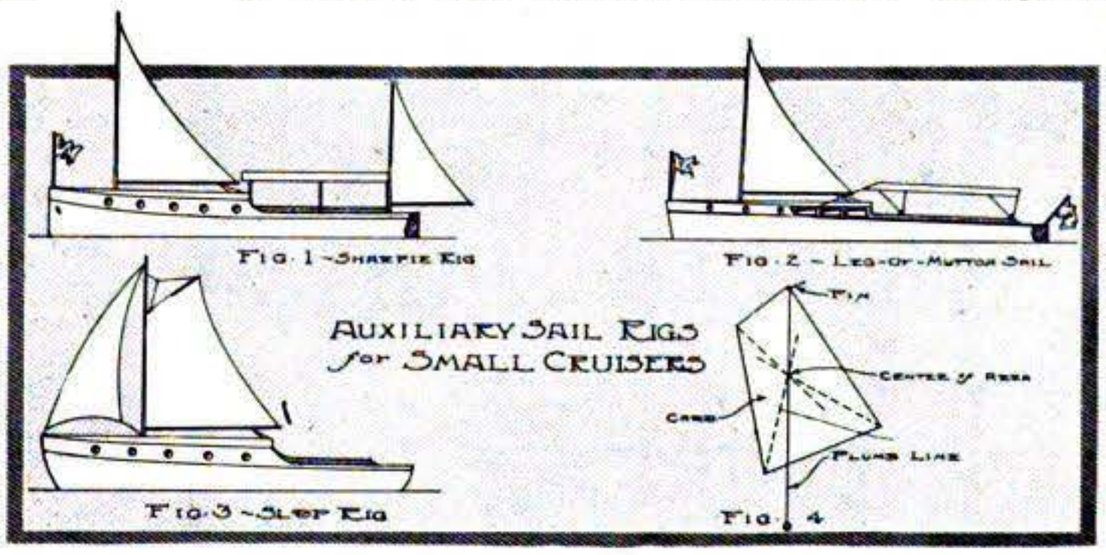
Take a piece of smooth cardboard about one foot square and cut it to the same proportionate shape that your sail is to be. Now pin this to the wall from one corner and drop a plumb-line down from the pin as shown in Fig. 4. Draw a pencil line to mark the path of the string. Repeat this from any other corner and mark a point at the intersection of the two lines. This will be the center of area of the card and the same relative point will be the center of area of the finished sail. To check yourself it is well to drop the line from all corners and if your hand is steady all the intersections will occur at one point.

Now to locate the proper positions for the sails it is only necessary to use a simple proportion as follows:

a = area of forward sail.
b = area of after sail.
y = distance from center of lateral resistance to center of forward sail.
z = distance from center of lateral resistance to center of after sail.

$$\text{Then } \frac{a}{b} = \frac{z}{y}$$

Of course, it is not possible for the modern popular cruising boat, designed for motor power, to be operated as efficiently with sails as a sailing craft designed as such, especially as regards direction, but the rigs suggested above will give good auxiliary service and will sail at a wide angle with the direction of the wind. R. W. HUESTIS, Springfield, Mass.



The sharpie rig, the leg-of-mutton sail and the sloop rig, as suggested by the prize winner.

The Trysail Rig.

THE sail plan shown in the accompanying sketch makes an ideal auxiliary and offers several advantages over the many other different types in use. While it is a well-known fact that a jib-headed sail does not have the pulling power of a gaff-headed sail or a lug rig, still how many of the raised-deck or trunk-cabin cruisers of today are capable of carrying sail where the drawing power is aloft? These types would be far superior if it were possible to control the wind and always have a following breeze, but, since we must utilize the wind as we find it, it is necessary to devise a sail with its drawing power as low as possible, hence the trysail. The spar is also selected with this object in view and measures two-fifths of the boat's over-all length. In this instance, the boat being a 35-footer, the spar is 14 feet above deck.

When rigging the mast so that it will be stiff enough to carry any amount of sail it is necessary to to step it firmly in a block bolted to the keel, even though this does entail its passing through the cabin, as no matter how firmly it may be stepped in a casting on deck, as most signal masts are, it is bound to work more or less, giving no end of annoyance, especially in a trunk-cabin boat where it is so difficult to keep the cabin from leaking. One-third of the length of the boat was selected in this case for the location of the mast, but this may be varied slightly to meet different requirements. It should not be set too far forward, as this may necessitate the rigging of a bowsprit to carry enough headsail so that she will steer properly.

Two phosphor bronze stays on each side secure the spar in place and are spaced 18 inches fore and aft of the mast to overcome the necessity of a jib stay. They are set up with turnbuckles fastened to chain plates which bolt through the ribs of the boat, and it may be necessary to vary the distance between them to meet the ribs. The deck is reinforced at the spar by two oak blocks, one above the deck and one below, bolted together. A can-

vas mast cast is fitted around the spar and tacked to the deck to prevent leaking and should be fitted loosely to allow for the "working" of the mast.

In computing the sails, allow a foot at the deck and a foot at the top and make the foot at right angles with the luff, roaching it slightly, as the strain will gradually pull it straight. Strain patches should be sewed in the corners and the whole sail roped with three-eighths manila after it has been well pulled down. Thimbles are seized in the corners of the sails and a sister hook is fitted to the thimble in the tack of the jib and mainsail. The masthoops on the mainsail are pieces of small cotton rope seized to the roping with an eye splice in one end and a small wooden toggle in the other. The regulation metal or wooden hoops may be substituted if desired, but in this case the toggle idea was used for convenience. Twenty-two-inch ten-ounce duck is suitable material, and in cutting it should run with the leach, as these sails set flying, and with the ease in which they are set or stowed they are not intended to be furled, but unrigged and stowed away when not in use.

E. A. CRAWFORD, South Orange, N. J.

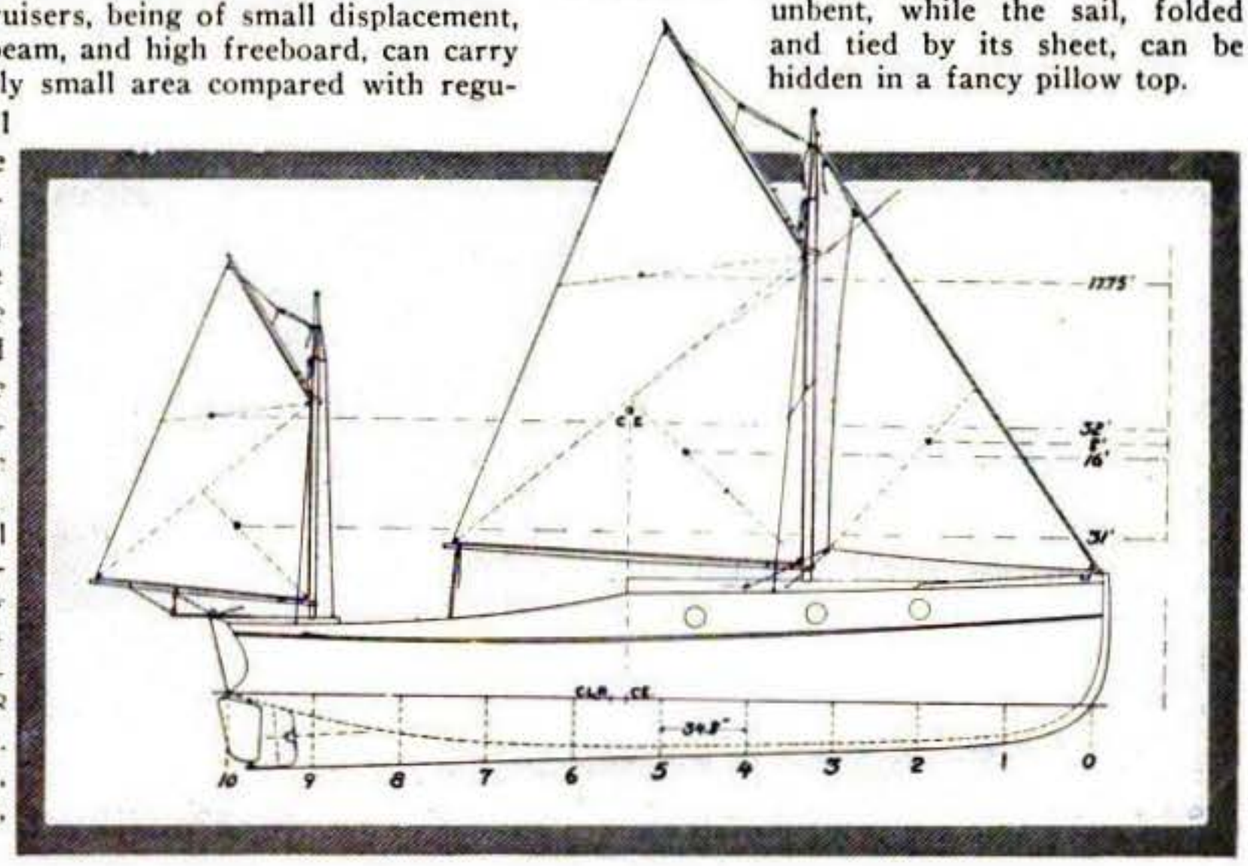
The Yawl Rig.

THE yawl rig has many advantages when used as an auxiliary on a motor cruiser. When properly proportioned the boat may be sailed with jib and mizzen or mainsail alone, allowing considerable choice in the amount of canvas carried in different weathers.

The location of the mast affects the balance of the vessel only in so much as it is desired—provided the sails are arranged so the center of effort is in the proper location in regard to the center of lateral resistance.

The amount of sail a boat could carry might be calculated for a certain velocity of wind, but this is not practical for the average boat. The usual way even in the old sail boat days was for the designer to study carefully the types, sizes and amount of sail carried in practice, this being considered of greater value than any calculations.

Motor cruisers, being of small displacement, moderate beam, and high freeboard, can carry sails of only small area compared with regular sail boats. The area suitable in each case can best be determined by some one experienced with sail boats. The sail plan submitted is for a 30-foot cruiser with 8 feet beam. C. H. C., Saginaw, Mich.



C. H. C.'s sail plan for a 30-foot cruiser having a beam of 8 feet.

Recommends a Gaff-Headed Sail.

AN auxiliary rig which is efficient, easily handled and equally suitable for small cruisers of the raised deck and trunk cabin types is that illustrated in Fig. 1. It is a gaff-headed loose-foot sail, a type possessing greater driving power than any other, especially when sailing off the wind.

The mast, equipped with shoulder cleats and a three-eye mast-band, as shown, also a screw-eye to which the sail is made fast at the tack, should be securely stepped and stayed.

The gaff, which has jaws easily removed by the use of two bronze bolts, serves the purpose of a boat hook when this rig is unbent, while the sail, folded and tied by its sheet, can be hidden in a fancy pillow top.

By using a gaff bridle block on the peak halyard, toggle lines to hold the sail to the mast and a rope running around the gaff from the peak to the throat through grommets in the yard of the sail, the operation of bending on the mainsail is a matter of but a few minutes. As for the jib, no trouble will be had with it if snaps are used as shown in Fig. 4.

This I have found to be the ideal rig and, although the leg-of-mutton sail, used with either a boom or loose foot, and the square yard sail (Figs. 2 and 3, respectively) are pretty good rigs on the wind, they are not nearly as good off the wind as the gaff-headed sail with a loose foot.

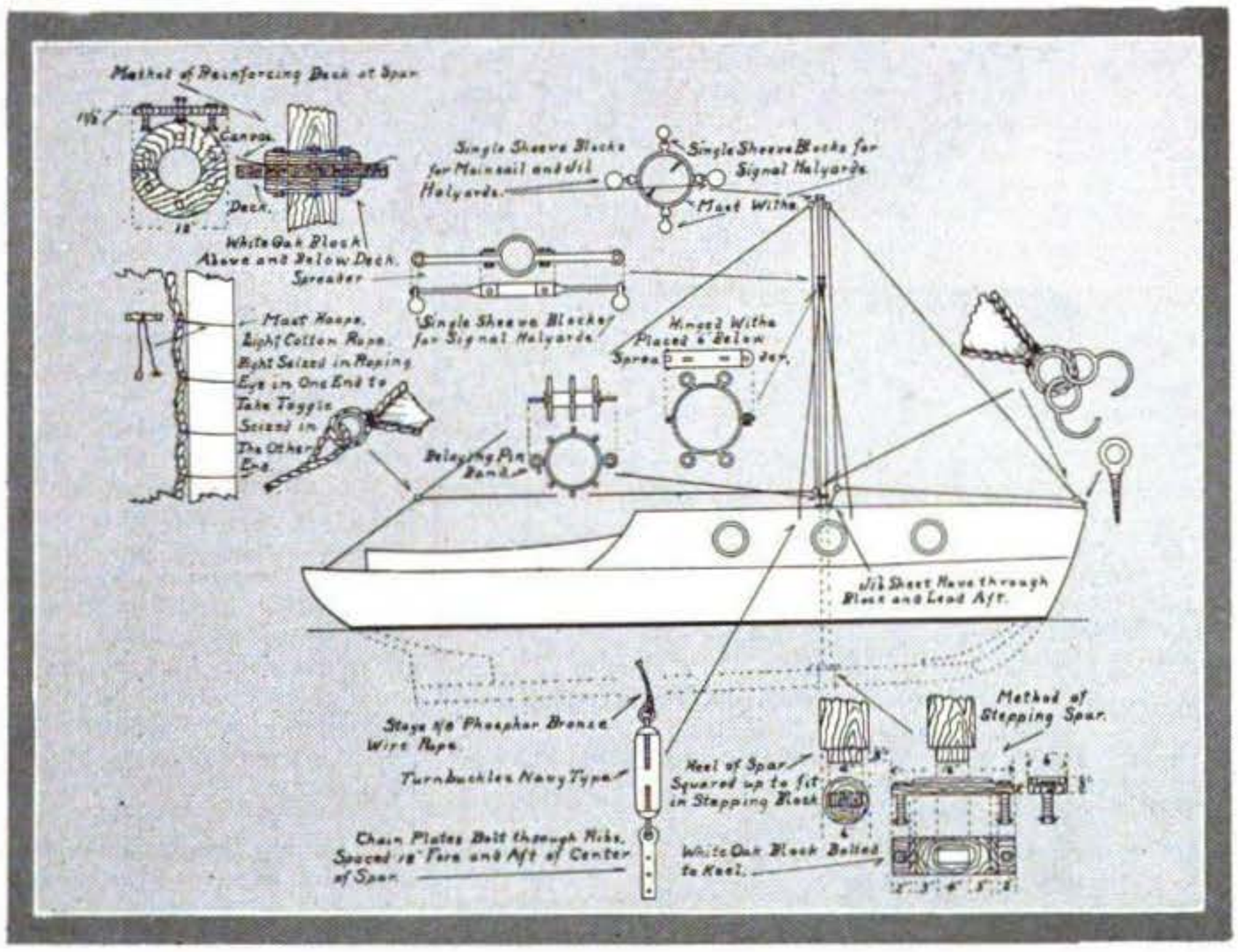
How much sail should the boat carry? To determine the exact amount is a problem too difficult for the average skipper and the only rule he can follow is that of appearance. You, of course, would not attempt to put the rig of a sail boat on a cruiser, nor could you expect to get any push out of a sail the size of a towel.

Make a sketch of your boat to scale, say ¼ inch, ½ inch or 1 inch to the foot. Then cut out cardboard patterns of the sails you think the boat can carry. Trim them up until they present a neat appearance when placed on the sketch, after which they should be measured by the same scale used in drawing the boat.

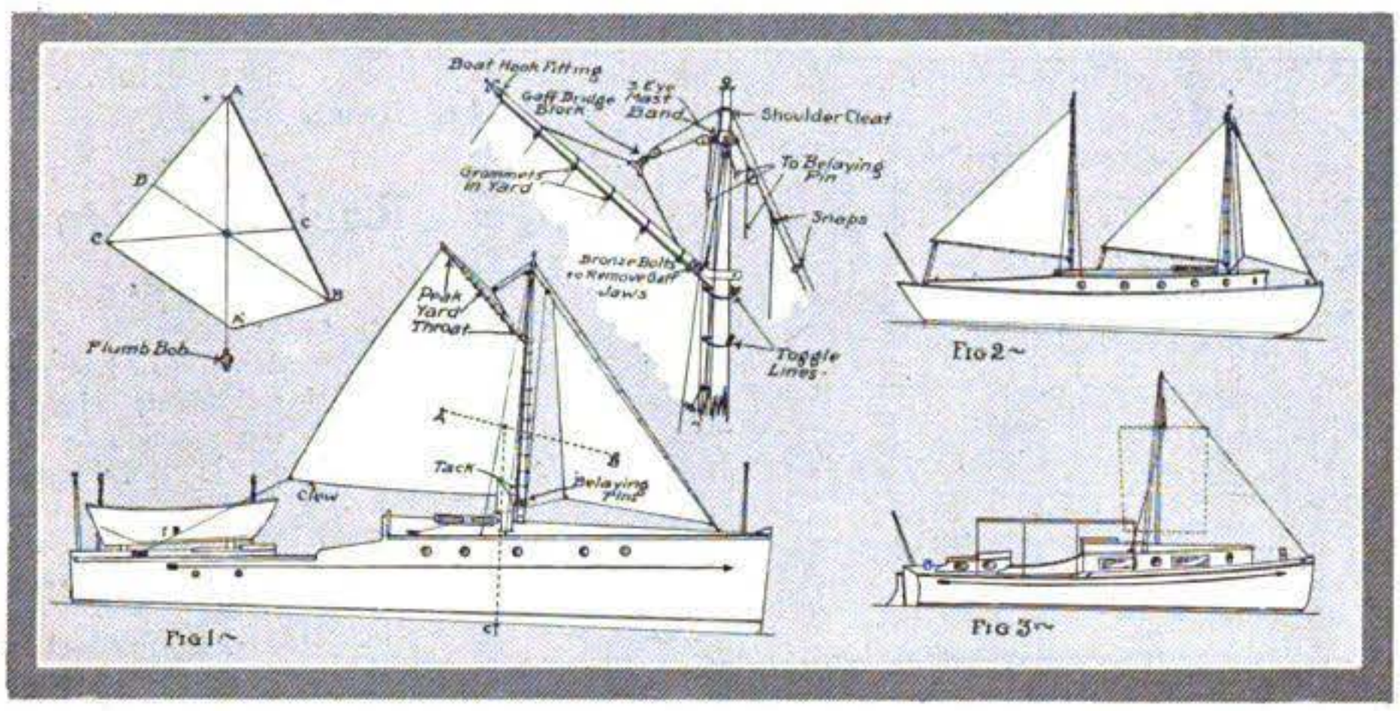
The next consideration is to ascertain where these sails should be placed so as to derive the greatest benefit from them. In order to do this you must know two things: First, the point of lateral resistance of the boat, and, second, the center of sail area, or center of gravity, as it is sometimes called.

The former is found by moving the anchor line, if in a tideway, or the tow line, if being pulled by another boat, along the gunwale until the cruiser is balanced broadside to the current. This is the point of lateral resistance and it will vary on different boats, due to the shape of their underbodies.

The latter is found by using the cardboard patterns of the sail plan mentioned above. As shown in Fig. 5, the pattern should be hung from corner *A* by a pin having a bob-line attached. The point where the bob line passes through the opposite side (*A'*) should be



Complete detail drawings by Mr. Crawford, with dimensions for fitting a trysail rig to a 35-footer.



A gaff-headed loose-foot sail which possesses great power when sailing off the wind, designed by J. K. B.

marked, after which draw the line *A-A'*. After going through the same operation with corners *B* and *C* as a basis, it will be found that lines *A-A'*, *B-B'* and *C-C'* all intersect at point *O*, which is the center of gravity.

By simply placing the mast so that the center of area of the sail is directly over the point of lateral resistance, you get a perfect balance, without which it would be almost impossible to hold the boat on her course if the wind was from any direction but aft.

With the addition of another sail, jib or jigger, the center of area is of course changed and the location of the mast should be shifted forward or aft accordingly. To find it, however, is a simple proposition. (Refer to Fig. 1.) Multiply the area of your mainsail by the distance between the center of area of the jib and that of the mainsail (*A-B*), and divide the result obtained by the two sail areas and the quotient is the distance the center of area will come aft of *B*.

J. K. B., Brooklyn, N. Y.

Stowing the Signal Flags.

Methods of Disposing of the Code Flags and Other Colors which Every Motor Boat Should Carry. Keeping Them Neat and Accessible at All Times the Prime Considerations.

A Flag Box.

(The Prize-Winning Answer.)

IN THE average small cruiser spare room is at a considerable premium and such things as signal flags, which are not used frequently, are generally stowed away in the bottoms of lockers or drawers where it will be very difficult to find them. To remedy this condition and keep the signal flags handy is something in which every motor boatman should be interested.

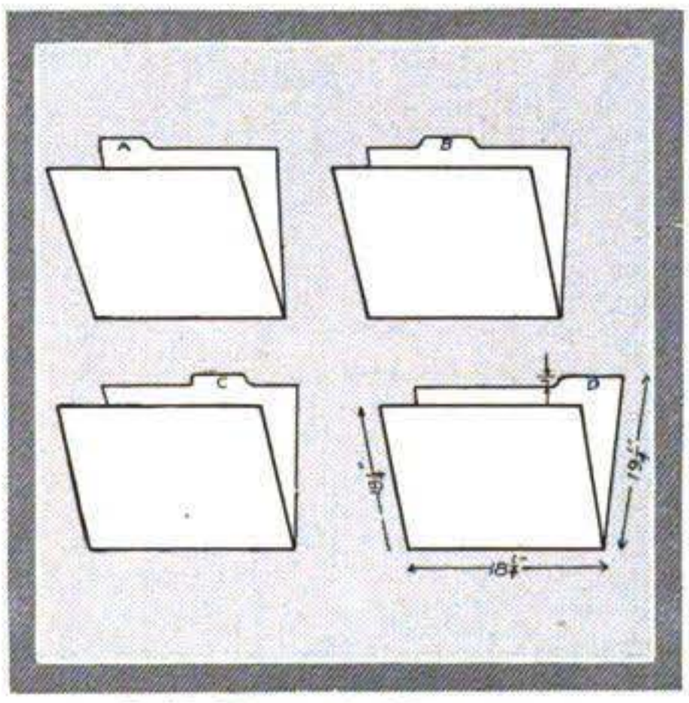
A convenient method of caring for signal flags is as follows: Finish a wooden box to harmonize with the other trim of the boat. Its size must necessarily be adjusted to local conditions. The average small set of flags should fit into a box of about 9x12x3 inches long. On the inside cover of the box twenty-seven one-inch cup hooks are screwed in three rows so that they overlap a little. A spacing of three inches in each direction will be ample. Each hook is then marked with a letter of the alphabet and a special mark allotted the code flag. The hooks on the tops of the flags are hooked into these hooks and the signal box is complete. When the box is opened the loop of each flag will be on a separate hook and in its proper place. When the cover is down they will all be on the inside. Additional hooks can readily be provided to care for the other flags in the boat's set if desired.

By cutting two small slotted holes in the back board it will be possible to suspend the box from large headed screws in a bulkhead or partition. When desired, the box with contents can be brought on deck for use.—F. W. H., N. Y. C.

Vertical File System Best.

THE best method of stowing signal flags is the one that permits the quickest and most accurate selection of such flags as may be wanted, and, at the same time, keeps the flags in the best condition. A simple vertical file system, such as is used in all large offices for handling correspondence, does this to the queen's taste.

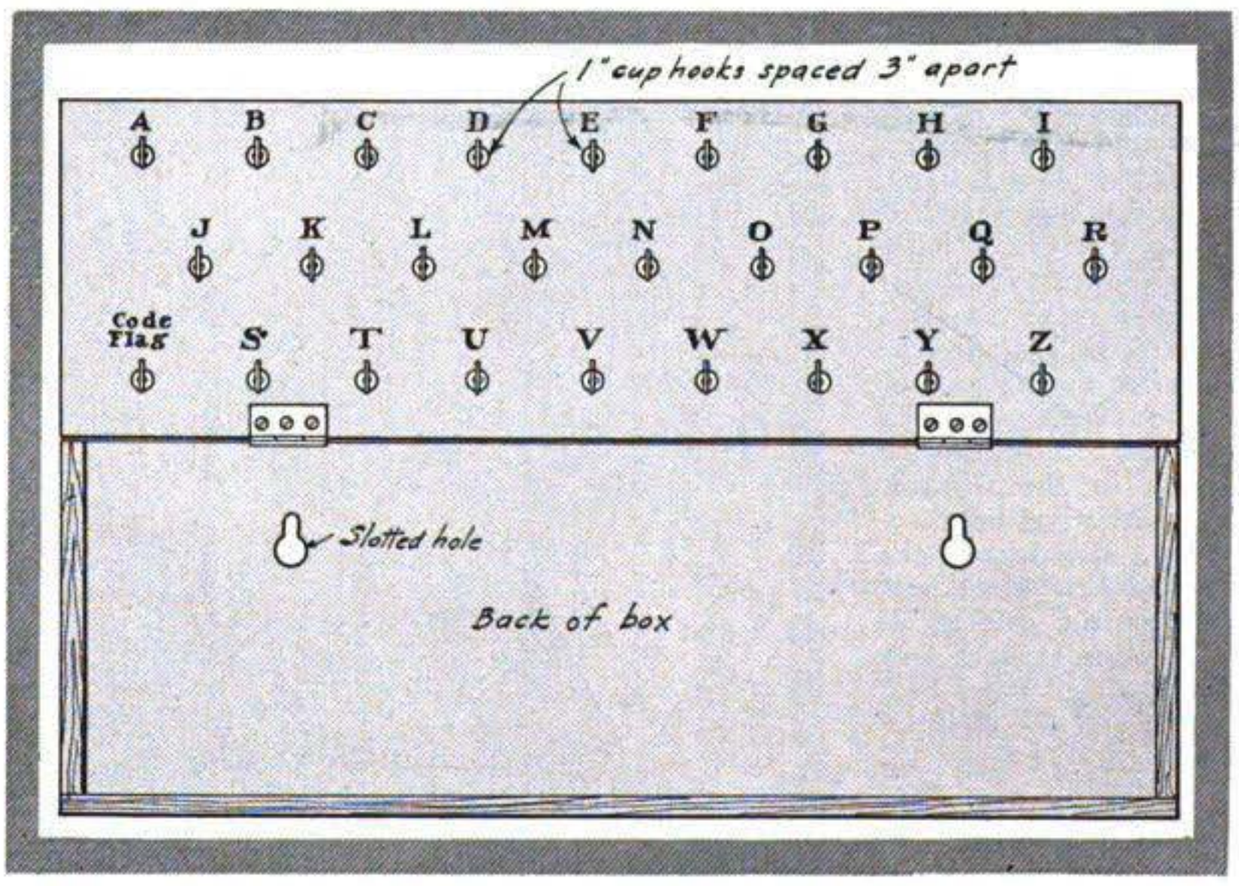
These flags are made in standard sizes, 18 inches square, 24 inches square, and so on, the smallest size being commonly used on small yachts. I keep mine, which are 18 inches square, in a mahogany box, which is 18½ inches wide, 19½ inches high and 8½ inches from front to back (inside measurements), the cover having a 1-inch rim. Each flag is kept in a separate paper cover, which is simply a folded piece of heavy manila stock, such as is used for correspondence files; this is 18¼ inches wide and 18¼ inches high, with a portion of the rear side left standing above the front edge, one-quarter of the length of the top. This flap bears a heavy face letter done with waterproof drawing ink, corresponding to the letter of the flag it contains.



P. E. F.'s vertical file system.

For a complete set you will need seven covers with the flap extending from the left-hand edge one-quarter of the length of the top edge; seven with the flap extending from the end of the first quarter to the middle, and seven each with similar flaps covering the third and fourth quarters.

Now, put flag A in one of the first covers, with a neatly printed *A* in the middle of the flap, and drop it into the box next to the front; put B in one of the second group of covers and put immediately behind A; C in one of the third group; D in one of the fourth, E in one of the fifth, and so on; the answering pennant goes in number 27. If desired, you can have several extra for your private pennant, absent pennant, meal pennant, etc.



The prize winning flag box suggested by F. W. H.

With this stowage of flags, you can select any flag instantly and accurately; it only remains to return it to its proper place when it has served its purpose. The flags are thus kept clean, without folds or wrinkles.

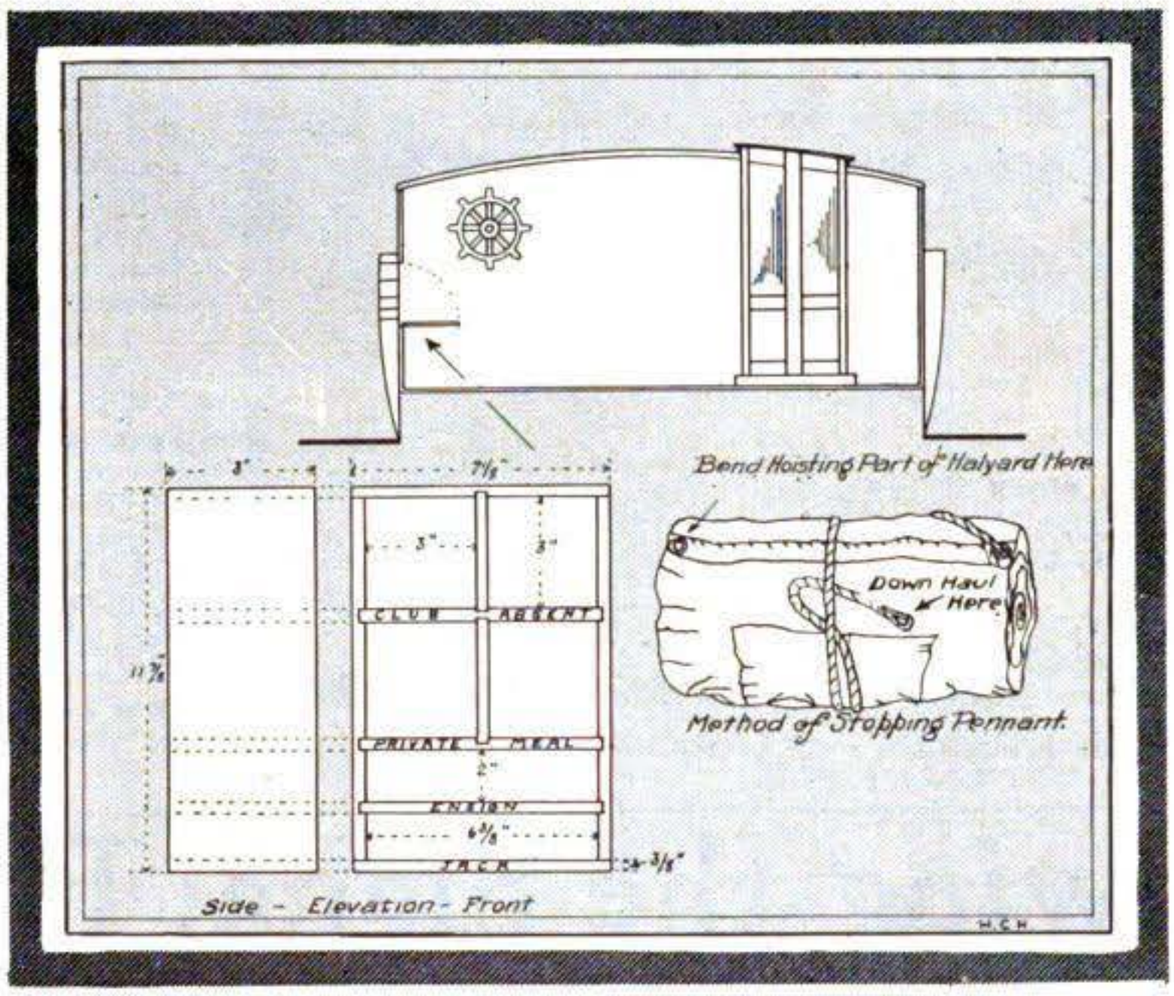
If you can't find room for a file this large, the flags may be folded and kept in smaller covers, but in this case one of the desirable features of the above, keeping the flags flat, is defeated.—P. E. F., St. Petersburg, Fla.

Sending Colors Up In Stops.

THIS locker, as shown in the drawing, is composed of 6 pigeonholes, the four upper ones 3 inches square and 3 inches deep, while the two lower ones are 2 inches high, 3 inches deep and 6⅜ inches long. The smaller ones contain the club, owner's absent, meal, and private pennants, and the two larger ones the ensign and jack. This is all the bunting we ever use on our cruiser, a 28-footer, so the locker was made to accommodate these six flags, but in the event of one wishing to carry the International Code or any other signals, it may easily be enlarged to suit requirements.

It is built of ⅜-inch whitewood, stained and varnished, and on the bottom of each hole the name of the flag is lettered so there is no confusion when selecting the flag wanted. The door in the side of the cockpit is hinged at the bottom and is secured when closed with two small brass buttons. As the locker occupies a space which is seldom used for any other purpose, together with the fact that all these flags are accessible in a moment when needed, it seems to be a very suitable place.

The sketch shows a method of stopping a pennant so that it may be sent aloft and broken out after it is in place. To do this it is necessary to have a short lanyard spliced in the eye at the bottom of the flag long enough to go around the pennant after it is rolled up, tucking the bight of the line under itself as shown. The hoisting part of the halyard is bent in the eyelet at the top of the flag and the down-haul bent in the eye in the lanyard. In hoisting be careful to leave the down-haul slack, and when the pennant is in place a slight jerk on the down-haul will pull the bight of the lanyard loose, releasing the flag. This may be applied to all the bunting except the ensign and jack, as it is customary to set them flying.—H. C. HUNIN, E. Orange, N. J.

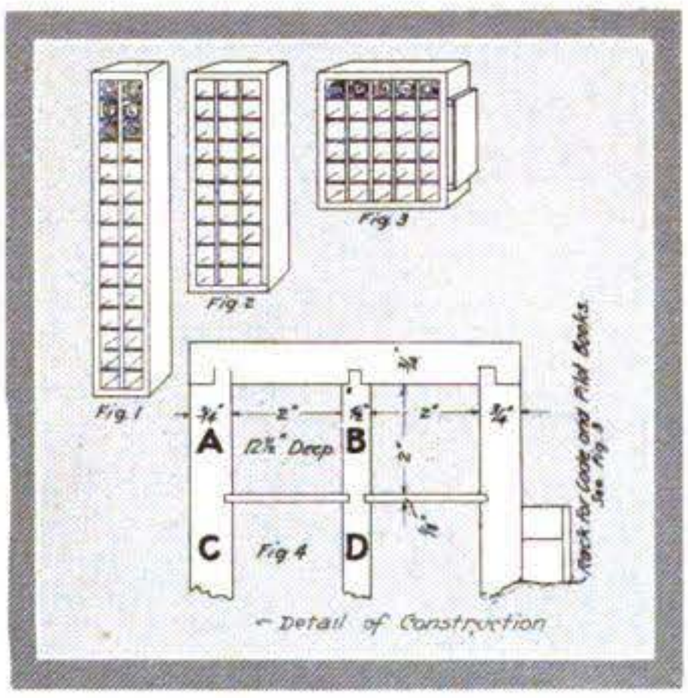


A flag locker arranged in the cockpit is Mr. Hunin's recommendation.

Rack for Signal Flags.

A SIMPLE, easily made and inexpensive rack for holding signal flags is the pigeonhole system shown in the illustrations, with a separate compartment for each flag, into which it may be easily slipped when tightly rolled. This scheme is very flexible and can be adapted to many spaces. Fig. 1 shows a double row to be placed vertically against a clothes locker or in any narrow space. The same can be used horizontally over a berth or under a cabin roof. Fig. 2 is a triple row and Fig. 3 is a form to fit a shorter wider space. The rack should have a back of galvanized wire mesh for ventilation and may have a door or not as preferred. Fig. 4 shows details of construction. The size and depths of compartments given are for signal flags 12 by 18 inches in size. If smaller flags are used the opening may be reduced to 1½ inches and the depth to ½ inch longer than the width of the flags. A convenient addition is the compartment on one side for holding the code book.

C. M. HARRINGTON, Worcester, Mass.



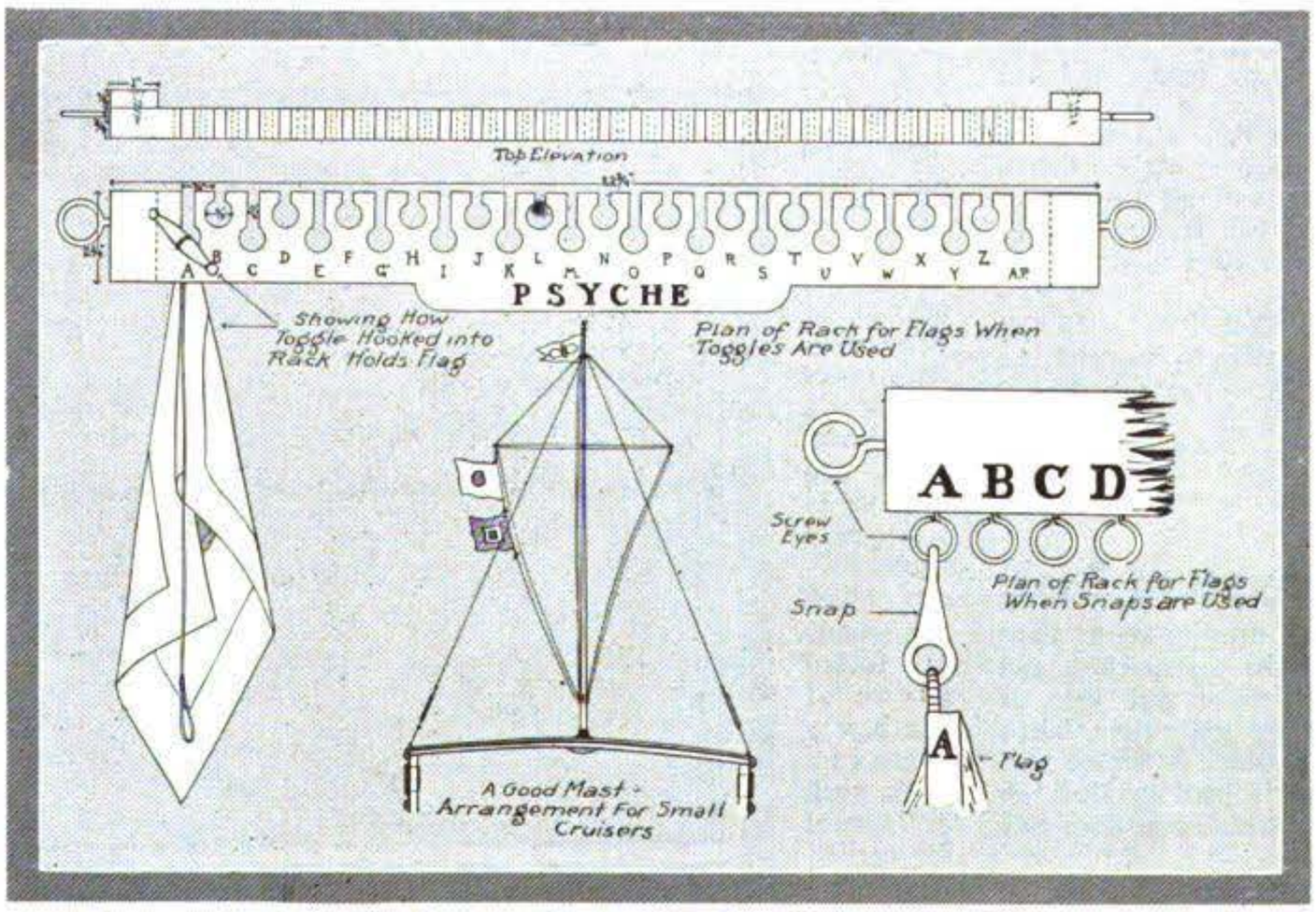
Pigeonhole system suggested by Mr. Harrington.

To Hang from the Mast.

THE arrangement described and illustrated herein is easily constructed and the flags, if damp when hung up, are sufficiently loose to allow the air to get to them and keep them dry. Of not the least importance is the fact that you can hook the rack to the mast and have every flag near at hand for immediate use.

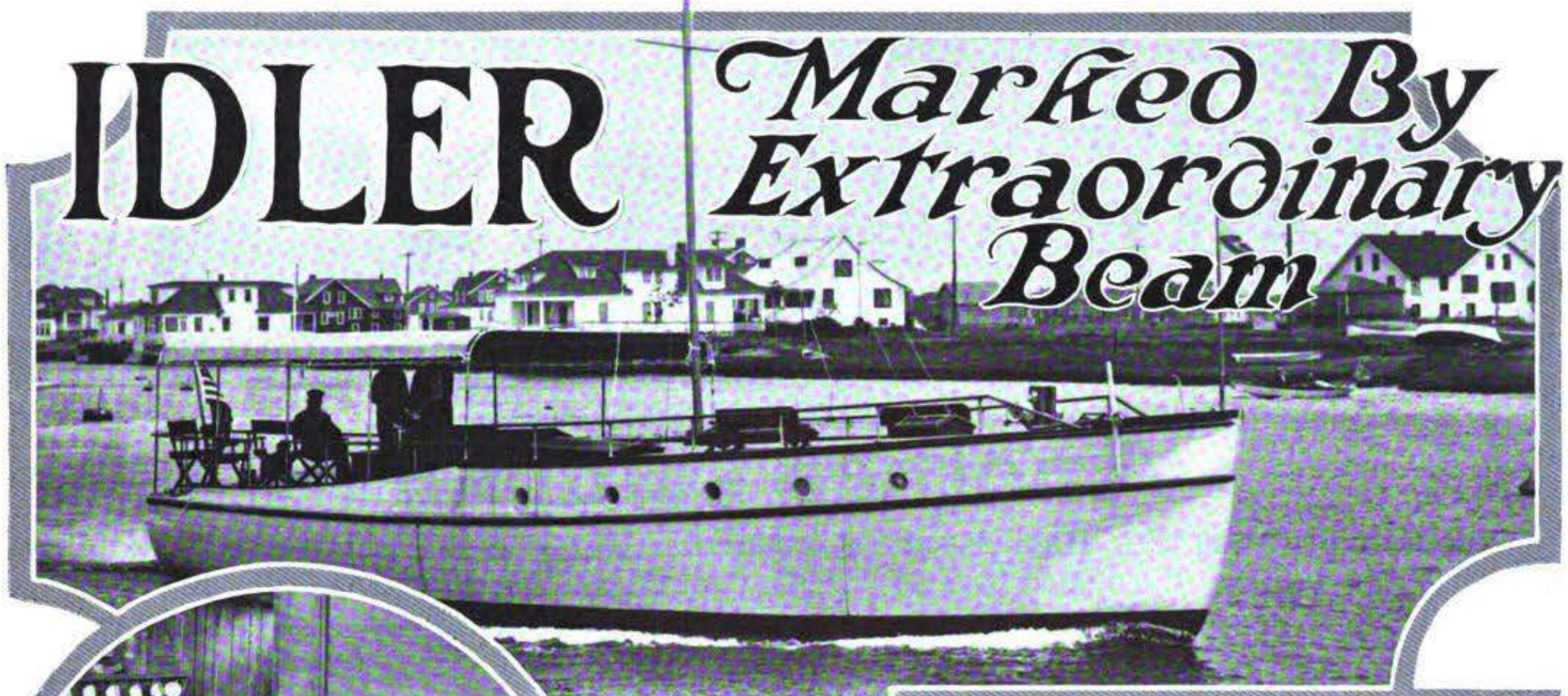
For flags equipped with toggles and loop ropes, take a piece of wood of the dimensions shown in the sketch, or, if you prefer, a sheet of brass about 3/16 inch thick, and bore ⅜ inch diameter holes in it, staggered and spaced as per distances given. Then saw slots ¼ inch wide in to these holes, and with the addition of two small pieces in the back, which allow for the thickness of the flags, and screw-eyes at the end, your rack is complete except for the lettering.

If, however, the flags are equipped with snaps, a shorter board with screw-eyes can be used and no drilling is necessary—J. K. B., Brooklyn, N. Y.

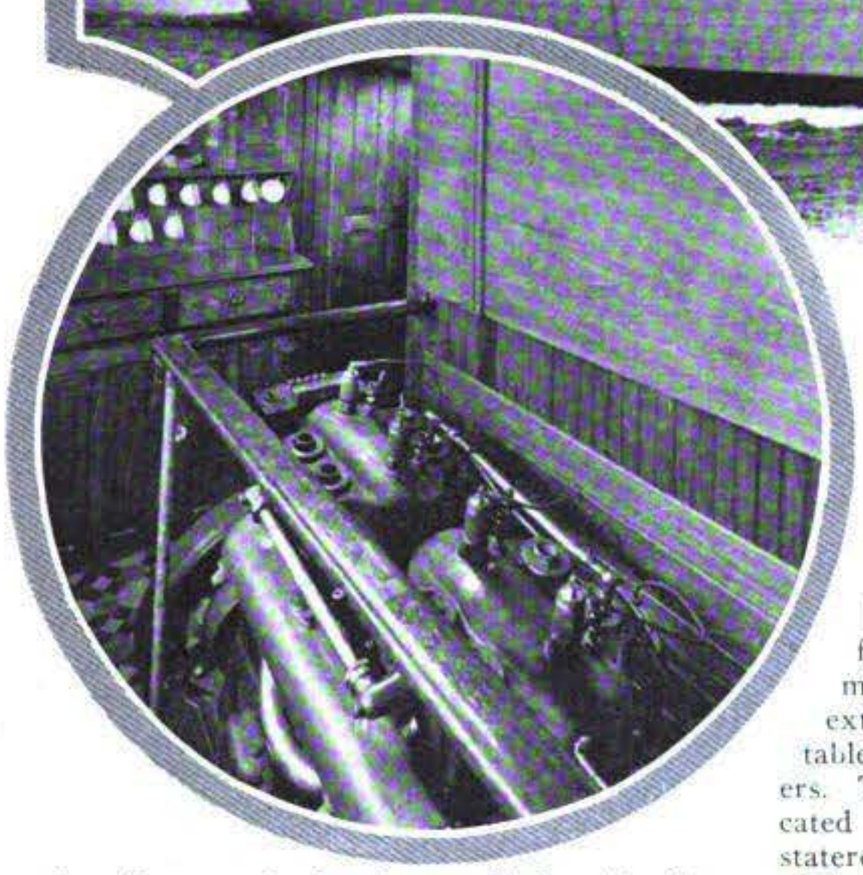


Simple and effective racks described by J. K. B.

IDLER Marked By Extraordinary Beam



Idler under way.

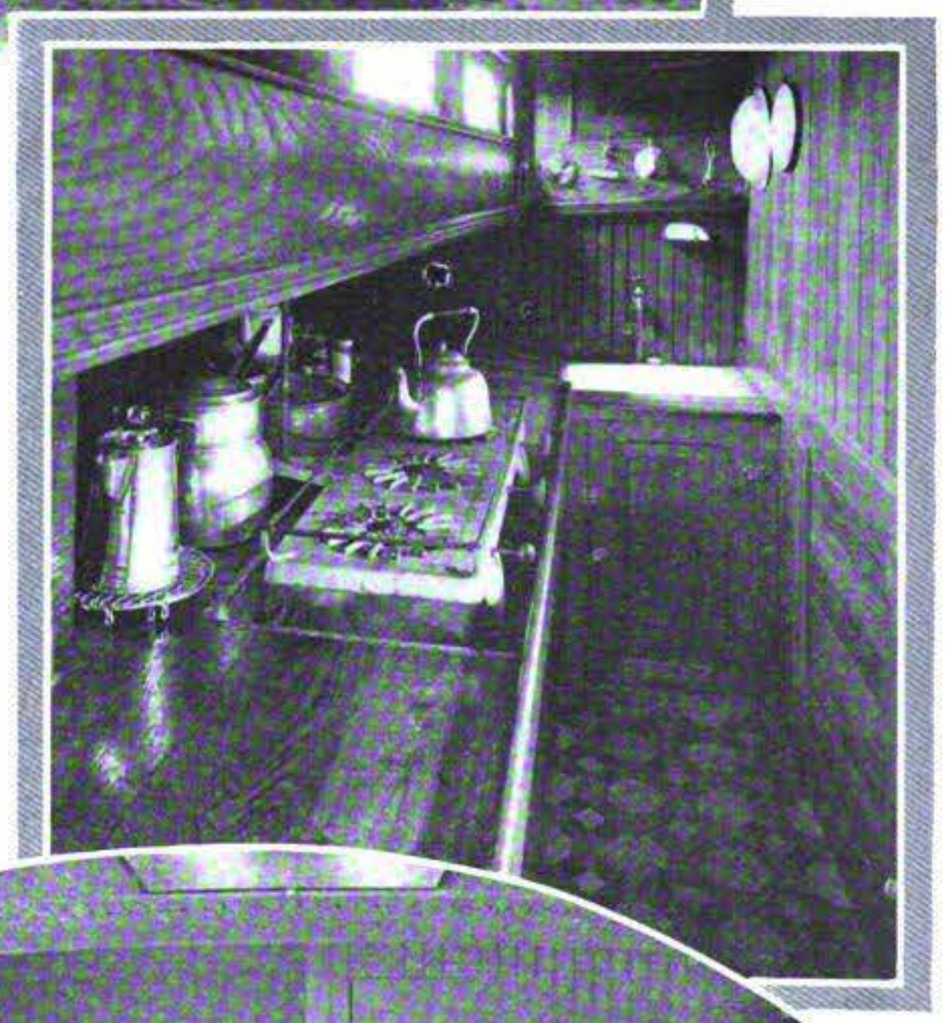


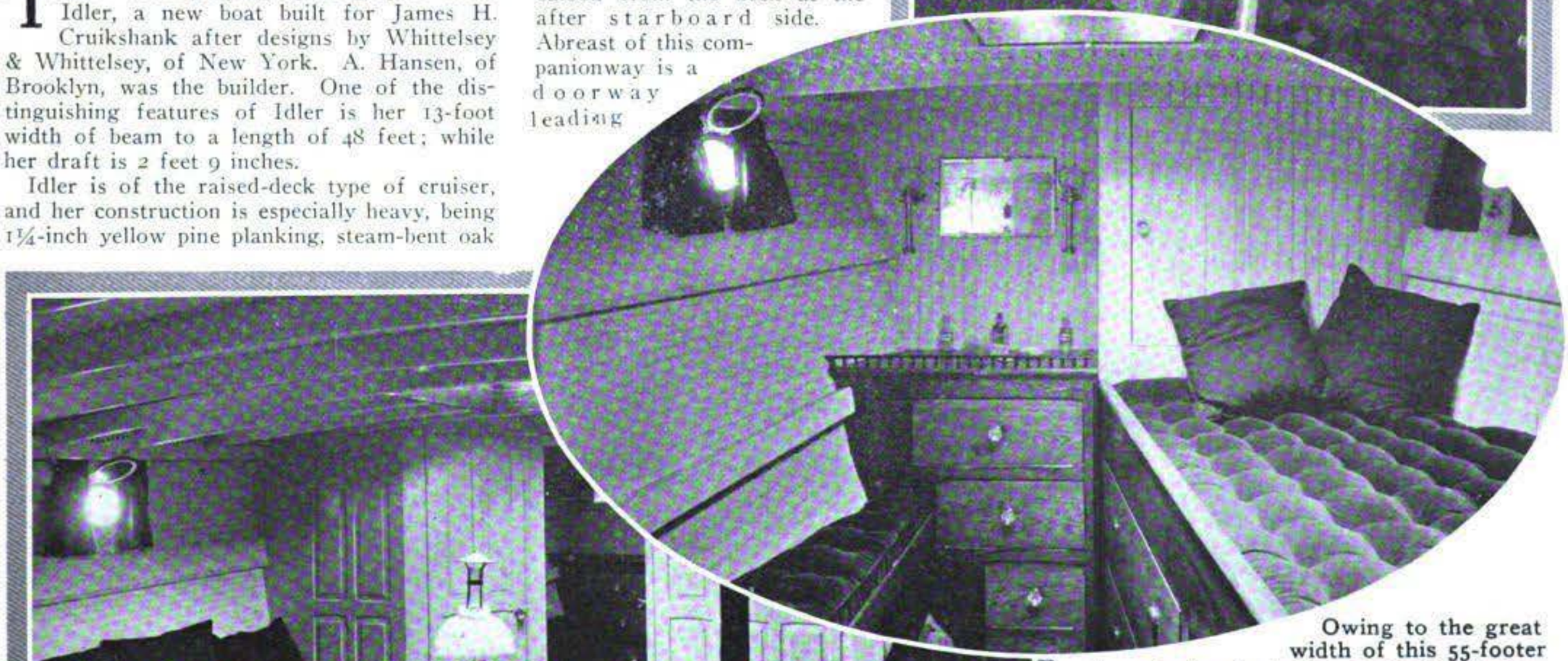
A glimpse of the four-cylinder Sterling motor.

THE accompanying photographs show Idler, a new boat built for James H. Cruikshank after designs by Whittelsey & Whittelsey, of New York. A. Hansen, of Brooklyn, was the builder. One of the distinguishing features of Idler is her 13-foot width of beam to a length of 48 feet; while her draft is 2 feet 9 inches.

Idler is of the raised-deck type of cruiser, and her construction is especially heavy, being 1¼-inch yellow pine planking, steam-bent oak framing and white pine decks, all copper fastened.

There is a wealth of room below decks, and the interior arrangement provides for a large double stateroom forward, followed by the main saloon fitted with extension berths, dining table, buffet and china lockers. There is a toilet room located between the forward stateroom and the main saloon, with doors leading from both compartments. The companionway leads to the main saloon from the deck at the after starboard side. Abreast of this companionway is a doorway leading





Owing to the great width of this 55-footer there is abundant elbow room in all compartments.

The dining saloon is particularly roomy and comfortable.

to the galley, which is very large and contains sink, ice-box, dish-racks, etc. The engine-room is opposite the galley and contains a berth for the boatman, with a toilet in the after end.

The power plant consists of a 5½x7-inch four-cylinder Sterling motor, which is controlled from the steering position on the main deck. The boat is equipped with electric lights.

The owner will use Idler at his home on the Great South Bay, Long Island. Her trial trip speed was 10 miles an hour.

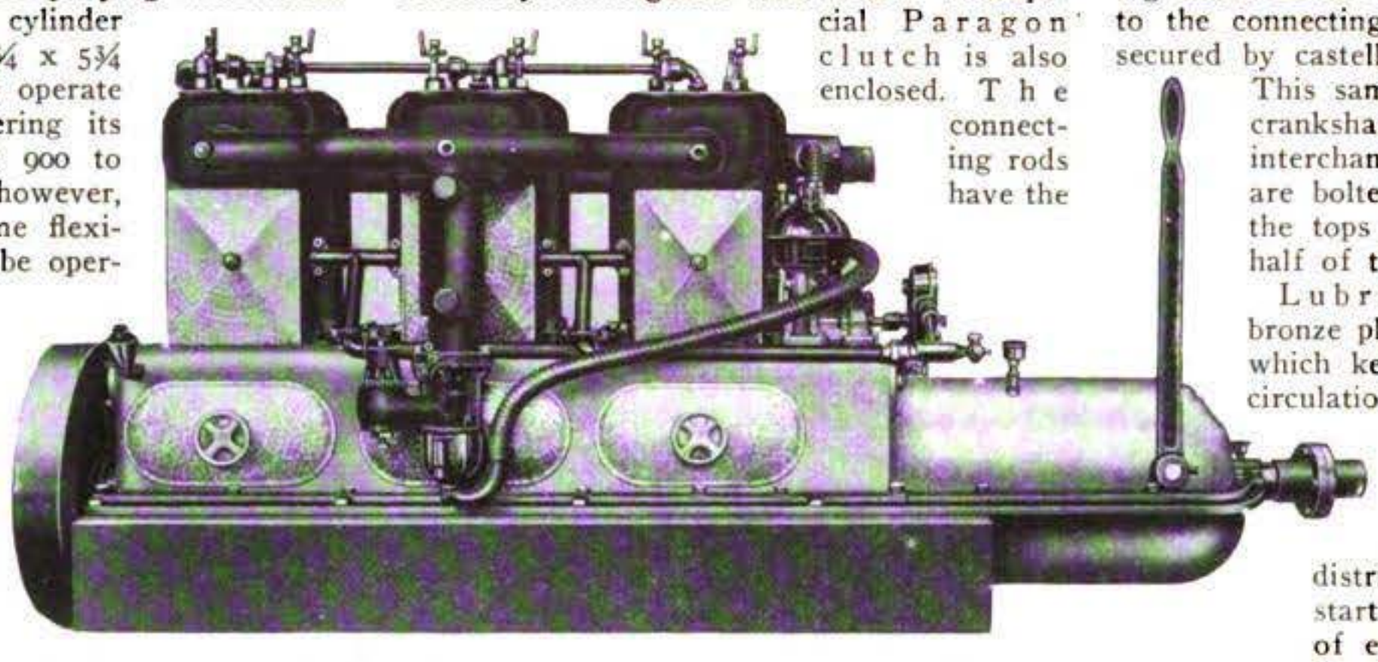
Photographs by Rosenfeld.

Another Lambkin.

Six-Cylinder 35-50 H. P. High-Speed Motor Noteworthy for Its Accessibility and Flexibility. Ignition Furnished by Two Independent Sets to Separate Sets of Plugs.

ONE of the newest engines turned out by the Lamb Engine Co., of Clinton, Ia., is the six-cylinder 35-50 h.p. Lambkin shown in the accompanying illustration. This motor, having cylinder dimensions of 3¾ x 5¾ inches, is designed to operate at high speed, delivering its rated power at from 900 to 1,200 r.p.m. It is, however, stated to have extreme flexibility, so that it may be operated at as low as 200 r.p.m.

Accessibility is one of the main features of this engine, and three large handhole plates on each side of the motor give instant access to the crankshaft and connecting rods. The valve action is enclosed by aluminum plates, as are also the gears operating the pump and magneto. All driving gears are contained in the crankcase, where they are constantly running in a bath of oil. The special Paragon clutch is also enclosed. The connecting rods have the piston end bronze bushed and running on a hardened and ground wrist pin. The lower or crankpin end is a bronze box lined with bearing metal of the highest grade, and fastened to the connecting rod by two turned bolts secured by castellated nuts with cotter pins. This same box is also used for the crankshaft bearing, the two being interchangeable. The bronze boxes are bolted to machined surfaces on the tops of the webs, in the lower half of the base, by turned bolts.



All driving gears in this new Lambkin are enclosed in the crankcase and are constantly running in a bath of oil. The Paragon clutch is also enclosed.

Lubrication is effected by a bronze plunger pump, pitman driven, which keeps the oil in constant circulation.

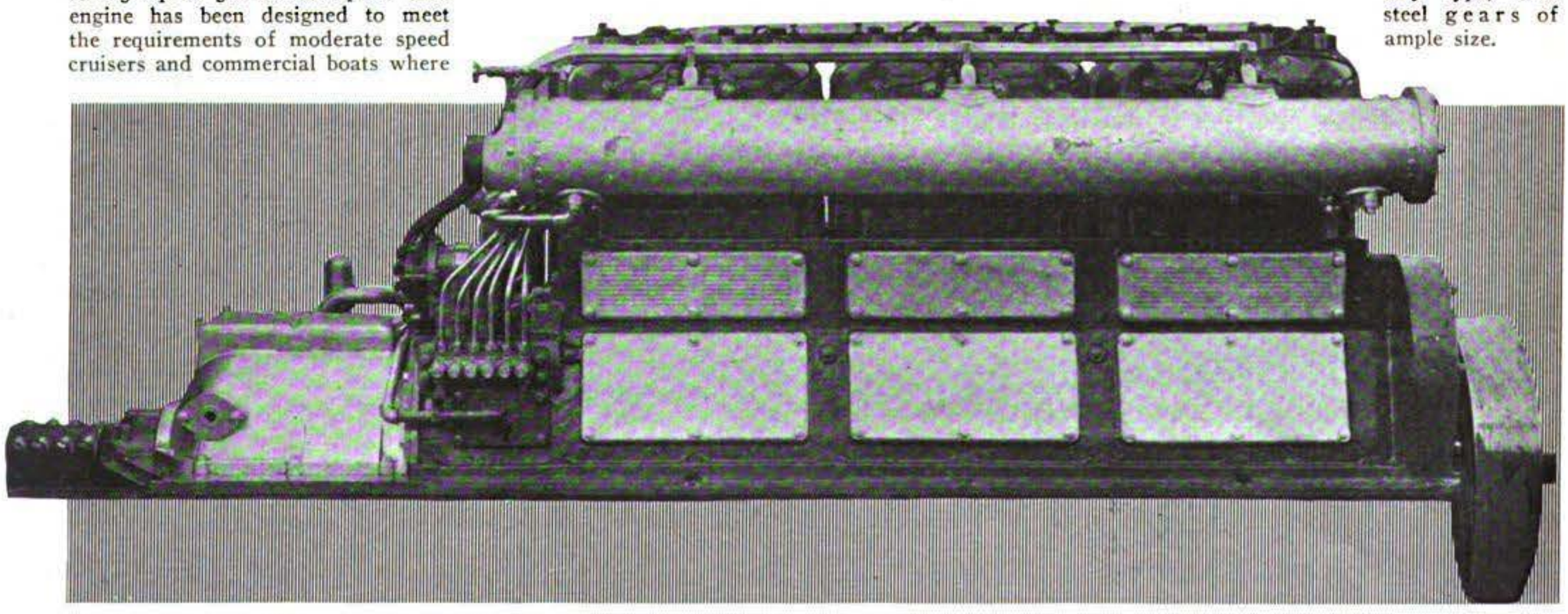
Ignition is furnished by two independent sets to separate sets of plugs, one set, consisting of a distributor, coil and batteries, to start on and to be used in case of emergency, and the other a Bosch high-tension magneto for regular operation.

A Smooth-Running Engine.

The New 100-115 H. P. Speedway Which Has Been Designed for Use in Moderate-Speed Cruisers. Having Frame of Cast Iron in One Piece, Strongly Webbed and Exceptionally Deep.

THE most recent model Speedway motor brought out by the Gas Engine & Power Co., and Charles L. Seabury & Co., Cons., of Morris Heights, N. Y., is an extremely smooth-running six-cylinder 6¼ x 8½-inch heavy-duty machine developing 100 to 115 h.p. at 500 to 600 r.p.m. This engine has been designed to meet the requirements of moderate speed cruisers and commercial boats where a quiet-running, economical oil-tight motor of not excessive weight is desired.

The cylinders, cast in pairs with integral heads and waterjackets, are of the L-type with the valves on the starboard side. They are completely jacketed above the frame, there being no exposed hot portion. The frame is of cast iron in one piece, strongly webbed and exceptionally deep, increasing the stiffness of the engine and also permitting the use of large handholes in both sides. The Speedway clutch and reverse gear are of the planetary type, with steel gears of ample size.



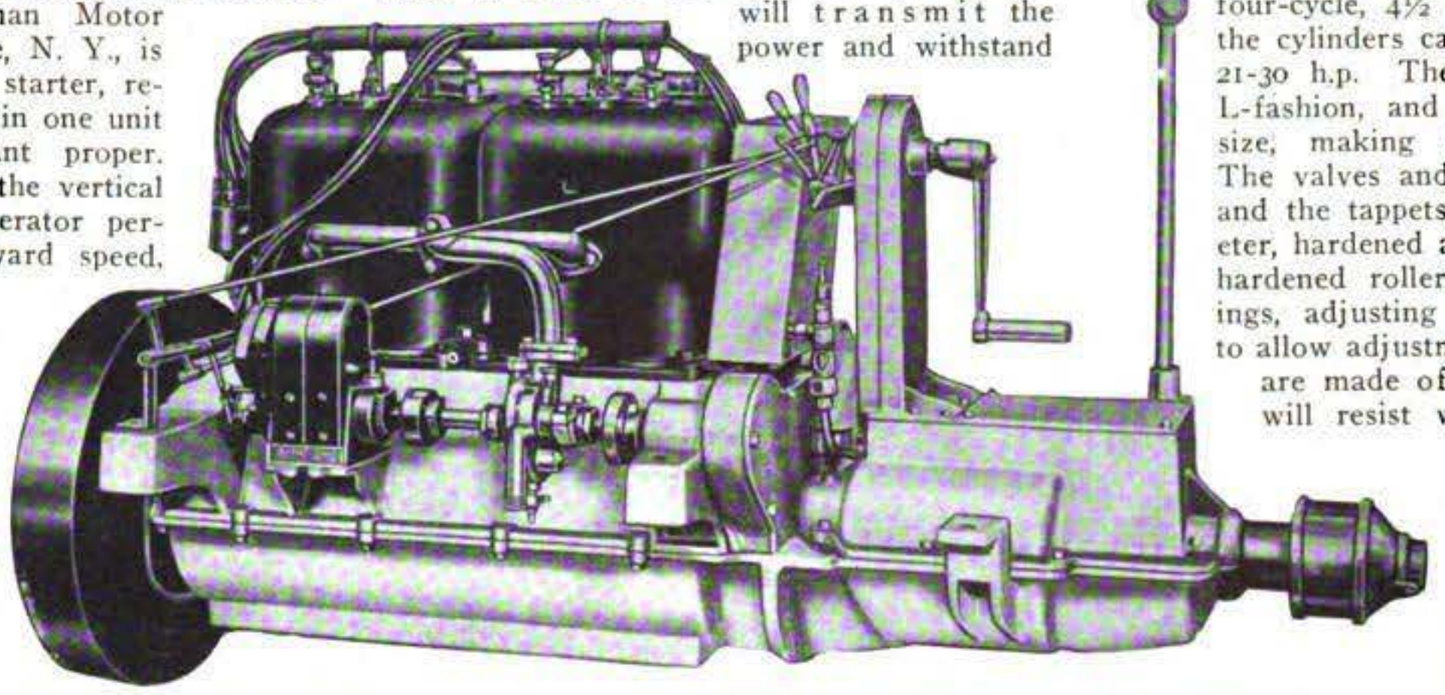
On the after end of the new six-cylinder 6¾ x 8½-inch Speedway motor there is an extension for carrying magnetos, air compressors, oil pump and circulating pump drive. A planetary clutch, integral with the motor, is employed.

A New Model for 1916.

The Four-Cylinder Brennan Standard, Having Starter and Reverse Gear in Unit With Motor. Reverse Clutch of Compression Type Capable of Adjustment While Boat is Under Way.

PERHAPS the most striking feature of the improved Brennan standard four-cylinder motor for 1916, now being manufactured by the Brennan Motor Mfg. Co., of Syracuse, N. Y., is the enclosure of rear starter, reverse gear and clutch in one unit with the power plant proper. The reverse lever in the vertical position gives the operator perfect control for forward speed, neutral position or reverse, and the control of the motor is further facilitated by mounting the spark and throttle levers on the rear starter standard.

The reverse clutch is made from bronze of the compression type, being very powerful with compound leverage. It is easily operated, and may be adjusted from the right-hand side of the case while running. The forward clutch is of the expanding type, with double compound leverage for expanding it. The gears are made from the best grade of nickel steel, cut to 6 pitch, heat treated and toughened, in order to make a very powerful gear which will transmit the power and withstand strain or shock. There are two ball thrusts in the gear case for forward or backward thrust. The connection to the propeller shaft is made through a universal joint that will take care of imperfection in alignment between gear and propeller shafts.



Port side of the Brennan Standard motor showing arrangement of magneto and carbureter and centralization of control.

The Brennan is a four-cylinder, four-cycle, 4½ x 5-inch engine, with the cylinders cast in pairs, developing 21-30 h.p. The valves are arranged L-fashion, and are all of the same size, making them interchangeable. The valves and tappets are enclosed, and the tappets are ⅞ inch in diameter, hardened and ground, fitted with hardened rollers and hardened bearings, adjusting screws and lock nut to allow adjustment. The valve heads are made of a special alloy which will resist warping and pitting.

The cylinders are finished on a special horizontal boring machine, there being three operations in the boring, the cylinders being allowed to season for one week between operations. They are also subjected to heat treatments at stated intervals, and the final finishing is by hand lapping, in order to make the cylinders perfectly round and smooth.

The 300 H. P. Sterling.

Most Important Model of This Extensive Line Built for Express Cruisers and Racing Yachts. Turned Out on Order Only for the Particular Requirements of Any Boat.

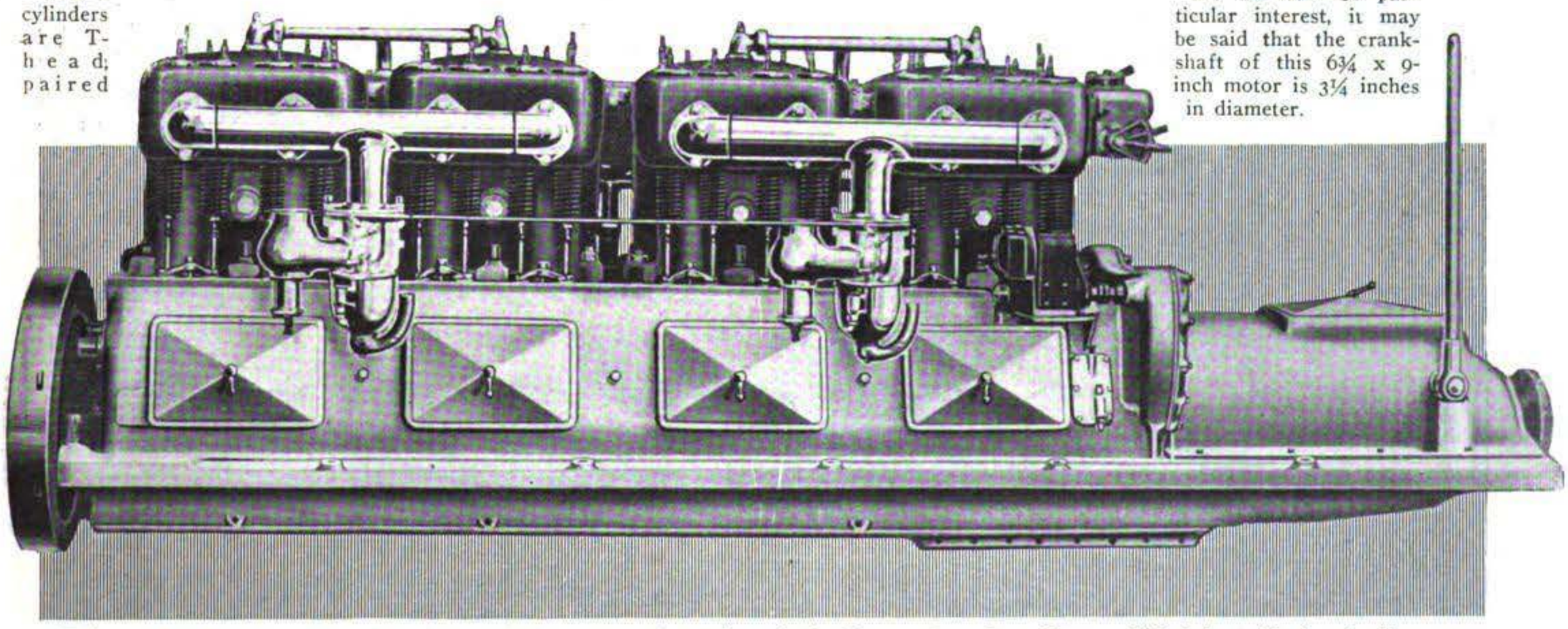
THE most important of the new models brought out this year by the Sterling Engine Co., of Buffalo, N. Y., is the eight-cylinder, 300 h.p. Sterling for express cruisers and racing yachts. This is a model built on order only, although the parts are all stock parts. The weight is from 5,000 to 5,600 lbs., and the revolutions from 700 to 1,200, according to the particular requirements of the boat for which it is built. It is pointed out that in building the motor for the exact requirements of any boat, the suitable and economical speed at which it should run can be worked out to a nicety.

The cylinders are T-head; paired en bloc, cast from a selected quality of auto analysis semi-steel, and having the jacketed portion projecting into the base. The upper base is of manganese bronze, and the lower of aero metal, extending the full length of the engine and carrying reverse gear, thrust bearings and upper portion of the engine.

The valve system is double, there being two inlet and two exhaust valves to each cylinder, insuring a more instant inlet vapor, and a more complete scavenging of burned gases. The ignition system is also double, consisting of two Bosch high-tension magnetos. One is a single-spark dual which is used for starting and can also be used for running, and the other is a two-spark system. Either system will run the engine independently, or both may be thrown in together.

The oiling system is very complete. The pump is attached to the after end of the upper base and is driven by a spiral gear on the camshaft. The oil, being drawn from the reservoir, is discharged by the pump into a passage in the lower base, which supplies oil for all bearings, as well as the cylinders. A regulating valve is provided, and a feature of this system is a pressure gauge which shows whether the pump is working properly.

As an item of particular interest, it may be said that the crankshaft of this 6¾ x 9-inch motor is 3¼ inches in diameter.



This 300 h.p. Sterling motor has eight cylinders measuring 6¾ x 9 inches bore and stroke. The crankshaft is 3¼ inches in diameter, double heat-treated and ground to size, and the pin bearings are 4½ inches.

Newsboys in Neptune's Service

CAPT. G. E. BENN is the newsboy, and Messenger III, the name of a boat which distributes interesting reading matter to thousands of sailors on the ships in New York harbor.

Messenger III, which has just been put into commission by the Mission Yacht Association of New York, was built by the Astoria Boat Works of Long Island City from designs by Capt. Benn himself, and is especially adapted to the work which he performs every day of the year when navigation is open. The hull is 55 feet in length by 14 feet extreme beam, and is powered with a six-cylinder, 60 h.p. Niagara motor, which gives a speed in excess of 10 miles an hour. The hull is planked with cedar below the waterline, and yellow pine above, each having a thickness of 1½ inches. The frames are of oak, steam bent, 3½ x 2 inches, spaced 12 inches from center to center. The keel is of one piece 12 x 8 inches. The deck is of Oregon pine, 1½ inches square.

The interior finish is of white pine. A 16 gauge copper gasoline tank, having a gasoline capacity of five barrels, is carried in a watertight compartment in the bow, and fifty gallons of fresh water are carried in two separate tanks.

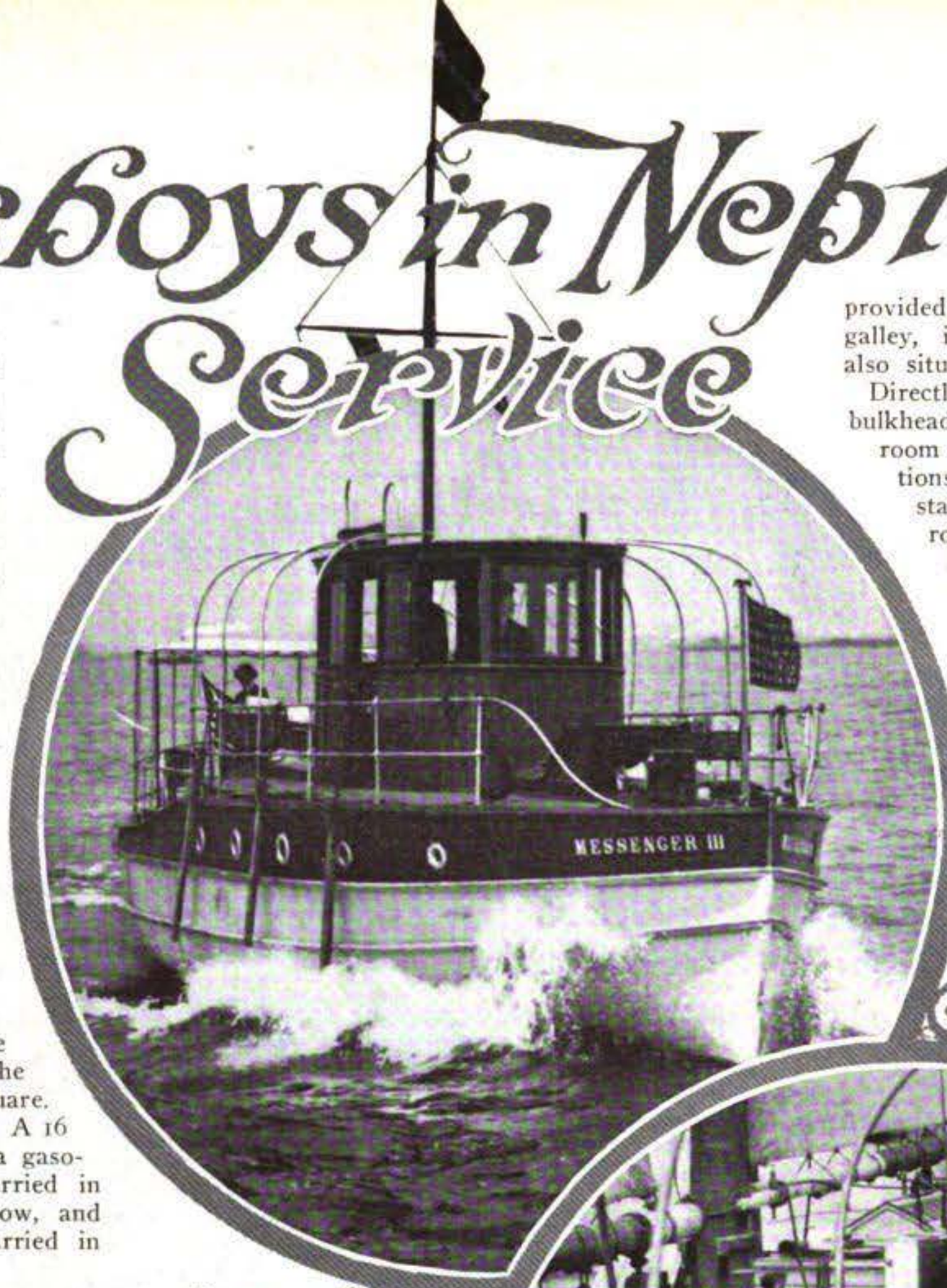
The motor is located forward directly under the pilot house with full control to the wheel, making Messenger III a one-man boat. Sleeping accommodations to the extent of one pipe berth are provided in the engine-room. The galley, ice-box, lavatory, etc., are also situated in the engine-room.

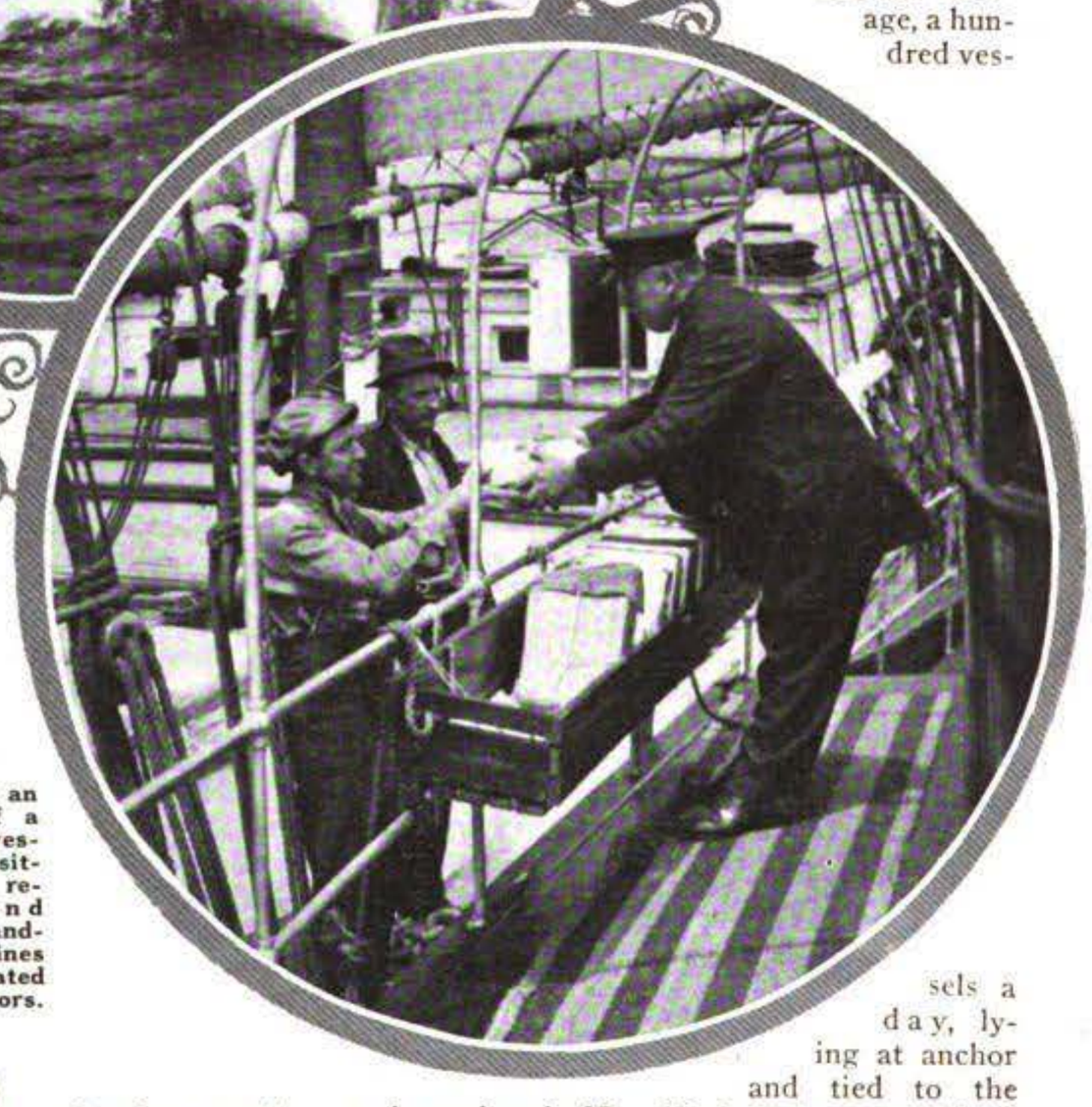
Directly aft of the engine-room bulkhead comes a 7 x 9-foot stateroom with sleeping accommodations for several people, on the starboard side, and the toilet room on the port side. A Sands toilet and Sands lavatory with running water are installed.

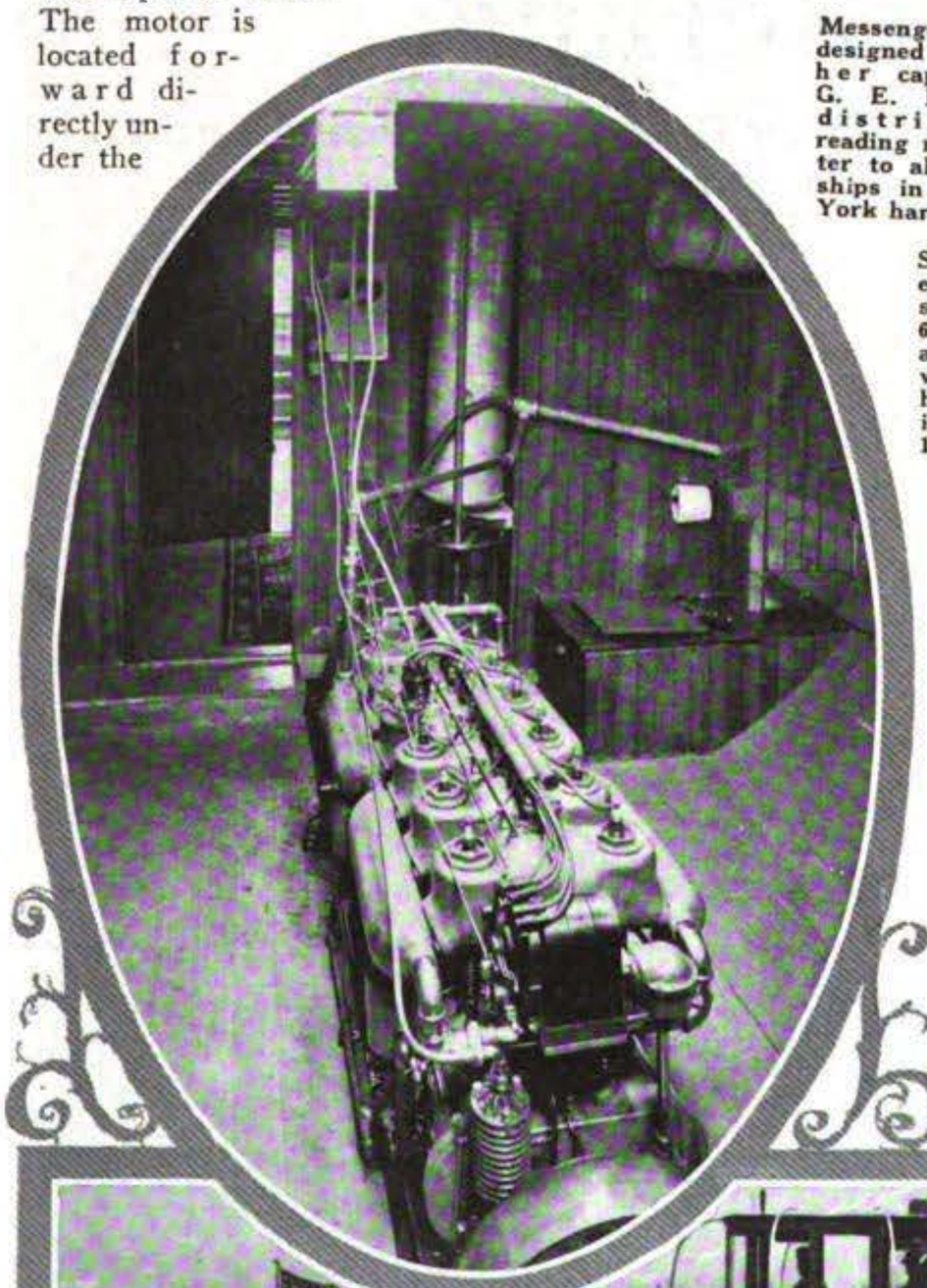
Directly aft is located the reading room, which in the clear is 15 feet long by 9 feet wide, with twelve lockers along the sides and under the deck, and other large lockers under the lazarette. The lockers have a capacity of five tons of reading matter which is so stored that it is not visible at all.

On the average, a hundred vessels a day, lying at anchor and tied to the various piers in New York harbor are visited, and on each vessel a package containing twenty religious and other standard periodicals are thrown aboard. Two and even three such packages are given to the larger vessels, as conditions warrant.

This literature, which is given to the sailors, is supplied by thirty Brooklyn public libraries and other libraries in the vicinity



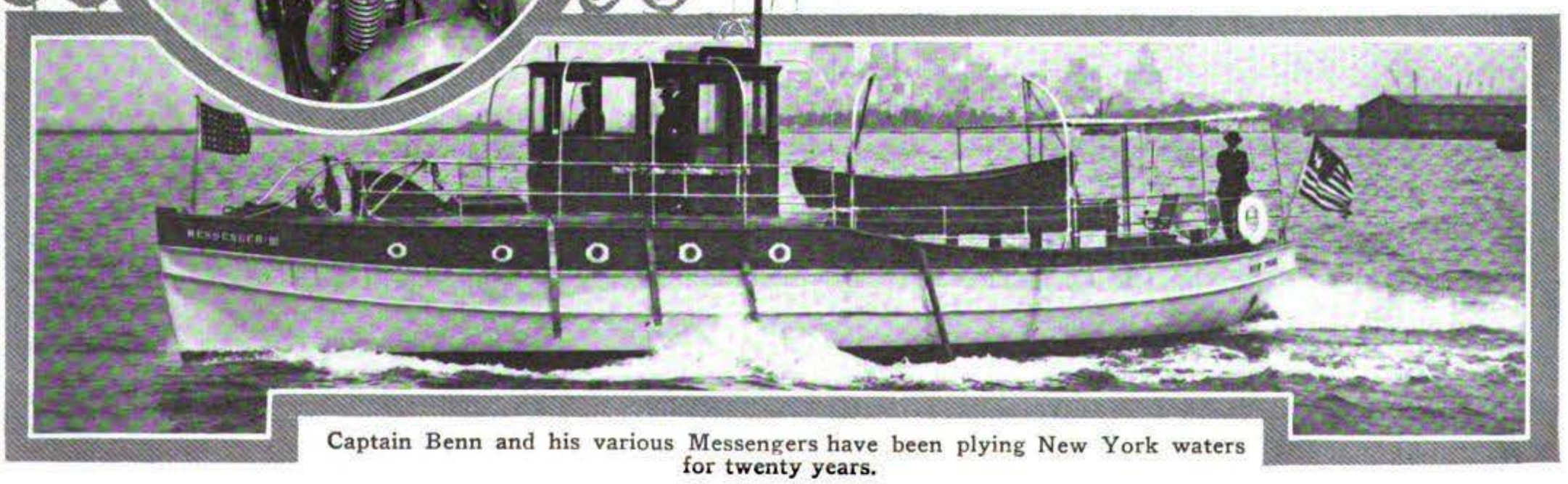




Messenger III, designed by her captain, G. E. Benn, distributes reading matter to all the ships in New York harbor.

She is powered with a six-cylinder 60 h.p. Niagara motor, which gives her a speed in excess of 10 m.p.h

Every day an average of a hundred vessels are visited, and religious and other standard magazines are donated to the sailors.



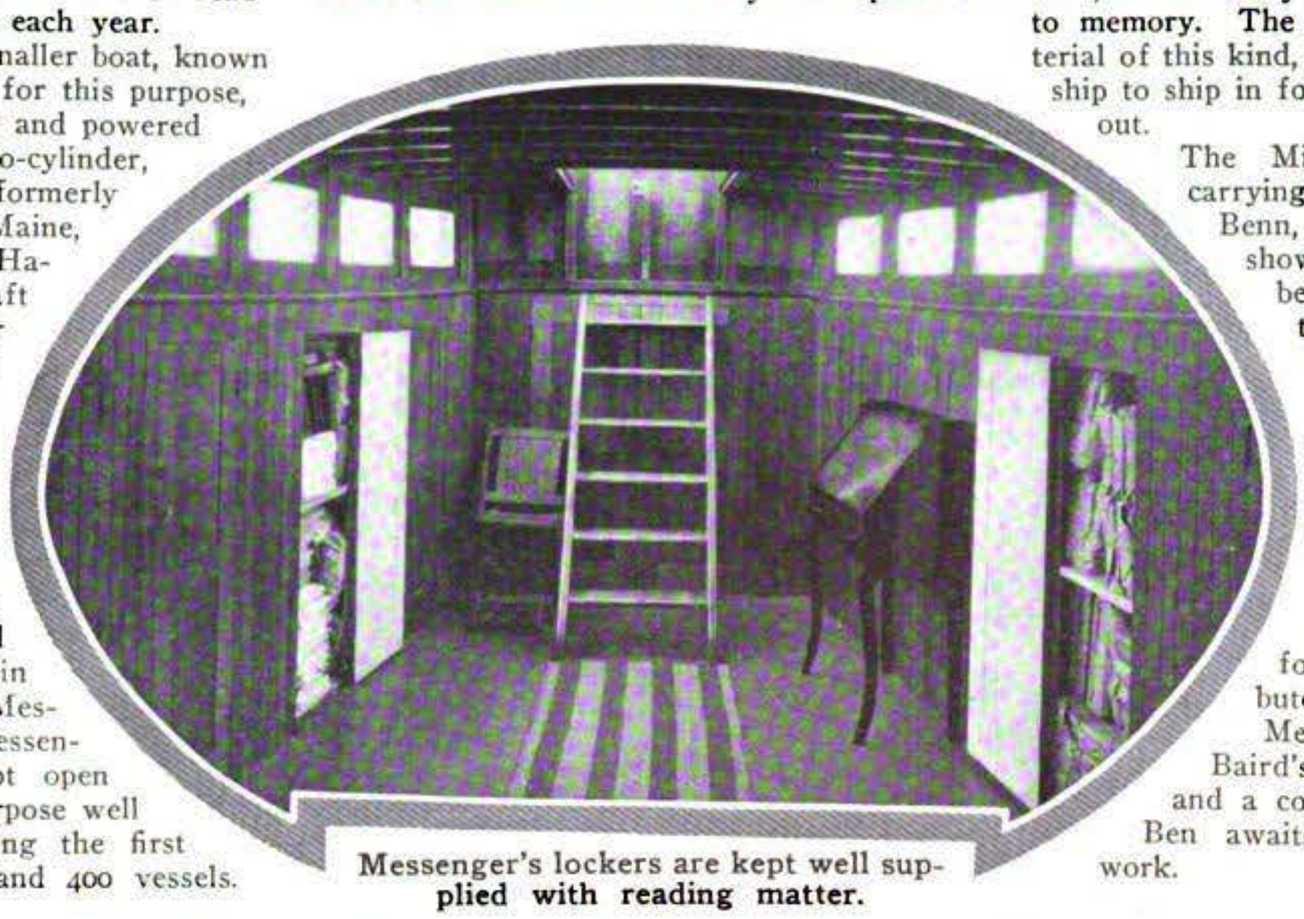
Captain Benn and his various Messengers have been plying New York waters for twenty years.

of New York City, and is furnished also by churches in all states east of the Rocky Mountains. Over one hundred tons of reading matter are handed out each year.

Until this year a much smaller boat, known as Messenger II, was used for this purpose, this boat being 35 feet long and powered with two 16 h.p. Barker two-cylinder, two-cycle motors; it was formerly a tender to the battleship Maine, which was destroyed in Havana harbor. This little craft distributed reading matter to 10,287 ships during her career, all types of boats being visited, from the smallest canal boat up to the largest ocean liner and battleship.

It was just twenty years ago that Captain Benn brought in his first boat and tied it up in the Erie Basin at the same wharf where Messenger III now moors. Messenger I was only a 26-foot open launch, but it served its purpose well for three years, and during the first year visited between 300 and 400 vessels.

Sailors in from a long voyage are very eager for the reading matter, and in some instances where the boat has been away from port for many months, the literature given to them during their last visit had been read and reread, and in many cases practically committed to memory. The sailors never destroy material of this kind, but it is passed along from ship to ship in foreign ports until it is worn out.



Messenger's lockers are kept well supplied with reading matter.

The Mission Yacht Association, carrying on this work through Capt. Benn, have many statistics which show that their endeavors make better men of the sailors, and that their work reaches to all parts of the world. During the winter season, when the boat is laid up, the work is carried on from shore stations, and during the Christmas season some 20,000 presents are given to the seamen, requiring a permit of from four to six weeks to distribute them.

Messenger III. moors at Baird's Yacht Basin in Erie Basin and a cordial reception from Capt. Ben awaits anyone interested in his work.

A Small But Speedy Hydroplane.

Carbo Flyer, a New 14-Footer, Which, Powered With a 10 H. P. Motor, Makes 15 Miles per Hour. A Hull Possessing Many Features in the Way of Material and Equipment.

A RATHER small, but from all accounts extremely speedy little hydroplane, the plans of which are shown on this page, has recently been put on the market by Carman & Bowes, of the Bourse Building, Philadelphia, Pa. This little speedster, which measures only 14 feet 3 inches, was designed by Bowes & Mower, the Philadelphia architects, and is being built as a stock proposition for Carman & Bowes by the Mathis Yacht Building Co., of Camden, N. J. Her beam is 4 feet, and powered with a 10 h.p. motor, she is capable of a speed of 15 miles per hour.

As will be seen from the following specifications, Carbo Flyer, as she is called, is very well constructed: The keel, stern knee, frames, chines and deck beams are of white oak, the frames being sawed ½ inch and the intermediate frames steam-bent ⅜ x ¾

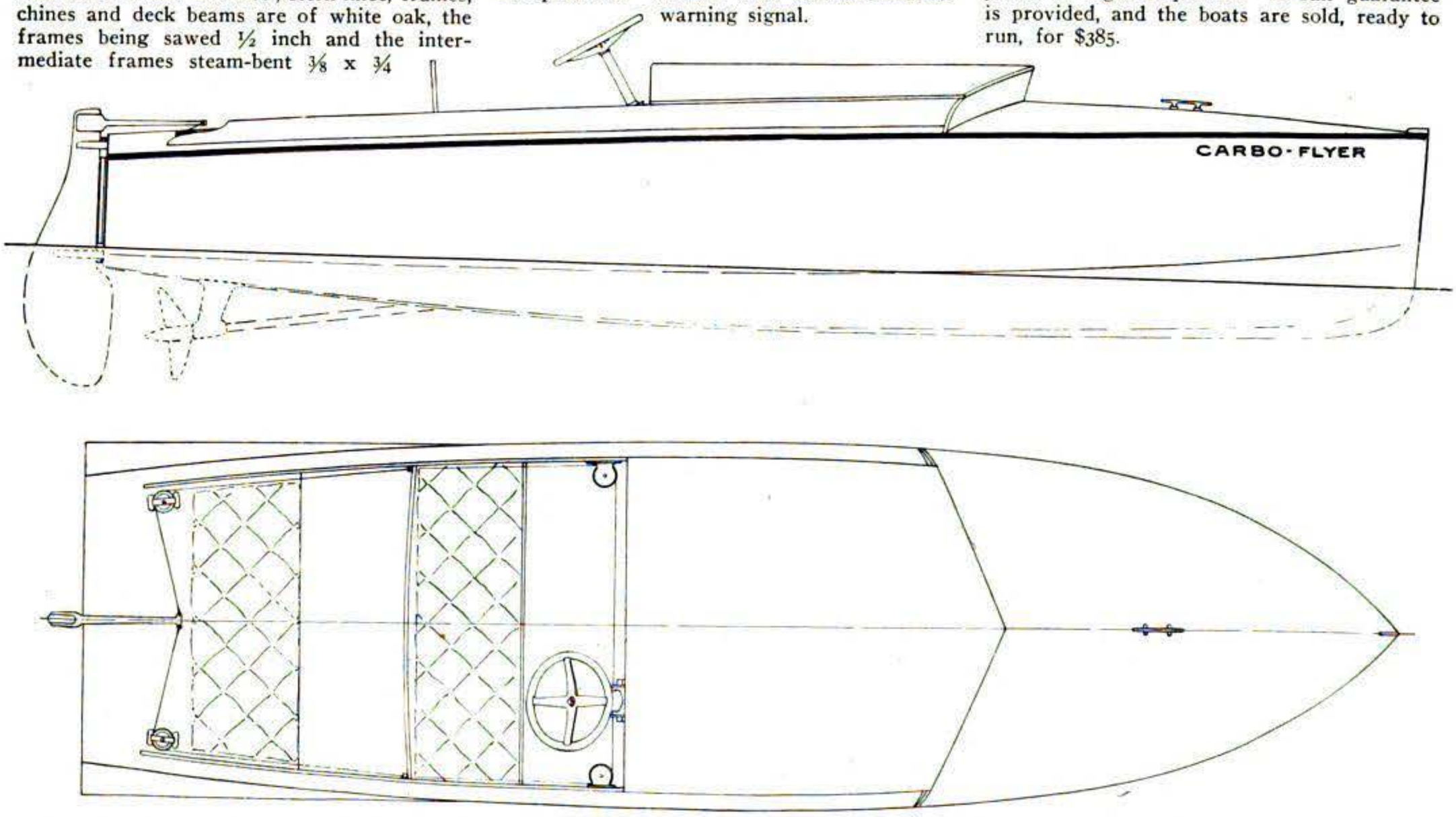
The transom is of mahogany fitted with a hackmatack knee, and the planking is of cedar, with all seams caulked and puttied. The deck is of ⅜-inch cypress, and the coaming, mahogany of the same thickness. Keelsons of ⅞-inch spruce are employed, and the engine bearers are of 1½-inch white oak. White pine slats are used for the floor. All fastenings are by brass orcopper screws.

The rudder is of mahogany or oak and has cast bronze fittings, including a tiller; the tiller lines lead through three-inch sheaves to an automobile type steering wheel. The fittings include brass stem band mooring cleats, two small cleats at the stern, flag pole socket, life-preserver cushion and Stewart-Warner warning signal.

The motor is an 8-10 h.p. Universal of four cylinders, of the four-cycle type, fitted with high-tension magneto, reverse gear and rear starter. The motive plant equipment includes a copper gasoline tank, Stewart-Warner vacuum feed fuel system, bronze shaft, propeller, stuffing-box and strut.

The hull is painted below the water-line with anti-fouling marine paint and above with white enamel paint. The deck is painted yellow over canvas, and the hull inside is given two coats.

The workmanship on these boats is stated to be of the highest order and every boat is built under careful supervision and is subjected to rigid inspection. A full guarantee is provided, and the boats are sold, ready to run, for $385.



Carbo Flyer's cockpit comfortably seats three in addition to the operator. The 10 h.p. Universal motor is installed forward, and is equipped with a vacuum feed system.

From MOTOR BOATING Readers

This department of MoToR BoatinG *is maintained for the purpose of giving its readers opportunity to ask questions, reply to other correspondents' communications and submit ideas, suggestions, opinions or experiences which may be of interest and assistance to motor boatmen. There are no rules governing the department other than that postage must be enclosed when an answer by mail is desired, and that the name and address of the writer must be given in each instance. No anonymous contributions will be considered for publication, but initials or a pseudonym will be substituted for the writer's own name if the request be made. The editor does not, of course, hold himself responsible for statements made or opinions expressed by contributors to this department.*

A Wheel for a V-Bottom.

To the Editor of MoToR BoatinG:

I have a V-bottom boat, 28 feet O. A., 7 feet beam, with a 12 foot trunk cabin.

The engine is 2-cylinder, 2-cycle, 3½" bore, 4" stroke, rated 7-8 h.p. at 800 r.p.m.

At present I am using an elliptical speed wheel, 16" diameter, 22" pitch; the greatest width of blades is 25% of diameter; 600 revolutions is the best the engine can turn it, which gives the boat a speed of 7½ miles an hour under favorable conditions.

When reversing, the wheel does not act satisfactorily; it slips, or, for a reason which I am unable to explain, does not give the desired control of the boat.

If the fault is to be found in the type of wheel now in use, please suggest one to replace it, which will give me more speed if that be practicable.

P. J. M., Washington, D. C.

[You are using a wheel decidedly too large in pitch at the present time, and we would suggest one having 3 blades 16 inches in diameter by 16 inches pitch, which should give you decidedly better results than you are obtaining now.

The trouble you are having when you are reversing is not altogether due to the wheel, as any boat of this type is more or less difficult to handle when going backwards, but we believe the wheel suggested above will give somewhat better results, even when backing, than you are now obtaining.]

Right of Way.

To the Editor of MoToR BoatinG:

At the recent boat races of our club the following mix-up occurred. Please advise me who should have been given the prize according to the A. P. B. A. rules.

The third race of the day started with three entries which we will call A, B and C. A and B soon left C well to the rear. The race was three laps around a four-buoy course, and on the second buoy A was two-thirds of its length ahead of B, but B had the inside track and was rapidly easing alongside A. A, which was well off the course, cut in straight for the buoy which would make B do one of three things: first, because of the short distance shut off his power, or second, steer straight to turn the buoy and eventually hit A, or third, turn inside the buoy and be thrown out of the race. B took the second method about twenty-five feet from the buoy, and the two boats sucked side by side; but B, sucking so hard on the port side of A, pulled both boats inside the buoy. It was about half a minute before the boats broke apart, each making its own circle around the buoy, with B crossing the finishing line first, seven seconds ahead of A.

The question we should like to have settled is this: Was B entitled to the inside track as long as her nose was one-third of A's length ahead of A's stern, or did A have the right of way which allowed her to crowd B out?

M. N. G., McIntosh, Fla.

[According to your explanation of this, we are of the opinion that the outside boat had no right to act as you state she did, and should therefore be disqualified.

We base our decision on the following rules of the American Power Boat Association, which you say governed in your races:

"The overtaking boat shall, as long as an overlap exists, keep clear of the boat which is being overtaken.

"Boats in passing shall allow at least 10 feet of clear water between them and the leading boat shall not alter her course so as to compel the overtaken boat to pass within the ten-foot limit.

"Should, however, an overlap exist between two boats when both of them are about to pass a mark on the required side, then the outside boat must give the inside boat room to pass clear of the mark. A boat shall not, however, be justified in attempting to establish an overlap and thus force a passage between another boat and the mark after the latter has altered her helm for the purpose of rounding.

"An overlap is established when an overtaken boat has no longer a free choice of which side she will pass."

You should bear in mind that you may not have given us full details in regard to the exact situation and conditions which existed at the time these boats were about to pass the mark and should be governed by the above rules rather than by our decision in this matter.]

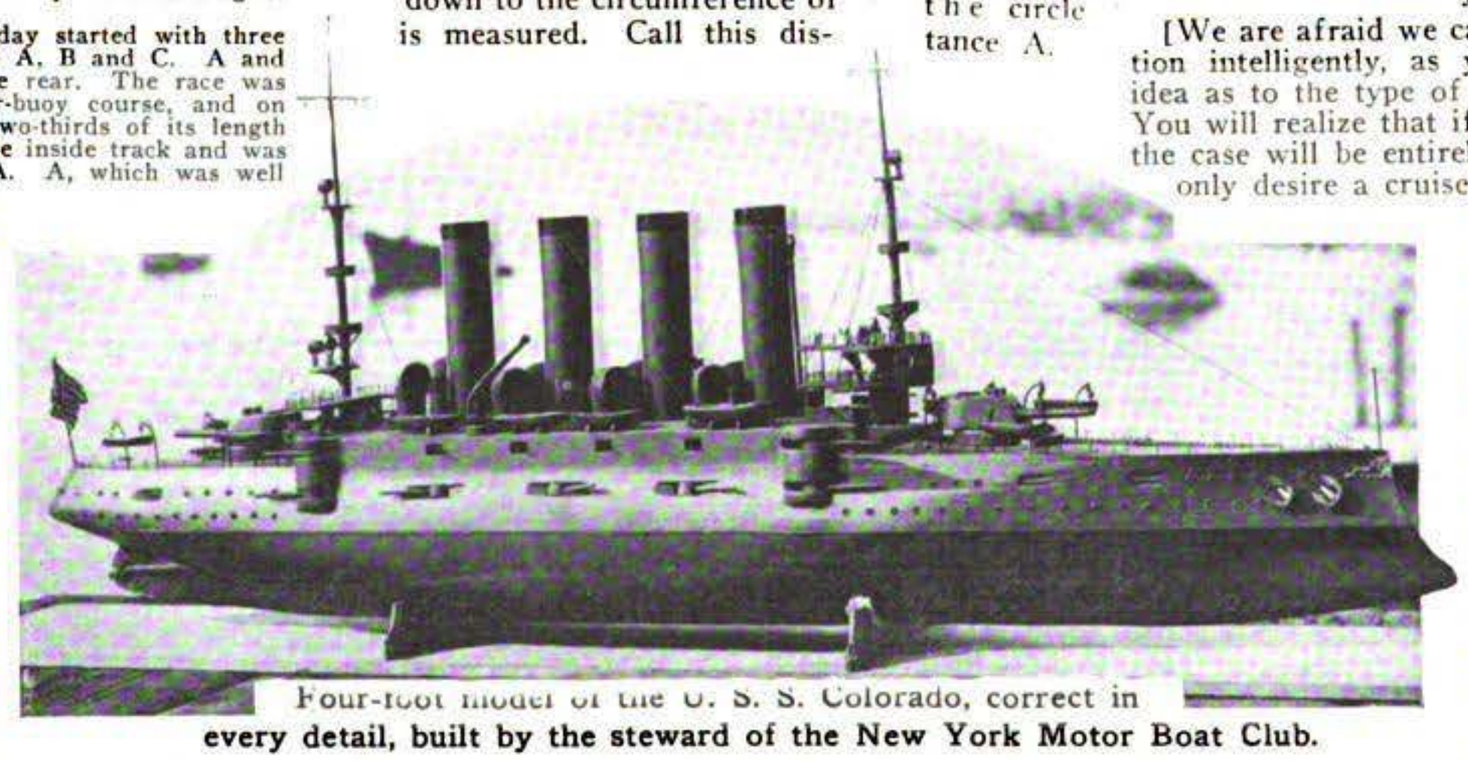
Measuring Pitch.

To the Editor of MoToR BoatinG:

Sir: I am a subscriber to your valuable publication and I am asking for information. Will you please send me the formula or advise me as to the correct method of finding the pitch of a bronze three-bladed propeller wheel? I have inquired in my vicinity of amateur yachtsmen, but cannot receive the desired information. I think this will be a very good question to insert in MoToR BoatinG columns for advantage to other MoToR BoatinG readers.

C. E. McC., New Haven, Conn.

[In the first place, a circle having a diameter of approximately two-thirds that of the propeller to be measured is drawn upon a plane surface, and the wheel is placed upon this circle so that its center and the center of the circle exactly coincide. Then the perpendicular distance from a point on the upper edge of any blade which is directly above the circle down to the circumference of the circle is measured. Call this distance A.



Four-foot model of the U. S. S. Colorado, correct in every detail, built by the steward of the New York Motor Boat Club.

The next step is to measure in a similar way the perpendicular distance from the circumference of the circle to the lower edge of the same blade, calling this distance B.

The only other measurement now required is the distance along the circumference of the circle between the points directly below the upper and lower edges of the blade referred to above, calling this distance C. This is best measured by removing the propeller from the circle, and by means of a strip of paper and a sharp pointed pencil which is used as the center and moved along the circumference allows one to expand the arc to a straight line. Considerable care should be taken in all of the measurements to have them absolutely accurate, and a slight error in any one measurement would cause considerable error in the result.

From the above measurements the pitch will be found from the following formula:

$$\text{Pitch} = \frac{6.28 \times \text{radius of circle} \times (A-B)}{C}$$

For a Forty-two Footer.

To the Editor of MoToR BoatinG:

I am going to build a boat of the bridge deck cruiser type, with a beam of 10½ feet and length of 42 feet over all, with a transom stern, fairly heavily constructed, say 4 or 4½ tons. She will be very flat and at the same time seaworthy. Built of oak and cypress, full keel, very good lines.

The motor is 5" x 6", 24 h.p., turning at 500 r.p.m. Would you kindly tell me what propeller to use? Weight of motor is 1,300 pounds. How much gasoline will she consume per hour? What speed do you think she will be able to make?

Can I use a K-W magneto for charging a battery?

J. S. Sundberg, Chicago, Ill.

[We would advise one having 3 blades 26 inches in diameter by 26 inches pitch, which should give you a speed of about 9 miles per hour.

A motor of this power should use between 2 and 3 gallons of gasoline per hour.

It will not be possible for you to charge a battery using a K-W magneto. A direct current is necessary for this purpose, which is only given by a direct-current dynamo, and cannot be obtained from a high-tension magneto.]

A Stern Wheel Boat.

To the Editor of MoToR BoatinG:

I have a motor of 18 h.p., 4-cylinder. How large a stern wheel, shallow draft boat would it handle on the upper Missouri, with average 4-mile current, to go 8 or 10 miles up stream? The shallow places in the river are from 12 to 14 inches. If a river current is 4 miles per hour will a boat that makes 12 miles per hour in still water make 16 miles down stream and 8 miles up stream?

J. N., Fort Benton, Mont.

[We are afraid we cannot answer this question intelligently, as you have given us no idea as to the type of boat which you desire. You will realize that if you wish a work boat the case will be entirely different than if you only desire a cruiser, and this in turn will be altogether different should you desire a speed boat. In the first mentioned case above, probably it would be impossible to obtain a speed anything like 8 or 10 miles an hour upstream against a 4-mile current with only an 18 h.p. motor, but if a speed boat is desired, probably the case could be worked out so it would give you the desired speed.

We would suggest that you refer this question to a naval architect, preferably one in your vicinity, who knows the local conditions. A boat which makes 12 miles per hour will, with a 4-mile current, make 16 miles, and against it the result of the speed will be 8 miles per hour.]

Opinion of Many Readers.

To the Editor of MoToR BoatinG:

I have devoured MoToR BoatinG since the first issue; I have a complete vertical file of all the dope that might interest me from this, and all the other boating magazines for years past; two full drawers on a large vertical filing cabinet—and this is the first time I have taken a crack at this department.

MoToR BoatinG is so far ahead of the rest of the bunch in every way that there is no runnerup. I am now working on a cruiser big enough to live on that will embody many of the ideas submitted to the Prize Contest Department, which alone is worth the price of the magazine.

P. E. Fansler, St. Petersburg, Fla.

Among the Clubs.

Start of race for express cruisers at Columbia Yacht Club, N. Y. City, Wilfreda at the left and Runaway on the right.

Columbia Yacht Club Spring Regatta.

The New York motor boating racing season was opened on June 5th by the Columbia Yacht Club, with their annual spring regatta, with classes for all types of motor boats. Probably the most important race of the day was the match for express cruisers, the newly formed class under the American Power Boat Association rules. This race, over a 20-nautical-mile course, was won by Harry C. Cushing's new cruiser, Runaway, which covered this course in 1:10:35, equivalent to a speed of 20 statute miles an hour. Wilfreda, owned by J. M. Rutherford, was second, covering the course in 1:23:10. In the open-boat class, Bunk III, owned by C. Firth, being the only starter, won in a walkover. In the class for open boats rating over 55, Amorita, owned by W. F. Randolph, won both on elapsed and corrected times, covering the 15-nautical-mile course in 46 minutes. Eastern Star, owned by E. L. Finch, was second, her time being 51:30. Standard Sr., owned by R. L. Kingston, was third, having an elapsed time of 50:30. Mon Plaisir, owned by Latimer Brothers, was fourth. In the class for displacement racers over a 30-nautical-mile course, there were two starters. Invader, owned by C. W. Baird, covered the course in one hour, 3 minutes and 50 seconds, and Cinderella, owned by H. Bahner, was second, in 1 hour, 10 minutes, 15 seconds.

In the class for cruisers rating 40 and under, over a 10-nautical-mile course, the first prize was won by Satsun, owned by Thomas Farmer, Jr., which covered the course in 1:19:43 elapsed time and 1:10:50 corrected time. Respite, the scratch boat in this class, owned by Dr. V. C. Pedersen, was second, time 1:12:15. The class for cruisers rating more than 40 feet attracted three starters, and the best time was made by Katy Did, owned by J. K. Van Denberg, which covered the 10-nautical-mile course in 48:50. Surline, owned by J. C. Campbell, was second, in an elapsed time of 53:45. Fabius, owned by W. E. Thomas, was third, in 1:11:35. On corrected time the boats took the same order, Katy Did having a corrected time of 48:45; Lurline, 50:47, and Fabius, 58:34.

Gold Cup Races for New York.

The details for the Gold Challenge Cup races and those for the one-mile championship cup, to be held on July 31st and August 2d, 3d and 4th, at Manhasset Bay under the auspices of the Motor Boat Club of America and conducted under the management and direction of the Long Island Sound Motor Boat Section of the American Power Boat Association, are fast taking definite shape, and the indications are that for number of entries and the speeds which will be made it will be a record breaker. A number of entries have already been received by the Motor Boat Club of America, and several new boats are nearing completion which are said to have a guaranteed speed of nearly 60 miles an hour. Each of the three races for the Gold Challenge Cup will be 30 nautical miles in length over a five-nautical-mile course, laid out in the sheltered waters of Manhasset Bay. The determination of the winner will be by the point system, whereby each boat starting and finishing receives one point each day for so doing, and in addition one point for each boat she defeats. The boat receiving the highest aggregate number of points for the three days' racing is declared the winner, and is entitled to hold the gold challenge cup for a period of one year. The course will be practically triangular in shape, and will have a minimum depth of water of not less than 12 feet, laid out by a professional surveyor several days before the race, to permit the owners and their crews to become familiar with the course before the day of the race. The length of the course and the position of the turning buoys will be checked up each day before the start, and the boats will not be allowed to start unless the buoys are in their correct position, and the length of the course absolutely accurate. The finish will be in front of the Manhasset Bay Yacht Club. A one-mile course will be laid out, with telephone communication between the starting and finishing points, and a half mile allowed at each end of the course for starting and finishing.

The following committees have been appointed:

Regatta Committee (appointed by the M. B. C. A.)—August Heckscher, chairman; Allan R. Hawley, Charles M. Englis.

Judges (appointed by the M. B. C. A.)—Albert E. Smith, chairman; Herman T. Koerner, C. L. Haydon, Morris M. Whitaker, measurer; Reuben B. Clark, timer.

Race Committee (appointed by L. I. S. M. B. A.)—Thomas B. Taylor, chairman; Charles F. Chapman, Herbert L. Stone.

Starters and Timers—Harry Jackson, chairman; Harry Sampson, James Alker.

World's Record for Flyaway III.

Just as we go to press Flyaway III, the Hand V-bottom cruiser, establishes a record which outshines any of her remarkable records of 1914. In the 270-mile long-distance race from New York to Albany and return, Flyaway III sets a new mark for the course, covering the distance in 12 hours, 34 minutes, an average of 21.4 miles per hour. A full account of this race will appear in the August issue of MoToR BoatinG.

Katy Did, the new Hand V-bottom cruiser owned by J. K. Van Denberg, of the Colonial Yacht Club, and powered with a four-cylinder, 5½ x 6¾-inch Sterling motor.

A. P. B. A. Doings.

The special committee appointed by President Koerner of the American Power Boat Association to suggest ways and means for broadening the scope and influence of the American Power Boat Association has made a number of suggestions and recommendations and each club in the association has been asked to report upon these recommendations, and from every indication it appears that in the near future the A. P. B. A. will no longer be restricted to interest in racing events alone. The committee has suggested the following:

1. Request each section to appoint a special committee to particularly look into and improve conditions for the cruising motor boatmen, especially in the following respects: (a) That waters used by motor boats are charted on government charts to depths of 3 feet; (b) that buoys are properly placed to designate channels used by motor boats; (c) that all harbors used by motor boats and dangerous points of land are properly lighted.

2. If necessary, supply, upon request, at a nominal cost to the various sections of the A. P. B. A., a limited number of distinctive A. P. B. A. buoys, to be planted by the government in case the government refuse to furnish their own.

3. Appoint a committee to formulate and have the A. P. B. A. supply printed instructions either separately or in the A. P. B. A. year book to the various clubs suggesting rules and methods of conducting contests other than speed races, such as: (a) Sealed order races, in which contestants have to comply with sealed orders; (b) disability races, in which one boat of a team has to tow the other home; (c) relay races between teams each composed of racers and cruisers; (d) bang-and-go-back races; (e) performance races necessitating each club or several combined clubs to have a certified measured course and a one-mile straightaway over which races and trials be held to furnish a basis for performance races and that the records of boats racing in these races be kept for future handicapping, no boat being allowed to enter such a race without a satisfactory performance from which she can be handicapped; (f) novelty races, such as starting crews of equal numbers from club house porch, to dinghies and anchored boats, over the course and return to club porch.

4. Appoint a legislation committee to see that no federal laws unfavorable to motor boat owners be enacted by the government.

5. Appoint a legal committee to arbitrate disputes between purchasers and manufacturers and to protect purchasers against fraud.

6. Request each section to have at least one section cruise every season.

7. Print a general list of measurers, timers and surveyors whose qualifications are satisfactory to the A. P. B. A., who are competent to perform their duties and whose services are available for purpose of obtaining authentic data.

8. Appoint a committee to affect an approved standardization of engine horsepower ratings, boats and equipment.

9. Print in the year book the government requirements for equipment of motor boats.

10. Award annually a gold medal with the seal of the A. P. B. A. on one side and appropriately engraved on the other side to that particular owner whose boat in the judgment of the A. P. B. A. has shown the most improvement in the development of the motor boat, based on the following point system: Reliability; design; consistency of performances; speed; appearance; utility for purpose intended.

11. The American Power Boat Association year book to contain more detailed information about those boats which win an American Power Boat Association certificate and if possible the plans of same, so that those interested may obtain information for purpose of improving the motor boats of each succeeding year.

Calendar of Big Racing Events.

(NOTES *This page will be a regular feature of* MoToR BoatinG *during the racing season, and to make it of the utmost value to our readers it is hoped that the chairmen of regatta committees or corresponding secretaries of the various clubs will send us the conditions of their more important events as they are scheduled. The RESULTS will also be featured, and, to the end that we may have a full record, we should like to be informed of the name, owner, make of engine, power, overall length, and actual time of the winning boats, as well as of the length of course and of any other details which may be of interest.)*

July 2-3. Fourth Annual Long Distance Race, New Orleans to Pensacola, Fla.

July 3. Race of the Los Angeles Motor Boat Club to Avalon, Wilmington, Cal. Mr. E. R. Abbott, Secretary, 612 Loomis St., Los Angeles, Cal.

July 3. Holley Beach Yacht Club. Races of the Racing Association of South Jersey Yacht Clubs. Sanctioned by A. P. B. A., and open to boats from any recognized club. Charles J. Curran, Chairman, R. A. S. J. Y. C., 2736 North Broad St., Philadelphia.

July 2-3-4 Annual Pacific Coast Championship Regatta, to be held under the auspices of the Astoria Boat Club, at Astoria, Ore. Floyd C. Foster, Secretary, Astoria National Bank, Astoria, Ore.

July 3-4. Race Around Long Island, under auspices of Yacht Racing Association of Jamaica Bay. Start and finish off Belle Harbor Yacht Club. B. W. Feeny, Secretary, 347 Fifth Ave., N. Y. C.

July 3-4-5. Race of the Seattle Yacht Club to Everett. Seattle Yacht Club, Seattle, Wash. Dr. A. F. Comings, Secretary, 421 Hinckley Building, Seattle, Wash.

July 5. Races of the Cleveland Yacht Club, Cleveland, O. F. O. Van Sickle, Secretary, Box 57, Rocky, River, O.

July 5. Open Race of the Tappan Zee Yacht Club, Grandview-on-Hudson. W. H. Aspinwall, Secretary, Piermont, N. Y.

July 5-6-7. Annual Speed Boat Races of the Mississippi Valley Power Boat Association, at Hannibal, Mo. Class A—Open to boats having piston displacement not exceeding 256 cu. in., 4-cycle, 224 cu. in., 2-cycle; Class B—Piston displacement not exceeding 400 cu. in., 4-cycle, 377 cu. in., 2-cycle; Class C—Piston displacement not exceeding 695 cu. in., 4-cycle, 608 cu. in., 2-cycle; Class D—Piston displacement not exceeding 965 cu. in., 4-cycle, 844 cu. in., 2-cycle; Free-for-all—open to all boats up to 40-feet overall length; Cruiser race—open to all cruisers as defined by M. V. P. B. A.; Mile dash; Webb Trophy Cruiser Cup Race; Admiral's Trophy Race—open to any boat representing a club in this association. Chas. P. Hanley, Muscatine, Ia.

July 10. Fourth Annual Cornfield Lightship Race for the Cyprian C. Hunt perpetual trophy and six other sterling silver trophies—Colonial Yacht Club, New York. Sanctioned under 1915 A. P. B. A. rules and open to boats of any recognized club between 28 and 50 feet, with a minimum rating of 32. Distance, 183 nautical miles. Class A—ratings 32 to 52, inclusive; Class B—ratings over 52; Entries to be addressed to Race Committee, Colonial Yacht Club.

July 10. Ocean City Motor Boat Club. Races of the Racing Association of South Jersey Yacht Clubs. Sanctioned by A. P. B. A., and open to boats from any recognized club. Charles J. Curran, Chairman, R. A. S. J. Y. C., 2736 North Broad St., Phila.

July 17. Second Annual Long-Distance Cruiser Race to Stratford Shoal Light and Return—Columbia Yacht Club. Distance, 112 nautical miles. Sanctioned under A. P. B. A. 1915 rules, and open to cruisers of any recognized club between 28 and 50 feet overall length, and whose rating is not less than 32. Boats of less rating will take this rating. Class A—rating 32 to 42 inclusive; Class B—rating over 42. Henry C. Pearson, Chairman Race Committee, Columbia Yacht Club, New York City.

July 10. Stratford Shoal Race of the New Rochelle Yacht Club, Harrison Island, N. Y. H. M. Lloyd, Secretary, 200 Fifth Ave., New York City.

July 12. Regatta of the Seattle Yacht Club, Seattle, Washington. Dr. A. F. Comings, Secretary, 421 Hinckley Building, Seattle, Wash.

July 17. Cape May Yacht Club. Races of the Racing Association of South Jersey Yacht Clubs. Sanctioned by A. P. B. A., and open to boats from any recognized club. Charles J. Curran, Chairman, R. A. S. J. Y. C., 2736 North Broad St., Philadelphia, Pa.

July 17-24. Annual Regatta of the Inter-Lake Yachting Association at Put-in-Bay. Races for motor boats of all classes.

July 17. Race for the Roost Cup, Flat Rock Motor Boat Club, Lafayette, Pa. George W. Sands, Secretary, 415 Monastery St., Roxborough, Pa.

July 24-31. Annual Cruise of the Chesapeake Bay Yacht Racing Association to Annapolis. J. Harvey Rowland, Secretary, 901 South Caroline St., Baltimore, Md.

July 25. Championship Cruiser Race of the Los Angeles Motor Boat Club, Wilmington, Cal. Mr. E. R. Abbott, Secretary, 612 Loomis St., Los Angeles, Cal.

July 25. Speed Boat Race of the Pacific Motor Boat Club, raced under A. P. B. A. rules. C. Willard Evans, Secretary, Belvedere, Cal.

July 29. Handicap Cruiser Championship, Baltimore to Camden. Sanctioned by the Racing Commission of the A. P. B. A. Start, the Maryland Motor Boat Club, Baltimore, Md., and finish at the Camden Motor Boat Club, Camden, N. J. Class A—Cruisers of not less than 43 feet overall length. Class B—Cruisers of not less than 30 feet overall length, and over 43 feet. Class C—Express cruisers of not less than 30 feet overall length, as defined by A. P. B. A. rule VI, Division 2. Distance, 368½ nautical miles. E. C. Headley, Chairman Regatta Committee, 600 Bullitt Bldg., Philadelphia, Pa.

July 31. Chelsea Yacht Club. Races of the Racing Association of South Jersey Yacht Clubs. Sanctioned by A. P. B. A., and open to boats from any recognized club. Charles J. Curran, Chairman, R. A. S. J. Y. C., 2736 North Broad St., Philadelphia.

July 31. Long Distance Race from Poughkeepsie Yacht Club to Brightwaters, Bay Shore, L. I., under the auspices of the Poughkeepsie Yacht Club. Wm. H. Frank, Poughkeepsie, N. Y.

July 31. Speed Boat Races for the Star Trophy, Camden Motor Boat Club. Joseph F. Magee, Secretary, 335 North Second St., Camden, N. J.

July 31-Aug. 2-3. Gold Challenge Cup Races of the American Power Boat Association. Manhasset Bay, Long Island Sound. Open to all boats of 40 feet and under for the One-Mile Championship of North America. Albert L. Judson, Secretary, A. P. B. A., The Plaza, 5th Ave. and 59th St., New York.

Aug. 7. Annual Race of the Shattemuc Yacht & Canoe Club, Ossining, N. Y. Charles W. Frean, Secretary, 45 Ellis Place, Ossining, N. Y.

Aug. 7. Sea Isle Yacht Club. Races of the Racing Association of South Jersey Yacht Clubs, Sanctioned by A. P. B. A., and open to boats from any recognized club. Charles J. Curran, Chairman, R. A. S. J. Y. C., 2736 North Broad St., Philadelphia.

Aug. 13. Races for the Commodore's Cup of the Sunset Yacht Club, Long Beach, Cal. Francis Hay, Secretary, 223 Central Building, Los Angeles, Cal.

Aug. 14. Cleveland Yacht Club Race to Vermilion, Cleveland, O. F. O. Van Sickle, Secretary, Box 57, Rocky River, Ohio.

Aug. 14. Race for the Virginia Cup. Sunset Yacht Club, Long Beach, Cal. Mr. Francis Hay, Secretary, 223 Central Building, Los Angeles, Cal.

Aug. 14. Corinthian Yacht Club of Cape May. Races of the Racing Association of South Jersey Yacht Clubs. Sanctioned by A. P. B. A., and open to boats from any recognized club. Charles J. Curran, Chairman, R. A. S. J. Y. C., 2736 North Broad St., Philadelphia.

Aug. 14. Speed Boat Races of the Flat Rock Motor Boat Club, Lafayette, Pa. George W. Sands, Secretary, 415 Monastery St., Roxborough, Pa.

Aug. 15. Races for the Examiner Cup and the Chamber of Commerce Cup, Sunset Yacht Club, Long Beach, Cal. Mr. Francis Hay, Secretary, 223 Central Building, Los Angeles, Cal.

Aug. 15. Colonial Yacht Club Race Around Manhattan Island, Colonial Yacht Club, N. Y. City. W. R. Gray, Secretary, 132 West 125th St., N. Y. City.

Aug. 18. Philadelphia Record Trophy Cruiser Race, Riverside Yacht Club to Ship John Light and return. E. C. Headley, Chairman Regatta Committee, 600 Bullitt Bldg., Philadelphia, Pa.

Aug. 21. Races of the Trenton Yacht Club, Trenton, N. J.

Aug. 21. Stone Harbor Yacht Club. Races of the Racing Association of the South Jersey Yacht Clubs. Sanctioned by A. P. B. A., and open to boats from any recognized club. Charles J. Curran, Chairman, R. A. S. J. Y. C., 2736 North Broad St., Philadelphia.

Aug. 22. Race Around Staten Island, under auspices of Jamaica Bay Y. R. A. Open event.

Aug. 22. Annual Cruiser Race of the Pacific Motor Boat Club. C. Willard Evans, Sec., Belvedere, Cal.

Aug. 28. Avalon Yacht & Motor Club. Races of the Racing Association of South Jersey Yacht Clubs. Sanctioned by A. P. B. A., and open to boats from any recognized club. Charles J. Curran, Chairman, R. A. S. J. Y. C., 2736 N. Broad St., Philadelphia.

Aug. 28. Return Race from Santa Cruz, Sunset Yacht Club, Long Beach, Cal. Mr. Francis Hay, Secretary, 223 Central Building, Los Angeles, Cal.

Aug. 28. Handicap Open Boat Championship of the Delaware River. Start and finish at Keystone Yacht Club; course, Bridesburg to Torresdale and return. Surveyed by Delaware River Yacht Racing Association. Race sanctioned by A. P. B. A., and open to members of any recognized club.

Aug. 28-Sept. 4. Annual Chicago Carnival. Classes for all types of hydroplanes and displacement racers.

Sept. 4. Cruise of the Delaware River Yacht Racing Association. E. C. Headley, Chairman Regatta Committee, 600 Bullitt Bldg., Philadelphia, Pa.

Sept. 4. Final Races of the Racing Association of South Jersey Yacht Clubs, at or over the course of the Ocean City Yacht Club. Open to contestants in the previous races of the South Jersey Association. Sanctioned by A. P. B. A.

Sept. 4-5-6. Annual Races of the Seattle Yacht Club at Venice. Seattle Yacht Club, Seattle, Wash. Dr. A. F. Comings, Secretary, 421 Hinckley Building, Seattle, Wash.

Sept. 5. Annual Long Distance Handicap Cruiser Championship of the Pacific Coast, for the Standard Gas Engine Trophy. Sanctioned by A. P. B. A. I. H. Cory, 457 Mills Bldg., San Francisco, Cal., Chairman Cal. Section.

Sept. 6. Annual Regatta of the Hudson River Yacht Racing Association. William H. Frank, President, Poughkeepsie, N. Y.

Sept. 12. Annual Regatta of the California Section of the American Power Boat Association—Corinthian Yacht Club of San Francisco. I. H. Cory, Chairman, Cal. Section A. P. B. A., 457 Mills Bldg., San Francisco, Cal.

Sept. 18. Annual Fall Regatta of the Columbia Yacht Club, New York. Open only to boats of the Columbia Yacht Club.

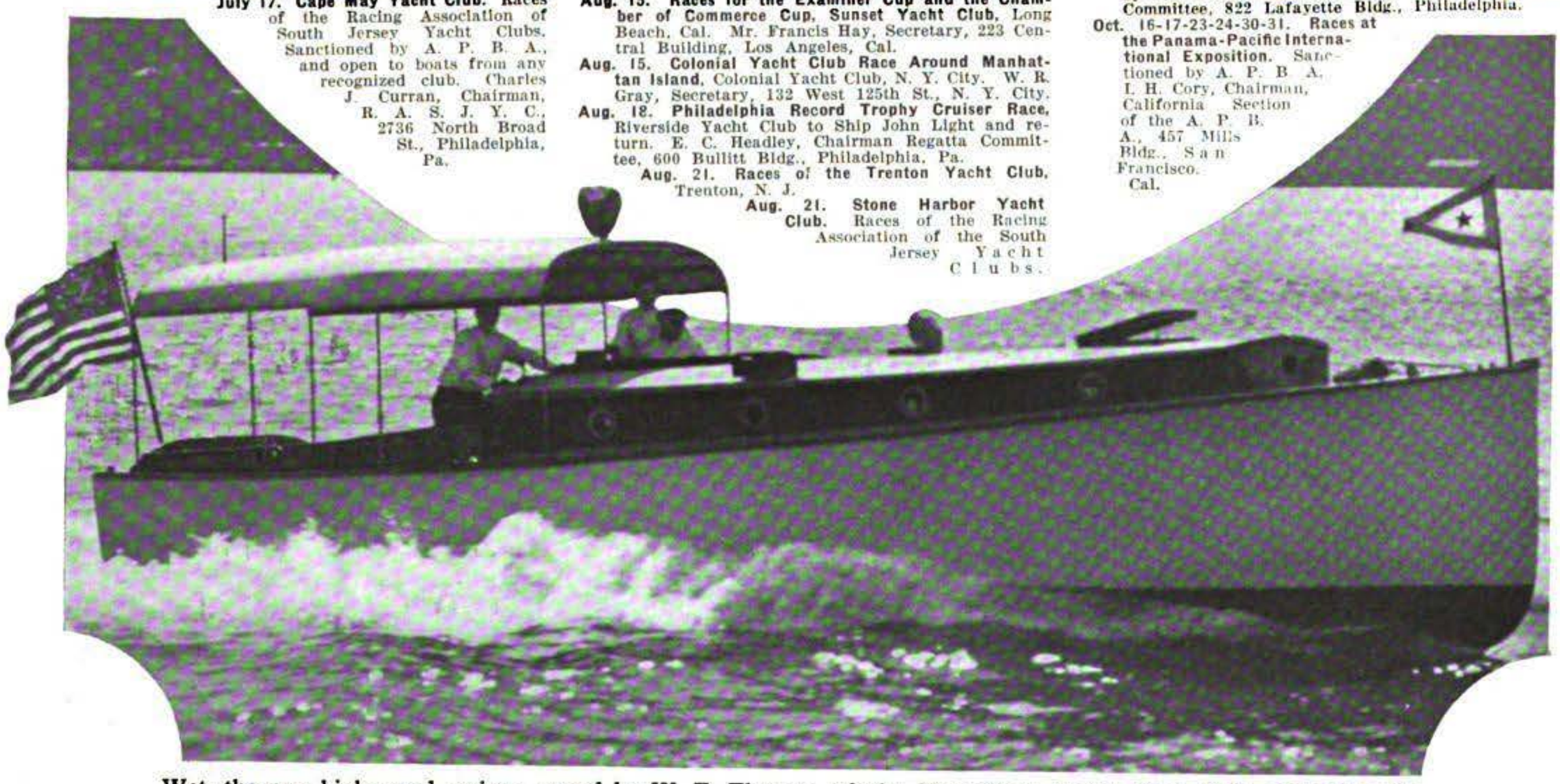
Sept. 18. Cruiser Race for the du Pont Trophy, Camden Motor Boat Club. Joseph F. Magee, Secretary, 335 North Second St., Camden, N. J.

Sept. 25.—Philadelphia Record Trophy Speed Boat Race, Camden to Torresdale. Start and finish at the Riverton Yacht Club, Riverton, Pa. E. C. Headley, Chairman Regatta Committee, 600 Bullitt Bldg., Philadelphia, Pa.

Sept. 26. Races of the Pacific Motor Boat Club, Belvedere, Cal. Mr. C. Willard Evans, Secretary, 187 Fremont St., San Francisco, Cal.

Oct. 1. Start of New York to San Francisco Motor Boat Race. Held under the auspices of the Panama-Pacific International Exposition. Sanctioned by A. P. B. A., and open to boats between 55 and 100 feet waterline length. Total distance 5,730 nautical miles. Cash prizes to the amount of $10,000 offered by P. P. I. E. Thos. D. Bowes, Chairman Eastern Committee, 822 Lafayette Bldg., Philadelphia.

Oct. 16-17-23-24-30-31. Races at the Panama-Pacific International Exposition. Sanctioned by A. P. B. A. I. H. Cory, Chairman, California Section of the A. P. B. A., 457 Mills Bldg., San Francisco, Cal.



Wet, the new high-speed cruiser, owned by W. E. Thomas, of the New York Motor Boat Club, powered with a six-cylinder 5.2 x 7-inch Wisconsin motor.

New Things For MOTOR Boatmen

Neptune Speedboat Life Preserver.

The Zephyrsilk Specialty Company, of South Bend, Ind., is putting on the market, as an addition to its extensive line of life preservers, life raft mattresses, pillows and boat cushions, the Speedboat life preserver so fashioned as to fit closely the body of any person, large or small, giving perfect freedom of action and at the same time protecting the wearer from cold or storm. The material with which this coat life preserver is filled is "Zephyrsilk," which is stated to be five times more buoyant than cork. The preserver weighs only 36 ounces. Covered with brown denim, the cost is $6; in khaki, $7.50 and in artificial leather, $15. One of the chief features of this preserver is that it is so constructed that there is but one knot to tie in fastening it around the body.

* * *

The Benton Spark Plug.

This new design of plug is claimed by the L. F. Benton Company, of Vergennes, Vt., to minimize or entirely avoid common defects, to resist fouling and to permit easy cleaning without breakage or injury, and is made with variations to assure constant high motor efficiency under all conditions. The insulator is of extremely thin sheet mica spirally wound upon the central electrode and forced to a permanent gas and oil-tight joint within a steel bushing. The layers of mica extending each way from the bushing overlap each other to avoid possibility of their becoming loosened or broken, and the mica above the bushing is enclosed in a porcelain spacer. The insulator, as a whole, is easily removed from the plug for cleaning by unscrewing a single metal-to-metal gasketed joint. As a precaution against overheating of the insulation, the central electrode or pin is made with much greater cross section than the mica insulation itself. The wire used in the electrode terminals is of a special composition, and the outer wire forming the spark gap, being bent in a semicircle around the central electrode, gives the spark a wide selection of points. The wire is anchored into the shell at both ends better to assure its staying in place and to conduct away excessive heat.

* * *

Handy Valve Lifter.

The Fulton Company, Milwaukee, Wis., manufacturer of Aermore exhaust horns and Eklips spark plugs, has recently placed upon the market a tool known as the Handy valve lifter. It is constructed of one piece of spring steel, fits in the port hole of an engine and its knurled ends engage the sides of the slot in a valve by a slight pressure of the fingers, enabling the valve to be easily removed. The ends of the tool spread apart when the spring is pressed together. These ends have a double knurling on the outside, which engages securely the sides of the slot in the valve. The price is 75 cents.

* * *

Universal Lighting Plant.

The Universal Motor Company, of Oshkosh, Wis., is putting out a new direct-connected electric lighting plant consisting of a four-cylinder, 2½ x 3½-inch engine connected to a 3 K. W. direct-current generator. The generator is a special machine designed to fit the Universal engine and consists of ten field poles with a large commutator. The armature is eleven inches in diameter and acts as a flywheel. The average speed of the machine is 1,100 r.p.m., and the voltage can be supplied in 40, 60 or 110 volts. The 110-volt outfit is the one generally used for boat lighting. The engine has a built-in high-tension magneto on which the engine starts and runs, or, if desired, an electric starter can be fitted. The governor is of the centrifugal type and is stated to control the speed perfectly from no load to full load with no noticeable flicker of the lights. The outfit, complete, weighs 450 pounds, and is 36 inches long, 18 inches wide and 24 inches high.

* * *

M. B. & S. Combination Light.

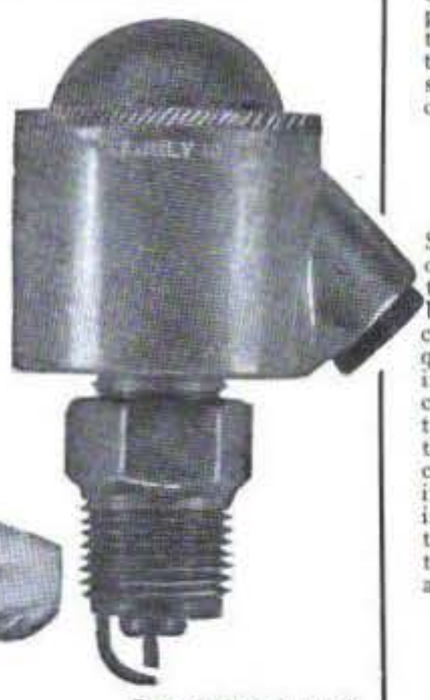
The Motor Boat & Supply Company, of Cleveland, Ohio, has put on the market an electric combination light made in galvanized iron and in black enamel.

Neptune Zephyrsilk Speedboat jacket life preserver.

M. B. & S. combination electric light.

The Morgan piston ring compressor.

Benton spark plug.



Day protected spark plug.

Fulton handy valve lifter.

Fahnestock spark plug connector.

This light is intended for bow use in Class I motor boats. The retail price is $1.50, and an electric bulb of 1½, 3 or 6 volts, with a lamp connector, will be furnished for 50 cents extra.

* * *

Morgan Piston Ring Compressor.

The Morgan Manufacturing Company, of Newport, R. I., has introduced a piston ring compressor or contractor which is designed to simplify the operation of fitting cylinders over pistons by taking care of the piston rings during the process. It is stated that the use of this device effects a very considerable saving in cost of labor and precludes the possibility of rings being broken or injured. The tool is made in three sizes, costing respectively 50 cents for pistons from 2 to 4 inches in diameter; 75 cents for 3 to 5-inch pistons, and $1 for pistons of from 4 to 6 inches.

* * *

Day Spark Plug.

George F. Day, of 21 Haverhill street, Boston, Mass., makes a spark plug the core of which is enclosed in a protecting metal case, the top of which is removable in order to enable access to be gained to the binding nut. This case may be readily separated from the plug and the core removed for inspection, cleaning or removal. The complete plug is priced at $1.50, and extra cores cost 50 cents each.

* * *

Fahnestock Spark Plug Connector.

The Fahnestock Electric Company, of 129 Patchen avenue, Brooklyn, N. Y., is making a neat spark plug connector which is operated by simply pressing down on the spring shown in our illustration, slipping the threaded stud of the spark plug through the hole and releasing the spring, which results in the stud being positively gripped by the spring pressure. There are no loose parts, and the cost of the connector is 7 cents.

* * *

Gardiner Bus-Bar Battery.

The Gardiner Storage Battery Company, of 2325 South Wabash avenue, Chicago, Ill., claims a number of exclusive features for the Gardiner Bus-Bar battery. Instead of connections, the battery is a solid bus-bar which unites the plates in one continuous construction, and it is said to take the charge quicker by reason of the absence of connections, giving the current an unobstructed flow through the commodious channels. Further, the claim is made that the plates cannot buckle, a result said to be due to the character of the plate and the peculiarity of its composition and manufacture. The battery is made in various sizes for lighting, ignition and starting. It is stated that the battery is practically non-sulphating, that damaged plates may be clipped away without interfering with the operation of the battery, and that a short circuited plate can be similarly cut away.

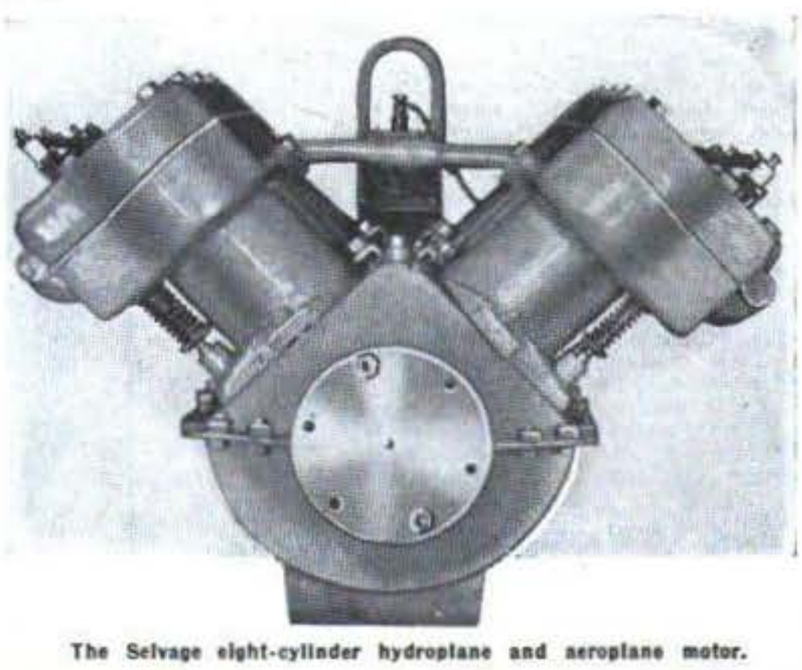
* * *

The Selvage V-Type Motor.

The Selvage Motor Company, of Eureka, Cal., is making a V-type eight-cylinder motor for use in hydroplanes, displacement boats and aeroplanes. The cylinders are cast in two blocks of four, giving, it is stated, great strength to the motor as a whole and noticeable freedom from vibration. The cylinder heads, cast in one piece, are removable, giving instant access for grinding or inspection of the valves. The base is a special aluminum casting designed with a view to strength and rigidity rather than extreme lightness. The crankshaft is supported on three interchangeable Parsons white brass bearings. In the forward end of the motor are two thrust bearings, which take the tractive and propulsive load of the shaft. Lubrication has been designed to meet the severe requirements of a motor for this service, no oiling by hand or grease cups being used. The motor is equipped with a Bosch high-tension magneto which is mounted in the V of the cylinder blocks.

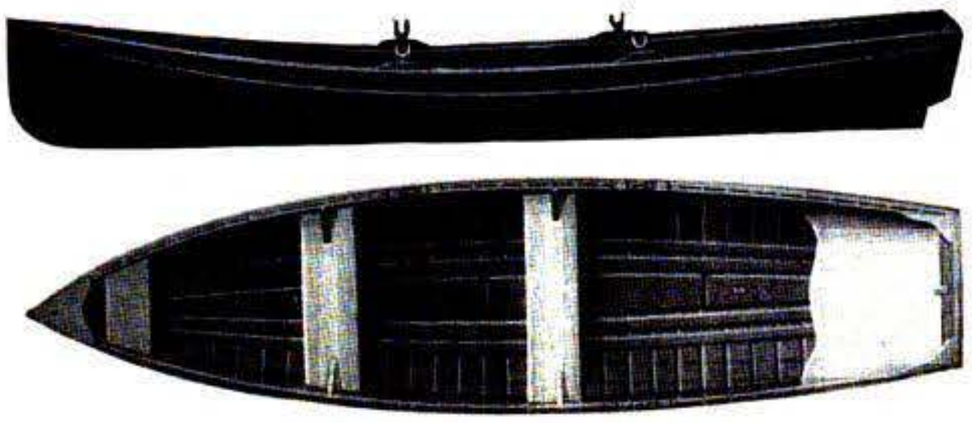
The Universal direct-connected generator.

Gardiner Bus-Bar battery.



The Selvage eight-cylinder hydroplane and aeroplane motor.

Baker binnacle with non-extinguishable kerosene lamp.



Profile and arrangement plan of the Kidney outboard motor rowboat.

The Schug type B-25 portable storage battery.

Baker Mahogany Binnacle.

George A. Baker, of 42 Elm Street, Melrose, Mass., is putting out a mahogany binnacle which may be equipped either with the Baker patented kerosene binnacle lamp or with an electric light. The kerosene lamp is made of polished brass and may be detached instantly for filling and cleaning. It is guaranteed not to blow out. The electric outfit is interchangeable and there are no screws or fastenings to remove, a turn to right or left attaching or releasing either instantly. The electric light runs on one or more dry cells or a storage battery. A feature of Baker compasses (which have been made for the last forty years) is the special colorless oil with which they are filled. This is stated never to freeze, congeal or change color, remaining the same under all conditions and standing any degree of heat or cold met with in any climate. Another feature of the compasses is the patent gimbal ring used for equalizing the two motions of the compass in its bearings.

* * *

The Stepp-O-Lite Lantern.

The Bass-Moody Co., of Peoria, Ill., makes the battery lantern shown in our illustration. This consists of bulb, reflector, switch, handle and attachment, enabling it to be firmly secured in a moment to any dry cell.

* * *

The Pathfinder Compass.

C. D. Durkee & Co., of 2 South St., New York City, have gotten out a new compass which is very compact and most substantially put together. It is of heavy brass, very simple in design, but handsome in appearance. The face is stated to be always level, irrespective of how the boat may toss. The needle is hung on a jeweled pinion, is true and steady, and has a lock-stop to hold it rigid when not in use. The size of this compass is four inches across the base by two inches high, and the dial is two inches in diameter. The makers have taken every care to make it an ornament as well as an instrument of practical value.

* * *

Olympic Horns.

The Electric Spark Appliance Co., of 140-162 Imlay Street, Brooklyn, N. Y., specializes in motor-driven and vibrator type warning signals. Our illustration shows a sectional view of the latter. The base of this horn is designed to perform the functions of four different elements. In conjunction with a disc cover it holds a single electric coil and forms the magnet. On its outer face are supported portions of the mechanism and the cover. The armature strikes the diaphragm directly without the assistance of an intervening rod or pin. The company is introducing a new motor-driven horn which is made entirely of stamped or drawn steel, a circumstance which, it is claimed, insures greater efficiency.

* * *

Enchased Joint Pliers.

H. D. Smith & Co., of Plantsville, Conn., makes a slot cutting plier furnished with an enchased joint which gives a bearing around its entire circumference except where there is an opening for a cutter. It is claimed that this feature insures perfect operation at all points, and, further, that it adds materially to the active life of the tool. The enchased joint is also applied to the company's side and diagonal cutting pliers.

* * *

Lake Breeze Motor Fan.

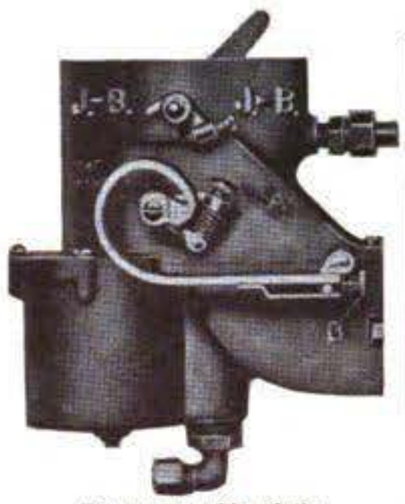
The Lake Breeze Motor, manufactured by Wm. J. H. Strong, of 120 No. Jefferson Street, Chicago, Ill., is a portable fan which is operated by alcohol. The motive power is derived from the expansion and contraction of air confined in a carefully ground cylinder in which there are two pistons properly synchronized. One piston is of the usual plunger type and the other is a displacement piston which serves to transfer the air from the hot end of the cylinder, where it is heated and expanded, to the cool end, where it is cooled and contracted. The difference in the temperature of the two ends of the cylinder and the expansion and contraction of the air as it moves from one end to the other produces the power which turns the fan. There is no exhaust, as the same air is used over and over again. The alcohol lamp which furnishes the heat is placed in the base of the fan support. This fan, which is stated to be eminently satisfactory for boat use, is sold for $15.

* * *

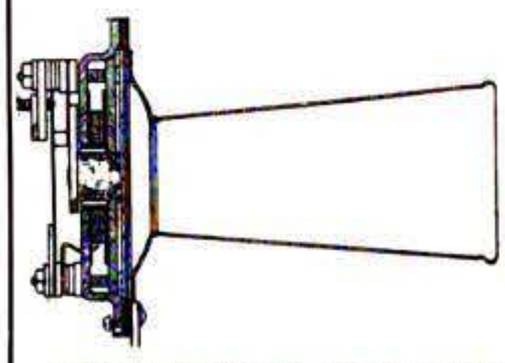
Schug Storage Batteries.

The Schug Electrical Manufacturing Company, of 252 Larned Street, East, Detroit, Mich., as part of a full line of electrical specialties, manufactures portable storage batteries for use on motor boats. These are stated to be of high-grade material and workmanship, giving excellent service. Type 25-A, with exposed rubber jar, 6-volt and 60-ampere hour capacity, is sold for $15, and type 25-B, with wooden case, is sold in 60, 80, 120, 150 and 250-ampere hour capacity, selling for $15, $21, $30, $35 and $50. These batteries also are 6-volt outfits.

Stepp-O-Lite lantern.



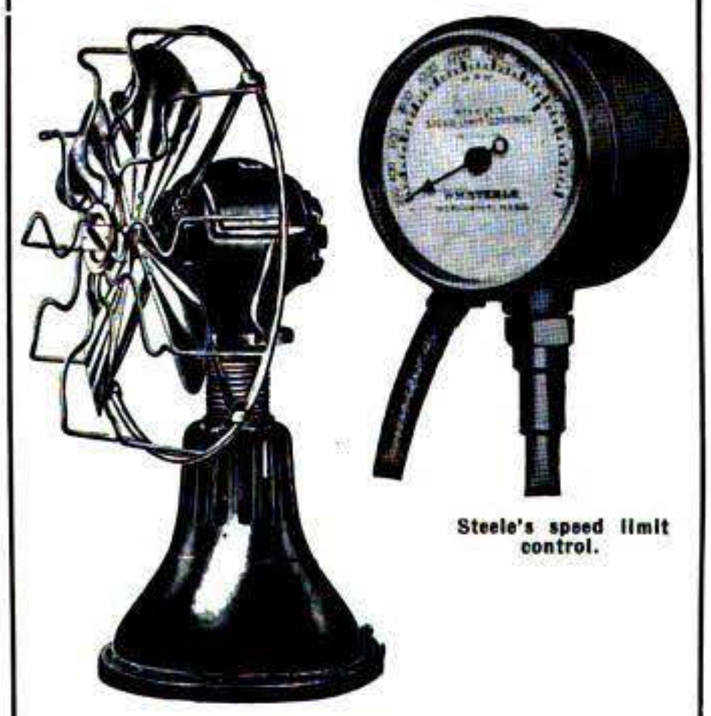
Thermostat side of the J. B. carbureter.



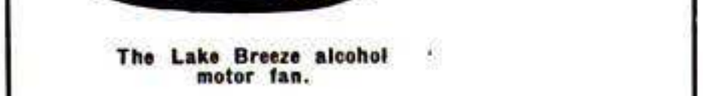
Sectional view of the Olympic vibrator warning signal.

Viking spark plug.

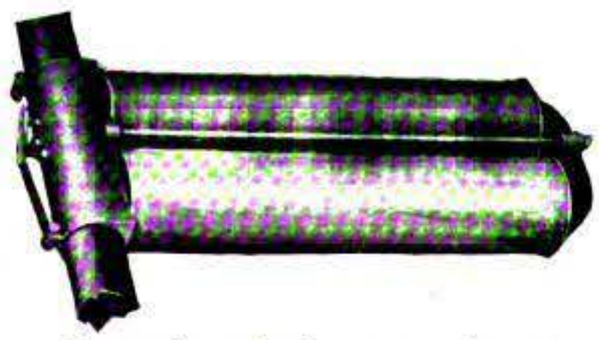
Smith enchased joint pliers.



Steele's speed limit control.



The Lake Breeze alcohol motor fan.



Gray marine muffler for express cruiser use.

* * *

Kidney Rowboat.

D. Kidney & Son, West De Pere, Wis., have recently put on the market a special 15-foot rowboat for use with a detachable motor. This boat, which is different in design from the other rowboats put out by these people, is very wide and full at the stern, flat on the bottom and of very little draft. With one person sitting in the stern, the boat is on an even keel instead of having a large part of her length out of the water, as is often the case with boats of the conventional type. The keel, stem, transom, breasthook and ribs are of white oak, and the planking of white cedar. The inwales are of oak, ash or rock elm, and the fender rail of oak or rock elm; the seats are of ash or elm, with two knees to each seat. The boat is furnished in carvel finish and clinker, costing $52 and $40 respectively.

* * *

The J. B. Carbureter.

A feature of the J-B carbureter, made by the J-B Carbureter Corporation, of Main and Washington Streets, Los Angeles, Cal., is the use of an automatic thermostatic control which is designed to permit the state of the surrounding temperature to assume complete control of motor and carbureter. On starting, the cold atmosphere contracts the thermostat, raises the needle valve and gives a rich mixture. As the motor warms up the thermostat expands, lowers the needle valve and reduces the supply of fuel to the needs of the motor. There are three adjustments for low and high speeds and for air valve, and once these are correctly regulated it is recommended that the carbureter be left alone.

* * *

The Viking Spark Plug.

The John MacGregor Co., of Roslindale, Boston, Mass., describes the Viking spark plug as one which will give perfect service under extreme conditions owing to absence of carbon deposit and the gas-tight features assumed by the heavy insulator and center electrode being hermetically fused together to make one solid unit. The plug is made in regular and special types in all sizes, including metric, and its price, in any style, is $1.

* * *

Platmridm and So-Luminum.

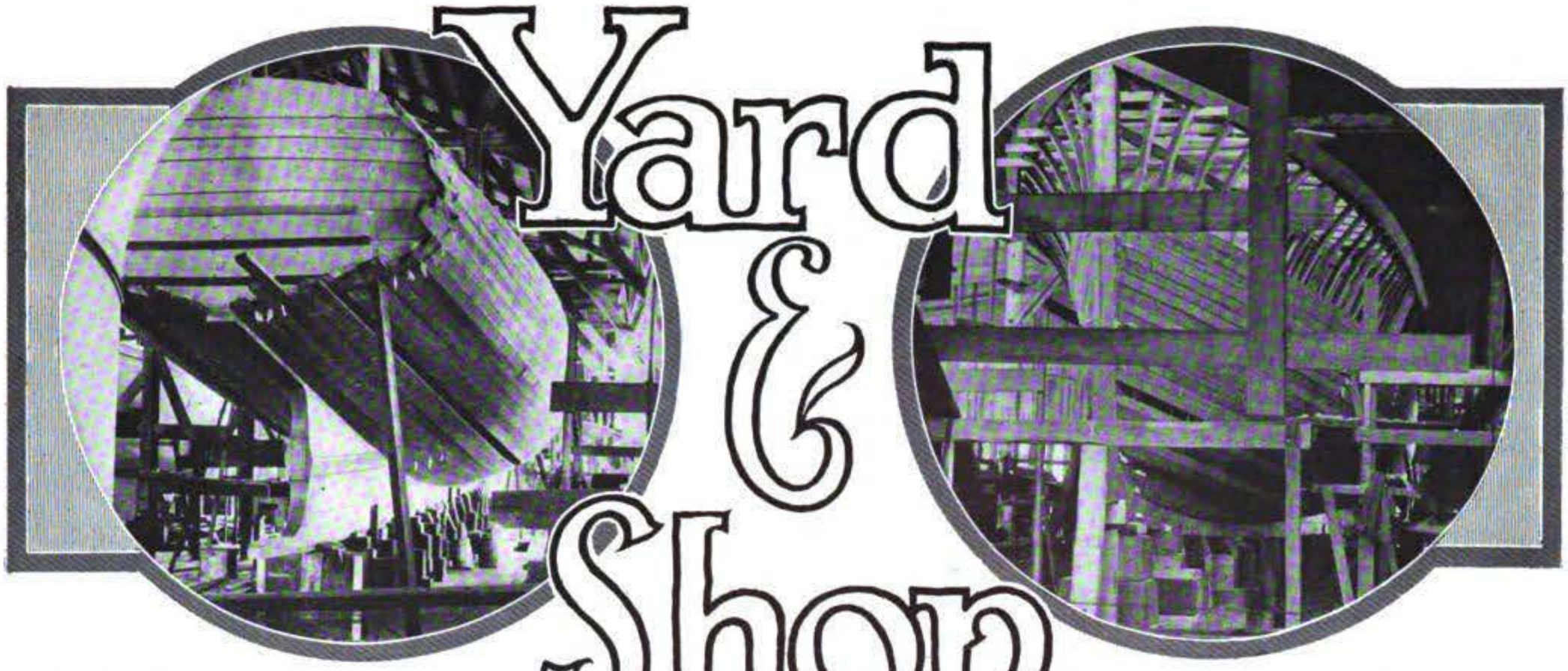
The Wholesale Distributing Co., Box 2630, Station J, Philadelphia, Pa., is marketing Platmridm, which is offered as a substitute for aluminum at an appreciably lower price. It is furnished for magneto and master vibrator points at 50 cents each and for coil points at 30 cents. It is said to give perfectly satisfactory ignition, to be non-corrosive and durable. So-Luminum is an aluminum solder which melts at a low temperature and, when cold, is harder than aluminum. It is priced at $3.50 per pound in sticks or flat bars.

The company states that So-Luminum is twice the strength of aluminum and that therefore a completed job will break in the aluminum and not at the joint itself.

* * *

Gray Marine Muffler.

This muffler, manufactured by the Gray-Hawley Manufacturing Company, of Detroit, Mich., is designed especially for use on the modern high-speed runabout or express cruiser, and is intended to be placed in the useless space at the extreme stern. A cut-out valve is fitted in the center of the receiving head, and when the valve is opened the exhaust gases pass straight through the head and out of the boat without even a bend in the pipe line. When the valve is closed, the exhaust enters the first expansion chamber, and by an easy curve into the silencer, then escapes through the same outlet as when the cut-out is open. The drums are made of heavy galvanized steel, or special materials can he had to order. With this muffler it is possible to turn water into the exhaust pipe, as it is so constructed as to allow free passage. The muffler is regularly made in 12, 18, 30 and 36-inch lengths selling for prices ranging from $7.50 for the smallest size up to $15 for the largest. Other sizes are built to order.



Yard & Shop

Lady Baltimore, the San Francisco racer under construction by the Mathis Yacht Building Company, of Camden, New Jersey.

Ray V. Warman Induces Dept. of Commerce to Make Change.

In the Foreign Trade Opportunities published in the Daily Commerce Reports mention has not been made (until now) of the country from which the inquiry originates. For example, the department has formerly referred to the far east or to South America instead of specifying the name of the country. It was pointed out by Mr. Warman, who directs the export business of the Scripps Motor Co., that this involved a great waste of time, not only on the part of each manufacturer, but on the part of the government as well. A manufacturer whose export distribution was practically world wide might have a small part of, say, South America which was not yet covered by an agency. This necessitated his writing to the Department of Commerce for the address of every inquiry which referred to South America, and if the reserved information showed that the agency inquiry originated in a country in which he was already represented both his efforts and the department's were worthless. The Daily Reports now indicate the country of origin and appreciating the time saved by this suggestion the department has since sent Mr. Warman other blanks for revision which are now used in the consular service.

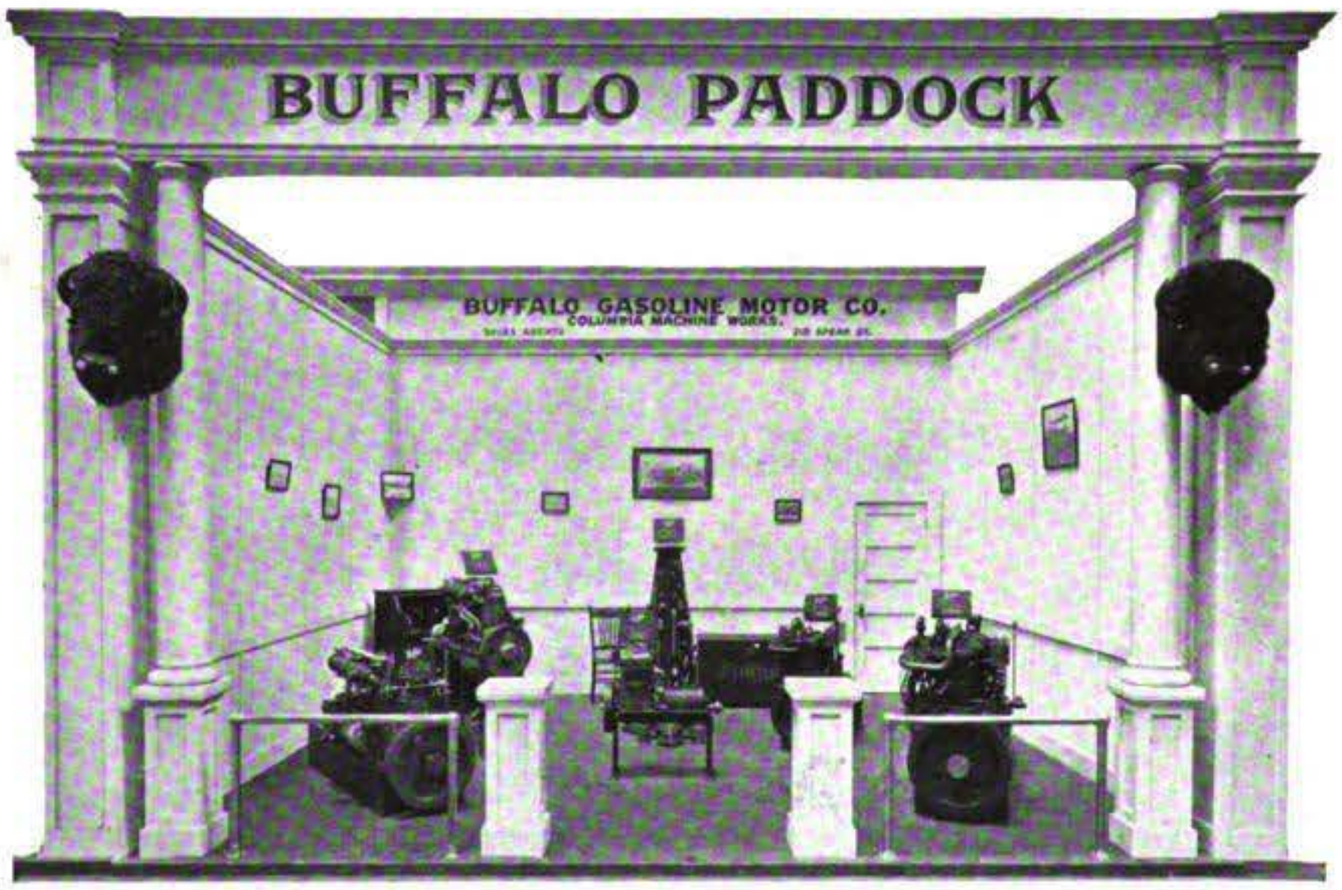
Anderson Engine Company Working to Capacity.

The Anderson Engine Co., of Chicago, are working to full capacity in meeting the increasing demand for their line of four-cycle engines. Their 24-h.p., four-cylinder, 5x6-inch, a popular size, well suited for pleasure and work boats, is an exceptionally high-grade engine and a typical example of what their line includes. With full marine and magneto equipment of the very best, it is offered at the moderate price of $666.66.

Hydro Cub.

At the time of writing "Aviation and the Possibilities of Surface Flying," in the June number of this magazine, the writer of the article, William H. Fauber, had no thought of getting out plans for the building of surface flying boats. Since then, however, he has designed a model known as Hydro Cub, which is intended to come within reach of the young sportsmen in the field who can afford to invest only a limited amount of money in the purchase or the building of a boat. This model will be a single-passenger craft with a V-type, two-cylinder, air-cooled motor of the motorcycle type, developing about 14 h.p. and weighing no more than 100 pounds. The total weight of the craft, it is estimated, with one hour's gasoline supply, can be kept down to 300 pounds, or 21 pounds per horsepower. The hull of the Cub model, which is 12 feet in length, will embody some new ideas and will be very light and strong, while the wing construction is not difficult to build. The motor will be mounted forward of and above the cockpit, and a tractor, mounted securely above the bow, will be used. Considerable interest will attend the building of the first model of this type, and, if successful, it will introduce a new phase of motor boating, wherein the boatist sails not in nor on the water but ten feet or so above it.

Proposed Fauber surface flyer, Hydro Cub.



The Buffalo Gasoline Motor Co.'s exhibit at the Panama-Pacific International Exposition.

Camden Anchor-Rockland Machine Company Keep Busy.

If the reports of one company are any indication, they seem to be pretty busy down in Maine building motor boats this summer. The Camden Anchor-Rockland Machine Co., of Camden, report that they now have under construction the following motor craft: A houseboat cruiser, designed by Swasey, Raymond & Page, and building for E. Stewart Davis, of New York. This is a 77-footer powered with two Sterling motors, and she is to be put in the water about the middle of July. Another boat by the same designers is being built for Irvin E. Raymond, of New York. This is a 46-footer whose power plant has not yet been decided upon. She will be used in New York waters. Then there is a 35-foot semi-speed boat designed by John Alden for A. M. Erickson, of Boston, which will be powered with a 90-h.p. Sterling and is expected to make a speed of 25 knots. In addition to these, there are a 30-foot, 20-knot boat for F. W. Burdett, of Boston, and seven 20-foot Knox runabouts for the Coastguard service. Other boats have been contracted for for later delivery.

Sterling on Night Shift.

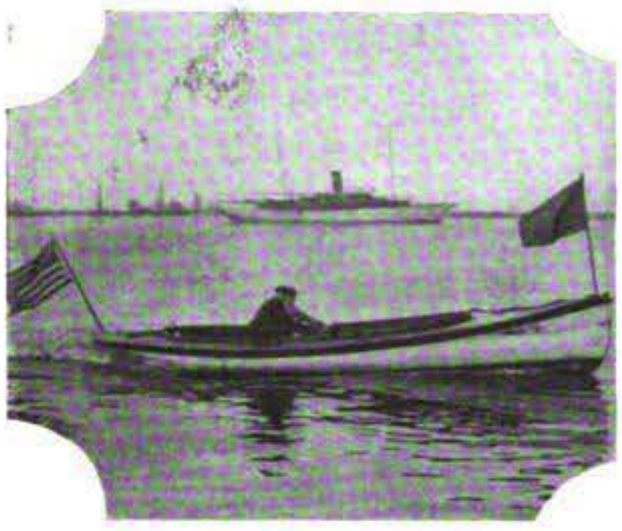
With a demand hitherto unparalleled in its history, the Sterling Engine, Buffalo, N. Y., finds itself obliged to put on a night force in the testing department for an indefinite period. The great amount of business necessary to compel a step of this kind is apparent when it is remembered that the Sterling Engine Co. has only lately greatly enlarged the capacity of its testing department by the erection of a new testing room in a separate building, permitting the simultaneous testing of twenty - one engines. The present demand for Sterling engines is of a general nature, including the speed, high-speed, medium-duty, heavy-duty and heavy-duty speed models. Their export trade is stated to be especially heavy.

An Interesting Test.

A test was held recently by the Gas Engine & Power Co. and Charles L. Seabury & Co., Morris Heights, N. Y., of the new six-cylinder 100-115-h.p. Speedway motor. This motor has several features which are new to Speedway construction, as is noted on another page of

this issue. During the test four pennies were stood up on edge on the top of the motor, and although the tachometer showed her to be turning 600 r.p.m. (full load), the coins were not upset.

This is believed to be the most notable demonstration of steadiness ever given.



A seaworthy runabout used in the Quarantine Service at Mayport, Fla. A Sterling runabout motor comprises her power plant.

Mietz & Weiss Oil Engines Sold to U. S.

The contract for Lightvessels 101 and 102 for the government includes two 200-h.p. Mietz & Weiss direct reversible marine oil engines, and four 50-h.p. oil engine compressor outfits. This order was placed on the decision of the government's engineers on account of their experience with the 100-h.p. M. & W. reversible oil engine in Lightvessel 98 and the 150-h.p. engine in Lightvessel 54.

Satisfied Wheel User.

The following letter has been received by the Bryant & Berry Co., of Detroit, Mich., from a satisfied customer living in Washington, D. C.: "I have now had one year's trial of the 26x30-inch propeller sent me by your firm, and can truly say that I consider it the only scientific wheel now on the American market . . . as it seems to cut the water into chunks and throw them directly astern. In putting on your propeller, I took off one made by one of the best firms in the United States, and your wheel added fully one mile per hour to the speed of my 40-foot boat. If I could not get another wheel of the same kind, I would not sell this one for $100."—D. KNOWLTON.

Motor Car Equipment Company Enters Marine Field.

The Motor Car Equipment Co., of 55 Warren street, New York City, importer, wholesaler and manufacturer of automobile accessories, has made the recent announcement that it has decided to add to its business a new department which will handle motor boat accessories and equipment, as well as a line of such marine hardware as is more or less standard for motorboat use.

Gordon Propellers on the Pacific Coast.

The Gordon Propeller exhibit at the San Francisco Exposition is demonstrating in such a thorough manner the good points of this wheel that good agencies at important points have seen the advisability of taking hold of it. The following have been appointed: A. R. Williams Machinery Co., Ltd., Vancouver, B. C.; U. G. Sherman, Seattle, Wash.; F. C. Gordon, Tacoma, Wash.; Atlas Gas Engine Agency, Astoria, Ore.; Gas Power & Supply Co., Inc., Portland, Ore.; Weeks-Howe-Emerson Co., San Francisco, Cal.; Marine Engine & Supply Co., Los Angeles, Calif. Good orders have already been received from the different agents, and a full stock of wheels will soon be available for prompt delivery.

For Quarantine Service in Florida.

The United States quarantine station, Mayport, Fla., at the mouth of the St. John's river, has just acquired a heavily constructed 26x6-foot runabout for use in boarding steamships and sailing vessels entering the big river. As the bar at the entrance is very rough at times, the little craft had to be of exceptionally seaworthy build and have a power plant that was absolutely reliable and efficient in every way. It gives the Sterling Engine Co., of Buffalo, N. Y., considerable satisfaction that the new Sterling Model E, 17-25 h.p. runabout motor was selected, the negotiations being transacted between Dr. Neil Alfort, assistant surgeon in charge, Mayport, Fla., and the National Boat and Engine Co., of Jacksonville, Sterling distributor in Florida. This engine gives the boat a speed of 10 miles per hour, turning a 20x18-inch Ailsa Craig Columbia propeller at approximately 840 r.p.m.

An attractive window display which was placed in the window of a New York dealer recently to illustrate the effectiveness of Pyrene as a fire fighter.

A 31-Foot V-Bottom Hunting Cabin Cruiser.

The accompanying illustrations are of a new 31x8.3x2-ft. V-bottom hunting cabin cruiser built by the St. Louis Yacht & Boat Co., as a standardized stock model for both deep water and river use. This is the smallest of the several standardized stock model cabin cruisers built by the St. Louis company. It has well ventilated stateroom forward accommodating two, and a main cabin with extension berths amidship accommodating four with clothes lockers between, and a well-appointed galley and enclosed lavatory in the after-end of the cabin on either side of the engine, which is entirely enclosed, although made readily accessible. All the controls are carried to the steering wheel in the forward end of the cockpit, which is covered with an awning with drop curtains to entirely enclose the cockpit when desired. The boat is designed for either two or four-cylinder, four-cycle engines up to 35 h.p., with which it develops a speed of 14 miles an hour.

The contented smile of C. Z. Kroh.

Pyrene Beats the Movies.

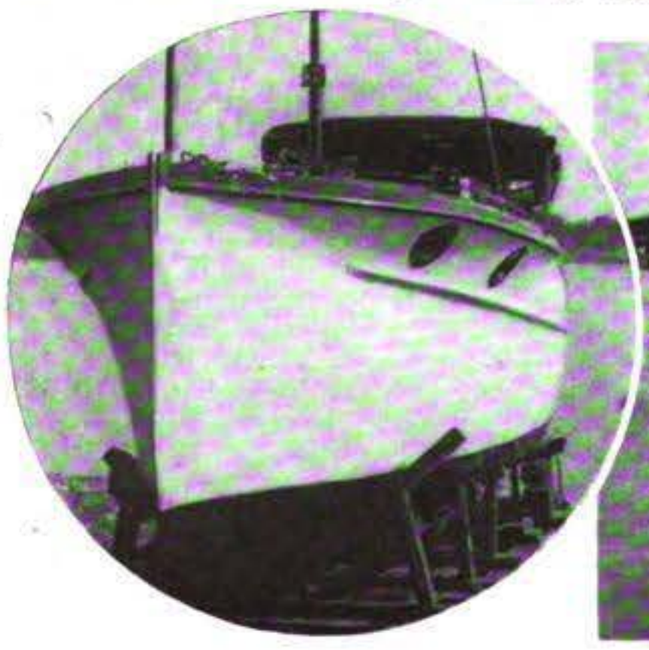
The Pyrene Mfg. Co., of New York City, has a mechanical sign which is so realistic that it gets as much attention as a real fire. A few weeks ago, when one of these signs was placed in the window of a New York City dealer, it attracted so much attention that it blocked the traffic during the rush hours.

The sign is a large mechanical one, with a big, broad arrow on top, swinging from side to side with a sweeping motion, while below there is portrayed on one side a disastrous fire, with the firemen hacking at the window, the smoke rolling out in clouds.

On the other side, the display shows a home protected by Pyrene extinguishers; the sunshine floods the room while inmates of the house easily stifle the fire at the start with the convenient and efficient Pyrene fire extinguisher.

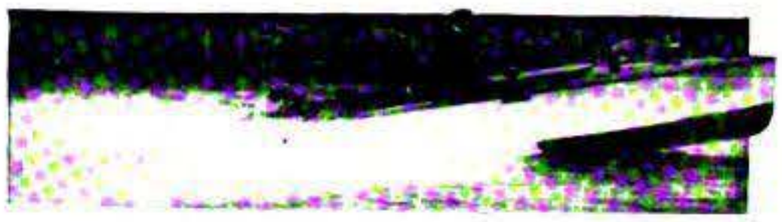
Government Pays Tribute to Kroh Company

When a concern specifies that a certain article must be the equal of a certain make, it is pretty much an endorsement of that make, and when the U. S. Government makes such a specification it is an even better endorsement.



A V-bottom hunting cabin cruiser put out as a standardized stock model by the Saint Louis Yacht & Boat Co.

This is what the Government did recently. It stated that certain tops must be the equal of the tops manufactured by the C. Z. Kroh Co., of Toledo, O. They say that a prophet is not without honor save in his own country, but if we may be permitted to mix metaphors



A Valley racer, powered with a four-cylinder Van Blerck motor. With the engine turning at 1,400 r.p.m., this boat makes 31 miles.

and pervert somewhat a well-known proverb, we will say that in Mr. Kroh's case the chickens have come home to roost. The accompanying photographic reproduction portrays the satisfied smile which illumines the countenance of Mr. Kroh. He is entitled to it.

Bruns-Kimball's Philadelphia Branch Moves.

Bruns, Kimball & Co., of New York City, advise they have located their Philadelphia branch in the machinery department in the basement of the Philadelphia Bourse building, removing from 608 Arch street. They believe their many friends and patrons in the Philadelphia territory will appreciate this change, as the Bourse building is centrally located and is the market place for buyers of marine engines and all other equipment of this kind. Bruns, Kimball & Co. will exhibit there a very complete and interesting line of the Sterling four-cycle engine, the Kermath four-cycle engine, the sturdy two-cycle Hubbard line, the Northwestern line, including the Northwestern rowboat motor, and the little American Boy engine.

Leece-Neville Moves to Larger Quarters.

The Leece - Neville Co., of Cleveland, O., manufacturer of electric starting and lighting systems, has purchased a two and three-story factory, located at 5353 - 5363 Hamilton avenue, N. E., Cleveland, O. The various departments, together with additional up-to-date machinery, will be gradually moved into the new plant without any interruption to the production of the company. The new building has a frontage of 150 feet, and is 312 feet deep, and the acquisition of this enlarged manufacturing space and additional machinery will give the company adequate facilities to take care of its rapidly growing business.

Thirty-one Miles an Hour with a Four-Cylinder Van Blerck.

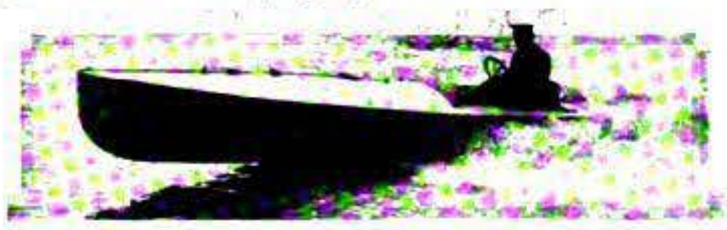
H. H. Behse, of Saginaw, Mich., purchased a 24x5 1-3 foot runabout from the Valley Boat Co., Saginaw, Mich., last season, in which a four-cylinder, 4½x5-inch motor was installed. Mr. Behse was quite satisfied with this motor and was delighted with the boat, but too many of his friends had a nasty, mean habit of coming up from behind and going by him without any appreciable effort, so this year he made up his mind that they would have to go some to beat his little boat, and so had the Valley Boat Co., of Saginaw, Mich., rip out his last year's engine and install a brand new 1915 model four-cylinder 5½x6-inch Van Blerck with its guaranteed horsepower contract. And immediately the little boat touched the 31-mile mark and it is expected to do better than that before the season is over. Mr. Behse is very enthusiastic over his new outfit, especially with action of his new motor, which he claims can't be heard or even felt. He had an electric starter installed, so just gets into the boat, turns on the switch, pushes a button and proceeds to churn up the waters surrounding Saginaw.

The Sterling in Florida.

The National Boat and Engine Company

Display of Sterling engines at the Sterling Co.'s representatives in Jacksonville, Fla.—the National Boat & Engine Co.

is Florida distributor of the Sterling Engine Company and at its show rooms in Jacksonville the Sterling engine in various models may be seen at all times. This concern has been rewarded for its energy by effecting a large number of sales of Sterling engines in its locality. The new Model E 17-25 h. p. motor runabout has attained great popularity in Florida, and one has recently been placed in the 26x5-foot displacement runabout of W. H. Dowling, county sheriff. The craft has a speed of better than 17 m.p.h. and is used for catching river thieves and fish pirates. Another of the Model E-1 17-25-h.p. motors has been in-



A stock 18-foot monoplane, built by the Saint Louis Yacht & Boat Co., doing 28 m.p.h., powered with a Pierce-Budd motor.

stalled in the 30-foot glass cabin launch of Hon. R. M. Call, United States district judge, of Jacksonville, and drives the boat at 10 m.p.h.

A Coast Cruiser.

The illustrations at the bottom of this page show an interesting type of auxiliary motor boat, which was designed and built by F. S. Nock, of East Greenwich, R. I., for Dr. W. S. Dennett, of New York City. The dimensions of the boat are 64 feet overall, 12 feet 6 inches beam and 4 feet 5 inches draft. This craft was designed with the idea of having a comfortable sea boat for use along the coast, and has proved exceptionally able. Her auxiliary rig is very substantial and the sail area is sufficient to allow the boat to be easily handled in case the motor fails to operate. The main power plant consists of a six-cylinder 6x10-inch Loew-Victor heavy-duty motor, which gives a cruising speed of 12 miles per hour.

New Loew-Victor Engine Promised.

It has been announced that the Loew-Victor Engine Co., of Chicago, Ill., is to build for 1916 an eight-cylinder, twin-valve, high-speed Harbeck motor and that this power equipment for some larger and faster express is now contemplated. Recently, this company delivered six-cylinder Harbeck-Loew-Victor engines to Messrs. Drexel and Burk, at Philadelphia, for installation in their new boats which are now building.

Putting the finishing touches on Alsorie III, a cruiser built by the Camden Anchor-Rockland Machine Co., of Camden, Me., for C. N. Burnell, of Boston, Mass. She measures 51 feet length by a beam of 10 feet 1 inch.

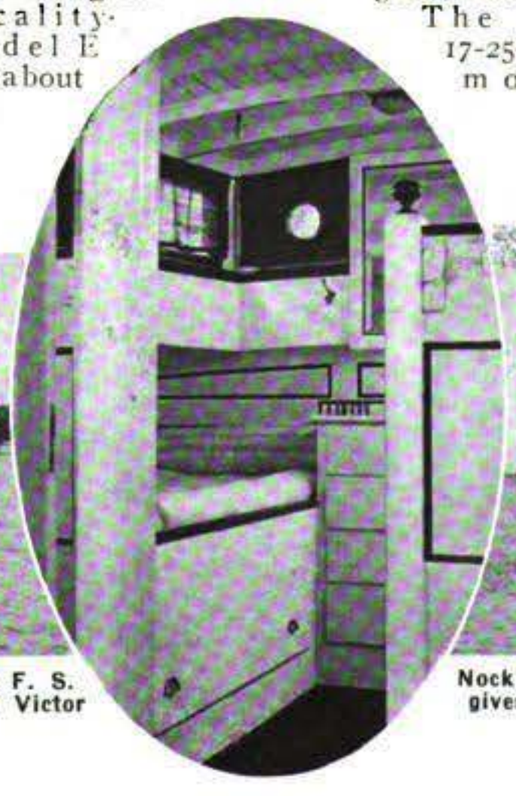
A Communication.

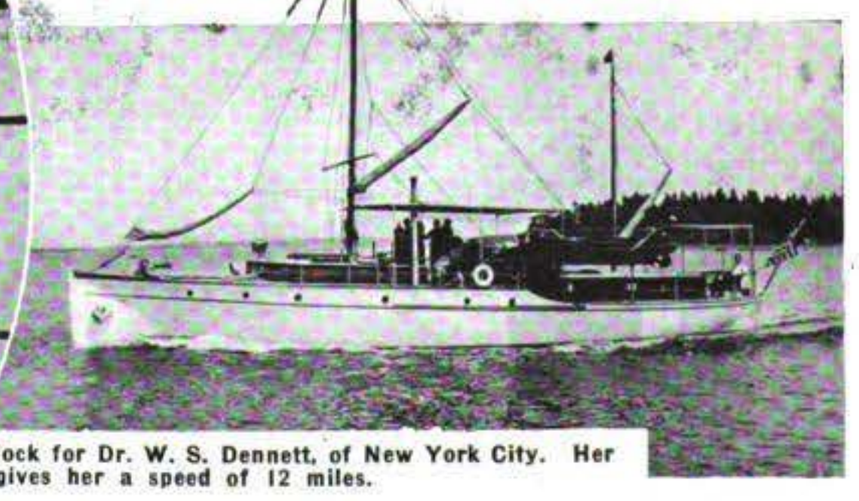
To the Editor of MoToR BoatingG:

The Prize Contest article on "Fitting the Stuffing Box" in the June number was certainly very interesting. How was it, though, that the latest stuffing box was not included in the representation, so as to bring every phase of the subject to the attention of those interested in this important adjunct to the motor boat, at date? You may not be conversant with the fact that the latest stuffing boxes have substituted lignum vitae for babbitt and have installed an internal thread gland and other improvements not found in any of the boxes heretofore.

Perhaps many who read with interest the article alluded to, would care to know about this latest stuffing box, and I send you the name of the inventors of the Knorr-Andrade stuffing box, viz., the Tracy-Knorr Co.,

Santa Maria, a 64-foot cruiser designed by F. S. Nock for Dr. W. S. Dennett, of New York City. Her six-cylinder Loew Victor gives her a speed of 12 miles.





Patchogue, L. I., and I am sure they or the manufacturers, Charles D. Durkee & Co., of 2 South Street, New York City, will be glad to send particulars to any one expressing a desire to learn the merits of this wonderfully simple but cleverly conceived stuffing box.—JOSEPH HOSSACK, Vale View, Rocky River, O.

Henry B. a Great Lakes commercial motor boat which is powered with a heavy-duty Sterling and makes her 12 miles right along.

Lloyd's Register of Yachts, 1915.

The new volume of Lloyd's Register of America Yachts for 1915 shows little difference in outward appearance from its predecessor of last year, but an inspection of the book discloses many interesting changes. The number of yachts listed is practically the same—just under 3,600 within the limits of the United States, the Dominion of Canada and the West Indies. The additions of the year are largely motor cruisers of the raised-deck type, in all sizes from 30 feet to upward of 100 feet.

Over 560 clubs and forty miscellaneous boating organizations are listed, with their burgees in color, and there are 1,800 private signals of yachtsmen. No charge is made for listing boats or clubs in this volume, and the information it contains is exceedingly valuable to any one interested in boating. The Register is shipped, postage paid, on receipt of order by Lloyd's Register of Shipping, 17 Battery Place, New York City, the price being $8.50 for the blue cloth edition and $7 for the canvas edition. A deduction of $1 is made to those who purchased the 1914 volume.

Old Sol Electric Lights.

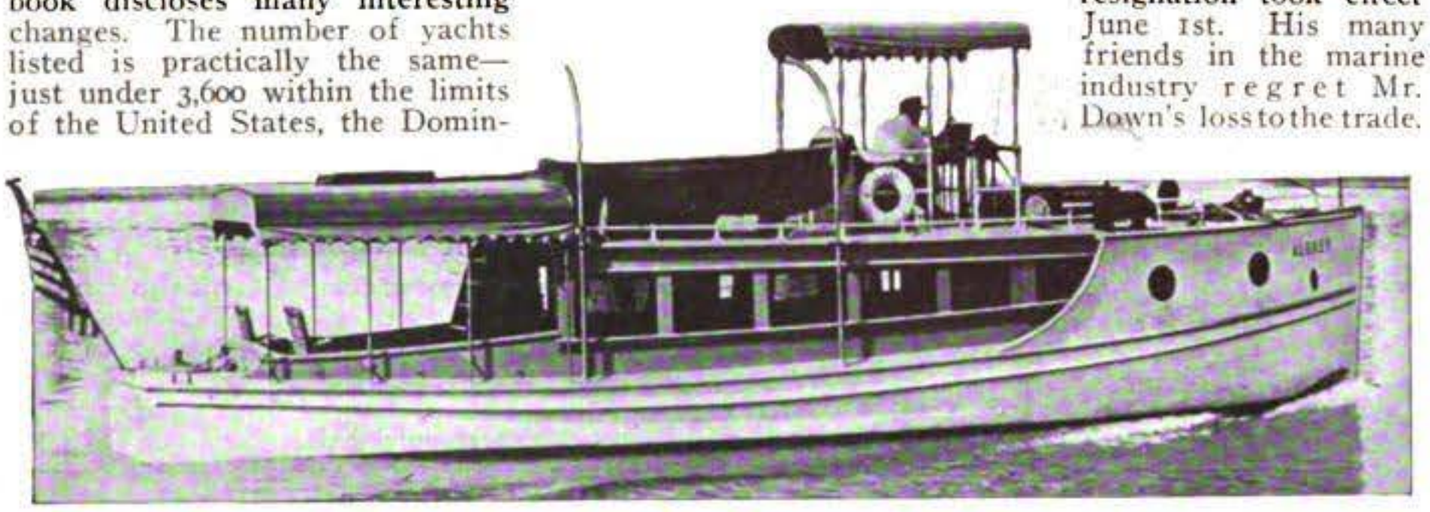
On the occasion recently of a jitney bus burning up when the operator attempted to locate trouble in the carbureter with the aid of a match, the Hawthorne Mfg. Co., of 35 Spruce Street, Bridgeport, Conn., took occasion to remark that such an accident would have been impossible if an Old Sol spot light had been used. These lights are made for marine as well as shore use, and are part of an interesting line of electrical accessories and novelties put out by the Hawthorne Company.

Prest-O-Lite Enters Electric Lighting Field.

The Prest-O-Lite Co., of Indianapolis, announces that it has purchased the business of the Pumpelly Battery Co., and is now entering the electric lighting field with the manufacture of the Prest-O-Lite storage battery. This battery is designed as a distinctive type in the field, and while embodying nothing that is revolutionary will include features upon which strong claims of increased current capacity, in connection with decreased weight, will be based. This line will include ignition, starting and lighting batteries of several types.

A Resignation.

Clinton A. Down has resigned as assistant advertising manager of the Ferro Machine & Foundry Co., of Cleveland, O., to act as assistant to Mr. Connolly of the B. F. Goodrich Tire & Rubber Co., of Akron, O. Mr. Down's resignation took effect June 1st. His many friends in the marine industry regret Mr. Down's loss to the trade.



Aubrey, owned by Louis Rippetoi, of Terre Haute, Ind. Ably assisted by a 50 h.p. Van Blerck, she plows the waters of the Wabash to the tune of the "Marseillaise."

Resuscitating a Scripps Motor.

A most interesting letter has recently been received by the Scripps Motor Co., of Detroit, Mich., from Charles E. Scott, of Linea Vieja, Costa Rica, as follows:

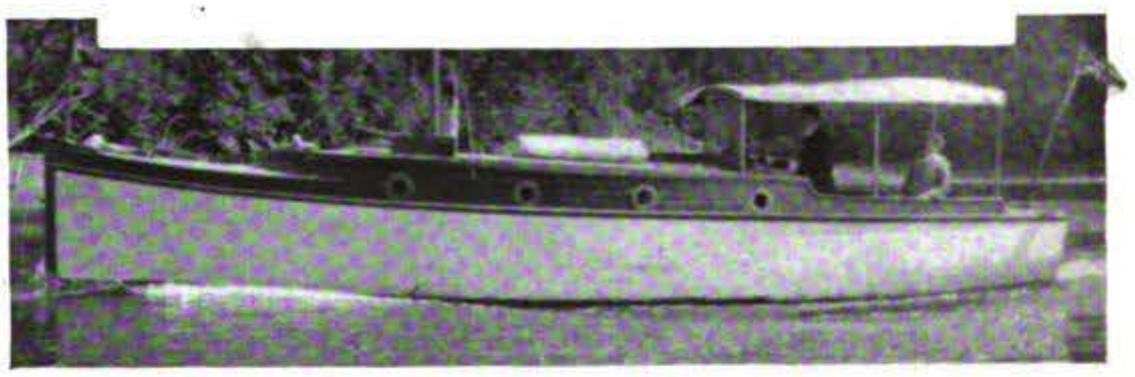
"Some nine months ago I heard that along the coast there had been a motor boat wrecked and was a total loss; as a speculation and without even having seen the wreck, I paid $100 for the ownership of the wreck. I awaited good weather, which did not come for about six weeks, and then started to see what I had bought and found only something that had once been a boat and an engine that certainly looked as if it would be cheaper to leave it where it lay than to take it apart. However, I took all I found home and dumped it into a large tank of kerosene and left it there for about a week, to see if I had enough parts to serve as repairs to other engines. I started to take it apart, but the condition of the engine after being in oil for a week made me think I had quite an engine, and I took the engine apart, cleaned it thoroughly and oiled it up, bought nineteen dollars worth of repair parts for a few necessary repairs, and installed it, after giving it a few coats of paint, in a boat or family launch of 30x7-feet dimensions. All this is five months ago and from that date to the present the purchaser of the boat and engine has run it to my knowledge 4,200 miles, and as he has the privileges of free repairs for six months I am afraid that it will be another five months before a cent will be spent on any further repairs. The engine in question is a Scripps Model M, two-cylinder, 9 to 13 h.p. The speed of the boat is just under 10 m.p.h."

Sighs of Satisfaction from the Wabash.

Down on the Wabash river there is a Louis Rippetoi, the proud and happy owner of the cruiser Aubrey, which is considered the fastest and finest cruiser on this far-famed river. Mons. Rippetoi makes his home port Terre Haute, Ind. Aubrey is a 42x10-foot tunnel stern cruiser designed and built by her owner. Powered with a four-cylinder 50 h.p. Model C-4 Van Blerck this comfortable boat moves along at a gait ranging from 13 to 15 m. p. h. Aubrey is now in her fourth season, but this is her first season with her new power plant, having previously had a 50 h.p. engine of the two-cycle type. With her new motor she makes just 4¼ m.p.h. more than formerly.

The Frisbie Motor in Life Boat Service.

At the New York show last winter the C. M. Lane Life Boat Co. exhibited a metallic life boat which was powered with a Frisbie 12-16 h.p. motor. This boat attracted a good deal of attention, the more so inasmuch as the new rules of the United States Steamboat inspection service require motor life boats for all ocean passenger steamers of over 2,500 tons and whose course carries them over 200 miles off shore. This ruling brings the motor lifeboat into more prominence than it enjoyed before, and the requirements of these boats are of some interest. The length varies from 20 to 28 feet, and the maximum capacity is 30 persons. To obtain this capacity air tanks confining 1½ cubic feet of air per passenger are installed and also tanks of sufficient air capacity to sustain the weight of the engine and fuel. The boat on display at the show was tested out with a full load and her Frisbie motor drove her 8 m.p.h., although only 5 miles is required by the inspectors. Metallic life boats powered with Frisbie motors were used to transport sailors from ship to shore in the recent naval assemblage in Hudson River.



A 35-foot raised-deck cruiser owned by Arthur A. Green, of Victoria, B. C. A model 11, 12 h.p. Loew-Victor motor furnishes the motive power.

The four leading Pacific Coast distributors for the Caille Perfection Motor Co., of Detroit. They collaborate on an elaborate distribution and service plan for the Caille company.

MOTOR BOATING ADVERTISING INDEX

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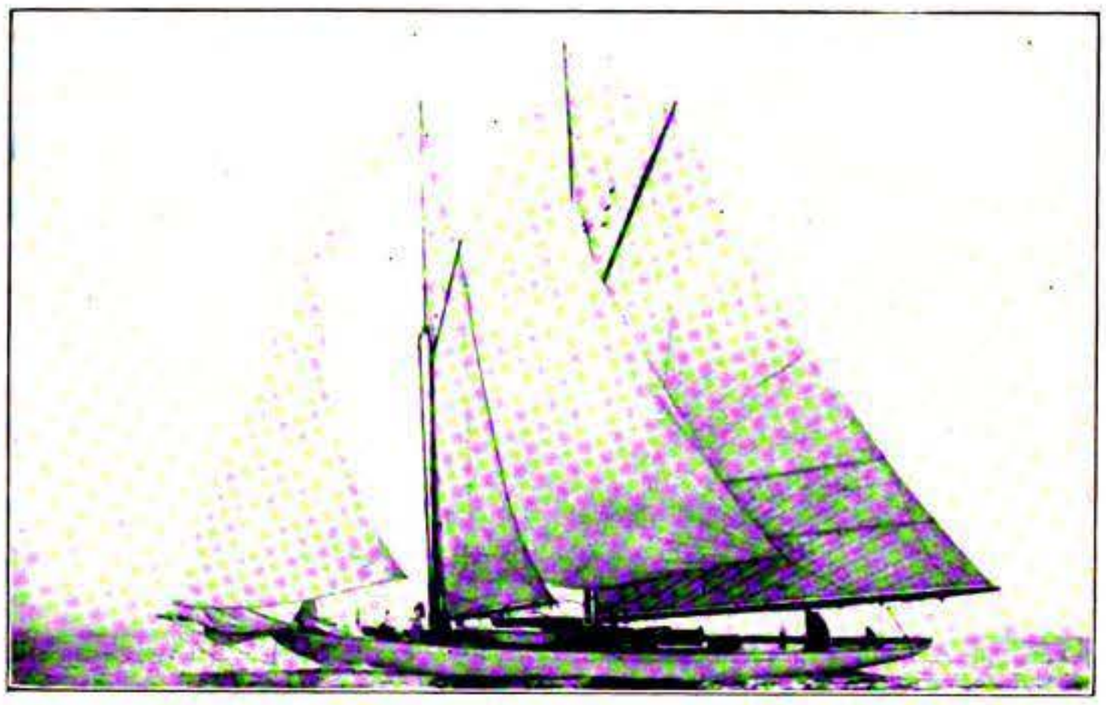
We have probably the largest list of American and European Yachts of all types for sale, charter or exchange, of any marine brokers. We give special attention to this department so that our information on each boat is always the most complete and up-to-date available.

As there are upwards of 3,000 yachts in our list, we can furnish you with exactly what you want, whatever the type, size, cost, equipment or class of service you have in mind. We publish no book of these, because our list is so large and constantly changing, but we will promptly submit photographs and full information on all suitable boats on the market, if you mention your requirements.

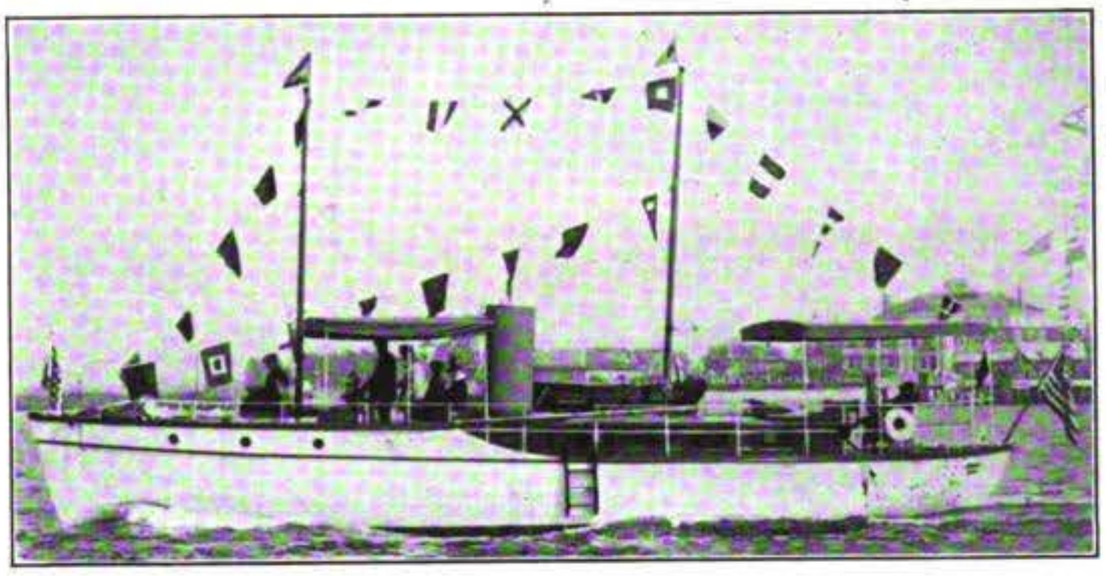
Our long experience as architects and engineers lends an added value to our brokerage service, in expert appraisal and advice, estimates and supervision on alteration, etc.



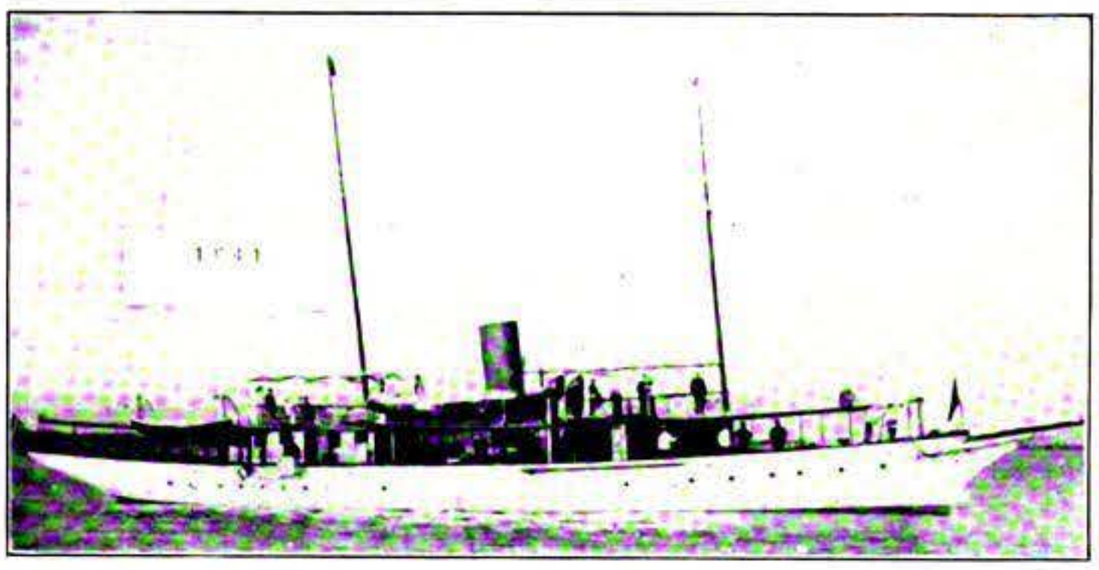
No. 1038—For Sale.—94-foot overall auxiliary schooner yacht. Lawley construction. New 6 cylinder 60 H.P. motor. New electric light plant. Roomy, fast and able. Reasonable.

No. 3516.—Sale or Charter.—60-foot waterline centerboard auxiliary schooner. 4 feet draft. Flush deck. 50 H.P. motor. 8 knots. Good accommodations. Electric lights. Located on Great Lakes.

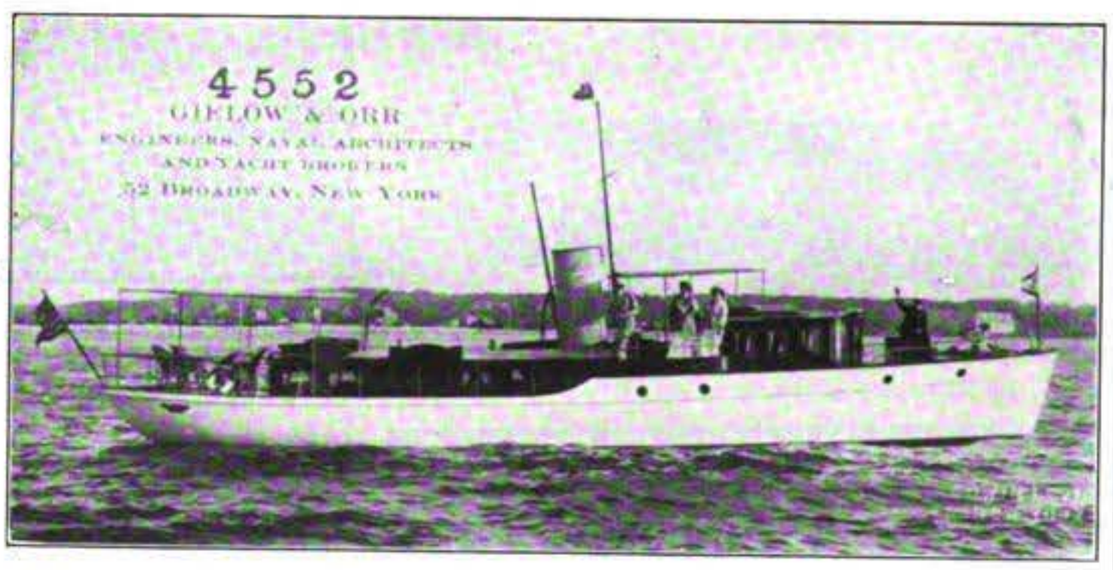
No. 3712.—Sale or Charter.—98-foot twin screw cruising motor yacht. 4 staterooms. Deck dining saloon. Large after deck. Well found throughout. Standard motors. Speed up to 14 miles.



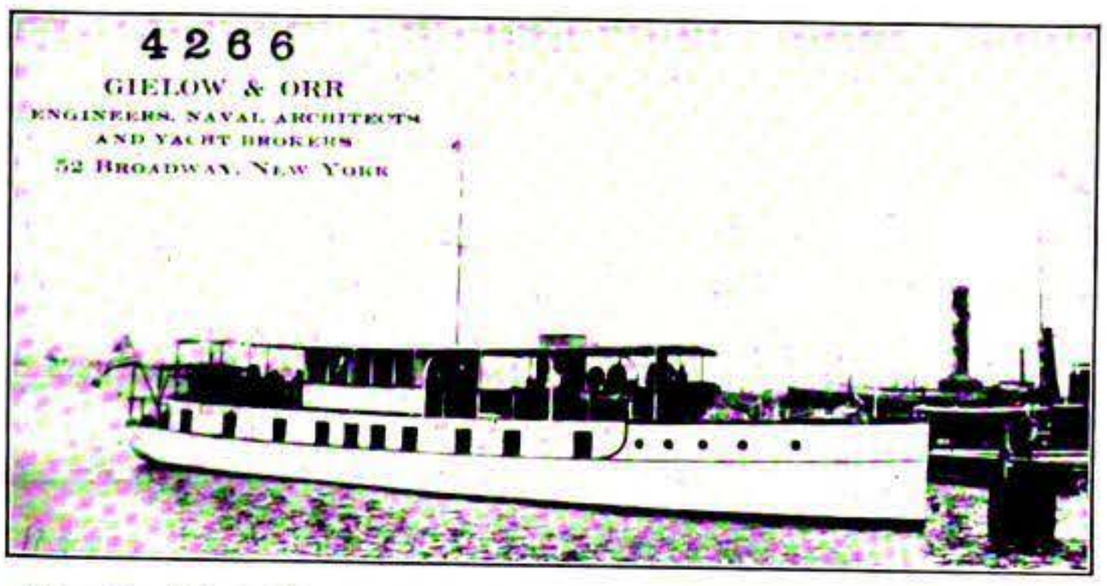
No. 3341.—For Sale.—50-foot bridge deck cruiser. Standard motor. 11 miles. Electric lights. Excellent accommodations. All newly furnished. In commission.



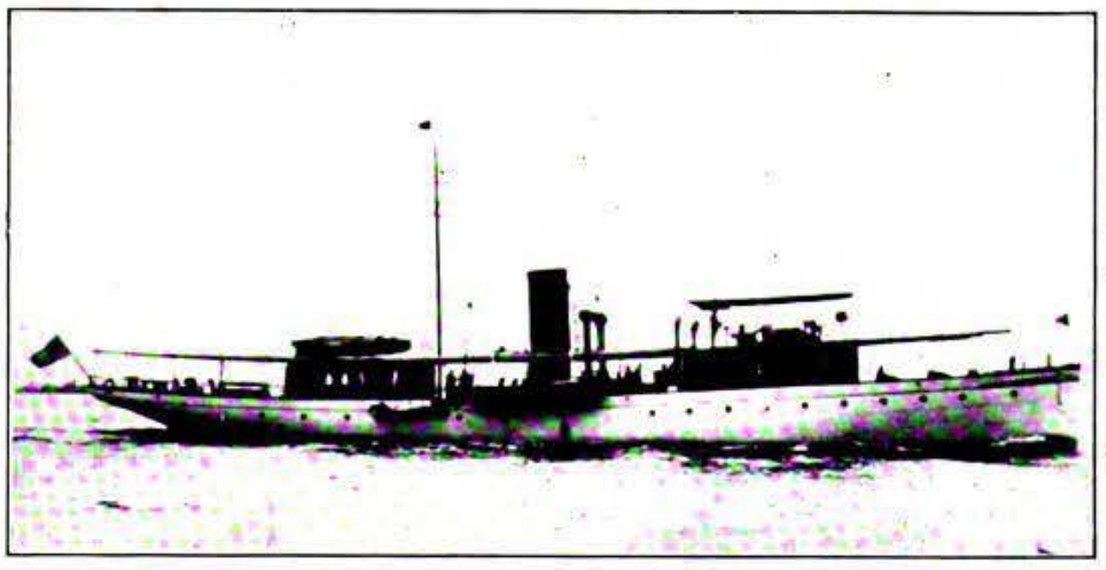
No. 1641.—For Sale to close an estate.—145-foot single screw steel steam yacht. 2 deck houses. Lawley construction. Speed up to 18 miles. Finely furnished. Has had very little use.



No. 4552.—For Sale.—High class 62-foot single screw motor yacht. In fine order. Speed 12 miles. Fully found.



No. 4266.—Sale or Charter.—95-foot high class, twin screw modern, semi-houseboat. Excellent accommodations. Finely finished and furnished. Speed 13 to 14 miles.



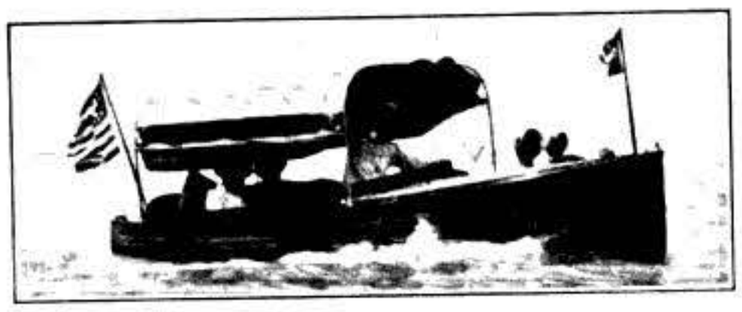
No. 3793.—For Charter.—Modern twin screw steam yacht, 145 x 22 x 7 feet. Speed up to 17 miles. 5 staterooms. 2 teak deckhouses. Yacht must be seen to be appreciated.

THE MOTOR BOATING MARKET PLACE

The rate for "For Sale" and "Want" advertisements is 3 cents per word. If an illustration is used the charge is as follows, which includes the making of the cut:
Cut one inch deep, one column wide..... $2
Cut 1½ inches deep, one column wide..... $5
Cut three inches deep, three columns wide..... $15

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MOTOR BOATING.



No. 3014.—For Sale.—Brand new yacht tender; 18 ft. x 5 ft. Only used one season. 10 H.P. Sterling Kid motor; speed 11½ miles. Complete equipment. Accommodates six people comfortably. Finished in mahogany throughout. Price low. Cox & Stevens, 15 William St., New York City.

FOR SALE—Day Cruiser, 36 ft. x 9 ft. x 3 ft. Comfortable accommodation four people. Large toilet room, refrigerator, sink, running water, stoves, buffet, large ice box, closet, cabin mahogany. Has 18 ft. cockpit with drop curtains all around cockpit which makes it comfortable to sleep six more people. New 1915 Wolverine 4 cycle 22 Horsepower engine, reversing deck controls, one-man boat, speed 12 miles, been used one month. Owner desirous to sell on account of business difficulty. Sacrifice for $1,500. Inspection appointment. Ed. Keil, 283 East 169th Street, New York City.

FOR CHARTER—By day or week, cruiser *Lily*, 30 x 8, completely equipped, electric lights, lavatory, galley, icebox, etc. Otto Thomas, 324 East 89th St., New York City. 'Phone Lenox 5123.

A new 35 x 5 ft. 6 in. runabout hull, never been used, with solid mahogany deck, white cedar plank, copper fastened and exceptionally fine sea boat with V shape stern. Can take motor from 40-75 H.P. Can be driven from 22-23 miles per hour. Price $600 f.o.b. West Mystic, Conn. Address The Holmes Motor Co., West Mystic, Conn.

REBUILT ENGINES—You can secure a bargain by writing for our list of second-hand engines which we have taken in exchange and rebuilt. Brown-Talbot Co., Salem, Mass.

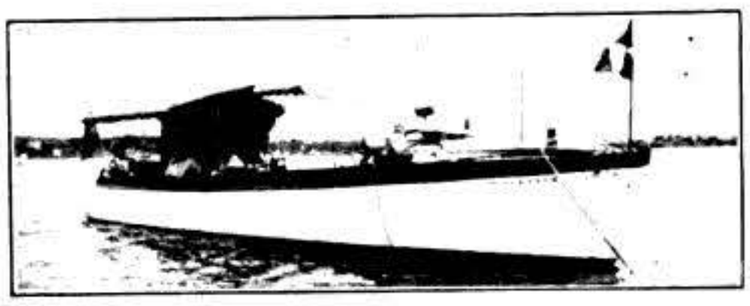
Motor and sail boats to let. Two hydroplanes, respectively 20 ft. x 5 ft., and 25 x 5 ft., for sale or to let. Yacht "Andrey," 46 ft. sailing yacht fitted for cruising. A big bargain at $675, or to let for the season. Frank M. Weeks, 272 River Ave., Patchogue, N. Y.

Trimount Rotary Whistle Outfits at Below Cost
The "Trimount" always sold for $15.00, $20.00, $30.00. We have a few hundred left which we offer at below cost to manufacture, as follows:
No. 0 size $5.00, No. 1 size $7.00, No. 2 size $10.00
Now's your chance to get a reliable, fine whistle blower and whistle for next to nothing. Runs by friction contact with engine-flywheel.
Trimount Rotary Power Co., 1343 Columbus Avenue, Boston, Mass.

MAN WANTED

The subscription department of Motor Boating Magazine requires the services of clean-cut, active man, to cover certain territory. Will be expected to travel. Exceptionally generous commission arrangement. Address,

C. C. S.,
Motor Boating Magazine,
119 W. 40th St.,
New York City.



FOR SALE—Fast day cruiser, 35 ft. x 6 ft. 2 ft. 8 in. Cedar planking. Copper fastened. Select mahogany finish. 36-40 H.P. Barber engine. Small cabin with toilet. Excellent sea boat. Brass nickeled trimmings. Complete equipment including awning. Used but little. H. T. Moody, Newburyport, Mass.

CANADIANS, Second-hand engine bargains. Send for list. GUARANTEE MOTOR COMPANY
73 Bay Street, North. Hamilton, Ont., Canada.

USE "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

WANTED—An expert small boat draftsman at once. This man should preferably have had experience in the design and layout of high speed motor boats. Address Box 1, MOTOR BOATING.

FOR SALE—27 ft. cruiser, brand new, latest style. Price $600 for quick sale. James Wilde, Pearl River, N. Y.

CYLINDERS REBORED—Pistons and rings fitted, new cranks, connecting rods, cases, transmissions, any part for automobile or motor boat motor reproduced like original. The shop of quality. McCadden Machine Works, Minneapolis, Minn.

ENGINE BARGAINS.
To close out our 1915 line of Monitor heavy duty motors built especially for work boats and fishing boats, we are prepared to offer special prices during July. These engines are entirely new, equipped with the Gere Reverse Timer and best attachments such as, Schebler Carburetor and Maxim Silencer. Address, 215 Emmett St., Newark, N. J. Monitor Boat & Engine Co.

WANTED—1, 2 and 4 cylinder motors—2 or 4-cycle. Must be cheap. Chas. Johnston, West End, Pittsburgh, Pa.

FOR SALE IMMEDIATELY—Boat factory on Lake Wawassee, Syracuse, Indiana. Excellent site. Big business. Good equipment of necessary woodworking and iron working machines in fine condition. Two buildings, 30 x 60 ft., and 16 x 40 ft. besides 12 x 18 ft. blacksmith and boiler room. Complete sets of boat forms, etc. Profitable gas engine business. Will stay sufficient length of time to teach purchaser the business if desired $1000 cash, clear title. Act quickly. Address Box 193, Syracuse, Ind.

FOR SALE—Patent outright, Non-sinkable Life Saving Boat, United States, Canadian and Great Britain Patents, on hand, others applied for. Inventor Deswatines, 621 Broadway, New York City, U. S.

Most Complete Family Cruiser of her size—MAKE OFFER. Specifications: V-bottom, Raised Deck, 30 ft. by 8.6 by 2.6. Speed 11 miles per hour. Engine 4 cylinder 4-cycle, 28 horse power. Sleeps two on transom berths in cabin—sleeps three more in cockpit. Separate toilet room. Galley stove. Icebox. Awning. Cushions. Electric lights. Full equipment. Newly painted, ready for commission. FIRST REASONABLE OFFER TAKES HER. Address Box 5. MOTOR BOATING.

THE HOLMES MOTOR COMPANY, INC.

2	RELACOS 50 H.P. 4 cylinder, pair	$1300
2	HOLMES 25 H.P. 4 cylinder, each	450
1	HOLMES 25 H.P. 4 cylinder	650
1	30 RUNABOUT with 25 H.P. Holmes motor in good condition	1250

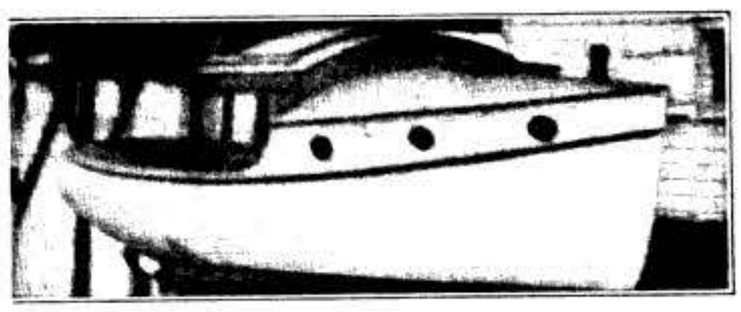
WEST MYSTIC, CONN.

We have a number of Galvanized 4 in. Ventilators with Brass Deck Plates, and key complete, which we are offering at $2.50 while they last.
The Motor Boat & Supply Co., 1409-15 W. Ninth Street, Cleveland, O.

FOR SALE—Ferro engine, three-cylinder, two-cycle, twelve horsepower. Rear starter and reverse gear. Run short time, now at Ferro shops. Will be put in thorough order and fully guaranteed by Ferro Company. Price $120.00, Cleveland delivery. Box 10, Motor Boating.

95 ft. CRUISER FOR SALE.
Up-to-date 95 ft. Cruiser—twin screw—two 60 H.P. motors, new this year—all ready for service. Light draft—at BIG BARGAIN. Walter A. Stock, 83 Fort St., W. Detroit, Mich.

FAST RUNABOUT FOR SALE—22 ft. x 5 ft., 30 H.P. Roberts motor, Wolverine gear and equipment. Hull, V-bottom, launch sides. 3 times winner in 3 races entered. Speed over 19 miles, 1½ seasons old. Condition perfect. Price low. Address E. F. Wood, 612 Sheldon Bldg., San Francisco, Cal.



MUST HAVE CASH—Sacrifice new handsome 26 ft. x 7 ft. raised deck and glass cabin cruiser, flare bow, "V" stern, 15 h.p. 2 cylinder Mianus, Paragon gear, fully equipped, value $1200. First $750 takes it.
KLINGER, 32 East 169th Street, New York City.

FOR SALE—20-ft. motor canoe, Carleton make, 5-6 h.p. single cylinder motor with double ignition. Speed 1500 revolutions per minute. A. C. W., 224 Eighth Street, Troy, N. Y.

BARGAIN—18 h.p., 3 cylinder, 2 cycle Knox engine, jump spark ignition. Paragon gear, Hyde wheel, thoroughly overhauled and in perfect condition. $225.00. Address Camden Anchor Rockland Machine Co., Camden, Maine.

HOLIDAYS AFLOAT
FOR HIRE—34 ft Cruiser RANSO. Just back from Florida cruise. Every comfort for ladies or gentlemen living aboard. River, Bay, Long Island Sound or anywhere. Experienced Captain. Cheapest, jolliest vacation possible. $40 week. Day parties Sandy Hook, Shrewsbury, etc., $10. Weakfishing parties from here $7. Captain Pearson, Great Kills, Staten Island.

WANTED—A neat, intelligent young colored man, 21 years, desires a position working on house boat, private yacht, launch or regular steamship. Willing to begin at anything. Willing to go abroad or remain in America. Will remain permanent if necessary. Can furnish best of references. Address, J. A. Brooks, 324 West Liberty St., Savannah, Ga.

FOR SALE—$35.00 4 cylinder 4-cycle, 40 H.P., air cooled, V type engine complete. Chas. Johnston, West End, Pittsburgh, Pa.

THE BEST BARGAINS IN MARINE ENGINES

5¼ in. x 6 in. 4 cylinder, 4-cycle,	24-30	H.P. new..	$450.00
4½ in. x 5 in. 4 cylinder, 4-cycle,	16-20	H.P. new..	360.00
4½ in. x 5 in. 2 cylinder, 4-cycle,	8-10	H.P. new..	225.00
4½ in. x 5 in. 1 cylinder, 4-cycle,	4	H.P. new..	125.00

All of the above are our 1914 model, fully guaranteed, and complete with extension base and usual marine equipment. 5¼ in. x 6 in. four cyl. four-cycle, second-hand, but overhauled and in first-class order, used two seasons. $300.00. 5 in. x 5 in. four cyl. two-cycle, bare Engine only, good order, $75.00. Miller Gas & Vacuum Engine Company, 2329 N. Talman Ave., Chicago.

FOR SALE—4 cylinder 4-cycle 12 H.P. high-speed CAMERON motor with Magneto, Carburetor and plugs $115.00
New 2 cylinder 7 H.P. TOLEDO..... 85.00
2 cylinder 5 to 6 H.P. LOCKWOOD ASH in perfect condition..... 55.00
4½ H.P. LACKAWANA..... 35.00
Wilmarth & Morman Co., Grand Rapids, Mich.

A brand new Continental Motor, never uncrated, Model "N" Independent Type, 3½ in. bore by 5 in. stroke. First check for $142.00 takes it f.o.b. Detroit. Address W. G. E. Birkett, 588 Hubbard Ave., Detroit, Mich.

BARGAIN—24 x 5, V-Bottom Fast Runabout. Recent build, perfect condition. 30 H.P. Roberts motor, Baldridge Reverse Gear, Rear Starter, Automobile Control, Electric Lights, 20 miles. Most beautiful boat between Cincinnati and Paducah. $500.00 immediate sale. Wm. H. Brannon, Jr., Owensboro, Ky.

Captain wishes position. Take full charge, 60-70 ft. power yacht. Age 27. Have had experience in North Atlantic, Caribbean, Panama and South Pacific waters. Well acquainted with New York waters. H. Kuhl, 262 W. 128th St., New York.

FOR SALE—Ball number two reverse gear, best of condition. H. J. Klug, 205 8th St., Aspinwall, Pa.

Marine Motors and Their Design.

(*Continued from page 9*)

we recommend using roller lifters), we shall use mushroom lifters, and our timing will be as accurate as the individual cam.

The cams should all be ground from one master cam, having separate division plates corresponding to the number of cylinders used. Master cams and plates being four or five times the size of the cam, the error in each would be correspondingly reduced. Lengthwise, the cams are off center about ¼ inch, which allows of a rolling action, reducing friction and wear. Radially they should be centrally over the shaft, but an error in this respect does not affect the accuracy of the timing. This latter quality does not hold good in regard to roller lifts, which must be exactly over the center of the camshaft and without appreciable lost motion or they will not reproduce the motion designed for the cam.

It will be well to have our cams and shafts integral, and with a flange for mounting our half-time gears. The half-time gears are of special gear steel, case hardened, with the teeth cut spiral 27½°, with face enough so that the foregoing angle will represent more than a single pitch, which insures always a constant pitch line contact. The timing should be marked in the same fixture or jig that locates the holes for mounting on the shaft. Purposely these holes should be unequally spaced, so that they can be assembled in one position only. (See illustration in June issue.) The timing would thus be predetermined, all alike, and would not be a tooth ahead or behind if the keyway were not just right, as is often the case with the old system.

The camshaft bearing should be split in three sections, coned on the outside and held in circular holders (Fig. 7). These holders always remain round, fit the reamed hole they go in and keep the camshaft in the center and in line. This is not true of the camshaft bearing made in two halves. When you take up the wear it becomes oval on the outside and the binding screw pushes it over that much out of center.

On our base we should have the top and bottom milled. The spring or wind should then be taken out on a disc grinder. After the bearings and camshaft holes are bored, they should be guide-reamed, with base firmly bolted, top side down, to a perfectly flat, rigid surface. While held in this true condition the bearings should be fitted and the crankshaft scraped in place. Take such a base, knowing the five bearings held by strong partitions with cross-webs are true and in line and bolt it with ten bolts to our rigid en-bloc cylinder casting and you have something that will keep its shape and help maintain the bearings. We must be sure the bottom of the cylinder is perfectly flat, as otherwise it will distort the cast base.

To insure this, it is well to take a finish cut after all other work is done and all metal has been removed and cylinders given a few days to season. This is the proper time to finish the cylinder by grinding or lapping.

Our bearings themselves can be die-cast from Parsons white brass for the slow type. For the faster model we shall use a bronze bearing, with a thin lining of the above metal. The white bronze makes the best bearing metal, but, unsupported, will pound out under hard service. The bronze should be 3/16 inch thick, with 1/16 inch white metal. The bearings are tinned so that the lining will make a perfect bond. This can be tested by ringing. The bearings should have liberal clearance at the ends and be scarfed at the joint, to prevent the brass binding when hot.

There should be no oil grooves on the pressure side, but very liberal ones on the opposite half. That would call for grooves in the cap of connecting rod and none in the other half, and just the reverse for the shaft bearings.

Our slower speed engine will have splash oiling. This is our cruiser engine, and, as you are supposed to be enjoying yourself and not standing over it, we want an oiling system we can practically forget. We shall use the space between the rear crank and the reverse gear for a settling chamber and provide a very liberal screen, easily removable for cleaning, to keep foreign particles from entering it.

An extension of the exhaust camshaft drives a double oil pump, one-half of which takes oil from the settling chamber and delivers it into the oil storage tank, which is cast integral with the case surrounding the rear starter.

The arranging of the oil piping is such that this part of the pump is self-pumping. The other part of the pump takes oil from the storage tank and forces it through a restricted outlet in a steady stream on the front connecting rod. This pipe leading from the pressure pump has a T outlet, from which a connection can be run to an oil gauge, and show about five pounds pressure when at mean speed. Oil gauges are to the writer's mind a better means of indicating the working of the oil system than sight feeds, which are usually too dirty to be seen.

That part of the pump which takes oil from the base has slightly greater capacity than the other to enable it to take away all the oil that is delivered to the base by the smaller pump. The pump is accessible, and has no stuffing box, as the leak around the shaft is internal and takes care of the gear set.

In case the oil pump fails, through any cause, we will not have to stop, as we have arranged cross partition dams for the oil scoop on each rod to dip into. These partitions are close to the after side of scoop, that varying angles of installation may not affect the oiling. On the sides of the oil pan and at a considerable angle are separate oil gutters to return the oil to the forward compartment in case of failure of the pump. An emergency hand oil pump should be located at a convenient place to deliver oil from the supply to the front of motor. It is important that the base should be oil-tight, having all joints packed and effective felts on the outer bearings.

Our high-speed motor will have the same oil pump arrangement and other provisions made for its failure, but the oil will be piped direct to the bearings, where it communicates for one-fourth of a revolution with the hollow shaft and this in turn with the crankpins. The oil pressure is necessarily increased because of the limited time it is admitted to each pin, to twenty-five pounds or more. Admission occurs just before top center and the bearings, due to the pressure, are practically supported on a film of oil.

By keeping our oil quite cold, the quantity passing

(*Continued on page 50*)

Marine Motors and Their Design.

(*Continued from page 49*)

through the bearing will keep them at a safe temperature at high speeds. In order to keep the oil cool, we have arranged our self-priming geared water pump to deliver directly to the water space under the oil in the oil pan. From here the water is conducted by straight copper pipe to the under side of the exhaust connection (the hottest place) and thence, owing to the shape of the castings, delivered fan-like to all cylinders. An internal pipe makes it possible to have a low overflow connection and avoids overhead piping. With this form of circulation in salt water we could not use pure aluminum for our oil pan, but would have to make it from a special alloy that is not quite as light, but has been found to stand salt water.

Our reverse gear, enclosed, has multiple disc clutch, with spur gears all turning at engine speed or less, and reverses at 1 to ¾ for the cruiser and 1 to 1 for the light runabout. The double-thrust bearing is inside, well oiled from the hollow shaft, with a return duct. The end connecting with the motor is squared and would make removal a simple matter. The band brake should be spring-clamped on each side, free from the drum, when not in use.

Our rear starter would not have the lower sprocket mounted on the revolving shaft, where it wears or gets dry and won't let go. In place of this we shall mount it on a stationary sleeve, extending from the bearing. Wear would only take place when in use and there would be no danger of seizing.

Referring to inlet side of motor shown in the May issue, it will be noticed that the magneto is incased just back of the rear starter. The cover has a felt edge and is waterproof, easily removed. The flywheel, which is enclosed, is shown in section. This is to enable us to show the internal gear, which, in connection with our gear reduction, enables us to use a single-unit electric generator and starter. We can get a close-coupled outfit, with an over-speed clutch, if an electric starter is desired. On longer cruiser runs in the daytime, when there is no occasion for generating, a manually controlled lever, withdraws the gears from mesh with the flywheel gear, leaving it idle. The general design favors an easy, thorough installation.

The carbureter is intended to take a portion of its air from the side connection on the breather. The hand-hole plate on each side affords light and room to work. There is nothing to obstruct these plates, and the sides of the motor are quite free from attachments.

On top, the cover is divided into three parts. The central part encloses the wires from the magneto, which pass through fiber bushings in the side of the spark plugs. This central cover is held in place by means of two thumb screws. Hinged to each side of this are two curved lids, one to shut down over the spark plugs, keeping them dry, and the other to cover the priming cups. An air pump for the gasoline tank, when the pressure system is used, is located over the camshaft in the center.

One detail which the writer thinks might add to the engine is to control the throttle, when making a landing, by means of a V cam on the reverse gear, causing the engine to slow down when in the neutral position. A movement of the lever, in either direction, opens the throttle the necessary amount to take care of the extra work at that position of engagement. At other times the throttle would be subject to regular control.

We shall let the Ideal Utility motor rest with you now until such time as MoToR BoatinG can spare the space to put this engine in trim for a race.

Uncle Sam Aids Motor Boatmen.

(*Continued from page 7*)

vising Steamboat Inspector General George Uhler is thoroughly a "steamboat" man and one heartily in accord with the rights of commerce and commercial craft, yet we will not let ourselves believe that he is not broad-minded enough to look over the heads of these interests and come down to the plane of the pleasure motor craft when occasion demands. In fact, we have seen many evidences of it that he can and he will. We know his attitude toward the motor boatman expressed through his supervising and local steamboat inspectors, and although this attitude is not unfriendly to the larger commercial interests, yet it is also far from unfriendly to our own. Gen. Uhler believes that there are at present many men operating motor boats which are in no sense capable and are endangering not only their own lives but the lives and property of many others. He also believes that there are many motor boats being operated along our seacoast and at our lake ports which are far from safe and seaworthy and should be condemned. We, too, are heartily in accord with the General's view on these subjects.

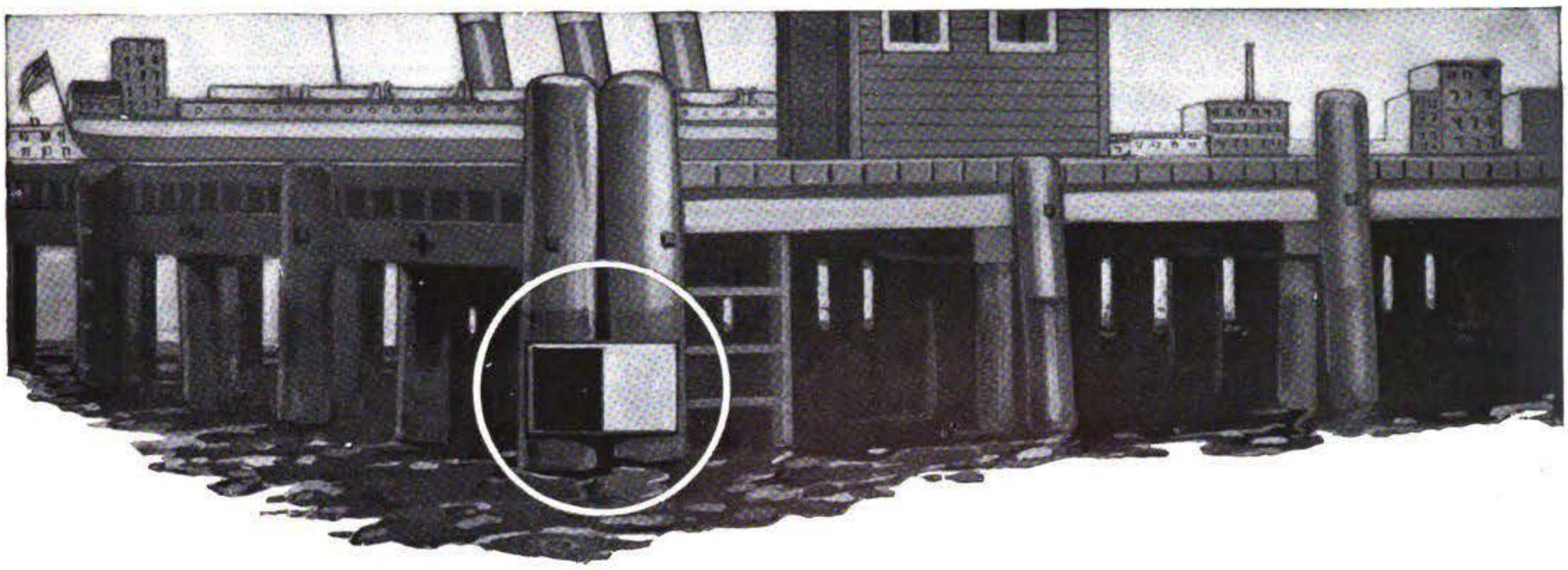
However, we do believe, and so does Gen. Uhler, that, generally speaking, a majority of the persons operating motor boats at the present time are capable, and, furthermore, have and are showing a great desire to learn more about the operation of their motor boats. We agree again with the venerable gentleman's views on the subject that some measures are necessary and should be taken to protect the sea-loving public from these incapable persons who are carrying passengers for hire, even though they are decidedly in the minority.

Seated around the massive desk of the Secretary of Commerce were many of his Department colleagues as we were ushered into his private office at Washington on the morning of June 10 for the purpose of discussing with these officials the proposed legislation drawn up by the department relating to motor boats.

Those not of the Department, while perhaps not boasting of as many official titles, prefixed to or following their names as the suggesters of this proposed legislation, yet represented about every phase of the motor boating and yachting game, both from the trade and sporting standpoints, and the attendance was about as representative a one as could be brought together.

The trade was represented by a committee from the National Association of Engine and Boat Manufacturers, headed by our friend George Lawley as spokesman. With him were J. J. Amory, of the Gas Engine & Power Co., and Henry Sutphen, president of the Elco Co., and three better qualified or more informed persons could not have been chosen the country over. W. P. Stephens, of Lloyd's Register of American

(*Continued on page 52*)



VALENTINE'S
VALSPAR
The Varnish That Won't Turn White

between high and low water

SOME skeptics varnished a board partly with Valspar and partly with another varnish regarded as standard, and nailed it to a bulkhead pile in New York Harbor between high and low water.

Twice a day the tides rose and fell and drowned those varnished areas with dirty, oily, acid, harbor water.

And in the course of some weeks the ordinary varnish turned white, lost its elasticity, crumbled and disappeared entirely, but

—the Valspar was still as good as ever!

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To be sure of getting a really good bottom paint specify Valspar Bronze Bottom Paint. It is durable, handsome, anti-fouling and easy to put on.

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Largest Manufacturers of High-grade Varnishes in the World

New York Chicago Boston TRADE VALENTINES MARK Toronto Paris Amsterdam

ESTABLISHED 1832

Uncle Sam Aiding Motor Boatmen.

(*Continued from page* 50)

Yachts, a man intimately connected with yachting for the last half century, was there with a whole boatload of good suggestions. So was Roger Upton, chief commander of the United States Power Squadrons, the originator and perpetrator of that wonderfully good movement. It was Commander Upton, who for many years a seafaring man himself and a most enthusiastic yachtsman as well, conceived the idea that it would be a good thing for the game if a voluntary organization was established, the members of which should be allowed to show that they had enough interest in their own welfare and in the welfare of other craft afloat, to learn the rudiments of seamanship, rules of the road, proper lights and whistle signals, use of the chart and compass, and, better still, put all of these into practice.

It was some ten years ago that Commander Upton first believed that such an organization was possible and would succeed if founded along the right lines, and about two years ago in his own characteristic, humble way suggested such an order. His thoughts immediately took root, and today we find fifteen local power squadrons in a most flourishing and enthusiastic condition and the movement gaining national importance. To become a member of the power squadron, a man must show that he is capable of handling his boat, know the rules of the road, can navigate by chart and compass, and is willing to help others learn and practice the same points. He is allowed to fly a distinguishing flag as an outward sign that the boat is in charge of a capable person. We heartily endorse this movement, as have the yachtsmen in general the country over, as well as both the Navy Department and Department of Commerce at Washington.

The Waterway Leagues of Greater New York and Long Island and New Jersey were ably represented by their officials at this conference, and numerous other yachting organizations and enthusiasts were present also.

THE NUMBERING BILL.

Be is enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That every undocumented vessel, operated in whole or in part by machinery, owned in the United States and found on the navigable waters thereof, except public vessels, shall be numbered. Such numbers shall be not less in size than three inches and painted or attached to each bow of the vessel in such manner and color as to be distinctly visible and legible.

Sec. 2. The said numbers, on application of the owner or master, shall be awarded by the collector of customs of the district in which the vessel is owned and a record thereof kept in the customhouse of the district in which the owner or managing owner resides.

Sec. 3. Notice of destruction or abandonment of such vessels or change in their ownership shall be furnished within ten days by the owners to the collectors of customs of the districts where such numbers were awarded. Such vessels sold into another customs district may be numbered anew in the latter district.

Sec. 4. The penalty for violation of any provision of this act shall be ten dollars, for which the vessel shall be liable and may be seized and proceeded against in the district court of the United States in any district in which such vessel may be found.

Sec. 5. The Secretary of Commerce shall make such regulations as may be necessary to secure proper execution of this act by collectors of customs and other officers of the government.

This act shall take effect six months after its passage.

EXPLANATION OF THE NUMBERING BILL.

To the motor boat owner this matter of placing a number on his vessel and having his name and address recorded in the custom house is a comparatively small matter. It involves no hardship and only such expense as he may care to incur in affixing the numbers to his boat. This is amply offset by the benefits which he will derive.

The bill has been drawn so as to enable the owner of the yacht to have numbers on her bow of a kind which will not disfigure her and at the same time will enable the fisherman who has little or no money to number his vessel practically without expense.

To avoid large numbers, it is proposed to assign a letter to each customs district, each district to assign its own numbers, beginning with the figure 1; for instance, the number 25-A would mean that the boat was numbered in the Maine district and that the name and address of the owner would be found in the custom house at Portland, Me. After the alphabet is exhausted, the letter would precede the number; for instance A-25 would mean that the boat was numbered in the Seattle, Wash., district. At Boston and New York it doubtless will be necessary to assign several letters each. Those who especially desire small numbers could make application for such numbers immediately after the passage of the act. As this act does not go into effect until six months after its passage, it is probable that the great majority of the applications for numbers will not be made for several months. In the case of builders of new vessels arrangements might be made to award such vessels a reasonable block of comparatively small numbers, to be used as the vessels were placed in commission.

Provision is made in the case of the destruction or abandonment of the boat for the cancellation and reissue of the number.

The sale of a boat or change of address of the owner would be reported at the custom house. Under the present law the most annoying part of an inspection to the owner of the boat, and also to the inspection officer, is securing the name and address of the owner. Having these boats numbered will not only do away with this annoyance, but will enable the inspecting officers, with their present facilities, to make double the number of inspections.

To the motor boat owner who keeps his vessel properly equipped, the greatest danger at present is the failure of other owners or navigators of vessels to comply with the rules of the road and to carry running or anchor lights after sunset. Without identifying numbers it is practically impossible to enforce the rules of the road. A small motor boat may cross the bow of a steamer or of another motor boat in a reckless manner, but nothing can be done, as there are no means of identifying the offending vessel.

It is probably a safe statement that, with these boats numbered in the manner proposed, violations of the light laws after sunset can be practically eliminated. Nearly all government vessels and many pri-

(*Continued on page* 74)

The Two Cycle Marine Engine

FERRO

Going Some!

It takes a powerful motor in a boat to get speed like this and kick up such a "wake" as you see here.

But there's more in a Ferro than the capacity for "stunts." Unusual performance alone doesn't make a marine engine good—it must stand up on all occasions and in all kinds of service. To do this it must be designed and constructed with a knowledge of what is going to be expected of it by its owner—whether used for speed, power, cruising or ordinary boating.

Working on these principles, the manufacturers of the Ferro Two Cycle have shown what can be accomplished by giving the boat owner what he wants. This has resulted in world-wide popularity for the Ferro. Dependable performance has earned for it the reputation of being "the world's standard."

This reputation has increased the demand. Our production is larger and manufacturing cost less. ***Now you can buy the Ferro Two Cycle at greatly reduced price.*** Take advantage of it. Write for descriptive folder at once. Send us the length and beam of your boat—tell us the speed you want and we will be glad to help you in the selection of the most suitable engine.

11 H.P. Two-cycle—
Outfit "B"
Was $200; now $158.

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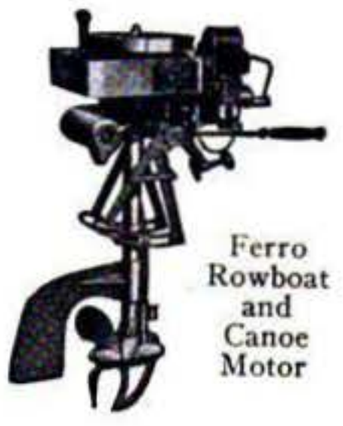

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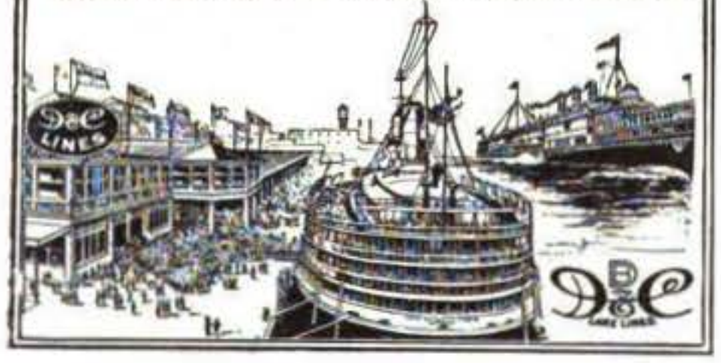

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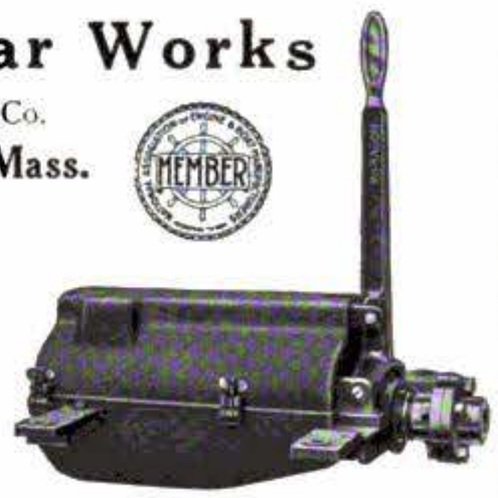

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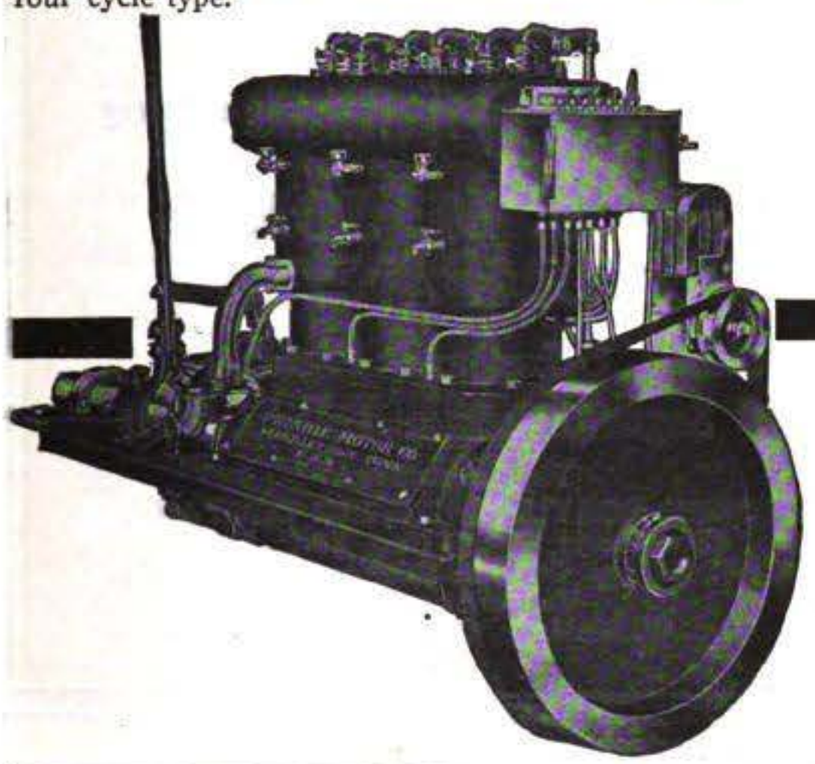

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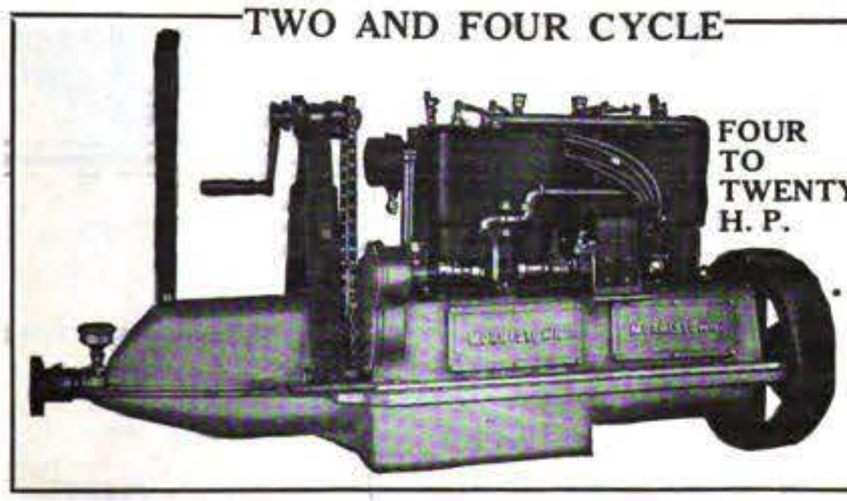

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Perhaps you have waterfront property suitable for a yacht club, or for individual yachting enthusiasts—the **Market Place** goes to over 25,000 individuals interested in all things pertaining to the water.

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MOTOR BOATING
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STANDARD AUTO BOATS

Standard Sr. Length, 25 ft. Beam, 5 ft. 2 in.
Speed (according to power)
20 Miles—$1250.00 22½ Miles—$1400.00 25 Miles—$1500.00

The Finest High Speed Runabouts of Their Size and Price Ever Built

Furnished complete or K.D. in groups—a new idea in K.D. boat building. You pay for each group when ready for it. Write to-day for details.

The latest V-bottom type and perfect streamline design—sturdy, fast, comfortable, dry and seaworthy—built in the way that only the best boats are built. Cedar planked, brass fastened. Mahogany decks and trim, genuine leather upholstery with high grade springs, full automobile control. High grade, light weight, high speed, four-cylinder, four-cycle engine with reverse gear.

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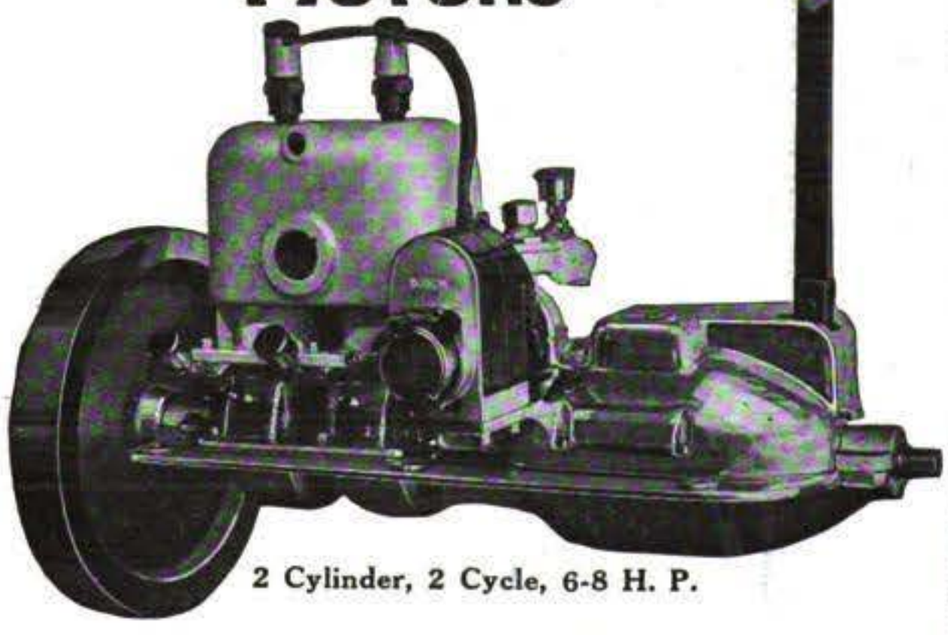
HOLMES-HOWARD MOTORS



2 Cylinder, 2 Cycle, 6-8 H. P.

A strictly high grade light weight unit power plant of the two cycle three port type. Two cylinders cast in a block, rated at 6 to 8 horsepower. Weight complete, including reverse gear, magneto and all equipment, only 125 pounds.

Suitable for the Finest Small Boats

For runabouts, tenders, dinghys, canoes, etc.

Bearings extra large. Lubrication automatic. Aluminum crank case extended to completely house the "Joe's" reverse gear. Bosch High Tension Magneto and waterproof shock-proof plugs.

$160.00 COMPLETE, including all equipment, propeller shaft, stuffing box and propeller.

Write for prices on 4 & 6 cylinder motors-Special proposition for agents

THE HOLMES-HOWARD MOTOR CO.
Main Office: 36 Rowland Bldg. Detroit, Mich.

Uncle Sam Aids Motor Boatmen

(Continued from page 52)

vate vessels are provided with searchlights, and any flagrant violation of the law would be almost certain of discovery. The owners of boats would be aware of the fact and would be careful not to lay themselves liable to the penalty.

In some sections of the country where vessels are used as collateral for loans it will increase their value as property, as they can be followed and identified. It will also assist in recovering such vessels when stolen.

The department would be able to place in the hands of all motorboat owners new laws and regulations, and the list of such owners may be of considerable commercial value if it is decided to give them out.

From the standpoint of the officers charged with the enforcement of the law, the bill is very important. When the department began enforcing the motor boat law in 1910 the practice of giving fictitious names or addresses by persons found violating the law was not common. Since that time, however, motor boat owners are realizing that penalties for violating the law may be avoided by this simple expedient. During last year, in the harbor of New York, 607 violations of the law were discovered. Of the offenders in these cases not less than 25 per cent. gave fictitious names or addresses. This not only increased considerably the work in the custom houses, but those who undoubtedly most deserved to be penalized escaped any penalty.

Motor boat owners are becoming aware of the fact that they have only to follow this practice to escape penalties, and it is the opinion of practically all the enforcing officers that, unless some means is devised for identification of these small vessels, the enforcement of the law by the Department of Commerce will not only be seriously interfered with, but it will be unjust in that the worst offenders will escape.

In the larger harbors the carrying of these numbers will discourage to a considerable extent the illegal use of these boats.

The safety of every owner of a motorboat depends not only on the equipment and the navigation of his own vessel, but on the conduct of others navigating in his vicinity. This bill is intended to enable the department to enforce the law, and in so doing the welfare of every motorboat owner is involved.

THE OTHER BILL.

That every vessel propelled by machinery other than by steam and every steam vessel not more than 65 feet in length from end to end over the deck, excluding sheer, while carrying twenty or more passengers for hire, in addition to the inspection already provided by law, shall be inspected as to the hull and general condition of the operating machinery, and the local inspectors, where certificates of inspection are not now provided for by law, shall issue to such vessels certificates of approval, in accordance with the form and regulations prescribed by the Board of Supervising Inspectors. All certificates of inspection and of approval issued under authority of this section shall state the number of passengers such inspected or approved vessels can carry with prudence and safety.

The operators of such vessels, except vessels propelled by machinery other than by steam above fifteen gross tons and over sixty-five feet in length from end to end over the deck, excluding sheer, while carrying twenty or more passengers for hire, shall be licensed by the local inspectors of steam vessels after an examination covering knowledge of the rules of the road, ability to distinguish colors, general knowledge of motor engines and machinery and of the navigation of waters in which the vessel is to be used.

The certificates of approval and the licenses of such operators shall be kept on board while such vessels are carrying twenty or more passengers, and shall be exhibited on request of any officer concerned in the enforcement of the navigation laws.

If any vessel subject to this section is navigated without complying with the requirements thereof, or carries passengers for hire in excess of the number allowed by her certificate of inspection or of approval, such vessel shall be liable to the United States in a penalty of $500 for each offense, for which sum such vessel may be seized and proceeded against, by way of libel, in the District Court of the United States of the district where the offense occurred, or where such vessel may be found.

All collectors or other chief officers of the customs and all inspectors within the several districts shall enforce, under the direction of the Secretary of Commerce, the provisions of this section.

EXPLANATION OF ABOVE BILL.

The proposed bill is intended only to require every motor boat carrying twenty or more passengers for hire to have its hull and machinery inspected and the operator in charge licensed under circumstances which will establish the fact that he is qualified to navigate properly such a vessel. Perhaps the most beneficial feature of the bill, however, is that part which enables the local inspectors of steam vessels to limit the number of passengers over twenty which such boats may carry with prudence and safety.

It is well known that at New York, in the Florida waters, at San Francisco, and, in some cases, at other ports, there is a tendency on the part of motor boat owners to carry more passengers for hire than their vessels will accommodate with safety. There is now no restriction on the number of people that may be carried on motor boats except that they must have a life-preserver for each person on board.

The inspection of hulls and machinery is general in its nature and is not as exhaustive as the inspection which is provided for steam vessels. The examination for licensing of operators also is general so far as knowledge of the machinery and of the waters on which the vessels is to navigate are concerned. It is not intended that this examination shall be as technical as would be an examination for licensed pilot on such waters.

It has been provided that after inspection of these small boats a certificate of approval instead of a certificate of inspection shall be issued the boat in order to relieve these vessels of a number of requirements of the steamboat inspection laws, which apply to vessels having certificates of inspection. For instance, it is not desired that they shall be required under section 4463 R. S. to carry a licensed first or second mate, or under 4446 R. S. that they must have this certificate framed and under glass. This certificate of approval, however, and also the license of the operator must be on board at all times while the vessel is being navigated.

The bill does not relieve motor boats of any of the present requirements of the act of June 9, 1910, or of section 4420 R. A., and it does not increase any of the requirements of those two laws except in regard to the inspection of the hulls and machinery, the licensing of the operators, and the restriction of the number of passengers that may be carried in excess of the twenty.

The bill will affect a comparatively small number of vessels, as it does not in any particular apply to private or pleasure vessels, but only to those conducting the business of carrying twenty or more passengers for hire.

Little can be added to the above full explanation of the bills. Their enactment and enforcement would work hardship on so few people and have so few faults, while, on the other hand, they would be of great benefit to so many that it is hard to see why there should be much opposition to them. How they are to be enforced and the clerical details involved is the government's worry, not the motor boatman's. That they are only 90 or 95 per cent. efficient is no logical argument why they should be condemned. The other 5 per cent. or 10 per cent. will come later.

The fact was brought out at the conference that there are nearly, if not fully, a million motor boats in this country at the present time, 50 per cent. of which are equipped with outboard motors, or, as they were termed, "Motor Boats for a Day." Naturally it would be rather difficult and perhaps a hardship to number and require registration of these craft. Likewise, there are thousands of motor tenders of 10, 12 or 15 feet in length which are so closely allied to their mother ships that registration hardly seems necessary.

The majority at the conference were of the opinion that there should be some length of boat or power limit, under which registration should not be required, and the length of 20 feet was tentatively suggested.

The bill requiring the licensing of operators of boats carrying twenty or more passengers for hire, and the annual inspection of the hulls and machinery of these boats was very favorably received, with the exception that it was the general opinion that the limit of twenty was too large and should be reduced.

HOLMES COMPANY BUILDING FOR BOOTH TARKINGTON.

Booth Tarkington, the author of the Penrod stories and other fiction, who has a home down in Maine, has decided to become a regular motor boatman, and has commissioned the Holmes Motor Co., of West Mystic, Conn., to build him a cabin cruiser and to power it with a Holmes motor. This boat will resemble Bostonia, the launching of which was mentioned in this department in the last issue, except that it will have a smaller cabin and a larger cockpit. Franklin Weston, of Pittsfield, Mass., is also having a boat built along the same lines, and both will be ready for their owners within a short time.

GRAY MOTORS

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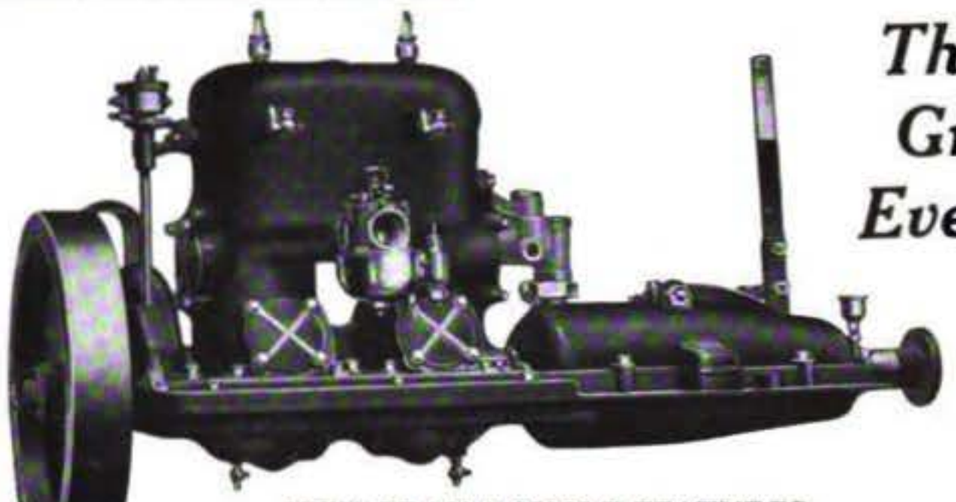
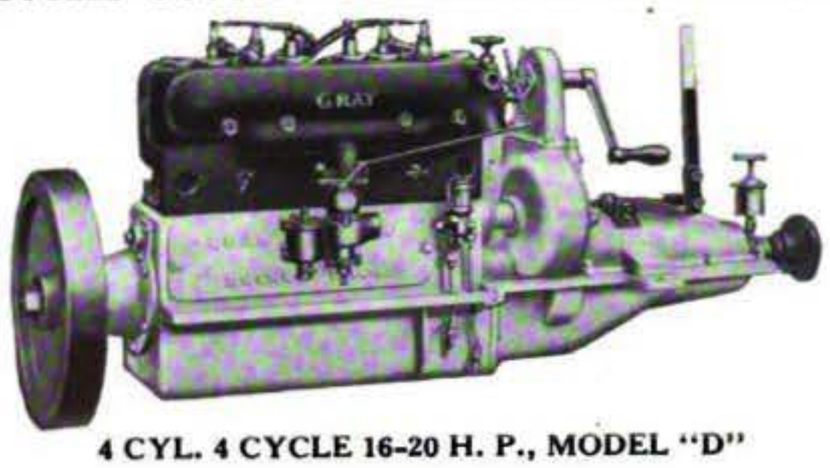


There's a Gray for Every Boat

2 CYCLES—4 CYCLES—DETACHABLE BOAT MOTORS



4 CYL. 4 CYCLE 16-20 H. P., MODEL "D"

NEW GRAY 2 CYCLE FEATURES

Complete Unit Power Plant.
Built-in Reverse Gear Enclosed.
Bronze Plunger Pumps.
Cylinder Controls.
Magneto Equipment.
Accessibility — Hand Hole Plates on both sides of crank case.
Non-backfiring Device.
Oversize Connecting Rod Bearings.

ALL 2 Cycles sold as Complete Outfits.

3 H. P.	Single Cylinder. Bore, 3½ inch; Stroke, 3½ inch. Complete Fresh Water Outfit.	**$55**
	Complete Salt Water Outfit, $59.	
5½ H. P.	Single Cylinder. Bore, 4¼ inch; Stroke, 4¼ inch. Complete Fresh Water Outfit.	**$86**
	Complete Salt Water Outfit, $92.50.	
6 H. P.	Double Cylinder. Bore, 3½ inch; stroke, 3½ inch. Complete Fresh Water Outfit.	**$114**
	Complete Salt Water Outfit, $120.	
11 H. P.	Double Cylinder. Bore, 4¼ inch; Stroke, 4¼ inch. Complete Fresh Water Outfit.	**$148**
	Complete Salt Water Outfit, $160.	

GRAY MODEL "D" MOTORS

Clean, accessible, silent. Adopted by all the leading boat builders and endorsed by naval architects and engine experts everywhere. Model "D's" are made in the following sizes:

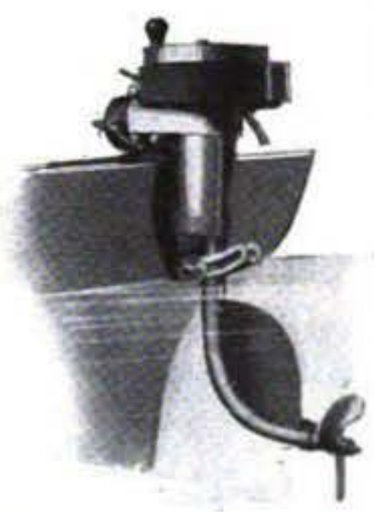
8-10 H. P.	Two Cylinder, Four Cycle. Bore, 3¾ inch; Stroke, 4½ inch.	**$156 and up**
16-20 H. P.	Four Cylinder, Four Cycle. Bore, 3¾ inch; Stroke, 4½ inch.	**$210 and up**

Prices of Model "D's" depend on equipment.

GRAY GEARLESS DETACHABLE BOAT MOTOR

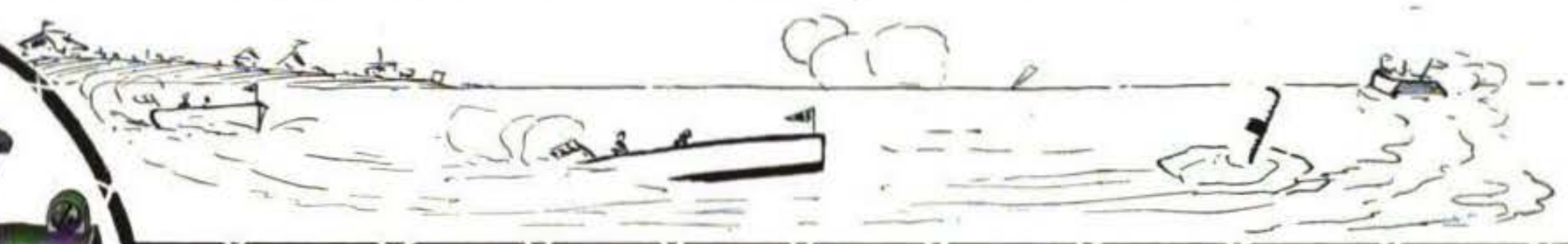
Lightest portable motor for its power on the market, crank case made of aluminum, main bearings are long and interchangeable. Power is transmitted to propeller by a Vanadium Flexible Drive Shaft. This Flexible Shaft Drive is the strongest part of the motor. Made of chrome Vanadium steel, heat treated; maximum strength, 250,000 lbs per square inch.

The Gray Gearless gives more power because it has greater cylinder displacement than any other portable motor of the same rating. Less power is wasted between motor and wheel. **Fits any rowboat.** Runs in either direction.



GRAY MOTOR CO.

774 Gray Motor Bldg., Detroit, Mich.



GET A KINGSTON CARBURETOR FOR SPEED

IF you want to tune up your engine so that you can win all the races in your class this summer and get the highest speed of which your present boat and engine are capable, just get a Kingston Carburetor. In fact, we will let you try it on your boat and prove its efficiency at our risk.

A new Kingston Carburetor will give you the greatest improvement in speed, power and efficiency of anything you can buy. It will save its cost in gasoline and give you continued dividends in pleasure and satisfaction.

This carburetor is adapted especially for marine work. It is scarcely affected by weather changes or atmosphere, and as there is only one adjustment, any novice can set it for highest efficiency under any condition. The air supply is absolutely and permanently automatic. No springs or dash pots are used.

Our latest type, Model Y, is designed especially for the present low grade gasoline.

Thirty Days' Trial Free

Write to-day for full information, prices, free trial offer and guarantee.

Made for all sizes and types of engines.

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7 Reasons Why

Penrose Motor

NO CRANKCASE COMPRESSION

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POWERFUL
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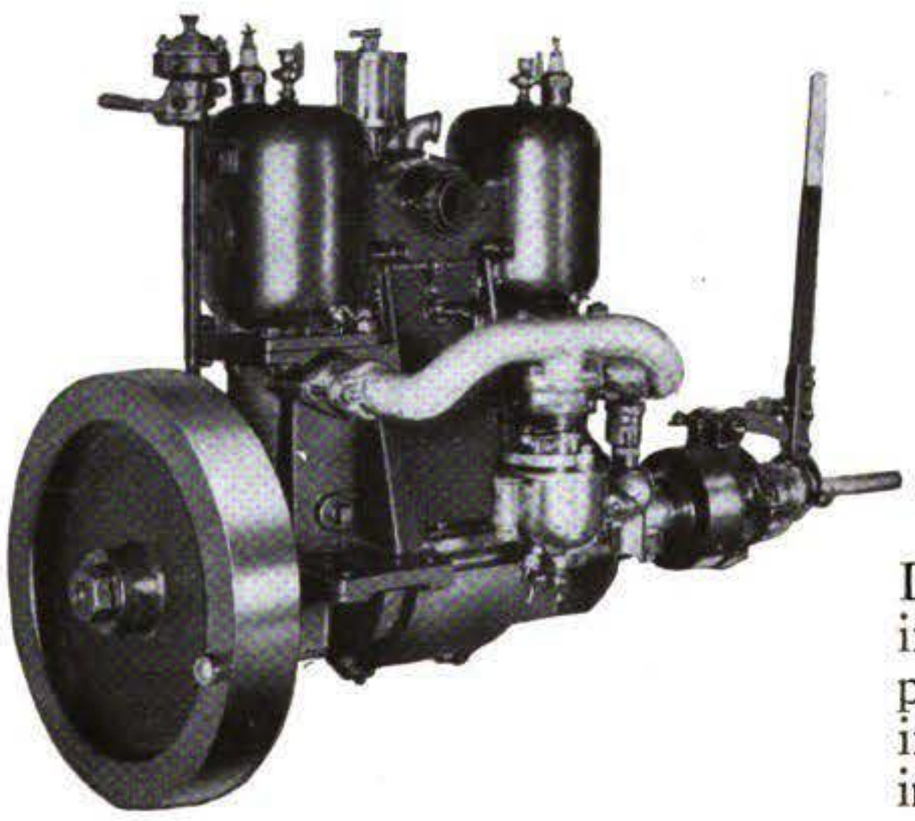
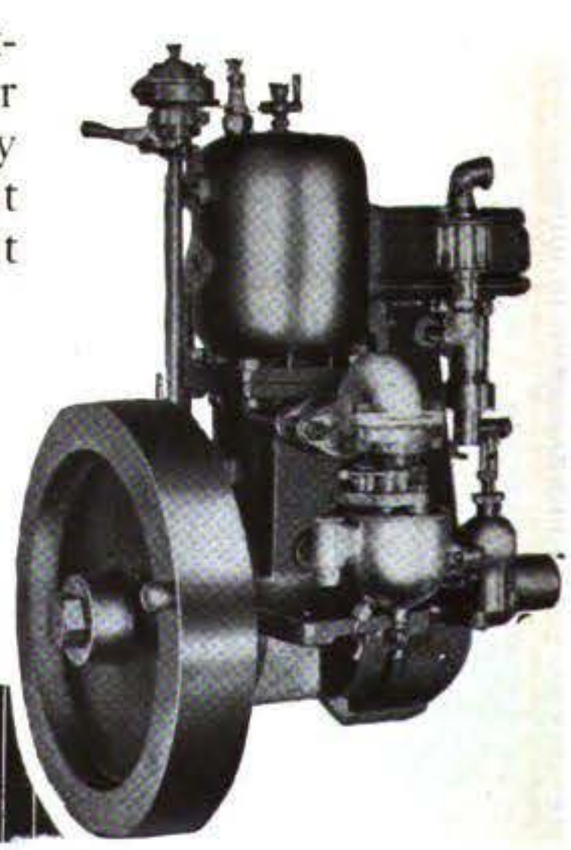


EVERY man who expects to buy a marine motor, and every man who sells marine motors, owes it to himself to investigate the peculiar advantages of Penrose design. The performance of the Penrose is different because the design is different.

It is reasonable to suppose that the ultimate limit of efficiency in marine motor engineering has not been reached in the present conventional types. Upon careful and unprejudiced investigation, you will find that the Penrose Motor is an improvement of real merit.

We stand ready to prove every one of our claims. In fact, we are more than ready—we challenge anyone to prove otherwise. We have eliminated crankcase compression and retained the ideal two-cycle feature of a power impulse every revolution.

Extreme economy of fuel is gained and the usual waste through the exhaust port prevented. Full expansion of gas is secured, giving full power from every drop of fuel. Working parts are more easily and quickly accessible than in any other motor. All moving parts are enclosed, but may be gotten at quickly for adjustment, repair or replacement without disturbing other parts.



Lubrication is more positive and reliable than in most marine motors, due to the exclusive features of Penrose design. This perfection of lubrication makes wear practically a negligible item and keeps the motor running like new after any amount of severe heavy duty service.

Write to-day for a full description of the wonderful new Penrose Motor. Don't wait until you are ready to buy a new motor. Write to-day.

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If Fay & Bowen products satisfy Mr. Maxim they surely ought to satisfy you.

Fifteen years of engineering experience stand back of every Fay & Bowen engine. Mechanically correct in every detail, their daily records and performances prove them to be the ***final*** word in modern engine building and equipment.

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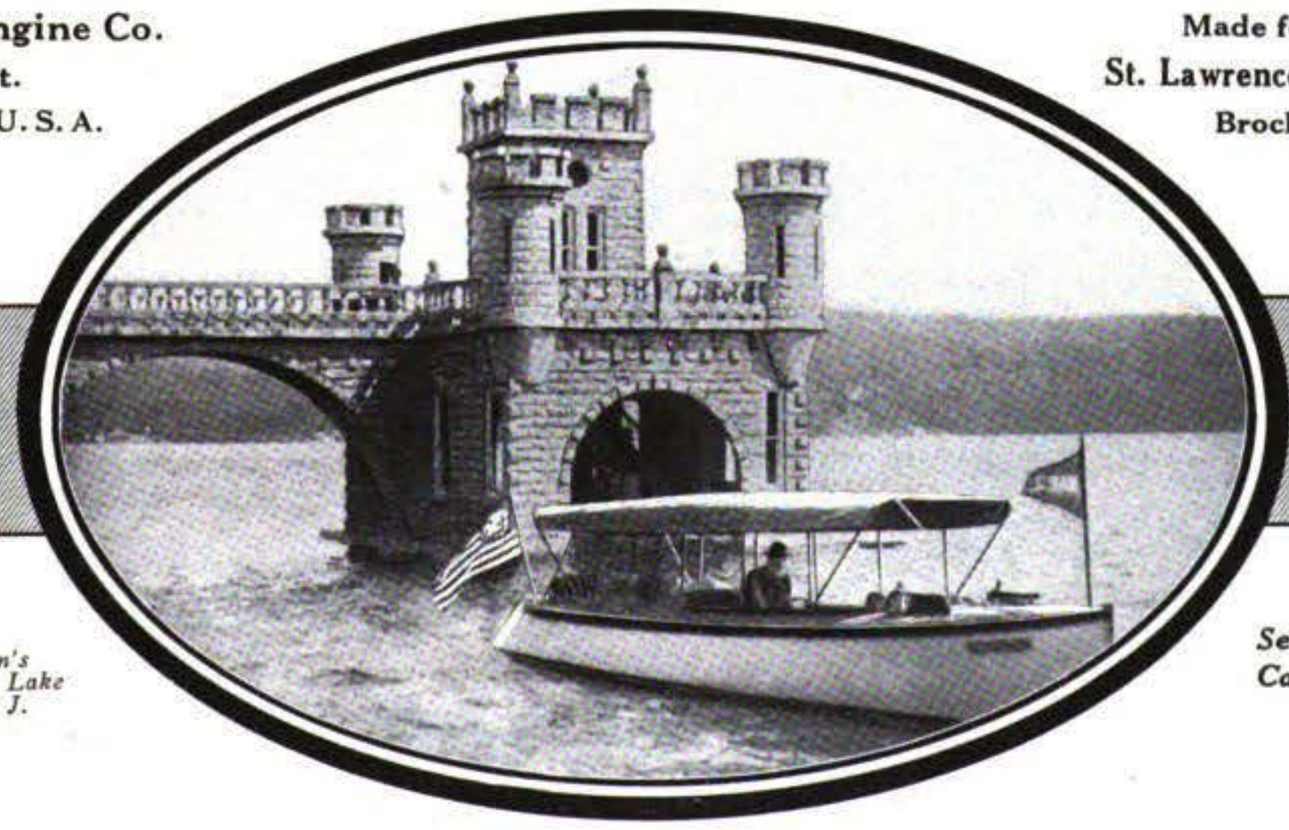

Photo of Hudson Maxim's boat house on Lake Hopatcong, N. J.

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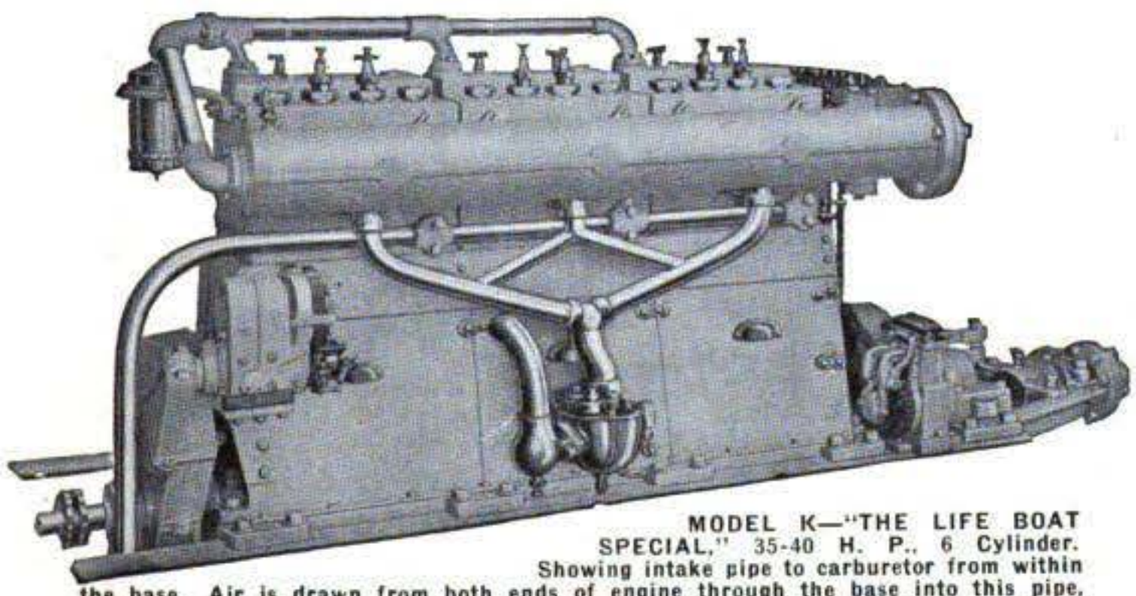
HOLMES

"THE MOTOR THE LIFE SAVERS USE"

The terrific loss of life in the sinking of the Titanic, the Empress of Ireland, and the more recent Lusitania disaster, has brought into the lime light the subject of life saving at sea.



MODEL K—"THE LIFE BOAT SPECIAL," 35-40 H. P., 6 Cylinder. Showing intake pipe to carburetor from within the base. Air is drawn from both ends of engine through the base into this pipe, scavenging the base of all smoke and gases. Should backfire occur it would be through this pipe and could do no harm.

The Holmes Motor was originally designed for exclusive life saving use. But the absolute reliability we developed for this purpose has found it a place in many of the finest pleasure boats and commercial boats ever built. Extreme in the qualities of quietness, cleanliness, accessibility, economy of fuel and maintenance, and reliable power.

Sizes:

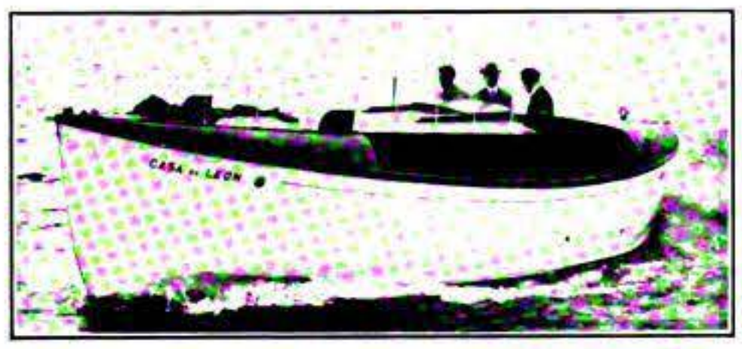
25 H. P., 4 Cyl. — **35-40 H. P., 6 Cyl.**
50 H. P., 4 Cyl. — **75 H. P., 6 Cyl.**
100 H. P., 8 Cyl.

It is certain that if any of these ill-fated liners had been equipped with

Holmes Life Boat Cruisers

hundreds of lives would have been saved. This is not an idle statement, designed to take advantage of the horror caused by a great international disaster. It is a fact which can be proved to the satisfaction of any one who cares to investigate.

Holmes Life Boat Cruisers are non-sinkable, self-righting and self-bailing. We are supplying them for many kinds of work and pleasure use, as their design permits unusually ample space for cargo or living quarters.



Life Boat Cruiser, built for use at the Isle of Pines, West Indies. Speed 9½ miles with 20-25 H. P. Holmes, or about 11 miles with 35 H. P. Holmes Motor.

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THE ENGINE of REFINEMENT

For the finest boats that float

Triple screw, 100' express cruiser "Marold" designed and built by the Matthews Boat Company of Port Clinton, Ohio; owned by Mr. C. Harold Wills, Chief Engineer of the Ford Motor Company, Detroit, Mich., and powered with three Model-F, 300 H. P. heavy duty, speed Sterlings. Speed 30 knots.

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Select Exactly the Right Power Plant to Meet the Requirements of Your Boat

HOW MUCH HORSEPOWER? AT WHAT R.P.M.?

Sterling Engines Are Built of Different Design for Different Service

Choose the Motor from below fully suited to your individual needs

High Speed Motors for Racing Boats, 1000—1700 R.P.M.

Model	No. of Cyl.	Bore	Stroke	1500 R.P.M.	Weight
R-50	4	4⅜"	5½"	50 H.P.	620 lbs.
R-90	4	5½"	6¾"	90 H.P.	850 lbs.
R-135	6	5½"	6¾"	135 H.P.	1150 lbs.
R-225	8	5½"	6¾"	225 H.P.	1400 lbs.

Medium Speed Motors for Runabouts and Light Express Cruisers, 600—1200 R.P.M.

Model	No. of Cyl.	Bore	Stroke	1000 R.P.M.	Weight
E-10	4	2¾"	4½"	10 H.P.	225 lbs.
E-25	4	3¾"	5½"	25 H.P.	550 lbs.
B-35	4	4⅜"	5½"	35 H.P.	620 lbs.
B-55	4	5½"	6¾"	55 H.P.	900 lbs.
B-85	6	5½"	6¾"	85 H.P.	1175 lbs.
F-140	8	5½"	6¾"	140 H.P.	1800 lbs.

Medium Duty Motors for Light Cruisers, 300—800 R.P.M.

Model	No. of Cyl.	Bore	Stroke	600 R.P.M.	Weight
E-17	4	3¾"	5½"	17 H.P.	550 lbs.
B-20	4	4⅜"	5½"	20 H.P.	840 lbs.
B-35	4	5½"	6¾"	35 H.P.	1200 lbs.
B-50	6	5½"	6¾"	50 H.P.	1500 lbs.

Heavy Duty Motors for Cruisers and Work Boats, 200—600 R.P.M.

Model	No. of Cyl.	Bore	Stroke	400 R.P.M.	Weight
C-8	2	4¾"	6"	8 H.P.	730 lbs.
D-12	2	5½"	7"	12 H.P.	1065 lbs.
D-25	4	5½"	8"	25 H.P.	1600 lbs.
D-50	6	5½"	8"	Power curve on request	3700 lbs.
D-45	4	6½"	9"	45 H.P.	2850 lbs.
D-70	6	6½"	9"	70 H.P.	3600 lbs.
D-200	8	8¼"	10"	165 H.P.	7000 lbs.

Heavy Duty Speed Motor for Express Cruisers and Despatch Boats, 500—1000 R.P.M.

Model	No. of Cyl.	Bore	Stroke	800 R.P.M.	1000 R.P.M.	Weight
F	8	5½"	6¾"	116 H.P.	140 H.P.	1800 lbs.
F	8	6¾"	9"	240 H.P.	300 H.P.	5000 lbs.

Sterling Engine Company

1254 Niagara Street

BUFFALO, N.Y.

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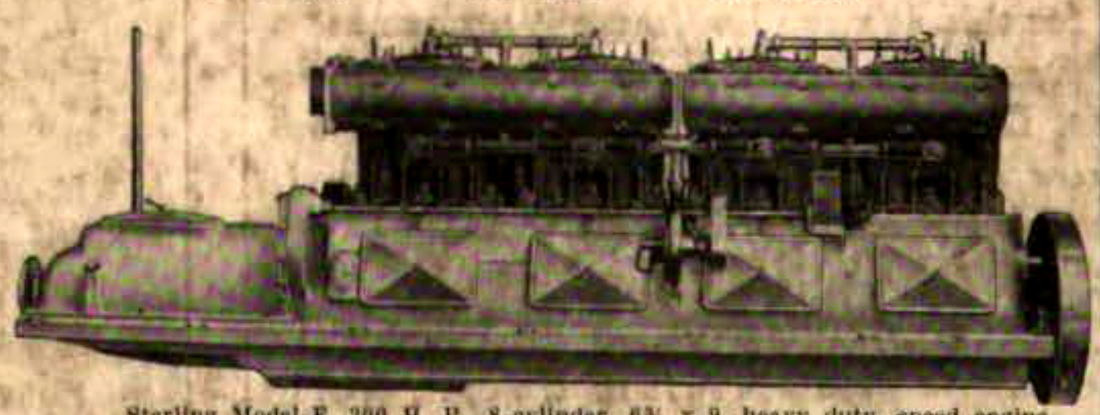

Sterling Model-F, 300 H. P., 8-cylinder, 6¾ x 9, heavy duty, speed engine. 300 H. P. at 1900 R. P. M. Weight 5000 pounds.