POWER-DRIVEN SCOOTER.

BY FREDERICK K. LORD.

In the issue of January 9th, 1909, there appeared plans for a scooter, with description of how it should be built.

The accompanying illustrations show how this scooter may be converted into a sort of automobile ice boat or auto scooter.

The motor should be preferably an air-cooled one, but as it may be difficult to get an outfit of ample power without high cost, a water-cooled motor is shown in the plan, as it is cheaper and there are a great variety to select from. It will probably be necessary to experiment with the water system. The plan contemplates a thin flat tank with a large cooling surface to act as a radiator. If the weather is very cold this may be sufficient; if not a simple radiator may be made by passing the water through thin copper tubing, coiled in a spiral. A seven-horse-power motor, as shown, weighing about one hundred and seventy-five pounds and running at seven hundred revolutions, should give the scooter a speed of about thirty miles an hour on good smooth ice. If a light-weight air-cooled motor of twenty horse-power is installed a speed of sixty miles an hour can easily be obtained.

The propelling outfit may be installed in such a manner that it does not interfere with the use of the boat for sailing. To do this it is only necessary to shift the gasoline tank forward and make the driving wheel case watertight, the same as a centerboard trunk. The steering runner could have a removable pin through the stock at the tiller head, thus allowing the runner to be unshipped. If the wind died out one could "auto scoot" home by simply putting in the rudder and starting up the motor. Of course the extra weight and windage of the sails and rigging would retard the speed somewhat.

The first step in construction is to put in the trunk in which the driving wheel runs. First cut a slot in the bottom 13 inches long and 3 inches wide to allow the wheel to touch the ice. The forward point of the slot is 5 feet 5 inches from the bow, if the boat is built accurately to the plans.

The old floor timber at station No. 7 will have to be cut amidships and a short one put in about two inches farther aft in order to allow sufficient space for the driving wheel.

The two trunk posts are now put in. These are of oak; the forward one is 2½ inches wide and 2½ inches thick. It is jogged out as shown in the plan so that it rests on floor No. 5 and supports the deck beam. The post must be securely bolted to both floor and deck beam, as a large part of the strain comes upon it. The after post is 2¼ inches by 2 inches, securely fastened to floor No. 7.

The sides of the trunk are of white pine ¾ inch thick, and put on two pieces to a side. The joint should come in line with the wheel bearing, and be cut out around it to allow play for the driving wheel, as it jumps over rough ice. The lower boards should land on top of the bottom and be fastened to it with brass screws put in from underneath. If the posts and boards are well fitted to the bottom and set in white lead the trunk should be fairly water-tight. A removable cap of ¾ inch white pine allows the trunk to be inspected.

The wheel yoke may next be shaped out. This comprises two pieces of oak 1¼ inches thick, 2 feet 2½ inches long, 4½ inches wide in the middle and 3 inches at the ends, with a 1¾ x 3 inch cross piece to hold them together. A 1⅝-inch hole is bored in them, 1 foot 2 inches from the after end, to take the flanged bearing of the driving shaft. Fig. 2 shows the layout of the yoke and trunk, also the little ½-inch oak strips *AAA*, which keep the yoke from chafing the sides of the trunk.

The driving wheel is of 1½-inch oak, 15½ inches in diameter. The rim is rounded over and fitted with twelve spikes. These can be made from 2¾-inch iron lag screws. Bore holes in the rim and screw them in. Then cut their heads off with a hack saw and file them to a chisel point at an angle of about 45 degrees, as shown in the upper portion of Fig. 4.

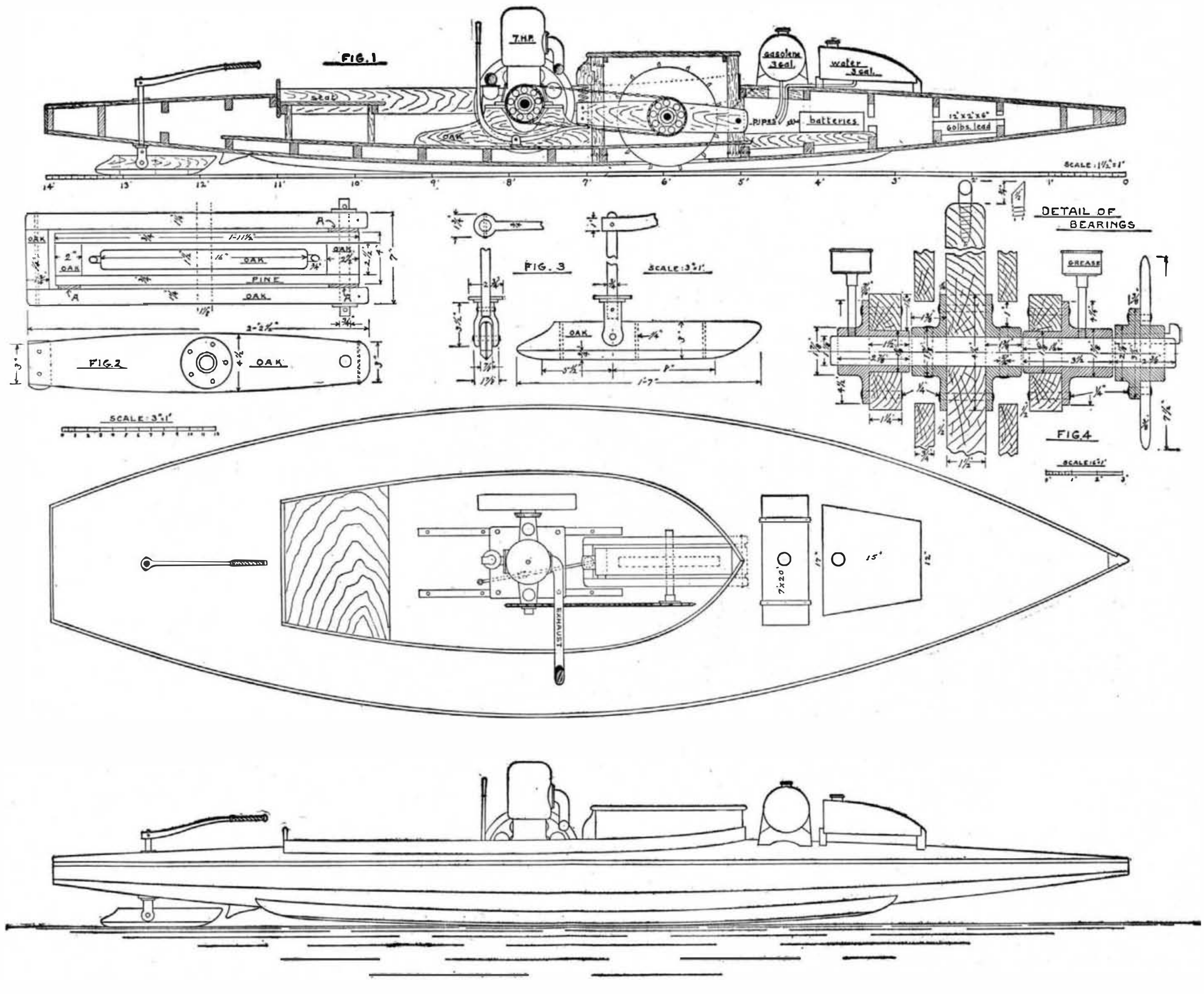
The same figure shows in detail the flanges and bearings for carrying the wheel and delivering the power. The flanges should be bronze castings turned and fitted on a lathe. The cheapest way is to make one pattern large enough to enable all the flanges to be worked down from it. This would not be very expensive, but the flanges must be well made or else trouble will surely ensue. The driving shaft is of 1⅛ steel, 14 inches long. A 7/16-inch driving sprocket about 7½ inches diameter is riveted to the flange and then keyed on to the shaft. As Fig. 4 shows clearly the dimensions of flanges and rivets, it is not necessary to describe them in detail. The driving wheel is pinned to the shaft with two 5/16-inch taper pins driven in tightly and riveted enough to prevent working out. A couple of grease cups are put in as shown.

To put the outfit together first pin the driving wheel on the shaft and lay it in the trunk, the two upper side boards being, of course, removed. Fasten the two bearing flanges on the yokes and then slip each side over the shaft. The yoke is now fastened together at the rear end by two ¼-inch through bolts, as shown in Fig. 2. The forward end has a ¾-inch pin passing through the oak post tightly and having two washers and pins to keep the yoke together. As the thrust of the motor is taken on this pin be careful to get it to fit the wood tightly. A small through rivet forward of the pin will help prevent the wood from splitting. The sprocket may now be keyed on and grease cups fitted. As the driving wheel will move up and down, due to bumps in the ice, it must be made flexible. This is accomplished by means of the movable yoke and a spring fitted at the after end of the yoke to keep it pressed down hard on the ice and prevent the teeth from slipping.

An oak block is fastened securely to the trunk post and a 3/16-inch spring about 1½ inches in diameter and 4 inches long should be about right. Drive nails in a row around the spring to keep it in place.

A means must be provided for raising the driving

(*Concluded on page 479.*)



CONSTRUCTIONAL DETAILS OF A POWER-DRIVEN SCOOTER.

(*Concluded from page 478.*)

most terrible pitfall that the world has ever seen. Any unfortunate man who should chance to stumble into one of these leaves would be speedily crushed to death by the steady pressure of the inclosing sides. One can imagine that a country in which the man trap abounded would be avoided as much as a district inhabited by man-eating savages.

The aquatic plants such as the bladderworts (Utricularia) would scarcely be behindhand in this forward movement among the carnivorous species. These plants capture small water creatures by means of little bladders which are attached to their stems. The entrance to these receptacles is guarded by a little door, which can be opened easily from the exterior but may not be pushed aside from the interior. At the present time the bladders of the Utricularia are small, but there is no reason to suppose that they will always remain so. It is quite likely that they may increase in size so that they are able to grapple with good-sized fish and other water animals.

In these far-away days of which we have been speculating, plants will be divided into wild and tame sorts in the very real sense of the words. The botanical gardens of the time will be far more exciting than are the zoological collections of to-day. It is fortunate that all natural changes come about with great slowness, and it may be that the condition of man himself will have changed considerably by the time he is called upon to face these aggressive plants. It is to be hoped that this may be so, otherwise the outlook for the human race is distinctly disquieting.

A New Substitute for Cotton.

(*Concluded from page 470.*)

German East Africa, and the exports thence to Germany are steadily increasing. So far, little attention has been given to cocoanut fiber and the fiber of the many palms growing in the protectorates has been allowed to run to waste. With a view to becoming independent of foreign countries for her supplies of this fiber, Germany is also going to see what can be done with the product of her own colonies. The whole aim of the German is to become "independent" and, as far as possible, do without foreign goods and foreign labor. Other instances could be given of this, were they not quite outside the scope of the present article.

POWER-DRIVEN SCOOTER.

(*Concluded from page 472.*)

wheel clear of the ice when the engine is being started. This is accomplished by a lever of ⅜ x 1-inch iron placed and bent as shown in Fig. 1. When starting the motor the lever is pulled back and a small wedge of wood is slipped between it and the engine bed. After the motor has got going nicely it is slowed down and the lever gently relaxed, allowing the teeth to take a slight hold. As the craft gathers headway increase the power and also the pressure on the spikes until the lever is slack and the motor running at its maximum power. To stop, slow down and raise the wheel off the ice.

The construction of the rudder is simple. The stock is of ¾-inch iron 12 inches long. An 18-inch tiller of forged iron is pinned to the post with a ¼-inch pin. The stock is recessed and pinned to the iron yoke which carries the runner. This yoke is forged out of 1¼-inch iron and has a collar slipped over its shoulder to wear against another collar or flange fastened to the bottom to act as a bearing. A ½-inch pin secures the yoke to the runner. The runner blade is of ⅞-inch oak 1 foot 7 inches long and 2¼ inches high.

For the shoe use a piece of soft iron ¾ inch deep and ⅞ inch wide cut to a V edge at an angle of 45 degrees on each side. The shoe should have a rocker of about ⅛ inch for the 13½ inches it is supposed to bear on the ice. It should have 8 inches bearing forward of the rudder pin and 5½ aft. The shoe is held to the runner by three ⅜ through bolts riveted and smoothed off. A guard is placed under the boat to prevent the runner from catching in obstructions.

The engine can now be installed. For a foundation use two 1¼-inch oak stringers running along four frames and shaped and spaced as per requirements of engine used. The stringers should be through bolted from the outside of planking to top of the bed and drawn up tight and solid.

Now set the motor in its bed and fasten down with ½-inch lag screws 3 inches long. The exhaust is piped over the side and the water and gasoline tanks are situated on the forward deck. They each hold 3 gallons, and should be made out of 18-ounce copper. The piping is led down through the mast hole along the floor to the motor. It should be of copper tubing, ⅜ inch for the gasoline and 1⅜ inch for the water.

The batteries and coil are placed just under the tanks. Six dry cells are sufficient. In order to have the scooter trim with one person on the seat it will be necessary to put about 60 pounds of lead up forward as shown. As the keels of these boats are rockered, attention must be paid to this or else the pressure on the rudder will be too great or it will be lifted clear.

A ½-inch heavy motor cycle roller chain should stand the strain with care; but as to the diameter of sprockets experiments would have to determine this, as it would vary for every type of motor. With the driving wheel turning up 700 revolutions per minute the scooter would be going about 33 miles per hour. If the motor could turn up to that or over, it would be better to let it run up and gear it down.

With a motor of six or seven horsepower and turning 700 to 800 per minute I would use for a starter an 8-inch sprocket on the driver and a 7-inch one on the engine.

(*Concluded from page 478.*)

Valve for steam traps, B. L. & G. H. Clover	942.246
Valve for train brakes, engineer's, W. K. Rankin	942.280
Valve grinder, I. C. Smith	942.222
Valve, pressure retaining, R. W. Kelly	942.331
Valve, quick action triple, D. S. Gilbert	942.634
Valve, regulating, T. M. Wilkins	942.360
Valve, safety gas, Yockey & McLeod	942.158
Valve, silcock and other, F. W. Carlson	942.541
Valve, throttle, Z. Paul	942,345
Valves, making records for setting slide, J. B. Michael	942.453
Vault vestibule, J. G. Giesting	942.633
Vehicle, A. F. Rockwell	942.219
Vehicle seats, shifting rail for, A. E. Smith	942.292
Vending apparatus, coin controlled, M. J. Forth	942.253
Vending machine, F. M. Weber	942,117
Vending machine, cigar, L. A. Vandiver	942.527
Vending machine, stamp, J. R. Armington	942,766
Veneer tapping machine, Nystrom & Taxon	942,277
Ventilator. See Car ventilator.	
Vessels, controlling device for filling, G. Schollmeyer	942.755
Vessels, towing arrangement for canal and river, E. O. Nikel	942.510
Vibrator, A. J. Stecker	942,596
Waistband for garments, adjustable, M. S. Erlanger	942,628
Warning signal and stopping device for the safe movement of public conveyances, W. Whitmah	942.388
Warp balling machine, W. G. Denn	942.813
Warp carriage, H. D. Colman	942.247
Washboard, D. C. Juleson	942.076
Washing machine, Ramthun & Gutekunst	942.664
Washing machine, J. Szava	942,758
Water closet, H. S. Rumsey	942.464
Water gage, R. H. Buckner	942.365
Water gate, J. H. Phipps	942.460
Water tube boiler, J. P. Sneddon	942.797
Water wheel, J. L. Bell	942,811
Weed cutter and cultivator, M. Pruyn	942,744
Welding device, foot power, Garver & Bissell	942.444
Well tube cutter, J. F. Baker	942.701
Wells, trip wall packet for oil, W. Palm	942.739
Wheel, Foss & White	942,819
Wheel block, A. J. A. Bennett	942.161
Wheel, pulley, and the like, P. Montupet	942.400
Wheel scraper, C. W. Stark	942.471
Whiffletree hook, R. F. Bloom	942,431
Whip lock J. W. Robertson	942.285
Winding indicator, O. Ohlson	942.659
Window cleaning apparatus, C. E. Prickett	942.743
Window grate, adjustable, S. Jablonovsky	942.502
Window lock and lift, R. T. Axe	942.851
Window, metallic, T. Lee	942.269
Wire bender, L. D. Danforth	942.440
Wire twister, I. N. Morford	942.732
Wire tying machine, automatic, O. L. Bowers	942.305
Wire wall pocket, T. V. Cromwell	942.714
Wire winding machines, notching means for, W. L. Wergin	942.118
Woods, treatment of coniferous, W. H. Rowley	942.106
Woodworking machines, pressure device for, C. G. Wilderson	942.804
Wrapping machine, A. M. Price	942.101
Wrapping machine, package, F. Girond	942 636
Wrought articles, making, J. H. Dods	942.489

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