

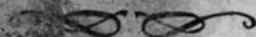
# INSTRUCTIONS

## Lockwood Twin Boat Motors



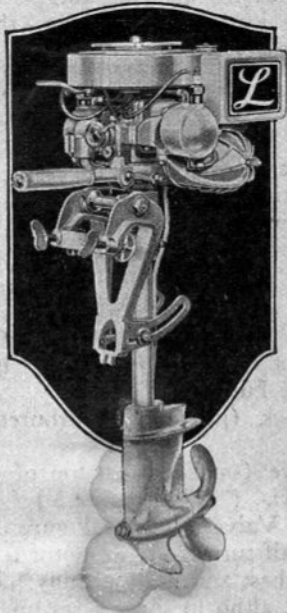
*1927 Models*

T      TS  
TL     TLS



It is **IMPORTANT** that you keep this Instruction Book; that you study it; that you **KNOW** how to operate your motor and how to take care of it. It has been built with painstaking care; it has been thoroughly tested; and now that it is in your hands. its useful life will depend on how **YOU** handle it.

In writing **ALWAYS** mention Model and Serial Number of your motor.



Every Lockwood Twin Motor is guaranteed to be free from defects in material or workmanship without time limit. Parts judged defective by us will be repaired or replaced F. O. B. our factory.

**Lockwood Motor Company**

Jackson, Michigan, U. S. A.

## WHEN YOU GET IT

Remove the lid and take the motor out of the shipping box carefully.

Clamp it on the stern of your boat—USE NO WRENCH. If the propeller is not well below the surface of the water (with boat running in trim) and, in most cases, also below the bottom of the boat—down in "solid" water—then notch or cut the top of the transom down until it is.

Adjust the Thrust Block in the quadrants so that the drive shaft casing is vertical when the boat is loaded and running—the top of the gasoline tank level. (See nut "F" Figure 5.)

## FUEL AND OIL

Mix one-half pint of heavy oil—such as Gargoyle Mobiloil "A"—with ONE gallon of gasoline in a separate CLEAN can. (NOT in the Motor Tank.) Fill the tank with this mixture.

While the motor is new, for the first week or two of operation, use three-fourths pint of oil per gallon of gasoline. RACING: Use a full pint of oil per gallon of gasoline.

## TO START MOTOR

1. Loosen "screw-vent" as far as it will go. It cannot come off. This is the small nut on top of the Filler Cap.

2. Open gasoline cock (just under carburetor bowl) by turning the handle DOWN.

3. See that float valve (small pin on top of carburetor bowl) rises, indicating gasoline in the bowl. ("A" in Figure 3.)

4. Close the Needle Valve ("C" in Figure 3) on the Carburetor and then OPEN it one and a half turns. After motor is running and warm, slowly close this until motor runs best and most steadily. It is unnecessary to change this once it is properly set, altho in some cases opening it a quarter turn will facilitate starting.

5. Turn the Choke-and-Throttle Lever ("B" in Figure 3) forward and down to position marked "Choke"—no farther.

6. Place Timing Handle of magneto in position "A" (see Figure 2) about 30 degrees left of center position. (For starting in REVERSE, place it in position "B".)

7. Place knot of Starting Rope in either notch of the Starting Sheave and wrap rope around in the groove to the RIGHT. (For starting motor in REVERSE, wrap in other direction.)

8. Fold the Steering Handle up as far as it will go. Grasp it with the left hand, thumb up. Press your thumb on the Stopping Button, thus cutting out the spark. Push on the handle to hold the motor in position. Then give the starting rope a quick pull, part way, and let the flywheel "bounce" back. Do this four or five times—the purpose is to get a charge of gasoline into the crank-case. Then release the Stopping Button and give the rope a sharp pull, all the way. In most cases the motor will start on the FIRST full pull of the rope.

Note—This method of "rocking" the flywheel back and forth is not so necessary when the motor is warm; but you will find it most convenient in any case to push on the folded steering handle when pulling the rope.

9. Move the Timing Handle of Magneto to the RIGHT to about position "B" or about 30 degrees to the right of center position. (See Figure 2.) The Timing Handle should be set where motor runs highest speed, but not beyond that. This is "Full Speed" position. A little experience will show you how to set it so the motor will run best.

10. Slowly move the Choke-and-Throttle Lever upward as the motor warms up, until it is straight up in the position marked "Run". (See Figure 3.)

11. Look to see that cooling water is being discharged from the water tube from each cylinder.

Do NOT choke the carburetor to start when the motor is hot, or if so, very little.

### **TO SLOW DOWN**

FIRST, move the Timing Handle of Magneto to the LEFT slightly beyond position "A", then move the Choke-and-Throttle Lever backward slowly until the desired speed is obtained. (See Figure 2.)

Note—If you put the Choke-and-Throttle Lever as far back as it will go, to position marked "S" in Figure 3, the motor will stop.

### **TO STOP MOTOR**

The motor may be stopped in two ways: By pressing the Button in the end of the Steering Handle or by moving the Choke-and-Throttle Lever clear back.

### **LAG SCREW IN BOAT**

The stern bracket has a slotted extension at the bottom. When the motor is operated on the same boat, screw a lag screw into the stern of the boat in this slot. Do NOT screw it in tight, but leave it so the head lacks 1/32 inch of touching the bracket. The motor can then be lifted off and replaced easily, yet the lag screw makes its attachment to the boat more secure. (See Figure 7.)

### **TO REVERSE**

See the instructions under "TO START THE MOTOR" as to position of the Timing Handle. THIS IS IMPORTANT.

### **STEERING**

The Lockwood Twin may be steered with the folding tiller handle or with ropes. The eye-nuts on each end of the muffler are for attaching the steering ropes. It is best to use a short piece of light chain 10 or 12 inches long on the end of each rope, with a small harness snap or steel wire hook to fasten to the eye-nuts. Quarter-inch braided sash cord makes the best rope. Use screw-eyes or small pulleys on sides of boat to guide the rope, if desired. (See Figure 4.)

### **LOCKWOOD PILOT**

The PILOT is adjustable by means of the small wing screw in the Pilot clamp. It is not necessary to make this very tight to absolutely hold the motor in the position you leave it. For rope steering, it should probably be somewhat looser than for hand steering. Adjust it to suit your conditions. You will find it can be very loose and still, because of its patented construction, will hold the motor from turning when you let go.

### **PROPELLERS**

The motor is regularly shipped with the two-blade weedless design Propeller, 9-inch diameter, 8-inch pitch, suitable for the average boat. On a boat capable of up to twelve miles per hour, this Propeller will not permit the motor to run at too high speed, but on a boat capable of making fifteen miles per hour, or more, a higher pitch wheel is necessary to HOLD THE MOTOR SPEED DOWN to normal.

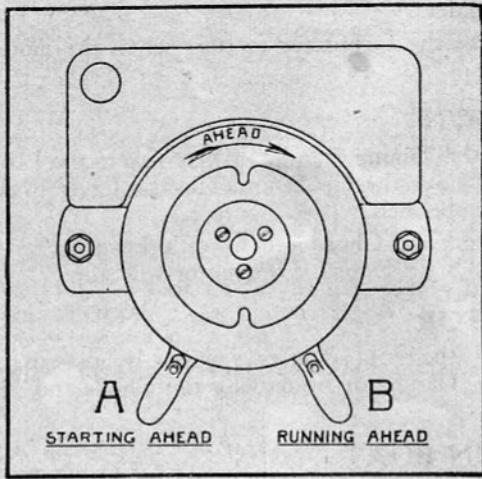


Figure 2

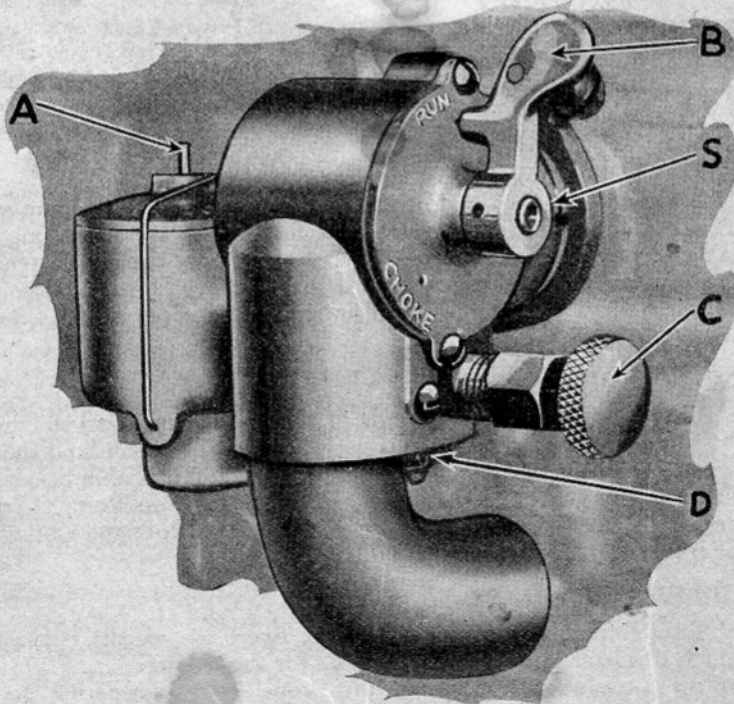


Figure 3

The Speed Propeller, No. 20123, two elliptical blades, bronze, 9-inch diameter and 9-inch pitch should ALWAYS be used on faster boats. It is supplied only as an extra, list price \$4.00. Unless this higher pitch propeller is used on faster boats and in racing, our guarantee on the motor is not effective. It is just as injurious to a motor of this kind to run it at excessive speeds as a motor car engine. Your motor will give you longer, more efficient service if you use the proper wheel. Retain the regular propeller for use on slower types of boats.

## IGNITION SYSTEM

The big Eisemann Magneto produces sparks in both spark plugs at the same time.

To test the spark, remove high tension wire from one plug and hold about 3/16 inch away from the end of the cylinder. Pull the starting rope. A fat, hot spark should jump the gap.

To remove the flywheel magneto (which should be very rarely necessary) simply unscrew the flywheel-nut on top the magneto. Do not remove the starting sheave. This nut is of special design and as it is screwed off, automatically pulls the flywheel from its taper seat on the crank shaft.

To clean the contact points, use a very fine coil file or nail file. A piece of hard-surface heavy paper drawn between the points will remove grease or dirt but care should be taken that no lint from the paper remains.

Should it be necessary to return the magneto to the factory, or to any Eisemann or Lockwood service station, for repair, be sure to send, not only the flywheel itself, but also the armature plate (stationary member) complete.

If the Timing Handle, which swings the whole armature plate, becomes too loose to stay in position when the motor is running, it may be tightened on the hub of the upper main bearing by means of the clamp screw which may be reached with a screwdriver and tightened up to give proper friction.

Should the motor be dropped over-board and submerged, remove the armature plate from the motor and thoroughly dry it out in the sun or a warm (not hot) oven. This will usually make it all right, but if not, it will have to have a new coil, which is replaceable. Drain all water out of cylinders and other parts of engine, put in oil, and run again as soon as possible, to prevent rust.

The coil in the new magneto is replaceable. If you order, ask for full instructions.

**Spark Plugs.** The Lockwood Twin is factory-equipped with the famous STERLING plug of our own manufacture. They seldom need attention, but if they do, it is a simple matter to separate the parts and clean the porcelain insulator. The plug gaps should be examined occasionally and set at not to exceed .020 inch.

The Button Switch in the end of the Steering Handle short circuits the magneto and stops the spark. Should the wire leading to this switch become short circuited through tampering or otherwise, the magneto will not spark.

The Stopping Button contacts against an insulated bolt. If desired, a wire may be attached to this, another to any stationary part of the motor, and the two run forward in the boat to a simple knife switch, which, when closed, will stop the motor. (See Figure 4.)

The Eisemann Magneto Corporation of Brooklyn, New York, has a nationwide service organization. They will be glad to give you the name and address of the nearest to you.

Note—The magneto will spark when running in either direction. It is

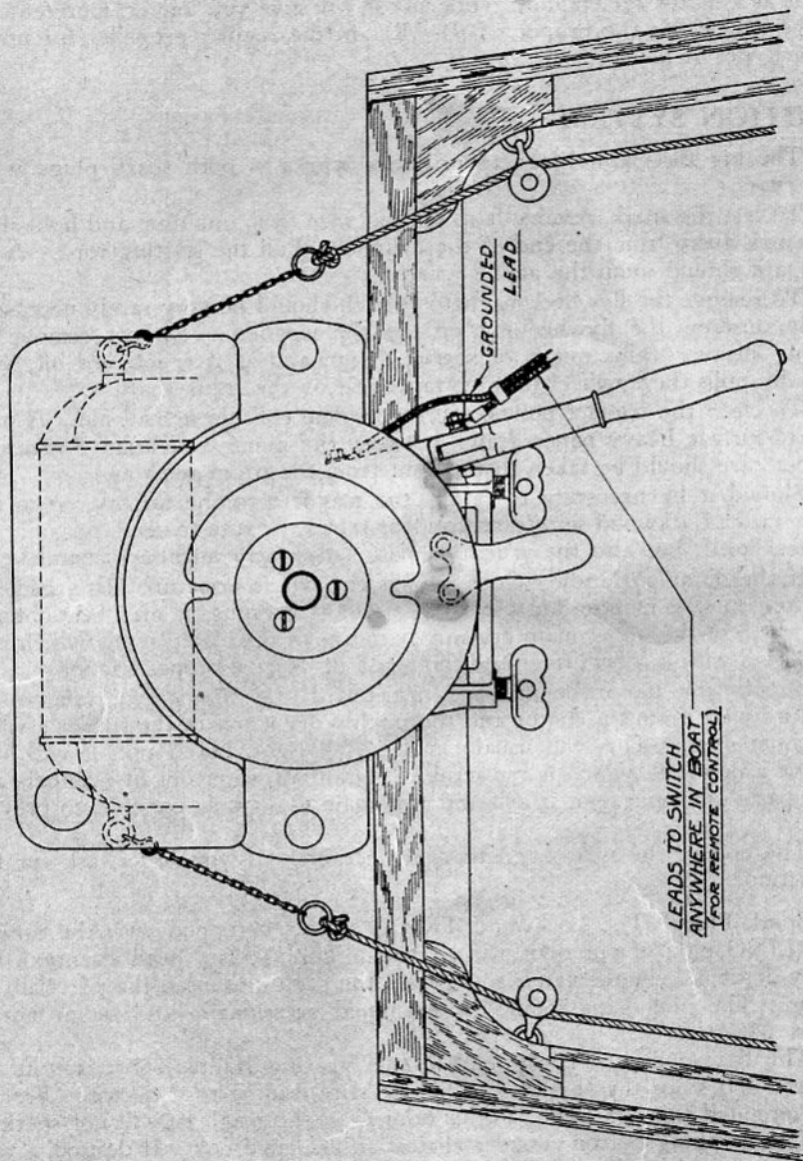


Figure 4



therefore **IMPORTANT** that the Timing Handle be set as per instructions under "TO START THE MOTOR" when starting.

The magneto is simple, rugged, and over-size. Do not tamper with it so long as it delivers a spark when tested.

## **CARBURETOR**

The carburetor on the Lockwood Twin is our own design and manufacture, simple and efficient, developed in field service. (See Figure 3.)

The Needle Valve "C" is the only adjustment needing attention. This controls the flow of gasoline from the Float Chamber or bowl to the engine.

When starting the motor the first time, close the Needle Valve, then open it one and a half to two turns. After the motor has been running for a minute or two with spark advanced, slowly close the Needle Valve to the point where the motor runs best. This will usually be about one turn open but will depend on operating conditions. When this point is once found **leave it alone**.

If the Float Valve (the pin on top of the carburetor bowl—"A", Figure 3) does not rise when the gasoline is turned on, it indicates no fuel in the tank or a stoppage due to dirt somewhere in the gasoline line, or that screw vent has not been opened.

When the Choke-and-Throttle Lever "B" is moved forward and down, it shuts off the air supply and makes a rich starting mixture. If it is moved past the position marked "Choke" where it tends to stop because of the little ball-check, all the air is shut off and pure gasoline is sucked in, flooding the motor. Do not do this.

When the lever is moved backward it throttles the mixture to the motor for slow speed. If moved clear back it shuts off all the gas and stops the motor.

When the motor is to be carried or shipped, it is well to stop it by shutting off the gasoline cock, thus letting the motor run until the carburetor bowl is empty. If you ship the motor be sure to empty all gasoline from tank and carburetor.

The gasoline is strained through a screen in a settling basin located in the bottom of the gasoline tank. This should be cleaned at intervals.

The screw ("D" Figure 3) may be removed and a very fine wire used to clean the nozzle in the carburetor should this become clogged with dirt.

## **GASOLINE TANK**

After a long period of use, flush out the gasoline tank with a little clean gasoline to remove all dirt and sediment.

The "Screw-Shut" Vent on top the Filler Cap should be screwed clear up when the motor is running, to permit entrance of air as the gasoline runs out. Screw it down to make the gasoline tank absolutely leak-proof in all positions.

## **LUBRICATION**

All moving parts of the power-head or motor proper are lubricated by the oil mixed with the gasoline. Be sure to use good oil (as specified) in the right proportions (measure, don't guess) and mix in a **clean** can before putting into the gasoline tank.

Lower Unit. (See Figure 5.) The gears and bearings in the lower unit are lubricated by grease. We advise use of LOCKWOOD "Gear Tooth Paste" supplied in handy collapsible tubes, a lubricant specially developed for this service. If not procurable, use a good grade of gear lubricant, such as Gargoyle Mobiloil "CC". Fill the gear housing full but do not **force** the grease after it is full. Fill through the plugged hole "G" in the side at upper part of Stream Line. (See Figure 5.)

Examine the gear housing every month and, if necessary, add more lubricant. One filling, in many cases, will last a whole season.

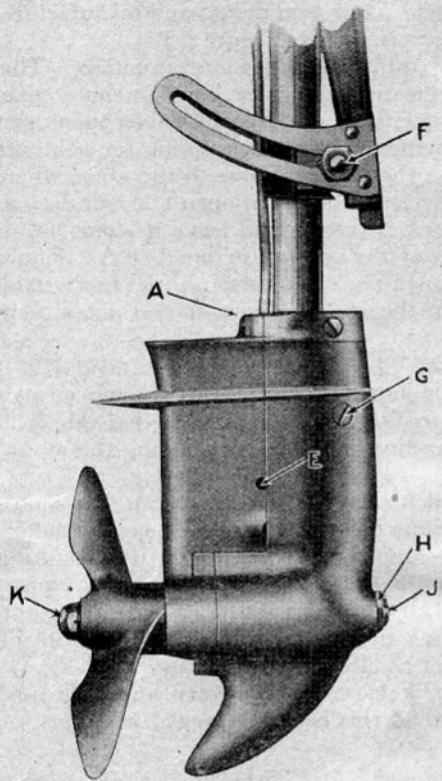


Figure 5

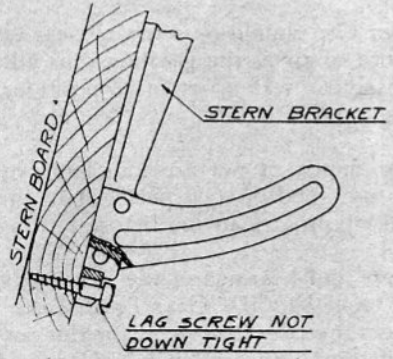


Figure 7

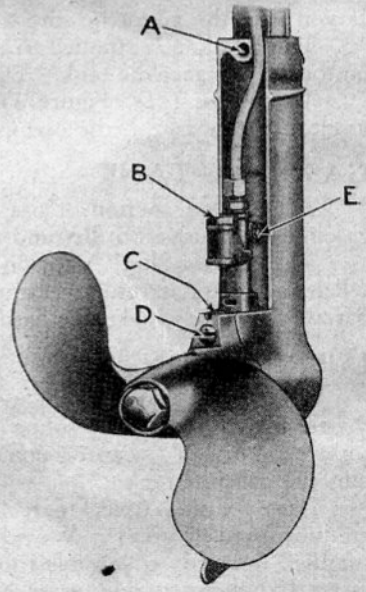


Figure 6

## AUTOMATIC TILTING

The Lockwood Twin Motor tilts upon hitting under-water obstructions. The tilt is controlled by friction and is adjustable. The large nuts on the swivel bolt should be adjusted to suit your conditions of operation. It should not be too tight. To navigate shallows, throttle the motor to slow speed and tilt motor by hand by pulling the tank toward you.

**NEVER ATTEMPT TO TILT MOTOR BY PRESSING DOWN ON STEERING HANDLE.**

Remember that the Lockwood Twin develops exceptional power and therefore very high speed. You would not knowingly drive your automobile over deep ruts and stones at highest speed and expect it to stand the strain. You must not expect the Lockwood Twin (or any other motor) to withstand unusual abuse. The tilting is a safety device and gives you reasonable insurance against damage to your motor when accidentally hitting obstructions. Breakage or damage from such causes are "accidental," do not reflect on the strength of the motor itself or on the quality of its workmanship or material.

## SAFETY PROPELLER (Patented)

The Lockwood Safety Propeller is a friction device inside the propeller hub. A bronze spring plus the natural thrust of the propeller, forces the propeller hub, which is babbitt lined, onto a bronze cone which is pinned to the propeller shaft. In normal operation there is no slippage, but should the propeller strike any obstruction, it will slip on the cone, thus protecting boat, boater and motor. Damage to the propeller blade may result from striking a hard object. It is well, therefore, with a motor as powerful as the Lockwood Twin, to avoid them all possible. Sharpen the blades if they become nicked or battered.

The pressure of the spring is adjustable. The motor leaves the factory properly adjusted and should not be changed unless it is found to slip in normal operation, or unless it does not slip easily enough. Be sure to pin the propeller nut ("K" Figure 5) after adjusting.

A shear pin through cone and propeller shaft gives double protection. Should this shear pin ever break, replace it only with a factory pin. Then see that propeller slips properly on the cone to prevent shearing the next time. No lubrication of this device is necessary.

## GEARS

The Gears are made of special alloy steel, heat treated, and run in a "pack" of gear lubricant. (See under "Lubrication.")

A special feature of the Lockwood Twin is the fact that the gear-housing construction balances the propeller thrust against the gear thrust. This feature means lower pressures, less wear.

There is but one adjustment. The large screw ("J" Figure 5) with lock nut "H" on the forward end of the gear housing is to adjust the mesh of the gears. Screw this up tight, then back off one-quarter turn and lock the nut. The gears should never be set together tight. If change of adjustment is made, be sure to tighten the nut on the adjusting screw TIGHT.

If, for any reason, the gear case head (propeller end) is taken off, be sure to use a gasket of the same thickness (.010 inch) when replacing.

It is well to wash all the old grease out of the gear case with kerosene at the end of the season and replace with a supply of new grease.

## COOLING SYSTEM

The Lockwood Twin is water-cooled by a positive plunger type, super-charged, submerged Pump located on top of the gear housing but **inside** of the "tail piece" cover. (See Figure 6.) To expose the Pump for any necessary work, remove the screw "A" attaching the "tail piece," near the top, then **lift** the "tail piece" straight up; it is dowel pinned at "C."

The bronze, steel-tipped plunger of the pump bears on the eccentric hub of the large gear. The ball valves are located in the pump body—one under the screw-cap "B," the other under the water pipe fitting.

Should the pump fail to work (evidenced by no water flow from the two discharge pipes back of and under the cylinders) remove the valve caps and clean the ball valves and seats with gasoline and a cloth.

If too much grease has been forced into the gear case, this may work up past the pump plunger and clog the valves. The remedy is to thoroughly clean the pump with gasoline and remove some of the grease from the gear case.

In **freezing weather**, drain the cooling system by loosening the Drain Screw ("E" Figures 5 and 6) in the side of the pump body two or three turns and hold the motor in an upright position until all water is out. This Drain Screw may be reached through the hole in the side of the "tail piece."

It is also well to see that any water which may have accumulated in the drive shaft casing is drained out. To do this, take the lower unit from the power-head by removing the four cap-screws, and invert the lower unit.

## TAKE DOWN

The Power Head may be easily and quickly removed from the lower unit by taking out four cap-screws under the crank case. **Lift** the Power Head straight off.

## IN CASE OF TROUBLE

Any gasoline engine operates on the basis of four fundamental principles:

1. A correct mixture of fuel and air.
2. A hot spark, correctly timed.
3. Good compression.
4. Freedom from mechanical difficulties.

If any one of these four fundamental things is lacking, the engine will not run.

In case of trouble:

1. Be sure the correct mixture of gasoline and oil is getting to the carburetor. Be sure to choke to get a rich mixture for starting a cold engine.
2. Test the spark. (See page 3.) If none, proceed as instructed.
3. Turn the motor to see that there is compression. In motors of this type there is bound to be good compression unless the motor has been seriously damaged through improper operation—such as lack of sufficient oil or cooling water.
4. Mechanical difficulties, such as worn or broken parts, seldom occur.

It is therefore evident that any failure to start is because of an apparent mechanical difficulty, OR, because of improper mixture of fuel and air (the mixture too "lean," or the motor flooded), OR, because of insufficient spark.

## FLOODED MOTOR

If in an attempt to start, too much gasoline is fed to the motor it will not start, or if it does, will run irregularly and emit a cloud of smoke from the muffler. In such case, close the needle valve on the carburetor, remove both spark plugs, and spin the motor five or six times with the starting rope. Then replace the plugs and begin all over again.

## IRREGULAR RUNNING

Examine the spark plugs and clean and adjust them if necessary. Adjust the carburetor needle valve.

## CARBON

After a long period of use, remove the muffler and exhaust castings and clean from the exhaust ports any accumulation of carbon found. Carbon in the cylinder will seldom give trouble unless it becomes very excessive through use of poor oil.

## FACTORY SERVICE

If trouble which seems elusive and cannot be remedied is encountered, write to the attention of our Service Department, giving a detailed statement of conditions and what you have done, and ask for advice. In most cases if a clear statement of the conditions is given we can quickly suggest the remedy.

If, after long use, your motor is in need of a thorough overhauling, send it to the factory or nearest authorized service station where it will have expert attention at nominal charge for time and new materials only.

## KEEP YOUR MOTOR BRIGHT

The Matchless Metal Polish Co., Chicago, make "Mexoline," a fine polish for aluminum. We recommend that you use it and keep your motor looking like new. We use it in our factory.

## TO STORE THE MOTOR

When storing the motor at the end of the season—

Drain all gasoline from tank and carburetor.

Drain cooling system.

Drain drive shaft casing.

Drain the gear case, wash out with kerosene, and repack with "Gear Tooth Paste."

Put a tablespoonful of pure oil (Mobiloil "A") into each cylinder through the spark plug hole.

Clean motor all over and then wipe with a very oily rag.

Lay away in a cool, dry place and cover with burlap. (Not in cellar or basement.)

Do not stand in an inverted position.

## WHEN READY TO USE IT AGAIN

When you take the motor out, polish it up. Inspect the gears, propeller shaft and bearings to see that they are in good condition. Take off the pump and wash the plunger, valves, etc., with gasoline. In reassembling the pump, oil the plunger with a few drops of light oil. Pack the gear case full of new, clean "Gear Tooth Paste" and reassemble.

Remove the flywheel, and clean the contact points by running a piece of hard paper or cardboard between them. If they are very dirty or rough, use coil file to polish them. See that the points open the proper distance.

Clean the screen in the gasoline tank. Clean out the gasoline tank, the gasoline feed pipe and the carburetor.

Mix your gasoline and oil in a clean can and in the right proportion. Fill the tank. See that the gasoline is flowing to the carburetor.

Thoroughly clean the spark plugs. Replace with new if cracked, chipped or broken. Set the gaps as explained on page 5.

Take off the muffler and exhaust castings. Clean all carbon from the exhaust port in each cylinder. In replacing the exhaust castings be sure the surfaces are clean, and use new gaskets.

If, in going over the motor, you find any parts that are damaged, replace them at once. Tighten up all screws and nuts.

Put the motor in the water and start it. Carefully adjust the carburetor. See that the pump is working properly.

After long, continuous, hard service, a very complete overhauling may be advisable. This should be done by an expert. If you desire, return the motor to the factory and you will get a workmanlike job at our usual nominal charge for time and materials.

## SALT WATER OPERATION

A standard fresh water motor (Model T or TL) may be operated in salt water, if desired, but in that case should be given special care. It should be thoroughly drained whenever removed from the boat, and should then be operated in a tank or barrel of fresh water for a few minutes to flush out the salt. It should be wiped all over with an oily rag. Lockwood fresh water motors will operate in salt water just as satisfactorily as any motor with aluminum under-water parts.

The Models TS and TLS with bronze under-water parts are built especially for salt water use, but we recommend that these models, too, be occasionally flushed out with fresh water.

Should salt spray strike and dry on the high tension cables or spark plugs, it may cause a temporary short circuit. Keep these parts wiped clean and dry.

## RACING TRIM

To put a motor into Racing Trim, remove the muffler and exhaust castings and the air intake pipe on the carburetor. In some cases it may be well to write us fully with full description of the boat to be used (photographs, too, if possible) and procure detailed advice. Use a full pint of oil per gallon of gasoline when running the motor at high speed in racing.

The best results will be obtained with a motor that has had at least 150 hours of actual running, or more.

The motor is  $2\frac{1}{4}$  inches bore, 2 inches stroke and has 15.9 cubic inches piston displacement. It is in Class "B" under the rules for outboard motor racing.

**Register your name and address and the  
Model and Serial Number of your motor  
with us AS SOON AS YOU GET IT.**

**When writing us about your motor  
ALWAYS mention the Model and Serial  
Number.**

#### **OTHER LOCKWOOD PRODUCTS**

**Marine Engines (inboard)**

From 2½ to 8 Horse Power

**Sterling Spark Plugs**

A Size and Type for Every Motor

**Gear Tooth Paste**

For Lubrication of Gears in Outboard Motors