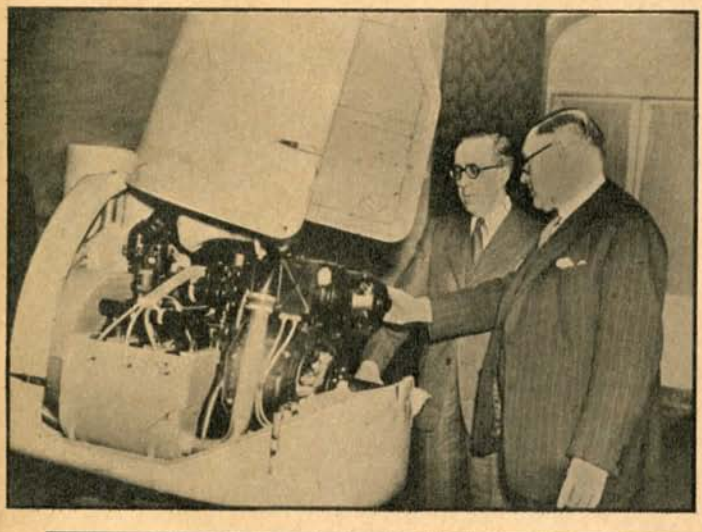
"Long Tom" Gets Around Fast Now

THE 155 mm. gun, known to cannoneers as "Long Tom," won't be late for work with this speedy prime mover, the latest thing in Army tractors. Known as the M-4, this armored machine, even with its antiaircraft gun, is roomy enough to carry an 11-man gun crew and plenty of ammunition. Easier to handle than a truck, it's a driver's delight. This one's "hitting the road" at the Field Artillery Replacement Center at Fort Sill, Okla.

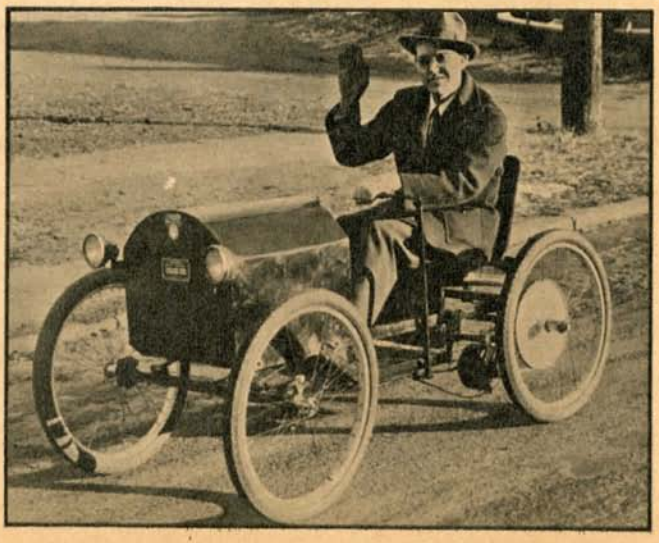


Here's An Engine That Even Cooks

THIS compactly boxed unit is a flying powerhouse—the fifth aero-engine that supplies all the power in our newest four-engined bombers. No bigger than your automobile engine, this potent little station pumps out current that starts the craft's main engines, operates the instruments, turns the gun turrets, works the radio, and recharges batteries. It even warms up radiators and lights the kitchen cooker.

No Gas? No Matter

JOSEPH JACOBS is one man who'll never fume over the gas shortage. Superintendent of a Minneapolis electric company, he built this electric car in his spare time. Powered by three 12-volt storage batteries and driven by two motors, the machine will keep plugging for 100 miles without recharging. Top speed of this overgrown scooter is 15 miles per hour, but Mr. Jacobs hasn't been late at the office yet.



Completed "windmill" registers wind speed on magnetic auto speedometer.

ANEMOMETER

OLD CAR SPEEDOMETER GIVES IT THE "WORKS"

Wind velocities can be measured with better than 95% accuracy by means of this home-made instrument. Just the thing for pilots!

by Raymond F. Yates

EVERY amateur meteorologist wishes to have some accurate method of measuring wind velocities and even the more inexpensive anemometers are far too costly for amateur use.

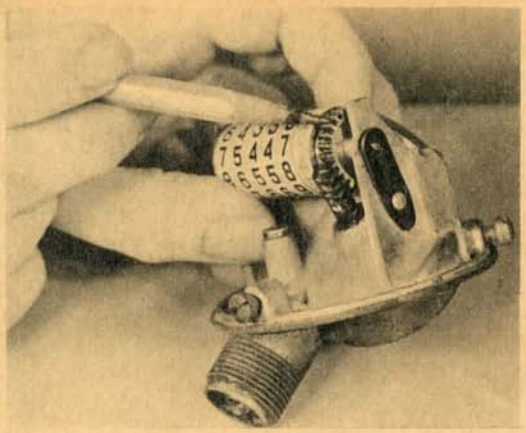
An ordinary speedometer of the magnetic type (practically all cars have these) which may be purchased reasonably at the auto junk yard, may readily be converted into an anemometer which will record wind velocities ranging from 5 to 100 miles per hour with a plus or minus error margin of less than five per cent. The speedometer illustrated and used for the original anemometer came from a 1933 Ford but any kind will do as long as it is magnetic.

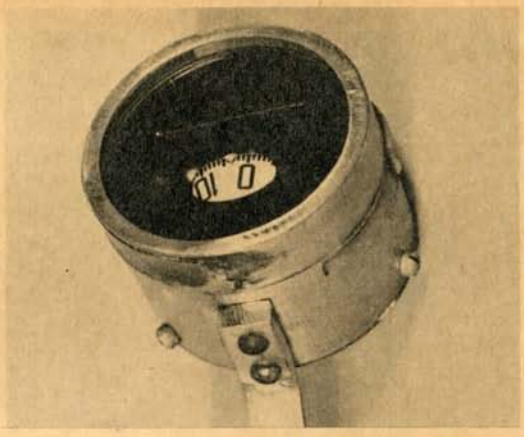
The main shaft of all speedometers is connected to the mile counter through a small worm gear. Since the mile counter cylinder is not needed for wind velocity measurement, this gear is first removed to relieve the drag and to make the instrument more sensitive.

Speedometer frames are usually zinc die castings, and it generally will be found that the worm gear bearing may be completely removed with a hacksaw. It will not be necessary to remove the tabulator itself.

Main shaft of the speedometer, which carries a circular magnet, is now equipped with a small windmill such as is shown in the drawing and the photos. The blades of the windmill are so arranged on the hub that their pitch may be adjusted for purposes of calibration, as we shall see.

The hub itself may be turned from most any metal or simply sawed off a





Closeup of dial face (above) shows mileage register blacked out as it is not needed. Left: Gears controlling this part are removed to reduce the drag.

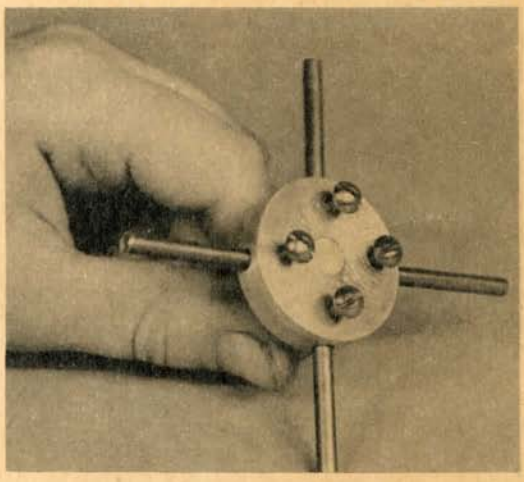
piece of rod stock of the right diameter. If at all possible, the center hole should be drilled on a lathe for accuracy. Wobble or eccentricity will greatly interfere with accuracy. Brass or cold rolled steel rod may be used for the hub of the shaft and the method of connecting this to the main shaft of the speedometer will depend largely upon the construction of the speedometer used. Solder was used in the original instrument. Naturally, there is little strain here and solder is quite sufficient.

Eighth-inch brass rod (or curtain rod) may be used for the shafts of the wind vanes and these fit in four ⅛" holes drilled 90 degrees apart in the periphery of the hub. Four 6/32 set screws are installed in the hub so that the vanes may be set at a particular angle and held there during calibration. Solder the sheet-metal vanes to their "spokes."

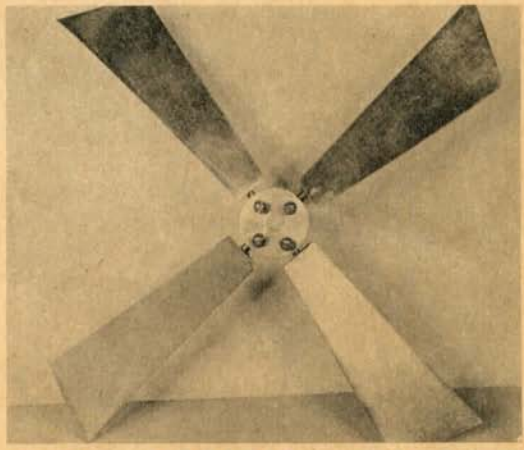
The mechanical part of the work is completed with the installation of the handle, which may be a piece of cold rolled bar of sufficient size. This is bent where it is attached to the speedometer so that the instrument will be in the proper position for reading and the windmill facing square to the wind when in use. The shafts of all speedometers enter the cases at an acute angle.

Calibration is easy enough, but it should be done carefully if the anomometer readings are to mean anything. The calibration is done on a perfectly quiet or windless day by the use of an automobile. The instrument is held out of the car window at arms' length and the car is brought to a speed of 25 miles an hour. The vanes of the windmill are then regulated until the car speedometer and the converted speedometer agree.

Locate the anemometer in a place as high as possible and free from obstructions.



Hub of rotor is drilled to receive vane spokes. Vanes are made adjustable in pitch by four set screws.



Vanes assembled on hub. Calibration of anemometer is made by adjusting vane pitch while driving in car at known speed, holding instrument in wind stream and then checking it against the car's speedometer.

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