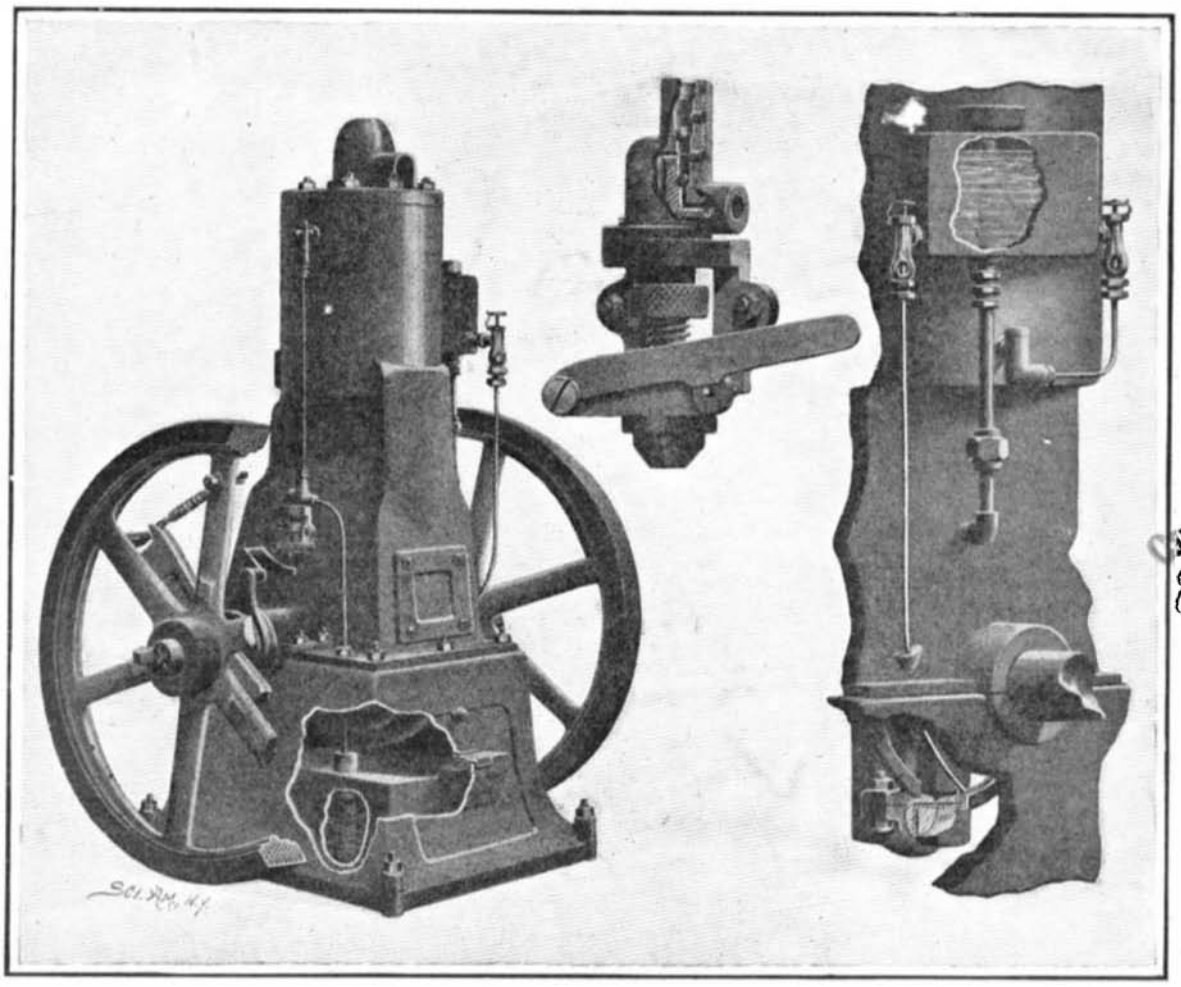
A COMPACT AND ECONOMICAL KEROSENE ENGINE.

There is a growing demand on the part of the users of engines of moderate horse-power for a light motor, that will occupy little space, can be quickly started and stopped, that is simple in its construction and operation, is thoroughly reliable, and above all that will yield its rated horse-power, day in and day out, with a reasonable economy of fuel. The accompanying drawings illustrate the most important features in a kerosene engine in which a successful effort has been made to meet the above requirements. The engine is simple in construction. It consists of a cast-iron base, reaching to the center of the crank-shaft, in which is placed a galvanized-iron kerosene tank holding enough oil for a whole day's run. To avoid the inconvenience of having to withdraw the tank for filling, a projection is cast on the side of the base and provided with a lid, on lifting which, the kerosene may be poured direct into the funnel of the tank. The crank-case and cylinder casting is bolted upon the base, and the whole can be readily taken apart at any time for inspection. Reliability and economy in running are assured by the use of a positive feed of oil, the supply being controlled by a force pump, operated from an eccentric, which is controlled by the flywheel governor. The device is so adjusted that the feed of oil is always proportionate to the load. Under full load and low speed, the eccentric gives a long stroke to the plunger; as the load lightens and the speed rises, the stroke shortens and the feed of oil is proportionately reduced. This is directly in line with the best steam-engine practice, in which the governor acts directly on the cut-off. Careful electrical tests have shown that the supply of oil is directly proportional to the work to be done; and as this regulation of the supply is automatic, a constant economy is assured. Particular care has been given to the design and construction of the pump. It is provided with steel ball valves, seating on phosphor bronze. The action is positive, and the many troubles which come from the use of spring-adjusted valves are quite avoided. The action of this mechanism is so sensitive that the interposition of a sheet of tissue paper between the eccentric lever and the plunger will produce instant increase in the speed of the engine. One of the sectional views shows the ingenious method of forced lubrication. A small pipe leads from the compression chamber to an oil tank attached to the cylinder, the top of the pipe terminating near the roof of the tank and clear of the surface of the oil, which is thus subjected to a pressure equal to that in the crank case. The oil is forced through two sight-feeds, one of which leads to the crank-pin, and the other to the cylinder and wrist-pin. The crank-pin oiler consists of a ring of channel section, which is set concentrically to the crank-shaft and eccentrically to the crank-pin, to which latter it is attached. A hole passes from the side of the oiling-ring into a hole bored through the crank-pin and communicating with oil channels in the wearing surface of the pin. As the engine revolves, centrifugal force retains the oil in the ring and forces it through the oil hole onto the wearing surfaces. The engine is adapted to use the ordinary grades of commercial kerosene; and the electrical tests, to which we have already referred, show that the larger engines of this type run on a consumption of somewhat less than one pint of oil per horse-power per hour, and that the smaller sizes show an economy that is proportionately good. The engine is manufactured by the Universal Kerosene Engine Company, 137 Liberty Street, New York.



Forced feed regulated from the flywheel governor; ball valves; forced lubrication; oil tank in base.

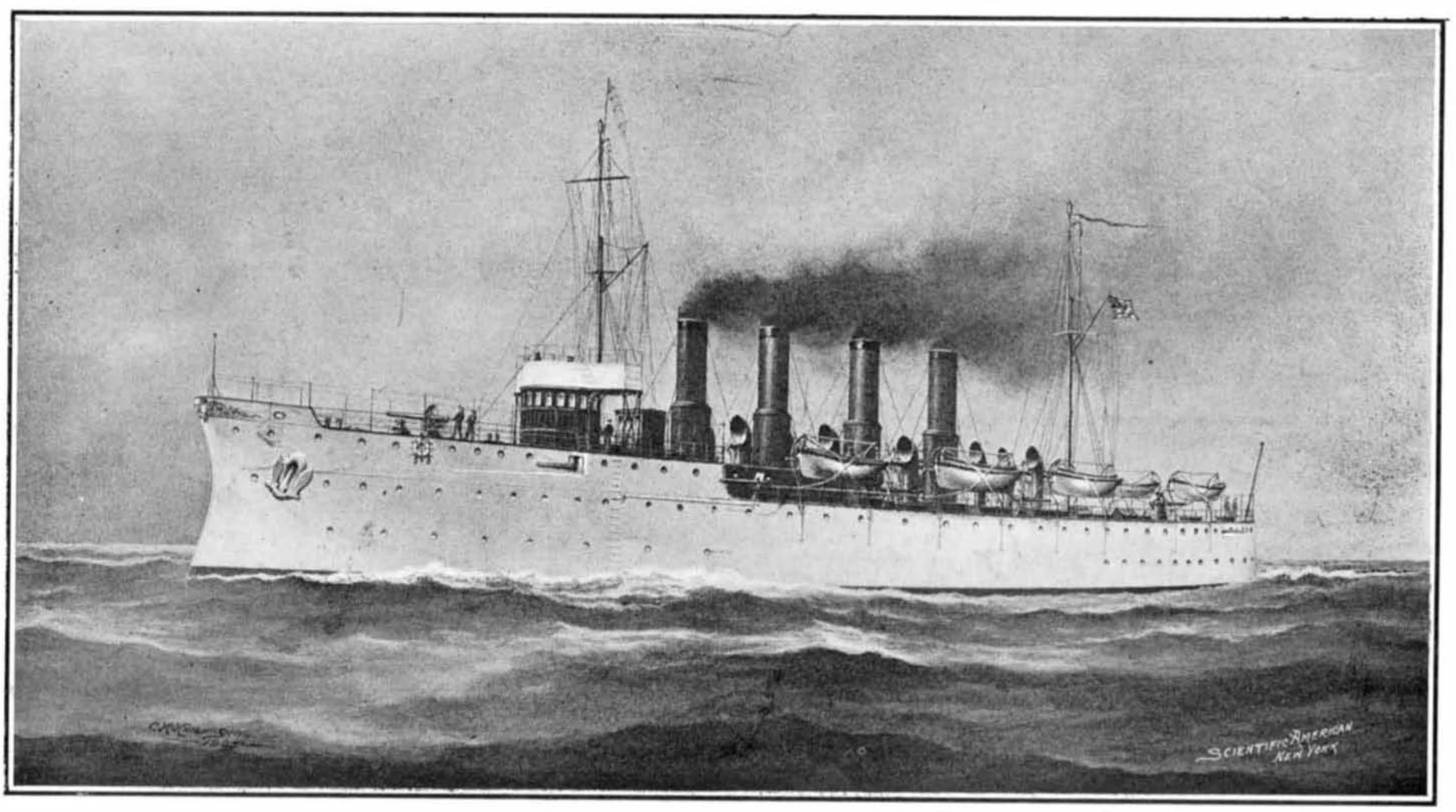
COMPACT KEROSENE ENGINE FOR ISOLATED PLANTS.

SCOUT CRUISERS FOR THE UNITED STATES NAVY.

BY LIEUT. H. C. DINGER, U. S. N.

The chief characteristics of the new 24-knot scout cruisers appropriated for in the Naval Appropriation Act of April 27, 1904, have been defined by the Boards on Construction, and the development of the details of design is now in progress. The chief characteristics are as follows: Length between perpendiculars, 420 feet; breadth, 46 feet 8 inches; draft fully loaded, 18 feet 3½ inches; depth amidships, 36 feet 5 15-16 inches; displacement loaded, 4,310 tons; draft on trial, 16 feet 10 inches; corresponding displacement on trial, 3,750 tons; speed, 24 knots. The battery will consist of twelve 3-inch guns, carried on the main deck. There will be two 21-inch submerged torpedo tubes; 3,600 rounds of 3-inch ammunition and 8 torpedoes to be carried. The estimated weight of battery and full ammunition is 140 tons.

The Board at first recommended a 1½-inch inclined nickel-steel deck for the length of the machinery space, and 2-inch vertical steel protection to extend



Length, 420 feet; **Beam,** 46 feet 8 inches. **Trial Draft,** 16 feet 10 inches. **Depth Amidship,** 36 feet 6 inches. **Displacement on trial,** 3,750 tons. **Battery,** twelve 3-inch guns. **Torpedo Tubes,** two submerged. **Armor,** deck 1½-inch, side 2-inch. **Horse-power,** 16,000. **Speed,** 24 knots. **Coal Supply,** 1,900 tons.

THE NEW 24-KNOT SCOUTS FOR THE UNITED STATES NAVY.