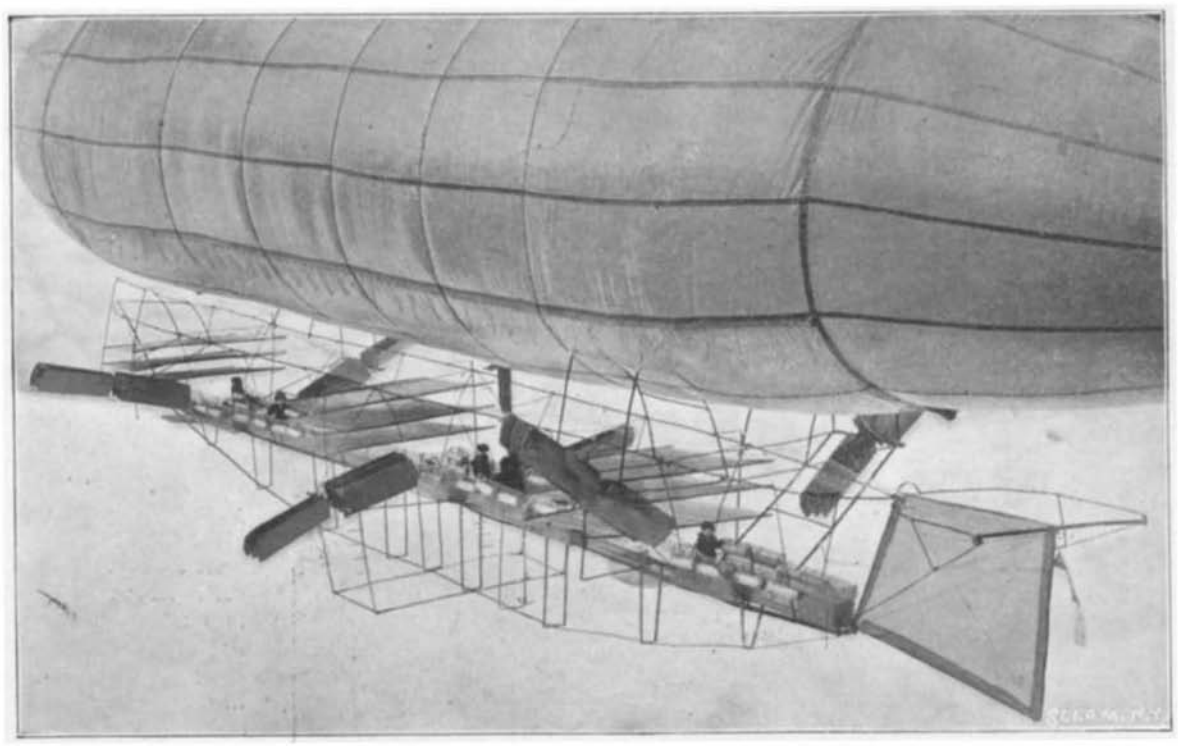
NEW AIRSHIP UNDER CONSTRUCTION FOR THE BRITISH WAR OFFICE.

BY OUR ENGLISH CORRESPONDENT.

The designer of the airship which is herewith illustrated, Dr. Barton, of London, England, after devoting the past two decades to the practical study of aerial navigation, has closed a contract with the British War Department for the construction of an experimental airship, on the lines of the model herewith illustrated, which is built on a scale of one-twelfth. Special interest attaches to it from the fact that it combines the good qualities of both the airship and the aeroplane.

The cigar-shaped balloon measures 180 feet over all, with a maximum diameter of 41 feet. The greatest diameter occurs at a point 72 feet from the bows. It is divided into three compartments. The diaphragms, or dividing walls, are built loosely, and are fitted with a special contrivance to permit the passage of the gas from one compartment to another, at will, the necessary action for this purpose being controlled from the car, as follows: In the central compartment is a balloonette of 12,000 cubic feet capacity, into which air, at a pressure of approximately one atmosphere, is pumped, to compensate for any leakage that may possibly occur in the balloon, and which is let out when the hydrogen expands, so that none of the gas is lost, while the whole structure is kept rigid. The balloon has a capacity of 144,000 cubic feet of hydrogen which, together with the 12,000 cubic feet air capacity of the balloonette, represents an aggregate capacity of 156,000 cubic feet, while its lifting capacity will be roughly 10,000 pounds.



Length, 180 feet; diameter, 41 feet; horse power, 135; speed, 20 miles an hour.

AN AEROPLANE AIRSHIP UNDER CONSTRUCTION FOR THE BRITISH WAR OFFICE.

The balloon is built of varnished Japanese silk, and over this is fitted a "chemise" covering, in the edge of which are sewn fine strips of bamboo, bound together so as to form one long suspending rod, to which are attached the cords that run down to the aeroplane frame. This bamboo is continued up over the nose to almost the largest diameter of the balloon, and through the side pieces as well as over the ends. These pieces are all connected by bamboo bound together in a similar manner and fastened in gussets in the chemise.

The aeroplane frame is 120 feet from end to end. It is built of tubular steel throughout. To this frame are fitted the three sets of horizontal aeroplanes, three to each set, which constitute the salient feature of the Barton airship. One set of aeroplanes is fitted near either end of the frame, and one in the center. The slats are placed one above the other on the interior transverse bars of the frames, but are movable up and down in an arc, the center of which is posterior to the anterior transverse bars. When resting in a horizontal position they are aeroplanes, but when raised or lowered form aerocurves. Each aeroplane measures 12 feet in length by 18 feet in width, thus giving a superficial area of 216 square feet per plane, and a total area of 648 square feet for each set of planes, while the aggregate superficial area of the three triple sets is 1,944 square feet. The aeroplanes are constructed of varnished Japanese silk, stretched out upon frames, and sufficiently supported by transverse bracings.

The inventor, in the combination of the aeroplanes with the balloon, has availed himself of the results of Mr. Hargreave's experiments with kites. The latter discovered that an aeroplane forced against the air at a speed of 20 miles per hour will give a lifting power of 2 pounds to the square foot. Dr. Barton in his airship has reduced Hargreave's lifting power per foot at the same speed to one fourth, so that even allowing ½ pound lifting power per square foot, with 1,944 square feet, which is the total superficial area of three triple sets of aeroplanes in his machine, a lifting power of 972 pounds results, which is equivalent to letting out approximately 14,900 cubic feet of gas or throwing out 972 pounds of ballast.

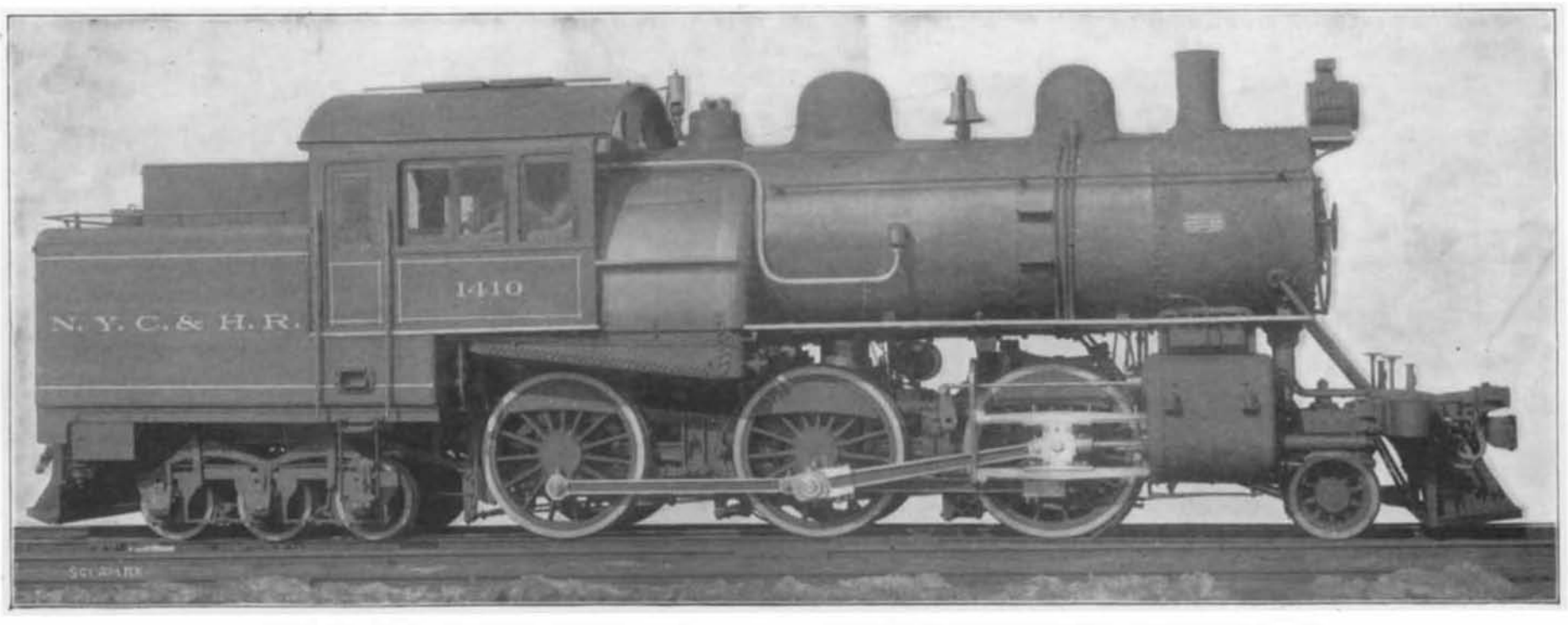
The airship is forced through the air by six sets of propellers, three on each side, placed at the bows, amidships and at the stern respectively. The set amidships, however, is placed in a lower plane than the bow and stern sets. They are of the two-blade triple Mangin type, each propeller measuring 17 feet from tip to tip by 2½ feet maximum width. Each pair of propeller sets is driven by a 45 horse power four-cylinder petrol engine and the thrust obtained will be 900 pounds, estimating a force of 20 pounds per horse power. As there are three sets of engines, one for each pair of propellers, the aggregate horse power is 135, which produces a total thrust of 2,700 pounds. Dr. Barton, however, anticipates obtaining a force of 25 pounds per horse power so that the aggregate thrust will be increased to 3,375 pounds.

The inventor has relinquished the sliding weight or trail rope counterbalance, but has devised an ingenious system of automatic water balance. At each end of the car is a tank capable of stowing 50 gallons of water. These tanks are connected by two pipes, running underneath the car. Amidships each pipe passes through a double pump, pumping in opposite directions, driven by a single cylinder 3½ horse power motor. Close to the aeronaut in charge of the steering apparatus is a pendulum, which is connected to cocks fitted to the above pipes, and controls the direction of the flow of water to and from the tanks. These cocks are opened or closed automatically according to the swing of the pendulum. When the ship is perfectly horizontal, the pendulum hangs at right angles to the deck, and both cocks are open, the water circulating freely and evenly between the two tanks. Immediately the ship dips at either end, the pendulum indicates the degree of deviation from the horizontal, and the water is shut off from flowing from the raised into the depressed tank, while the water pumped from the lat more freely into the form thereby equalizing the weight and causing the ship to resume its equilibrium. Supposing, for instance, the engineer at the forward motor walks to the stern. As he traverses the deck the center of gravity is shifted, and the ship will commence to dip down at the stern. The pendulum comes into action, the water supply from the forward tank is cut off, and the water is pumped from the stern tank more quickly into the forward tank, the operation being continued until a volume of water equivalent to the weight of the engineer has been discharged from the stern into the bow tank, thus compensating the removal of the engineer s weight upon the bows. The car is built on the latticed bridge principle and is 104 feet in length. Three hundred and sixteen gallons of petrol are carried for the supply of the propelling motors. It is stored in cylindrical tanks, each of six gallons capacity, slung upon either side of the car.

The War Office airship is to travel at a speed of 20 miles per hour, and to have accommodation for seven men. It is to be equipped with every appliance necessary for reconnoitering and signaling. For maintaining communication with the earth a wireless telegraphic apparatus is to be installed. It is to remain steaming in the air for 48 hours. A French government firm has already endeavored to purchase the Barton airship, but a contract has been entered into between the British War Office and the inventor for its exclusive use by the British Military Department, and the essential and vital details of the vessel are maintained secret, the negotiations for patenting the invention having been interrupted by the authorities. The government trials are to be carried out in the course of the next two or three months.

POWERFUL LOCOMOTIVE FOR SUBURBAN SERVICE.

For suburban work, where there is frequent stopping and starting, the steam locomotive is at a great disadvantage as compared with the electric motor, because of the much more rapid acceleration which is



Cylinders, 20 by 24 inches; driving wheels, 68 inches diameter; heating surface, 2,437 square feet; steam pressure, 200 pounds to square inch; weight, 108 tons.

POWERFUL LOCOMOTIVE FOR SUBURBAN SERVICE.