

# THE GOODYEAR "PILGRIM" AIRSHIP

## A New American Sporting Dirigible

Mr. H. T. KRAFT, Chief Aeronautic Engineer to the Goodyear Tyre and Rubber Company, of Akron, Ohio, gives some particulars in our American contemporary *Aviation* of an interesting little airship recently produced by his company and tested successfully last July. As the "Pilgrim"—which is the name given to this little ship—possesses many novel features, we think these particulars will be of interest to many of our readers.

The "Pilgrim" was designed for P. W. Litchfield, first vice-president of the Goodyear Company, and, while intended for pleasure cruising, it is also regarded by the manufacturers as a demonstration ship, and it will be employed in certain tests and experimental work. It is one of the smallest dirigibles in the world, being very much the same size as the Italian semi-rigid "Mr." previously described in *FLIGHT*. As regards type, it should, perhaps, be classed midway between the non-rigid and semi-rigid, for, although it possesses a keel, it is very similar to a non-rigid.

It is 105 ft. in length and about 45 ft. high, and has a capacity of just over 50,000 cub. ft., the gas employed being helium.

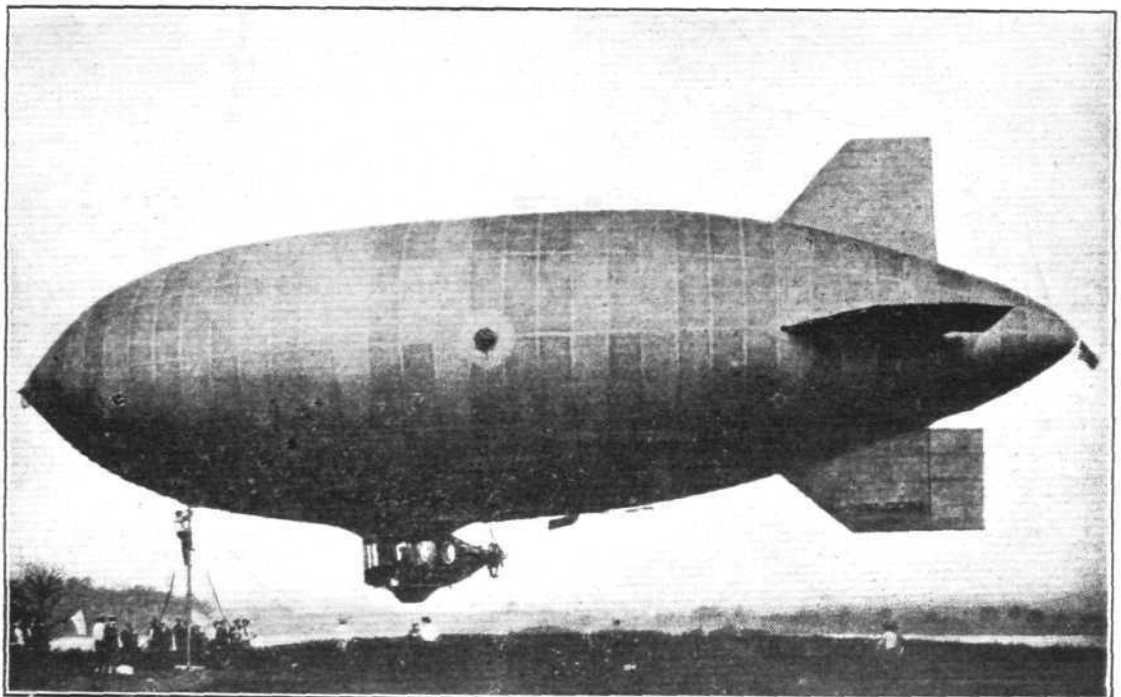
is laced on the inside of the envelope after the ship is inflated. It is readily removable, and full facilities are offered for adjusting any of the suspension cables that radiate to the top of the envelope and then spread out into two longitudinal catenaries. The result is that the hull maintains practically a circular cross section at all times, except for a slight indentation at the point of attachment at the top of the envelope.

The car is suspended to this keel by a series of wires, which are very short and rigid, and the difficulty of adjustment of these cables is entirely eliminated. At the rear of the car is a steel "wishbone" which fastens to the keel at the centre of gravity of the engine. This arrangement acts primarily as a torque arm to relieve the car of the torsional reaction of the engine.

The engine is mounted to a combination rubber fabric base, which is fastened to the car, eliminating any direct mechanical connection between the power plant and the car. The upper end of the "wishbone" is also fitted with similar material to dampen the vibration, and incorporates a ball-and-socket joint to allow free articulation at the point of attachment to the keel. A Reed four-bladed propeller, with

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The Goodyear "Pilgrim" Type AD Airship: An experimental and sporting airship—one of the world's smallest dirigibles—constructed by the Goodyear Co. of America. It is fitted with a 60 h.p. Lawrence engine and is provided with a portable mooring mast.



Powered with a 60 h.p., three-cylinder, air-cooled radial Lawrence engine, this ship has a maximum speed of nearly 60 m.p.h. and a cruising radius of from 10 to 20 hours—the economy in fuel consumption being exceptionally good. Besides the pilot and mechanic, accommodation is provided for two passengers in an enclosed cabin-car suspended directly under the envelope.

A portable mooring mast has been devised for use with the "Pilgrim," which can be set up anywhere that 250 ft. of level ground is available, and attached to the mast the airship will revolve with the wind.

It is claimed that there is a great future for this type of airship, and its mooring masts should be found at country clubs, private estates, etc., while the holding of airship regattas—in the same way that motor boat and yachting clubs now have similar events—can also be held with success. Personally, we think this small "blimp" type of airship possesses great possibilities from the sporting point of view, as is the case with ballooning—although, of course, "blimping" comes out a trifle more expensive.

The general lay-out of the "Pilgrim" deviates considerably from past practice of non-rigid airship design, the principal changes being in the suspension, nose construction, keel construction, and fin design. This ship has some characteristics of the semi-rigid which allow it to be housed in the hangar at zero pressure without serious deformation of the hull, and thereby considerably reduces fabric tension and the occasion for high diffusion.

The keel is a magnesium girder of triangular section, 21 ft. long, tapering at the ends. It weighs but 30 lbs., and

spinner, is fitted, giving a higher efficiency than the wooden type and weighing only 32 lbs. The engine is provided with a crescent-shaped exhaust manifold, terminating in an exhaust muffler, which considerably reduces the noise of the exhaust.

The car is constructed of steel tubing, of 0.75 in. diameter and 0.03 in. wall, with a covering of 0.02 in. magnesium sheeting. The windows are of watch-case crystal celluloid, of heavy gauge. Although very light, the car is strong enough to withstand severe landing shocks—one section having been tested with a static load of 5,000 lbs. before it failed. The interior of the car is upholstered in blue mohair velour with mahogany-finished veneer below the window lines. Seats are provided for one pilot, two passengers, and a cockpit at the rear accommodates the mechanic.

All instruments and controls are conveniently located on a board in front of the pilot, with throttle and spark control to the left. A rudder bar is provided for directional control, and a wheel, at the right of the pilot's seat, for vertical control.

The envelope, which has a capacity of 50,000 cub. ft. of helium, has an aspect ratio of 3.4 to 1. Two valves are provided, one for discharging gas in extreme emergencies, and the other for ballonet control. It is claimed for this ship that during all general flying conditions there should be no cause for valving the helium gas owing to the great controllability of the airship dynamically.

A radical departure from usual practice is to be found in the nose cone construction. The structure consists of a 16-ft. long tube, 3.5 in. diameter and 0.03 in. wall, carrying