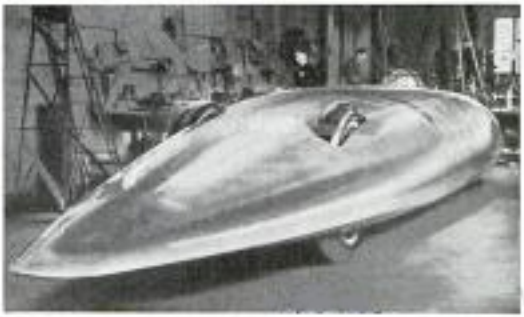
Turreted 'Whale' Tries for Land Speed Title

Beneath the "blister" turret that protrudes above the sleek steel nose of a land-going whale, John Cobb will grip the wheel next August as he roars across the Utah salt flats toward a new land speed record. The low-built racer has remarkably clean lines, broken only by the driver's turret and the four wheels set in slots through the body; it tapers to a beaver-tail rear end. Designed by Reid Railton, the superspeedster is powered by twin engines of 1,250 horsepower each, driving the front and rear axles independently. Thus the three-ton monster is really two racing cars in one. Lacking the conventional radiator in front, the engines are cooled by water and ice in a seventy-five gallon tank. The wheelbase is thirteen and one-half feet; the car is only fifty-one inches high. Its front wheel track measures five and one-half feet, the rear three and one-half feet.



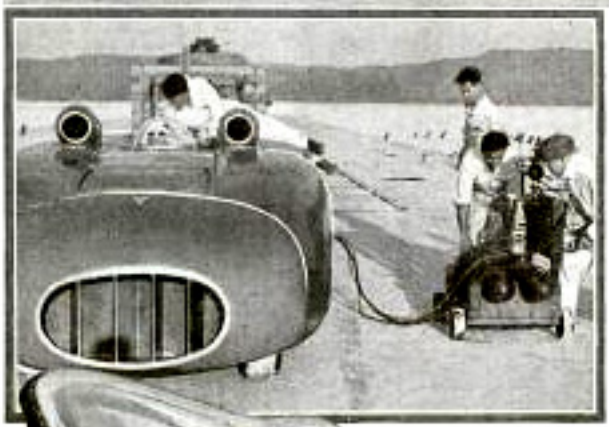
Top, fitting protective turret over driver's cockpit in nose of racer. Below, a rear view showing the clean lines and tapering "beaver tail"

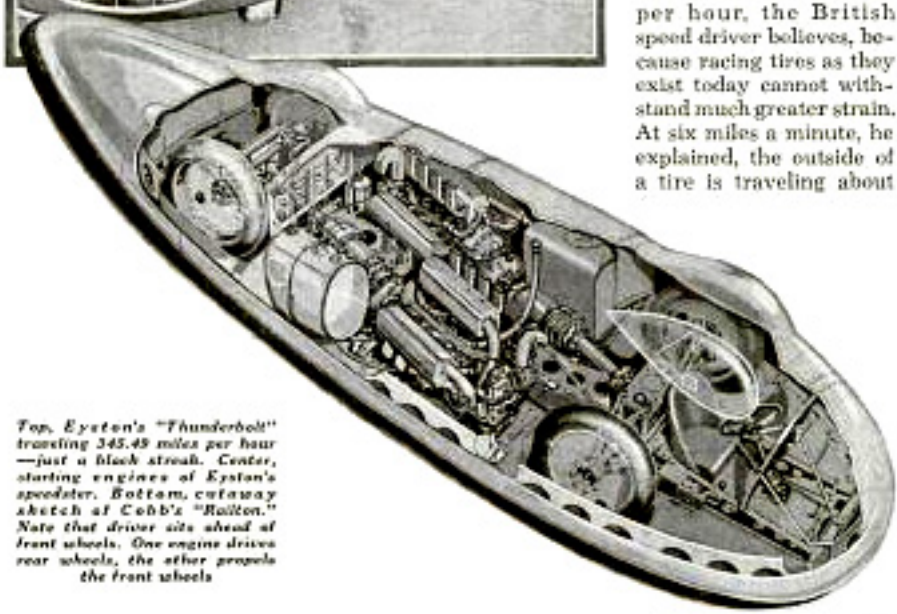
Forty Pound Welding Kit Carried on Back Speeds Work

Carried on the back of the operator, a portable welding outfit speeds up work at Grand Coulee dam. The outfit consists of a midget gas tank and the welding equipment, weighing about forty pounds complete. In comparison, the ordinary gas tanks used in welding weigh about 150 pounds. With the outfit on his back, the welder may go from one job to another, even climbing ladders if necessary.

Send return postage to our Bureau of Information to learn the name of the maker of any device described in this magazine.

HOW FAST *on* WHEELS?

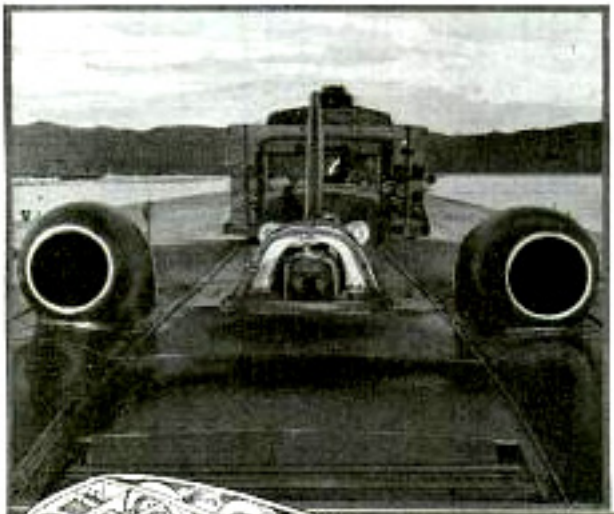


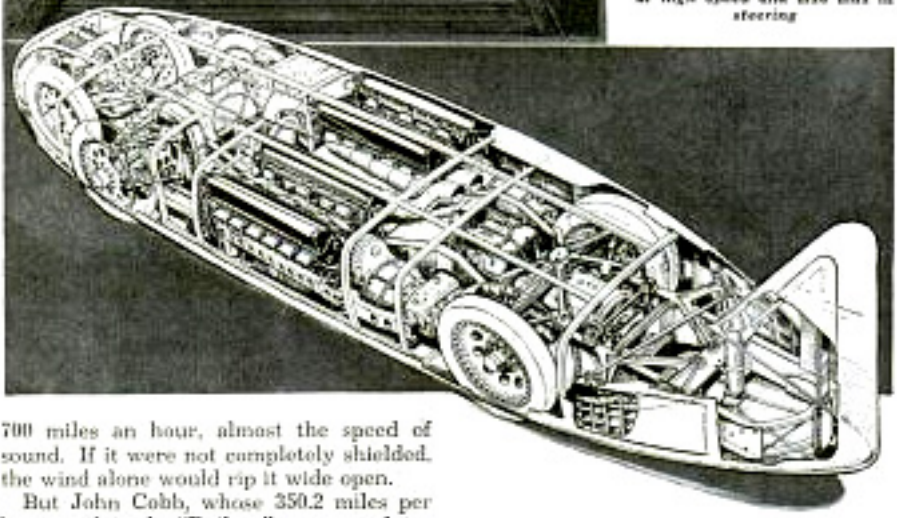


AFTER Capt. George E. T. Eyston had driven his "Thunderbolt" over Utah's Salt Flats at 345.49 miles an hour to set a new speed record a few weeks ago, he expressed the opinion that man probably will never travel much faster than six miles a minute on land.

Speed on wheels is limited to about 360 miles per hour, the British speed driver believes, because racing tires as they exist today cannot withstand much greater strain. At six miles a minute, he explained, the outside of a tire is traveling about

Top, Eyston's "Thunderbolt" traveling 345.49 miles per hour —just a black streak. Center, starting engines of Eyston's speedster. Bottom, cutaway sketch of Cobb's "Railton." Note that driver sits ahead of front wheels. One engine drives rear wheels, the other propels the front wheels





engineering continues to progress and if long enough straightaways can be found to reach top speeds and stop safely.

The British rivals are trying to solve the problem of super-speed from different angles. Eyston's formula was tremendous

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Top, Eyston in cockpit of his mighty speed machine wearing gas mask as protection against fumes. Center, drawing of "Thunderbolt" shows its "crab" front wheels and its dual rear wheels. Driver sits just ahead of the engines, one of which is located on each side. The fin helps to stabilize the machine at high speed and also aids in steering

700 miles an hour, almost the speed of sound. If it were not completely shielded, the wind alone would rip it wide open.

But John Cobb, whose 350.2 miles per hour mark in the "Railton" was upset later by Eyston traveling at 357.5 miles an hour, held that higher speeds than any yet attained were likely. In fact, he could see no limit, although he agreed with Eyston that better tires are necessary. Given such tires, he said, man can go faster if mechanical

Bottom, side view of Eyston's huge speedster just before starting world's record run over the Salt Flats course

How Fast on Wheels?

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weight to hold him on his course plus a giant power plant to overcome the handicap of extra weight in attaining high speed. Cobb, on the other hand, depended on a smaller and lighter car and only about two-thirds as much power. The smaller size, Cobb reasoned, would decrease the terrific wind resistance encountered at very high speeds.

Eyston's "Thunderbolt"—the most powerful car in the world—has two twelve-cylinder Rolls-Royce engines developing a total of 3,600 horsepower as compared to the 2,500 horsepower developed by Cobb's two twelve-cylinder Napier Lion aviation engines. The total piston displacement of Eyston's car is 4,462 cubic inches while that of Cobb's is 2,920 cubic inches.

Mounted side by side, the "Thunderbolt's" engines deliver power to dual drive wheels at the rear through a normal pinion type transmission having three forward speeds but no reverse. The engines in Cobb's "Railton" are mounted on a diagonal, one motor driving the front wheels and the other the rear wheels.

Braking the seven-ton "Thunderbolt" called for the most ingenuity in its design. In last year's runs, Capt. Eyston found it more difficult to stop his speed machine in the six miles left of the course after completing the measured mile than to hold the great racer on a straight course at top speed. To stop with a minimum of side sway, he now uses a combination of mechanical and air brakes.

The air brakes are flaps sunk into the top of the hull. On pressure from hydraulic jacks actuated by a button in the driver's cockpit, these flaps elevate at right angles to the body, providing sudden uniform air resistance. The flaps are applied to slow down the car before the mechanical brakes are used.

Both cars are super-streamlined, the "Thunderbolt" resembling a huge, slightly flattened cigar while the "Railton" is turtle-backed. Only the driver's cockpit and two supercharger intakes project from the "Thunderbolt's" hull. The cockpit itself, placed almost above the front axle and near the comparatively small radiator matrix in the nose, is covered completely

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with a sliding glass top. Specially built conduits assure proper ventilation and elimination of gases but, as an added precaution, the driver wears an oxygen helmet.

The "Thunderbolt" has a fin at the tail to give it stability at high speed. Cobb did not consider this precaution necessary on his smaller and lighter "Railton." Eyston uses the fin and the four front wheels for steering. The front wheels are in tandem, "crab" fashion, the second pair with a wider axle than those in front. Each of the eight wheels on the "Thunderbolt" is forty-four inches in diameter.

The "Thunderbolt" is thirty-four feet long, seven feet wide and forty-six inches high at the top of the hull above which the fin projects about three feet. The car is low, its radiator being only seven and one-half inches above the ground. It carries thirty gallons of gasoline and twenty-eight gallons of oil, consuming about six gallons of gasoline per minute when operating. A truck provides the starting power because, if the machine started on its own, its great weight might burn the tires before an actual run started. The tires are smooth rubber, have no tread on the road surface and the fabric sidewalls are covered with only a thin film of rubber.

The Bonneville Salt Flats track, on which the world's highest land speeds have been reached, provides miles of gleaming white salt, hard as concrete when dry. The measured mile forms the center of a thirteen-mile straightaway, marked its entire length by a black oil stripe eleven inches wide. The course allows six miles to reach peak acceleration and six miles to stop after passing through the measured mile.

While the course seems long, experts say the distance is insufficient both for acceleration and deceleration. A longer pick-up stretch, they assert, might enable drivers to attain even higher speeds before reaching the measured mile while a longer stopping distance would mean greater safety.

To establish a record, a run is made in each direction and both must be made within an hour. Three sets of electric eyes, one at each end of the measured mile and one at the judges' stand in the center, give the time to one-thousandth of a second.

Auto speed marks have been pushed

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steadily upward during recent years because, among other things, designers have been able to draw upon the aviation industry for engines of super-horsepower, thus bringing down the cost of construction. Eyston's car, for instance, cost about $50,000 and both cars are powered by airplane engines.

While land speed marks are still about 100 miles an hour under air speed marks, land speeds during the past few years have been pushed up faster than airplane speeds. As far as spectators are concerned, however, a car traveling about six miles a minute appears to be going faster than an airplane doing seven miles a minute because it is nearer the scene of action.

Those who have seen the speed machines in action on the Salt Flats assert the cars travel so fast they have passed before you hear the noise of the exhaust. And when something whizzes by so rapidly that it is gone before you hear it, it's traveling, whether it's on the ground or in the air.

LIGHTWEIGHT BRICK PERFORATED WITH INSULATING AIR CELLS

Cellular brick that weighs one-third less than the standard building brick of the same size, yet contains the same amount of clay, is being produced by a new machine.

Air and moisture are squeezed out of the clay and it is pressed into a highly concentrated structure honeycombed with air cells which have an insulating value. The walls are strong and impervious to moisture, and in a laboratory test one of these bricks withstood a load of 220,000 pounds. In every ten square feet of wall there are 48,700 small air cells, set back against each other by mortar which prevents circulation of air or moisture. Lighter weight means a saving in freight handling and laying.

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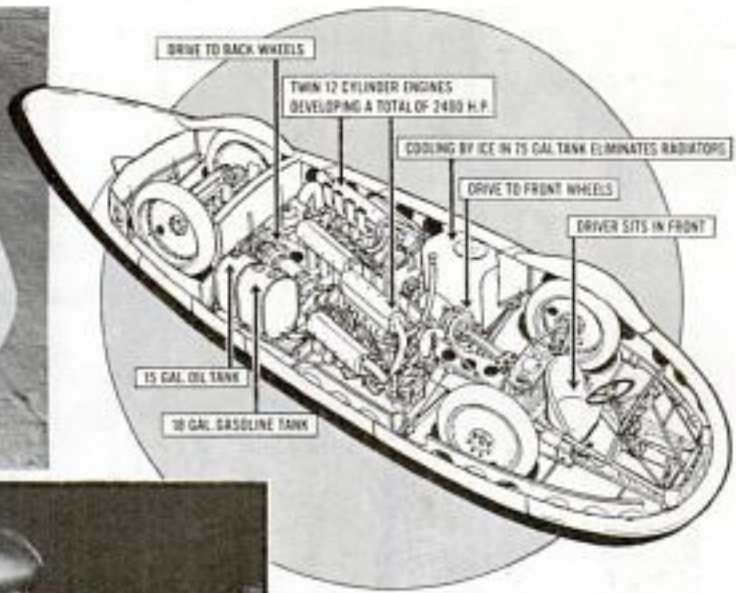
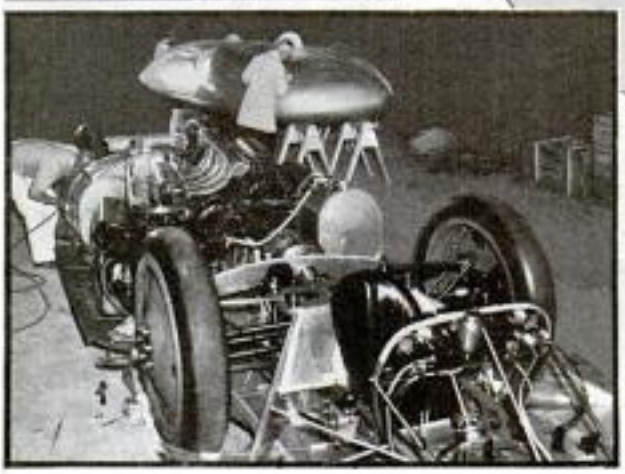
Beetle-Back Car Is Fastest Thing on Wheels





Above, left, streamline racer in which Cobb broke speed record is pictured from rear on Salt Bed course, and diagram, right, shows location of engines and other inner works of racer. Below, mechanics make final adjustments; body is in background

In colonial days men riding in ox-drawn wagons traveled at speeds of three or four miles per hour. Today, at least one man has traveled on land faster than six miles per minute. He is John R. Cobb, of London, who brought his racer, the "Railton Red Lion," to the Bonneville Salt Beds in Utah to establish new world's records. The course is ten miles long, with a run of about a mile and a half before entering the ten-mile stretch. Starting northward Cobb drove through the measured mile where time traps were set at 370.75 miles an hour —the fastest ever traveled by man—and then came back at 366.97 miles an hour. Officially, his average speed for the mile is computed at 368.85. In this same run a new record for the kilometer (five-eighths of a mile) was fixed at 369.74. Previous marks were held by Capt. George E. T. Eyston who pushed his "Thunderbolt" to 357.5 miles per hour. Three other international speed records on the straightaway were smashed in later attempts by Cobb, for five kilometers, ten kilometers and for ten miles. Cobb's automobile is unique in its lack of a tail, which was considered unnecessary for a straight track. The $100,000 speeder has two twelve-cylinder Napier Lion engines set off center between the front and rear wheels, the rear engine driving the front wheels, and the front engine driving the rear wheels, totaling more than 2,400 horsepower to move the three and one-half ton creation. The sleek body is regarded as the last word in streamlining. It has no radiator, ice in a seventy-five gallon tank being used to cool the engines.

¶ Because many bridges as now built need all but one-sixth of their strength to support their own weight, Prof. J. B. Wilbur of Massachusetts Institute of Technology predicts future bridges will be built of aluminum.