

A NEW AUTOMOBILE BOAT.

BY JACQUES BOYER.

A French inventor, J. Ravallier, has devised a self-propelling vehicle which can navigate the water like an ordinary motor boat and also travel overland like an automobile. The official tests of the boat, recently made in the presence of M. Barthou, the Minister of Public Works, and other distinguished persons, were crowned with complete success. To tourists who make use of this amphibious vehicle canals, rivers, and lakes will present no serious difficulties, as they can be crossed with ease and comfort wherever moderately gentle and smooth slopes, natural or artificial, can be found for entering and leaving the water.

The hull of the boat, which is made of steel plates riveted to steel ribs of T-shaped section, is mounted by means of springs on axles and wheels of pressed steel. The axles pass through water-tight tubes which traverse the hull. This part of the construction, which is very cleverly designed, is the invention of M. Gustave Pitre, the naval architect of the Maisons Laffitte.

The motor (constructed by Gontallier, of Vincennes) is placed near the bow. It drives, by means of a clutch of the disk type, two distinct systems of mechanism: 1. A variable speed shaft transmits the power to the rear or driving wheels by means of chains and pinions, the arbors of which pass through stuffing boxes. Three forward speeds and one backward speed

fastened to a stake driven into the ground, and the boat is hauled up by the capstan.

The equipment of the boat is completed by a pump for bailing, an anchor, a buoy, and a pair of oars and movable rowlocks for use in case of accident to the motor while afloat.

The Ravallier automobile boat seems destined to render valuable services to tourists. The best proof of the practical value of this invention is the fact that

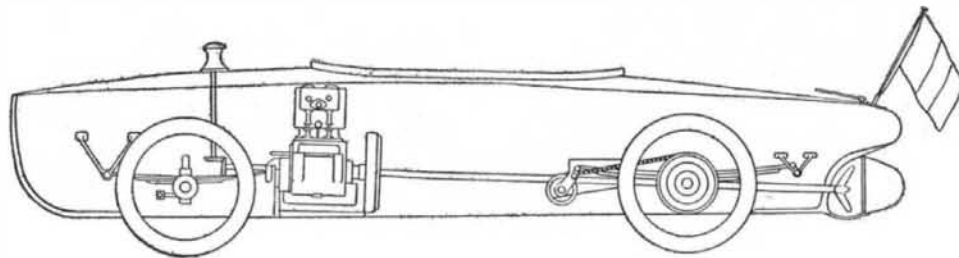


DIAGRAM SHOWING MECHANISM OF THE AUTOMOBILE BOAT.

it has been purchased, together with all its patents, by an American.

Temperature of the Planet Mars.

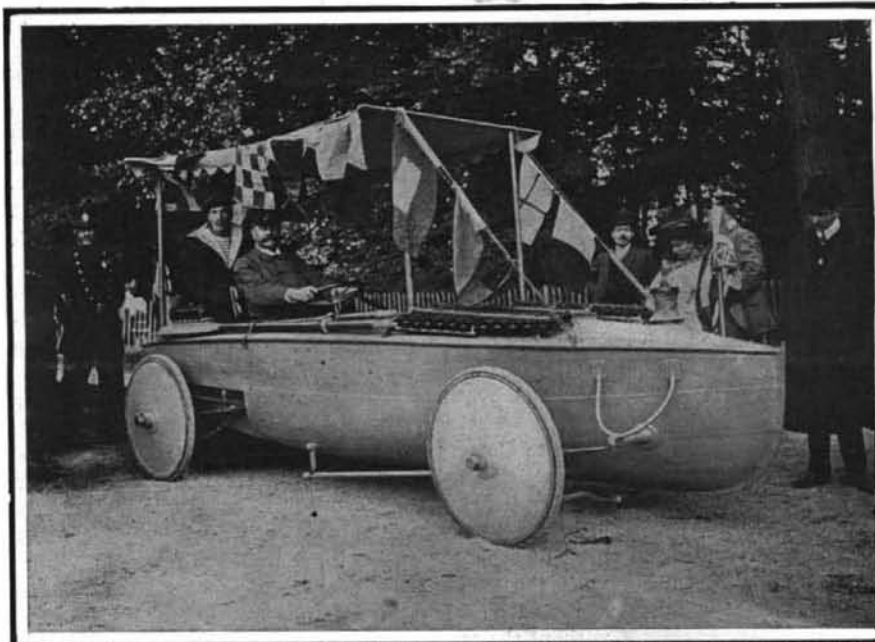
In a recent communication to the American Academy of Arts and Sciences, Prof. Percival Lowell discusses the probable temperature conditions of the Martian surface, in the course of which he introduces several novel considerations which have not received attention by previous workers on the same problem. Up to the present time the chief obstacle to the ac-

protective value of whatever atmosphere exists. After a discussion of the investigations on solar radiation at various altitudes, by Langley, Very, and others, and taking the earth as being 50 per cent cloud-covered, the earth's mean albedo is taken as 0.75, and that of Mars is computed to be 0.27. Applying now Stefan's law, and including the effect of albedo, the mean annual temperature of Mars is found to be 72 deg. F. or 22 deg. C. This would correspond to the conditions if the heat were retained on Mars to the same extent as it is on the earth. The retentivity is not the same, however, being greater on the earth on account of its denser air covering, and the inclusion of this factor brings down the value of the Martian mean annual temperature to 47.7 deg. F. (8.7 deg. C.). An interesting side issue on this matter leads Prof. Lowell to state that the special brilliance of Venus as compared with the other planets is to be ascribed to the

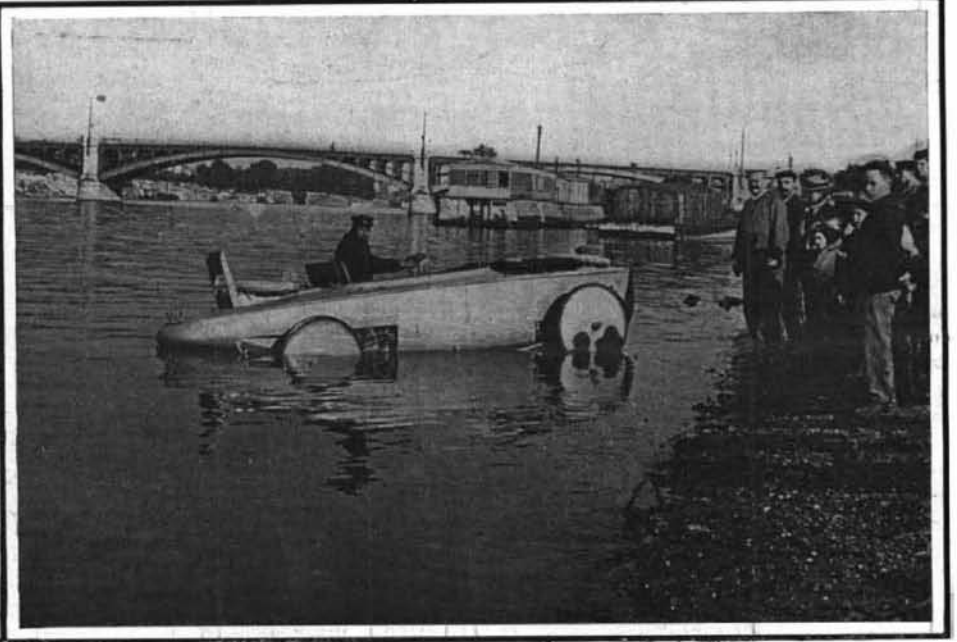
presence of a dense air envelope, from which sunlight is directly reflected. This conclusion is also in agreement with the prolongation of the terminator of the planet as it passes inferior conjunction before the sun.

Reverting to Mars, it is found that five-eighths of the surface is desert, and the mean surface albedo comes to be 0.10, and as the total albedo is 0.27, the albedo of the air envelope will be 0.17.

The air density at the surface is given as 2.5 inches, which would give 111 deg. F. (44 deg. C.) for the



THE AUTOMOBILE BOAT TRAVELING ON LAND.



THE AUTOMOBILE BOAT LEAVING THE WATER.

are provided. Coupling, retarding, and speed-changing levers, a differential brake worked by a pedal, and a brake lever acting on the rear wheels complete the mechanism of propulsion on land. Steering is effected, as in an ordinary automobile, by a wheel connected with the front axle, the shaft of the wheel passing through a stuffing box. 2. The variable speed driving shaft, prolonged backward beyond the rear axle, may be connected, by means of a clutch, with a screw propeller at the stern of the boat, the connection being made by moving a lever placed at the left hand of the driver of the vehicle. The rudder and the front axle are turned by the same steering wheel.

The capstan, which is seen at the bow of the boat, is turned by a tangent screw which is driven by the motor, by means of a wheel and belt, and connected and disconnected by a loose wheel, or idler.

The driving wheels, the propeller, and the capstan can be operated separately or simultaneously.

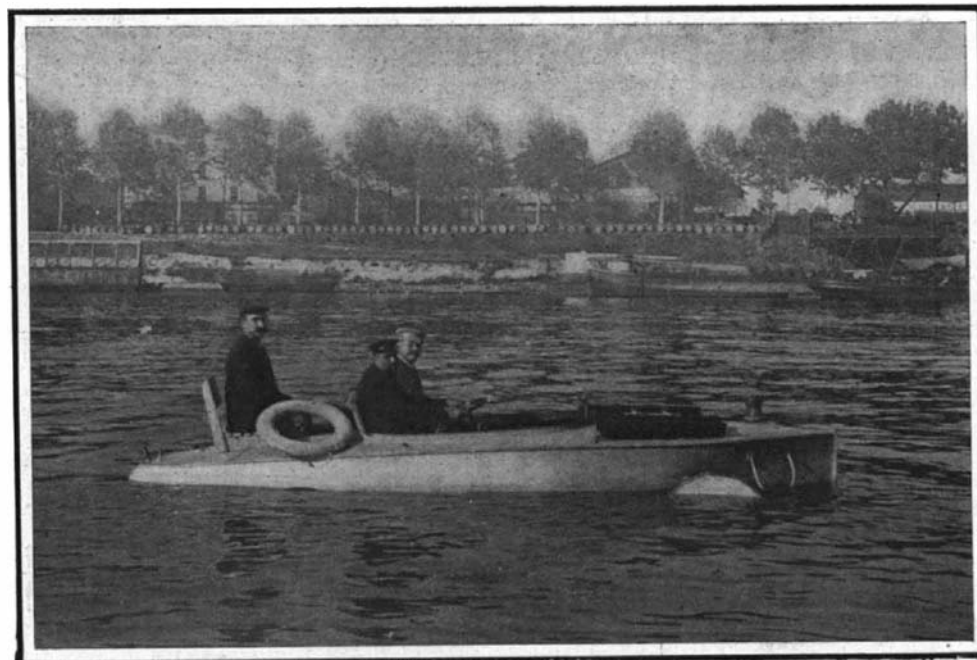
The speed of the vehicle, as determined by numerous trials, is 35 kilometers (21¾ miles) per hour on land, and 9 kilometers (5.6 miles) per hour in the water.

The boat enters and leaves the water without any preparation or change, except in mechanical connections. When afloat its stability is perfect, as is shown by one of the illustrations. It leaves the water and climbs the bank under the impulsion of its driving wheels if the ground is reasonably firm and the grade less than 15 per cent. If the bank is steeper or softer, a rope is

ceptance of the belief in the existence of life on the planet has been the extremely low surface temperature assumed to exist. It has been customary to only consider the planet's distance from the sun as the factor; in this way Moulton, by the application of Stefan's law of radiation, found the value -0.33 deg. F. for the mean temperature. Prof. Lowell insists that the planet's distance is only one of several determining factors, and proceeds to discuss minutely the effect of the planet's albedo or reflecting power, the screening action of any clouds which may be present, and the

boiling point of water. As sublimation will take place more freely on Mars at a given temperature there will be proportionately more water vapor in the air there.

A wealthy Frenchman recently bought a ticket at a Paris railway terminus, but missed the train he intended to take. While waiting for the next one, which left two hours later, he studied the company's tariff to pass away the time. He then found that he had been charged 14 francs 45 centimes, whereas the proper fare was only 14 francs 42 centimes. He asked for his money back at the office, but without result. An interview with the stationmaster was also unsuccessful. He afterward wrote a number of letters to the company, but received no answer. He then commenced an action to recover the three centimes. He won the action in the lower court, but the company took it to the appeal court, afterward the Cour de Cassation. Both courts dismissed the appeal and the company was ordered to pay the plaintiff the three centimes. The cost to the company amounted to 8,250 francs, or \$1,650.—Railway and Engineering Review.



THE AUTOMOBILE BOAT NAVIGATING THE SEINE.

The United Steel Company, Canton, Ohio, recently made a heat of about 30 tons of vanadium steel, which is claimed to be the largest heat of this class of steel thus far made.