

### THE WINNING CARS IN THE AUTOMOBILE CLUB OF AMERICA'S TWO-GALLON FUEL EFFICIENCY CONTEST.

We reproduce herewith photographs of the cars which won the first, second, and third prizes, as well as two single-cylinder automobiles that made the best showing in their class, in the fuel efficiency contest conducted by the Automobile Club of America, on May 5. As has been previously noted in these columns, the prize was won by a four-cylinder light runabout of the air-cooled type, and the second and third places were taken by large four-cylinder cars of the air-cooled and water-cooled types, respectively. The contest gave a practical demonstration of the well-known theory that an air-cooled car is more economical than a water-cooled car. This theory can now be taken as an established fact, since it was proven to be correct not only with a light automobile of low horse-power, but also with a large, high-powered touring car as well. The covering of 87 miles upon two gallons of gasoline by the Franklin runabout caused a great deal of comment by those well informed in automobile matters. As noted in our last issue, this distance was covered under adverse conditions, and we prophesied that under favorable conditions at least 90 miles could have been made. In order to put a stop to all criticism the Automobile Club had the Franklin and Frayer-Miller cars repeat the test on the 8th instant. A thorough inspection was made before the start, and the officials were satisfied that no extra supply of gasoline, other than the two gallons put in the tank, was available. As a result of this test, the Franklin runabout covered 95 miles upon two gallons of gasoline and the Frayer-Miller touring car 59.8 miles. The record of the runabout for economy of fuel stands, we believe, unbroken among records of this character the world over to-day.

The car which obtained third place was a 24-horse-power Darracq touring car carrying five passengers. Machines of this make have made records before for speed, endurance, and economy, and it was not a surprise to see one of these cars, when owned and driven by an amateur having the qualifications that has Mr. S. B. Stevens, win such a prominent position. Another large French touring car of 24 horse-power, the Berliet, obtained fourth place. A 16-22-horse-power four-cylinder touring car of this make holds the record of being driven 100 kilometers (62.1 miles) in 1 hour, 21 minutes, and 11 3-5 seconds with a fuel consumption of but 2.37 gallons. The American Locomotive Company is building this machine in America.

The machine which obtained fifth place was a 20-passenger Mack bus of 50 horse-power. This huge car weighed 9,325 pounds complete, and covered 17.13 miles upon its two gallons of fuel, making a total cost of operation of one-half cent per ton-mile. Sixth place would have been obtained by the single-cylinder Cadillac touring car shown herewith on the scales, had it not been that this car was handicapped by the deduction of 30 per cent of its weight from the total weight, which was 2,250 pounds. Carrying four passengers, the machine covered 55.5 miles, making 124,875 pound-miles in all at a cost of 0.646 cent per ton-mile. The sixth place went to a Franklin 12-horse-power light touring car, which weighed 2,140 pounds and covered 58.4 miles at an average cost of 0.64 cent per ton-mile for gasoline. The next six places were taken by the Queen 26-28 horse-power, 4-passenger, touring car (weight 3,160; distance 41.4); the Stoddard-Dayton 30-horse-power, 5-passenger touring car (weight 3,200 pounds; distance 40.83); the Lozier 40-horse-power, 6-passenger touring car (weight 4,490; distance 30.28 miles); the Renault 14-horse-power, 3-passenger brougham (weight 3,400 pounds; distance 31.61 miles); the Darracq 20-32 horse-power, 4-passenger touring car (weight 3,600; distance 34.62); and the Compound 16-horse-power, 5-passenger touring car (weight 2,635 pounds; distance 43.5 miles). A complete list of all the cars which finished, giving their position, weight, score, distance traveled, and the number of pound-miles covered, will be found in the current issue of the SUPPLEMENT, together with a full description of the mechanical features, such as engines and carbureters, of the winning cars.

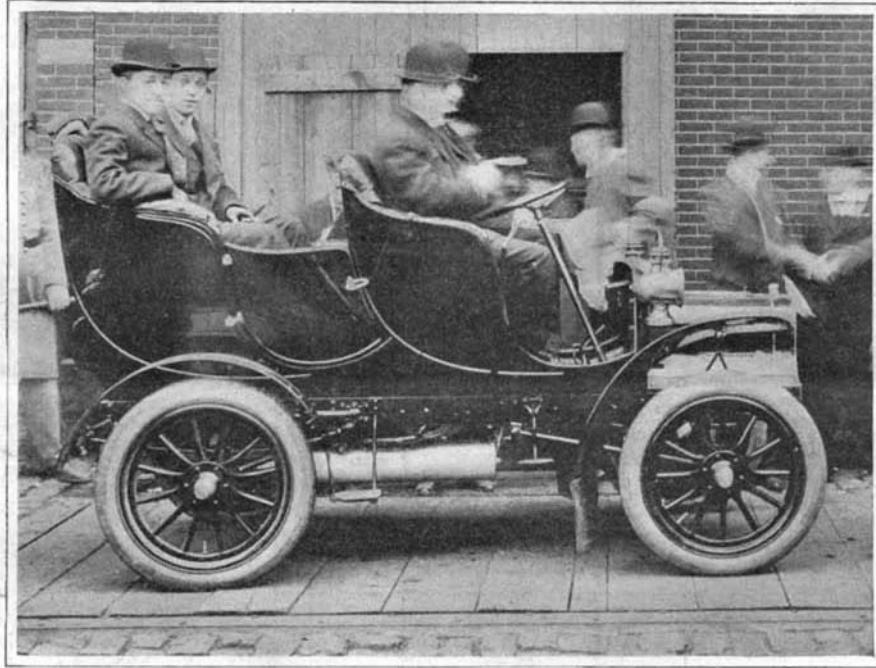
The record for mileage by an automobile proper was made by the single-cylinder, 4-horse-power, Orient buckboard which we illustrate. These machines ranked nineteenth and twenty-seventh. They weighed 930 and 920 pounds, and covered 98.8 and 93.8 miles with a cost of running of about 0.876 cent per ton-mile. A Covert, single-cylinder runabout of 1,220 pounds weight made the highest mileage after the winner by covering 73.25 miles. The record for mileage for any ma-

chine was made by an Indian tri-car of 1 1/2 horse-power. This machine weighed 500 pounds with two passengers, and covered 99.8 miles on one gallon of gasoline. This is equivalent to 199.6 miles on two gallons. In other words, one of these machines can be depended upon to carry two people from New York to Boston, at a total cost of about fifty cents, and an average speed of about twenty miles an hour. This is certainly cheap transportation.

As this test was the first which the Automobile Club has held, and as the rules were somewhat tentative, the light-weight cars of one or two cylinders did not have the chance of winning the prizes that they should have had. With the actual results before them, the officials can, no doubt, devise a method of handicapping which will put all cars more nearly upon the same basis. This will make the next contest much more exciting, and much fairer as well.

### A New Method of Stage Lighting.

A Spanish painter, Mr. Marinno Fortuny, proposes an original plan for the lighting of theater stages. At present, the stage receives direct light projected usually by incandescent lamps, or sometimes by arc lamps located in the side-scenes, or in the body of the house. The result is that shadows are projected which, if they do not kill the illusion of the perspective, at least have an effect disagreeable to the eye. For this direct light Mr. Fortuny substitutes diffuse light. The ceiling of the stage is composed of a vault of white cloth, upon which is reflected the light of the voltaic arc from a band upon which is simulated the color of the sky. This band being movable, it is sufficient to paint upon it different scales of color and to cause it to glide



Single-Cylinder Cadillac Touring Car Which Would Have Won Sixth Place Had It Not Been Handicapped.

Weight, 2,250 pounds. Distance, 55.5 miles. Total pound-miles covered, 124,875. Cost of fuel per ton-mile, 0.646 cent.

under the pencil of luminous rays, to produce a succession of tints as varied and as graduated as we desire. By using at once two or three bands placed at points more or less distant, we could realize upon the celestial vault effects of color unknown to this day. Finally, we might oppose to the rays of certain lamps mirrors upon which we should have painted clouds, which would be themselves projected upon the sky, and the movement of which could be obtained by a simple movement of the mirror. The light thus reflected would envelop the whole stage, the scenery and the characters would be in natural conditions of lighting, and the stage illusion would thereby gain greatly. In theory, the method seems perfectly reasonable. Experience alone will determine us as to its practical value.

### The Current Supplement.

How submarine boats observe the movements of an enemy forms the subject of the opening article of the current SUPPLEMENT, No. 1585. The illustrations which accompany the article splendidly elucidate the text. In view of the importance of the subject of locomotive superheaters, Mr. W. F. N. Goss's discussion of the subject will be read with interest. James P. Maginnis's paper on "Reservoir, Fountain and Stylographic Pens" is continued. Among the miscellaneous articles of interest may be mentioned those on the "Manufacture of Gun Cotton," "The Champagne Industry," and Prof. W. H. Bristol's paper on "A Low-Resistance Thermo-Electric Pyrometer Compensator." Prof. H. H. Turner gives a very clear account of the times and places of earthquakes. The automobilist will read with interest a description of the cars which recently took part in the fuel-economy test held on May 5.

### Respiratory Power and Its Limits.

Nowadays, when questions of steerable balloons, airships, and aeroplanes are the *piece de resistance* of many scientific and other journals, the side issue suggests itself with renewed vigor in the form of a vital problem, to wit, to what height can an aeronaut ascend without losing his life? Some twenty years ago experts stated that it was impossible to exceed an altitude of from 26,244 to 29,523 feet. Accidents were likely to occur at 19,683 feet and, after this altitude, the aeronaut becomes insensible. Mr. Paul Bert, however, demonstrated that it was possible to avoid the risk of suffocation at great altitudes by repeated inhalations of oxygen, and it was due to the use of oxygen that some three years ago Messrs. Besson and Suring succeeded at Strasburg in reaching the highest altitude ever attained, viz., 34,770 feet; even then, despite a liberal use of oxygen, one of the intrepid aeronauts fainted.

A few years ago Prof. Musso, of Turin, made some researches in connection with the question of asphyxiation at great altitudes and he came to the conclusion that to enable the influence of highly rarefied air to be successfully combated, it was necessary to inhale oxygen mixed with a strong proportion of carbonic acid.

Mr. Agazzotti, one of Prof. Mosso's pupils, has now just taken up again the experiments commenced by his old master. Instead of making an ascent in a balloon he had himself inclosed in a large bell in which the air, by means of a pump, was gradually rendered more and more rarefied. The bell was provided with a tap, communicating with the outer air, by means of which and a small pump the foul air was expelled. The experimenter then covered his face with a specially constructed mask provided with two valves; one of these enabled the air expired to escape while the other permitted the inspiration of a mixture of 67 per cent oxygen, 13 per cent carbonic acid, and 20 per cent nitrogen.

When thus equipped Mr. Agazzotti entered the bell and, in half an hour's time, the air was rarefied up to a pressure of 440 millimeters, almost equal to the atmospheric pressure prevailing on Mont Blanc. Mr. Agazzotti seemed to be suffering no inconvenience at this time but, a few minutes afterward (when the rarefaction of the air had reached 360 millimeters), symptoms of asphyxiation were observed. The mixture of oxygen and carbonic acid was now brought into play, and an immediate improvement was noted in the condition of the subject in the glass bell. The pressure was now brought down to 140 millimeters and, more marvelous still, even to 122 millimeters of mercury. On leaving the bell Mr. Agazzotti said to the attendants: "I could have stood a still greater rarefaction, as my memory was quite clear, and my power of movement normal."

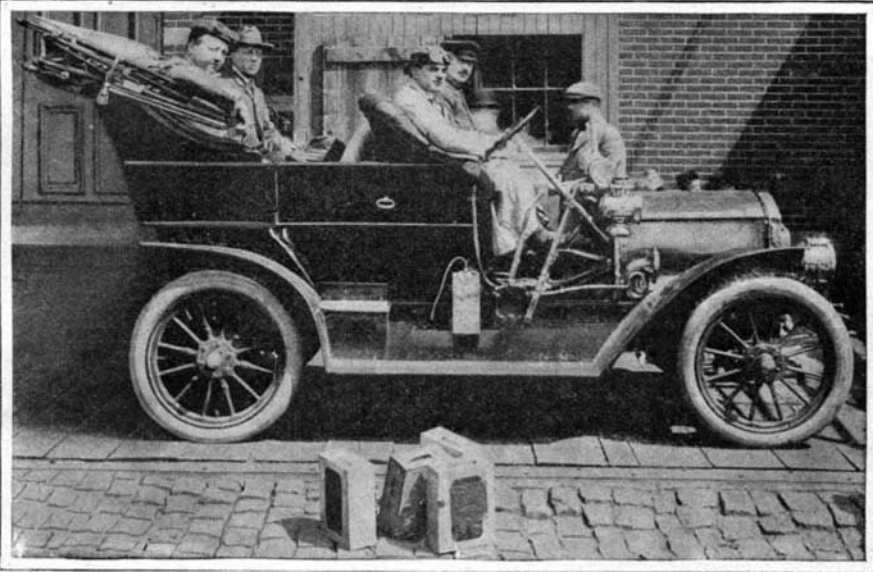
As a matter of fact, upon the occasion of a third experiment made quite recently, the rarefaction of the air produced in the bell corresponded to that prevailing at an altitude of 14 1/2 km. (9 miles), thus exceeding by 4 km. (2 1/2 miles) the greatest altitude ever reached by man—even in a practically semi-conscious condition. The experiments made by Mr. Agazzotti, therefore, show that with the use of the mixture prescribed it will be possible for the aeronaut of the near future to render great services to science at large.

### Artificial Solar Eclipses.

The following description of an apparatus for artificial eclipses of the sun is given by C. André in Comptes Rendus:

A small occulting disk is fitted in a slide near the eyepiece collar of an astronomical telescope, driven by clockwork, so that observations may be made of the solar disk when occulted to various degrees by the artificial screen. The practice thus obtained facilitates the taking of measures of the varying geometrical figures presented during a real solar eclipse. Imitations of partial or total eclipses are regulated by adjustment of the occulting disk.

The new regulations concerning the introduction of cars into Holland, for a temporary visit, are now in force. According to the Automobile Club Journal, no customs deposit will, in the future, have to be made if the visit does not exceed eight days, and the customs officials are empowered to issue temporary permits to visitors, available for the period mentioned. Cars bearing foreign numbers do not have to carry special Dutch numbers. It will be remembered that the speed limit, which was at times rather needlessly enforced in Holland, has, by the new law, been abolished, the only offense now being "driving to the public danger."



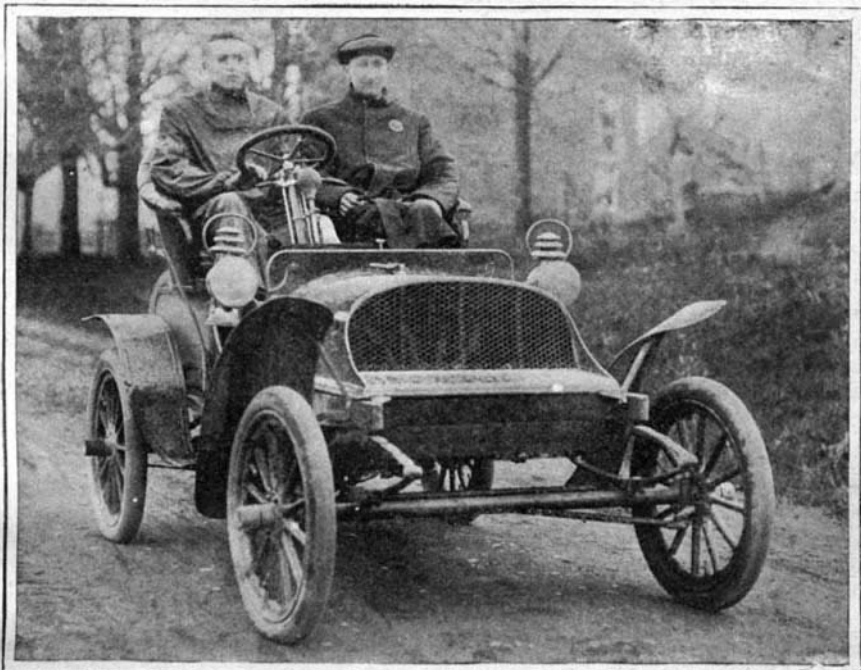
**Weighing-in the 24-Horse-Power Air-Cooled Frayer-Miller Touring Car, Which Obtained Second Place.**

This car covered 47.9 miles in the test and 59.8 miles subsequently. It weighed 3,270 pounds, and covered 156,633 pound-miles at a cost for fuel of 0.517 cent per ton-mile.



**Refilling the Fuel Tank of the 24-Horse-Power Darracq With Gasoline at the End of the Run.**

This car, of the regular four-cylinder water-cooled type, carried five passengers and covered 46.44 miles (equal to 144,428 pound-miles), at a cost for fuel of but 0.553 cent per ton-mile. It obtained third place.



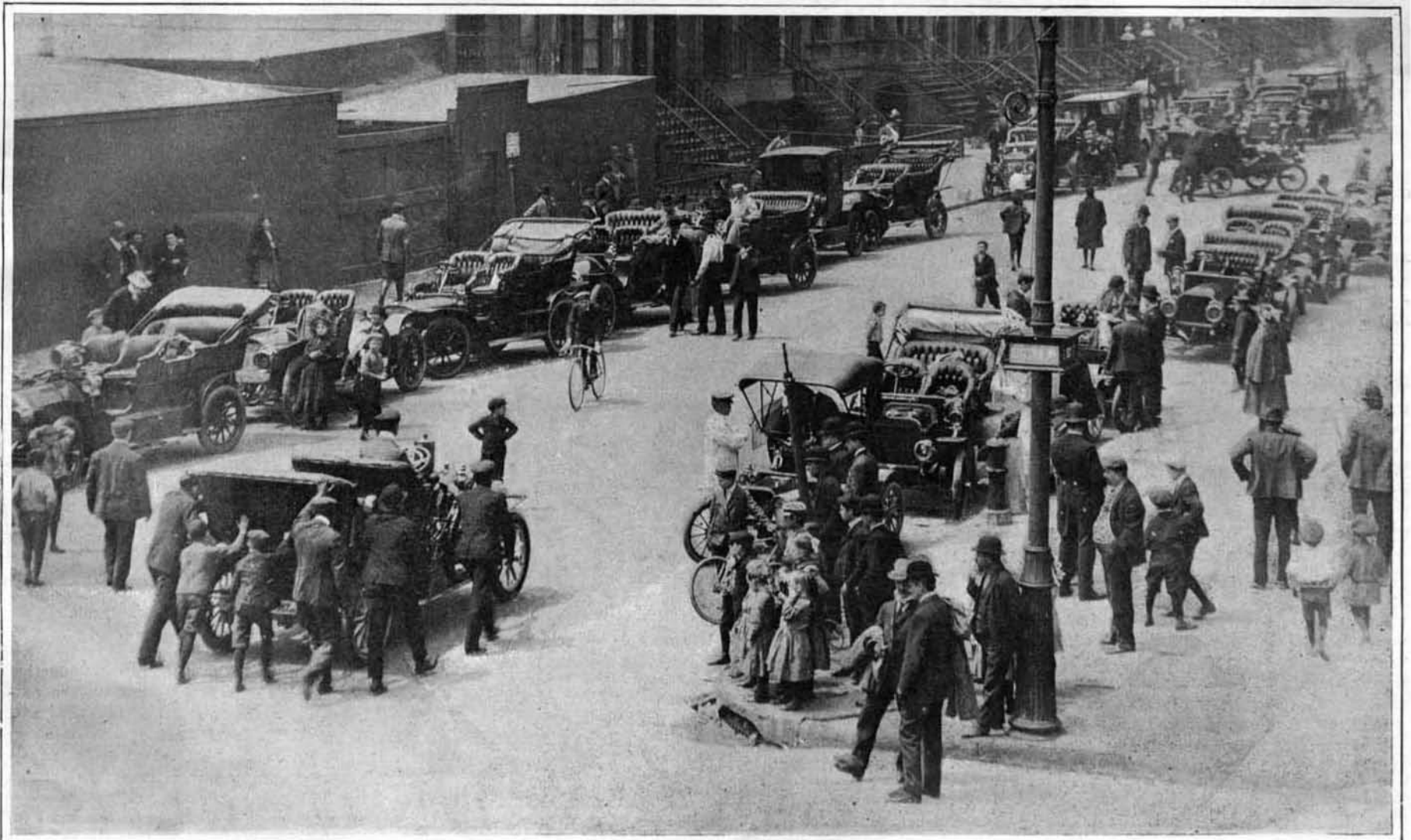
**The Winning Franklin 4-Cylinder Air-Cooled Runabout With Arthur Holmes Driving and Our Automobile Editor Acting as Observer.**

The photograph shows where the car stopped, at 6:55 P. M., in North Haven, Conn., a distance of 87 miles from the starting point. The car weighed loaded 1,500 pounds, and covered 130,500 pound-miles, at a fuel expense of 0.613 cent per ton-mile. It made 95 miles on two gallons subsequently.



**Light-weight Orient Buckboard Fitted With 4-Horse-Power Air-Cooled Motor and Friction Disk Transmission.**

This machine covered the greatest distance—98.8 miles—on two gallons of gasoline. It weighed 980 pounds, and made 91,884 pound-miles. This brings the cost per ton-mile for fuel up to 0.876 cent.



**Automobiles With Empty Gasoline Tanks and Carbureters, Lined Up on East 57th Street Before They Were Inspected, Filled, and Weighed In.**

**THE TWO-GALLON FUEL EFFICIENCY TEST OF THE AUTOMOBILE CLUB OF AMERICA.**