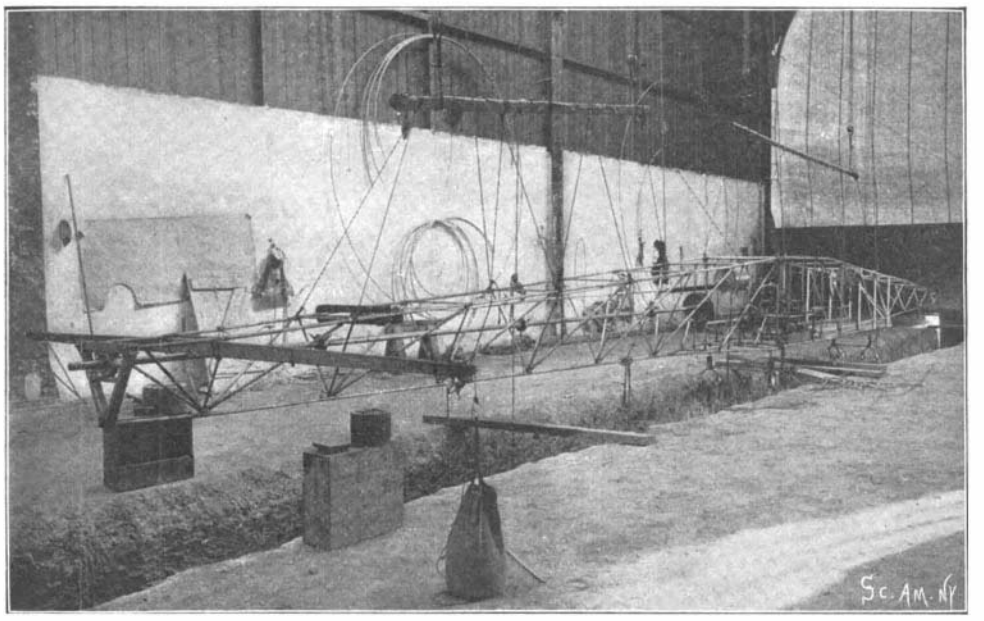
THE DE BRADSKY AIRSHIP AND THE TRAGIC END OF ITS INVENTOR.

BY THE PARIS CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

Following hard upon the untimely death of M. Severo comes another sad aeronautical accident. The latest unfortunate is the Baron de Bradsky Laboun, who only recently completed an airship of his own design at the Lachambre establishment.

The De Bradsky airship ascended from Vaugiraud, a Parisian suburb, early on the morning of October 12, for a trial trip. After apparently satisfying himself that the contrivance was safe, De Bradsky cast off the rope which held him captive to the ground, and started southward at a height of about 350 feet. The propellers, of which there were two, seemed to work well. But the rudder seemed not as responsive as it should be. About half an hour after the ascent the balloon had returned to its starting point, and then gradually rose higher and higher until it disappeared. Later the Prefect of Police received a dispatch stating that the airship had fallen at St. Denis, 5½ miles from Paris, and that its two occupants were killed. The balloon car fell at Stain, the wire ropes connecting it with the balloon having been broken.

The gas-bag was constructed of light Japan silk. It had a total length of 110 feet and a capacity of 1,010 cubic yards. It was not of the usual elliptical shape, but approached more nearly the form used by Count

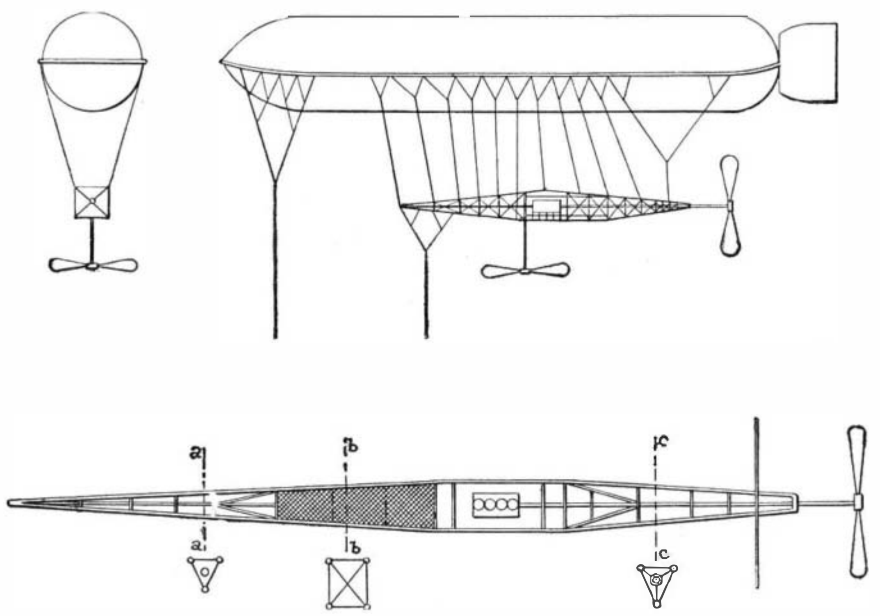


THE FRAME OF DE BRADSKY'S AIRSHIP.

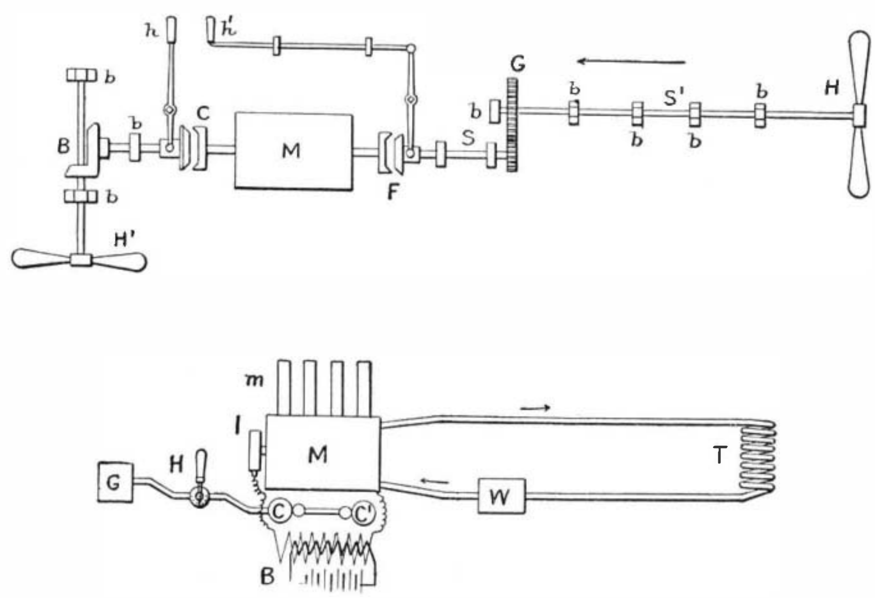
and below the middle a horizontal ascensional screw. Both screws were composed of a steel frame and silk canvas. Their form resembled somewhat that of a bird's wing. The propeller had two blades and measured 13 feet in diameter. It revolved at 300 revolutions per minute. The ascensional screw, of similar design, was 8 feet in diameter and made 350 revolutions.

A single motor was used to drive both screws. Each of the latter had a clutch by which it was thrown on or off. The motor was placed in the center of the screws. At *M* was the motor, and on the right the main shaft of the motor carried the friction clutch, *F*, which was worked by a lever for throwing on the middle shaft, *S*. At *b b* were the bearings for the [illegible]. The shaft, *S*, carried at the end a pinion which engaged with a large spur gear of bronze on the end of the outer shaft, *S'*, passing to the end and supported on five bearings. The latter were ball-bearings of a type devised by the inventor in order to give an easy transmission. The bearings were supported from the corners of the triangular frame by means of piano wires provided with tighteners. On the other side of the motor was the mechanism for the lower screw. First came a friction clutch, *C*, also controlled by a handle. The shaft of the ascensional screw was connected to the horizontal shaft by a special gearing inclosed in an aluminium box, *B*. The bearings, *b b*, supported the shaft at the top and bottom of the frame. To control both screws from the platform, the handles, *h h'*, were brought together. The aeronauts' platform was next the motor and had a solid flooring of basket work. Space was provided for two aeronauts. One improvement was a long cross-arm which was placed a few feet from the propeller. The wires supporting the frame at this point were attached to the outer end of the arm instead of to the frame itself, as in the latter case they were in danger of becoming entangled in the helice.

A gasoline motor of the Buchet type was used, hav-

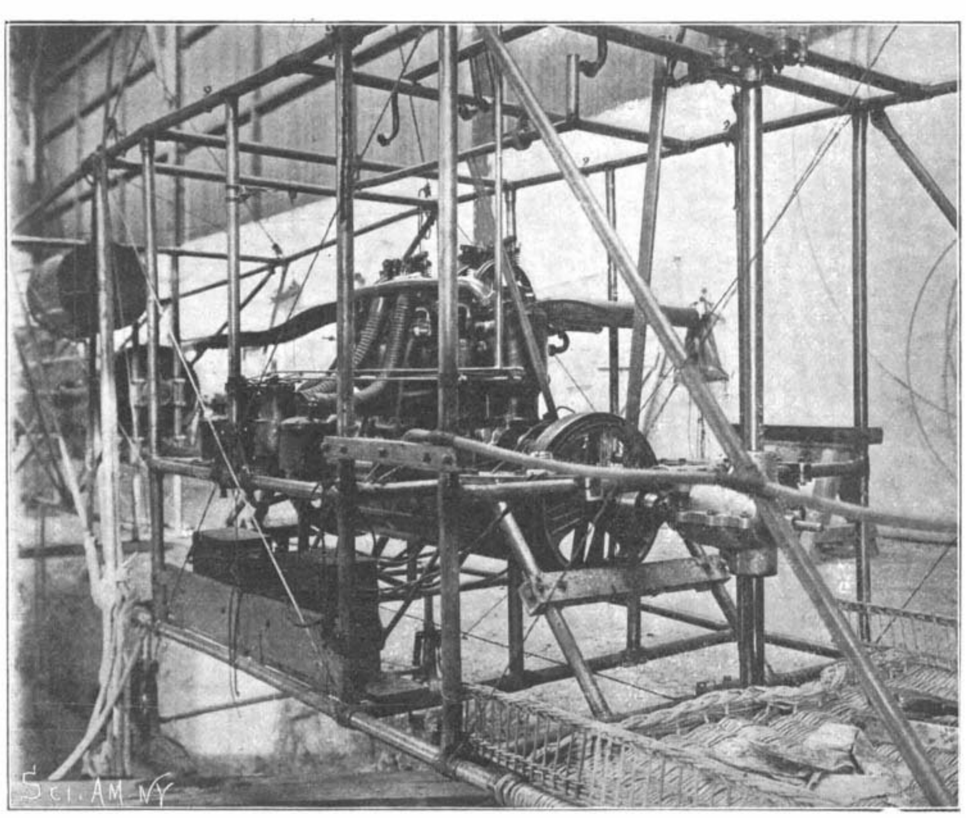


DE BRADSKY'S AIRSHIP IN ELEVATION AND PLAN.



THE DRIVING MECHANISM OF THE AIRSHIP.

Zeppelin, as it was mainly cylindrical, pointed at one end and round at the other. Its diameter was 21 feet. The balloon was divided into three nearly equal parts by two internal partitions, independent of each other. At the rear end was the rudder of about 3 square yards surface, made of a light steel frame covered with silk canvas. The rudder was operated by cords which passed down into the car. The supports for the car were attached to a frame of light wood which passed along the whole length of the balloon, being fixed to the canvas. To this frame were secured the piano wires that held the car to the balloon. The car or framework was suspended about 10 feet below the body. This frame was very rigid and at the same time not too heavy. De Bradsky used a light steel tube throughout. The total length of the framework, counting the propeller was 55 feet; its height about 4 feet and its greatest width the same. The motor and the aeronaut's platform were placed in the central part, which was the widest portion, and from here the frame tapered to a point at either end. The middle section was rectangular, but this became triangular in the tapered parts. The steel tubes used for the frame varied from 1 inch to ½ inch in diameter and were about 0.04 inch thick. The construction was also braced by double steel wires which were tightly stretched. At the rear end of the frame was the propeller frame and drove the propeller by a long shaft supported by bearings. The ascensional screw was mounted on the end of a vertical shaft geared to the horizontal shaft of the motor. The diagram of the motor shows the method of transmission for both



THE MOTOR AND MECHANISM OF DE BRADSKY'S AIRSHIP.

ing a capacity of 16 horse power. The motor had four cylinders, cooled by water jackets, mounted on a cylindrical crank-box in aluminium, which contained also the flywheels. The second diagram shows the disposition of the petrol motor system. Beside the motor, *M*, are the two carbureters, *C C'*, of the float and atomizer type, fed by gasoline tank, *G*, which is fixed to the upper part of the frame. At *H* is a valve with a handle and dial by which the aeronaut can vary the gasoline supply. *B* shows the position of the batteries and induction coil and *I* the spark-break of the motor. On the other side is the water-cooling system, which comprises the water tank, *W*, and the radiating tube, *T*, placed near the rear of the frame. The radiator was made especially light and the water supply reduced to a minimum. The gasoline and water reservoirs contained each about 3 gallons. One feature of great value was the arrangement for preventing sparks from the motor from reaching the balloon or igniting the hydrogen which should leak out. This was no doubt the cause of M. Severo's catastrope, and succeeding constructors will be especially careful as to this point. The exhaust gases from the cylinders escaped into muffling tubes, *M*, of sheet iron about 3 inches in diameter and 18 inches long. Each cylinder had a separate tube which had its outer end pierced with small holes. The total weight of the car fully equipped, including the propellers, gasoline for the motor and water supply, was about 852 pounds. The airship had two guide ropes, whose position will be observed. The heavier of these was attached toward the front of the balloon, while the lighter rope was suspended from the framework.

Most of the Parisian experts agree that this aeronautical tragedy was due to De Bradsky himself. One expert claimed that the ascensional screw was at fault, the perturbing influence of which would have sufficed to paralyze both the propelling screw and the rudder, even if the motor had been strong enough to resist the light breeze from the southwest. The ascensional screw turned vertically under the car at the rate previously mentioned, and caused the airship to swing around at the rate of one turn per minute. Under these circumstances the propelling screw and rudder were powerless. From the Place de l'Opéra it was plainly visible that under the influence of this horizontal screw the axis of the balloon, obliged to turn by the resistance of the air, ceased to be parallel with the axis of the car, and in consequence the steel wires which fastened the car to the balloon were subjected to a torsional strain which they could not withstand. When the balloon was completely inflated, and the network of the steel wires completely stretched, little danger was to be anticipated. But when the balloon lost gas and its silk envelope became flabby, the steel wires from which the car was suspended were subjected to unequal strains and were easily enough twisted and broken one after another at the point at which they were fastened near the gas bag. Lachambre, the constructor of the airship, states that he had no confidence in the mechanical construction of the airship. Nevertheless, he says that the balloon had points of merit and marked a real progress in airship design. The defects were that the car was too light and that the motor and guiding screw were too weak, in Lachambre's opinion.

The army rifle competition held at Fort Sheridan, shows that the scores made this year have never been exceeded except during 1892 and 1893.

NEW YORK-BOSTON AUTOMOBILE RELIABILITY TEST.

BY THE SCIENTIFIC AMERICAN'S OFFICIAL OBSERVER.

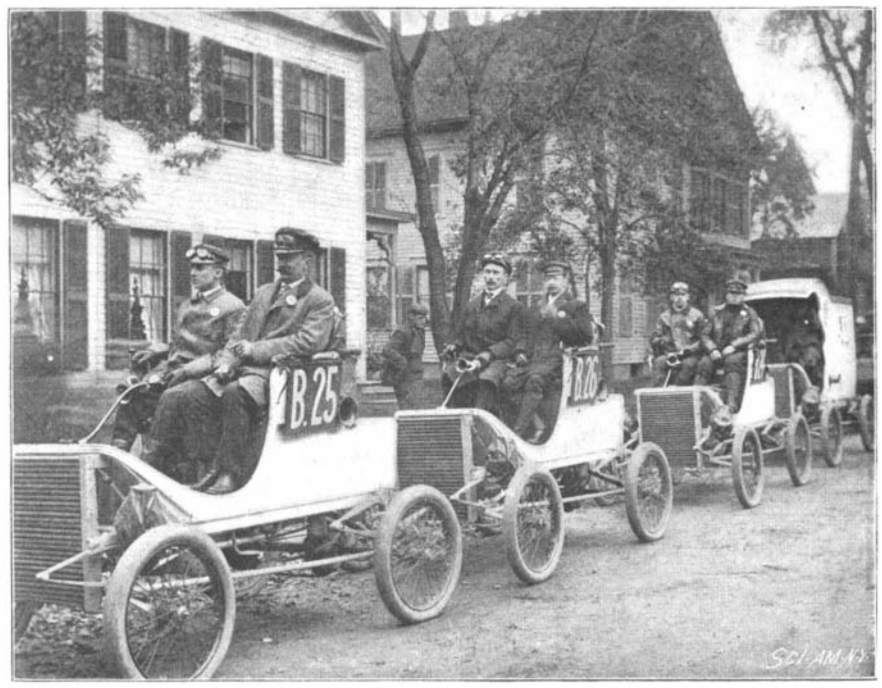
After six days of dusty traveling, sixty-eight out of seventy-five automobiles that left New York on October 9 arrived again at the starting point at 4 P. M. on Wednesday, the 15th, some twenty without having made any stops other than those on the schedule, and the rest with but one or two stops and very few breakdowns. Although the roads and weather conditions were much better than those encountered last year in the New York-Rochester test, this alone does not explain the much better showing recently made by the automobiles. In the former test, but 50 per cent of the vehicles that started finished; in the present one less than 10 per cent failed to do so. This large increase of successful contestants is the direct result of improvements in American machines.

The breakdown that occurred on the Knox machine at the beginning of the second day's run, as noted in our last issue, was repaired by the operator and observer with the aid of one local assistant, and, after six hours' delay, a second start was made from New Haven shortly after 6 P. M. Hartford, 42 miles distant, was reached in three hours, which was the schedule time; and Springfield, the terminus of the day's journey, was entered at the end of a two and one-quarter hours' run, just after midnight. The next morning at 9 o'clock this machine started with the others, and had no further stops or mishaps throughout the rest of the tour. The other two Knox cars, which were new, had no trouble whatever. The test has therefore demonstrated once more that the single-cylinder air-cooled motor of as much as 8 horse power is a success; and that larger waterless gasoline motors can be built by simply increasing the number of cylinders, is a natural deduction. Another car driven by an air-cooled motor was the Franklin, which weighs 1,125 pounds, and was equipped with a quadruple-cylinder, 8 horse power motor of the ordinary flange type. This motor also made a very creditable performance, and brought the vehicle through with but one penalized stop. It was the only other representative of the air-cooled class of motors in the test.

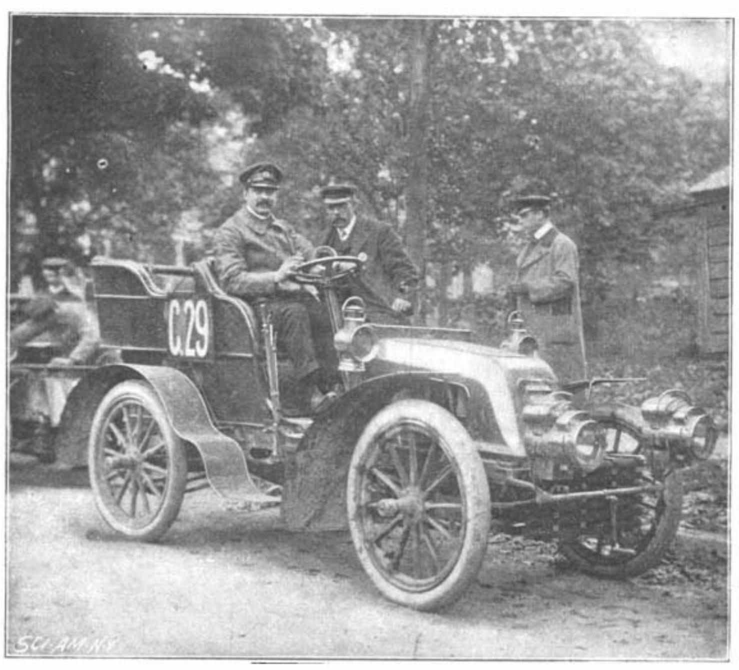
Among the new gasoline cars that had but little trouble on the journey was Mr. A. L. Riker's tonneau machine, which we illustrate. Its only accident was the breaking of four bolts in the differential gear, just after entering the Hartford control on the homeward trip. This necessitated a delay of four hours to obtain some new ones, after which the machine proceeded to New Haven without any other delays. The car behaved remarkably well for a new one. It has several novel features which we hope to illustrate later. The percentage of steam carriages that participated in the trial was quite small; but most of the machines of this type made a very creditable performance. There were five White carriages entered, four of which are believed to have made no penalized stops. These are shown in one of our illustrations. The condenser fitted on the front of each carriage gives it a radius of 150 miles with one filling of water. The advantages of the steam carriages for mounting hills were clearly shown, and their running on the level was smooth and even. The Stearns stanhope we also depict is another steam car that is said to have made a perfect score. It was about the only machine equipped with tubular steel wheels, most of the others having wheels of wire or wood.

A touring car of decided novelty is seen in the lower right-hand illustration. It is a combination gasoline-electric machine, the invention of Mr. Knight Neftel. It has a set of sixty-four storage battery cells of 75 ampere-hour capacity. This is sufficient capacity to propel the car about fifteen miles. An 8 horse-power gasoline motor coupled to a dynamo and placed in the front end of the car generates sufficient current to run the car on a level road and charge the batteries at the same time. When a hill is mounted, the battery discharges and furnishes the extra power. By employing this arrangement, a mechanical transmission is dispensed with, and an electrical car with portable charging plant is obtained. The motor is started by throwing a couple of switches, which cause the dynamo, then acting as a motor, to turn it over. The control of the car is entirely electrical, and, although the machine weighs 3,500 pounds, it can be handled with the

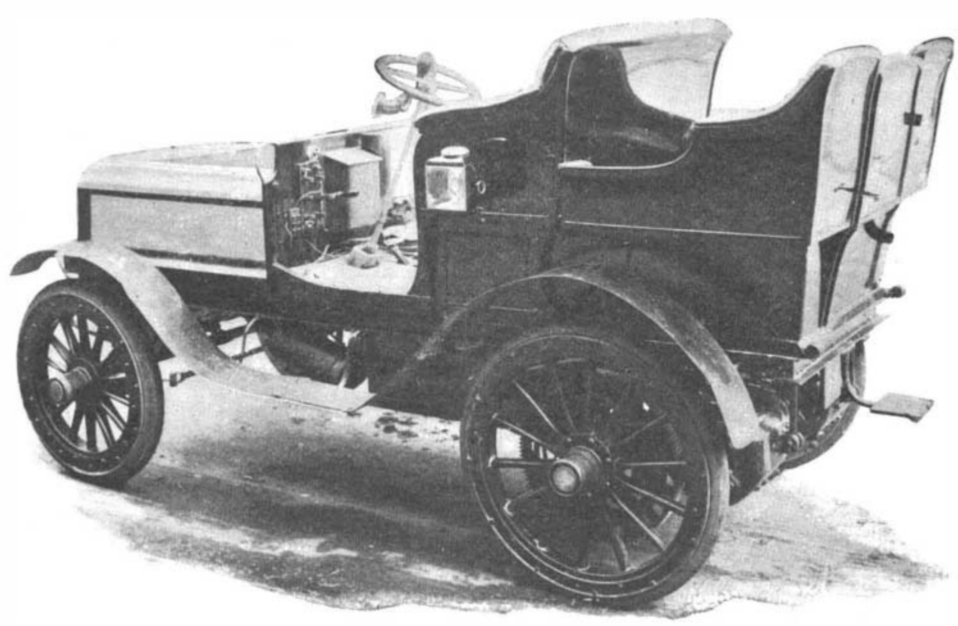
Stearns Steam Stanhope with Tubular Wheels.



White Steam Stanhopes and Delivery Wagon, Showing Condensers Arranged in Front.



The Riker Gasoline Touring Car.



The Neftel Gasoline-Electric Automobile.

THE NEW YORK-BOSTON AUTOMOBILE RELIABILITY TEST.