

ables false starts and errors to be readily corrected. This kind of puzzle has attracted a good deal of attention, and has received a multitude of solutions. Thus we may instance the solution given in Fig. 17. Here the lower half of the board is covered before any beginning is made with the upper half. The two halves are precisely symmetrical with each other, as may be seen by referring to Fig. 18, where the path of the knight is indicated by a continuous line. This division of the solution into two duplicates is not necessary, but is an added refinement. In one sense it simplifies matters, as we have but half the board actually to solve. We are restricted, however, as to the point of termination. Thus in the present example, the point of beginning, 1, having been determined, the point 33—the beginning of the second half—is thereby fixed, so 32 must come where it is at present or must be at position 6. Fig. 19 is an illustration of a solution where the resulting arrangement of figures has some of the properties of a magic square. Thus every column and every horizontal line sums up 260. If the diagonals each totaled the same number, 260, then the whole would form a perfect magic square.

TERMINATION OF THE RHEIMS AVIATION MEETING.

THE WINNING OF THE INTERNATIONAL TROPHY.

As briefly noted in our last issue, Glenn H. Curtiss won the Bennett International Aviation Trophy on August 28th at Rheims.

This trophy—a beautiful model of a Wright biplane held aloft by a female figure—was contested for the first time on the date above mentioned, France being represented by two monoplanes—a Bleriot and an Antoinette—and one Wright biplane, and America by one tiny biplane with a powerful 8-cylinder motor. The real race was between Curtiss and Bleriot, the champions of the biplane and the monoplane types of flying machines respectively; and that the former accurately sized up his rival soon after he reached France is shown by the facsimile reproduction of the postal which he at that time sent our Aeronautic Editor.

The morning of August 28th was mild, calm, and hazy at Rheims. As the weather conditions were so favorable, Mr. Curtiss brought out his machine a few minutes after 10, and immediately started off on a preliminary round of the course. Despite the fact that he made rather wide turns and that the aeroplane pitched considerably, the time of the round was but 7 minutes, 55 1/5 seconds—a decided improvement over Curtiss's former fastest round of 8:09 1/5, and 9 1/5 seconds less than Bleriot's fastest lap. Mr. Curtiss decided to try for the trophy at once. His small gasoline tank was refilled, more water was put in the radiator, and, after signing the official paper, he quickly rose for the second time. After circling around once in front of the grand stand, he crossed the line at full speed. The aeroplane still pitched perceptibly, and the turns were, with the exception of the very last one, all rather wide; but nevertheless both rounds were made in record time, the second one being 4 1/5 seconds faster than the first and 2 seconds faster than the time in the trial flight. The times of the rounds were 7:57 2/5 and 7:53 1/5, the total being 15 minutes, 50 3/5 seconds, which corresponds to an average speed of 47.04 miles an hour.

The 4 1/5 seconds gain in time on the second round, Mr. Curtiss attributed to a slight change in the mixture which he effected by turning a small wheel he had conveniently at hand. He ran the engine at its fastest speed all the time, but during the second lap thought that it started missing explosions on one cylinder, so he made

a slight adjustment. The pitching of the machine seems to have been due to the fast speed at which it was being driven in conjunction with the sensitiveness of the horizontal rudder control. When the machine would pitch downward and Mr. Curtiss would

monoplane where it alighted for over an hour with the aid of several mechanics, he at length flew back to his shed. As it was now almost 5 P. M., and as no start was allowed after 5:30, he made hurried preparations for the test. It was 5:10 before the start was made. The monoplane flew splendidly without any rolling or pitching. The time of the first round was but 7:47 4/5, which was 5 2/5 seconds faster than Curtiss's second lap. If Bleriot could do as well in the second round, he would be the winner. There was intense excitement among the spectators at the grand stand. The machine finally rounded the last pylon. The timers called the seconds remaining before his time would be up, but it was 5 3/5 seconds over Curtiss's 15:50 3/5 before the indomitable Frenchman crossed the line. After conquering the Channel he had finally been defeated for lack of speed. Nevertheless, the performances of his and Latham's monoplanes remained unsurpassed for stability, even in strong winds. The latter started in the cup competition just as Bleriot

turn it upward again, the shock was so great that he said it was like striking a bump when riding in a fast automobile.

The other main event of the day—the Prix du Tour de Piste, or 10-kilometer speed test for one circuit of the course—did not bring out any contestants, since the two events could not be run together, and since competitors were obliged to state for which prize they were competing. But one trial was allowed for the

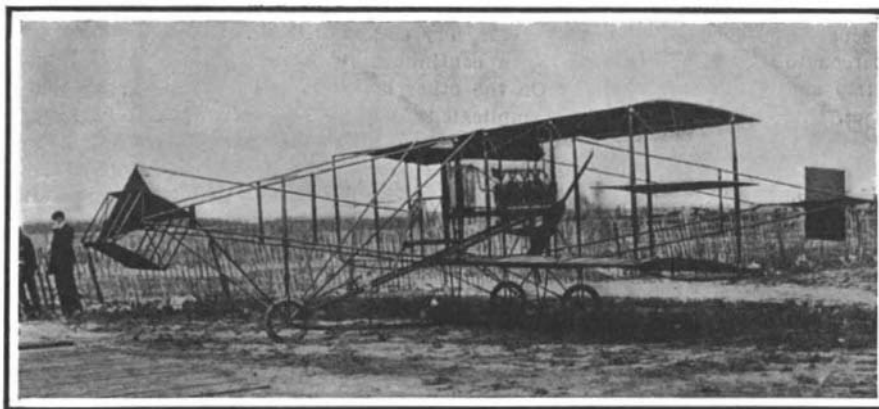
was finishing. He flew at a great height—about 150 feet—and covered the course in 17 minutes, 32 seconds, thus securing third place. Lefebvre, the third French representative, with a Wright biplane fitted with a 40-horse-power motor, was fourth in 20:47. Mr. Cockburn, who represented England with his Farman biplane, got half way around the course when the end of one plane struck a standing shock of corn, whirling the aeroplane around and bringing it to the ground.

Latham met with a similar mishap afterward when carrying M. Sariano as a passenger in the passenger-carrying competition. This was won by M. Farman, who, after making a round with one passenger in 9:53 4/5, afterward carried two around the course in 10:39 2/5, or at a speed of 34.96 miles an hour. The total live weight lifted by his machine was in the neighborhood of 450 pounds. A Wright biplane carried Franz Reichel around the course in 11:05 4/5. Farman's biplane was the only machine that succeeded in carrying three people. Bleriot's "No. 12" monoplane, however, was the first aeroplane to accomplish this feat, which it did at Douai last June, when a total weight of

1,234 pounds was carried at about 30 miles an hour with a 30-horse-power motor. Farman's biplane had a 50-horse-power Gnome revolving-cylinder motor. This engine was fully described in SUPPLEMENT No. 1729.

In addition to winning the International Trophy Mr. Curtiss, the following day, carried off the first prize (\$2,000) in the 30-kilometer speed contest, known as the Prix de la Vitesse. His first attempt was made early in the afternoon. The three rounds of the course were made in 24 minutes, 15 1/5 seconds. Believing that Latham had made better time, he made another attempt. This time he made very short turns and drove his machine at even greater speed. The three rounds were made in 7:49 2/5, 7:48 2/5, and 7:51 1/5, the total time for the three laps being 23 minutes and 29 seconds, or a speed of 47.6 miles an hour. The second lap was made at a speed of 47.73 miles an hour, which was the fastest time for the course by any machine, with but one exception. Because Mr. Curtiss did not start in this contest on the first day of the meeting, he was penalized 1/20th of his actual time, so that his official figures were 29 minutes and 49 seconds. Latham made another attempt to better his previous record, but in this he was unsuccessful.

Bleriot started about 10 o'clock with the intention of making another trial in this competition. He crossed the line and made the first turn at a rapid rate, flying at a low elevation. He finally disappeared from



The Curtiss biplane which won the International Aviation Trophy.

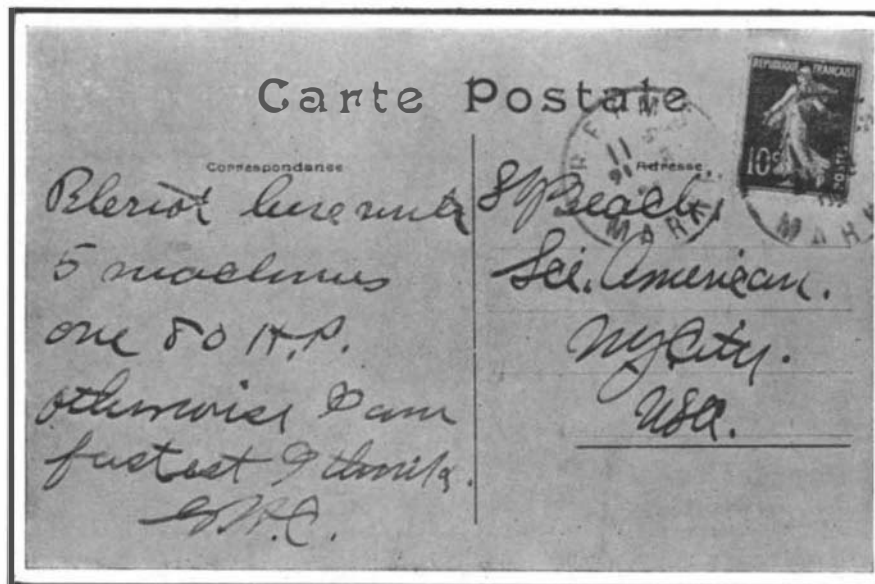
This machine made one circuit of the course at the rate of 47.73 miles an hour. It traveled 18.63 miles in 15 minutes 50 3/5 seconds (47.04 miles an hour) in winning the International Trophy.



The Bleriot monoplanes in front of their sheds.

The No. 22 machine was fitted with an 80-horse-power, 8-cylinder motor. It made the fastest round of the course at the rate of 47.78 miles an hour.

International Trophy, also. After Curtiss's excellent flight, no other machines were brought out till about noon, when M. Bleriot made a slow round with his 80-horse-power "No. 22" monoplane. About 2 P. M. he tried another propeller, but only succeeded in making a round in 8:14 1/5. An hour later he had changed the 2-bladed propeller for a 4-bladed one. He attempted to make a round, but was obliged to descend before completing it. After working at the



Postal card showing how Curtiss sized up his opponents.

view at the far end of the long side of the course. It was supposed that he had passed out of view in the depression at this point, which was called by Curtiss the "Aeroplane Graveyard" on account of the strong wind currents there and the many machines which met with accident at that point. Soon, however, a column of smoke arose, and upon going to the spot in an automobile it was found that Bleriot's machine had dived to the ground, caught fire, and was rapidly being consumed. M. Bleriot was rather badly burned

ping to the right, it descended at a sharp angle until the low end of one plane struck the ground and swung the machine around, while it at the same time reared up on its prow. Fortunately, M. Bréguet was not injured.

The results of the Prix de la Vitesse were therefore as follows:

First, Glenn H. Curtiss, with his 60-horse-power biplane. Time 23:29; official time with penalization, 25:49 2/5.

The other speed contest, the Prix du Tour de Piste, which was for one circuit of the 10-kilometer (6.21-mile) course, was won by M. Bleriot, who covered the distance in 7:47 4/5 (47.78 miles an hour). Curtiss's time of 7:48 2/5 for one round in the Prix de la Vitesse gave him second place in this contest.

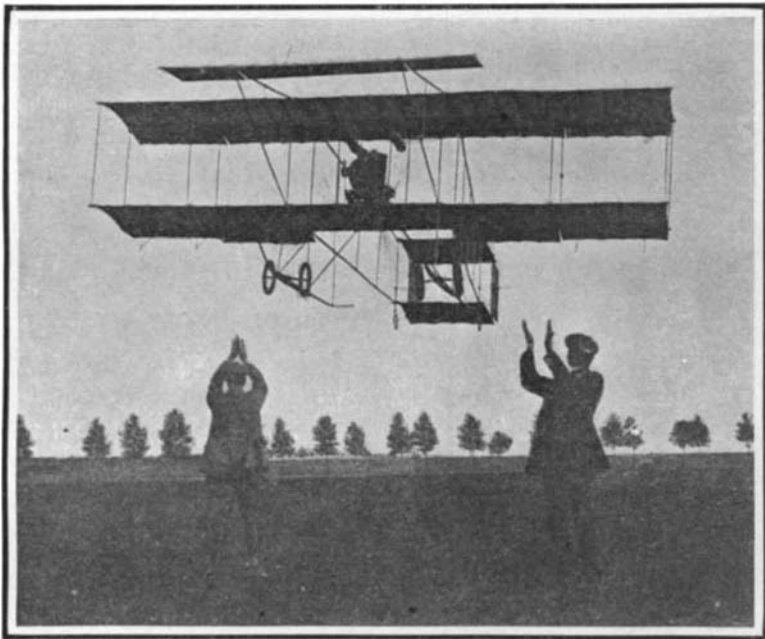
The Prix de l'Altitude, or Height Competition (\$2,000 prize) was won by Latham, who reached a height of 155 meters (508.5 feet), as recorded by a barometer upon his monoplane. Farman was second with a



One of the winning Voisin biplanes.



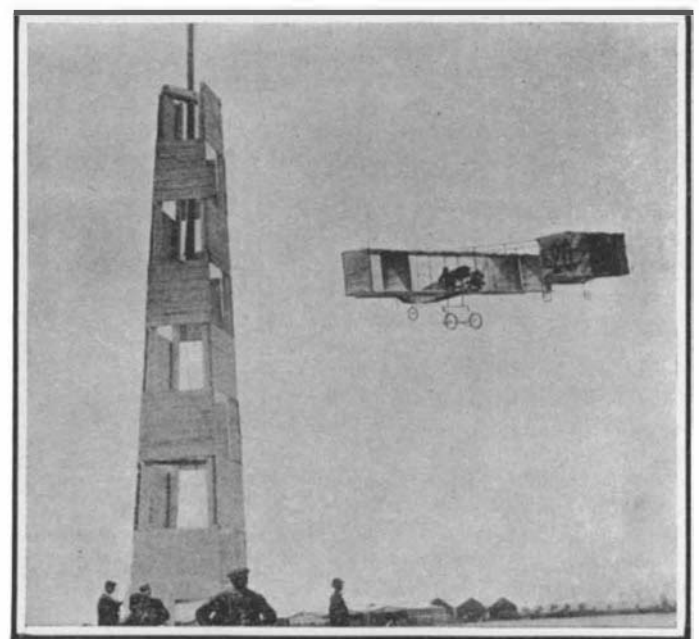
General view of the aviation field, as seen from the grand stand.



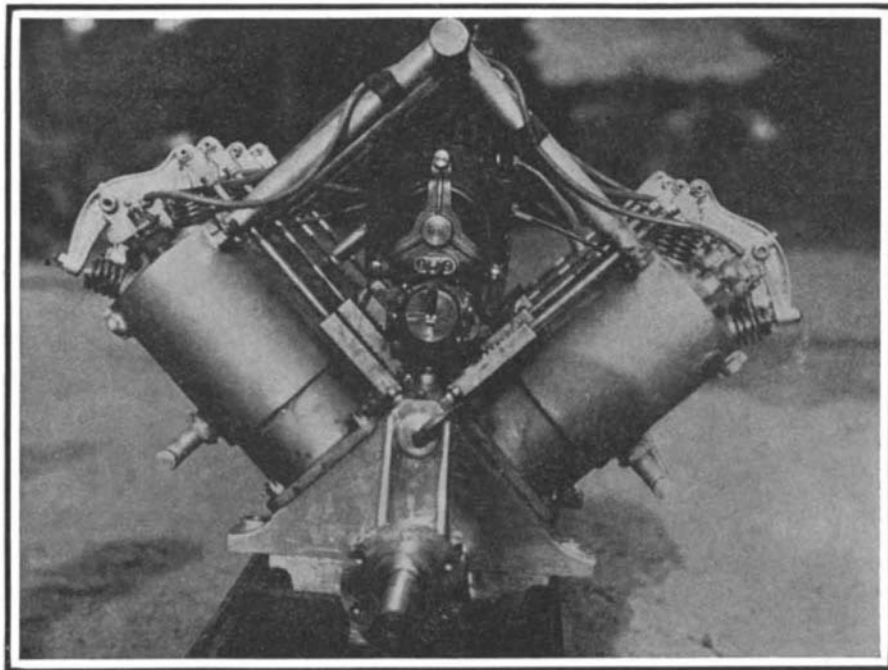
Sommer flying in his Farman machine.



Roger Sommer, aviator.



Paulhan circling a pylon in his record endurance flight.



60-horse-power, 8-cylinder water-cooled motor of the winning Curtiss biplane.

All valves are mechanically operated and the ignition is by magneto. The bore and stroke are both 4 inches. The weight is 200 pounds.



Glenn Curtiss, the winner of the International Aviation Trophy, at the wheel of his biplane.

Weight of the aeroplane loaded, 700 pounds; total surface 225 square feet. Speed 47.73 miles an hour. Thrust developed by propeller, 280 pounds.

THE RHEIMS AVIATION MEETING.

and received numerous bruises. His only explanation was that something must have broken about the rear horizontal rudder, which caused him to lose control of the machine so that it dashed to the ground. The gasoline tank was broken and the fuel quickly ignited from the motor.

Another machine which was wrecked at this time was a rather heavy biplane built and flown by M. Louis Bréguet. This machine made its short flight the evening before. On Sunday morning a short flight of about 300 feet was made, the machine alighting without injury. The next time flight was attempted, however, the machine shot upward to a height of about 100 feet and, after traveling a short distance and tip-

Second, Hubert Latham, with "No. 29" Antoinette monoplane. Official time, with penalization, 26:33 1/5.

Third, Tissandier, with his Wright biplane. Time 28:59 1/5.

Fourth, Lefebvre, with a Wright biplane. Time 29 minutes.

Fifth, Count de Lambert, with a Wright biplane. Time 29:02.

Sixth, Latham, with "No. 13" Antoinette monoplane. Time, with penalization, 29:11 2/5.

Seventh, Paulhan, with a Farman biplane. Time 32:49 4/5.

Eighth, Bunau-Varilla, with a Voisin biplane. Time, with penalization, 42:25 4/5.

height of 110 meters (360.9 feet), Paulhan third with 90 meters (295.3 feet), and Rougier fourth with 55 meters (180.4 feet).

The Prix des Mecaniciens was won by M. Bunau-Varilla with a distance of 100 kilometers (62.1 miles) to his credit, while M. Rougier was second with 90 kilometers (55.9 miles).

The Prix des Aeronauts (\$2,000) for the fastest five circuits of the course, a total distance of 50 kilometers (31.06 miles) was won on Sunday by the large dirigible "Col. Renard," the time being 1:14:49. The smaller dirigible "Zodiac" covered this distance in 1:25:01. The average of the winner was 24.9 miles an hour.