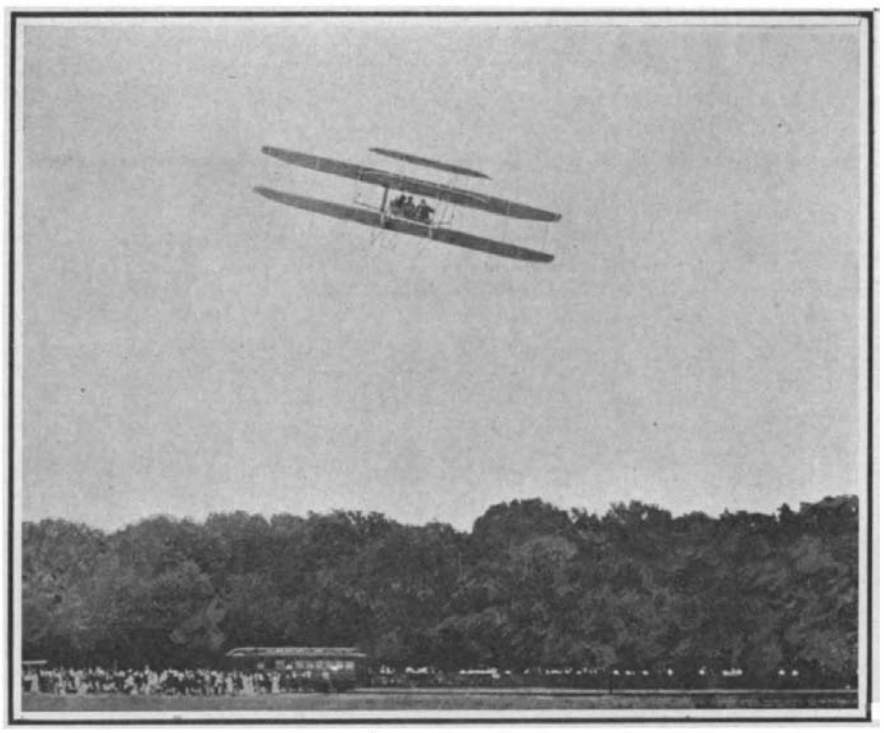
ORVILLE WRIGHT'S RECORD FLIGHTS AT FORT MYER.

On Saturday, July 24th, Orville Wright, in continuing his practice flights for the performance of the government contract, made a flight of 20½ minutes. He made this flight preparatory to taking Lieut. Lahm as a passenger, but unfortunately, when descending, the aeroplane was caught by a sharp air current and twisted slightly, so that when it struck the ground one of the skids was broken. During this practice flight, Mr. Wright described very small circles and performed various difficult maneuvers in order that a cinematograph operator could take photographs. The flight began at 6:56 P. M., and was terminated at 7:16:30. There was a light breeze of about 6 miles an hour, and the aeroplane bobbed up and down considerably. It also tipped at an alarming angle when making the short turns.

On July 26th Orville Wright started the machine successfully without the aid of the falling weight. The machine was placed upon the rail and held in position. It gathered headway quickly as soon as it was released, but after running off the rail it skimmed along through the grass a considerable distance before it finally rose in the air. The start was made against a wind of some 15 to 18 miles an hour velocity. On the first round the machine did not rise more than 25 feet, but during the remaining two and one-half circuits of the parade ground it went up to three or four times this height, and the descent made in several long swoops, was quite thrilling. The flight was made specially for President Taft, who for the first time visited Fort Myer for the purpose of seeing an aeroplane fly. The War Department had announced that the endurance test would be made, and a crowd estimated at 10,000 people was present; but on account of the wind Orville Wright thought it best not to make the test, so he made the brief exhibition flight instead. The flight was also notable for the fact that it is the first time the Wrights have publicly demonstrated in their native land that their machine can rise from the starting rail under its own power, and also that it is capable of flying in a strong wind.

July 27th was the record-breaking day as far as the endurance flight with a passenger was concerned. At 6:36:40 P. M. Orville Wright and Lieut. Lahm started on what turned out to be the longest flight yet made by an aeroplane carrying two men. To fulfill the government contract, an hour's flight with two men was required. There was no breeze of any account blowing at the time the flight began, though during the course of it a breeze sprang up which at times caused the machine to bob up and down considerably. There had been a high wind all the afternoon, and just at its close there was a slight shower. Subsequent to this the wind died down, and it was decided to attempt a flight. As soon as the machine had been started by the falling weight, Orville Wright drove it to a good height and circled seventy-five times around the parade ground, which is about 4,000 feet in circumference. Some of these circuits were smaller than others but their average was probably such that the machine traveled in all in the neighborhood of 50 miles at an average height of 75 feet. At the close of the seventieth round, which completed the hour in the air, there was great applause, waving of hats and handkerchiefs, and tooting of automobile horns. Also when Wilbur Wright's record of 1 hour, 9 minutes, and 45 seconds was broken, the latter ran out and cheered for his brother. Soon after this the machine gradually sank to a lower altitude, and finally alighted easily at the end of the seventy-fifth round. Orville Wright's previous best record with a passenger was 9 minutes and 6 seconds on September 12th, 1908, when he traveled about 5.88 miles with Major Squier as passenger. He had also made a 6-minute flight with Lieut. Lahm as passenger last September. It is therefore quite remarkable that he was able to soar aloft with Lieut. Lahm for the first time this year on a machine which is somewhat smaller than that used before, and to remain in the air nearly an hour and a quarter without mishap. The time of the flight was 1 hour, 12 minutes, and 36 seconds. The next day he hoped to complete the cross-country speed test to Alexandria, Va., and back, a distance of 5 miles each way, but owing to a strong wind and afterward to a balky motor, due, it seems, to a stoppage in the gasoline feed pipe, no flight was attempted. Nor was it possible to make a flight on July 29th; for after the wind had died out at Fort Myer, and when he was about to start, word was received from Alexandria that a very strong wind was blowing, and so it was not thought best to attempt the flight.



ORVILLE WRIGHT AND LIEUT. LAHM FLYING IN THE GOVERNMENT ENDURANCE TEST AT FORT MYER, VA., ON JULY 27TH.

Late in the afternoon of Friday, July 30th, Orville Wright accomplished a flight such as had never been made before by any aviator—a flight which gives without question to him and his brother the title of premier aviators of the world. This was the 10-mile speed test across rough, wooded, and broken country to Alexandria, Va., and back. The flight was made with a strong westerly wind blowing across the course. The wind carried the machine out of the direct line which

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THE FIRST SUCCESSFUL CROSS-CHANNEL FLIGHT.

Six days after the first attempt at flying across the English Channel was made by Hubert Latham, M. Louis Bleriot, who had brought his "No. XI." monoplane from Paris to Calais especially for the purpose, made a successful flight and landed on the English shore. The "Antoinette IV." monoplane used by Latham was so badly damaged when being pulled aboard the torpedo-boat destroyer and transported to the shore, that a complete new machine—"Antoinette VII."—was brought on from Paris and was in readiness whenever this aviator should make a second attempt. On Sunday, July 25th, M. Bleriot arose at 3 A. M. As the weather conditions seemed favorable, he examined his machine, started the motor, and, shortly after 4 A. M., made a fifteen-minute trial flight, circling for 9½ miles around Calais and its environs and landing upon the cliff from which he was to start. Everything worked perfectly and consequently, as soon as the sun had risen, he immediately climbed into his seat, had the motor started, and, speeding it to the limit, shot up over the telegraph wires and started off over the strait, heading directly for the English shore. The start occurred at 4.35 A. M. The air was clear and a southwest breeze was blowing. The torpedo-boat destroyer "Escopette" was several miles out in the Channel, headed for England also. As soon as the captain saw Bleriot coming, he put on full speed, but was soon overtaken and passed by the fast-flying mechanical bird. Ten minutes after leaving the French coast the monoplane was out of sight. After passing the torpedo boat, Bleriot flew for ten minutes without steering to right or left. There was nothing to go by and flying at a forty-mile clip without compass or any other guide must indeed have been a thrilling sensation. After about ten minutes of such flight the English shore came into the view of the intrepid aviator. He recognized that the strong southwest wind of about twenty miles an hour velocity had carried him to the eastward. He was heading toward Deal. As soon as he found this out, he turned to the left, heading directly into the wind, and following the coast for two or three miles until, when within a mile or two of Dover, he turned into an opening between the cliffs. A strong wind caught him and swung him completely around, but he managed to make an abrupt descent upon suitable ground between the cliffs, where a fellow countryman was awaiting him and holding aloft the French flag. The running gear and propeller were damaged, but the aviator landed without hurt, although he dropped quite suddenly from a height of 65 feet. The news had been flashed to England that Bleriot was making the crossing and there were a considerable number of people on hand to witness him make the descent. He was given a great ovation and was taken by his friends to the hotel immediately. Mme. Bleriot arrived on the destroyer soon after and added her congratulations when met by her husband at the pier.

M. Latham overslept and was only awakened just after Bleriot had left France. He attempted to follow with his Antoinette monoplane, but the strong wind that sprang up soon after caused him to change his mind. He wired congratulations and said he hoped to follow soon.

Two days later he made a second attempt in the afternoon, and this time he succeeded in traveling to within two miles of the English shore,

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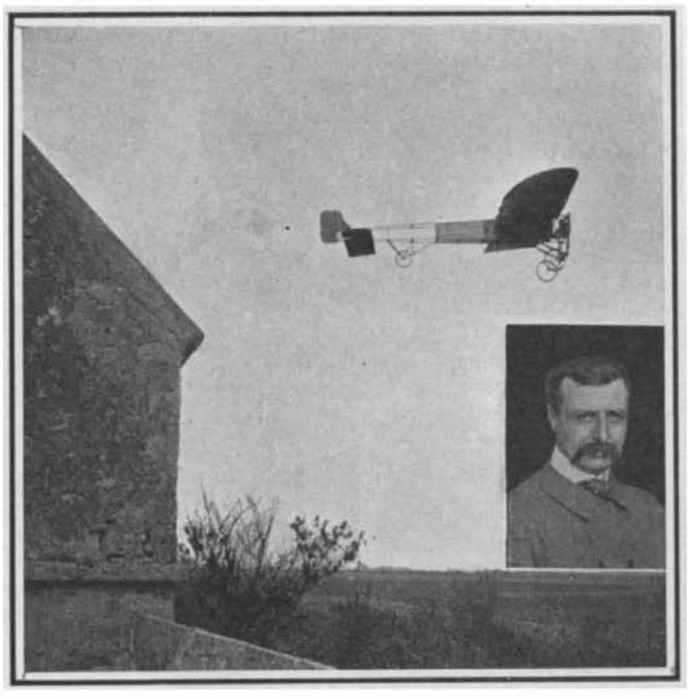

The No. XI. monoplane and M. Louis Bleriot, engineer, its designer, builder, and pilot.

The machine is shown in its ¾-hour cross-country flight of July 13th. It covered 25 miles with one intentional stop at an average speed of 35¾ miles an hour.

Rear view of the Bleriot XI. monoplane making its 25-mile cross-country flight.

This is the same machine which, 12 days later, on July 25th, accomplished the record-breaking feat of flying across the English Channel in 37 minutes.

LOUIS BLERIOT AND HIS FAMOUS NO. XI. MONOPLANE WHICH CARRIED HIM SAFELY ACROSS THE ENGLISH CHANNEL.

ORVILLE WRIGHT'S RECORD FLIGHTS AT FORT MYER.

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Mr. Wright naturally tried to follow and obliged him to make a turn to the right in order to circle around the stake balloon at Alexandria in the right direction. Upon the return trip, after passing over the top of Shuter's Hill—a high hill near the turn—a strong downward current drove the machine toward the earth, and the aviator was obliged to set the horizontal rudder sharply upward in order to regain his proper elevation. After doing this he flew steadily back to the starting point and crossed the line 14 minutes and 42 seconds after first passing over it on the outward journey. Deducting the time of the turn at the far end of the course, the time for the 10 miles was 14 minutes and 12 seconds, which corresponds to a speed of 42.25 miles an hour. This means that the Wrights will receive a bonus of $5,000 in addition to $25,000 they bid for supplying a 2-man machine. The flight was made with Lieut. Benj. D. Foulois as passenger, and, save for the points mentioned above, was uneventful according to Orville Wright. The precision with which he maintained his level while flying over a valley 200 feet or more in depth on the outward trip was remarkable, and had not the downward wind current caught him on the return trip, he would have accomplished this just as well. The undulation and veering out of the course owing to the wind doubtless made a slight diminution in the speed. Had there been no wind the brothers might have made faster time and obtained a greater bonus. But, on the other hand, a flight under such conditions as obtained was a far better demonstration of the possibilities of the machine for war purposes, and the Signal Corps may well be proud of its first war aeroplane, which is without doubt the premier machine of the kind in the world to-day.

THE FIRST SUCCESSFUL CROSS-CHANNEL FLIGHT.

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when the motor slowed down and stopped and he again came down in the Channel. Although his monoplane struck the water rather more gently than on the previous flight, Latham's nose was broken and his head cut open by his broken goggles, so forcibly was he thrown against some of the guy wires of his machine. Nothing daunted, however, he has announced that he will again make the attempt as soon as he recovers. Thus has been opened a new era in aviation—the era in which the flying machine is to be used for traveling from one country to another, be it over land or sea.

The triumphant 25-mile flight of Bleriot across the English Channel, which was accomplished in 37 minutes, or at the rate of about 40 miles an hour, is the culmination of a large number of more or less lengthy, yet successful flights that have been made by this aviator with his "No. XI." machine since it was first brought out last January. Some of the more recent of these flights we mention herewith.

During the past two months, M. Bleriot has been experimenting almost daily with either his "No. XI." or "XII." monoplane. The former of these he has kept at Issy-les-Molineaux, while the "No. XII." machine has been at Douai. On June 8th he made two excellent 500-meter flights with the latter at Issy-les-Molineaux, the first alone, the second with his mechanic as passenger. On June 11th he made several short flights of from 500 to 600 meters in length, keeping the machine close to the ground; and afterward a magnificent flight of fully a mile, which was terminated by a double S turn at a height of 15 feet. With M. Guyot as passenger, another flight of 1½ kilometer (nearly 1 mile) at a height of 7 meters (23 feet) was accomplished. The following day M. Bleriot made a straight-line flight of about 250 meters (820 feet) with Santos Dumont and A. Fournier as passengers. This was the first time that three people had flown in an aeroplane. The same day several other flights were made with one passenger, the longest of these being about a mile in length at a height of 20 feet. By himself, Bleriot afterward flew about 3 miles.

On June 14th Bleriot made some more flights with his "No. XII." monoplane. After a short flight of 4 kilometers (2½ miles), he landed to repair his magneto. As soon as this was accomplished he made a magnificent flight of 10½ minutes duration, in the course of which he turned his machine in all directions and executed various maneuvers that demonstrated thoroughly its stability. Several times he took his hands off the steering wheel. The next day, after making a 5-minute flight at a height of 20 feet, he flew with a passenger, but the flight was stopped by the breaking of a connecting rod of the 8-cylinder motor.

On June 18th, Bleriot began flying again his "No. XI." monoplane, fitted with a 3-cylinder Anzani air-cooled motor of about 25 horse-power. He made a flight of 4 kilometers (2½ miles). On the 21st he made flights of 3 and 6½ minutes, the motor stopping from lack of oil. Just as he was starting on a third flight, the exhaust from the motor set fire to the gasoline in the carbureter, due to the latter being placed too near to the exhaust pipe. The flames were quickly extinguished with sand.

On June 25th, he took out his machine about 7 P. M., and, notwithstanding a quite heavy wind, he flew for 15½ minutes, making about 12 circuits of the parade ground and showing perfect stability in spite of the violent wind gusts. Each time he passed over the aeroplane shed he took his hands off the steering wheel. The flight was terminated because of too much oil, which fouled the spark plugs. The flight was officially timed by M. Ernest Zens. At 7 A. M. the next day Bleriot made a record flight consisting of 20 circuits of the parade ground in 36 minutes 55 3/5 seconds. In the early evening he made three more circuits.

On Monday, June 28th, Bleriot started making flights at Douai with his "No. XII." machine. He won the first of five prizes of $400 each in a magnificent 1½-mile flight at a height of 65 feet. In a second flight made on this day, he carried a passenger once around the field.

On June 30th, he tried to break his previous record at Issy with his "No. XI." machine, but after flying only 650 feet, the engine stopped on account of too much oil. Shortly after, he remedied this trouble, and then made four excellent circuits of the parade ground at a speed of over 37 miles an hour. The time of the flight was 6 minutes, 11 seconds. There was a gusty wind of from 15 to 20 miles an hour. More lubrication trouble was the cause of his alighting.

On July 4th Bleriot set up a new record at the Aerodrome at Juvissy. This record was made at an aeronautic meet for the benefit of the many people who suffered from the recent earthquake in the south of France. The flight this day was made with the "No. XI." machine. After making one circuit of the course, Bleriot started upon his long flight. This flight lasted 50 minutes and 8 seconds. It was brought to a close through trouble with the gasoline feed. The flight was made at a height that varied from 50 to 80 feet, and it was the best Bleriot had made up to that time.

On July 9th and 10th, at Douai, he made several flights before 20,000 spectators; but his greatest performance prior to that of July 25th was his cross-country flight of 25 miles on July 13th. This flight from Etampes to within 8 miles of Orleans was accomplished early in the morning and was broken by a descent in a field near Barmainville. The flight was for the "Prix de Voyage." While it was not necessary to make a descent, Bleriot chose to do this so as to show

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the practicability of his machine. Soon after he started up again, Bleriot passed Toury and Dambron. As he came in sight of Artenay, which was the half-way point of the cross-country flight last year, a rather strong wind from the west caused him to make a semi-circle. He flew sufficiently high to clear the telegraph wires and then came to earth on the selected spot at Croix-Briquet-Cheville. The start was made at 4:44 A. M. and the landing took place at 5:40. Deducting the 11-minute stop, the net time was 45 minutes and the distance 41.2 kilometers (25.58 miles). The average speed was therefore 34.1 miles an hour. In making this flight Bleriot received a prize of 5,000 francs as pilot and 4,000 francs as constructor. The motor manufacturer received 3,000 francs and the designer of the propeller 2,000 francs. All these prizes are conditional upon the performance not being beaten before the first of next January. The practicability of Bleriot's machine is shown by the fact that 35 minutes after he had alighted the machine had been taken apart and shipped back to his factory at Neuilly, near Paris.

M. Bleriot's two latest aeroplanes have been illustrated and described heretofore in our columns, but it would perhaps be well to give the particulars of these machines again at the present time. The spread of the "No. XI." is 7.8 meters (25.58 feet) and the length of the body 7 meters (22.96 feet). The lifting surface is 14 square meters (150.69 square feet). The machine is equipped with a 3-cylinder Anzani air-cooled motor which weighs 60 kilogrammes (132.27 pounds) complete in running order. A 2.1-meter (6.88-foot) diameter Chauviere wood propeller is driven direct from the motor. Complete with Bleriot (whose weight is said to be 195 pounds) and with fuel sufficient for a two-hour run, the "No. XI." machine weighs but 300 kilogrammes (661.38 pounds). It rises in the air at a speed of 55 kilometers (34.17 miles) per hour when the surfaces are loaded to the extent of 22 kilogrammes per square meter (4.46 pounds per square foot). This is about double the weight carried per square foot of surface by most bi-planes. It is probable that this machine, which is the smallest and lightest that Bleriot has built, is able to raise even a greater weight. It might perhaps carry an extra passenger, although this has not yet been tried. The plane is said to be warpable, somewhat similar to those of the Wright bi-plane. Consequently, there are no wing tips. The "No. XII." monoplane, on the other hand, has rectangular balancing planes attached to the body framework just below the aviator's seat. It is somewhat surprising that planes so near the center of the machine will work satisfactorily for this purpose, but photographs of the "No. XII." making a turn show that it tips very little. Bleriot has two vertical surfaces on each side of the body at the front end and he has also covered the framework about half way back to the rear end and placed a fin keel above it. As a result of all this vertical surface the machine does not tend to skid very much in making a turn, and consequently it does not have to be tipped inward to counteract the effects of centrifugal force.

The "No. XII." monoplane has a spread of 9 meters (29.52 feet) and a surface of 22 square meters (236.8 square feet). It is equipped with an 8-cylinder V-type E. N. V. motor of 30-35 horse-power. The total weight of the monoplane in running order with water in the radiator, but without fuel, is 350 kilogrammes (771.61 pounds). With Bleriot, Santos Dumont, and A. Fournier on board, and with 16 kilogrammes (35.27 pounds) of fuel, the total weight was 560 kilogrammes (1,234.58 pounds). Therefore this machine, which weighs only 350 kilogrammes (771.61 pounds) carried a dead weight of 210 kilogrammes (462.97 pounds). The total weight lifted per square foot in this instance was 5.21 pounds—an altogether unprecedented amount. The machine rises at a speed of 55 kilometers (34.17 miles) per hour with 25 kilogrammes per square meter (5.12 pounds per square foot) loading of its single surface. The weight lifted per horse-power varies from 35 to 41 pounds, according to whether the motor is taken as developing 35 or 30 horse-power. This monoplane is therefore by far the most efficient aeroplane flying machine that has ever been constructed.

After his record flight M. Bleriot was presented with a gold medal by the Aero Club of Great Britain and also by the Aero Club of France. A few days before, he and Gabriel Voisin had been awarded the Osiris prize, which is given every three years to the men who make the greatest advance in science. He was also decorated with the ribbon of the French Legion of Honor, as were the Wright brothers. In addition to winning the prize of the London Daily Mail ($5,000), Bleriot also won a prize of $2,500 offered by a French wine firm two years or more ago. The Alaska-Yukon Exposition has put up a prize of $25,000 for a race between Bleriot and the Wright brothers.

ELECTRIC LAMPS IN THE MAKING.

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the bulb are then joined together. The operation is known as "tubulating," and the tube thus made temporarily a part of the bulb furnishes the means for the removal of the air inside at almost the final stage in the manufacture of the lamp.

With the filament now made and the bulb washed, cleaned, dried, and tubulated, the filament-bearing stem and the bulb proper are assembled at one machine. The operation of sealing these two parts can best be likened to inserting a stopper in a bottle; the bulb being the bottle, and the stem the stopper. A girl inserts this stem into the neck of the bulb, and both parts are revolved on the sealing machine into jets of flame, where they melt together. Knowing the exact amount of glass that must be melted away and the shape the molten glass will assume when it cools, the operative is able to unite the stem and bulb skillfully.

Then the bulb goes into another tray along with other bulbs, and is taken to a girl in the vacuum room. This girl is seated before an earthen pot in which there is a bubbling liquid—phosphorus in a liquid state—which is kept stirred by a jet of water. She takes the bulb, and with a brush hardly larger than a knitting needle coats the air-extraction tube with a phosphorus solution.

After this the bulb is ready for the exhaustion of the air and final sealing. Already the air has been drawn from the bulb several times in the processes of manufacture, but each time the bulb has been left unsealed. It is now ready for the final air test. The tube at the big end of the bulb, through which the air is withdrawn by a most ingenious pump, is to be sealed by melting.

When the bulb is placed in position for exhausting the air, the wires running through the neck are connected with an electric current, which causes the filament to glow. If it were allowed to glow more than a few seconds with oxygen present in the air, the filament would burn up and collapse So, while the tube is connected with the vacuum pump, the operative touches it with a blue flame spray which melts bulb and stem apart, and the melted end next to the bulb draws up and closes automatically, leaving the little point seen in the finished bulb over your desk or table. Before the sealing is completed the light within the bulb has a bluish cast, and this reveals the fact that all the oxygen has not yet been withdrawn from the bulb. It is then that the coating of phosphorus in the air extraction tube plays its part. The heat upon the tube converts the phosphorus into a phosphorescent gas, and this gas, entering the bulb, neutralizes the oxygen in the bulb. Almost instantly the color of the bulb changes from blue to white. In this manner the operative

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