

# Another Attempt to Solve Aerial Navigation Problem

## Flying Machine Invented by the Wright Brothers Sails Through the Air Without Aid of Balloon or Gas Bag--Working On It in Secret for Years.

**A** FLYING machine, or aeroplane, constructed by two young brothers, Orville and Wilbur Wright, has been propelled by its own power and without any aid of balloon or gas bag, for a distance of twenty-four miles in thirty-eight minutes, or at the rate of very nearly thirty-eight miles an hour.

These young inventors are the sons of a minister, now residing at Dayton, Ohio. They have been experimenting in strict secrecy for several years, but their final success is to be made public in connection with the exhibition of the Aero Club, to be held in conjunction with the Automobile Show at the Sixty-ninth Regiment Armory, Jan. 13 to 20. A model and photographs of the machines in flight will be there on view.

Not more than a dozen persons have been in the secret. Among these is A. L. Root, the apiculturist of Medina, Ohio, from whose statements the following details are mainly derived. The chief facts have been indorsed by members of the Aero Club.

The Wright brothers first turned their attention to the subject of aeroplanes when, as boys, they made an apparatus on which they could slide down hill in the air a few inches from the ground. They made a number of these gliding machines, and experimented with them during their Summer vacations until they found that they could to a considerable extent control their movements while in the air, and turn them from side to side, as well as slightly up or down. They then began the study of the flight of birds and insects, and read up the history of the numberless attempts that have been made to solve the problem of aerial navigation. The Wrights now possess one of the largest collections of books on this subject in the world.

Thus the boys developed into scientific explorers. They were familiar with what others had done or were trying to do, and they laid their own plans so

carefully that there has been no waste of effort, but a progressive accumulation of experiences on which to build up both theory and practice. At the same time they have maintained a discreet and consistent silence.

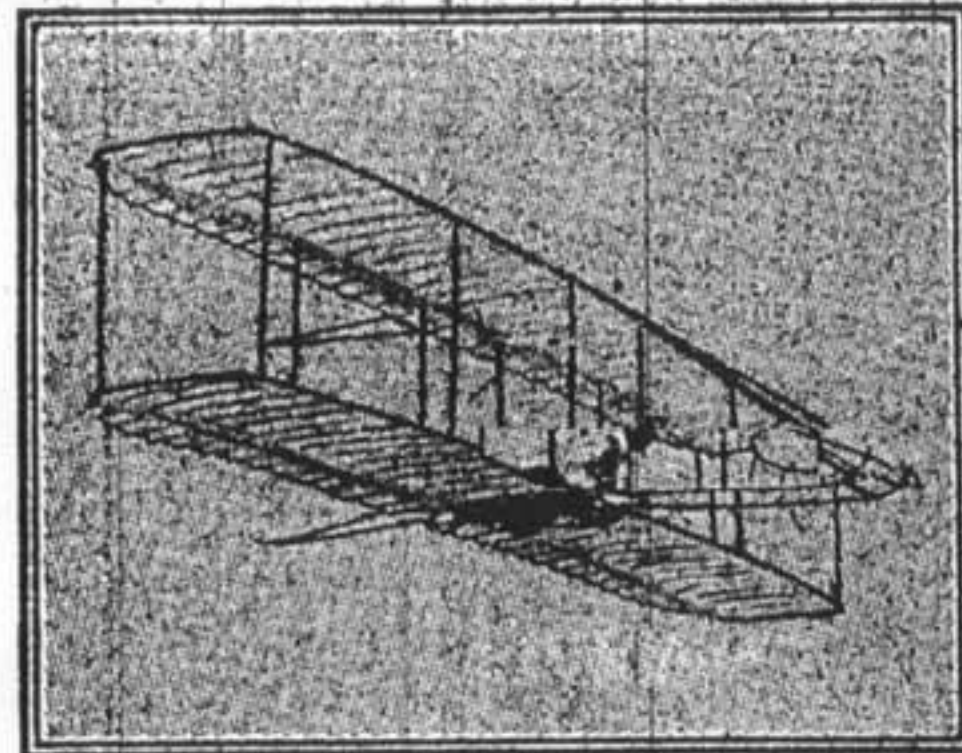
They experimented with their gliding machines for several Summers. They used to glide down hill against the wind, so that the wind helped them to carry the machine up again. When they were satisfied both that the wings were constructed as nearly perfect as possible, and that they were able to control the machine within broad limits, they bought a gasoline engine, attached a propeller to the apparatus, and obtained some slight success in flying through the air at the end of the Summer of 1903.

They resumed their secret experiments in the Summer of 1904, and conducted their investigations in a large level field of eighty-seven acres of pasture near Dayton, Ohio. The location allowed them a straight run of about half a mile, and a circular course of a little less than a full mile. In their first trials with gasoline propulsion they kept near the marshy ground, but this precaution proved unnecessary, because in none of their experiments did any accidents happen that occasioned more than a scratch either to the machine or the brothers.

At first the aeroplane, when driven by the engine, persisted in going up and down with a wave-like motion, but when, after a large number of trials, fifty pounds of cast iron were placed on the "nose" of the machine, or at the head of the forward steering gear, this fault was remedied. Other defects were likewise overcome with patience and ingenuity.

Toward the end of the Summer of 1904 the brothers were able to fly one at a time in their machine for a few seconds, and to attain a height of fifty or sixty feet above the ground. On these short flights, and going against the wind on the straight course, they attained a velocity of from thirty to

forty miles an hour, with the ballast increased to seventy pounds. They did not at that time try going with the wind, but they experimented turning corners, until on Sept. 20, 1904, the aeroplane went round the circular track of about one mile and came back to its starting point without touching the ground once. This achievement was witnessed by Mr. Root and a few others, and proper notes were made of the



ORVILLE WRIGHT IN HIS GLIDING MACHINE.

facts connected with the event. In the next few weeks they succeeded in making as many as four complete circles without alighting, and on one flight the machines remained in the air for five minutes and twenty seconds.

The last flight of the season, made on Dec. 1, could have been prolonged but that the operator's hand became cramped on the rudder. In the season

of 1904 altogether a hundred flights were made, and certain facts as to the behavior of the aeroplane had been positively ascertained. In rounding corners it was found that it was necessary to ascend to at least twenty or thirty feet, so that the tip of the inner wing (the wings being forty feet long) would always clear the ground. The machine turns corners in the same manner as a bird, by raising the outer wing. In the earlier trials the machine was always run against the wind, so that the operator would be longer in the air, and have more opportunity to make experiments, and also because the inventors did not at first wish to go very far from the shed in which the machine was housed. After they found that they could turn around, they felt it advisable to start with the wind, and in this way, for short distances, they attained a speed of one mile a minute.

Last Summer the experiments were continued, and late in the Fall the machine, with one of the brothers on board, went round and round the circular track for a distance of twenty-four miles in thirty-eight consecutive minutes, or at the rate of nearly thirty-eight miles an hour. On the half-mile straight portion of the course the speed was greater. This flight was accomplished at a height of from seventy-five to one hundred feet above the ground, but no attempt was made to drive the engines at the fullest speed nor to mount any higher. The gasoline gave out at the twenty-fourth mile; but seeing that forty pounds of ballast were carried, it would have been easily possible to carry enough fuel for a full hour's flight or even longer. But the Wright brothers have not sought for spectacular success, such as flying from city to city, but are determined to go along step by step and test everything that they do.

The Wright aeroplane consists of two wings or planes, forty feet long, about four feet broad, and arranged above each other on a slight wooden framework, with the planes about five feet apart. The

sails are of white canvas, and the framework, strengthened by diagonal wire braces, is painted white. The "planes" or wings are not strictly speaking planes, but each is slightly concave. The front edges of the wings are stiffened by means of light wooden rods, but at the rear the canvas is free to bend. The whole construction is built on the same principle as the wing of an albatross, except that it is rectangular in shape. In the middle of the machine, a rudder, controlling the up and down movement, projects about six feet in front, and a turning rudder is attached in a similar manner at the rear. The front rudder is a small independent plane, which can be raised or lowered by the hand of the operator. The rear rudder consists of two vertical planes made to rotate on a pivot.

The operator reclines across the middle of the lower wing and the gasoline engines are beside him. The engines are of aluminium, and of about the power required to drive a two-passenger automobile. Each of the two engines has four cylinders, which drive a shaft stretching out at the rear. On each shaft is a two-bladed propeller working on either side of the back rudder. When preparing for a trip through the air the machinery is started and gets up speed gradually, and at the right moment an ingenious tripping device releases the mooring, and the aeroplane quickly soars aloft from the short metal track on which it reposes when not in use. The aeroplane can be started as quickly as an automobile. When the power is shut off while flying, the apparatus glides quietly to the ground and slides along its runners for perhaps six yards. There is no difficulty in alighting on a fairly smooth field, and it is found better to come down while traveling at a good rate, say, thirty miles an hour, rather than to drop down straight on stopping the engine. Speed can be reduced by raising the forward rudder, so that the air acts as a brake.