

## “COANDA 1910” JET AIRCRAFT – THE FIRST JET AIRCRAFT OF THE WORLD

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**Abstract:** We are now celebrating one hundred years from the test of the world first jet aircraft. This aircraft was designed, built and tested in France by the Romanian inventor and engineer Henri Coanda, at the age of only 24 years. The moment we consider that attests the first run of this jet aircraft, seems to be the test of the aircraft from the 16th of December 1910, from Issy les Moulineaux, near Paris, France. It wasn't really a controlled certified flight, because Henri Coanda didn't intend to fly in that day, but we believe that the plane left the ground for a moment, before it hit the wall around Paris, and caught fire.

**Keywords:** Henri Coanda, “Coanda 100” Jet Aircraft, first jet aircraft.

### 1. THE INVENTOR

Henri Coanda was born in Bucharest in 1886 on 7th of June.



Fig. 1 Henri Coanda at the 24 years old [1]

At the 24 years old, at the moment of the testing of the first jet aircraft, Henri Coanda was qualified as aero-engineer, licensed of Paris and Liège Faculties, as it was mentioned inside the paper presented that next to his jet aircraft.



Fig. 2 Henri Coanda's *Diplôme d'ingénieur* [2]

At only three years after the test of the first jet aircraft, Henri Coanda was designated the MEN of the MOMENT IN THE WORLD of FLIGHT – 1913 as a technical director at *British and Colonial Aeroplane Co.*



Fig. 3 Henri Coanda's *Diplôme d'ingénieur* [3]

Henri Coanda was Rodin's student and he was friend with Constantin Brancusi. One of Coanda's sculpture, made near after the dead of his first child Monique (possible 1911), is „Christ en Croix”, from Migne Auxaunce Church, near Poitier, France.



Fig. 4 Christ en Croix

It was the first ever jet aircraft ever built and presented at *The Second Aeronautical Exhibition* from Paris, in October 1910.

The first jet aircraft in the world was designed, built and tested by the brilliant inventor and engineer Henri Coanda, when he was only 24 years old.

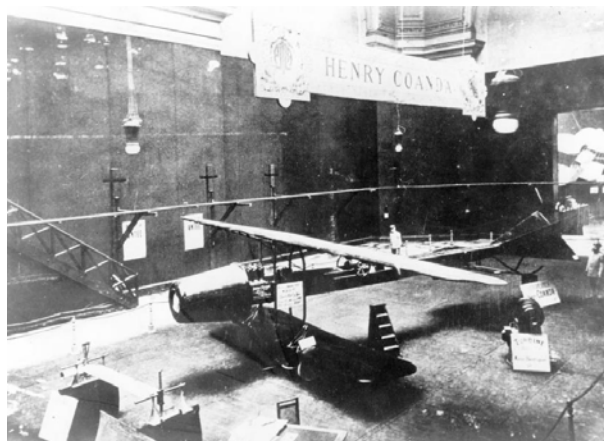


Fig. 5 Coanda 1910 [4]

**Type of the aircraft:**

- biplane with two known places (maybe even three places or luggage place);
- jet without propellers, using „turbine” (in according with the name that Coanda gave it in 1910), means centrifugal compressor after nowadays name.

**Dimensions and performances:**

- Span: 10,3m,
- Chord: 1,75m,
- Length of the aircraft: 12,5m,
- Lift surface: 32sqm,
- Wing charge: 33kg/sqm
- Weight, without pilot: 420kg,
- Thrust turbine: 220kg at 50HP

**Main structure:**

- wood and steel fuselage, covered with thin wood plates;
- rounded triangular fuselage sections, having in the back of it, a tail having the St Andrei cross shape;
- airfoil that has a central moving point;
- unequal wings;
- aerodynamic nervures at the down part of the wing;
- landing system with two wheels and two slades in front and the back of the plane.

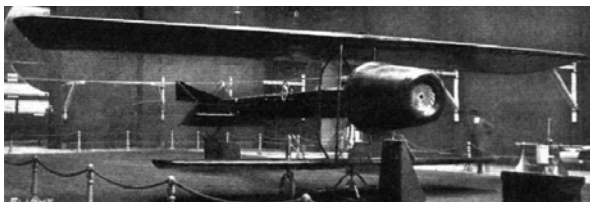
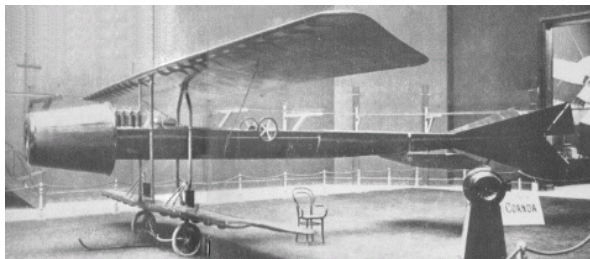


Fig. 6 Coanda 1910 [4]

- longitudinal stability done by the St Andrei cross shape of the tail, for vertical and horizontal movements;

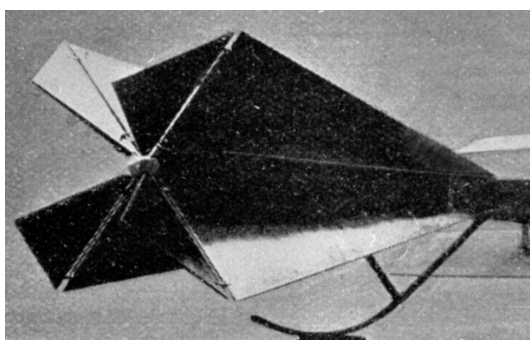


Fig. 7 Coanda 1910's tail [4]

- two separate hand wheel for tail control, that if they were simultaneous acting, were done up and down movements and if they were differential acting, were done lateral movements.

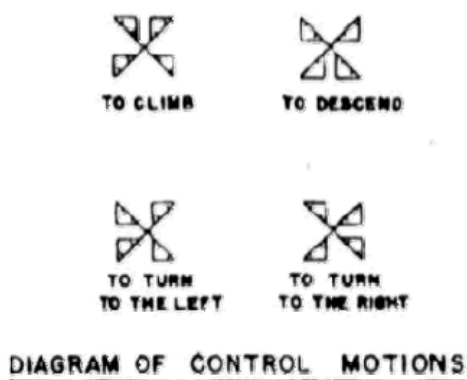


Fig. 8 Diagram of control motion [5]

**Thrust:**

- thrust done by turbine reaction inside the engine(in according with the name done by H. Coanda back in 1910);
- jet thrust (in according with the actual definitions).

**2. 50HP CLERGET TYPE 4V PISTON ENGINE**

The jet system were made from a single 50HP CLERGET type 4V piston engine +multiplicator speed up to 4000rpm +metal centrifugal compressor (two known variants) +injectors and burners (in according with Coanda says).

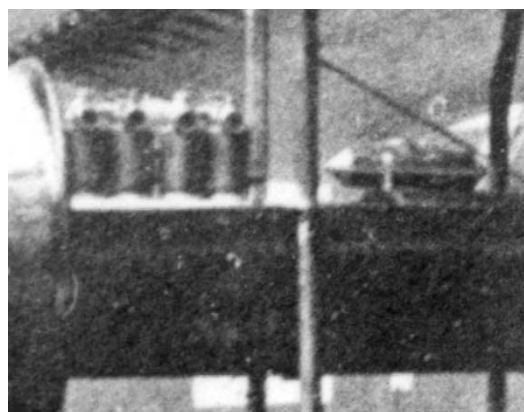


Fig. 8 50HP CLERGET type 4V piston engine

A similar engine from 1909, is now expose at the Technic Museum fromVienna, in according with Aircraft Engine Historical Society - AEHS.



Fig. 9 A similar engine [6]

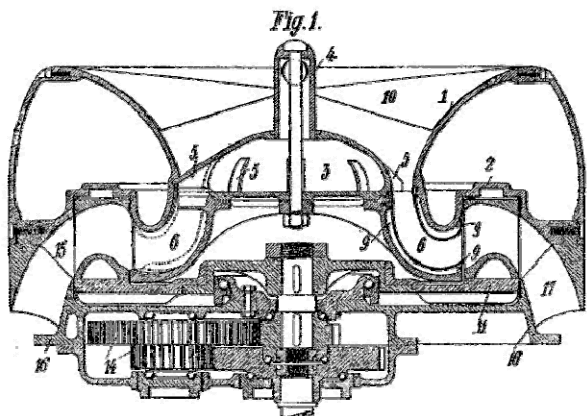


Fig. 10 Multiplier speed up to 4000 rpm

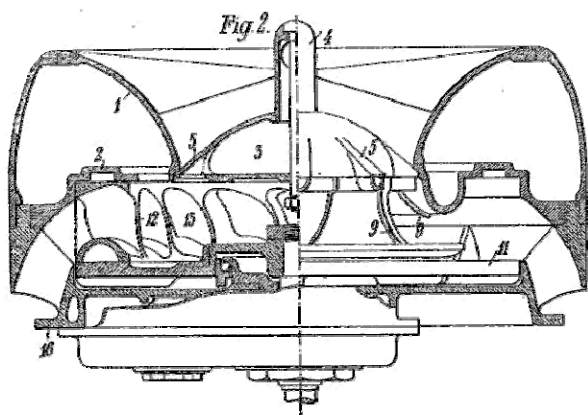
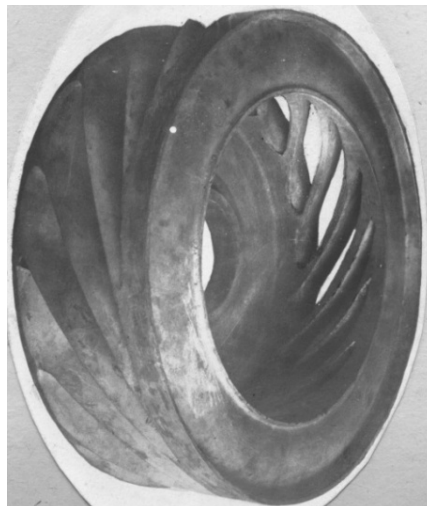


Fig. 11 Metal centrifugal compressor (two known variants)



Fig. 12 The rotor and static parts

The rotor of the Coandă 1910 jet aircraft was made to accelerating air, similar to a centrifugal compressor, with rotation per minute up to 4000, placed in a conique shape.

The second way for building the 1910 jet thruster was indicated by Coanda, late in December 1910, similar to next one, indicated below.

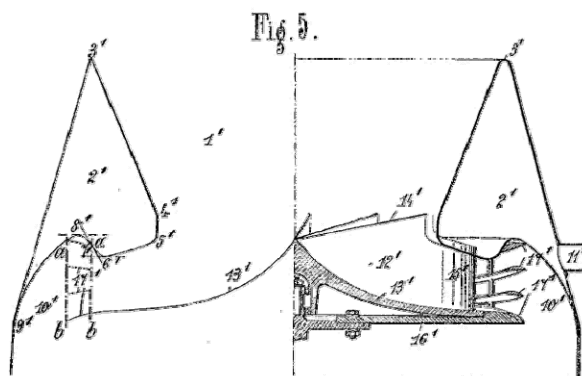
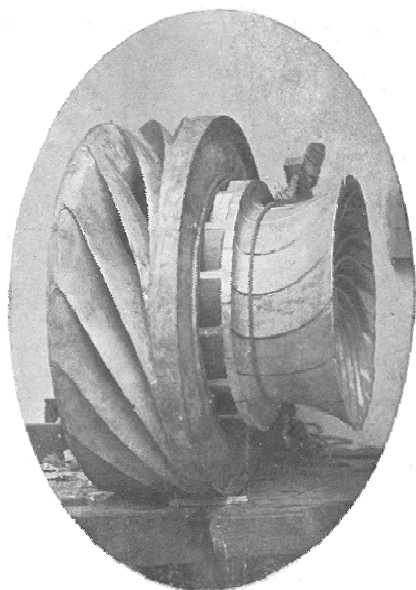


Fig. 13 The second way for building [7]

This device was used to thrust the Gregoire-Coanda slide, with a 30HP Gregoire engine, with near to 50 miles/hour, in according with its marketing texts back to December 1910.

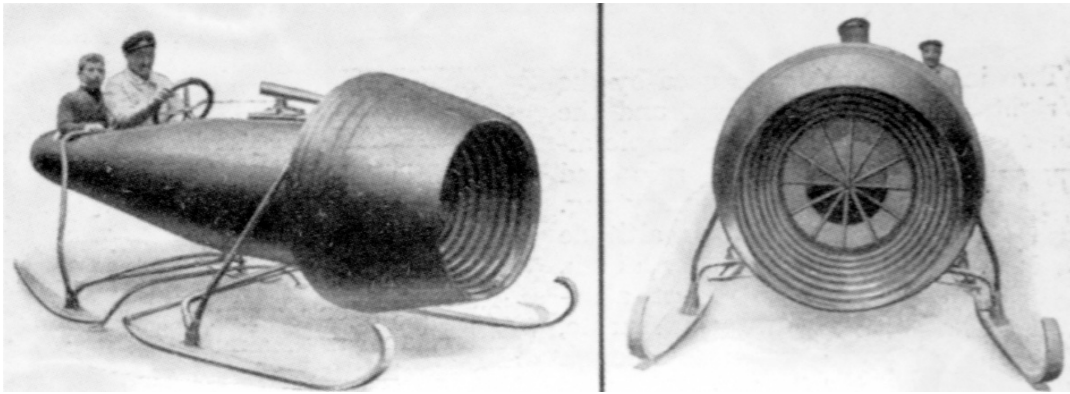


Fig. 14 Drawings from popular Mechanism from March 1911

The slide was a special order from the Grande Duke Cyril of Russia and was baptized by the priests of the Russian Church.

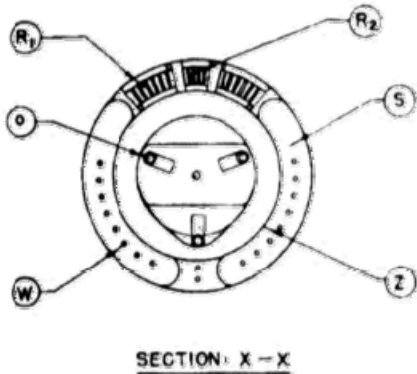


Fig. 15 Injectors and burners (in according with Coanda says later in 50's) [5]

The jet system According to what Coanda says later, after the World War II, the 1910 thrusters has after the turbine (rotor) a burner having two „reactive tubes” placed in „both parts” of the wooden fuselage.

In these tubes probably were placed a burning process capable to generate two „powerful flames” that produces a „temperature that feels too much” enough to determine the young pilot (Henri Coanda) to „cover these flames, up and down, using two mica plates”.

It seems to be the main cause of burning the hole aircraft. We believe that during May 1910 and December 1910 the jet aircraft *Coanda 1910* had supported many updatings, many of this never had been drawn or patented.

### 3. THE TEST MOMENT

**Place.** In according with Coanda says the main test was at the 16th of December 1910 at Issy les Moulineau near Paris.



Fig. 16 Issy les Moulineux [8]

**Weather.** In the 1910 was recorded grate floods in Paris and Issy les Moulineaux.



Fig. 17 Airfield in fold [9]

According to Mr. Cyril Dupont researches about the weather in Paris of 1910, it had been raining every day between 1st and 15th of December and between 18th and 19th of December. In the 16th and in the 17th the weather was calm with no rain. The 16th of

December was the date of the first test of the first jet aircraft. It was Friday.

**The test.** In according with Coanda says, the main test done in a December cold morning, without any officials because he didn't intend to make any decisive test, but to move the aircraft with the turbo engine in running. For the time being, we have only Coanda's testimony during recorded and written interviews, late after the World War II. This first flight was described by Coanda in 1964 as follows [10]:

*“The machine gained height much faster than I thought; it was not my fault, but after a while it entered a glissade, stroke the ground and burned completely. I was very lucky I was not tied on the chair, such that I was pushed out when the airplane stroke the ground; otherwise I would have burned with it.*

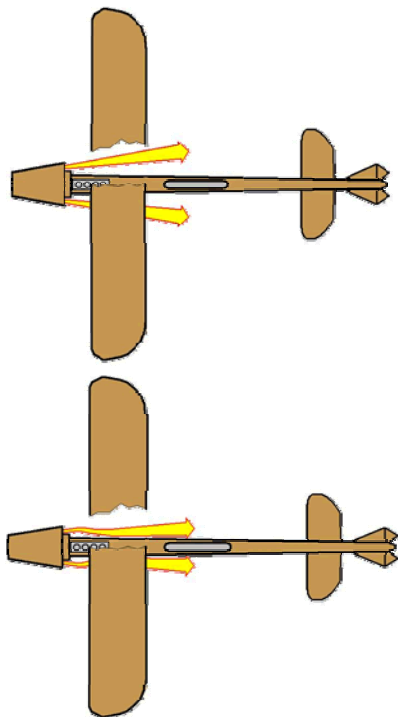


Fig. 18 The first flight

*In 1910, the wind tunnel was unknown but I found a way to test the design. I mounted the wings on a railroad locomotive and was able to watch their performance in this fashion. Finally, after all the tests were over and the machine assembled, we prepared for the first experiments. In December, we brought the air*

*plane out of its hangar at Issy-les-Moulineaux and, after a bit of coaxing, started the motor.*

*I must admit that I was never a very outstanding pilot. I always seemed unable to shake off a vague apprehension and, that morning, in addition to my usual uneasiness, I was rather excited.*

*I climbed into the cockpit, accelerated the motor, and felt the power from the jet thrust straining the plane forward. I gave the signal to remove the wheel blocks, and the plane started moving slowly ahead. I had anticipated that I would not attempt to fly today, but would make only ground tests on the small field at Issy-les-Moulineaux.*

*The controls seemed too loose to me, so I injected fuel into the turbine. Too much! In a moment I was surrounded by flames! I had to cut back and reduce my power quickly.*

*I worked the throttle and the flames subsided. Only then did I have opportunity to lift my head. I saw that the plane had gained speed, and that the walls of the ancient fortifications bordering the field were lunging toward me. I pulled back on the stick, only much too hard.*

*In a moment, the plane was airborne, lunging upward at a steep angle. I was flying . . . I felt the plane tipping . . . then slipping down on one wing.*

*Instinctively, I cut the gas with my left hand and the jet fuel with my right. The next thing I knew, I found myself thrown free of the plane, which slowly came down, and burst into flames. It was impossible to determine from the wreckage whether the celluloid or the fuel was the cause of the fire.*

*But the test was over. I had flown the first jet airplane.” [11]*

### 3. THE TIME AFTER THE TEST

#### A financial disaster

*“... I was lucky, so very lucky to have general Coanda for my father. He was not only a father to me, but also a friend, a counselor; he used to be a professor at the Polytechnic School, he had a PhD at Sorbonne, although he had been an officer, he graduated from the Polytechnic School in*

*Paris, all in all, he was a man of an extraordinary refinement and quality. And, at that time, having this opportunity, all that came to my mind could be achieved due to him. Americans asked me about the way I managed to sustain the construction of my first jet airplane financially. I could only tell them that it was achievable once I had started to write...*

*'Oh..., they wondered, so you are a writer!'*

*I replied 'No, I am not.' I was writing to my father! The truth is that but for my father and family – who disappeared – I could not possibly build my first jet airplane... I did not only make the whole reactor, by drawing it and building it, but I had to design the entire airplane system – at a time when nobody had any idea of how it can be made. I used to have a friend, named Bleriot, who used to manufacture car headlights and was also trying to make an airplane, but to me, building the first jet airplane turn into a disaster, from a financial point of view. From the technical perspective, it was extremely interesting, though, because only after I had built it I realized what was that we, today, call the Coanda effect... It was an accident... I could*

*see the flames coming out towards the fuselage. This system proved to be the Coanda effect later on, but it took me 20 years until I realized what phenomenon had caused the flames to be led from their axis towards the wooden fuselage of my airplane." [12]*

## REFERENCES

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