

BULLETINS

OF THE

Aerial Experiment Association

Bulletin No. v Issued MONDAY, AUG. 10, 1908

MR. McCURDY'S COPY.

BEINN BHREAGH, NEAR BADDECK, NOVA SCOTIA

Bulletins of The Aerial Experiment Association.

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BULLETIN NO. V ISSUED MONDAY AUGUST 10, 1908.

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Beinn Bhreagh, Near Baddeck, Nova Scotia.

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The members of the A.E.A. would do well to consider what is to be done with the Association after September 30, 1908 when the Association expires by limitation unless otherwise decided by vote of the members.

We have already completed three successful aerodromes, associated with the names of Selfridge, Baldwin and Curtiss. McCurdy's aerodrome No.4 will soon be ready for trial, and Hall's tetrahedral aerodrome No.5 will not be long behind. There may also be time for another tetrahedral aerodrome on the Oines plan employing a tetrahedral framework and both oblique and horizontal surfaces. We certainly can do no more than this before September 30, and then what?

We cannot stop although the object of the Association at its inception has already been attained. The limit of our desire in the beginning was to "get into the air" by hook or by crook, and in any sort of a heavier-than-air machine in the nature of "an aerodrome propelled by its own motive power and carrying a man". We have made three successful aerodromes and more will doubtless follow, and four of us have already been in the air. Can we be satisfied with this, and cease our labors? We know we cannot; but we have already nearly reached the limit of our financial resources and we must consider ways and means and the best mode of procedure.

We now desire to push our aerodromes into commercial use and go on with improvements upon them. This means that we must find a company to take up the commercial end, and continue an Experiment Association to improve our apparatus.

The first step towards commercial use has been taken by instigating a patent investigation to find out whether we have accomplished anything patentable that could be sold to a company. The report of Maure, Cameron, Lewis & Massie has not yet been received. The next step in the same direction should be the appointment of a Trustee for the Association to whom should be turned over any patents we may obtain, and all rights we may have of a commercial nature, such as rights to manufacture and sell our aerodromes, or exhibit them for money. Our Trustee should be a business man familiar with the organization of companies. He should be empowered to organize a company, or sell our rights, whatever they may be, to some company approved by him, and be instructed to turn over the proceeds to the Association, whether in cash, in fully paid up shares of the Company, or in any other form, to be divided up in accordance with our agreement of organization. This is all we can do at present to promote the commercial side of our investigation. Appoint our Trustee and let him attend to the commercial matters. Mr. Charles J. Bell would be an admirable man for Trustee, but it is very doubtful whether he would accept. He is also a very busy man and could not give much time to the affairs of the Association. Mr. Curtiss has closer affiliations with business men than any other member of the Association and perhaps he may be able to suggest the name of a suitable person to act as Trustee.

In continuing experiments to improve apparatus, it might be well to consider whether it might not be advisable to broaden out into an Association to promote experiments in

Aviation in America, increase our membership, and go to the public for donations and bequests in aid of experimental work. Your Chairman for one, would willingly donate to such an Association any proceeds that might accrue to him personally from our experiments in Aviation, and Mrs. Bell and others would probably contribute. A membership fee might also be charged sufficient to cover the cost of any printed publications.

Such an Association would have to be incorporated in legal form and it would probably involve the dissolution of the present Association to secure to the present members the proceeds of their researches without having to divide with new members. A new Association, on an enlarged basis, might promote the progress of Aviation generally in America (1) by interchange of thoughts between the members through periodically issued Bulletins; (2) by making grants of money to individuals to assist experiments in Aviation; (3) by examining and reporting upon plans relating to apparatus for Aviation, and in other ways.

Inventors as a rule are poor men and find difficulty in obtaining capital to put their inventions into operation. Capitalists, as a rule, are ignorant of what has been done in Aviation, and hesitate to embark in a new enterprise without some assurance of success. A favorable report from the Association, showing that proposed experiments are worthy of encouragement, would undoubtedly prove of value to inventors, and aid them in gaining the ear of Capitalists, thus helping the progress of Aviation in America.

Grants:- In making grants of money to individuals various stipulations might be made. The results of the experiments for example, should be communicated to the Association and published in its Bulletins. It might be agreed that the money should be returned to the Treasury of the Association with interest should the researches prove remunerative, or perhaps an equivalent in fully paid up shares of the exploiting Company.

These are simply a few thoughts for the consideration of the members. Another plan would be to continue the Association as at present organised for another limited period of time, arranging with Mrs. Bell for continued financial aid.

A. G. B.

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FARMAN AND ST. LOUIS.

Another subject for serious consideration arises from Farman's visit to America.

It is a very tempting proposition to race the June Bug against Farman's machine for the honor and glory of America and the A.E.A., and incidentally to make some money for the Association. It is a very tempting proposition to exhibit the June Bug at St. Louis and receive the sum of ten thousand dollars. Such propositions, however, cannot be entertained by us.

Our Association has been organized for experimental purposes only, and we have unfinished experiments upon our hands that should occupy our attention quite up to the end of September.

Such exhibitions belong to the commercial stage of development not to the experimental, and might well be undertaken by a company organized to exploit our work, but not by us.

If we authorize public exhibitions of our aerodromes involving pecuniary transactions or emoluments, we at once lay ourselves open to attack from numerous inventors who will claim that we are infringing their patents, and we will be obliged to defend ourselves. The letter from Orville Wright in the present Bulletin indicates clearly what would happen and the Wright Brothers would not be the only aggressors.

We cannot control the expenses of litigation in which we appear as defendants, and we have no funds that could be used in our defense. As we are not a legally incorporated

Association each member would be liable for the debts and liabilities of the whole as in the case of an unlimited liability company and the wealthiest member of the Association would be compelled, against his will, to shoulder the expenses of litigation.

So long as we are an Experiment Association carrying on experiments, not for gain but simply to promote the art of Aviation in America, there can be no possible ground for legal action of any kind. But the moment we begin to make money look out for trouble. Litigation is certain to arise, and expensive litigation too. It would be rashness in the extreme for us to invite attack before we are ready for defence.

We should await the report of Haure, Cameron, Lewis & Massie so that we may know what we may justly claim as our own, and we should proceed as soon as possible to organize a company, or sell out to a company, so as to provide ample capital for any purpose. Whether we are placed in the position of plaintiffs or defendants we must have capital behind us to see us through, and an organized company will be a necessity.

The work of manufacturing and selling aerodromes and of exhibiting them to the public for gain properly belongs to such a company; and it would be unwise for us to attempt any of these things without a legal incorporation and capital behind us.

Telegrams.

To Dr. A. G. Bell,
Baddeck, N.S.

Hammondsport, N.Y., July 26, 1908;--Made four short flights,
Curtiss one, Selfridge three; landed safely; everything O.K.

(Signed) J.A.D. McCurdy.

To Dr. A. G. Bell,
Baddeck, N.S.

Hammondsport, N.Y., July 27, 1908;-- Had grand afternoon and
evening work-out with June Bug. Had many trials. Longest
flight brought machine and McCurdy to spot where Curtiss land-
ed July 4th. Time one minute and forty-five seconds. Mach-
ine absolutely intact. Curtiss has gone to Washington. Tom
leaves to-morrow night.

(Signed) J.A.D. McCurdy.

To Dr. A. G. Bell,
Baddeck, N.S.

Hammondsport, N.Y., July 28, 1908;---Tom in New York, Curtiss
Washington. Made eight flights to-day, three of which took
one minute and fifty seconds. Made turn but within six hun-
dred yards of starting point. Flight about sixty feet above
the ground. Machine intact.

(Signed) J.A.D. McCurdy.

Letters.

(Extract from letter to Mr. Bedwin).

Hammondsport, N.Y., July 11, 1908;-- We have made a lot of
changes in the machine; have shifted my position forward un-
til I am 4 1/2 feet further forward than on the Red Wing. The
same old engine is still doing the pushing. We are getting
up one with mechanical valves for B.B.

(Signed) G. H. Curtiss.

(Extract from Letter to Mr. Bedwin).

Hammondsport, N.Y. July 20, 1908:--- Everything O.K. on here. Are getting out material for new machine. Am making a few changes over June Bug. Giving greater lateral extension and larger tips. Having the body all covered in to reduce head resistance. Two propellers and stronger running gear.

(Signed) J.A.D. McCurdy.

To Dr. A. G. Bell,
Baddeck, N.S.

Hammondsport, N.Y., Aug. 4, 1908:---Assembling machine; delayed for cloth. Send samples as soon as arrive.

(Signed) J.A.D. McCurdy.

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(Extract from letter to Dr. Bell).

The Engineer's Club, New York, July 30, 1908:—I have just run down to New York for a few days (till Saturday evening) to see Farman fly. Besides being an interesting sight, we thought that we might glean a few ideas from him and his machine to incorporate in our new aerodrome.

As I telegraphed you from Hammondsport Selfridge left there a few days ago for New York and incidentally to pay a visit to Dr. Woods, who is spending his holidays on Long Island. I have not seen him yet as I only arrived the morning Curtiss went to Washington to help Capt. Baldwin with the Government Balloon.

The day Selfridge left we had (Selfridge and I) a grand work-out with the June Bug. It was my turn to attempt a flight, so I started off with the incident of the White Wing still fresh in my mind. I think that watching Curtiss fly so often has instilled into our minds the motions to be gone through with in handling the machine from just talking things over, and I was surprised myself at the ease with which I could manipulate the controls.

I got so much confidence during the short flight which was down to the railway track across the potato patch that next time I tried a longer flight and succeeded in going the full length of the field, two thousand yards and over in the time of 1 minute and 45 seconds.***Selfridge thought that he would fly back but the machine refused to support him after

carrying him in the air for about 200 ft. He made two attempts after changing trousers with Mr. Bradford to reduce his weight, also changing shoes with me.

The machine, however, even with these precautions refused to fly so we thought that perhaps my reduced weight of 30 lbs. would make the difference. I also made the attempt but with the same result.

We then pushed the machine through the first three fields to the end of the oats and then I tried it again, and it carried me back across the potato patch to the track. Now what was the meaning of this? Selfridge thought that it was due to the porosity of the surfaces which seemed to be again porous; and I thought that perhaps it was due to bad batteries. As Selfridge could not try again till the surfaces are revarnished he left Hammondspert that night, and I tried her again next day with new batteries. Well Sir, she flew beautifully, and carried me down to the limit of the field again; but as I made a few curves to test out the rudder, I was in the air for about 1 minute and 50 seconds. This time we pushed her back as before to the oats, and then I flew her home again.

The wind was by this time blowing just a little bit so we decided not to try again till the evening.

At six o'clock I tried her again and this time made a complete turn and got almost home about the middle of the potato patch when the power gave out and I dropped.

I tried several flights after that but each one was shorter than the preceding one owing to the power giving out in the engine.

I thought perhaps the fault lay in the gasoline pipe which fed the carburetter. I had Ingraham put in large ones, and I decided to stay over another day and try that turn again. I made the complete turn three times that day but always on the first flight, in other words when the engine was perfectly cool each flight lasting the same length of time 1 minute and 50 seconds. I had to go high in order not to strike the down wing on the ground in making the turn.

I think that some day a great artist who has great powers of description will describe in writing the feelings and sensations of the aviator. Mr. Bell I had perfect control of the machine and could have steered her anywhere. Please don't consider this as a brag, I only put it that way to try and convince you that we have absolutely mastered the control of the machine. You can either steer her round quickly or slowly as you will. I think the secret of making a successful turn is to go high (that is comparatively speaking of course).

I made a series of flights yesterday and completed the turn every time, but each time as before the power died away, and it turns out that the air-cooling is not perfect and will only cool for about 1 minute and 30 seconds, and allow the engine to develop its full power.

I think that we must have a water-cooled engine, one that will maintain a given power for a long period of time. I would suggest one similar to Capt. Baldwin's new engine which gave us a steady pull of 240 lbs. with a theoretical speed of advance of 50 miles an hour. I don't know whether I wrote this

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before but it is an astonishing fact. That engine will run in the stand for perhaps half an hour and develop its full power. What do you think about it? You know that the Frenchmen have discarded their air-cooled engine for water-cooled.

Couldn't we place an order with Curtiss for one to be got out at once in time to use on the new aerodrome; and then when we go to Baddeck we could take it along for the tetrahedral aerodrome?

I am satisfied that the air-cooled engine we are using will not sustain the machine in flight for over 2 minutes in a straight course. This seems to be borne out by the fact that each flight was shorter than the preceding one.

About the Farman-St. Louis proposition. We have not heard of the detailed arrangement yet, but we have been given to understand that we would secure \$10,000.00 to cover expenses if we would go.

Don't think that if such a proposition were definitely put to us we could accept, and make the public pay some of our expenses?

I think with a water-cooled engine we could give old Farman a good run for his money, and you would be pleased to."

(Signed) J.A.D. McCurdy.

WORK OF THE HAMMONDSPORT LABORATORY SINCE THE
FLIGHT OF THE JUNE BUG, JULY 4th, 1908: by
G.H. Curtiss, Director of Experiments.

After the winning of the Scientific American Trophy July 4th, we felt that it would be safe to do a little experimenting as we had accomplished our purpose and an accident to the machine would not be so serious as it would during the preparations for the Cup. Therefore on July 5th while the Aero Club members and visitors were still here, and after our little excursion and dinner on the Lake, we went to the testing grounds and got the June Bug out for the purpose of trying to fly it in a circle. The start was made as usual and after going about half a mile in a straight line, the writer attempted the curve. To do this, I steered, to the right with the rudder and inclined the right wing tip down at the same time by the movement of the shoulders. I made rather an awkward turn, either tilting the machine too much or not enough but finally got around and was headed back toward the starting point. The course back would have led over the vineyard and to avoid this, I attempted to make another turn to the right to get round the vineyard, and return over the same course I came out. I had probably lost considerable momentum on the first turn and the final cut down the speed to such an extent that I could not keep the machine in the air and had to make a landing. This broke a strut in the right wing which was depressed and also broke the front wheel. These repairs were made on the 6th and 7th, and on the 8th with some other slight alterations, another trial was made with a view of completing the circle and return-

ing to the starting point. The start was late, however, and it was so dark that it was hard to see the fences. After passing over one fence, I decided to land and not attempt the circle. Mr. Cameron witnessed this flight and was very much pleased.

On July 10th, the attempt was again made, and I made a flight of a mile circling around a large tree in the meadow and again failing to make the second turn but landed without accident.

Immediately after receiving a message from Doctor Bell in regard to building a Number 4, we became busy on the plans and have all of the designs worked out, including improved rigs, sockets, turn-buckles etc. We made a steam chest for making laminated work such as propellers and ribs. We now have all of the ribs made up and are in a position to make them in about one fourth of the time occupied by the old methods. All of the sockets are also made and ready for the No. 4 as well as the turn-buckles and engine section of the frame. The propellers are well under way and the rubber cloth is ordered from Mr. Baldwin.

The tent we had been using belonged to Mr. Baldwin and as he had sold it we found it necessary to make some other arrangements for the storage of the machine. I therefore designed and ordered made a tent 30 ft. by 50 ft. to open on the side so that the machine can be wheeled out. This tent has been completed and delivered to us. We have it erected and the aerodrome in it. Baldwin's tent has been taken down and is ready for shipment.

A few days last week were entirely taken up in testing out the Government airship engine much to the satisfaction of Mr. Selfridge as with this four cylinder engine a pull of 240 pounds was secured with a propeller ten feet in diameter, 15 degree and revolving at a speed of 550 rpm. The Government engine is water-cooled, being down in a covered frame where it is difficult to cool by air.

Complete drawings have been made of the June Bug and of the best propellers, also of a clutch which we thought might be needed later. Drawings have been made for Aerodrome No. 4.



A DEVICE FOR RAISING AND DEPRESSING AN AERODROME
OR AEROPLANE WHILE KEEPING THE MACHINE ON AN EVEN
KEEL: by T. Selfridge.


(First suggested by me on July 20th, 1908).

The present device of moving the June Bug up and down is, as you know, to raise or lower the front rudder, which operation always throws the machine off an even keel and causes ⁱⁿ it an oscillation from fore to aft, or a pitching which must be corrected by further motion of the control. The machine as it now is corresponds to the old diving submarine and dirigible balloon both of which have been or are being discarded for the even keel type. This plan for the aeroplane is the same as that used in these other two engines (i.e. the submarine and the dirigible) of using two horizontal controls one in front and the other in the rear instead of a single one in front used by the June Bug. The machine will then be pushed bodily up and down instead of being inclined up and down, and the thrust of the propeller will always remain horizontal, hence there will be a less diminution of horizontal velocity also the resistance to horizontal movement of the whole machine will not be increased as it is now by the tilting of the whole structure, but only by the increased resistance of the two controls. In other words the stationary or fixed tail of the June Bug would be replaced by one which would be controlled by the same or different lever as the front control and move in connection with the front one so as to always maintain the machine on an even keel. (see accompanying illustration).



HISTORICAL NOTES, TURNBULL'S RESEARCHES;
by Thomas Selfridge.

W. R. Turnbull published an article entitled "Researches on the Forms and Stability of Aeroplanes" in the *Physical Review*, Vol. XXIV, NO. 3, March 1907, later brought out in pamphlet form.

In it he describes a very interesting set of wind tunnel experiments to determine the relative efficiency of various forms of aerodromes. The velocity of the wind was the same in all cases, namely 10 miles per hour. He finally concludes that an  shaped curve at $8\ 1/2^\circ$ will give much greater efficiency than single curves. His measure of efficiency is the ratio of drift to lift. This reaches a value of 5.48 in this particular curve.

He started to apply this discovery to the construction of a hydroplane but has so far been prevented from making any practical tests of value due to engine troubles.

(This paragraph should follow the account of the Wright Brothers on page 28 of Bulletin NO. II).

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IDEAS ON AVIATION: by G. H. Curtiss.

(Note:- In this paper Mr. Curtiss gives an account of his first experience in the air on May 22, 1908, in aerodrome, No. 2, Baldwin's "White Wing").

Although I have given the subject of aviation much thought, it was not until the flight of the "White Wing" on May 22, that my ideas of how to operate a heavier-than-air flying machine were tangible enough to be of any service to another. The act of flying, even though but the short distance of a thousand feet, gives a person something to work from, and his ideas follow on a more practical course.

Describing the flight of the "White Wing" on May 22, I will say that it had been my opinion during the previous experiments that the nose of the machine was rather light, and that the center of weight should be shifted forward and as my weight was some 20 pounds less than Self-ridge's or Baldwin's, we placed the batteries and cell ^{coil} well in the nose.

The engine was started in the usual manner and after it had speeded up well, I gave the signal to let go. The flyer was being held by the tail at the upper end of the back stretch of Harry Champlin's half mile track on Stony Brook Farm. Upon being released she darted forward and sped down the track at a speed of perhaps 25 miles per hour. After about 300 feet, I inclined the control expecting to feel her rise into the air, but she failed to do so, and as I was nearing the end of the stretch, I shut off the power and grasped the lever of the steering wheel, guiding the

machine around the curve until she came to a stand still. Upon investigation we found that the engine had not been given the usual dose of oil, and that it had been running a little dry, and not giving power enough to push the machine into the air.

She was then taken back to the starting point, and after being given the usual dose of oil the engine was again started. Upon being released, she started down the track faster than before, and raised with the front control in the normal position. She glided for a short distance gradually rising to a height of 12 ft., and then seemed inclined to settle to the ground. I pulled back on the steering wheel thereby raising the front controlling plane slightly when the machine immediately rose and would probably have gone on to an indefinite height had I not reversed the plane again and brought it down, but as is usual in any balancing act, the novice over does matters, and I came down too far. As soon as I realized this, I again raised the control slightly. I afterwards learned that she touched the ground on this dip. By this time I realized that this vertical control was a very delicate thing, and although I did my best to keep on a constant level, there was more or less pitching up and down through the entire distance.

In the meantime, I had steered slightly to the left in order to make sure of clearing a vineyard which had been worrying us and which was directly in front of the start. When I found myself clear of the vineyard, I again turned to the right and on a line parallel to the track. There seemed

to be no trouble in steering in this direction.

When the machine first raised, the right side began to tilt down which was easily corrected by the use of the adjustable tips which were operated by leaning to the high side and engaging a lever with the shoulders. This control seemed to work very well indeed. After the plane was restored to its normal position the machine did not vary again.

I don't know just why I landed but I found myself so close to the ground that a landing seemed inevitable and rather than take any chance on trying to get up again, I shut off the engine, raised the front control to the limit, grasped the tiller of the front steering wheel with my hand and steered straight ahead out into the ploughed field until the machine came to a stand still.

The machine was found to be in good order and nothing broken. A bolt in the rudder had jarred loose and might have interfered with the steering had I gone farther.

I now believe that the front horizontal controlling plane should be hinged well to the front of the plane and a little forward of the center of pressure so as to dampen the inclination to turn the plane too much.

Also believe the machine should be mounted on small strong wheels with a longer wheel base than we have used. The two rear wheels should be under the rear edge of the main surfaces and the one front wheel should be as far forward as possible and pivoted so that it can be steered. A spring on this wheel would be of advantage, but not absolutely necessary. A longer body with a tail placed farther back would also be

of an advantage in keeping the machine on an even keel.

I also believe that the nose of the machine should be entirely open so that the aviator can see the ground and better gauge distances. There would be only a slight increase of head resistance at the worst, and I am inclined to think there might be less. At any rate, with the consent of the others, I would like to try leaving off the cloth covering in front of the plane.

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EXPERIENCES IN THE AIR;
by J.A.D. McCurdy.

(An account of Mr. McCurdy's flight in the
White Wing, May 23, 1908).

On Saturday, May 23rd, 1908, experiments were continued with the aerodrome White Wing at Hammondsport, New York.

It was decided by the members of the A.E.A. present on the field that I should operate the machine. A few changes were made from the previous flight.

The connecting rod running from the steering wheel to the control was placed higher up on the strut which is perpendicular to the surface of the control, thus giving the operator greater leverage, and hence a more steady motion in changing the angle of incidence of the control. It was found from previous trials that the pressure of the air on the control was apt to cause a greater change of angle of incidence than the operator wished and consequently the flight of the machine was not as steady as it might otherwise have been.

In the flights made by Mr. Curtiss and myself the batteries and spark-coil were placed well forward in the nose in front of our feet, instead of being just behind the seat as in the case of Baldwin and Selfridge. This change was made on account of the difference in weight, Curtiss and I being about 20 lbs. lighter. This change brought the balance of the machine about right.

It was a comparatively calm day, the wind only coming in puffs, but it was through one of these puffs that the machine met its Waterloo. Curtiss started the engine and as in previous trials, the aerodrome was held by half a

dozen men till the engine was turning over properly and developing its full power. Curtiss gave the signal to let go, and in an absolute calm the machine started. She left the ground after running about 100 to 150 feet, and so gently did she rise that I was unconscious of any lift. The control was slightly depressed so the machine didn't rise till it had full supporting power from its own velocity.

The machine took a slight turn to the left and then curved round to the right. The wind blew about on her port quarter, and as she turned to the right a puff elevated the port wing, and depressed the starboard wing so that it caught in the grass. I leaned to the high side (port) with the idea of adjusting the tips so that a righting couple would be produced. As I was sitting too far forward my back failed to engage the lever which operates the tips, and so no righting result was produced.

I would like to say that my leaning to the high side of the machine was the result of thought, and not done intuitively. All the other motions for control, and steering to right or left, or changing your elevation are done instinctively. I think that, as has already been suggested, if the wires which operate the tips were controlled from the steering wheel instead of by the body we would have a more natural movement. Such a method of control would undoubtedly change the course of the machine, but this is what happens in the case of a bicycle or motor-cycle to preserve its equilibrium, and would come as a natural movement to us all.

As the starboard wing struck the ground the machine pivoted about that tip, and the nose swung round and dug into the ground. The front wheel might have saved the resulting shock had the machine been on an even keel, but the wheel striking sideways was instantly disabled.

I was deposited gently and without any jar whatever on the ground, and the machine turned a complete somersault leaving me free from the debris. The engine stayed securely in its bed, and was therefore uninjured. The distance covered was about 600 feet at an elevation of about ten to twenty feet, and lasted for eleven seconds.

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Before the machine started Lieut. Selfridge and his dog were standing directly in the path the machine would take in its run along the race track, so that Selfridge could note the exact time the machine left the ground and also mark the spot for future reference. So swiftly did the machine gather speed in coming down the track that Selfridge had not time to get out of the way, and his presence of mind warned him to lie flat on the ground.

I from my seat in the machine saw the dog scurry off through the grass, but did not realize that I had flown directly over Selfridge. In fact none of the A.E.A. were aware of the fact till Selfridge communicated it to us later.

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WORK OF BRIEN BIRREACH LABORATORY:-
by Wm. F. Redwin, Superintendent.

We have on hand 50 small floats, which are simply small rubber bags which can be blown up with the mouth to a size approximately 50 cm long, and 5 cm in diameter. Have made and ready 40 silk bags in which these floats can be blown up. We have also two large rubber floats with silk bags for them. These measure, when blown up, about 300 cm long and 25 cm diameter. One of these floats blown up in its casing weighs 930 gms. We are getting material ready to make a structure to study a method of attaching these floats to a large machine. Have also one rubber tube received from Hammondsport which is considerably larger than the two mentioned above, and a lot heavier.

Have received from Hammondsport the new Anemo-Clinometer made by William Ferguson of the Blue Hill Observatory. Received with instrument a lot of blank charts for records; also two letters from Mr. Ferguson to the A.R.A. There were no pens or ink received with the instrument, and I telegraphed Mr. Curtiss at Hammondsport to send them forward.

Work is progressing rapidly on the construction of the new catamaran structure which was launched on the 30th of July and christened by Miss Gertrude Grosvenor, "The Get-Away" (see accompanying photographs which were taken of the apparatus after launching with a large party on board. Since launching "The Get-Away", the tilting-arms used on the Ugly Duckling have been put on (see accompanying photographs), and other work such as steering gear etc., is nearing completion.

Have put telephone line from Association's Boinn through Headquarters to Superintendent's Office in the Laboratory Annex. We are at work on a globular connection device for tetrahedral structures, a model of which was completed August 1, 1908. We have one of these connection devices made of wood with 12 sockets of aluminum piping; and another made of aluminum entirely (see accompanying photographs).

Have started on construction of a twenty-two-celled kite made of 50 cm triangles mentioned in previous report, converted into 50 cm cells. Kite will be eight cells on top, seven cells on bottom, and two cells deep (see accompanying photograph), and will have guy wires strengthening the center parts of cell-sticks to illustrate Baldwin's method of trussing shown in Bulletin III page 44. Have repaired an old Oionos kite and made experiments with it. Experiments have been made on the following dates:-

1908, July 24:- Experiments with small rubber floats arranged catamaran fashion.

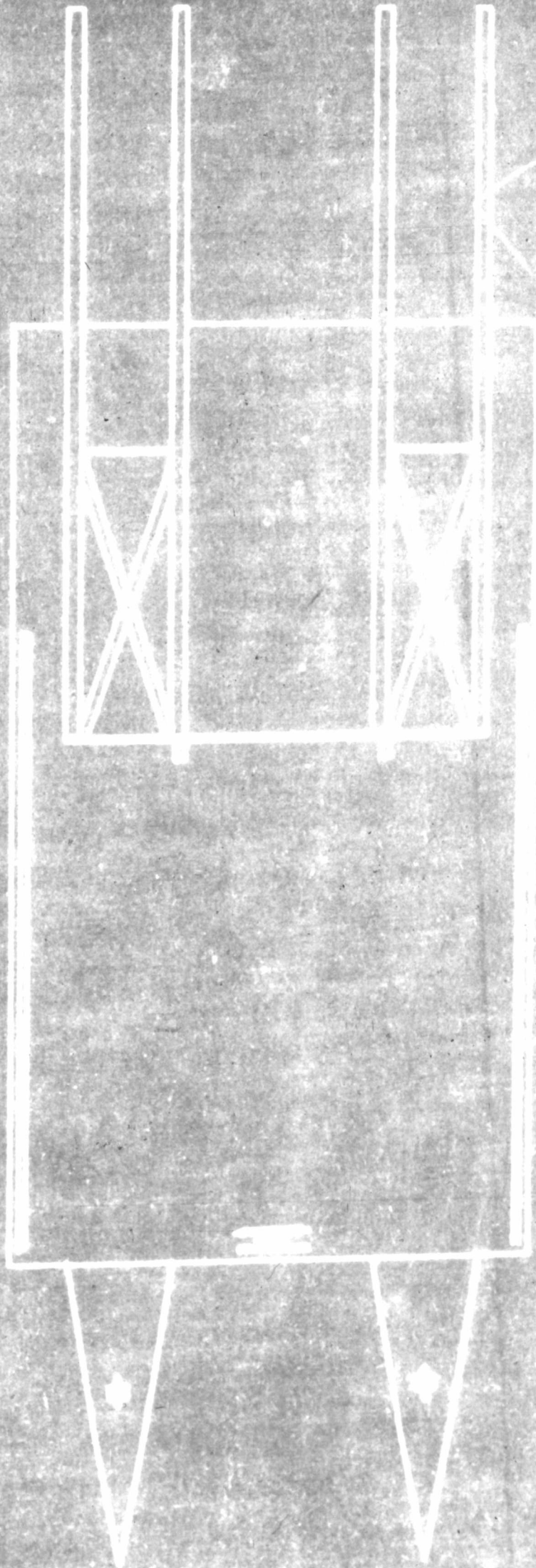
1908, July 28:- Experiments with the B B towed by the Gaudric to test the strain and the pull.

1908, July 29:- Experiments with Kites A & C. Full series of observations obtained.

1908, Aug. 1:- Old Oionos kite tried.

1908, Aug. 3:- Experiments with Oionos kite. Several series of observations were made to test efficiency.

Kite B has been taken to pieces and the material utilized in the construction of Kite D (see photograph) which carries out to the extreme the hollow plan of construction used in Kite C (Bulletin I, 36).



Scale 1/4" = 1"

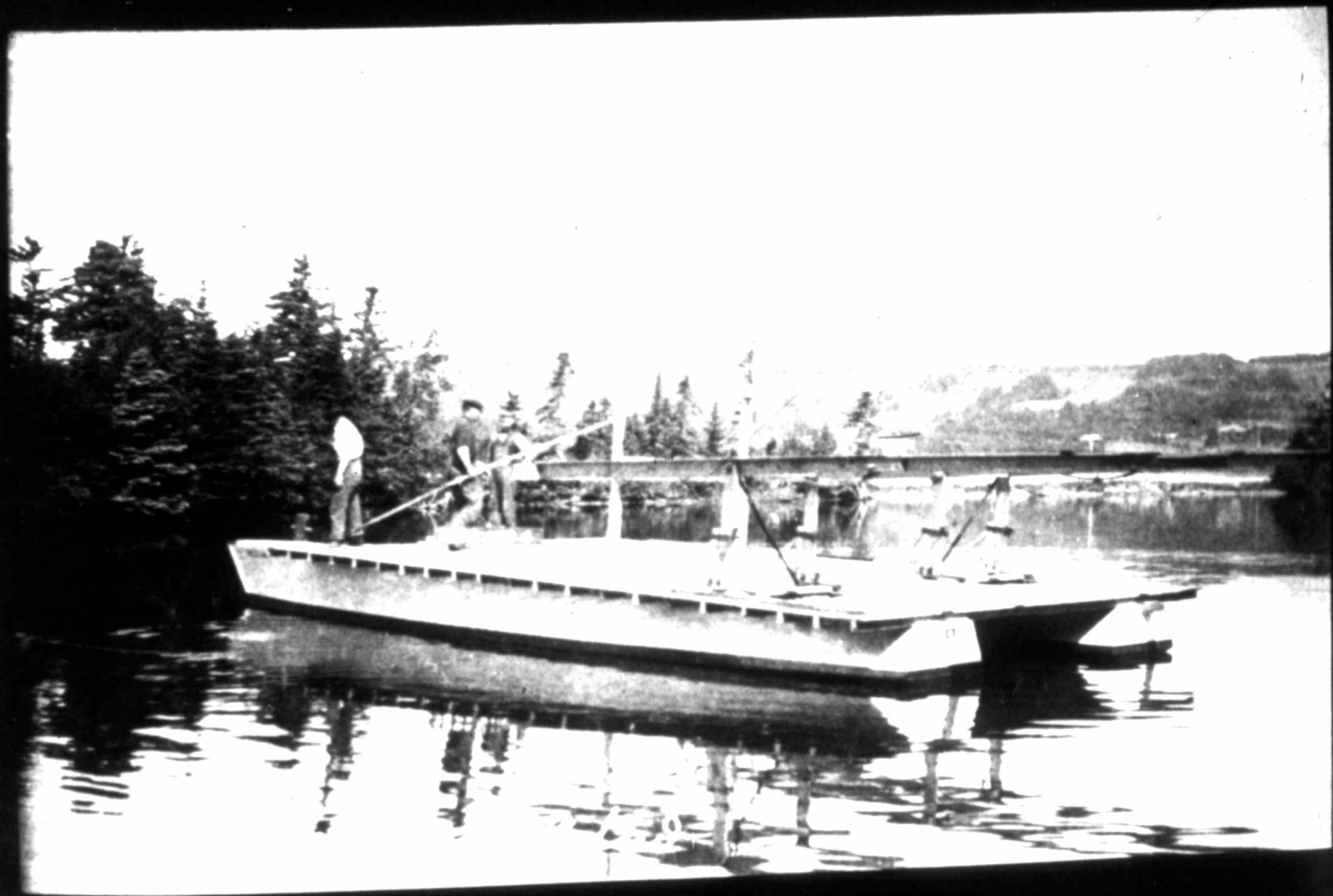
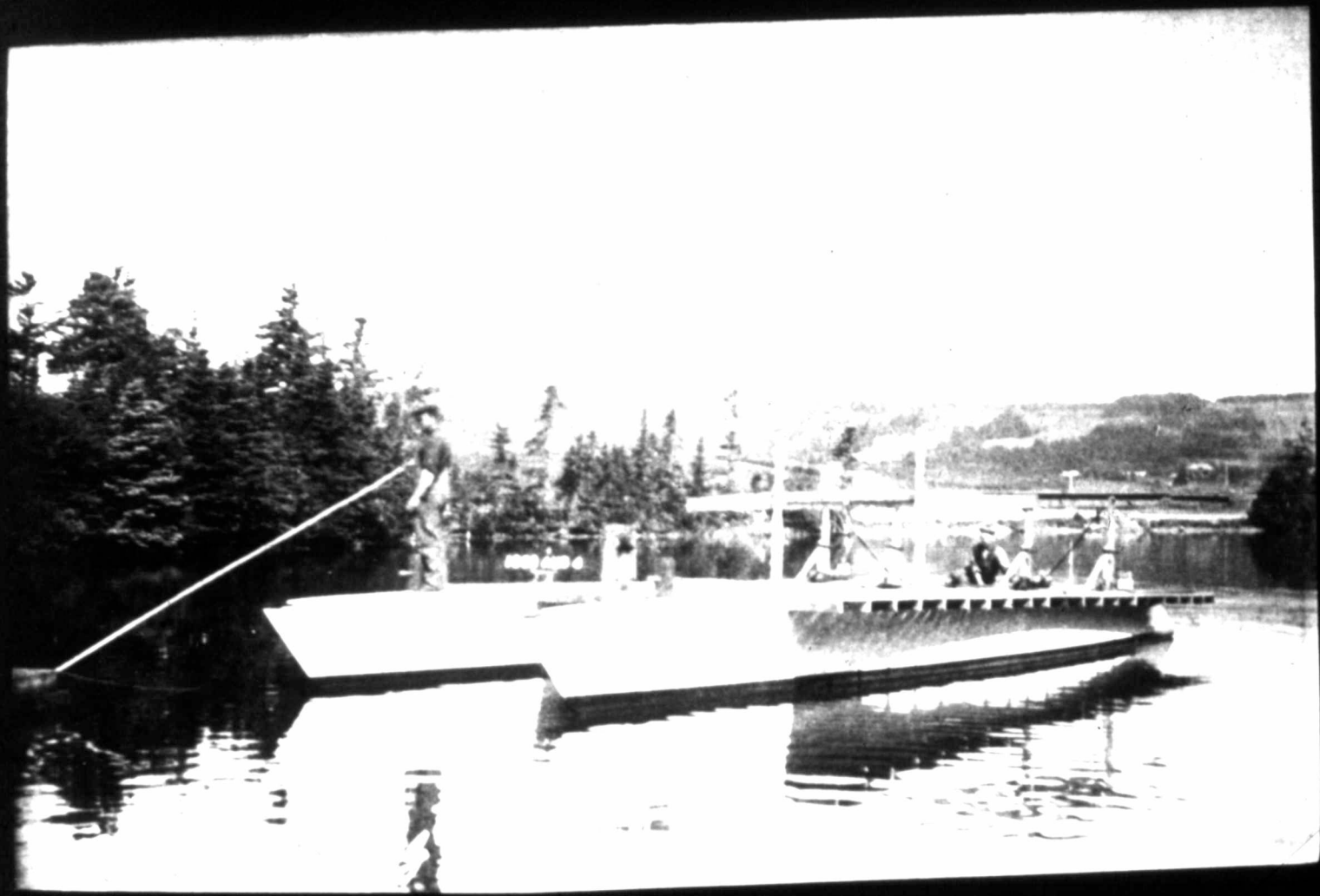
The End View

Aug 1 1904

W. H. H. H.

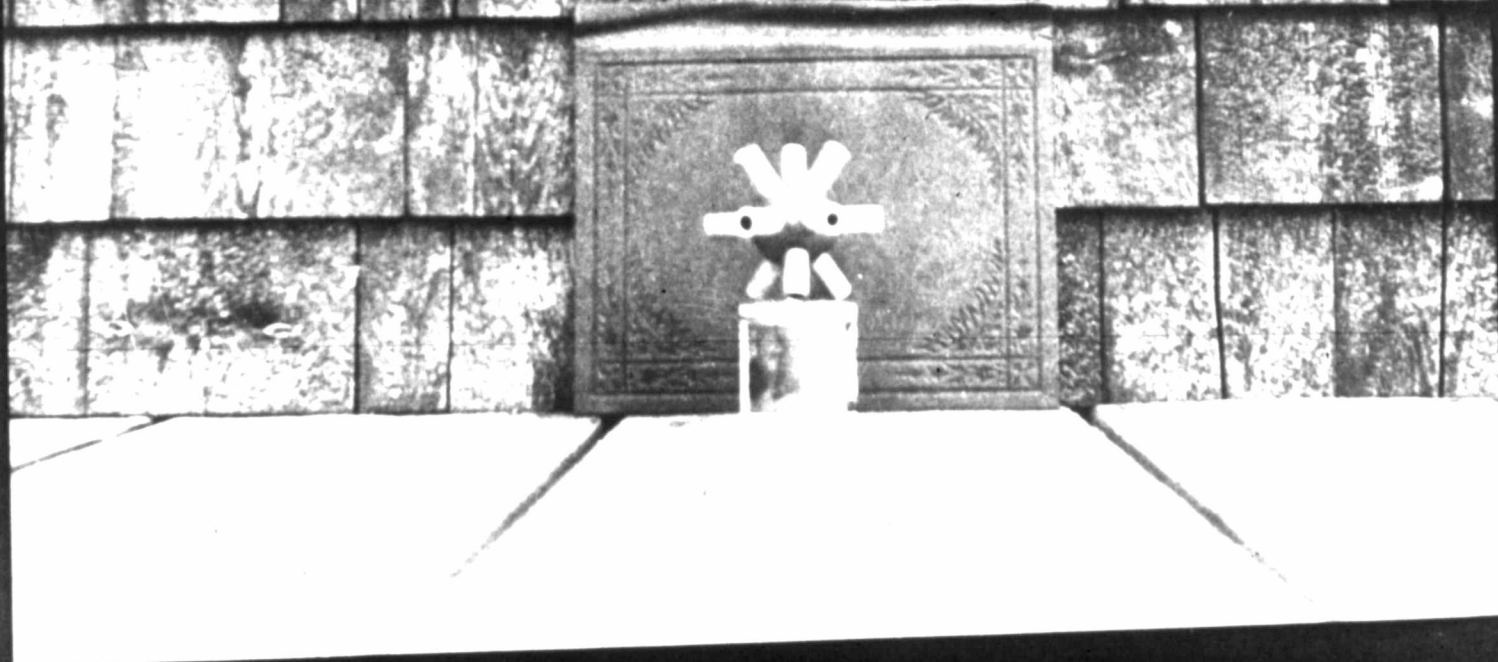






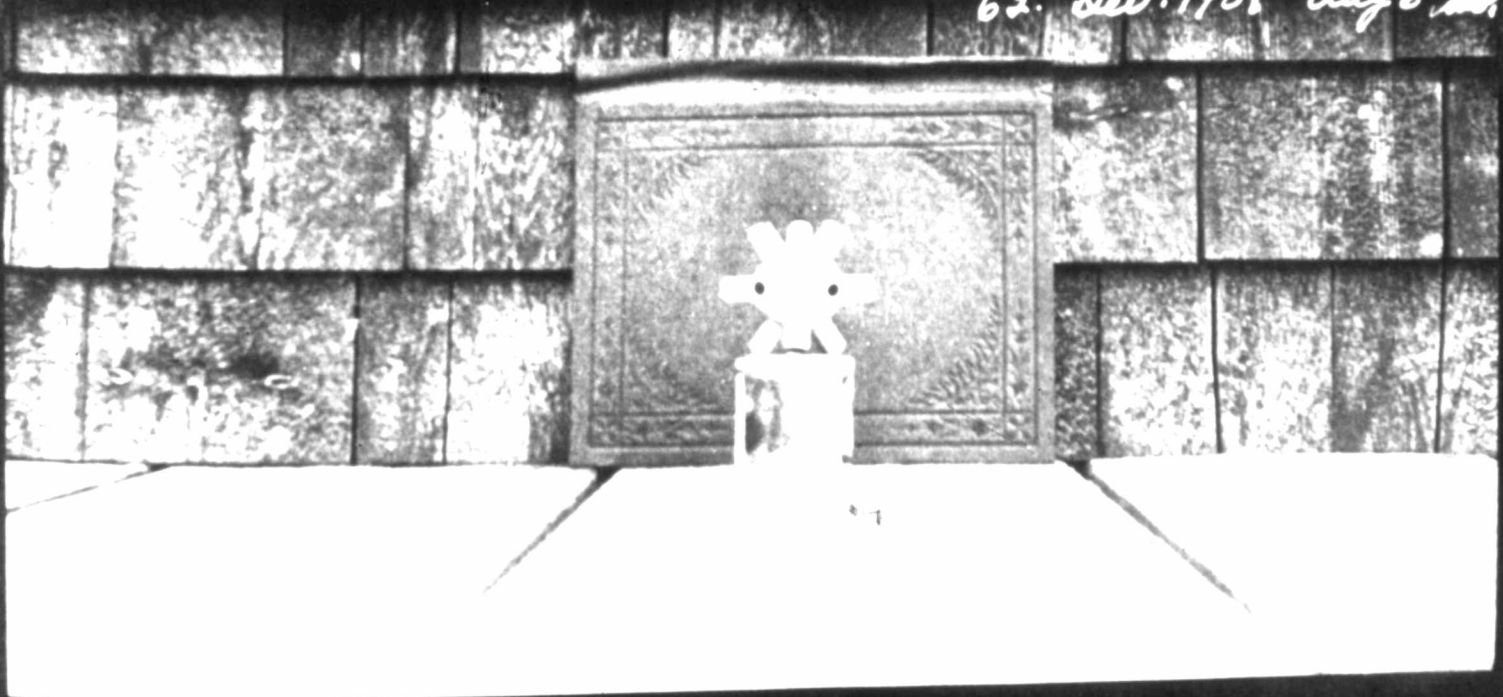
908 AUG 4

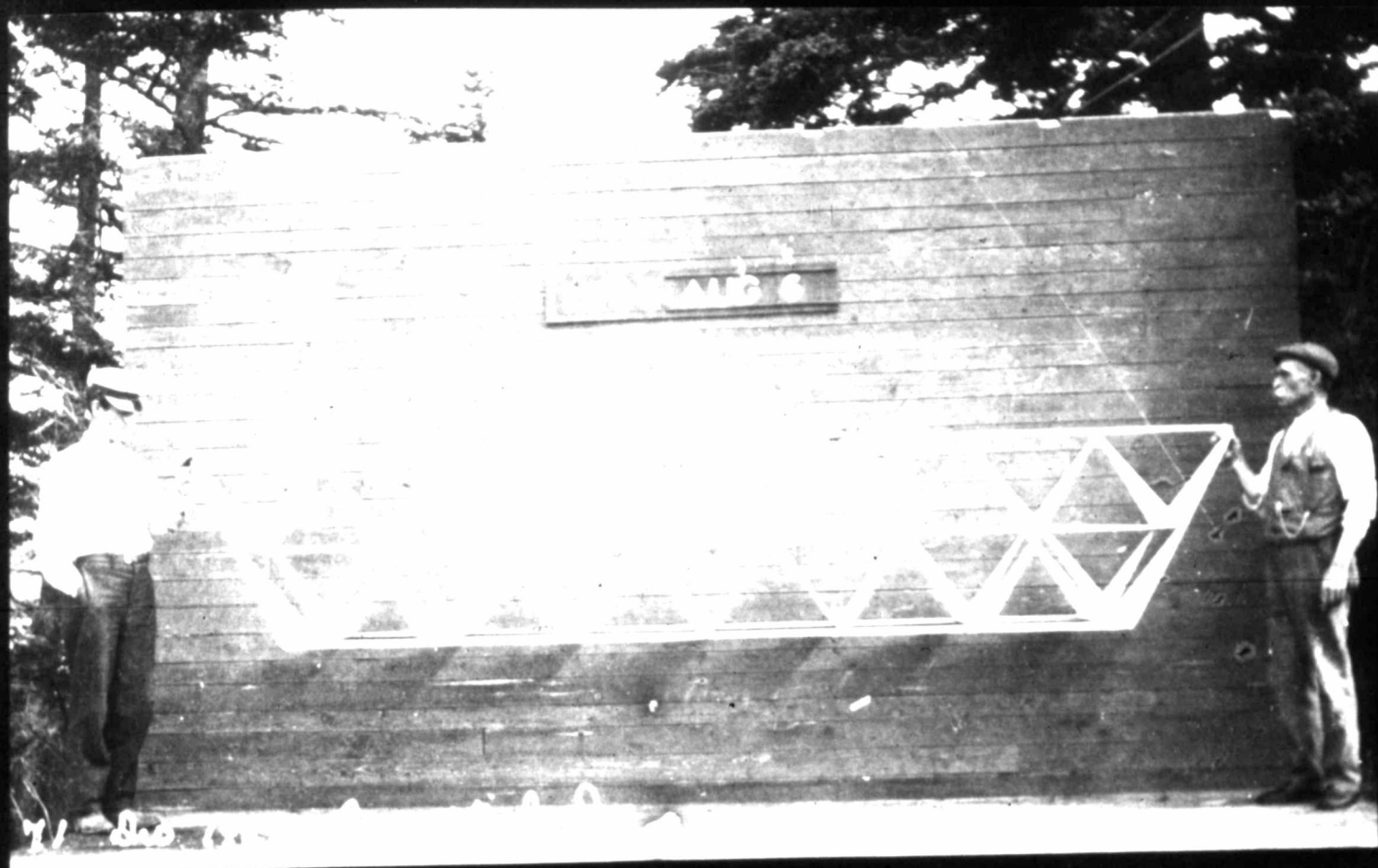
61. Dec 1908 Aug 6 1909



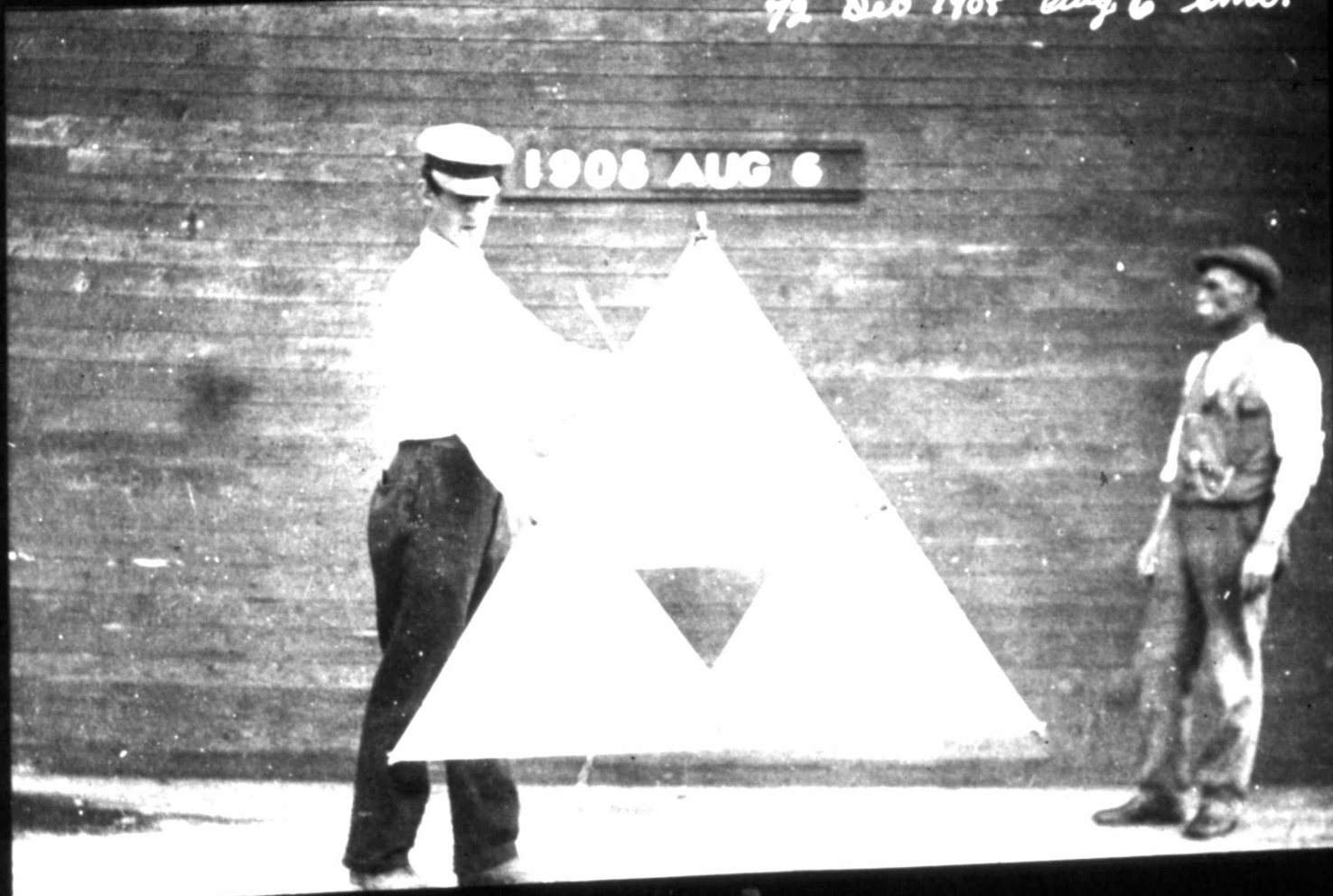
908 AUG 4

62. Dec. 1908 Aug 6 1909





72 Dec 1908 Aug 6 - Lind.

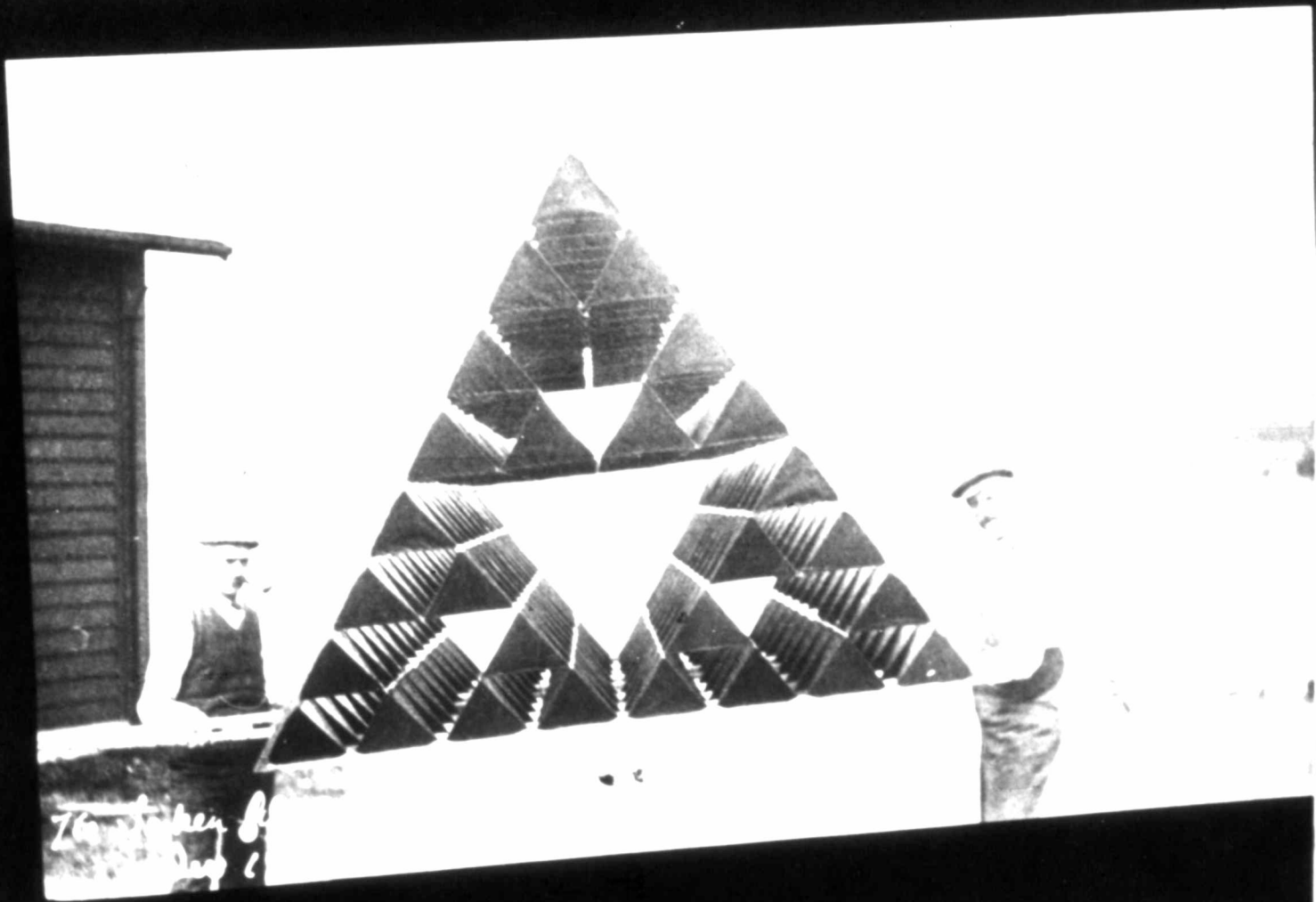
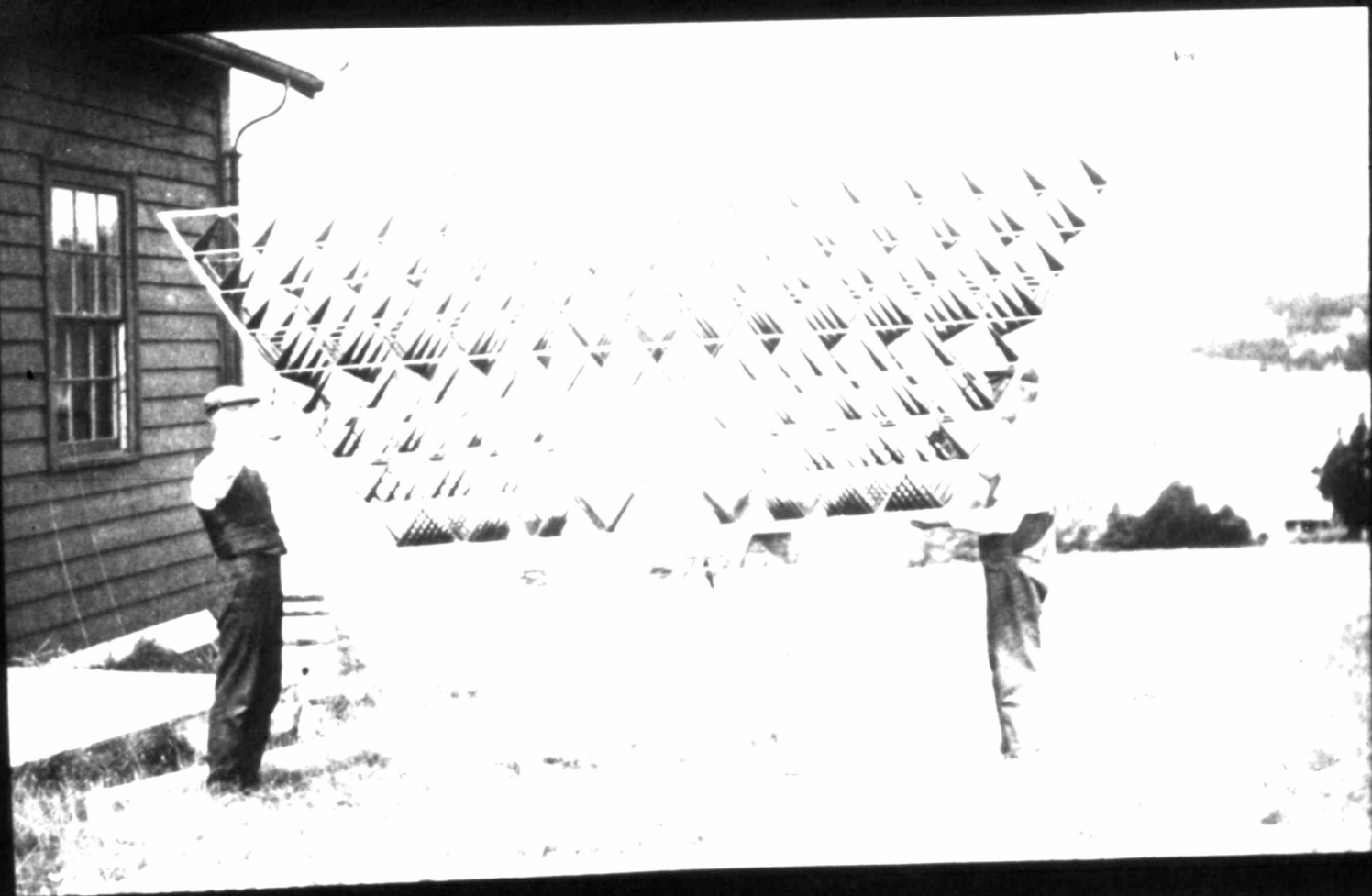


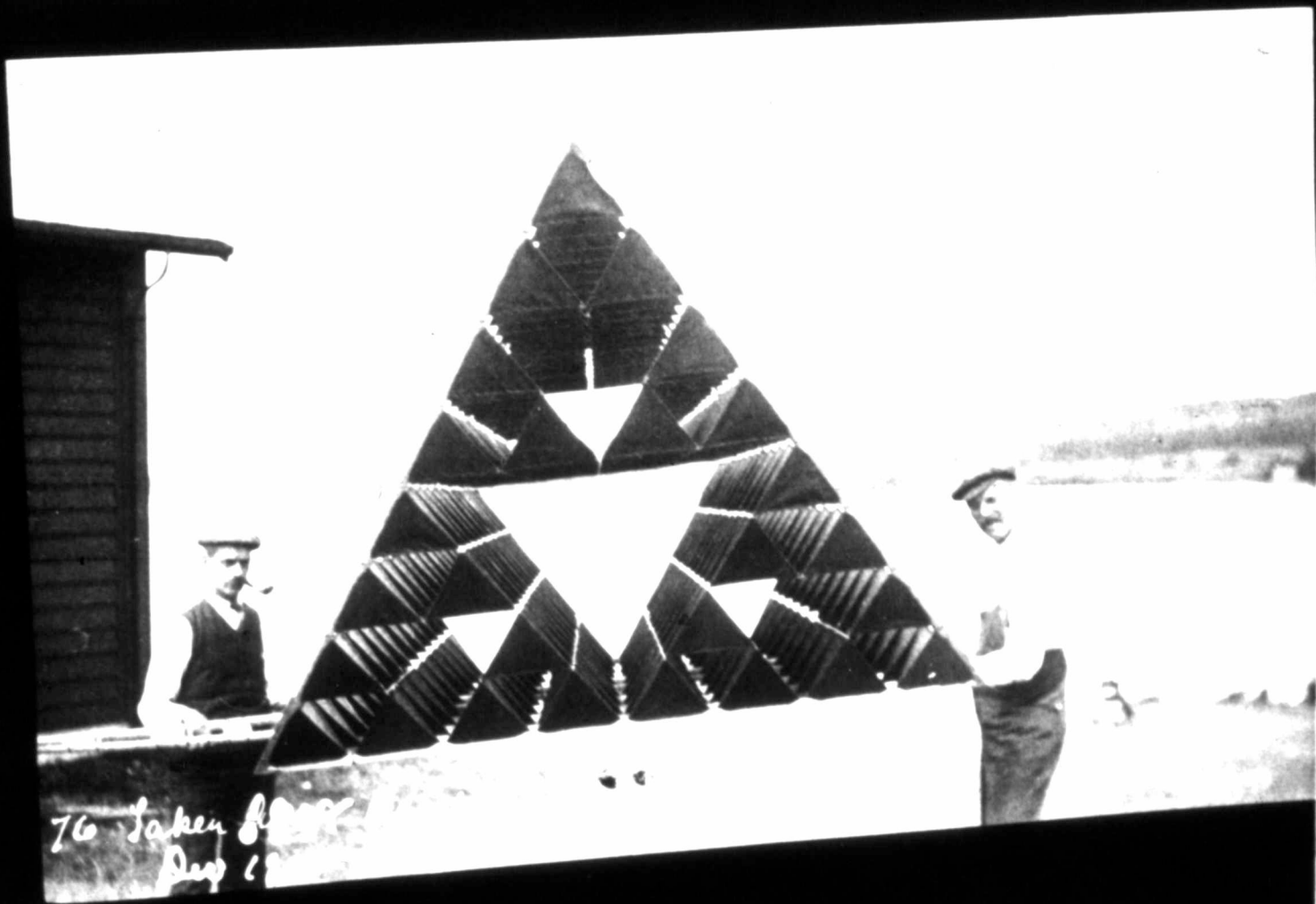
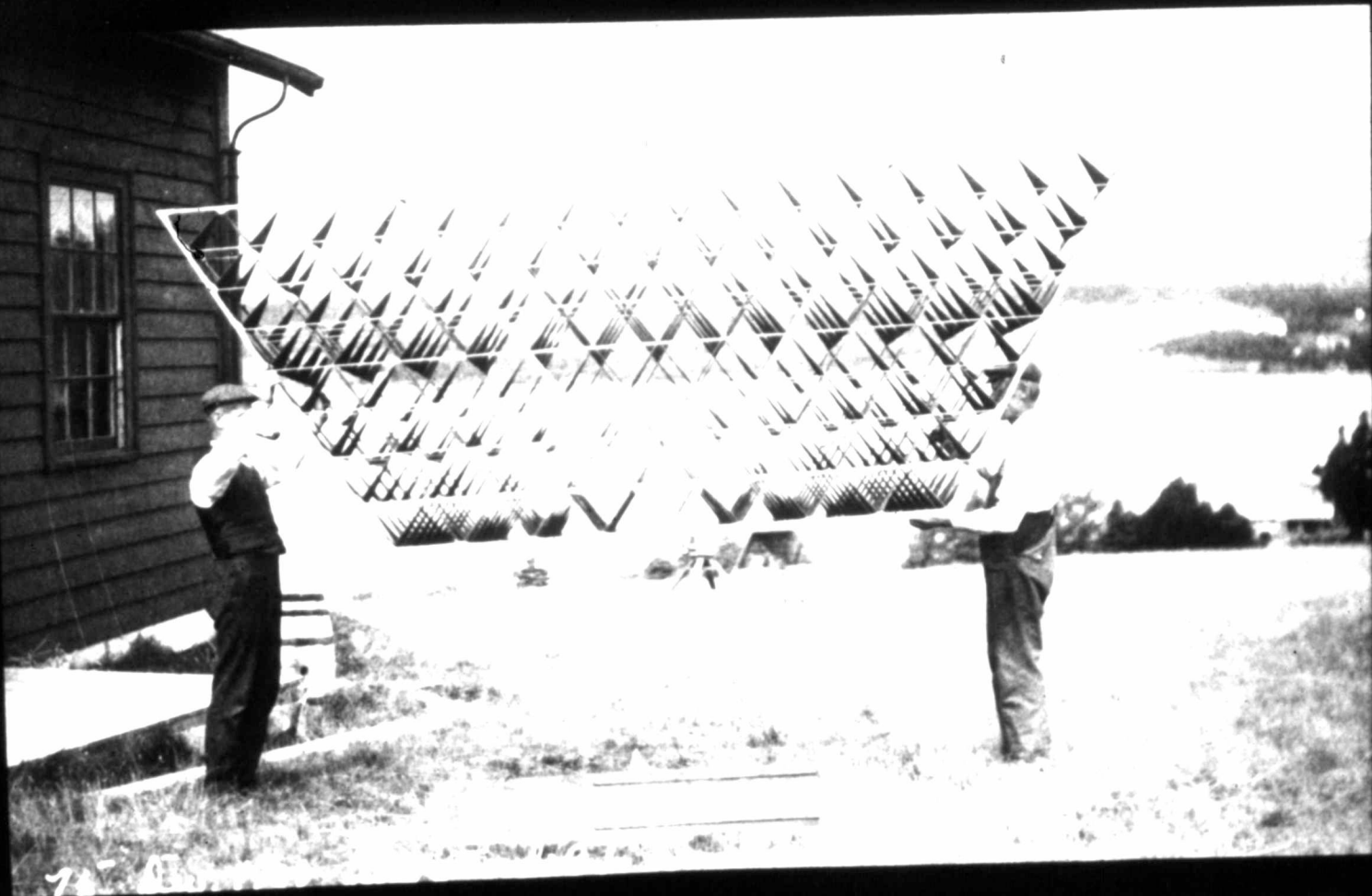
White Kite
Baldwin Truss
Sep 23 - VII



74 Dec. 1908

Old Olney
see VII 14





WAS THE DESTRUCTION OF BLERIOT'S MONOPLANE AERODROME JULY 23, 1908, CAUSED BY THE GYROSCOPIC ACTION OF ITS PROPELLER? by A. G. Bell.

The New York Herald of Friday July 24, 1908 (page 9) describes the destruction of Bleriot's Monoplane Aerodrome. The following is quoted from the account.

***"Bleriot fetched the machine out into the open and had the propeller turning in a second. Within a hundred yards he was well up in the air, traveling fifty kilometers an hour, apparently steady as a train; then he tried to turn. A height of ten meters, which had been attained, fell to eight in making the curve, but all seemed well. Then came the shock. A sudden gust of wind across the field caught the tail of the apparatus and threw it skyward. The head naturally tipped to the ground before the operator had time to stop the motor, or even think about anything save holding on. Bleriot found himself sitting amid a heap of wreckage." etc. etc.

It is difficult to understand how a gust of wind could have lifted the tail as stated; but a vertical dive of this kind might have been caused by gyroscopic action.

Perhaps Lieut. Selfridge can tell us whether Bleriot used a single propeller, the direction of its rotation, the direction in which Bleriot steered (left or right) when making his turn; and whether the reported dive was consistent with the gyroscopic effects noted in Bulletin III, Page 39.

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(Note:- Remarks by Mr. Williams following the reading of Mr. McGurdy's paper, May 17, 1908, revised for the Bulletin).

A shaft rotated in bearings by a force applied at one point, and with a resistant force at another point, develops torque, and as applied to flying-machines, aeroplanes in particular, a shaft parallel to the longitudinal axis of the machine, and with a rotative force at one end, applied from the machine, and a resistant force at the other end, which is attached or connected to the frame or structure of the aeroplane, then, whether the structure is resting upon the ground or suspended in the air, the torque of the shaft will have no effect upon the balance or equilibrium of the structure, being resisted, or absorbed at both points by the structure itself.

If, however, when suspended in the air, the resistant force, or its source, is disconnected from the structure, as atmospheric resistance to rotation of propellers, then the re-action of the applied force tends to turn the structure in an opposite direction.

If this shaft is concentric with the longitudinal axis and center of gravity of the structure, when suspended in the air, then the torque will exert its greatest force in disturbing the lateral equilibrium. If while remaining parallel, the shaft is placed at a distance from the center of gravity, then, while exerting, or developing just the same torque, its effect upon the balance or equilibrium of the structure would be reduced in proportion to the length of leverage

against which it was being exerted, and through which it was being resisted, by gravity and inertia. The length of leverage being represented by the distance of the shaft from the center of gravity.

If two separate propeller shafts are placed upon an aeroplane, parallel to its longitudinal center, they are necessarily some distance from each other, and from the center of gravity, and if rotated in opposite directions, the torque of each neutralizes the effect of the other upon the equilibrium of the structure.

If, however, they are both rotated in the same direction, the resultant force of the torque would tend to turn the structure about its longitudinal center of gravity, as the torque of each tends to revolve the structure in a different orbit, and around its own center of rotation, and the leverage through which this force is resisted, leaves the resultant force of the torque somewhat neutralized or reduced, and in the present state of the art probably a negligible quantity.

(Signed) J. Newton Williams.

LETTER FROM ORVILLE WRIGHT:

Dayton, Ohio, July 20th,

To Mr. G. H. Curtiss,
Hammondsport, New York.

Dear Mr. Curtiss:

I learn from the Scientific American that your "June Bug" has moveable surfaces at the tips of the wings, adjustable to different angles on the right and left sides for maintaining the lateral balance. In our letter to Lieut. Selfridge of January 18th, replying to his of the 15th, in which he asked for information on the construction of flyers, we referred him to several publications containing descriptions of the structural features of our machines, and to our U.S. Patent #821,393. We did not intend of course, to give permission to use the patented features of our machine for exhibitions, or in a commercial way.

This patent broadly covers the combination of sustaining surfaces to the right and left of the center of a flying machine adjustable to different angles, with vertical surfaces adjustable to correct inequalities in the horizontal resistances of the differently adjusted wings. Claim 14 of our patent #821,393, specifically covers the combination which we are informed you are using. We believe it will be very difficult to develop a successful machine without the use of some of the features covered in this patent.

The commercial part of our business is taking so much of our time that we have not been able to undertake public

exhibitions. If it is your desire to enter the exhibition business we would be glad to take up the matter of a licence to offer it under our patents for that purpose.

Please give to Capt. Baldwin my best wishes for his success in the coming Government tests.

Sincerely yours,

(Signed) Orville Wright.

(Note:- The full correspondence with Mr. Orville Wright upon the above subject should, I think, be made known to all the members of the A.E.A. for it is obvious that we may expect to be brought into a law-suit with the Wright Bros., if we make any public exhibitions of our apparatus for gain without an arrangement with them. I do not know exactly the circumstances that led to the adoption of the moveable wing tips as I was in Washington at the time; but if, as I have reason to believe, their adoption was due to a suggestion of mine that moveable wing tips should be used, contained in a letter to Mr. Baldwin, I may say, that this suggestion was made without any knowledge upon my part of anything the Wright Brothers may have done. They had kept the details of construction of their machine secret; and I was ignorant of anything contained in their patent. I have no copy of their patent here, and do not therefore know whether their claim covers our wing tips or not. The matter should be enquired into by Messrs. Mauro, Cameron, Lewis & Massie and reported upon by them. They are more competent than we are to determine this point. A.G.B.).