GOOD POINTS OF BALDWIN BALLOON

Analysis by Expert of Features of Inventor's Latest and Best Work.

IS LIKE ZEPPELIN'S NO. 4

Framing and Gas Bag Are in Similarly Close Relation to Each Other and Two Craft Have Other Points in Common.

(Carl Dienstbach, a German aeronautical engineer of recognized ability, the American representative of Aeronautische Mittheilungen of Berlin and foreign secretary of the Aeronautical Congress, made the accompanying analysis of the Baldwin dirigible balloon for the Philadelphia Inquirer:)

The recent flight of 12 hours, and at a speed sufficient to show its heels to the train between Constance and Zurich in an almost dead calm, of Count Zeppelin's latest airship has again emphasised the value of air craft which depend for support on the buoyancy of hydrogen and employ mechanical power, and plenty of it at that, only for propulsion.

It is now hardly any longer disputed that America has gained a substantial lead in first perfecting the lower supported aeroplane, with its wonderful speed possibilities, which were only recently so brilliantly vindicated by an otherwise still imperfect apparatus, the Bleriat machine, with its record flight of more than 1200 meters at a speed of 80 kilometers an hour, and, by the way, at an elevation of nearly 100 feet above the ground.

But it seems much less known that in the same field where European inventors have so far achieved their greatest successes there has also been a display of American ingenuity, and results have been attained which need so little fear the comparison with those abroad that the United States Signal Corps, when ready to add a motor propelled gas bag to its equipment, did not need to imitate in any way European designs, but could fall back on the developments of a distinctly American type.

The history of the case might be traced to the race between mechanically propelled air craft which followed the international aeronautic cup race for drifting balloons at St. Louis last October. The participation of the military element was a prominent feature at both of these events, and the writer was especially impressed by the unmistakable display of enthusiasm on the part of many army officers, especially at the second occasion mentioned.

However, another experience of his is very significant in throwing light on the real importance of the air motor race.

A German officer, who accompanied the German aeronautic team and who had before not only held an important commission in the Empire's aeronautic service but also had been in the closest of touch with the development of the powerful airships both of France and Germany, became so deeply impressed with the performance of these small American craft that he spoke of them as "his most enjoyable aeronautic experience in this country." He was surprised at their unexpected speed and their maneuvering capacity.

To the scientific observer the fact to become first apparent seemed that all of the ships in the St. Louis race belonged to the same type. At the first glance they seemed, indeed, to resemble the craft with which Santos-Dumont had many years ago first demonstrated the possibilities of "air motoring" to the public at large. On closer inspection, however, important and ingenious differences were discovered which led materially to the quest after the origin of this distinctly American species. It would then be found that all of these balloons were imitations of one certain type of airship, which made its first appearance as the only successful competitor for the aeronautical prizes that had been offered by the World's Fair at St. Louis. It made there many flights under good control, and was called by its designer, Captain Thomas S. Baldwin, a professional aeronaut of large fame, the California Arrow. Though provided with a motor of quite moderate power it seemed to obey the will of its pilot to perfection.

Rigidity of Structure.

As a matter of fact, it really represented a great progress over Santos-Dumont's design, at that time considered the best. The gas bag was stouter and shorter and the frame larger. The gas bag was enclosed in a very fine netting and the propeller placed in front. There was no basket for the operator, who instead rode astride on the bare frame. The most notable difference was, however, placing the long frame very close to the gas bag. It takes all the science of present day aerial engineering to explain why these various features were indeed a source of perfection, and on the inventor's part they prove, therefore, a wonderful practical insight. A wonderful rigidity of the whole structure was thus attained. It could almost "stand on its head" without any harm, while with Santos-Dumont's slight deviation from the horizontal caused several times an accident. The design, contrary to its sturdy appearance, was really rather favorable to speed.

The modern remedy against that pitching which always prevents increasing the speed over certain limits was not yet known in those days, and therefore the seeming advantage of Santos-Dumont's slender pointed bag was illusionary, because in flight it would cut through the air, instead of with the sharp point, just as often more or less with the whole elongated broad side. With Baldwin there was not so much difference in cross section between the bag's horizontal and its inclined position, but principally he had means to counteract the pitching by changing its position in the frame. The shortness of the bag would even make a slight shifting instantly efficacious. Steering up and down could, of course, be done in the same manner. Baldwin and his first pupil, Roy Knabenshue, whom he let operate his first ship, an aeronaut of light weight, acquired great skill in this steering and balancing. The rudder was worked by means of tiller ropes, and could thus be operated from any position on the frame.

Government Awards Contract.

Baldwin's airship was in turn imitated by his several pupils when they left him to give exhibitions on their own hook. Gradually there was stronger motive power employed. The imitators finished by adding horizontal stabilising surfaces adapted from the European designs which had in the meantime been perfected by scientists. These surfaces proved especially efficient in Baldwin's type, due to its own inherent stability. Baldwin himself disdained to employ them, confiding in his skill. Though at St. Louis Lincoln Beachy, his own pupil, won the race, favored by his light weight, which permitted him to use the same motive power on a smaller and less "draggy" balloon, the merits of the winning craft were eventually traced back to its originator, who was officially recognized when the men at the head of the Signal Corps of the United States Army awarded a contract for the first American Government airship to Captain Thomas L. Baldwin.

No easy task indeed was imposed by the conditions, any more than in the case of the aeroplane contracts. A speed minimum required of 20 miles an hour for a balloon just large enough to lift two men, for constructors on the European scale there were not funds enough, although the two most desirable qualities in an airship—speed and endurance—are principally a function of size, would tax the resources of the most skillful inventor. Baldwin, who had not been satisfied during the five years following the first practical application of his design for exhibition purposes unless each succeeding season found him with a new and better equipment, was equal to this occasion as well. He planned improvements which would not change any of the essential features, but which would eventually result in increased speed and also embody all the achievements of modern European aeronautic science in his American design.

Looks Like Zeppelin's.

His new ship reminds the expert strongly of the Zeppelin model. Framing and gas bag are almost in equally close relation to each other. With a length of 96 feet for the latter, the former extends over 84 feet, and the two are separated by only four feet distance, bringing the load almost fully as much up to the center of support as Zeppelin's cars, an excellent stabilizing feature. The shape of the bag resembles that of Zeppelin's hull. There is the same long cylindrical part with two pointed ends. The diameter of that cylinder is, indeed, 19 feet in front and two feet less in the rear, resembling French designs in this feature, which, according to the careful measurements of Professor Zahn in Washington, favors speed, though it is also more difficult to stabilize.

Baldwin seems, however, to have just struck a happy medium. There is a fine strong netting, which not only increases the rigidity of the whole structure wonderfully, making almost one piece of gas bag and frame, but also increases the ship's range of action. The latter depends, as is well known, on the capacity of the balloonette, a "balloon within a balloon," that makes up for gas losses by being extended with air and thus preserves the much-needed stiffness of the balloon.

Baldwin's arrangement of netting will to some extent perform the same service automatically. It causes the sides of the bag simply to flatten out with gas losses, decreasing the capacity of the space within and preventing flabbiness. In his former ships Baldwin could thus dispense with the balloon net altogether; the one added in the Government design will then become twice as efficient. The one disadvantage of a net has been greatly eliminated by making its meshes only four inches wide and using a very fine, strong thread.

A Slender Hull.

A ratio of length to greatest diameter of 96 to 19 gives a much more slender hull than any Baldwin ever constructed before. The speed requirements necessitated that change, which in turn called for an extensive application of scientific stabilizing devices. Consequently the vertical rudder in the rear has been provided with large horizontal steadying surfaces, equaling it in size (50 or 58 square feet). As in Zeppelin's ship, a few comparatively small stabilizing planes were found to be fully sufficient. In Baldwin's new craft, with its equally high center of gravity, there will be no difficulty whatever in preventing that pitching motion which requires a large extent of pendulum swing, caused by a low canter of gravity and of propelling effort.

In the framing the triangular construction of the Santos-Dumont was dropped in favor of a quadrangular, well-braced design of the modern giant, Ville de Rus, which has proved more commodious and equally strong and light. Baldwin's is indeed a singularly graceful construction. It carries two stands as cars for two aeronauts—one for the engineer, directly behind the motor, the other far enough back to just equalize the load, as longitudinal trimming by moving along the frame became thus restricted, the vertical steering is now principally done by two separate sets of superposed horizontal rudders disposed fore and aft, exactly as in the Zeppelin craft. In accordance with the general merit of the design, these rudders may be expected to be quite as instantly efficient.

A specially good point sems the position of the motor, well ahead, directly below the maximum support, doing away with extended shafting and making the action of the propeller very positive. The latter will be made of laminated wood, two bladed, and have a diameter of nine feet with the same pitch. The former will be covered with cloth to facilitate propulsion.

Steadying Surfaces.

Besides the horizontal steadying surfaces there also will be a fixed vertical plane right in front of the rudder, which is, in fact, hinged to it. It is expected to increase the latter's efficiency, as it will form an "air pocket" if the rudder be set at a steeper angle. The necessary equipment with maneuvering and safety valves—the latter for both gas and air, in order to have the air of the balloonette blow off first in place of losing gas—has been arranged in the most practical way.

The ventilator feeding the balloonette is worked by hand, certainly the most reliable way, which suffices that size, and for which one of the men is always available.

The balloonette is disposed in the center, where there is not much load, nicely equalizing the lifting effort. The gas bag has a capacity of 18,600 cubic feet and a lift of 1160 pounds. The motor was developed from the standard Curtiss type, which, originally designated for motorcycles, has been extensively applied to airship propulsion. It has four cylinders, 4x3½, and will give more than 30 horsepower at 1300 revolutions per minute. However, it was found that the regular air cooling device does not allow it to develop its maximum, and as high power is the principal requirement of the case, new cylinders of the same bore and stroke, with water jackets of copper sheeting, are just being substituted for those first employed.

A remarkable novelty is the material of the bag. All European dirigibles are made of the same layer of fabric with a sheet of rubber between, furnished by a factory in Hanover, Germany, which was supposed to be the only one having fully mastered the technical difficulties involved. Captain Baldwin, impressed by the materials, undeniably perfect, became associated with the principal manufacturers of rubber goods in this country, and under his supervision there was finally a balloon fabric produced which seems even to surpass the imported one. Not only the dirigible, but also the spherical Army balloons are in the future to be made of it.

It will thus be seen that America did not need to copy foreign designs for its first Government dirigible, and that the design accepted, while distinctly American, will, for its size, not be any inferior to the best ones abroad.

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SEDITION RIFE IN INDIA

Native Newspapers Call for Blood of Englishmen and Appeal to People to Sacrifice Lives for Motherland.

CALCUTTA, July 25.—(Special.)—Various causes have been assigned for the present agitation in Bengal and other parts of India. The Boer war no doubt taught the Indians that Great Britain was not so invincible as they had imagined, and the defeat of a great European power like Russia by a smaller Asiatic one like Japan furnished perhaps a still more striking object lesson in the same direction. But the effeminate Bengali and the astute Poona Brahman would never have dared to flout the governing race as they have done were it not for the impunity which for many years past has waited on and encouraged covert and even open sedition.

There has been no peace in Bengal since Sir Bamfylde Fuller felt obliged to resign his Lieutenant-Governorship for want of support from higher authority. English sympathizers with the latter in and out of Parliament attribute all that has occurred to Lord Curzon's tyrannical partition of Bengal, while others venture to think that, had Lord Curzon remained to give effect to this measure for a year or two with the support of a Unionist government, the difficulties would never have arisen. The sacrifice of a Lieutenant-Governor, with the advent to power of a government pledged to reward agitation in the Transvaal and Ireland, naturally stimulated the 'extremists of the Indian congress party. Fortunately, Mr. Morley soon stiffened his back against these gentlemen, but the mischief had begun.

Honeycombed With Revolt.

The whole country, with the exception of Rajputana and one or two other parts, is now more or less honeycombed with disaffection towards British rule, and the government knows it. There have been riots in Tinnevelly and some other places, but secret agitation is rife everywhere. When Lord Ripon repealed Lord Lytton's vernacular press act and encouraged Indian deputations to agitate for the attainment of their aspirations, he laid the foundation of the Indian congress and opened a door to any editor who chose to spout sedition for the purpose of blackmail or in order to have his mouth stopped by government employment. The alumni of the schools and colleges, who wield for the most part the power of the press in India, are under no illusions. They asperse the character of the rule to which they owe their education either because they are paid, or find it pays them, to do so. They would much rather have a regular salary in government employ which, they have not been slow to note, sometimes comes to those who make themselves disagreeable to the ruling powers. The example of the West, where a candid friend or able opponent has often a better chance of office than one of the trusty rank and file, is ever before them.

Urged to Harden Hearts.

Finally, the Legislature Council passed the explosives and newspaper acts and some salutary results have already followed. At the meeting of the Council Sir Harvey Adamson quoted the following passage from the official translation of an article in the "Yugantar," which appeared a few days after the attempt on an officer's life in Muzaffarpur resulted in the death of two ladies. An independent-spirited youth arrested in connection with the incident is reported to have said: "The work of the revolutionists, though progressing slowly, was very satisfactory, but two innocent women having met with violent death, all their attempts have been foiled by a curse of God." Proceeding, the "Yugantar" said: "If any youth aspiring to freedom has really said so, then he has not yet become fit to obtain freedom. Hard-heartedness is necessary to trample the enemy under foot. When, during the 'Treta Yugu' the Rakshasas were perpetrating frightful oppression in the Dandaska forest, Rama extirpated the whole race of the Rakshasas. Laksman Thakur cut off the nose and ears of Surpanakha, the beautiful sister of Ravana, and then let her go. It is not necessary to give illustrations. If in the attempt to destroy the enemy a woman is accidentally killed, then God can have no cause of displeasure. Like the English, many a female demon must be killed in the course of time in order to extirpate the race of Asuras from the breast of the earth. There is no sin in this, no mercy, no affection."

Hindoos Cry for Blood.

"Two days ago," added Sir Harvey Adamson, "I saw a telegram from Calcutta, stating that the 'Yugantar,' which usually appears on Saturday, had unexpectedly appeared on Friday, that thousands of copies had been struck, and that they were selling at a rupee a copy. The telegram gave some description of the contents, which in violence outvied any previous issue. Writings of a similar type abound in other newspapers, not only in Calcutta, but throughout India.

"One article, referring to the partition of Bengal, states that 'the ruthless knife of the butcher has severed in twain the throbbing body of the Motherland,' and makes frantic appeals to all 'sons of the soil to combine and avenge the atrocity.' Another makes insidious attempts to propagate the cult of Ramdas, who instigated Shivaji to revolt against Moslem rule. Another instigates Indians to 'sacrifice their lives and to teach the rulers a bitter lesson.' Another urges the Bengalis and Goorkhas to join hands and to rebel against the oppression of the bureaucracy. Another advises the Bengalis to resort to red as the color of revenge, and to sing the 'hymn of retaliation'—'A hundred heads for one head to avenge the murder of the Motherland.' Another states that 'a huge sacrificial fire should be lit and fed, not with glee, but with blood.' Another advocates that Indians should make use of blacksmith's tools, lathes, and slings and stones to overmatch the enemies of their country. Another says that 'if resorting to boycott, we can gain our desires, we can also be said to postpone for the present our resolve to shed blood.' Another says that 'if we desire independence we should be ready to be massacred by our rulers so that their swords may become blunt. Another exhorts to die after killing, as therein the glory of dying will be enhanced. Another urges the sacrifice of life and liberty, 'for is it not a fact that Kali will not be propitiated with blood?' Another advocates the methods of Nihilists and the use of bombs.'"

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St. Louis Millionaire Files Notice of His Candidacy.

JEFFERSON CITY, Mo., Aug. 8.—Colonel R. C. Kerens, of St. Louis, millionaire owner of railroads, banks, mines and newspapers, filed with the Supreme Court of Missouri today a formal declaration of his candidacy for the Republican nomination for United States Senator.

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