

pronounced forward stagger, whilst the lower plane is given a slight dihedral angle. Ailerons are fitted to the top plane only. The whole wing unit is braced with steel cable. A comparatively thick wing section, of the bi-convex type, is employed.

This machine is equipped with a camera, wireless, and two parachutes, in addition to the usual instruments. The armament consists of two machine guns mounted on revolving mounts operated by the observer, and a fixed machine gun, firing through the air-screw, operated by the pilot.

The principal characteristics of the Sesefsky biplane are :—

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| Span | 41 ft. 4 ins. |
| O.A. length | 28 ft. 2 ins. |
| Height | 10 ft. 2 ins. |

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|-------------------------------|-------------------|
| Wing area | 394 sq. ft. |
| Weight, empty | 2,469 lbs. |
| Weight, laden | 3,571 lbs. |
| Useful load | 661 lbs. |
| Weight per sq. ft. | 9 lbs. |
| Weight per h.p. | 14 lbs. |
| Speed at ground level | 115 m.p.h. |
| " 3,280 ft. | 113 m.p.h. |
| " 6,562 ft. | 110 m.p.h. |
| " 9,843 ft. | 106 m.p.h. |
| Landing speed | 56 m.p.h. |
| Climb to 3,280 ft. | 5 mins. 56 secs. |
| " 6,562 ft. | 13 mins. 52 secs. |
| " 9,843 ft. | 23 mins. 57 secs. |
| Ceiling | 17,060 ft. |

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THE DEATH OF A GREAT PIONEER

Gustave Eiffel Passes Away

It is with very great regret that we have to announce this week the death of M. Alexandre Gustave Eiffel in Paris on December 27, at the age of 91. The work of Gustave Eiffel has been of incalculable value to the development and progress of aviation, and forms a monument greater and far more lasting than that which the general public will mainly associate with the name of the dead engineer—i.e., the Eiffel Tower in Paris. The famous tower must, sooner or later, be dismantled or entirely rebuilt and renewed until no part of the original structure remains, but the published works of Eiffel, not to mention the knowledge and experience which these works have diffused into aeronautical circles throughout the civilised world, will endure for ever.

Alexandre Gustave Eiffel was born in Dijon in 1832, and was educated as an engineer. He early turned to structural engineering as his *speciale*, and in 1858 he completed his first important work, the railway bridge across the Garonne at Bordeaux, whose swift-flowing stream and periodic floods (who has not read Zola's wonderful *L'Inondation*?) were a serious obstacle to bridge building. Eiffel succeeded, by means of compressed air, in sinking the piers to a depth of 80 ft. below the surface of the river. In 1886 Eiffel offered to build the tower which was later to carry his fame to the four corners of the world, and in 1889 the tower was finished in readiness for the Paris Exhibition of that year. The tower was not built without opposition, both on technical and æsthetic grounds, but it was finished, and proved Eiffel's theories correct. Regarded by many as an eyesore, the Eiffel Tower has outlived that opinion long ago, and Paris would not be Paris without the famous tower, which can be seen from almost anywhere in the French capital. From a practical point of view the Eiffel Tower has proved of the greatest utility as a wireless station; its 1,000 ft. height making it admirably suitable for this purpose.

With the rest of Eiffel's structural engineering work we are not so much concerned here. What is of surpassing interest is his work in aerodynamics, and although this work is, or should be, well known to many of our readers, it may not be amiss if we make a brief reference to the main milestones in Eiffel's aeronautical career. Having been for a number of years interested in meteorological subjects, and as the author of many important works on meteorology, Eiffel began to turn his attention to aerodynamic problems, and in 1907 he published his first work on this subject, entitled "*Recherches Experimentales sur la Resistance de l'Air exécutées à la Tour Eiffel.*" In 1910 came "*La Resistance de l'Air. Examen des formules et des Experi-*

ences," and in 1911 the famous "*La Resistance de l'Air et l'Aviation,*" giving the results of experiments carried out at the Champ-de-Mars laboratory. This was, perhaps, the volume which more than any other made Eiffel known throughout the world, and its popularity in English-speaking countries was in no small measure due to the excellent translation by Jerome C. Hunsaker (now Assistant Naval Attaché at the American Embassy in London) published in 1913.

In 1914, just before the outbreak of war, was published the volume entitled "*Nouvelles Recherches sur la Résistance de l'Air et l'Aviation.*" This work gave particulars of the work carried out at the laboratory at Auteuil, whence Eiffel had in the meantime transferred from the Champ-de-Mars laboratory. Incidentally it is of interest to note that the earlier experiments made by Eiffel were made by dropping various surfaces from the Eiffel Tower, and by timing their fall through a given distance the forces on them were deduced from consideration of the weight of the surfaces.

Perhaps the last great work of Eiffel's to become known in wide circles was his "*Résumé des principaux travaux exécutés pendant la guerre au Laboratoire Aérodynamique Eiffel, 1915-18,*" which was published in 1919. As the title indicates, this work contained a résumé of the very valuable experiments made during the war, and needless to say proved of surpassing interest in view of the scarcity of published data during the four years of war. Incidentally it may be of interest to mention that whenever he had published a new volume Eiffel never failed to send *FLIGHT* a copy, and one of the most cherished books in our possession is the above volume, inscribed in Eiffel's own peculiar handwriting, "*Au FLIGHT, hommage de G. Eiffel.*" This was four years ago, when Eiffel was 87, and we prize it particularly because, although by then Eiffel had relinquished the reins at Auteuil and turned the laboratory over to the authorities, it showed that he had not lost interest in his favourite subject, nor had he forgotten old friends who were among the first to study his early works on aerodynamics.

What makes Eiffel's life and work all the more valuable is that his aerodynamic researches were not carried out with the object of making financial gains. In fact, within the time at his disposal Eiffel was always willing to test models of new designs, be they wing sections, fuselages or complete machines, free of cost, the only stipulation made being that the results of the tests should be published in his works so that the knowledge gained might be available to all. The loss of Gustave Eiffel is a serious one, but his memory will live for ever.

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THE HEART OF AN AEROPLANE OR "THE 'LION' OF THE MOVIES"

At the invitation of Messrs. D. Napier and Son, Ltd., we were given the opportunity of witnessing, on Monday afternoon, the 31st ult., the private view of an extremely interesting and instructive film. This film was entitled "*The Heart of an Aeroplane,*" and the principal part was played by the famous Napier "*Lion.*" The subject for the "*story*" was a somewhat ambitious one, viz.: the construction, etc., of the Napier "*Lion,*" and the producers (The Gaumont Company, Ltd.) were wise in not attempting to make this film a complete story, from start to finish, of an aero engine. Those of our readers who have at some time or other made a tour of inspection of the Napier—or any other—aero engine works, and have attempted to follow up the progress of an engine during the various stages of its construction, need not be told that this is a very prodigious, not to say, tedious task. To attempt to

achieve this same object on the film would require even greater time and patience, both on the part of the producers and the "lookers-in."

Each part—and there are a great many—used in the construction of the "*Lion*" has to undergo a large number of operations before it is satisfactory for inclusion in the complete engine. A selection of these operations have been filmed, with the result that a very good idea is obtained not only of the construction of the Napier "*Lion,*" but of the care and the enormous amount of work involved during the construction.

"*The 'Lion' of the Movies*" finishes up with a few incidents and "close-ups" of some of the Napier "*Lion*" aviation achievements, such as the Aerial Derby winners, Supermarine Schneider Cup winner, commercial activities, etc.