



Smithsonian

National Air and Space Museum

Emile and Henry A. Berliner Collection

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2024

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Collection Overview

Repository:	National Air and Space Museum Archives
Title:	Emile and Henry A. Berliner Collection
Date:	1892-1978
Identifier:	NASM.XXXX.0247
Creator:	Berliner, Emile, 1851-1929 Berliner, Henry Adler
Extent:	1.67 Cubic feet (2 document boxes, 2 flatboxes, 1 reel of microfilm)
Language:	English .
Summary:	The father-and-son team of Emile (1851--1929) and Henry Adler (1895--1970) Berliner became the first Americans to make any significant progress towards the creation of a practical helicopter, experimenting with this type of aircraft between 1907 and 1925. This collection consists of approximately 1.67 cubic feet of material relating to their work on helicopter development including correspondence, financial records, photographs, and two scrapbooks.

Administrative Information

Acquisition Information

Col. Henry Berliner, Gift, 1957 and 1963, NASM.XXXX.0247.

Related Materials

Berliner Helicopter in the Smithsonian National Air and Space Museum Collection: [Berliner Helicopter, Model 1924, A19240006000](#) .

Processing Information

Arranged, described, and encoded by Melissa A. N. Keiser and Jessamyn Lloyd, 2023 to 2024.

Preferred Citation

Emile and Henry A. Berliner Collection, NASM.XXXX.0247, National Air and Space Museum, Smithsonian Institution.

Restrictions

No restrictions on access

Conditions Governing Use

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Biographical / Historical

Emile Berliner (1851--1929) was an inventor, holding patents for substantial improvements he made to the design of gramophones, phonographs, and telephone transmitters, but he is best known today for his innovative helicopter designs. He began experimentation with rocket propulsion as early as 1903 and began exploring the possibilities of vertical flight shortly thereafter. In 1907, Emile began work on a helicopter with a tandem intermeshing-rotor system and decided on a rotary model instead of the heavier in-line engines used previously in aircraft. Berliner worked with the Adams-Farwell Company to develop a 36-hp rotary engine for his helicopter, marking the first application in aviation of the rotary engine. A short time later, Berliner founded the Gyro Motor Company in Washington, DC to further the development of rotary engines in aviation. On July 11, 1908, Berliner's first "test-rig" helicopter design demonstrated that it had the potential to lift twice its own empty weight. Emile then constructed a larger version with a 55 hp motor, which he dubbed the Aeromobile. Simultaneously, Berliner cooperated with John Newton Williams on a coaxial design. In 1910, Berliner began to consider the use of a vertically mounted tail rotor to counteract torque on his single main rotor design, a configuration that later played a pivotal role in the development of practical helicopters during the 1940s.

Emile's son Henry Adler Berliner (1895--1970), was also an engineer who began to work with his father in helicopter experimentation in 1919, after serving in the US Army Air Service as an aerial photographer. Henry's first effort was a coaxial design mounted on a two-wheeled test stand that was soon transformed into a crewed version. It was able to lift Henry and make the transition from a hover to forward flight, but its control was so poor that assistants running alongside had to steady it. In 1922, Henry mounted a Bentley 220 hp engine to the front of a surplus Nieuport 23 fuselage and attached a spar mid-way up the fuselage to form the bottom of a truss extending from the sides of the aircraft. The aircraft featured two counter-rotating lifting rotors that could tilt slightly in opposite directions to control yaw, and a variable-pitch tail rotor to maintain pitch control while hovering, as well as elevators and an enlarged rudder on the tail of the fuselage, which helped maintain control at higher forward speeds. Two sets of five louvers, located below each rotor, opened and closed differentially to provide roll control, although this feature was ineffective and was replaced by a novel differential collective pitch control system in a later version of the aircraft. In the fall of 1923, Henry decided to mount a set of triplane wings onto the aircraft to allow for a safe glide in case of an engine failure. With the new design, he found he could marginally control the helicopter in a hover and in forward flight at speeds up to 40 mph (64 kph) but the helicopter did not have adequate thrust to climb out of ground effect. On February 23, 1924, the helicopter recorded its best performance when it reached a height of 15 ft (4.57 m) during a one minute, thirty-five second flight at McCook Field that was observed by a US Army engineer. After the Berliners completed testing on this triplane machine, it was donated to the Smithsonian Institution (Artifact number A19240006000). This aircraft is the oldest intact helicopter in the world and is currently on loan to the College Park Aviation Museum, appropriately located on the site of the Berliners' original testing ground.

Henry and his father then decided to build a new, lighter helicopter to improve the thrust-to-weight ratio. Completed in 1925, the new design bore a superficial resemblance to the previous model, but it utilized a more efficient biplane configuration and had enlarged rotors. The lower wing relied on a high angle of incidence and large camber to generate some lift from the rotor downwash. However, even with the reduced weight and aerodynamic alterations, the 1925 model showed only a marginal increase in performance over the triplane version. While this marked the end of the Berliners work on helicopter development, Henry went on to establish the Berliner Aircraft Company and played an important role in the development of the innovative Erco Ercoupe aircraft.

Scope and Contents

This collection consists of approximately 1.67 cubic feet of material relating to Emile and Henry Berliner's work on helicopter development including correspondence, financial records, photographs, and two scrapbooks. The scrapbooks contain photographs, news clippings, ephemera, and extensive handwritten notes that document in detail the Berliners' work on various versions of their helicopter design. Other topics represented in the scrapbooks

include the work of Samuel P. Langley on his Aerodromes, the Wright Brothers Fort Myer Trials in 1908 and 1909, helicopter development in Europe during this period, and general aviation and engine related subjects.

Arrangement

This collection is arranged by type of material.

Names and Subject Terms

This collection is indexed in the online catalog of the Smithsonian Institution under the following terms:

Subjects:

- Aeronautics
- Helicopters
- Langley Aerodrome Family

Types of Materials:

- Correspondence
- Financial records
- Photographs
- Scrapbooks

Container Listing

Box 1, Folder 1	Berliner, Emile [Documents], 1919-1923 Notes: Material previously located in NASM Technical Reference Files.
Box 1, Folder 2	Berliner, Henry Adler [Documents], 1 of 10, 1920-1922 Notes: Material previously located in NASM Technical Reference Files, Biographical Series, CB-128900-02 Berliner Henry Adler (Documents), 1 of 2.
Box 1, Folder 3	Berliner, Henry Adler [Documents], 2 of 10, 1919-1923 Notes: Material previously located in NASM Technical Reference Files, Biographical Series, CB-128900-02 Berliner Henry Adler (Documents), 2 of 2.
Box 1, Folder 4	Berliner, Henry Adler [Documents], 3 of 10, 1919-1922 Notes: Material previously located in NASM Technical Reference Files, Biographical Series, CB-128900-03 Berliner Henry Adler (Documents), 1 of 2.
Box 1, Folder 5	Berliner, Henry Adler [Documents], 4 of 10, 1920-1923 Notes: Material previously located in NASM Technical Reference Files, Biographical Series, CB-128900-03 Berliner Henry Adler (Documents), 2 of 2.
Box 1, Folder 6	Berliner, Henry Adler [Documents], 5 of 10, 1920-1923 Notes: Material previously located in NASM Technical Reference Files, Biographical Series, CB-128900-04 Berliner Henry Adler (Documents), 1 of 2.
Box 1, Folder 7	Berliner, Henry Adler [Documents], 6 of 10, 1921-1923 Notes: Material previously located in NASM Technical Reference Files, Biographical Series, CB-128900-04 Berliner Henry Adler (Documents), 2 of 2.
Box 2, Folder 1	Berliner, Henry Adler [Documents], 7 of 10, 1921-1923 Notes: Material previously located in NASM Technical Reference Files, Biographical Series, CB-128900-05 Berliner Henry Adler (Documents), 1 of 2.
Box 2, Folder 2	Berliner, Henry Adler [Documents], 8 of 10, 1921-1923 Notes: Material previously located in NASM Technical Reference Files, Biographical Series, CB-128900-05 Berliner Henry Adler (Documents), 2 of 2.
Box 2, Folder 3	Berliner, Henry Adler [Documents], 9 of 10, 1919-1923

Notes: Material previously located in NASM Technical Reference Files, Biographical Series, CB-128900-06 Berliner Henry Adler (Documents), 1 of 2.

Box 2, Folder 4 Berliner, Henry Adler [Documents], 10 of 10, 1920-1923, 1945, 1978
Notes: Material previously located in NASM Technical Reference Files, Biographical Series, CB-128900-06 Berliner Henry Adler (Documents), 2 of 2.

Box 2, Folder 5 Additional Materials, Documents, 1922-1923
Notes: Material previously located in NASM Technical Reference Files.

Box 2, Folder 6 Additional Materials, Photographs, 1922-1925
Notes: Material previously located in NASM Technical Reference Files.

Box 2, Folder 7 [Loose Photographs, Not Found in Scrapbooks](#)
Notes: [NASM 9A08374 through 9A08380] Found in Smithsonian mailing envelope with handwritten note: "6/25/63 Mr. Garber [Paul Edward Garber], You wanted these photos returned to you for insertion in the Berliner scrap book. The copied prints & slides have not been returned from the photo lab. M. Beldon."

Box 3, Folder 1 [\[Scrapbook\] A](#)
Notes: Loose and detached items found in this scrapbook during processing are physically stored in separate folders in Box 3 of this collection. They are displayed digitally in the slideshow of the entire scrapbook in sequence of the location where they were originally found. Blank pages in original scrapbook have not been digitally reproduced in slideshow. Any gaps in numbering of filenames are due to their omission. Portions of fold-out or multipage documents not pertinent to the topic of the rest of the document, or that were not marked by the creator of the scrapbook to indicate their interest, have not been digitally reproduced.

Box 4, Folder 1 [\[Scrapbook\] Gyrocr.](#)
Notes: A large quantity of loose and detached items were found in this scrapbook during processing. These items are physically stored in folders in Box 2 of this collection. They are displayed digitally in the slideshow of the entire scrapbook in sequence of the location where they were originally found. Blank pages in original scrapbook have not been digitally reproduced in slideshow. Any gaps in numbering of filenames are due to their omission. Portions of fold-out or multipage documents not pertinent to the topic of the rest of the document, or that were not marked by the creator of the scrapbook to indicate their interest, have not been digitally reproduced.

Roll M30 Microfilm
Notes: This roll of microfilm contains a partial copy of the scrapbooks.