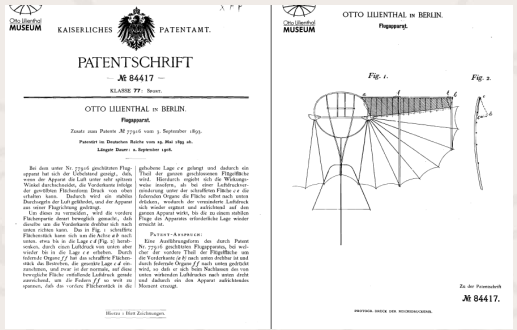
26th ICHST
VIRTUAL CONGRESS
JULY 25–31, 2021
PRAGUE

26th International Congress
of History of Science and Technology
www.ichst2021.org

Authors and patentees in aeronautics and aviation, 1880-1914

Peter B. Meyer
U.S. Bureau of Labor Statistics
Views and findings in this work represent only the author

ICHST 2021
July 29, 2021



KAISERLICHES PATENTAMT.

PATENTSCHRIFT

№ 84417

KLASSE 77: Sport.

OTTO LILIENTHAL in BERLIN.

Flugapparat.

OTTO LILIENTHAL in BERLIN.

Flugapparat.

Fig. 1.

Fig. 2.

№ 84417.

Data

Context

- 19th century: Ballooning clubs & journals
  - Aeronautics as a hobby
  - Maybe hopeless, useless, dangerous
  - But growing
  - Shared designs / Open source practices
- 1903-6: Powered gliders, first airplanes
- Patent conflicts begin
- 1908-11: Big exhibitions.
- New manufacturers
- 1912-14: Shakeout? Decline in patents
- 1914 World War I begins

Data from pre-invention to industry to war period.

Sources – EPO/Espacenet, patent offices, journals of the time, bibliographies, historical books, Wikipedia, Web

Our **wiki** has a page for each:

- 15,000 patents
- 20,000 publications
- 400 companies
- 900 clubs, govt, university orgs
- 100 exhibitions, conferences, and prizes
- 1000 aero inventors, patentees, and authors
- 600 letters and telegrams

Goal: Incorporate micro-histories of each item
Completeness to the extent possible, globally

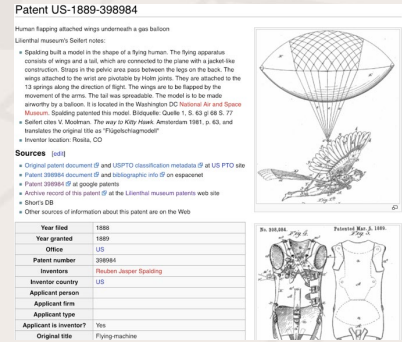
➔ Show counts, trends, statistics


LISTE DES BREVETS

RELATIFS À L'AÉRONAUTIQUE ET AUX SCIENCES QUI S'Y RATTACHENT DÉLIVRÉS EN FRANCE DU 10 AOUT 1901 AU 19 SEPTEMBRE 1901 (1)

312.642. — 20 août 1901. — de Dion : Perfectionnements aux ballons dirigeables.
312.685. — 21 août 1901. — de Dion : Perfectionnements à la construction des ballons dirigeables et à leurs mécanismes de propulsion.
312.675. — 21 août 1901. — Sebillot : Perfectionnements dans la navigation aérienne.
312.676. — 21 août 1901. — Duguet : Aérostat dirigeable.
312.682. — 21 août 1901. — Dhemin : Nouveau système de ballon dirigeable.
312.689. — 22 août 1901. — Hebert : Planoplane le « Georges Hebert », nouvel appareil d'aviation.
312.758. — 24 août 1901. — Lemaire : Perfectionnements aux aéroplanes.
312.786. — 26 août 1901. — Delaunier : La navigation aérienne synthétique.
312.957. — 2 septembre 1901. — Tarr : Nouveau système de ballon.
312.962. — 3 septembre 1901. — Paquier : Perfectionnements dans l'aérostation.
312.993. — 4 septembre 1901. — Porak : Machine à voler.
314.495. — 7 septembre 1901. — Vreland : Système de ballon dirigeable.
314.146. — 10 septembre 1901. — Riedinger : Hélice aérostatique à poids formant volant.
314.297. — 12 septembre 1901. — Magnie : Nouveau ballon dirigeable.
314.219. — 13 septembre 1901. — Guillaume : Perfectionnements apportés aux dispositifs employés dans la navigation aérienne.
314.368. — 19 septembre 1901. — Piatti del Pozzo : Aérostat dirigeable.

(1) Communication de MM. Marillier et Robelet, Office International pour l'obtention de brevets d'invention en France et à l'étranger, 25, boulevard Bonne-Nouvelle, Paris.


Patent US-1889-398984

Human flapping attached wings underneath a gas balloon

Lilienthal museum's Sellert notes:

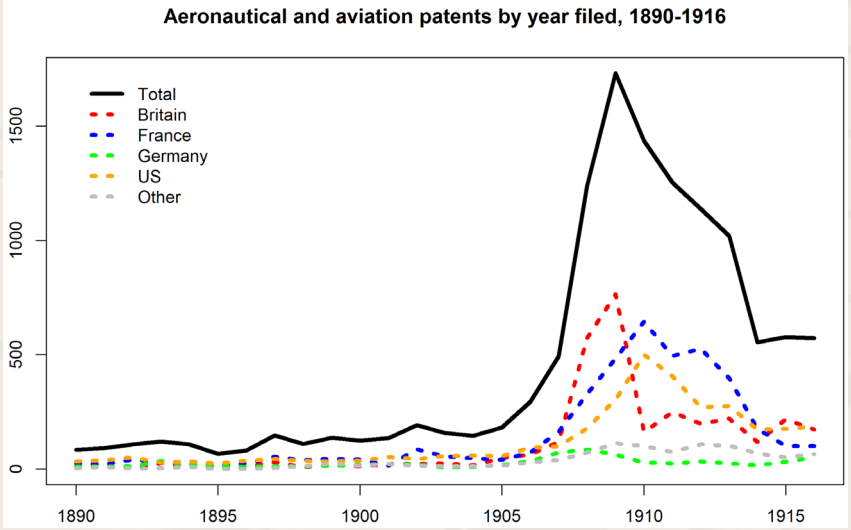
- Spalding built a model in the shape of a flying human. The flying apparatus consists of wings and a tail, which are connected to the plane with a jacket-like construction. Straps in the pelvic area pass between the legs on the back. The wings attached to the wrist are pivotable by Holm joints. They are attached to the 13 springs along the direction of flight. The wings are to be flapped by the movement of the arms. The tail was spreadable. The model is to be made airworthy by a balloon. It is located in the Washington DC National Air and Space Museum. Spalding patented this model. Bibliquelle: Quelle 1, S. 63 g/ 66 S. 77
- Sellert cites V. Mosiman. *The way to Kitty Hawk*. Amsterdam 1981, p. 63, and translates the original title as "Flügelschlagmodell"
- Inventor location: Roslia, CO

Sources [edit]

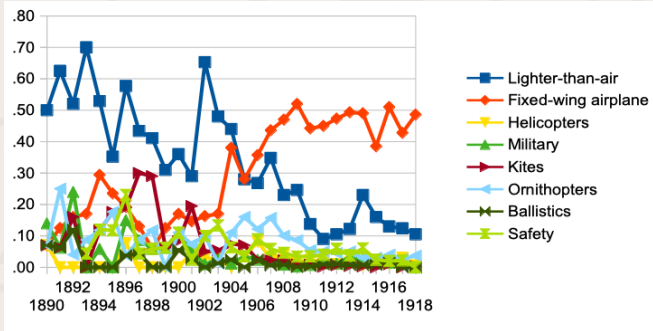
- Original patent document and USPTO classification metadata at US PTO site
- Patent 398984 document and bibliographic info on espacenet
- Patent 398984 at google patents
- Archive record of this patent at the Lilienthal museum patents web site
- Short's DB
- Other sources of information about this patent are on the Web

Year filed	1888
Year granted	1889
Office	US
Patent number	398984
Inventors	Reuben Jasper Spalding
Inventor country	US
Applicant person	
Applicant firm	
Applicant type	
Applicant is inventor?	Yes
Original title	Flying-machine

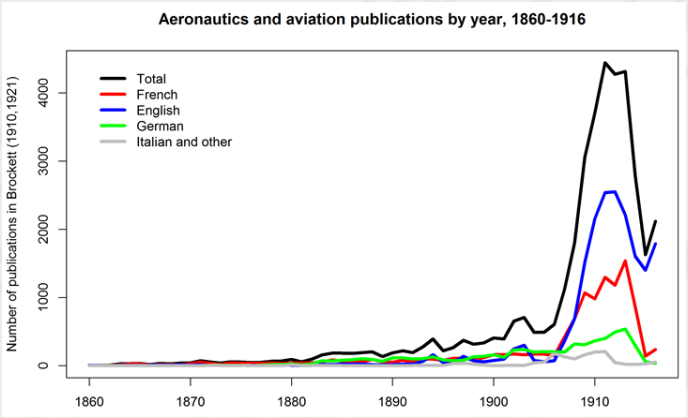
(1) Patents boom 1906-1910



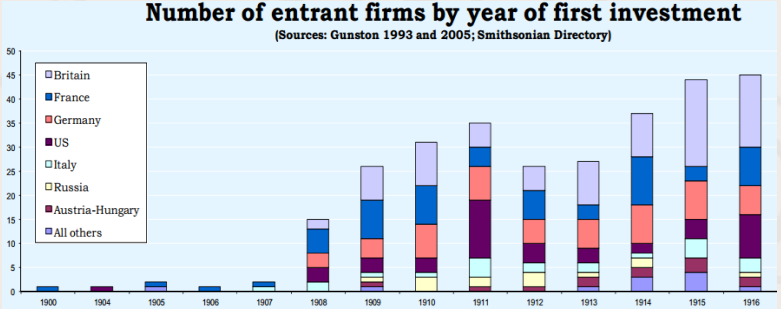
(2) Patent designs shift from balloons to fixed wings



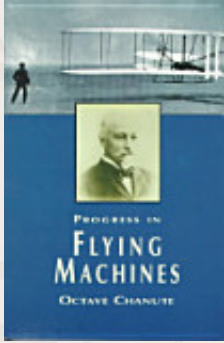
(3) Similar publications boom



(4) Wave of startup firms 1908-1912



Individuals



We can identify "giants" who are cited most, *before* airplane invented

- Maxim, Lilienthal, Pénaud, Mouillard, Hargrave, Moy, Le Bris, Langley, Wenham, Phillips – as cited by Chanute (1894)

We have some biographical info on 1036 individuals as of this writing (not just "giants")

For 557 of these we have an **occupation**, usually from patent specification

- About half described themselves as "**engineers**" (227)
- 25 meteorologists; 25 as "industrialist" or "manufacturer"
- Others: "gentlemen"; merchants; physicians; dentists; chemists; professors; mechanics
- Some were professional balloon-makers or lighter-than-air gas suppliers
- Later: "aeroplane manufacturer", designer, or mechanic

Broad country representation: 881 known so far: 221 US, 204 FR, 141 GB, 88 DE, 50 AT or AH, 30 IT, 20 CH, many others

Some individuals had >40 patents. Many patentees also published articles and we are matching names
Few of these "tinkerers" founded companies; more founders were industrialists already

Some conclusions so far

- There were vast numbers of aero patents and publications by 1916
  - Many of the 15,000 patents are duplicative ; we can identify some of those

- The wiki database approach integrates precise micro-histories with macro-histories
  - E.g. networks and shifts among activity re balloons, ornithopters, fixed-wings, helicopters, etc.
  - Who started firms; whether aero company founders had a history in the aero field

- Most participants had some technical education; about half were engineers
- They shared designs and information
- They networked through clubs, conferences, visits, exhibitions, letters, and journals