No. 235 JANUARY 2006

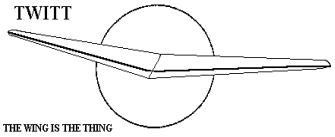
T.W.I.T.T. NEWSLETTER

Picture from the demonstration flight of the Horten IX during the Nurfluegel-Treffen 2002. More information will be part of the program.
Source: http://home.wanadoo.nl/dutch-horten-team/

T.W.I.T.T.
The Wing Is The Thing
P.O. Box 20430
El Cajon, CA 92021

The number after your name indicates the ending year and month of your current subscription, i.e., **0601** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, January 21, 2006, beginning at 1:30 pm at hanger A-4, Gillespie Field, El Cajon, CA (first hanger row on Joe Crosson Drive - Southeast side of Gillespie).



THE WING IS THE THING (T.W.I.T.T.)

T.W.I.T.T. is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation, which is dedicated to furthering education and research in a variety of disciplines.

T.W.I.T.T. Officers:

President: Andy Kecskes **(619) 589-1898**
Secretary: Phillip Burgers **(858) 581-3748**
Treasurer: Bob Fronius **(619) 224-1497**
Editor: Andy Kecskes
Archivist: Gavin Slater

The **T.W.I.T.T.** office is located at:
Hanger A-4, Gillespie Field, El Cajon, California.
Mailing address: P.O. Box 20430
El Cajon, CA 92021

(619) 596-2518 (10am-5:30pm, PST)
(619) 224-1497 (after 7pm, PST)
E-Mail: twitt@pobox.com
Internet: http://www.twitt.org
Members only section: ID – **twittmbr**
Password – **member02**

Subscription Rates: $20 per year (US)
$30 per year (Foreign)

Information Packages: $3.00 ($4 foreign)
(includes one newsletter)

Single Issues of Newsletter: $1.50 each (US) PP
Multiple Back Issues of the newsletter:
$1.00 ea + bulk postage

Foreign mailings: $0.75 each plus postage

Wt/#Issues	FRG	AUSTRALIA	AFRICA
1oz/1	1.75	1.75	1.00
12oz/12	11.00	12.00	8.00
24oz/24	20.00	22.00	15.00
36oz/36	30.00	32.00	22.00
48oz/48	40.00	42.00	30.00
60oz/60	50.00	53.00	37.00

Meetings are held on the third Saturday of every other month (beginning with January), at 1:30 PM, at Hanger A-4, Gillespie Field, El Cajon, California (first row of hangers on the south end of Joe Crosson Drive (#1720), east side of Gillespie or Skid Row for those flying in).

TABLE OF CONTENTS

PRESIDENT'S CORNER

First of all I would like to thank Henry Whittle and Serge Krauss for their efforts in putting together some excellent material for the newsletter. I think Serge out did himself with the level of research and detail he has included in his patent searches of tailless aircraft. He explained that some of the older ones take a lot more digging since they are not as well indexed for electronic searches. If you are interested in this kind of research, I am sure he will be glad to provide some guidance on how to get started.

In an effort to get things rolling meeting wise we are trying a new approach this month with the program. I encourage everyone who normally attended in the past to please come to the meeting so we can get a good feel for whether this will work for future programs when we are unable to find a speaker. It offers an opportunity to take something from the Internet and supplement it with the experiences of the group. This will provide much better material for the newsletter than just cutting and pasting the text and pictures from the web site.

I hope that everyone had a good holiday season and that everything is going well so far in the New Year. I am looking forward to trying some new things this year for both the TWITT and ESA newsletters. Hopefully, I will really find the time to work on the web site and get some of this new information loaded so others can see it and perhaps consider joining the group. If you have any friends who are interested in flying wings, make sure to show them your newsletters and see if they might join us.

Andy

JANUARY 21, 2006 PROGRAM

We are going to try something different this month for a program. Sven Heinz came across some Internet pages that dealt with the construction and flying of a scale model of the Horten IX by a Dutch team. So we are going to download as much as we can and use it to put together a slide show of the project and solicit audience participation discussing the pros and cons of the approach taken by the builders.

One of the other reasons for taking this approach is that some of our members don't have access to the Internet so when we talk about this stuff they are sort of in the dark. So this will put it in the form of a program with questions and answers from the group that will help make it more than just a reprint of website pages.

If this works out and we have the participation we would like, then it might become an avenue for doing future programs where we can't get a speaker, which we all know has gotten to be a tough job.

So mark you calendar for January 21st and come to the hanger for an experiment in program development and to learn about the exciting modeling program.

LETTERS TO THE EDITOR

November 19, 2005

I had sent in a set of foils in answer to Brunno Barretos request for input. This fellow has responded to me along with someone in Argentina. It's nice to have some email of value.

Following mail received from B. Barreto regarding airfoils:

Thank you very much for the airfoils for low speed flight. The SAE competition took place a couple of weeks ago and my model did very well with the Fauvel airfoil...

I'd like to wind tunnel test your airfoils here at college(I'll give proper credit if I do so) and try to "push the envelope" with a new wing. By the way, have you calculated polars for the airfoils?

Thanks again,

Brunno B

Thank you, Andy, for your advice on choice of ISP. I've grown accustomed to them, however. The constraints placed on file transmission size are a recent occurrence. I'd been able to download files of the size of the TP I wanted, in the past. In order to get past the constraints and any possible problem with transmission of large files I have purchased a file splitter program from a software company by the name of YoGen. If only it worked on the download.

I note the mention of the workshop held by Jim Marske in the newsletter. I have contacted him regarding attending same.

I've got two nurflugel models in the final stages of completion that I would like to send for inclusion in the TWITT newsletter. I want to photograph them as uncovered frames and then as completed. What format (extension) would be best for you?

Regards

Henry E. Whittle
<Gulfrose@Juno.com>

(ed. – Henry sent along a CD with the article and some pictures of his project that I will publish in another section of the newsletter. I would like to thank him for taking the time to put this together and, he has indicated there may be more to come in the future.

His response from Brunno is an example of how we can all help each other and perhaps have it lead to new and exciting discoveries. So just remember that no matter how little you think you can offer in response to a question or request, it may be just what is needed so don't hesitate to pass it along.)

December 1, 2005

This just came in and I thought you all might enjoy it.

SLAC and the Exploratorium in San Francisco have joined forces for a unique web cast.

Beyond Einstein is a 12-hour non-stop web cast to celebrate the end of the World Year of Physics.

Different laboratories, science museums and institutes from Switzerland, the UK, Italy, Israel, the US, Taiwan, Tasmania, Finland, Egypt, Holland and Germany will be participating in the full program.

Visit http://www.cern.ch/beyondeinstein at 2 pm on Thursday December 1st to watch the SLAC contribution live from the Exploratorium. Stephon Alexander and Caolionn O'Connell, SLAC's Quantum Diarists, will be explaining their work and there will be live hands-on demonstrations of Brownian motion and relativity, specially prepared by Exploratorium staff. SLAC's Neil Calder will be hosting the event.

Allan Morse
<skunkdaddy@juno.com>

(ed. – I included this even though the time is well past for the webcast just to let you know there are these types of things going on in the world. If you go to the website you may find other webcasts of interest in the future or, you can do a search for them.)

December 29, 2005

HALLOCK ROAD WING Tailless

I just found your question on the Hallock "Road Wing" on some chat line.

I can answer any of your questions since I have the actual aircraft sitting outside in my garage!!!!!!!!

Bruce K. Hallock was my father and he gave the airplane to me several years ago when it was moved out of storage after 40 years.

If you will go to www.roadabletimes.com web site and look for the Hallock Road Wing, you will see several more photos and some details I gave them.

Don't know who ever said it was donated to the EAA but that is not correct. The airplane is still 99% complete but in need of a full restoration. My father just died a month ago and the family now plans to donate this and one of his other tailless designs to the FRONTIERS OF FLIGHT museum at Dallas Texas Love Field.

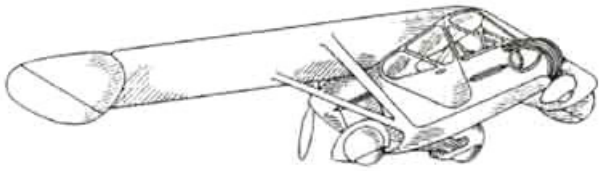
Let me know if you have any other questions.

Sincerely,

Don Hallock
<donsden@totalaccess.net>

(ed. – This is an interesting site and makes some good comparisons between the Hallock and Waterman aerocars.)

Above & Below: Hallock Road Wing.



Above: Waterman Aerobile.

January 1, 2006

Hi TWITT:

This e-mail is from a B-10 customer and builder from Argentina. I think you will find his attachments very interesting. Have a look.

Richard Avalon
<mitchellwing@earthlink.net>

Hello Richard, sorry by so many questions, but that type of plywood is not obtained in Argentina. Can you tell me how many m^2 are needed? Since I can't get it here can you give me directions on how it might be ordered from a store in the US?

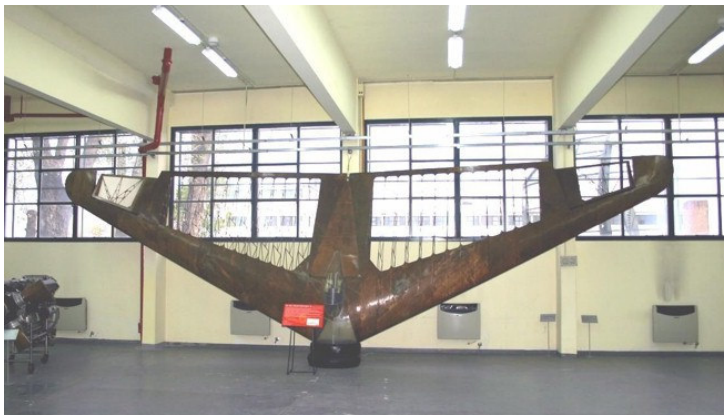
Reimar Horten lived in Argentina and built the Piernifero H xb of plywood of 1mm. I am doing a scale model of that wing and you can see the Piernifero and the construction of my model at these links.

http://www.miliamperios.com/foro/viewtopic.php?t=19609
http://www.miliamperios.com/foro/viewtopic.php?t=23319

Thanks.

Gustavo Lucero
<gclucero@gmail.com>

(ed. – For those of you without an Internet connection I have included the photos. Thanks to Richard for forwarding this to us.)



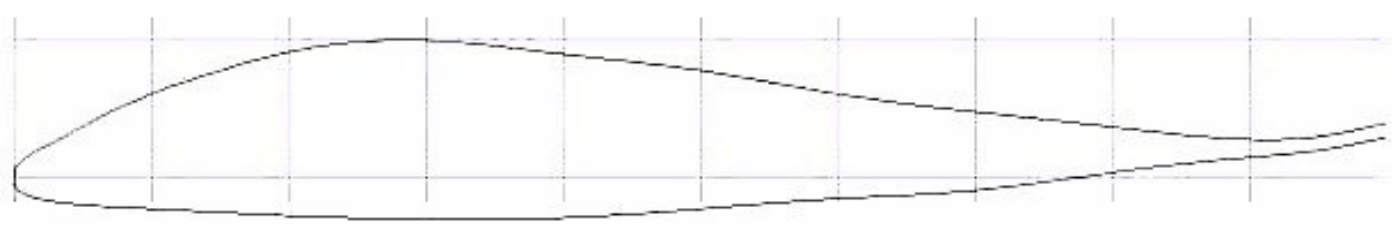
Ellipse Airframe Development

By Henry E. Whittle

Along with the check to cover my initial membership dues in TWITT I sent a drawing done on MS paint of an all-wing idea that was included in the January 2004 issue of the TWITT newsletter. I've continued consideration of the basic design and have the airframe constructed in scale of 1/8" plywood for the center section and the wing main spars; the wing ribs are of 5 MM Mahogany plywood used by a Chinese firm to crate its medical equipment. The leading and trailing edge spars and webs are of 1/32" plywood. Adhesives used were Cyanoacrylates (Crazy Glue) and PC-7 two-part Epoxy. When completed the airframe will be covered in Coverite Microlite, a plastic heat set covering.

This planform has the greatest reflex towards the center section with an inverted butterfly tail.

I will send images of this airframe when covered and some flight images when completed. Propulsion will be by Latex tube catapult.



Ellipse II Data Sheet

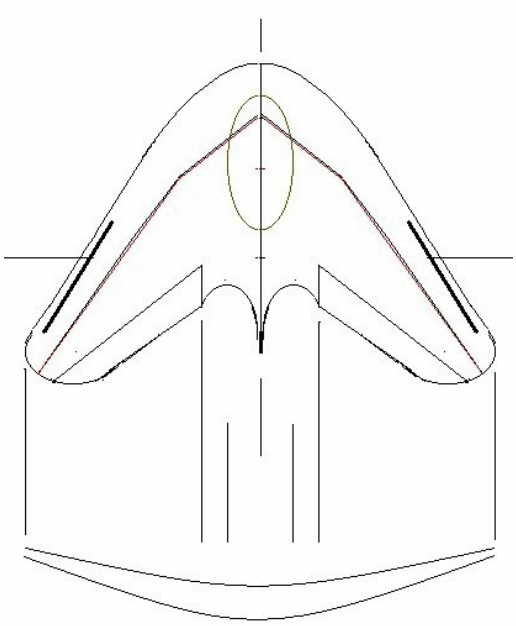
Whittle Reflex Foil Root Ordinates

x	0.00	2.50	5.00	10.00	15.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00
	95.00	100.00											
Yo	0.00	2.40	3.75	6.10	7.80	9.15	10.00	9.00	7.80	6.10	4.80	3.70	2.80
	3.00	4.00											
Yu	0.00	-1.65	-1.95	-2.25	-2.50	-2.75	-3.00	-2.90	-2.25	-1.50	-0.90	0.40	1.50
	2.00	2.95											

Whittle Reflex Foil Tip Ordinates

x	0.00	2.50	5.00	10.00	15.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00
	95.00	100.00											
Yo	0.00	2.40	3.75	6.10	7.80	9.15	10.00	8.90	7.50	5.30	3.40	1.20	-0.20
	0.00	1.05											
Yu	0.00	-1.65	-1.95	-2.25	-2.50	-2.75	-3.00	-3.00	-2.50	-2.40	-2.10	-1.80	-1.50
	-1.00	0.00											

Semispan Wing Area from station 1- 15.78"2 Wing Area from centerline- 31.56"2
Twist-7*@40* chord Sweep- 57.41*LE 40*TE Mainspar Sweep- 54* 30" Dihedral of 10* starting outboard of station 1



(ed. – Serge Krauss submitted the following information in response to the comments by Doug Geffner in last month's issue. He has also provided some information on that issue's cover

picture. The piece is quite extensive so I will have to split it over at least two issues and, fortunately I will be able to split it at the place suggested by Serge by eliminating the classifieds section which I am sure won't bother anyone. This is an unusual circumstance for me in having too much information for an issue, but I'm not complaining. My thanks to Serge for taking the time to put this all together in-between taking care of some family emergencies.)

December Cover Photo:

The December cover photo apparently went unidentified on p.3. It is the B.I Tscheranowski (I use the old spelling) B.I.Tsch.-11 glider (aka GL-1 or RP-1) intending for testing with a Tsander rocket unit. It was built sometime around 1931, glided in early 1932, and flew 1931-3 with a conventional pusher engine. I believe that its wing then was used in the B.I.Tsch.-12, which also flew in 1932.

Pre-Burnelli Lifting-Body, All-Wing, and BWB Origins

The passionate defense of Burnelli by Mr. Geffner invites comment, not just regarding priority in all-wing or BWB aircraft, but the excitement in aviation at that time. I'd like to highlight some of his many active, imaginative, sometimes visionary predecessors and contemporaries, whose ideas ranged from the erudite to the truly adventurous and even grandiose. I hope TWITT members find something new here.

Priority in aviation ideas has posed problems at least as far back as Wright vs. Curtiss. Early in this area where few had real expertise, what was actually possible and similarities in ideas may sometimes have been misunderstood. More confusing were original combinations and applications of previously recognized ideas. I have read seemingly equivalent claims in patents granted on supposedly different ideas. Also, where care is taken, descriptive ideas for a subject aircraft often far outnumber those surviving as patent claims. Finally, there are the cases of actual aircraft built, with or without patent protection.

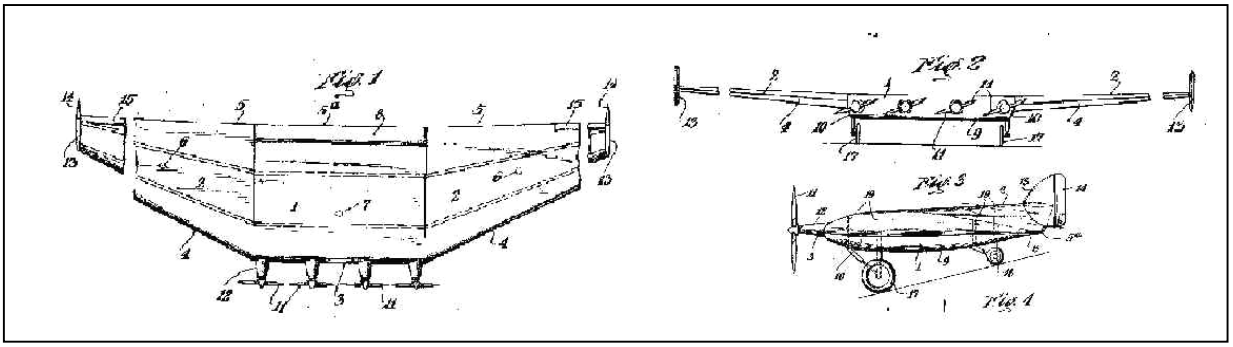
Concepts necessary in judging priority in BWB's show considerable overlap and seem almost trivial today, when thick airfoils are common. The lifting-body concept cited by Mr. Geffner was important, but this can be deceptive and confusing. For instance, are we making a fuselage into part or all of a wing (Burnelli, Snyder) or a wing into a fuselage (Junkers), or both (Stout)? This may seem silly, but obviously, patents exist for each. What about the "blending"? Fauvel, Junkers and Stout, among many, offer claims based on differing interpretations. Finally, how about configurational variance and structures, a more recent focus?

SO…there are reasons for confusion. I believe though that the key original ideas involved in BWB predated Burnelli's. Below, I've cited pertinent patents and aircraft from Burnelli and others for your own perusal.

Mr. Burnelli's U.S. Patents seem to date from about 1928 (filed ca. 1921?), the earliest pertaining directly to tailless aircraft having been granted in 1935 (filed 1933):

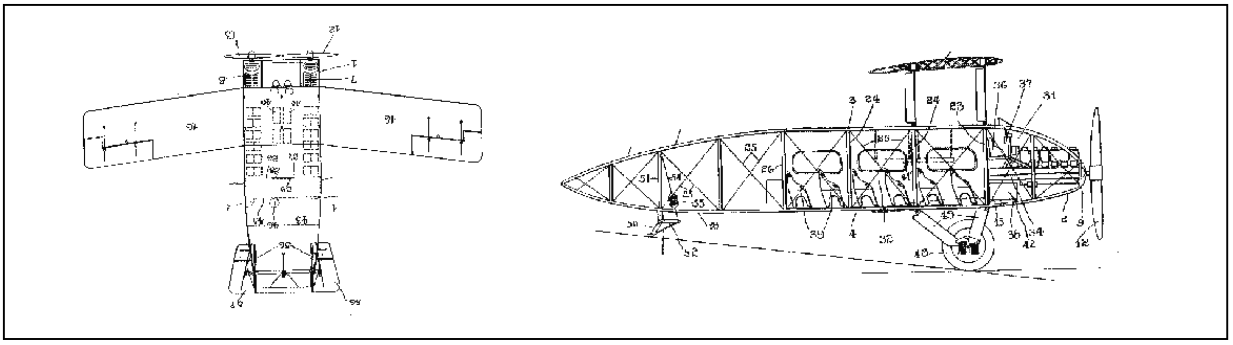
> Burnelli, V.J.; **U.S. Patent No. 1,987,050:**"Tailless Airplane"; 1/8/35 (filed 2/23/33; all-wing tailless w/str., deep center section to house load [not claimed; #1,758,498 of 5/13/30 cited], central l.e. engines and t.e. elevator, and swept lateral sections with c.p. aft of center for stability; 4 pp., 7 figs.)(ex.c.)

Griffin, E.G. (London, for Burnelli Aircraft., Ltd., U.S.); **British Patent No. 445,634:**"Tailless Aeroplane"; 4/16/36 (appl. 1/8/35; c.f. equivalent U.S. Pat. No. 1,987,050 of 1/8/35)(ex.nc.)



The tailless patent references a 1930 patent (filed 1921, the year his like-configured RB-1 flew):

Burnelli, V.J., **U.S. Patent No. 1,758,498:** "Airplane"; 5/13/30 (filed 1/6/21; tailed biplane with wide airfoiled fuselage, containing engines, passengers, etc., and conventional wings)(ex.c.)

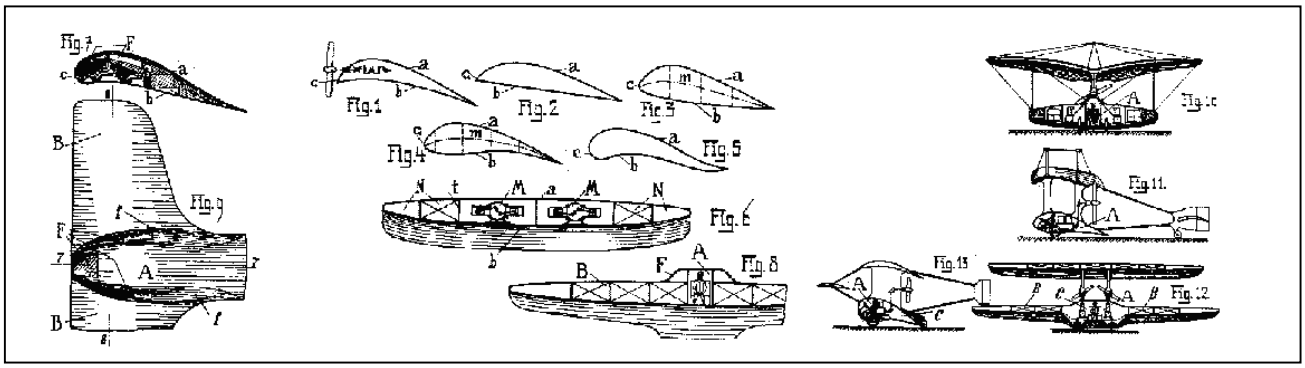


Reference to the 1930 patent is made in the descriptive part of the tailless patent to show priority in enclosing engines, passengers, load, etc. in the center section, but new (allowed) claims ultimately concern only aerodynamics: relative lifting capacities and centers of lift for center vs. swept outer panels. So dating from 2/23/33, we have the intent to enclose all in a "continuous" wing, citing a 1921 idea that fuselages can be airfoil shaped. Airfoil shaped fuselage and non-blended wing thus apparently form the basis for a wing incorporating a fuselage, an idea that I believe was no longer patentable and which was not claimed in the tailless aircraft patent. Burnelli's other early work concerned tailed types, many of which featured twin boomed stabilizers, relative c.p.'s of fuselage vs. wings, etc., if memory serves. I hope I'll be corrected, if I'm wrong here, but I don't remember reading any other directly relevant early Burnelli patents.

So how does Burnelli's timeline relate to other relevant patents and aircraft, and does it afford any priority in this area? Of the 54 high-A/R all-wing, flying-wing, or BWB creators and 52 low-A/R all-wing or lifting-body creators listed in my bibliography (some having authored numerous planes), a few important ones do predate Burnelli's Tailless aircraft patents. Perhaps surprising to some, even the fuselage-as-airfoil idea is trumped in this area. - by a well known patent. I should point out that almost all actual aircraft of these categories ever produced were compromises, and the "gray areas" could be argued forever. Confusing to some is that several designers whose intent was to create large all-wing planes had to be content with aerodynamic proof of concept from smaller aircraft, which required protruding fuselage structures or open cockpits. Snyder, the Hortens, and Stout are examples. Note too the apparently separate patent recognition given low-aspect-ratio all-wing or lifting-body types (e.g. Snyder, Stout below).

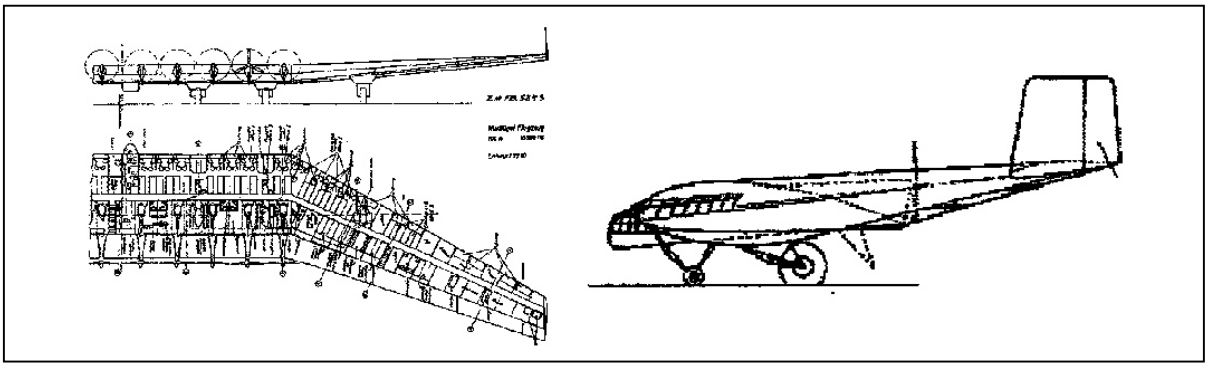
The following relevant published, patented, or constructed ideas predate Burnelli's tailless-aircraft patent. At least TWO definitely predate all of V. Burnelli's patented work, Junkers incorporating a "blending" idea in his text. I'll just include those that specify or show useful load (including the pilot) being carried within the lifting surface (wing) contour, whether or not it is "blended".

JUNKERS, H.: All-wing patents; **Ger. patent No. 253,788**, 11/14/12 (2/1/10 -'the 1910 patent'); **U.S. patent No. 1,114,364:** "Flying Machine", 10/20/14 (1/26/11)…the equivalent U.S. patent.



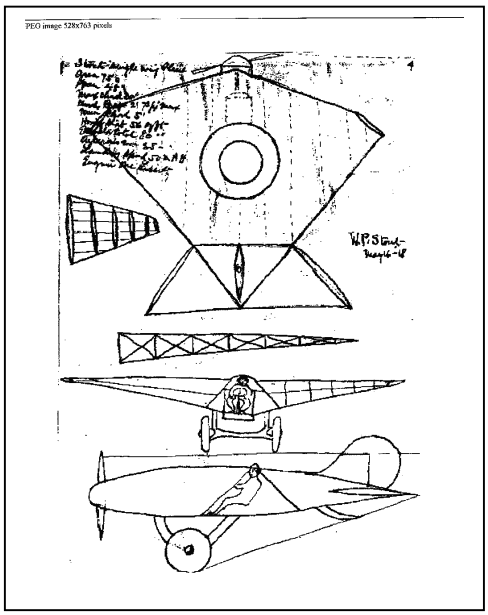
The famous "1910 patent" is for carrying pilots, engines, and other load within the lifting surfaces. It is looked upon as *the* pioneering patent in that field. A significant quote from its claims: "…means for connecting said wings and said shell, so as to offer a smooth surface to the air, …". This and his figures 8 and 9 above suggest the blending of wing and airfoiled "body" or "shell".

Junkers, among several of this time, also proposed **giant flying wings**, here a 10-engined, proposal of 1930:

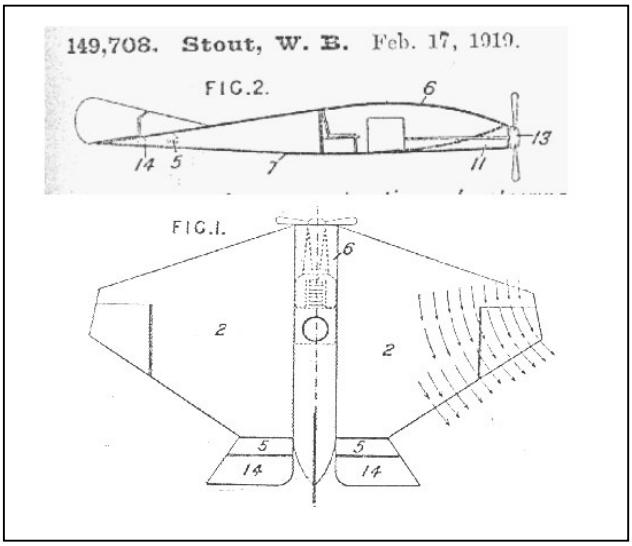


This wing configuration incorporates ideas of Burnelli's later all-wing patent, the outer panels functioning after pioneer J.W. Dunne or, by a stretch, Etrich and other Zanonia exponents. Junkers also proposed the giant **J1000** canard with passenger-carrying wing in 1924 and built the more conventional G38 transport in 1927.

STOUT, W. (father of the Ford "trimotor")**:** Here's his **drawing, dated 5/16/18**, for a low-A/R, all-wing light plane with pilot and engine within wing (NASM from P. Vigneron):

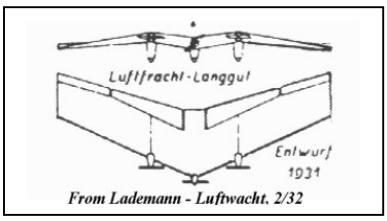


His **British patent #149,708 of 2/17/19** enclosed all but the pilot's head within a low-A/R, tapered wing:



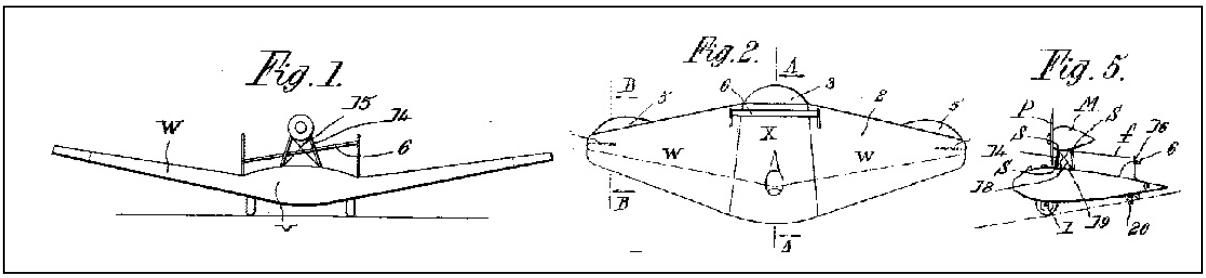
In this patent, wing surfaces taper from surfaces 6 and 7 of the cabin to the tips. His **#149,709** specifies "An aeroplane in which substantially all detrimental surfaces are located within the camber of the planes, as in Specification 149,708", but is provided with a sealed transparent canopy and other transparent "panels". Again, other than the tapering, we see otherwise apparently equivalent ideas by Junkers and Stout given separate recognition for differing aspect ratios. Regarding nationality, whether or not recognized by a British patent, the Junkers patent idea was publicized in the British press. Nationality was definitely not an issue later for Snyder and Junkers, both of whom were granted U.S. patents. Stout built a diamond-shaped low-A/R **"Batwing" tailless, which flew in late 1918**. An attempt at cantilevering through a thick wing that could house structure, pilot, and propulsion, it of necessity had a protruding fuselage. In a later, corresponding **U.S. patent, No. 1,862,102** of 6/7/32 (filed 3/29/19) a partial fuselage again protrudes.

LANGGUTH, W. (LUFTFRACHT CO.): Ger.; swept tractor trimotor commercial plane w/span- and chord-distributed load: proposed 1929-31 (DNF); **U.S. Patent No. 1,924,996** of 8/29/33 (filed 1/23/32): "Tailless Airplane". Claims include load at each (spanwise and chordwise) point approximately equaling lift at that point.

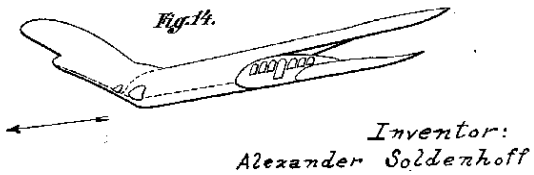


From Lademann - Luftwacht, 2/32

FAUVEL, CHARLES: Of his early planes and patents, these seem relevant. **AV-1:** W.T. tests only, 1926? [Tunstall: 1928 or later]; **AV-2** (see below) constr. , flew 1929-30; **Fr. patent:** filed 6/2/29; **U.S. patent:** No. 1,915,055 of 6/20/33 (2/24/30); **Br. patents:** No. 344,653 of 3/12/31 (2/28/30), No. 474,065 of 1/17/36 (void). The AV-2 was definitely a BWB, although the engine was in a raised pod. The slightly later AV-3 was compromised (minimized pod "fuselage"). Patent drawings below show AV-2 configuration. Claims include "central portion of airfoil profile…wings having substantially similar parallel profile sections from said central portion to their respective tips."

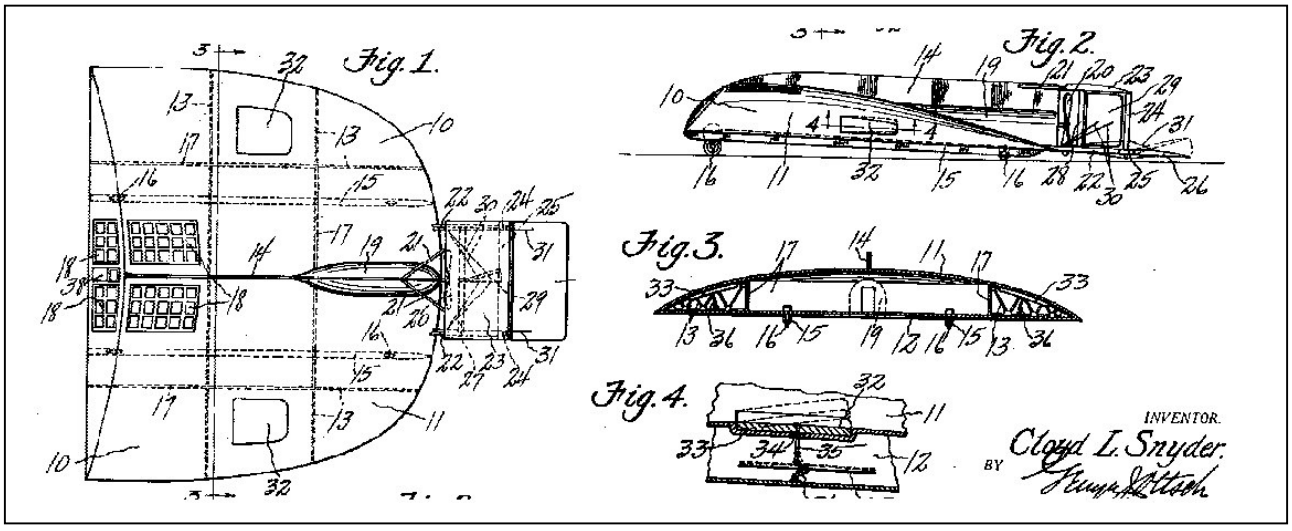


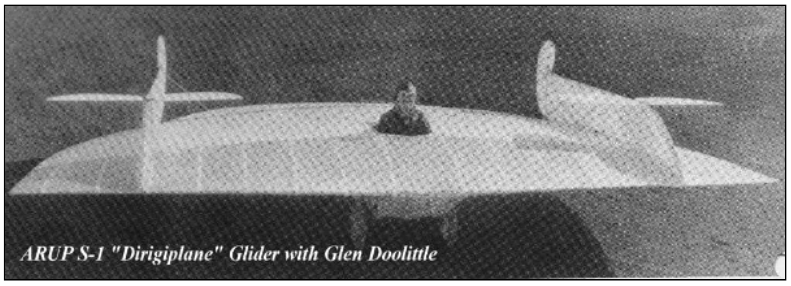
SOLDENHOFF, ALEXANDER: noted Swiss builder of tailless light planes also patented giant flying wing designs with internal seating. Of his many patents, **British patent No. 383,637** of 5/21/31 (c. 5/22/30) and **U.S. patent No. 1,848,752** of 3/8/32 (5/19/31), for thick monoplane center w/biplane tips, are relevant. There may be others.

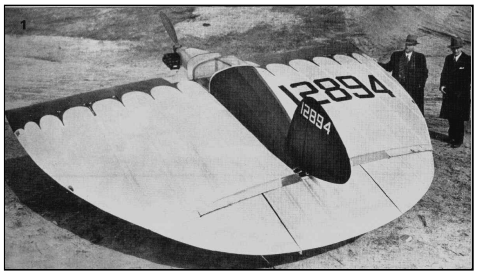


CHRISTMAS, W.W.: U.S. Patent No. 1,797,326: "Flying Wing Airplane", 3/24/31 (filed 7/18/29; thick wing w/twin-boomed tail). Claims include "a single continuous wing…without any central fuselage or equivalent enlargement,…central section having sufficient head room within itself to accommodate persons…"

SNYDER, C.L. (later w/HOFFMAN, R.): **U.S. Pat. No. 1,855,695:** "Aircraft", 4/26/32 (filed 9/8/30; a controllable "compartment" lifting body with straight l.e. joined to curved t.e., and length approximately equal to span; pref. embodiment describes pilots, passengers, engines, etc. inside airfoiled, possibly buoyant body):




ARUP S-1 "Dirigiplane" Glider with Glen Doolittle



Dr. Snyder's low-A/R **"Dirigiplane"** glider flew and was then motorized in 1932. Highly successful powered versions, like the 1933 **ARUP S-2** at right, grew protruding fuselages with airfoil contours to the extent thought necessary on such a small plane.