

THE FIXED-GEAR STAGGERWINGS

By ROBERT T. SMITH

The name, "Negative Staggerwing Beechcraft" goes back to the All American Air Maneuvers held in Miami, Florida in January, 1933. The show announcer is credited (by an early Beech test pilot) with having called the new Beech airplane by that name. As anyone who has ever heard or seen one of these airplanes knows, the name stuck. Today it has been shortened to "Staggerwing Beech", or sometimes simply "Stagger-Beech". In all cases it refers to the distinctive cabin bi-plane built by the Beech Aircraft Company in Wichita, Kansas from 1932 through 1946.

The Beechcraft Model 17 cabin biplane is one of the very few biplane types ever built with negatively staggered wings. Stagger refers to the arrangement of the wings when viewed from the top as concerns whether they are superimposed (neutral stagger), the top wing is forward (positive stagger), or the bottom wing is forward (negative stagger). There are several advantages of negatively staggered biplane wings. First, the lower wing is more efficient since it will not ride in the down-wash from the upper wing. Second, the pilot (particularly in a cabin biplane) can be seated so that his visibility is not restricted by the upper wing. That is to say, it will not be restricted as much with negative stagger as with positive stagger. Third, if a retractable gear is desired, the negative stagger arrangement allows the gear to be mounted on the lower wing, and retract into the lower wing centersection.

When Walter H. Beech founded his own company in 1932 (after having sold TravelAir, his original concern) he obviously considered the first two advantages, but not the latter for the first Staggerwing had fixed landing gear. Four Staggerwings were built with this fixed gear. When it was decided to fully retract the

gear on later models, the lower wing was already conveniently located to house the gear.

The original Staggerwing was conceived as a four-place development of the TravelAir "Mystery" racer. An upper wing was added, and the aircraft was rigged through the landing gear as had been done on the "Mystery" racer. The biplane configuration made a strong, light structure, and allowed the use of a fairly thin airfoil section. Wing spars were of steel tubing, and were considerably stronger than wooden types. Pilot Eddie Ross found this out when he hit an oil pump polish rod in the Oklahoma oil fields with the right wing of No. 2 Staggerwing. The wing crumpled badly, but didn't fail, and Ross was able to make a successful forced landing. The wing panel was replaced, and the airplane was airworthy again.

The first two Staggerwings, Construction/Number 1 and C/N 2, were designated Model 17R. At the time Walter Beech sold TravelAir to the Curtiss-Wright Corp., the last number he used for a TravelAir model number was 16. Thus, when he formed Beech Aircraft, he continued the same numbering system, and the first Beech airplane became Model 17. The letter after the number indicated the engine installed. "R" was assigned to the 420 HP Wright which the first two Staggerwings used.

In sales literature for Model 17R a footnote stated "Also Available With Wright Cyclone" though none (airplane) actually existed. But, one was ordered.' Since installation of the larger engine required modifications in the airframe structure, the model number was changed to A-17, and the letter F was assigned to the Wright "Cyclone" engine. Two of these types were built, C/N 5 and C/N 11, both in 1934.

The jump from C/N 2 to C/N 5, and thence to C/N 11

The first Beech Aircraft Company Airplane, Model 17, C/N 1, NC 499N, in its original configuration. The narrow landing gear and individual holes in the cowling for each engine cylinder can be noted. (Photo - Beech Aircraft Corp.)



Pilot Eddie Ross with C/N 2, NC 58Y, at Santa Rita, Texas in 1933. At this time the cowling had been re-worked with scoops around the air intake openings. This did not work and at 100 hours the No. 1 cylinder blew its top. (Photo - E.F. Ross Collection)





Probably C/N 1, since this photograph appeared in AERO DIGEST Magazine of December 1932 prior to the time that C/N 2 was built. It then had an NACA type engine cowling. (Photo - Peter M. Bowers Collection)



Not positively identified as C/N 1 or 2 but probably the latter with fixed tailwheel. This was not revised on C/N 2 as Pilot Ross became used to handling the airplane with the fixed rear wheel. (Photo - Bowers)



The narrow landing gear is very evident in this view of C/N 2. Note the landing lights above the wheel spats and the second phase cowling. (Photo - E. F. Ross Collection)



The rear view of C/N 2 with empennage bracing wires. These broke several times in flight and Eddie Ross suggested the change to steel tubing, which was used on all later Staggerwings. (Photo - Ross Collection)

was due to a "modernization" program underway at Beech in 1933 and 1934. The first 17R flew on Nov. 4, 1932, and the second was delivered in June, 1933. Then, two things happened almost simultaneously. First, it was decided to "modernize" the Staggerwing design toward a fully retractable landing gear, thicker wings, a smaller engine, and ease of maintenance. Second, an order was received for an A-17F from the Goodall Worsted Company, a division of Sanford Mills in Sanford, Maine. By the time the first A-17F was ready for delivery, two of the new B-17 Staggerwings were under construction, and already had C/N 3 and C/N 4 assigned. So, the first A-17F was C/N 5, although it was really the third Staggerwing built. By the time the second A-17F was built, several B-17 Staggerwings were on the production line (1934), and it carried C/N 11.

The first 17R (NC 499N, C/N 11) was sold to the Ethyl Gasoline Corporation and piloted by Dewey Noyes. Although C/N 1 first flew in November, 1932, it was not delivered to Ethyl Corp., until early 1933. Before delivery its landing gear tread was widened, and a full swivelling tail wheel was fitted. In its original configuration the 17R had extremely narrow landing gear, and a fixed tailwheel. The 17R's (Likewise the A-17F's) were markedly noseheavy, and were difficult to handle on the ground; groundloops were so common that pilots thought them part of the aircraft's standard equipment. The fixed tailwheel made taxiing almost impossible in a strong wind. Turns were difficult to make as the throttle had to be opened to blast the tail up, then full rudder and brake applied to turn the airplane. Therefore, a full swivelling tailwheel was installed, and the

main gear tread was widened to improve landing and take-off characteristics. These two modifications were made to C/N 1 only. The second 17R was not changed, probably due to its short life.

One other modification was made, greatly affecting appearance. The original engine cowling on the Model 17R airplane completely enclosed the engine, even the front. Holes were cut in front of each individual engine cylinder, but not enough air could enter as evidenced by high cylinder head temperatures. After about 100 hours of flying C/N 2 blew a cylinder head, the "closed" cowling was removed and a standard NACA cowling was installed. Cylinder head temperatures dropped nearly 100°F.

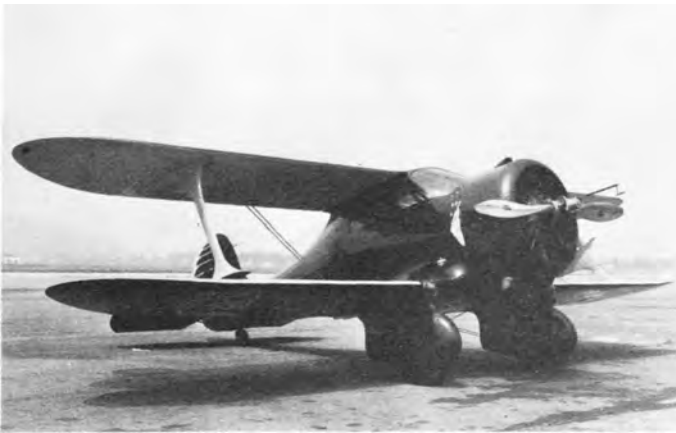
Photographs of C/N 1 exist with both the individual cylinder openings (the so-called "closed" cowling), and the NACA cowling, but all photos with the Ethyl Corp., emblem on the airplane show individual cylinder openings. Since earlier photographs of the No. 1 airplane show the NACA cowling, my conclusion is that it was installed as a test measure before C/N 2 blew the cylinder head. But, when C/N 1 was delivered to Ethyl Corp., apparently they wanted the original design and it was evidently installed.

Dewey Noyes flew C/N 1 (NC 499N) for the Ethyl Corporation until the winter of 1935-36. In a flight over Pennsylvania the airplane iced up and he was killed.

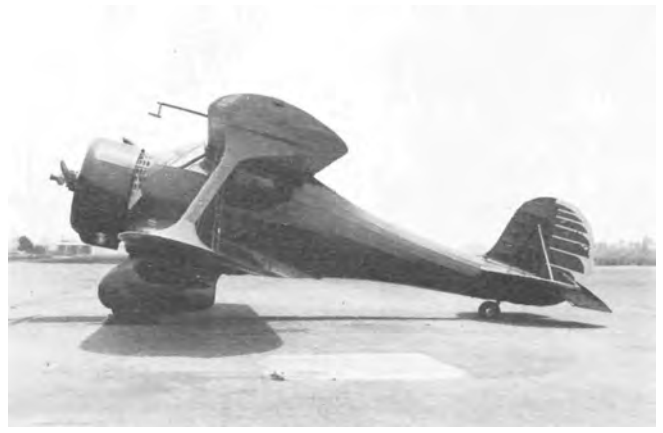
Following the sale of C/N 1 to the Ethyl Corp., Beech Aircraft was low on funds, and there were no customers in sight. Tom Loffland, of Loffland Brothers Company in Tulsa, Okla., and a personal friend of Walter Beech, had been using TravelAir Biplanes for several



Another view of C/N 2 in which it is possible to just make out the fairing around the fixed tailwheel. (Photo - Ross Collection)



Another view of C/N 5 where the diameter of the "Cyclone" engine is even more pronounced. (Photo - (Bowers Collection)



The first Model A-17F, C/N 4, NC 12583, featuring the large diameter Wright "Cyclone" engine. (Photo - (Bowers Collection)



C/N 5 when it was entered in the 1937 Bendix Trophy Race, but failed to take off. It is surmised that the landing gear collapsed while taxiing.

years and agreed to help Walter Beech meet his payroll if Beech would build a Model 17R for Loffland Brothers Company, which Walter Beech promptly did, and delivered it to Loffland's pilot, Eddie Ross, in June 1933. Registered NC 58Y, C/N 2 was flown by Ross for Loffland Brothers Company until the summer of 1935 when it was traded in on a later model. Although Walter Beech offered to give the airframe (less engine and instruments) to Eddie Ross if he would not sell it or allow anyone else to fly it, Ross declined the offer and has since regretted it. It is not known what happened to C/N 2; probably it was kept at the factory, and eventually dismantled.

The first Model A-17F airplane, C/N 5 (NX 12583 - later NC 12583), was sold to the Sanford Mills of Vermont and delivered in February 1934. Veteran pilot Robert S. Fogg, Sr., flew it for the Sanford Mills Company until November, at which time he went to Wichita to begin some flight tests on the second Model A-17F. He and Louise Thaden were to use this (C/N 11) for the famous London to Melbourne Race, but decided not to when it became apparent that a slower airplane with a longer range would have a better chance. The Dept. of Air Commerce purchased C/N 11, and registered it as NS-68. It is listed as an "A-17FS" in the Civil Register, but what the "S" stands for is unknown; perhaps some A.A.H.S. Member knows.

The Sanford Mills A-17F (C/N 5) was sold to Howard Hughes, and was later registered for entry in the 1937 Bendix Trophy Race. Bob Perlick was to be the pilot but the airplane did not leave the ground. The eventual disposition of this airplane, too, is unknown.

The Dept. of Air Commerce A-17F (C/N 11, NS-68) was flown by one of their pilots for a while, then dismantled, and last shown on the Civil Register dated 1 January 1937.

The Wright "Cyclone" installed in the A-17F Staggerwings is variously shown to have from 690 to 750 hp. Since most sources quote the horsepower as being about 700, I prefer to call it so. In any case, it was a very large engine for such an airplane to have in the mid-thirties, and the A-17F was reported to be faster than any military fighter of 1934, with 250 mph top speed. Most pilots were unwilling to fly the A-17Fs on account of the big "Cyclone". One fellow told Robert Fogg that he had "...100 hours to live..." if he continued to fly it. Bob Fogg, Sr., is still very much alive today in New Hampshire. Even so, both Models, 17R and A-17F, were real 'tigers' with poor landing and takeoff handling characteristics caused by lots of engine torque, narrow landing gear, and nose heaviness.

Walter Beech's idea in designing the Staggerwing Beech was to provide a fast airplane with plenty of range, and still retain a low landing speed. He liked the idea of a fast airplane, but the large engines in both 17R and A-17F made them expensive aircraft, difficult to sell in the middle of the Great Depression. For this reason, the Staggerwing was "modernized" during 1933 and early 1934 resulting in the Model B-17. Its landing gear was fully retractable, and a lower horsepower engine was installed. Speed was sacrificed somewhat for better economy, and most importantly, a lower selling price. The first B-17 was a B-17L powered with a 225 HP Jacobs L4MB engine.



It has been stated, that C/N 5 was not repaired, after its attempt at the 1937 Bendix Trophy. However, the photographer's note on this photo of C/N 5 states it was taken 20 July 1940. Could there be more to this Beech's history? (Photo - Barney Deatrick)



The first of the B-17 Models, C/N 14, NC 12597, with retractable landing gear. Several of the Model B-17L are still airworthy. They were popular with oil companies and other industrial firms needing a small, fast aircraft. (Photo - Bowers Collection)



An unfortunate incident in the life of a B-17L. This was C/N 25 shown at Mines Field before it became Los Angeles International Airport on 26 March 1938. Nose heaviness of the type sometimes led to incidents like the one depicted here. (Photo - Bowers Collection)



The last of the Model 17 Staggerwing Beech airplanes was the G-17S, C/N B-3. It was completed in 1946 and is shown here as it appeared sixteen years later. The photo was taken at Fulton County Airport, Atlanta, Georgia on 14 October 1962. (Photo - Robert T. Smith)

The B-17 used wooden wing spars instead of expensive steel spars, and a thicker airfoil section was used to reduce the landing speed to 50 mph or less. From that time on, few changes were made in the design of the Staggerwing. The landing gear was shortened in the C-17 model, and other changes were made in the D-17 aircraft, but the basic design evidenced by the first B-17 was little changed over the years. The last model was the G-17, built in 1946.

ABOUT THE AUTHOR - Robert T. Smith, of Syrna, Georgia, is currently publishing several books on aircraft including the Cessna Guide, Classic Biplanes, The Piper Cub Story, Antique Plane Guide, and others. However, his specialty at present is a history of the Staggerwing Beech airplanes. From his experience he has prepared the foregoing article concentrating his attention on the four, fixed landing gear models that began the famous Staggerwing line. The subject, therefore, is a civil one, but it is hoped that the chapter of Staggerwing history devoted to the type's use, and contemplated use, in racing will be explored for the JOURNAL in the near future.

EDITOR'S NOTE - Beech Staggerwings began to appear in the Bendix Trophy Races in 1936. That year, after Benny Howard was forced out of the Bendix (and almost killed along with his wife) by the loss of a propeller. Blanche Noyes and Louise Thaden went on to take first place in their Beech C-17R. They flew from New York to Los Angeles in 14 hours, 55 minutes and 1 second. The following year Miss Jacqueline Cochran finished third, flying from Los Angeles to Cleveland in a Beech D-17W. Her time was 10 hours, 29 minutes and 8.7 seconds. In 1938 Max Constant flew this same place to fourth place in the Bendix, flying from Los Angeles to Cleveland. His time was 10 hours, 14 minutes and 39.6 seconds. In 1939 Max Constant again took the Beech to fourth place from Los Angeles to Cleveland but this time in 8 hours, 49 minutes and 33.01 seconds.

Representative of all these planes in Jackie Cochran's No. 13, the Beech D-17W registered as R18562. No. 13 is shown on the opposite page through Bob Cunningham's fine drawing. The drawing is based on the "National Air Race Sketch Book, 1930 - 1949" by Fred Buehl and Harry Gann. Los Angeles: Floyd Clymer Publications, 1949.

