

# Weld Done: A Century of Sparks

**World War I lessons inspired a new arc-welding process**

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**Sparks flew 100 years ago,**

and aircraft production would never be the same.

In the time of wood and fabric biplanes, timber baron Bill Boeing showed his pioneering vision by ushering in planes made with metal and bonded by arc welding. World War I had demonstrated aviation's usefulness and propelled engineers to work on designing more practical and efficient aircraft. Traditional stick, wire and fabric construction gave way to welded steel framework and duralumin, an early aluminum alloy.

#### ARC SUPPORT

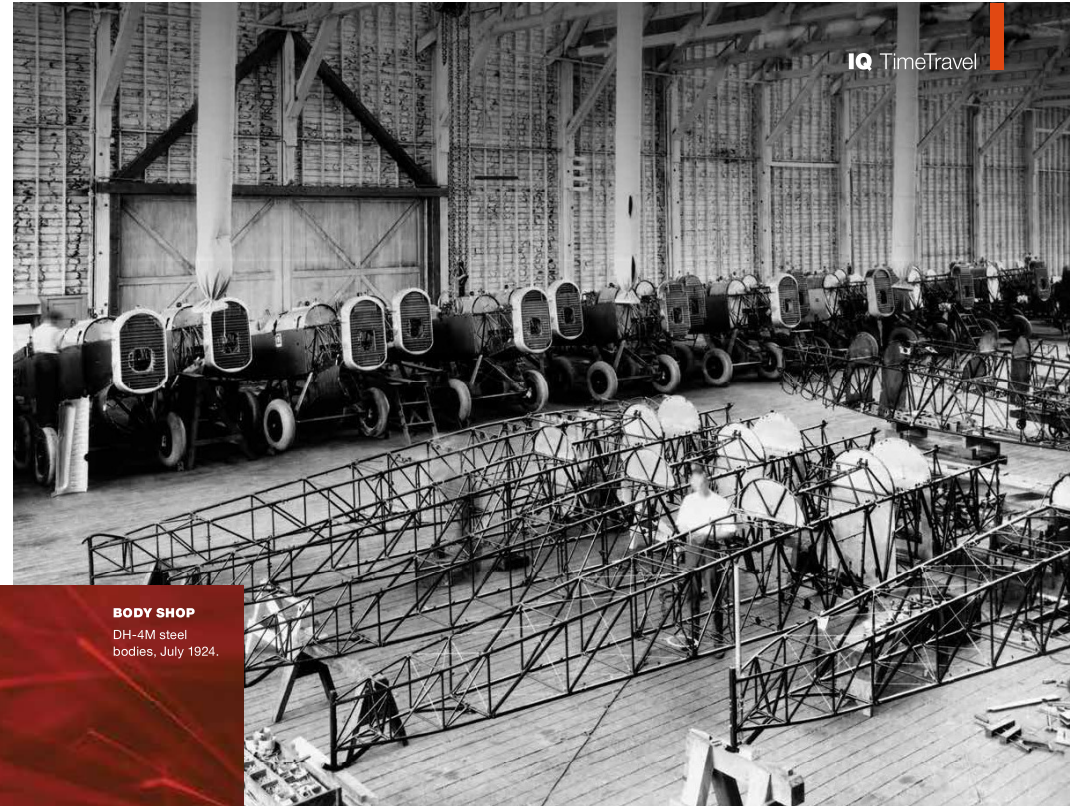
Workers perfect the Boeing-developed arc-welding technique inside the company's first factory, March 1922 in Seattle.



## In February 1923,

Boeing's newly developed arc-welding process was used for the first time to equip three remodeled de Havilland DH-4s with steel tube fuselages. From 1923 to 1925, Boeing modified 186 airplanes using the method. These aircraft were designated DH-4M (M for modernized).

Arc welding was used extensively in the following years and was crucial in the development of the first Boeing-designed fighters. The technique was eventually adopted for landing gear and other steel structures. **IQ**

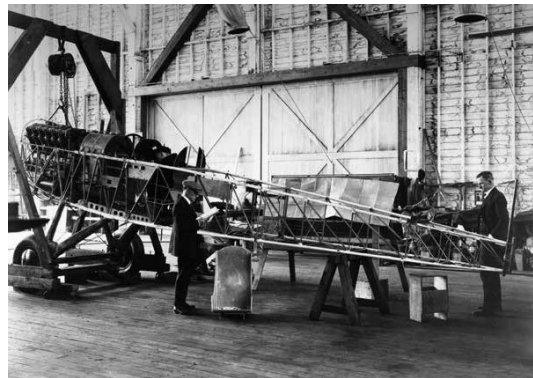


**BODY SHOP**  
DH-4M steel  
bodies, July 1924.



**MAN OF STEEL**

Working on a DH-4M fuselage wing frame, March 1923.



**EARLY METAL FRAME**

A DH-4M frame in a jig, April 1923.



**MULTIPURPOSE  
BIPLANE**

The only U.S.-built aircraft to see combat during World War I, the de Havilland bomber later served as an air ambulance, photographic plane, trainer, target tug, forest fire patroller, mail carrier and even an air racer.