

June 17, 1930.

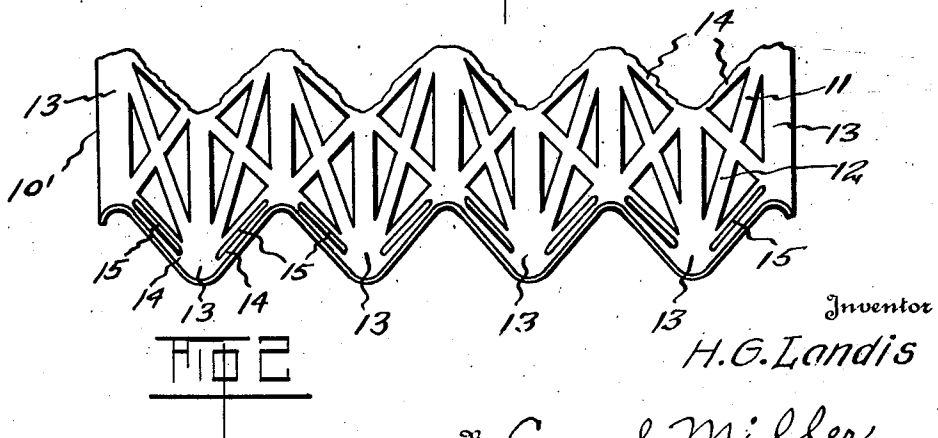
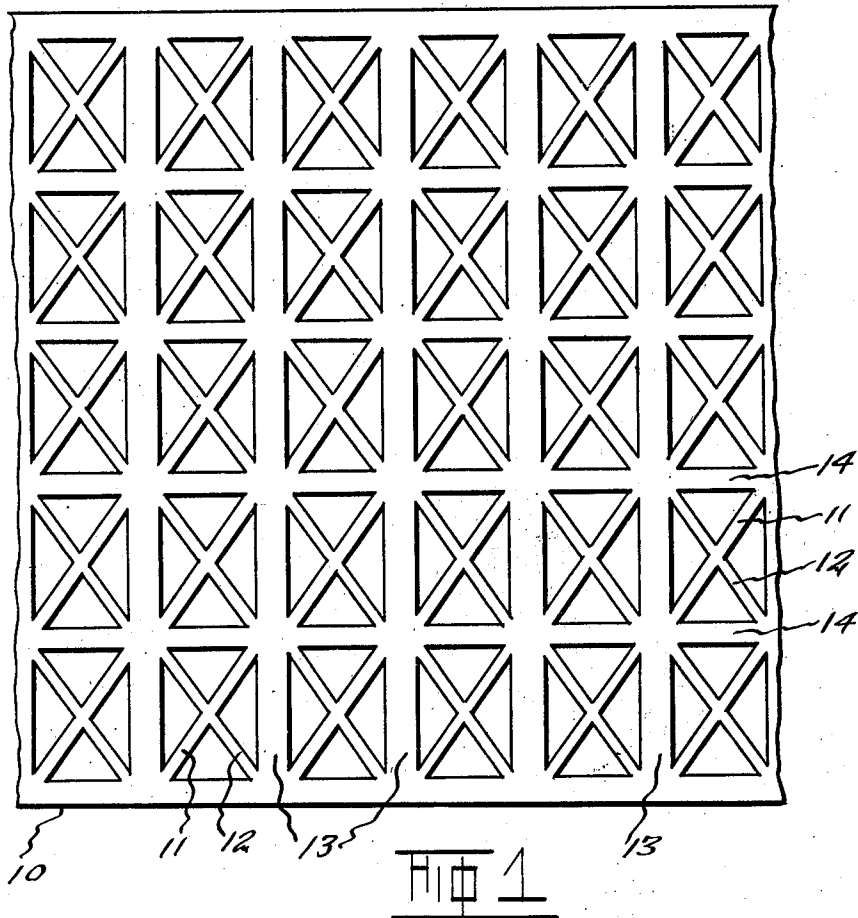
H. G. LANDIS

1,765,079

METAL AEROPLANE WING

Filed Dec. 13, 1929

3 Sheets-Sheet 1



Inventor

H. G. Landis

By Carl Miller

Attorney

June 17, 1930.

H. G. LANDIS

1,765,079

METAL AEROPLANE WING

Filed Dec. 13, 1929

3 Sheets-Sheet 2

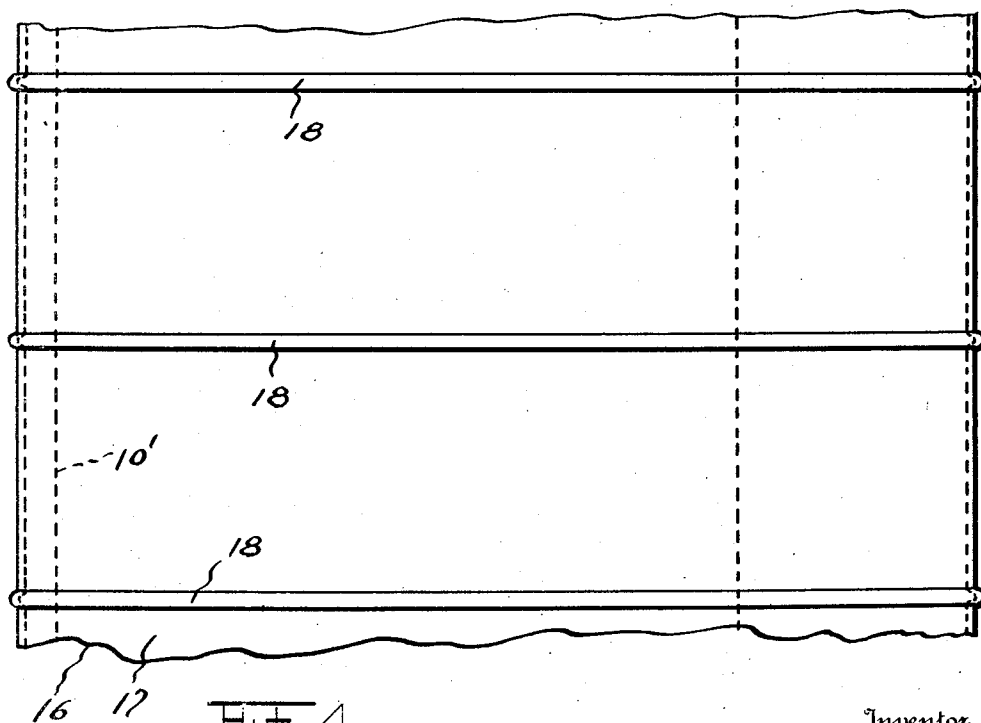
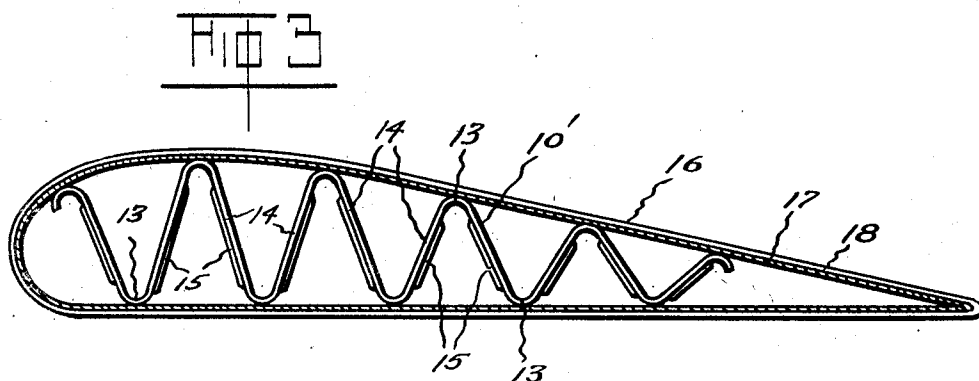


FIG 4

Inventor

H. G. Landis

By Carl Miller

Attorney

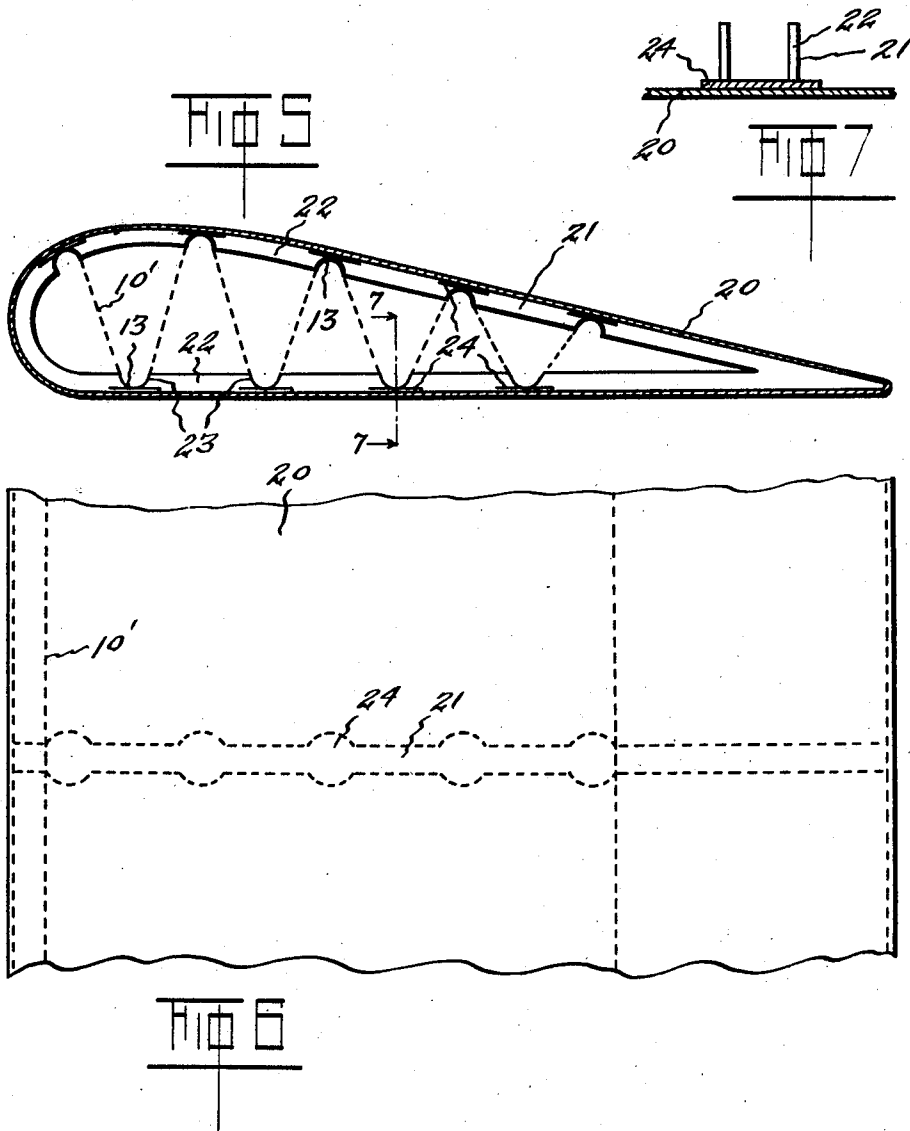
June 17, 1930.

H. G. LANDIS
METAL AEROPLANE WING

1,765,079

Filed Dec. 13, 1929

3 Sheets-Sheet 3



Inventor

H. G. Landis

Carl Miller

Attorney

UNITED STATES PATENT OFFICE

HARRY G. LANDIS, OF MARSHALL, MISSOURI

METAL AEROPLANE WING

Application filed December 13, 1929. Serial No. 413,921.

This invention relates to the manufacture of aeroplane wings, and has for an object the construction of an all metal wing that is exceedingly strong, easy to manufacture, cheap, light in weight, and comprising only two major elements—a thin metal cover, and a stamped one piece spar and brace work.

Other objects of this invention will become apparent as the description thereof, given hereunder proceeds, reference being now had to the accompanying drawings, wherein:—

Figure 1 is a plan view of a stamped sheet combination spar and brace, prior to forming.

Figure 2 is a partial perspective view of the same, formed into the shape of a truss.

Figure 3 is a cross-sectional view of an aeroplane wing.

Figure 4 is a partial plan view thereof.

Figure 5 is a cross-sectional view of a modified form of wing.

Figure 6 is a partial plan view thereof.

Figure 7 is a detail view taken on line 7—7, Figure 5.

The internal supporting structure of the contemplated aeroplane wing comprises a one piece sheet metal stamping 10, shown in Figure 1, so stamped as to form a plurality of evenly spaced equal diagonal braces 11 and 12 throughout the entire surface thereof. Separating transverse rows or bays of said diagonal braces are parallel beams or spars 13, and at right angles thereto separating longitudinal rows or bays of said diagonal braces are spaced parallel struts 14.

The stamping 10 is bent or formed into the form of a truss 10', as shown in Figure 2, in such a manner that the transverse rows of diagonal struts are inclined at an angle towards each other, the beams or spars 13 assuming a U-shape. Prior to inclining or bending the stamping 10, each strut 14 is provided with a central depressed corrugation 15, so that the same will withstand compressive stress and prevent any lateral buckling in the stamping 10. If desired, each row or bay of transverse diagonal braces may be made of a different length, so that the truss 10' when formed will be of varying height or the angle of inclina-

tion between the inclined bays may be varied to accomplish the same effect.

The width of the stamping 10 or truss 10' is substantially equal to the length of a wing 16, which is formed by attaching a thin metal cover 17 to the U-shaped beams 13 of the truss 10' as by spot welding or rivets. To prevent any buckling of the cover 17 the same is provided with spaced longitudinal corrugations 18 as shown in Figures 3 and 4.

It has been found advantageous at times to use a metal cover the surface of which is perfectly smooth throughout. In order to use this form of cover 20 (Figure 5) a plurality of transversely spaced channel ribs 21 are used which are provided on the flanges 22 thereof with depressions 23 adapted to closely fit over the U-shaped beams 13 of the truss 10' shown in dotted lines in said figure. Over each of said depressions 23 is formed a flat portion 24 flush with the web of the channel 21 to provide a large area of contact between said channel and said metal cover.

The ribs 21 are positioned on the truss 10' and completely encircle the same, and are secured thereto in any desired manner, as by spot welding or rivets. The metal cover 20 is then placed over said ribs 21 and is securely attached thereto either by spot welding or countersunk rivets (not shown).

While preferred embodiments of metal aeroplane wing constructions have been disclosed, the same is susceptible of numerous modifications within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. An aeroplane wing consisting of a rigid one-piece metal truss member comprising a plurality of bays, each bay formed of a plurality of equally spaced pairs of diagonal braces, said bays inclined at an angle toward each other, U-shaped beams connecting adjoining upper and lower ends of said bays and integral therewith, a corrugated vertical strut between each pair of said diagonal braces integral therewith and extending from an upper U-shaped beam to a lower U-shaped beam, and a metal cover positioned over said

truss member and rigidly attached thereto.

2. An aeroplane wing consisting of a rigid one-piece metal truss member comprising a plurality of bays, each bay formed of a plurality of equally spaced pairs of diagonal braces, said bays inclined at an angle toward each other, U-shaped beams connecting adjoining upper and lower ends of said bays and integral therewith, a corrugated vertical strut between each pair of said diagonal braces integral therewith and extending from an upper U-shaped beam to a lower U-shaped beam, a metal cover positioned over said truss member and rigidly attached thereto, said cover having formed thereon spaced longitudinal corrugations to increase the rigidity thereof.

3. An aeroplane wing consisting of a rigid one-piece metal truss member comprising a plurality of bays, each bay formed of a plurality of equally spaced pairs of diagonal braces, said bays inclined at an angle toward each other, U-shaped beams connecting adjoining upper and lower ends of said bays and integral therewith, a corrugated vertical strut between each pair of said diagonal braces integral therewith and extending from an upper U-shaped beam to a lower U-shaped beam, a metal cover positioned over said truss member and rigidly attached thereto, said corrugated struts in different bays being in alignment with each other.

4. An aeroplane wing consisting of a rigid one-piece metal truss member comprising a plurality of bays, each bay formed of a plurality of equally spaced longitudinal braces separated by pairs of intersecting diagonal braces, said bays inclined at an angle toward each other, U-shaped beams connecting adjoining upper and lower ends of said bays and integral therewith.

5. An aeroplane wing consisting of a rigid one-piece metal truss member comprising a plurality of bays, each bay formed of a plurality of equally spaced longitudinal braces separated by pairs of intersecting diagonal braces, said bays inclined at an angle toward each other, U-shaped beams connecting adjoining upper and lower ends of said bays and integral therewith, and a cover positioned over said truss member and rigidly attached thereto.

6. An aeroplane wing consisting of a rigid one-piece metal truss member comprising a plurality of bays, each bay formed of a plurality of equally spaced pairs of diagonal braces, said bays inclined towards each other, U-shaped beams connecting adjoining upper and lower ends of said bays and integral therewith, a corrugated vertical strut between each pair of said diagonal braces integral therewith and extending from an upper U-shaped beam to a lower U-shaped beam, a plurality of channel shaped ribs positioned over said truss and completely en-

circling the same, and a flat metal cover positioned over said ribs, said cover, ribs and truss member being rigidly connected together.

7. An aeroplane wing consisting of a rigid one-piece metal truss member comprising a plurality of bays, each bay formed of a plurality of equally spaced pairs of diagonal braces, said bays inclined towards each other, U-shaped beams connecting adjoining upper and lower ends of said bays and integral therewith, a corrugated vertical strut between each pair of said diagonal braces integral therewith and extending from an upper U-shaped beam to a lower U-shaped beam, a plurality of channel shaped ribs positioned over said truss and completely encircling the same, a flat metal cover positioned over said ribs, said cover, ribs and truss member being rigidly connected together, each of said ribs being provided with a plurality of spaced depressions adapted to have seated therein the U-shaped beams of the truss member, a flat portion formed integral with said ribs just above said depressions and flush with the web of said channel rib to serve as a connecting surface for attachment to said cover and said truss member.

In testimony whereof I affix my signature.
HARRY G. LANDIS.

70

75

80

85

90

95

100

105

110

115

120

125

130