

No. 785,740.

PATENTED MAR. 28, 1905.

I. LANCASTER.
COVERING FOR AEROPLANES.
APPLICATION FILED JULY 12, 1904.

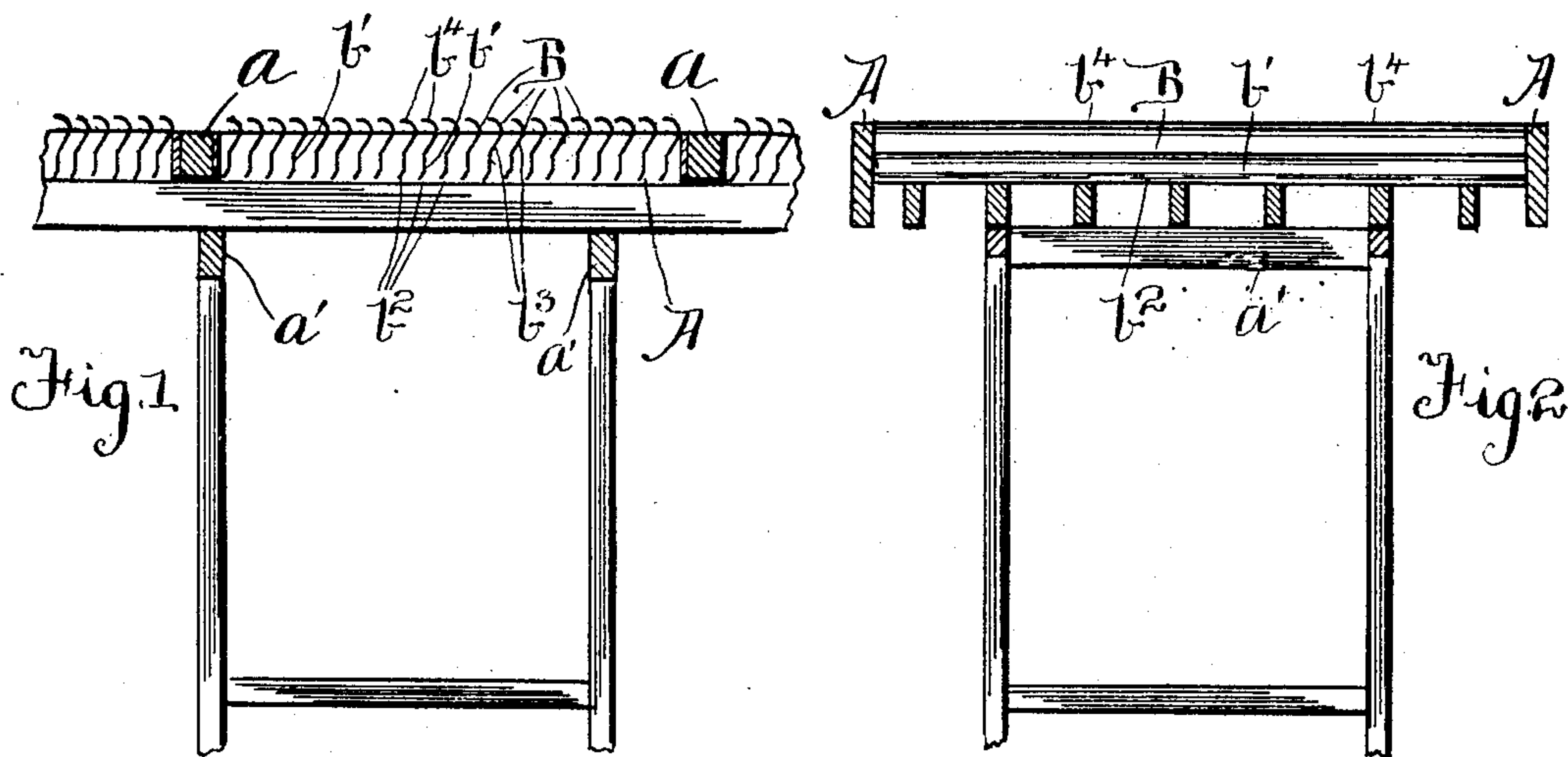


Fig. 3.

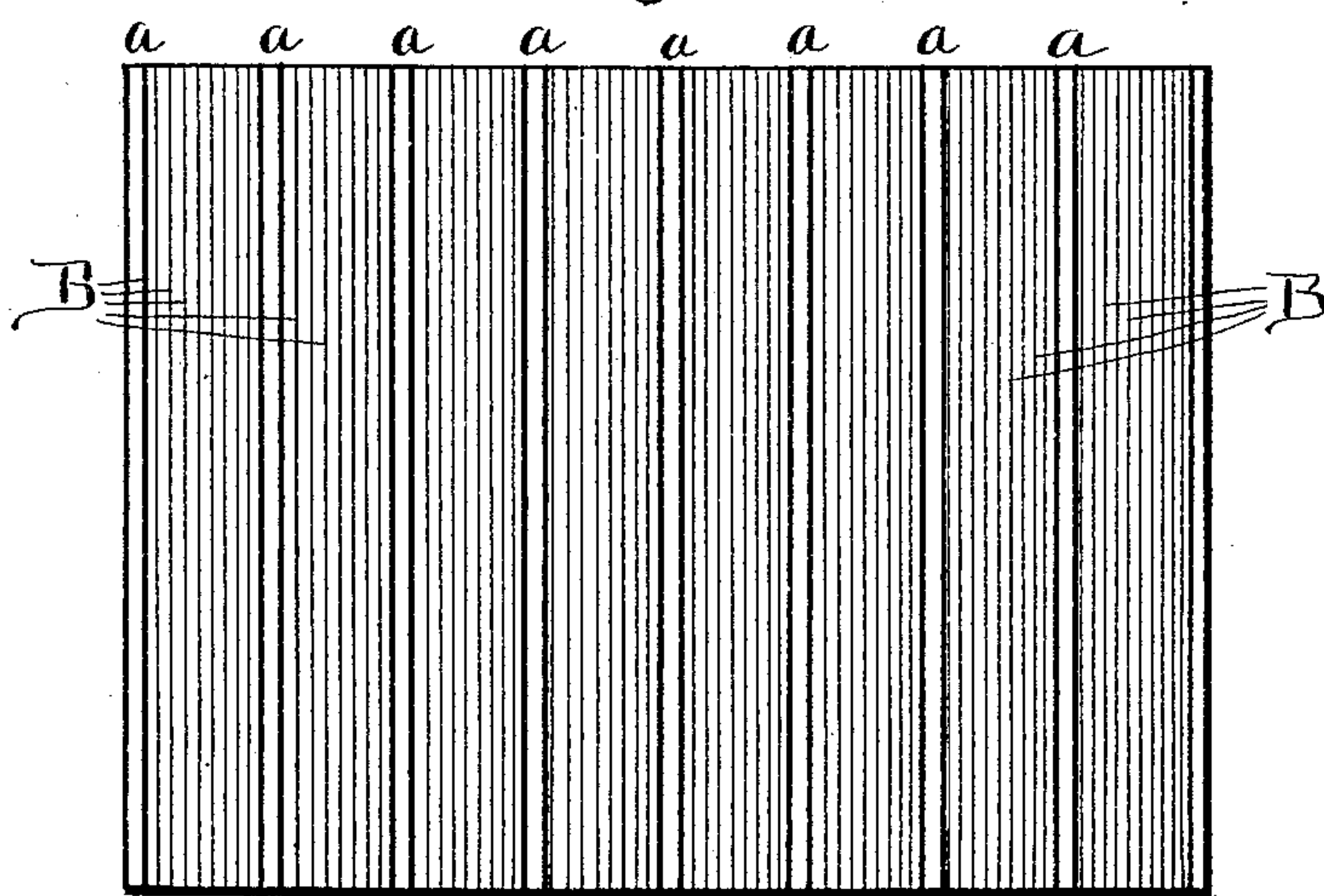
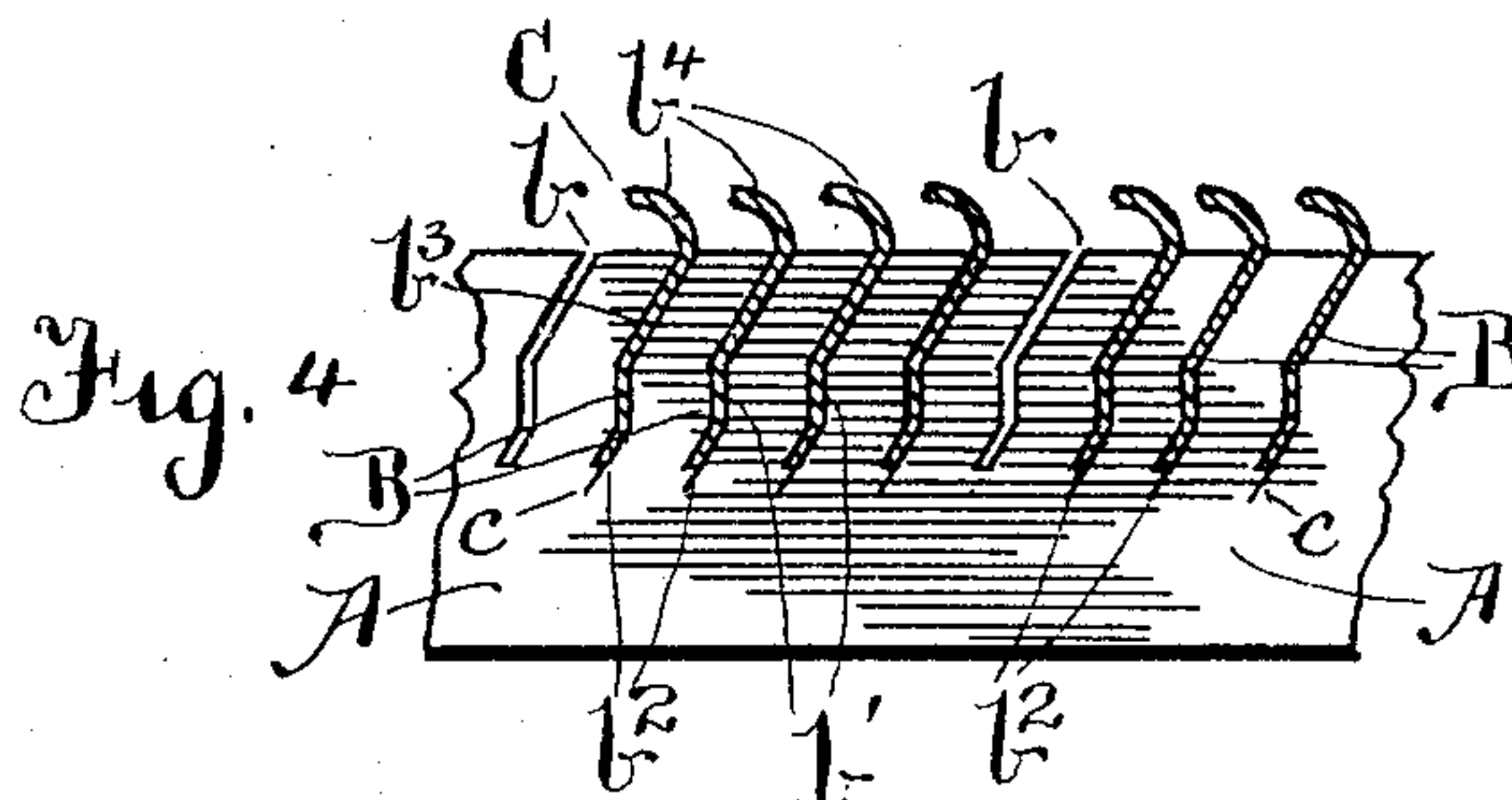


Fig. 5.



Witnesses:
William P. Bond
Walker Banning.

Inventor.
Israel Lancaster.
By Banning & Banning,
Attys.

UNITED STATES PATENT OFFICE.

ISRAEL LANCASTER, OF CHICAGO, ILLINOIS.

COVERING FOR AEROPLANES.

SPECIFICATION forming part of Letters Patent No. 785,740, dated March 28, 1905.

Application filed July 12, 1904. Serial No. 216,276.

To all whom it may concern:

Be it known that I, ISRAEL LANCASTER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Coverings for Aeroplanes, of which the following is a specification.

The present invention is designed as an improvement on the device described and claimed in Patent No. 706,832, issued to me August 12, 1902, and relates to a surface for aeroplanes—such as kites, gliding devices, blades of wind-mills, flying-machines, and similar structures designed to move in air deriving their movement from the pressure or force of the wind or otherwise—the thin surface being designed to allow of the passage of the air therethrough and furnishing an air-pressure on the under surface by which a motive power results for driving the aeroplane edgewise or parallel to itself.

The principal object of the present invention is to increase the energy or motive power of the aeroplane by producing a difference in pressure on the two sides thereof, which function is accomplished by the construction of the surface of the aeroplane for allowing the passage of air from the under to the upper face, through which passage the air is deflected rearwardly and discharged in a manner to force or drive forward an aeroplane in the line of its travel.

The invention consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a longitudinal sectional elevation of a portion of the aeroplane, showing the spicules or plates proportionately enlarged for purposes of illustration; Fig. 2, a cross-sectional view of the same; Fig. 3, a plan view of the driving or motor surface of the plane; Fig. 4, an enlarged cross-sectional detail showing the formation and arrangement of the spicules, and Fig. 5 an enlarged detail showing the toothed acting edge of one of the spicules.

The aeroplane is constructed of any suitable size and shape, and consists of a frame of suitable construction having, as shown, longitudinally-extending side walls A, connected by

means of upper cross-rails a and lower cross-rails a' , preferably of light construction, to increase the soaring power of the plane, and between the side rails are arranged a series of plates or spicules, which more especially form the subject-matter of the present invention. The plates or spicules are inserted at their ends into slots b in the side rails, which slots correspond in shape to the spicules hereinafter described. Each of the spicules B is formed from a plate of extremely thin and light material, such as aluminium, and is provided with a straight body-section b' , having at its lower edge a rearwardly-projected portion b^2 , and said body portion has a forwardly-bent upper portion b^3 , terminating in a rearwardly-curved upper edge b^4 . The lower edge is provided along its entire extent with a large number of extremely fine teeth C, (best shown in Fig. 5,) which teeth consist of a series of long teeth c and short teeth c' , which give a saw-tooth or ragged edge to the spicule. The spicules are arranged closely together and are all of the same shape and construction, the acting or discharge edges being all bent or turned toward the rear, as shown, throughout the entire extent of the aeroplane. It is preferred to form the toothed edges of the spicules of .002-inch silver wire cut into lengths and laid in alternately, the wires being placed close together and about five hundred to the inch, the operation of the device depending largely upon the fineness and perfection of arrangement of the spicules. On account of the small space between the spicules it becomes necessary to provide the saw-toothed edge above referred to, for the reason that if the edges b^2 b^2 were smooth they would succeed each other so quickly during the movement of the aeroplane that the effect upon the air would be that of a closed smooth surface and the air between the spicules would be separated from the air adjacent to the plane, so that no air would go through. By making the edges toothed cleavage is prevented and the air on the lower side of the edge is broken up, allowing the air to enter the interstices in the aeroplane at so many places that the effect is to make the entire body of the plane permeable by the air. The air as it

passes through is deflected in a rearward direction, which gives a forward impetus to the plane. The more minutely the columns of air are broken the more efficient will be the aeroplane; but for purposes of illustration the drawings show the spicules enlarged and arranged at a greater distance from one another than is ordinarily desirable in practicing the invention. This mode of illustration, however, is necessary, for the reason that it would be impossible to clearly show the minute arrangement of the parts which is necessary in constructing the areoplane of the present invention,

It is desirable to use as many plates or spicules as possible without interfering with the free flow of the air or pressure from the under side to the upper side of the covering, and at least twenty plates or spicules to the inch should be employed; but more than twenty will secure better results, for the reason that the interstices of one thirty-second of an inch wide will approximately be twice as effective as the interstices of one-fourteenth of an inch wide.

What I regard as new, and desire to secure by Letters Patent, is—

1. A covering for an aeroplane, consisting of a series of plates or spicules arranged closely together to leave interstices or spaces between them each of the spicules having its discharging edge bent toward the rear and having its under or intake edge provided with a series of teeth to disintegrate the currents of air entering therethrough, substantially as described.

2. A covering for an aeroplane, consisting of a series of plates or spicules closely ar-

ranged in parallel relation to leave interstices or spaces between them, each of the plates or spicules formed of a thin sheet of metal having an angularly-formed body portion and having its discharge edge bent toward the rear to discharge currents of air in a rearward direction, substantially as described.

3. A covering for an aeroplane, consisting of a series of plates or spicules closely arranged in parallel relation to leave interstices or spaces between them, each of the plates or spicules having an angularly-formed body portion such portion consisting of a straight section and a forwardly-bent section, the latter section terminating in a rearwardly-bent discharging edge and a series of teeth along the intake edge for disintegrating the currents of air passing thereinto, substantially as described.

4. A covering for an aeroplane, consisting of a series of plates or spicules closely arranged in parallel relation to leave interstices or spaces between them, each of the plates or spicules having an angularly-formed body portion consisting of a straight section and a forwardly-bent section, the latter section terminating in a rearwardly-bent discharging edge, and a series of teeth along the opposite or intake edge of the spicules for disintegrating the currents of air and allowing said currents to enter through the interstices between the spicules, said teeth consisting of adjacent wires of alternating lengths closely arranged along the edge, substantially as described.

ISRAEL LANCASTER

Witnesses:

C. E. LITTLEFIELD,
A. H. MERSHON.