M. T. BRUSH.

AIRCRAFT.

APPLICATION FILED JULY 5, 1917.

1,293,688.

Patented Feb. 11, 1919.

Fig. 1.

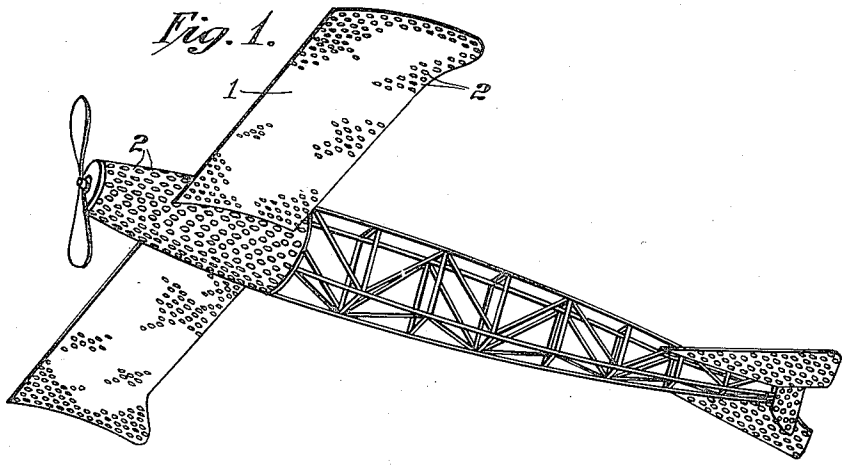

Fig. 2.

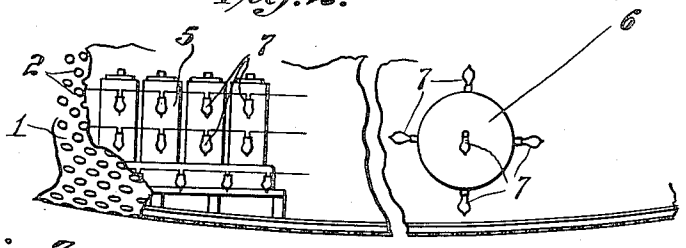

Fig. 3.

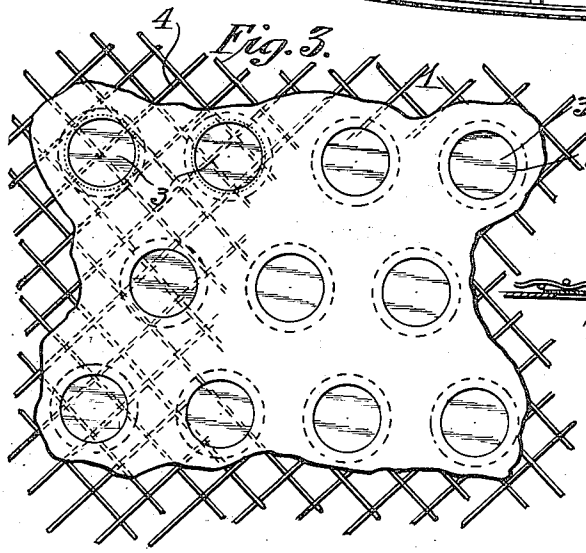

Fig. 4.

Witness Taylor Brush

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AIRCRAFT.

1,293,688. Specification of Letters Patent. Patented Feb. 11, 1919.

Application filed July 5, 1917. Serial No. 178,652.

To all whom it may concern:

Be it known that I, MITTIE TAYLOR BRUSH, a citizen of the United States, residing at Dublin, in the county of Cheshire and State of New Hampshire, have invented certain new and useful Improvements in Aircraft, of which the following is a specification.

My invention relates more particularly to air-craft of the aeroplane type, and has for its object the reduction of the visibility of such machines when in the air to a minimum.

The visibility of an object is dependent upon the contrasts of light and shade on its different surfaces, due to the different amounts of light reflected therefrom, and between the object as a whole and the background against which it is silhouetted. Consequently, a transparent object will be invisible (at least if its surfaces do not reflect light or all reflect the same amount) because an observer, looking toward it, will see only the background.

It has accordingly been proposed to use a transparent material for the surface covering of the wings and body of aeroplanes in order to reduce their visibility when in use, but no suitable material has as yet been found for the purpose.

I have discovered, however, that, viewed from an appreciable distance, the effect of transparency is obtained when a non-transparent material or body is provided with a plurality of relatively small and more or less regularly distributed openings, since the rays of light which pass through such openings become diffused and practically obliterate all contrasts of light and shade on adjacent surfaces. Thus, by forming in the linen cloth or other non-transparent material ordinarily used for the purpose a number of small openings and filling or covering them with a suitable transparent medium, I have obtained what is in effect a new transparent covering material; and I have found that by artificially lighting the non-transparent bodies, such as the motor, fuel tank, etc., usually mounted upon or within the fuselage of an aeroplane thus covered, I am able to produce a machine which is practically invisible when in the air.

My invention, which embraces the two features mentioned, will be understood by reference to the accompanying drawing, in which—

Figure 1 is a perspective view, from below, of a common monoplane showing by way of illustration merely one embodiment of my invention; Fig. 2, a broken detail, enlarged, showing one means of lighting the engine and fuel tank mounted within the fuselage; Fig. 3, an enlarged detail of my improved surface covering material; and Fig. 4, a section of such material as shown in Fig. 3.

As here illustrated, the covering with which the upper and lower surfaces of the wings, the forward end of the fuselage, and both surfaces of the elevating planes and the vertical rudder of the machine are covered consists of a thin body-piece or sheet 1, provided with openings 2 to the edges of which are sewed or otherwise suitably secured thin pieces 3 of transparent material, and a sheet of woven wire or light wire or linen mesh 4 which is applied to and reinforces the back of the body-piece and the windows. For the body of the covering I prefer to use the prepared linen cloth now commonly used as a surfacing material for aeroplanes and for the windows a non-inflammable or slow burning material which is known in the market as "celestrome", and the front of the covering is, or may be, varnished to better secure the edges of the openings in the cloth and to give a smooth outer surface. I thus obtain a strong smooth covering which is non-combustible, or, rather, slow burning, and which, when the machine is in the air, is practically transparent. It is to be understood, however, that I do not limit myself to the specified materials for the body and the windows, as any suitable materials may be used; and, whenever it may be found to be desirable to cover the fuselage, either in whole or in part, with a sheathing of wood or with metal plates, windows of suitable material may be set in openings therein and secured in any suitable manner. The wire backing may, of course, be omitted if not required to secure the needed strength.

The outer surfaces of the engine 5, fuel tank 6, and other similar non-transparent bodies mounted within the fuselage, or between the wings of a biplane, are lighted by electric lamps 7, which may be conveniently

supported either upon the parts themselves or on the adjacent framework of the fuselage and are supplied with electricity from any suitable source (not shown); or, instead of electric lights, acetylene lamps or other suitable means for illuminating these surfaces may be employed. It may also be found desirable, wherever practicable, to light the edges of the wings and control planes and the outlines of the fuselage.

Having explained the principle of my invention and illustrated and described one practical embodiment of its several features, what I claim as new, and desire to secure by Letters Patent, is—

1. An aircraft having for its outer surfaces a covering provided at intervals throughout its area with relatively small openings filled with a transparent material.

2. An aircraft having for its outer surfaces a covering provided with a plurality of relatively small openings filled with a transparent material and means for illuminating the surfaces of non-transparent bodies carried therein.

3. An aeroplane having wings which are covered above and below with a surfacing material provided with a plurality of relatively small windows closed to air but permitting the passage of rays of light.

4. An aeroplane having its wings and portions of its fuselage covered with a non-transparent surfacing material provided at more or less regular intervals throughout its area with closed windows through which rays of light may pass.

5. An aeroplane having its wings and fuselage covered with a non-transparent surfaceing material provided at intervals throughout its area with relatively small windows which permit the passage of rays of light, and means for illuminating the outer surfaces of the engine and fuel tank carried by the aeroplane.

6. As a new article of manufacture, a covering for aircraft which consists of a thin non-transparent body provided with a plurality of relatively small and more or less regularly distributed openings filled with a transparent medium.

7. As a new article of manufacture, a covering for aircraft which consists of a thin body of non-transparent material provided with a plurality of relatively small and more or less regularly distributed openings filled with a transparent medium, and a backing of woven wire.

8. As a new article of manufacture, a covering for aircraft which consists of a body of prepared linen cloth having a plurality of relatively small and more or less regularly distributed openings and thin pieces of a transparent slow burning material secured to the edges of and covering the openings.

9. As a new article of manufacture, a covering for aircraft which consists of a prepared linen cloth provided with a plurality of small openings covered with pieces of transparent slow burning material and a reinforcement of woven wire secured to the back of the cloth.

MITTIE TAYLOR BRUSH.