Aug. 4, 1931. R. ROHLFS 1,817,268

NIGHT AERIAL ADVERTISING SIGN OR THE LIKE AND FASTENING MEANS THEREFOR

Filed May 14, 1928

FIG. 1.

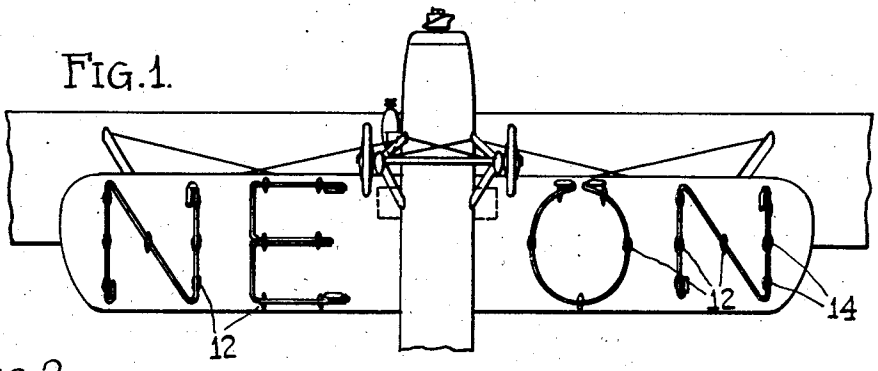


FIG. 2.

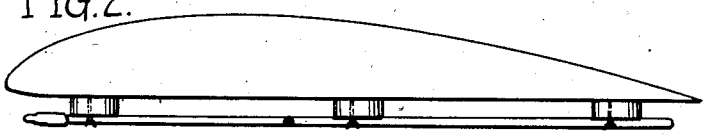
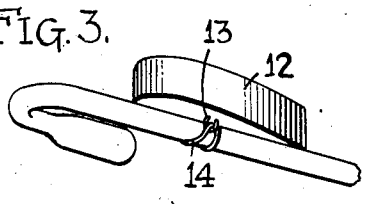


FIG. 3.



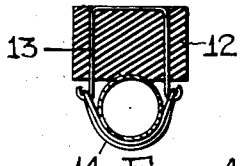


FIG. 4.

FIG. 8.

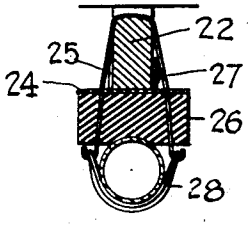


FIG. 9.

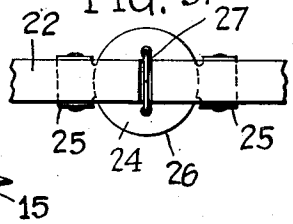


FIG. 5.

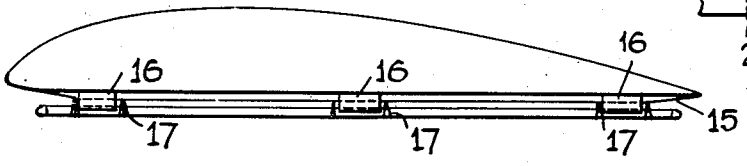


FIG. 6.

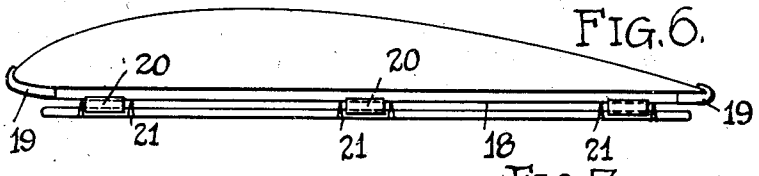
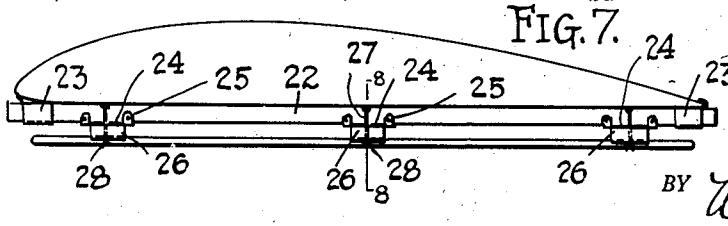


FIG. 7.



INVENTOR.
ROLAND ROHLFS.
BY W. E. Trace Jr.
ATTORNEYS.

Patented Aug. 4, 1931

1,817,268

UNITED STATES PATENT OFFICE

ROLAND ROHLFS, OF FOREST HILLS, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO L. FRANK KOHLER, OF BROOKLYN, NEW YORK

NIGHT AERIAL ADVERTISING SIGN OR THE LIKE AND FASTENING MEANS THEREFOR

Application filed May 14, 1928. Serial No. 277,595.

My invention relates to aerial advertising and is concerned more particularly with electrical advertising signs or the like so constructed and operated as to render practical its or their use on or in connection with aircraft.

In application Serial Number 48,933, filed August 8th, 1925, that combination of separately old devices or elements which contribute to the successful and practical operation of the night aerial advertising sign is fully set forth. Instead of using, as an illuminating means, a multiplicity of incandescent lamps or bulbs, (and the attendant intricate wiring) one or more so-called luminous tube lights are employed. These tubes, one or more for each letter or other character comprised in the sign, are formed from a single length of translucent glass or other translucent material. Before installation, each tube is permanently shaped or formed to present in outline the letter or other character, or a portion of the letter or other character desired. The tubes, thus formed, are then fastened to and upon the underside (preferably) of the aeroplane wing or wings, a proper sequence of course being selected according to the nature of the sign. The present invention is a division of said original application.

The object of the invention set forth in this the divisional application, is to provide an extremely simple and exceptionally light tho rugged means for fastening said tube light or lights on the aircraft. Heretofore comparatively heavy and bulky metal fittings and/or frames have been used. These frames or fittings, where lamps and reflectors are used as in the old type sign, are necessarily exposed and accordingly enormously flight resistant. Such resistance, coupled with the weight increase (augmented by the use of storage batteries) renders the areoplane dangerous in operation. Maximum power is required, even under the most favorable conditions, to sustain the machine in the air. Its ceiling is very appreciably reduced and forced landings are the rule rather than the exception. Moreover, and equally important, is the fact that the lamps, reflectors, and fastening means, due to the necessity of mounting them close up against the underside of the aeroplane wing or wings, very appreciably lower its or their lifting efficiency.

In addition to being more efficient aerodynamically, the fastening means of the present invention is advantageous in that a yielding connection for the tube light or lights is provided. The fastening devices, of which there are one or more for each tube, are preferably formed of a cushioning element against which the tube is held, an elastic or yielding element beneath which the tube is passed and by means of which it is embraced, and suitable anchorages for the elastic element carried by or embedded in said cushion. The latter, if desired, can be either cemented directly to the fabric or other covering of the wing or fastened thereto in any suitable manner. Thus characterized, said fastening not only embraces the tube or tubes, but so embraces and holds it or them as to absorb and dissipate all shocks due to vibrations, etc. Moreover, the sign, including its fastening, offers a very minimum of head resistance or drag.

In the drawings, wherein like reference characters denote like or corresponding parts,

Fig. 1 is an inverted plan view of an aeroplane showing the arrangement of the sign characters therebeneath;

Fig. 2 is an end elevation of one of the wings thereof;

Fig. 3 is a perspective view of one of the fastening devices;

Fig. 4 is a transverse vertical sectional view of one of said fastening devices;

Fig. 5 is an elevation of a modified form of fastening;

Fig. 6 is a similar view of a further modification;

Fig. 7 is a similar view of a still further modification;

Fig. 8 is a section on the line 8—8 of Fig. 7, and

Fig. 9 is a plan view of said last mentioned modified form of fastening.

In the embodiment of the invention selected for illustration the letters or other char-

acters 10 comprising the advertising sign are fastened on the underside of the lower wing or wings 11 of an aeroplane. Each letter, if possible, is formed from a single length of glass or other translucent material tubing such as is now used in the construction of the so-called "neon" luminous tube lights. In the formation of each letter or other character, the tube material is permanently shaped by any well-known process to conform in outline with the outline of the particular letter desired to be reproduced. In completing the letter outline, care should be exercised to effect a completion without a break in the continuity of the tube. It is also essential that the opposite ends of a given tube length be in no way joined. Each tube end, in the operation of the lights, may be said to provide one or the other of the positive and negative terminals essential to the completion of the light circuit.

Illumination is made possible by passing either a high frequency current or a high voltage alternating current thru the tube or tubes. High frequency current may be obtained by passing the direct current from a generator through a high frequency unit, while the high voltage current may be obtained by passing an alternating current from a generator through a step-up transformer. The tubes themselves, however, and the means by which they are continuously illuminated, form no part of the present invention.

The means for fastening or attaching the tube lights or sign characters 10 to the aircraft is such in its nature as to prevent at all times breakage of the tubes due to vibrations and shocks in the operation of the machine. Such means is also useful and desirable in that tube vibrations, with a resulting blurred light outline, are avoided. In the preferred embodiment of the invention such fastening means comprises a plurality of streamlined cushions 12 (sponge rubber), wire hooks 13, and an elastic band or the like 14. The cushions 12 are cemented or otherwise permanently fastened to the fabric or other covering of the wing 11. Collectively, they provide a soft bearing surface against which the tubes are yieldingly held. The hooks 13 are either inserted or embedded in the cushions 12 and may or may not be formed from a single wire length. In spacing them (the hook ends) one at each side of the tube, and extending an elastic band 14 from one to the other thereof on the opposite sides of the tube from that in bearing contact with the cushion, a positive and at the same time a yielding means is provided for firmly holding the tube against the cushions and firmly tho yieldingly in place beneath and close up under the aeroplane wing.

In the modified form of fastening illustrated in Fig. 5, no hooks, such as are indicated at 13 in Fig. 4, are used. An endless wire 15 encircles the wing in a fore and aft direction. Between it (the wire 15) and the underside of the wing, one or more cushions 16 are interposed. As in the preferred disclosure the cushions 16 provide a soft bearing surface for the tubes. Elastic bands 17 fastened around both the tubes and the wire 15, at opposite sides of the cushion, hold the tubes yieldingly against the cushions at all times.

In Fig. 6 of the drawings a fastening means of extreme simplicity and light weight is disclosed. As in the fastening of Fig. 5, a wire 18 is provided. This wire is extended in a fore and aft direction along the undersurface of the wing from its leading to its trailing edge. It is fastened to said edges by clips 19 extending thereover. No cushions, between the wire and the wing, need be used. Only such cushions as have been designated as 20 are required. These cushions merely hold the tube lights against direct bearing contact with the wire 18. Elastic bands 21, passing beneath the tubes and over the wire complete this form of fastening.

In the modification of Figs. 7, 8, and 9 a somewhat different character of fastening is shown. Provision is made in this type of fastening for certain adjustments tending to admit of the use of the same fastening means for tubes or letters of different size. Small strips 22 of wood or metal are mounted on the underside of the wing. These strips 22 are preferably straight and extend in a fore and aft direction to provide a flat base for the tubes or letters regardless of the curvature or camber of the wing. They are held in place by clips 23, front and rear, extending up and over the leading and trailing edges respectively of the wing. One of said clips is made freely slidable longitudinally of the strips 22 to admit of its use upon wings of varying chord length. In addition to the clips 23, each strip 22 is provided with disc-like fittings 24 having spaced upstanding ears 25 between which the opposite sides of the strip 22 are adapted to engage. Each fitting 24 is also provided, on its underface, with a cushion 26. A wire 27 of inverted U-shape, extends over the strip 22, the bight portion of the U-shape wire being in engagement with that face of the strip adjacent to the undersurface of the wing. The arms of the extensions of said wire 27 are carried outwardly or away from the wing and penetrate both the fitting 24 and the cushion 26, each arm terminating in a hook end. An elastic band 28 extending from one to the other of the wire ends, and across or beneath the tube, completes the tube fastening means. As in the previously described fastenings, the tubes or letters are yieldingly tho firmly held. The fittings 24, wires 27, cushions 26 and elastic bands 28, are all slidable as a unit lengthwise of the strip 22.

An electrical advertising sign, fastened as above described, when used on or in connection with an aeroplane or other aerial craft, effects thru such use a big saving in weight and head resistance. The light weight tubes (small in cross-section), the absence of light reflectors, and the continuity of letter outline, etc., all contribute very materially to this end. In using a non-heat generating light (within certain limits) rubber may be directly applied both as a cushioning and as a fastening means against the tubes. The lift efficiency of the wing or wings (when used on an aeroplane) is but slightly, if to any appreciable degree impaired. And last, but not least, that which has heretofore been considered dangerous and impractical, is made, thru the combination of devices and the adaptation of an extremely simple fastening means, both entirely safe and entirely practical.

While I have described my invention in detail in its present preferred embodiment, it will be obvious to those skilled in the art after understanding my invention, that various changes and modifications may be made therein without departing from the spirit or scope thereof. I aim in the appended claims to cover all such modifications and changes.

What I claim is:

1. The combination, in aircraft, of a luminous indicia forming tube mounted beneath the aircraft close up against, tho out of direct contact with, the under side thereof, resilient means hung from the under side of the aircraft to embrace and hold said tube in place, and a shock absorber engaging within the embrace of said last mentioned means and against which said tube is held.

2. The combination, in aircraft, of a shock absorbing member mounted beneath the under side of the aircraft, a luminous indicia forming tube engaging said shock absorbing member and spaced from the under side of said aircraft a distance at least equal to the thickness of that portion of the shock absorbing member engaging between said tube and said aircraft, and resilient means hung from the under side of the aircraft, and within the embrace of which said shock absorbing member is at least partially confined to hold said tube in spaced relation to said aircraft and against said shock absorbing member.

3. The combination, in aircraft, of a luminous indicia forming tube secured to the aircraft, an elastic means embracing said tube to yieldingly hold it in place on the aircraft, and a shock absorber between said tube and aircraft against which said tube is yieldingly held.

4. The combination, in an aeroplane, of an aerofoil including a skeleton frame and an outer covering within which said frame is enclosed, a luminous indicia forming tube mounted beneath said aerofoil, a shock absorbing member fastened by adhesion to said outer covering, and means encircling said tube for holding it in place against said shock absorbing member.

5. The combination, in an aeroplane, of an aerofoil including a skeleton frame and an outer covering within which said frame is enclosed, a luminous indicia forming tube mounted beneath said aerofoil, a shock absorbing member fastened against said outer covering, and an elastic means for holding said tube in place against said shock absorbing member.

6. The combination, in aircraft, of a luminous indicia forming tube secured to the aircraft on the underside thereof, a shock absorbing member fastened to the aircraft and against which said tube is held, and resilient means extending from one to the other side of said shock absorbing member and transversely across and in direct contact with said tube for holding said tube in place.

7. The combination with an aerial vehicle of a luminous indicia forming tube mounted beneath the vehicle, a shock absorbing member fastened on the vehicle, one or more elastic bands secured to the shock absorbing member and extending over the tube to normally urge said tube against said shock absorbing member, said bands forming the sole support for the tube when the vehicle is in an upright position.

8. The combination with an aerial vehicle of a luminous indicia forming tube mounted beneath the vehicle, a shock absorbing member tapered toward the rear of the vehicle, and means to normally urge the tube against said shock absorbing member, said means forming the sole support for the tube when the vehicle is in an upright position.

In testimony whereof I hereunto affix my signature.

ROLAND ROHLFS.