Jan. 30, 1934. F. MAZZINI 1,944,990

AIRCRAFT COVERING

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Fig. 1.

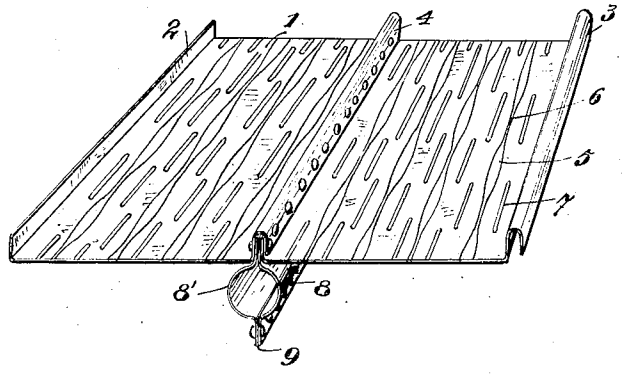
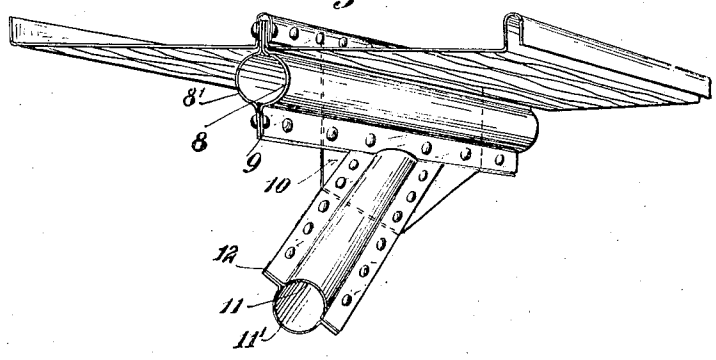


Fig. 2.



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AIRCRAFT COVERING

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3 Claims. (Cl. 244—31)

The well known advantages offered by all metal coverings for all the surfaces of aerovehicles, as also of floating vehicles, are not made use of in every case on account of the inconveniences met with, due to the insufficient resistance offered by thin metal sheets and which must be overcome by the help of reinforcements rendering the construction costly and making the vehicles too heavy. Corrugated sheets also add considerable weight due to the large surface of the sheets employed; they cannot be adapted to surfaces having a curvature along the longitudinal direction of the corrugations without difficult and costly working; besides, they do not offer sufficient rigidity in the direction across the corrugations.

The object of this invention, is to fashion metal sheets which will eliminate the above mentioned drawbacks because they are stiffened in every direction whilst being adaptable to any curvature; their weight is not increased and they can be easily obtained, very simply and economically by pressure stamping or by rolling.

In effect, this method of fashioning the metal sheets is characterized by the fact that in the flat metal sheets there are produced, by simple localized extensions, elongated bosses of suitable shapes and dimensions these being suitably spaced and arranged in the surfaces of the aforesaid sheets so as to constitute rows having directions best adapted to the shape which it is desired the sheets should take.

The bosses have a rectangular outline and are so disposed as to form rectilinear rows; the bosses of the different rows may be equal to each other or may differ; they may form lines with each other or be arranged in any suitable fashion. In any case, each of the rows may show a curved or zig-zag line if such be necessary to render possible their adaptation to special surfaces. The rows of bosses might also possibly form two systems crossing each other. In sheets thus constituted and fashioned the necessary connections do not present any special difficulty; these connections should always be chosen so as not to eliminate the advantages gained by the structure.

These structures are characterized by the fact that the sheets, destined to form coverings (skins) and having rows of elongated bosses shaped like drops of water and obtained by local extensions, also have marginal and intermediary folds (flanges) suitable to allow of their union, by riveting, bolting and soldering, with ribs and struts, these being also formed of thin metal sheets suitably bent and assembled together so as to constitute tubes stiffened by ribs, useful to effect the assemblage of the different parts of the structures to be made.

The annexed drawing shows many ways of fashioning these structures, given only as illustrations and examples of the different methods of carrying out the invention to which this lends itself.

Fig. 1 shows, in perspective, a part of a structure consisting of a flat covering sheet joined to a simple reinforcing tubular rib.

Fig. 2 is an analogous drawing where the covering sheet is associated with a hollow strut.

In the method of carrying out the invention shown in Fig. 1, the metallic sheet 1 destined to form the covering or skin of the structure has a square marginal flange 2, a marginal fold forming a channel 3 and middle channel fold 4. These folds, which help to stiffen the covering sheet, serve excellently for making the necessary connections with other members of the structure. All these folds are made in such a way as to be parallel to the passage through the air.

The stiffening of the metallic covering-sheet is completed and perfected by systems of elongated bosses or sinuous ridges 5, shaped as drops of water and so disposed as to form parallel straight rows in the direction of movement. These bosses 5 are joined together by less pronounced lineal protuberances 6, favouring the flow of air without producing eddies; these additional protuberances render uniform the distension produced in the sheet at the time of raising the bosses. Other parallel rows of elongated bosses 7 forming lines also placed in the direction of the air flow may be suitably interposed in the spaces existing between the rows of bosses 5.

The marginal flange 2 will allow the sheet to be directly joined, either by riveting or soldering, to the corresponding flange of an adjoining sheet. It will also allow of an analogous joint to be made by introducing the said flange into a channel fold 3 of the adjoining sheet. One can also form a joint by forcing a marginal channel 3 into a similar marginal channel of the next sheet.

The aforesaid joints can be made with the interposition of reinforcing strips or of ribs of strengthening members of the structure, as is well shown in Fig. 1. In this case there is a reinforcing stem formed of two thin bands 8—8′ folded into channel section and riveted at their edges 9 bent squarely outwards of which one pair is held and riveted in the median channel 4 of the covering metallic sheet 1. This joint can always be made against the edge 2 or in the marginal channel 3.

The arrangement described also favours a simple assembly of many pieces of the structure, as is shown in Fig. 2. For this purpose it is sufficient to insert between the two channel strips 8—8' a connecting plate 10 to which are riveted the two channel strips 11—11', these being riveted together by their flanges 12 so that they also form a hollow strut with longitudinal stiffening ribs.

It will be seen that by reason of the present invention, a covering for aircraft wings is provided with means for insuring the necessary stiffness and rigidity to the sheet material, which, at the same time, permits the sheet to be bent to any desired curvature to which structural aircraft parts of this character must conform.

It is of course evident that the different arrangements of construction may, according to necessity, vary in any manner apparent to expert technicians.

What I claim is:

1. A covering for aircraft wings and the like including a thin metallic sheet having short elongated bosses spaced apart and connected by lineal reduced protuberances, said bosses extending in the direction of flight of the aircraft whereby to provide stiffening means which permits the sheet to assume any desired curvature without impairing its rigidity.

2. A covering for aircraft wings and the like including a thin metallic sheet having short elongated bosses spaced apart and connected by lineal reduced protuberances, said bosses extending in the direction of flight of the aircraft, and supplemental elongated bosses disposed in parallel rows between said first-mentioned bosses whereby to provide stiffening means which permits the sheet to assume any desired curvature without impairing its rigidity.

3. A covering for aircraft wings and the like including thin metallic sheets having short elongated bosses spaced apart in straight parallel rows, said bosses being connected by reduced lineal protuberances and extending in the direction of flight of the aircraft with the major axes of the bosses disposed along the lines of the rows, each sheet being provided with means for connecting the adjacent sheet thereto when the parts are set up, an intermediate channel shaped flange for receiving a reinforcing member, and supplemental elongated bosses disposed in parallel rows between the rows of said first-mentioned bosses.

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