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J. ROONEY.
AEROPLANE CONSTRUCTION.
APPLICATION FILED SEPT. 2, 1909.

985,372.

Patented Feb. 28, 1911.
2 SHEETS-SHEET 1.

Fig. 1.

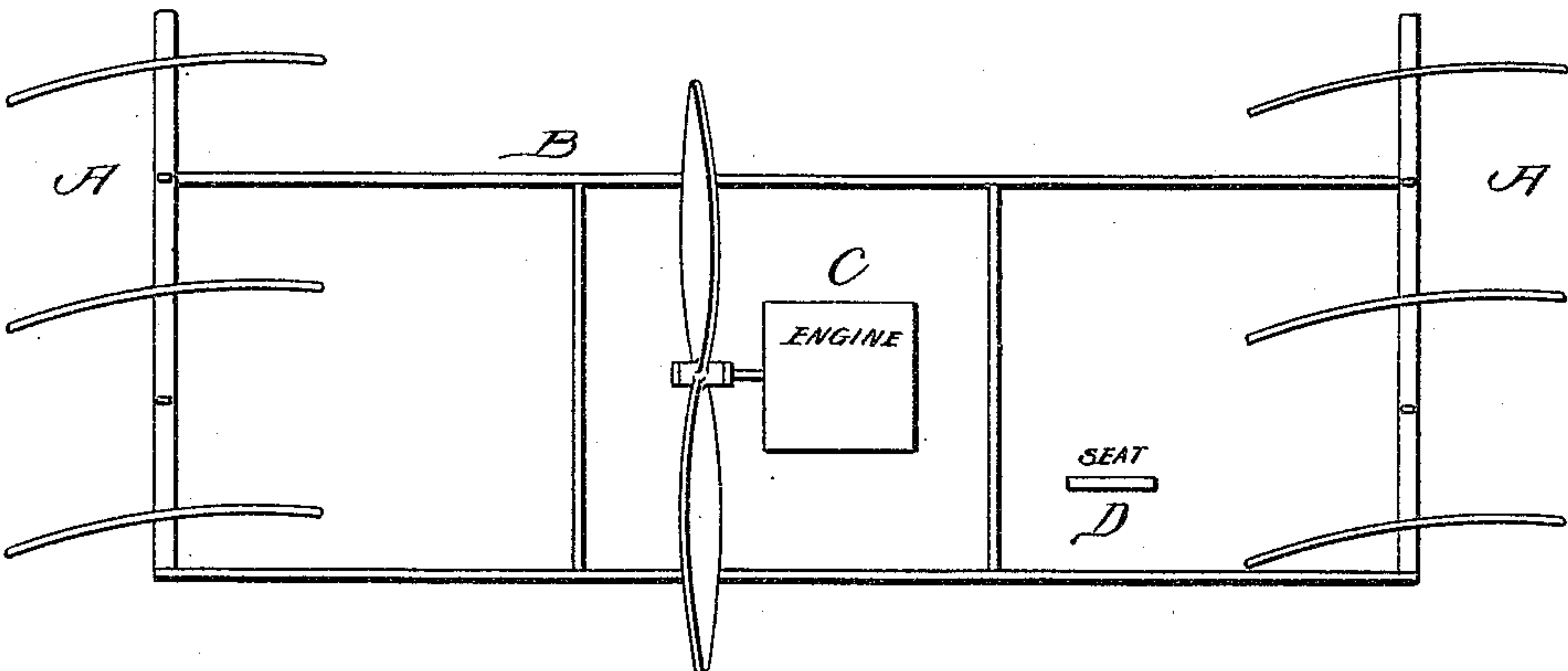
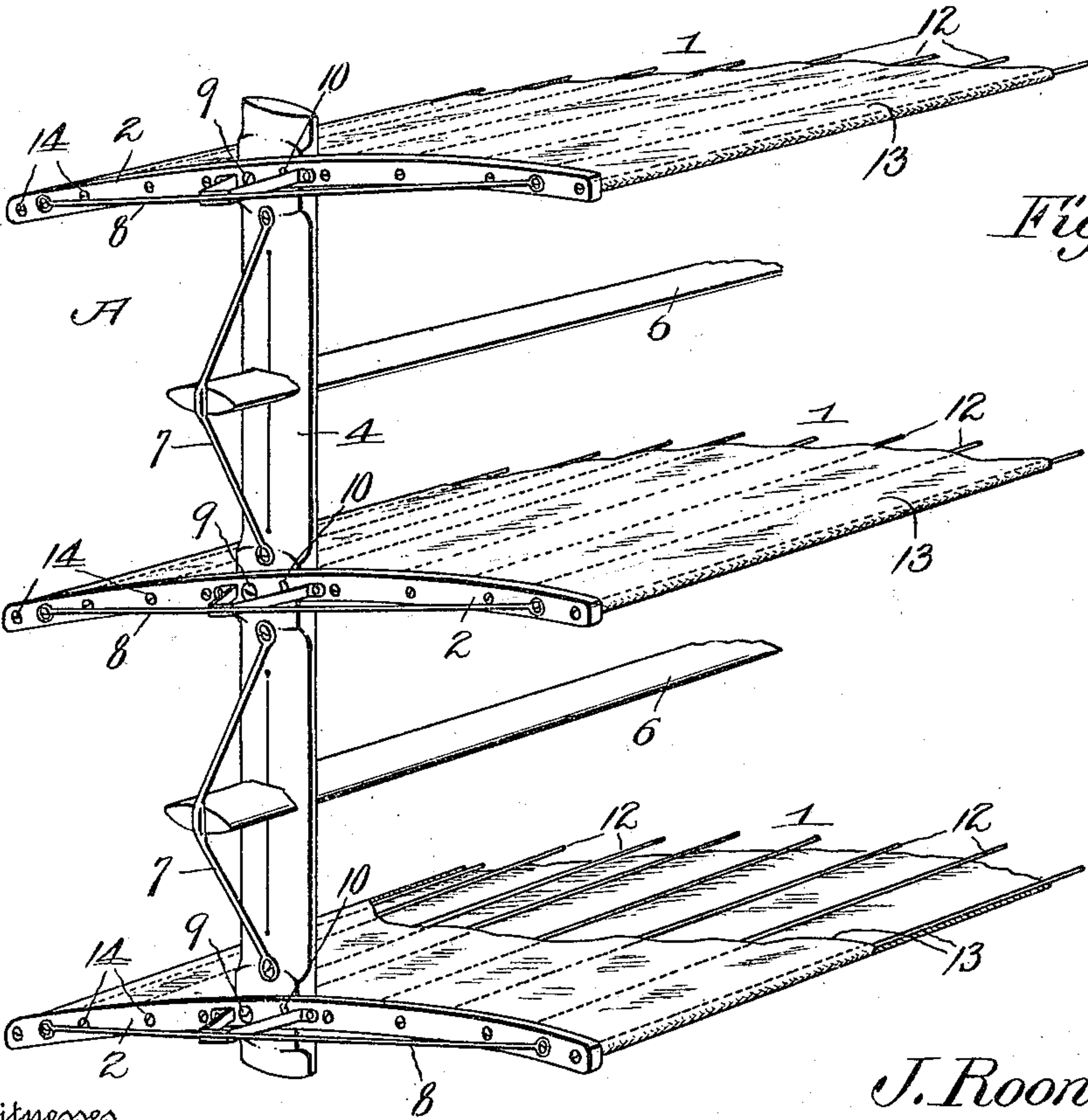


Fig. 2.



Witnesses

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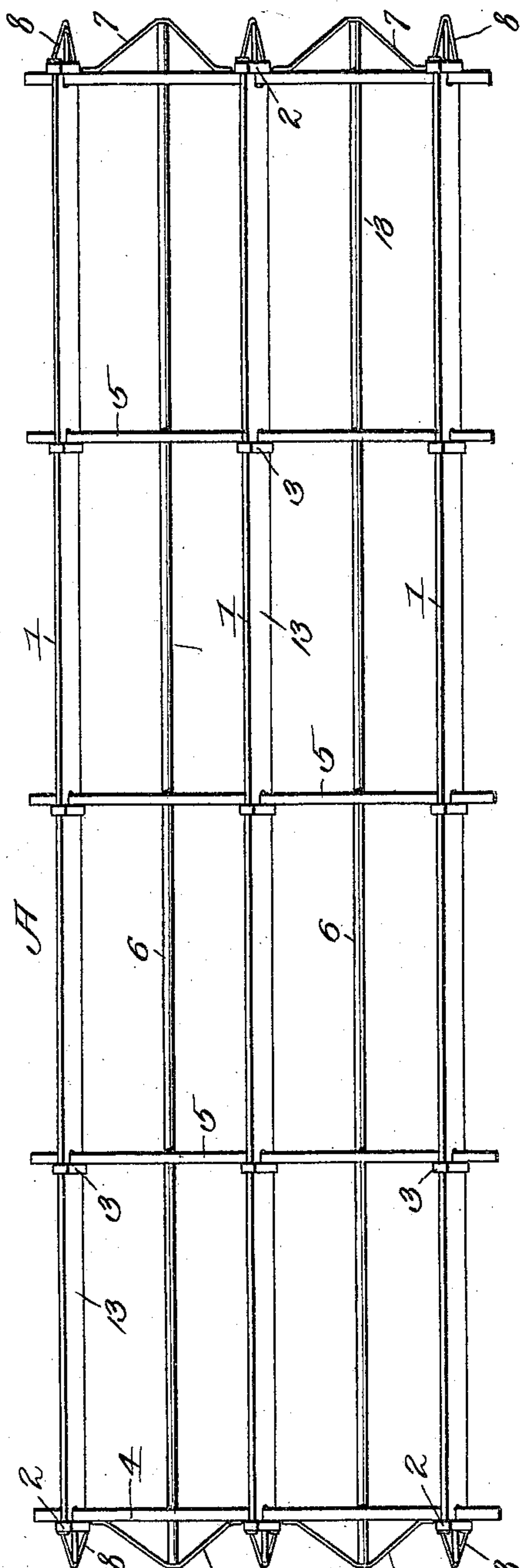


Fig. 3.

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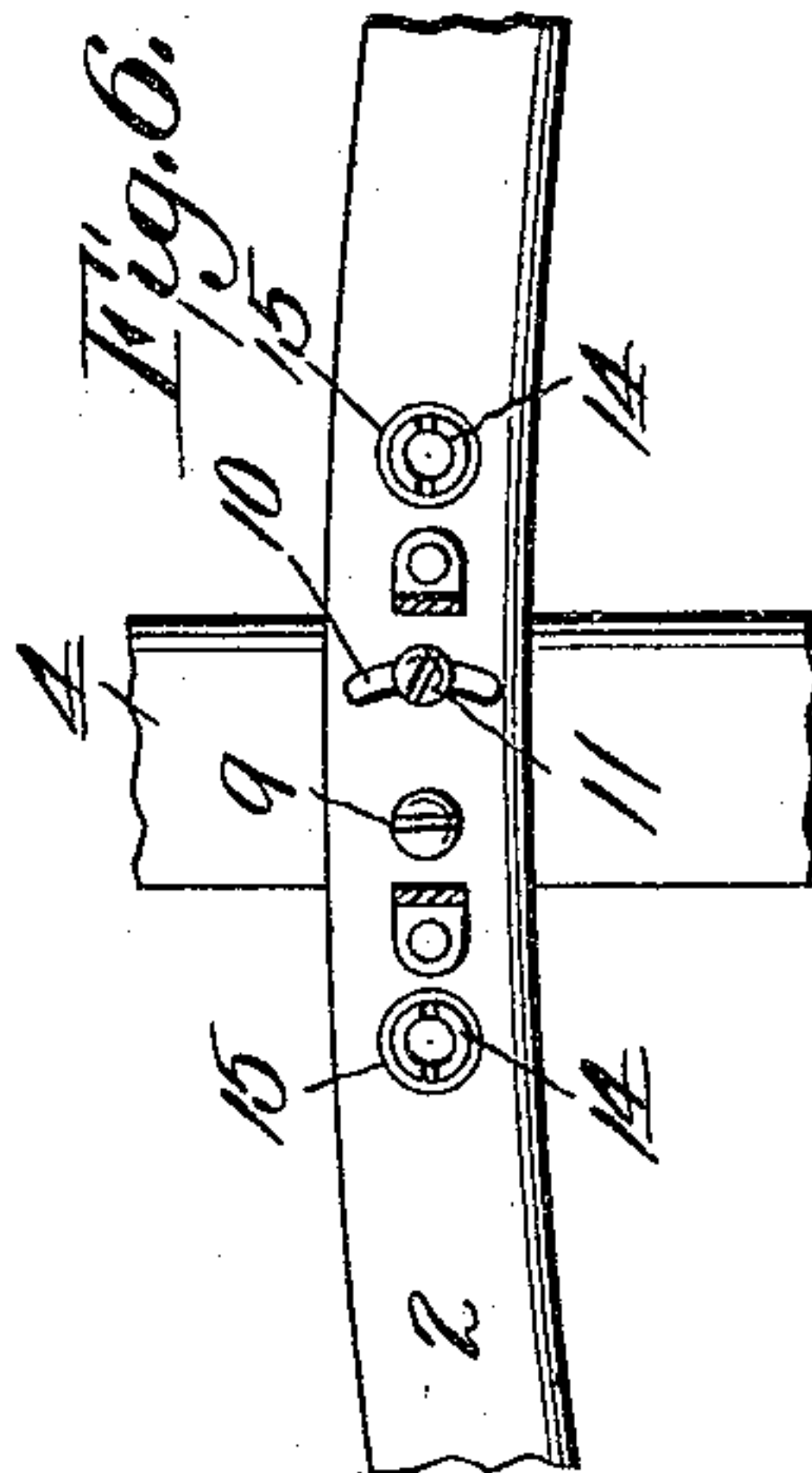


Fig. 6.

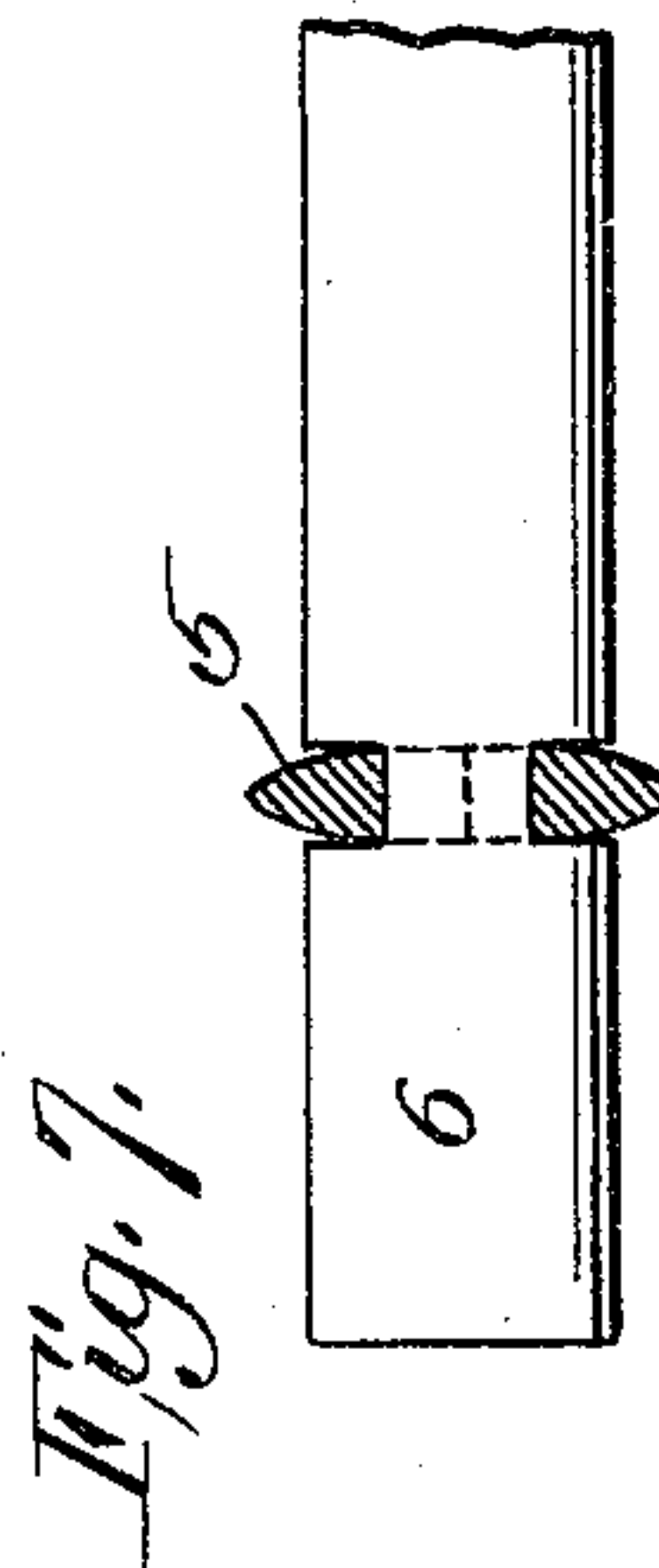
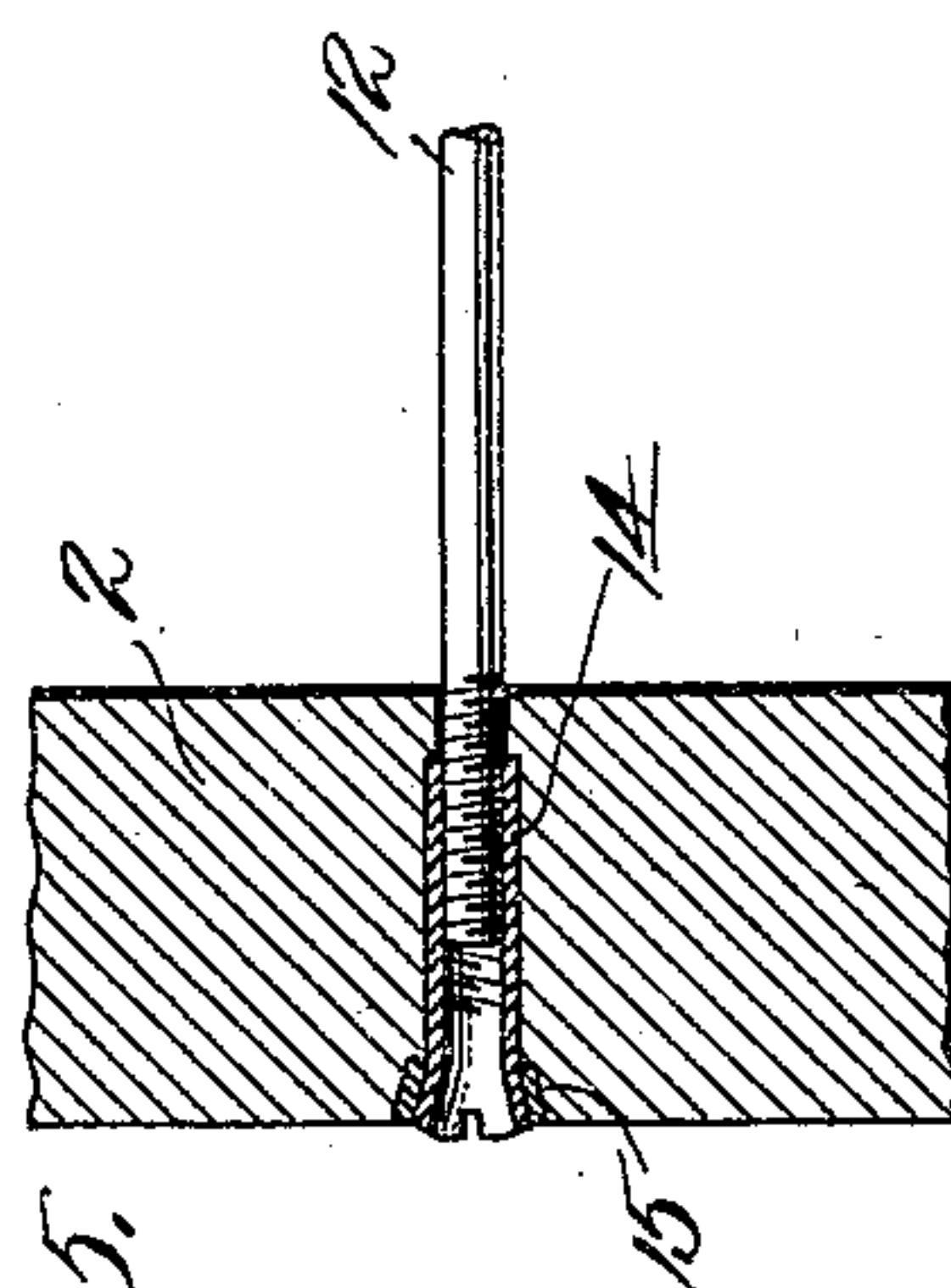


Fig. 7.



Fig. 4.



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AEROPLANE CONSTRUCTION.

985,372.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed September 2, 1909. Serial No. 515,825.

To all whom it may concern:

Be it known that I, JAMES ROONEY, a citizen of the United States, residing at Croton-on-Hudson, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Aeroplane Construction, of which the following is a specification.

The present invention relates in general to aerial navigation, and more particularly to a novel and advantageous method of constructing aeroplanes whereby the same are rendered extremely light in weight, offer but a small resistance to the air, and have smooth upper and lower surfaces so as not to rupture the air as they pass through the same.

The invention further contemplates an aeroplane construction which is simple and inexpensive in its nature, which enables a maximum amount of strength and rigidity to be obtained for the materials employed, and which enables a number of superposed aeroplane surfaces to be placed comparatively close to each other without causing undue compression of the air between the planes when the machine is moving at high speed.

With these and other objects in view, the invention consists in certain combinations and arrangements of the parts as will more fully appear as the description proceeds, the novel features thereof being pointed out in the appended claims.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a diagrammatic view of one type of aeroplane in which my improved construction can be used to advantage; Fig. 2 is an enlarged perspective view of one end of a frame provided with three superposed aeroplane surfaces; Fig. 3 is a side elevation of the said frame; Fig. 4 is a transverse sectional view through one of the aeroplane surfaces; Fig. 5 is an enlarged sectional view through one of the end cross bars showing the manner of connecting the tension members thereto; Fig. 6 is a detail view showing the manner of connecting the end cross bars of the aeroplane surfaces to the uprights of the frame; and, Fig. 7 is a detail view of the joint between the uprights and the longitudinal frame members.

Corresponding and like parts are referred

to in the following description and indicated in all the views of the drawings by the same reference characters.

In Fig. 1 of the drawings is shown one type of aeroplane in which my improved construction can be used to advantage, the said aeroplane comprising two sets A of superposed aeroplane surfaces connected by a frame B upon which the engine C and seat D for the aviator are mounted.

In the embodiment of the invention illustrated on the drawings, as is more clearly shown in Figs. 2 and 3, there are three of the superposed aeroplane surfaces 1 to each of the sets A and each of the said surfaces 1 is supported by a pair of end cross bars 2 and a number of suitably spaced intermediate cross bars 3. These end cross bars 2 are pivotally connected to the end uprights or vertical frame members 4 so as to swing about a horizontal axis, while the intermediate cross bars 3 are pivoted to intermediate uprights 5, the various uprights 4 and 5 being held apart in a properly spaced relation by means of the longitudinal frame members 6 one of which is preferably disposed between each pair of the superposed aeroplane surfaces 1. The joints between the upright frame members 4 and 5 and the longitudinal frame members 6 may be of any desired type, such as indicated in Fig. 7, and the extremities of the longitudinal frame members 6 project slightly beyond the end uprights 4 for coöperation with the truss wires 7 which reinforce the said end uprights and prevent bending thereof. It will also be observed that the end cross bars 2 of the aeroplane surfaces are provided with a truss construction 8 which prevents the end portions thereof from swinging inwardly and enables them to be formed of very light material. It is further contemplated to connect the end cross bars 2 to the end uprights 4 in such a manner that the aeroplane surfaces 1 can be set at various angles as may be required for the proper operation of the machine. For this purpose, as indicated more clearly in Fig. 6, the end cross bars 2 are pivoted to the uprights 4 by means of the screws or pivot pins 9 and formed with the segmental slots 10 receiving the clamping bolts 11. With this construction it will be obvious that by loosening the clamping bolts 11 the aeroplane surfaces 1 can be swung to different

angles, while when the clamping bolts are tightened the said aeroplane surfaces are held rigidly in position.

Specifically describing the manner of constructing the aeroplane surfaces 1, it will be observed that each of the said surfaces is formed of a series of longitudinal wires 12 having a suitable covering 13 of muslin or other material applied thereto. The wires 12 are held under tension and in the present instance are shown as having the ends thereof threaded and engaged by the interiorly threaded sleeves or nipples 14 rotatably mounted upon the cross bars 2. By reference to Fig. 5 it will be observed that the outer ends of these nipples 14 are flared outwardly and bear loosely against the metallic collars 15, and that the extremity of each of the nipples is formed with a kerf for engagement with a screw-driver or other tool. Such a construction enables the tension in the wires 12 to be readily increased or decreased as desired. The covering 13 preferably extends both over and under the wires or tension members 12 so as to provide smooth faces for the aeroplane surface and prevent the same from rupturing the air as it passes therethrough. The aeroplane surfaces thus constructed have very thin edges as compared with the thick edges heretofore employed, and offer but a very small amount of resistance to the air even when the machine is moving at a very high rate of speed. This thin construction has a further advantage of enabling a number of superposed aeroplane surfaces to be placed much closer together and arranged in a much more compact manner without causing undue compression of the air between the various surfaces when the machine is traveling at a high speed, than would be possible with the thick aeroplane surfaces now in use. Attention may also be directed to the fact that an aeroplane surface constructed with the tension members and the fabric covering is much lighter in weight and hence more suitable for aeroplane construction than a surface formed of fabric stretched over a wooden frame. It will also be apparent that the aeroplane surfaces formed with the tension members as above described may be either slightly arched as indicated on the drawings, or made flat, as may be found the most desirable.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. An aeroplane including a main plane formed with pivotally mounted transverse bars arranged parallel to the line of flight, a series of spaced and parallel tension members connecting the transverse bars and extending at substantially right angles to the line of flight, and a thin flexible covering applied to the tension members so as to be held in a stretched position thereby and form a stiff surface, the pivotal movement of the transverse bars serving to warp the said surface.

2. An aeroplane including a main plane formed with a pair of pivotally mounted transverse bars arranged parallel to the line of flight, a series of spaced and parallel tension wires connecting the transverse bars and extending at substantially right angles to the line of flight, means for regulating the tension in the said tension wires, and a thin flexible covering applied to the tension wires so as to be held in a stretched position thereby providing a stiff surface, the independent pivotal movements of the transverse bars enabling the said surface to be warped.

3. In an aeroplane, the combination of a frame, transverse bars pivotally mounted upon the frame so as to be moved independently of each other, a series of longitudinal tension members connecting the transverse bars, and a thin flexible covering applied to the tension members so as to be held in a stretched position thereby.

4. In an aeroplane, the combination of two upright frame members, longitudinal frame members connecting the upright frame members, transverse bars pivotally mounted upon the upright frame members so as to be moved independently of each other, spaced and parallel longitudinal tension members connecting corresponding transverse bars upon opposite ends of the frame, and a thin flexible covering applied to each set of the tension members.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES ROONEY.

Witnesses:

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WM. D. HENRY.