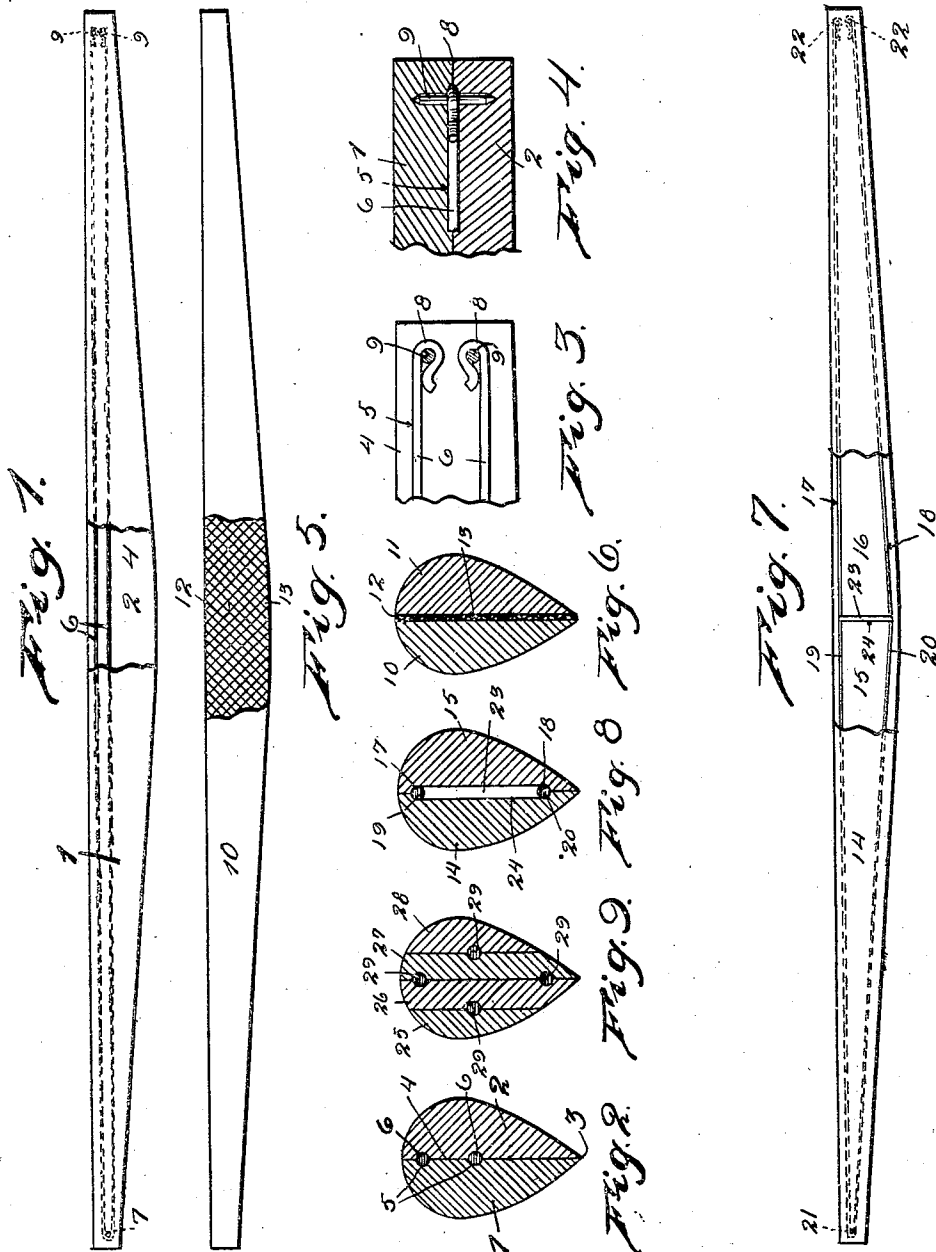


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STRUT.
APPLICATION FILED FEB. 15, 1912.

1,042,808.

Patented Oct. 29, 1912.



Witnesses

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STRUT.

1,042,808.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed February 15, 1912. Serial No. 877,700.

To all whom it may concern:

Be it known that I, AUGUSTUS F. W. MACMANUS, a citizen of the United States, residing at Pine Bluff, in the county of Jefferson and State of Arkansas, have invented certain new and useful Improvements in Struts, of which the following is a specification.

The present invention relates to an improved strut or rod for use in the construction of the frame-work of a flying machine, either those known as heavier than air machines or dirigibles.

An important object of my invention is to provide a strut or rod of the above mentioned character, which is light and very strong.

A further object of my invention is to provide means of the above mentioned character, which is simple in construction and cheap to manufacture.

Other objects and advantages of the invention will be apparent during the course of the following description.

It is well known that a strut or rod formed of a plurality of strips or sections of wood which are firmly glued together, is much stiffer and stronger than a strut formed of a single piece of wood. This advantage is gained by the fact that the several strips which form the strut have their grains running in different directions. These strips are secured together by strong glue under high pressure. Struts of this character are now in use upon a great number of well known types of flying machines. Although this improved strut is stronger and stiffer than the strut heretofore employed, yet it has been found that it is not sufficiently strong to stand the strains to which it is subjected when used in connection with a flying machine.

In accordance with my invention I form a strut out of wooden strips which are firmly glued together. These strips are reinforced by metal wires extending longitudinally thereof. These wires are so arranged that when a force tends to bend or buckle the strut the wires are pulled longitudinally. By this construction the strength of the strut is greatly increased without perceptibly increasing its size and weight.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a

side elevation of the strut, a portion thereof being broken away, Fig. 2 is a cross section through the same, Fig. 3 is a fragmentary end view of one strip of the strut, Fig. 4 is a fragmentary horizontal sectional view through one end of the strut, Fig. 5 is a side elevation of a modified form of strut, a portion thereof being broken away, Fig. 6 is a cross sectional view of the same, Fig. 7 is a side elevation of a third modified form of strut, a portion thereof being broken away, Fig. 8 is a cross sectional view through the same, and, Fig. 9 is a similar view through a fourth modified form of strut.

In the drawings, wherein for the sake of illustration, I have shown preferred embodiments of my invention, the numerals 1 and 2 designate wooden strips which are placed together to form the strut. These strips are of such a shape in cross section that when assembled the strut formed thereby will be approximately heart-shaped. It is thus seen that the leading edge 3 of the strut is tapered or pointed to offer the least resistance to the air. The strips 1 and 2 are tapered longitudinally toward their ends, as shown. These strips have their inner adjacent faces 4 formed flat, as shown, and such faces are provided with longitudinally extending registering grooves 5, for receiving longitudinal reinforcing metal wires 6. These metal wires may be formed of steel or other suitable metals. The reinforcing wires 6 are spaced, as shown. At one end of the strut the wires 6 may be run about a transverse pin 7. At the opposite end of the strut the wires 6 (see Fig. 3) are bent in the form of loops 8, for receiving transverse pins of plugs 9, which extend within suitable openings formed in the strips 1 and 2. The inner faces 4 of the strips 1 and 2 are suitably coated with glue and the reinforcing wires 6 and associated elements placed in their proper positions. The strips 1 and 2 are then properly assembled and placed in a press where they are subjected to great pressure until the glue has thoroughly dried.

In accordance with the form of my invention as illustrated in Figs. 5 and 6, the strut is formed of wooden strips 10 and 11, between which is placed a strip of reinforcing open metal fabric or netting 12. The strips 10 and 11 have their inner faces properly coated with glue subsequently to which the reinforcing strip 12 is placed in position.

The strips 10 and 11 in their assembled positions are then subjected to great pressure until the glue is thoroughly dry.

In connection with Figs. 7 and 8, the numerals 14 and 15 designate wooden strips which are combined to form the strut. These strips are provided upon their inner faces 16 and near one longitudinal edge with registering grooves 17 and near their opposite edge with registering grooves 18. The grooves 18 converge toward the outer ends of the grooves 17. Disposed within the grooves 17 and 18 are reinforcing wires 19 and 20, which at one end of the strut, pass about a transverse securing pin 21. At the opposite end of the strut the wires 19 and 20 are attached to transverse pins 22, in the same way as shown and described in connection with the first form of my invention referred to (see Figs. 3 and 4). The reinforcing wires 19 and 20 converge toward their outer ends and are held apart midway their ends by a spacer 23, which fits within registering transverse grooves 24. It is thus seen that the reinforcing wires 19 and 20, together with the spacer 23 provide reinforcing means for the strut in the form of a truss-structure. The inner faces 16 are suitably coated with glue and the reinforcing wires 19 and 20 and associated elements put in their proper places. The strips 14 and 15 are then properly assembled and held under great pressure until the glue has thoroughly dried.

In Fig. 9 I have shown a strut formed of a large number of wooden strips 25, 26, 27 and 28, which are glued together. Extending longitudinally between these strips are reinforcing longitudinal wires 29, as shown. These wires may have their free ends attached to the strips, as hereinabove explained.

It is to be understood that the forms of my invention herewith shown and described are to be taken as preferred examples of the same and that certain changes in the shapes, sizes, and arrangements of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. A strut or rod for a flying machine construction, comprising a plurality of wooden strips having their inner faces glued to-

gether and provided with sets of longitudinally extending grooves which converge toward their outer ends, reinforcing wires disposed within such grooves, transverse elements extending into the material of the strips near the ends thereof and engaged by the reinforcing wires, and a spacer disposed between the wires midway the ends thereof for forming with the reinforcing wires a truss-structure.

2. A strut or rod for a flying machine construction, comprising a plurality of wooden strips cemented together, a reinforcing wire extending longitudinally through the strut, and transverse anchor-pins extending through the end portions of said strips to connect and reinforce them transversely and having attachments with the ends of the reinforcing wire, said reinforcing wire by virtue of its secure attachments with the anchor-pins serving to prevent the bending of the strut as said reinforcing wire is incapable of being perceptibly stretched.

3. A strut or rod for a flying machine construction, comprising a plurality of wooden strips cemented together, strands of reinforcing wire extending longitudinally through the strut and being spaced and converging toward their outer ends, and transverse anchor pins extending through the end portions of said strips to connect and reinforce them transversally and having attachments with the ends of the strands of reinforcing wire, said strands of reinforcing wire by virtue of their secure attachments with the anchor-pins serving to prevent the bending of the strut as said strands of wire are incapable of being perceptibly stretched.

4. In a strut or rod for a flying machine construction, a plurality of wooden strips having their inner adjacent faces glued together, a transverse securing pin extending through end portions of the strips, two spaced transverse securing pins extending through opposite end portions of said strips, and a reinforcing wire disposed between the strips, extending about the securing pin and having its free ends attached to said securing pins.

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

AUGUSTUS FREDERICK WATSON MACMANUS.

Witnesses:

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