C. F. WICKER.

AEROPLANE PROPELLER BLADE.

APPLICATION FILED APR. 3, 1918.

1,329,735. Patented Feb. 3, 1920.

Fig. 1.

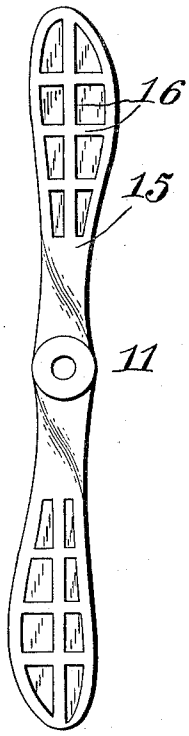


Fig. 2.

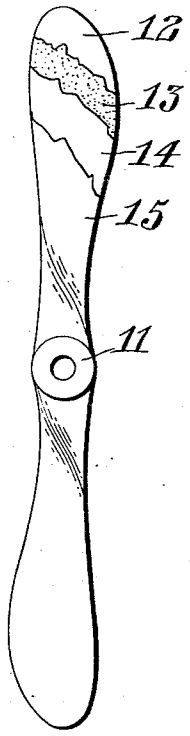


Fig. 3.

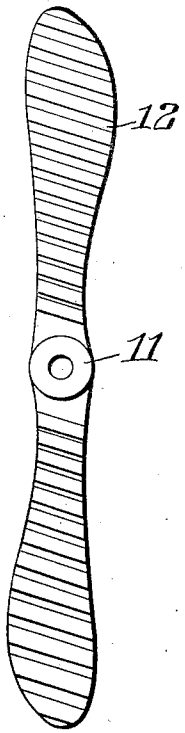
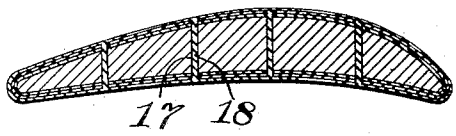


Fig. 4.



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AEROPLANE-PROPELLER BLADE.

1,329,735. Specification of Letters Patent. Patented Feb. 3, 1920.

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To all whom it may concern:

Be it known that I, CYRUS FRENCH WICKER, a citizen of the United States, residing at New York city, State of New York, have invented a new and useful Improvement in Aeroplane-Propeller Blades, of which the following is a specification.

This invention relates to aeronautic propeller blades and its object is to devise a blade that will be as light and as strong as the present wooden blades but which will not have their present disadvantages of warping and excessive wearing due to wind pressure, and the invention consists in a closely adhering protective metallic covering or armor for the blade that will bind it together externally so that its surface can not fray or shatter from the wearing effect of air pressure; that will strengthen the blade; and that will protect it from the effect of moisture, spray, gases or other deleterious substances, and which is not liable under pressure to loosen or separate from the part which it protects. While my coating or armor may be only infinitesimally thin, it will absolutely prevent deterioration of the wooden blades from any of the above causes and will, at the same time, give added strength and rigidity to the blades besides protecting them from projectiles if on war machines.

With this and other objects in view, the invention consists in the construction, arrangement and combination of parts hereinafter described and particularly pointed out in the claims, it being understood that I do not intend to limit myself to the details of construction.

The invention is illustrated in the accompanying drawings in which Figure 1 illustrates one form of my improved blade. Fig. 2 shows a step in the construction of the device of Fig. 1 with parts broken away to show the interior construction. Fig. 3 shows a further form of my device. Fig. 4 is a sectional view of the device of Fig. 3.

In the drawings, 11 indicates my improved blade which is made of wood or any non-metallic material 12. This wood is covered with an adhesive water proofing compound such as shellac 13. The compound is covered with graphite or any levigated electrical conductor 14. The blade, at this stage, is placed in an electrolytic bath wherein copper or other metal 15 is deposited thereupon in a relatively extremely thin layer. Where lightness is desired, portions of the complete armor could be worn away or otherwise removed to leave bare portions of the wooden blade 12 as shown in Fig. 1. The important part of the blades to protect are the edges so that armor would be left on these, as shown, and strips 16 of the armor would be left on the blade to tie the armor on the edges together.

Another form of tying the armor on the edges together may be used and this is shown in Figs. 3 and 4. Holes 17 are drilled through the blade near the edges before the blade is covered with the graphite so that when the coated blade is immersed in the electrolytic bath, armor is deposited on the edges as shown in Fig. 4 and the metal will flow into or be deposited in the holes 17 so that ties 18 are formed for holding the armor of both sides on each edge together without any possibility of the blade splitting and letting the armor fly off as where such armor is riveted on.

While I have mentioned an aeronautic propeller blade and refer to the same in the claims, it should be interpreted to include both aeroplane and hydroplane propeller blades and any non-metallic article that is subject to splintering, fraying, warping, decomposition, or deterioration. Where I have mentioned graphite in the process of armoring the blade, I may use a metallic salt. Instead of shellac, varnish could be used or collodion dissolved in alcohol or some alkaline solution. While I have referred to the use of a wooden core, I may use a non-metallic core, or I may even use a liquefiable or removable core. In the form shown in Figs. 3 and 4, the ties passing through the blade may or may not be used in conjunction with the arrangement of Fig. 1. Likewise, instead of coating the entire blade with armor and then wearing parts away, only certain portions of the blade need be coated with the electrical conductor so that only those portions will be armored.

My preferred form is to have the finished blade coated or protected by strips of the metal encircling the blade spirally as shown in Fig. 3, and these strips may only be separated by the smallest fraction of an inch but the greater number of grooves or bare portions 12 to the inch should occur on the neck of the blade where the flexion is greatest and the fewer number will be on the broad part of the blade.

A blade made in accordance with this invention is far superior to one that might be coated by flowing molten metal over the core for the wood is sure to burn and have its strength diminished by the great heat. It would also be superior to a blade bound with strips of metal riveted in the wood for by reason of the great pressure such strips soon become loose and destroy the delicate balance of the blade or fly off and cause serious accidents. By the process, the metallic covering is affixed in such a manner that it cannot become loose or fly off and the thickness, location and weight of the armor can be absolutely controlled by this process. A blade made in accordance with this invention is free from the main difficulty with metal coverings of being inflexible while the wood of the blade is flexible. The wood will bend under the terrific air pressure, and the metal covering, if rigidly attached in a single enveloping sheath, will of course tear loose.

What I claim is:

1. A method of armoring an aeronautic propeller blade consisting in drilling holes through the blade, and then electrically depositing armor on the blade so that the holes are filled with metal and the armor on the faces of the blades are thereby tied together.

2. An aeronautic propeller blade having a body of non-metallic material and a spiral metallic sheathing intimately connected to said body.

3. The device of claim 2 in which the spirals of the metallic sheathing are nearer together at the neck of the blade than elsewhere.

4. A method of armoring a propeller blade consisting in drilling holes through the blade, then electrically depositing armor on the blade so that the holes are filled with metal and the armor on the faces of the blades is thereby tied together, and then removing parts of the armor.

5. A method of armoring a propeller blade consisting in electrically depositing a covering armor thereon, and then removing a portion of said armor spirally to leave a spiral metallic sheathing intimately connected to said blade.

CYRUS F. WICKER.