

P. THOMSON AND M. J. WHELAN.  
AERONAUTICAL PROPELLER,  
APPLICATION FILED DEC. 15, 1917.

1,419,180.

Patented June 13, 1922.

FIG. 1.

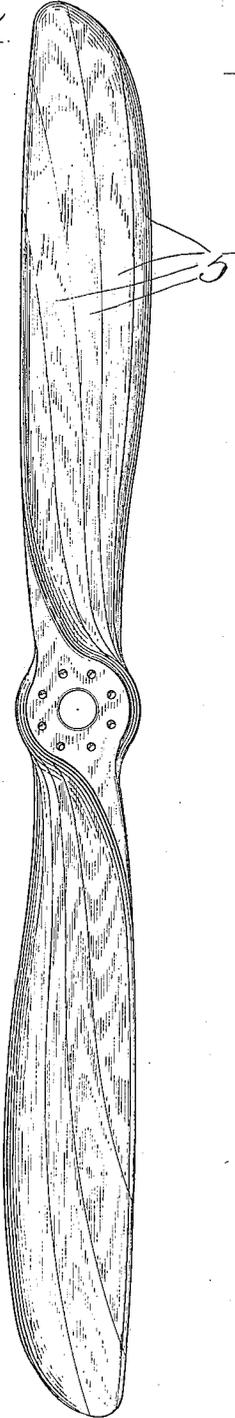


FIG. 2.

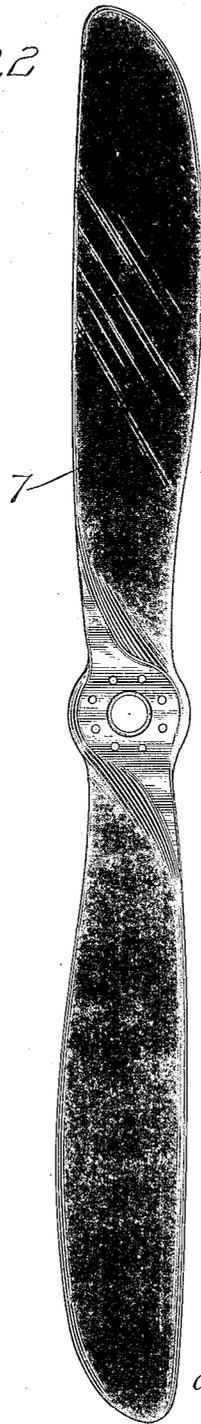


FIG. 3.

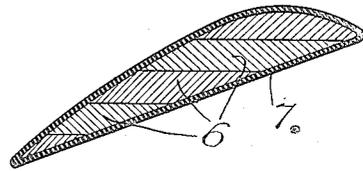
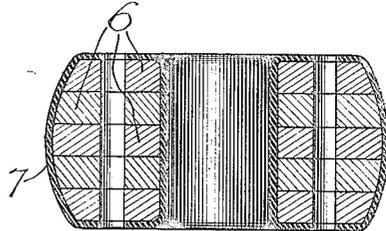


FIG. 4.



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# UNITED STATES PATENT OFFICE.

PROCTER THOMSON AND MICHAEL J. WHELAN, OF MUSKEGON, MICHIGAN, ASSIGNORS  
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## AERONAUTICAL PROPELLER.

1,419,180.

Specification of Letters Patent. Patented June 13, 1922.

Application filed December 15, 1917. Serial No. 207,282.

*To all whom it may concern:*

Be it known that we, PROCTER THOMSON and MICHAEL J. WHELAN, citizens of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Aeronautical Propellers, of which the following is a specification.

This invention relates to aeronautical propellers and has for its object the elimination of the inherent disadvantages resulting from the common mode of constructing propellers and the provision of a propeller of the requisite strength, rigidity and lightness which presents a smooth, indurated, weather-proof surface.

Further objects and advantages of our invention will be better understood by reference to the following specification when read in connection with the accompanying drawing, illustrating the preferred embodiment thereof, in which—

Fig. 1 is a side elevation of an aeronautical propeller of the well known form and construction;

Fig. 2 is a side elevation of a propeller according to our invention;

Fig. 3 is an enlarged sectional view of the structure illustrated in Fig. 2, and

Fig. 4 is an enlarged sectional view through the hub of the propeller.

Aeronautical propellers have heretofore been constructed by superposing a plurality of layers or laminations of some suitable hard wood, the layers being secured together by an adhesive such as glue. From the block thus formed the propeller is shaped. Even when the utmost care is exercised in building up the blocks a large proportion of the propellers will be rejected because of imperfect joining of the layers which becomes apparent only after the propeller is partially or wholly shaped. A large amount of material and labor is thus wasted. More-over propellers apparently perfect when finished frequently develop flaws after being used for a short time. These flaws permit the air to enter between the layers of wood and such a propeller cannot be used with safety owing to its liability to disintegrate unexpectedly and disastrously. The rapidly varying atmospheric conditions of temperature and humidity to which propellers are subjected in use sooner or later affect

the wood and glue and increases the liability of wood propellers to fail. Finally the constant friction of the air on wood propellers quickly wears the surfaces to an extent which ruins them after a short interval of use.

We propose to overcome these and other inherent defects of wood propellers by providing a core and enclosing the same in a hard, dense, impervious shell of a suitable weather proof material which is integrally united with the core. We have found that hard rubber is a very desirable material for this purpose because it can be vulcanized to the core and integrally united therewith, providing a hard, indurated, weather proof surface impervious to moisture and not affected by changes of temperature. Thus, wearing by attrition of the air is entirely overcome and the atmospheric changes can no longer affect the structure.

The glue which secures the layers of wood together is protected by the shell and slight flaws in the joining of the layers are prevented from developing under the pressure of the air. The proportion of propellers rejected by reason of slight flaws which in themselves do not affect the strength of the propeller is reduced to a minimum, thereby saving material and labor which more than offsets the slightly increased cost of our construction. A safer and more dependable propeller is thus provided.

Referring to the drawing, we have illustrated in Fig. 1 for purpose of comparison a common wood propeller made up of a plurality of layers of wood joined by means of glue.

In Figs. 2, 3 and 4 we have illustrated our propeller which consists of a core made up of a plurality of layers of wood secured together by means of glue and shaped to approximately the finished form of the propeller. The surface of the wood is preferably left rough, thus eliminating the necessity and expense of finishing, and also permitting a better bond between the wood and hard rubber shell.

The shell is applied by arranging a layer of uncured rubber composition about the core which is then disposed in a suitable mold of the shape and contour of the finished propeller. By subjecting the mold to pressure and heat in the well understood manner

the rubber is vulcanized and integrally united with the core. Upon removal from the mold at the completion of the vulcanizing operation the propeller may be polished and  
5 it is then ready for immediate use.

From the foregoing it will be readily understood that we have perfected an aeronautical propeller which presents numerous advantages over wood propellers and that  
10 various changes may be made in the shape, dimensions and relative thickness of the core and shell without departing from the spirit and scope of the invention or sacrificing any of the advantages of the invention,  
15 the form hereinbefore described being merely the preferred embodiment thereof. While we now prefer to use hard rubber to

cover the core, we may use any other material which will provide a hard, indurated weatherproof surface suitable for the purpose.

We claim:

An aeronautical propeller comprising a core made up of a plurality of layers of wood adhesively secured together and having a roughened surface and an enclosing  
25 shell of hard rubber vulcanized to and integrally united with said core.

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Witnesses:

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