May 1, 1951 W. S. McKINSTRY ET AL 2,550,707

PITCHOMETER SUPPORT

Filed Sept. 17, 1945

FIG 1

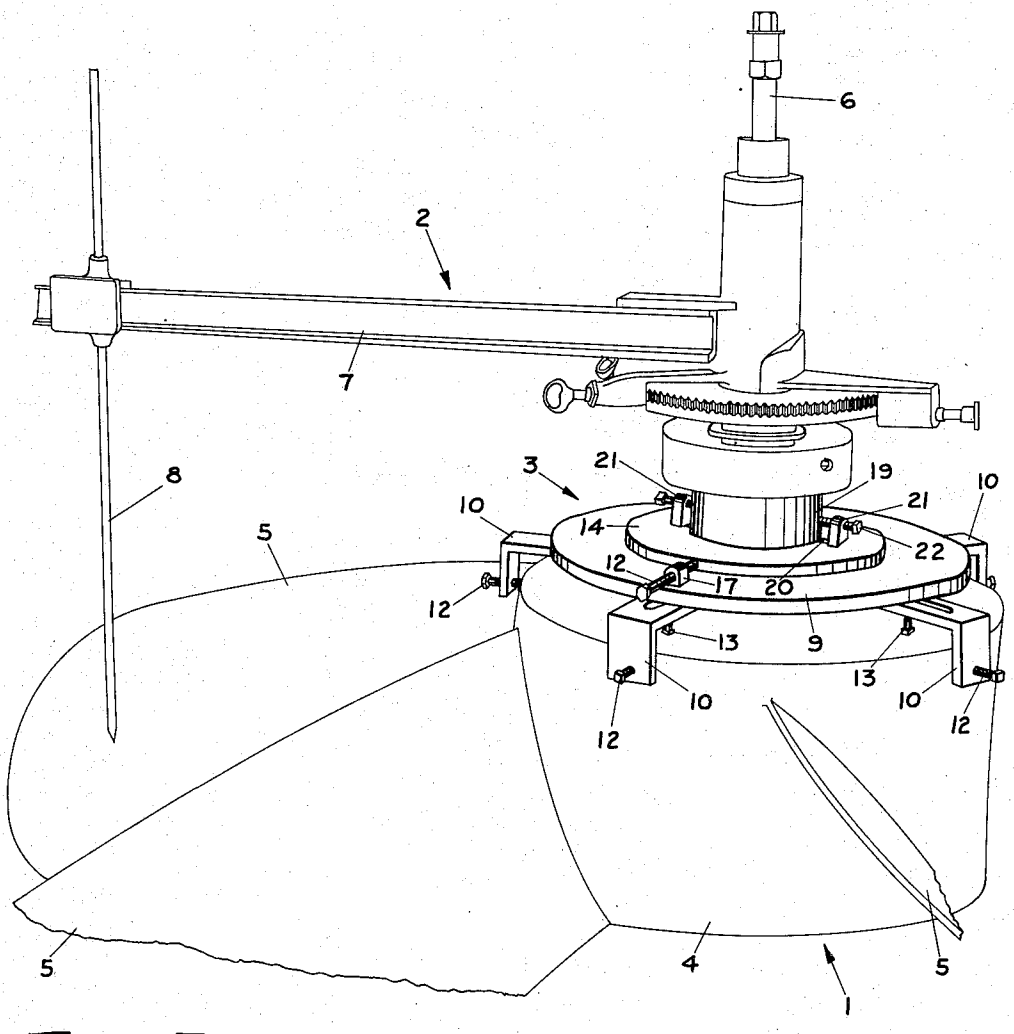
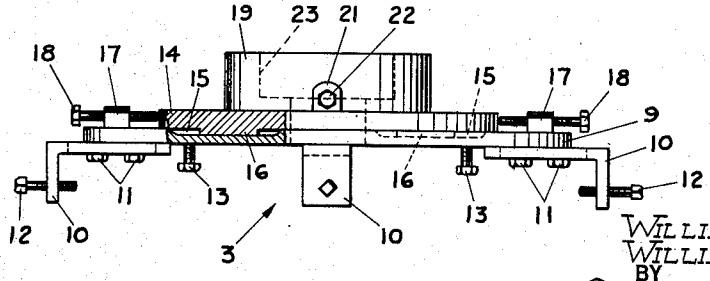


FIG 2



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Patented May 1, 1951 2,550,707

UNITED STATES PATENT OFFICE

2,550,707

PITCHOMETER SUPPORT

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Application September 17, 1945, Serial No. 616,952

3 Claims. (Cl. 33—174)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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This invention relates to a support for pitchometers or the like and more particularly to a support adapted to secure such devices to propeller hubs.

In the manufacture of propellers for use on ships it is customary practice to form the propeller as a rough casting and then to lay out and machine the finished propeller from the casting. A measuring device known as a "pitchometer" is commonly employed to determine the thickness of material to be removed from the casting at each point on the blades in order to provide the desired pitch. The pitchometer is secured to the hub of the casting and the determination requires measurements of a high degree of precision.

Supports heretofore used for securing a pitchometer to a propeller hub have been designed to be secured only to a finished hub; consequently, it has been necessary to lay out and machine the hub before a pitchometer could be employed to lay out the blades. This practice has necessitated an extra machining operation and furthermore, after the hub has been machined, it is not possible to change the center axis of a propeller to balance the material to be removed from each blade.

The principal objects of the present invention are to provide a support for pitchometers or the like adapted to be secured to an unmachined hub of a propeller casting and to provide a support of the type referred to that enables the center axis of the propeller to be shifted to balance the material to be removed from the different blades.

It is a further object of the invention to provide for carrying out the foregoing objects in a facile, economical and efficient manner.

In accomplishing these and other objects of the present invention, we have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein:

Fig. 1 is a perspective view of a propeller casting having a pitchometer supported thereon by a support embodying the features of our invention.

Fig. 2 is a side elevational view of the support employed in Fig. 1.

Referring more in detail to the drawing:

There is shown at 1, Fig. 1, a rough casting of a propeller of the type commonly used on ships. A pitchometer, designated generally as 2, is mounted on the propeller casting 1 and is used to determine the thickness of material to be removed from the blades to finish the propeller. The pitchometer 2 is secured to the propeller casting 1 by a support designated generally as 3.

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The propeller casting 1 comprises a hub 4 and a plurality of blades 5, in this case five in number. Before the propeller casting may be finished it is necessary to determine the thickness of the material to be machined from each blade at each point thereon and the pitchometer 2 is employed for this purpose.

The pitchometer 2 comprises a shaft 6, an arm 7 and a gauge rod 8. The arm 7 is pivotally mounted on the shaft 6 and the gauge rod 8 is adjustably mounted on the arm 7. The construction of the pitchometer is not a part of this invention; hence, it is not described in further detail.

The support 3 of our invention comprises a base plate 9 preferably substantially circular in outline and having substantially planar faces on opposite sides thereof.

A plurality of inverted L-shaped clamp brackets 10 are secured to the under face of the base plate 9 as by the bolts 11. Preferably the lateral legs of the brackets 10 are slotted to receive the bolts 11 to permit radial adjustment of the brackets with respect to the plate 9. The brackets 10 have tapped bores in their depending legs and a stud 12 is threadedly engaged in each of the tapped bores. The studs 12 are adapted to engage the peripheral wall of the hub of a propeller casting to secure the support thereto.

A plurality of legs 13 are threadedly engaged in suitable tapped bores in the base plate 9 for vertical adjustment thereon. Preferably one leg 13 is provided adjacent each bracket 10. The lower ends of the legs 13 are adapted to rest against the upper surface of the propeller casting hub 4.

A center plate 14 is supported on the upper surface of the base plate 9. The latter has a pair of diametrically opposed radial grooves 15 in its upper face and the center plate 14 has projecting guide portions 16 adapted to ride within the grooves 15, Fig. 2. The center plate 14 is thus supported on the base plate 9 in such manner that it may be adjusted thereacross in a substantially straight line in radial directions.

The base plate 9 has a pair of upstanding bosses 17 on its upper face that have tapped bores therethrough substantially radially aligned with the grooves 15. A stud 18 is threadedly engaged in the bore of each boss 17 and the inner ends thereof are adapted to engage the peripheral face of the center plate 14 to secure the center plate in adjusted position with respect to the base plate 9.

A block 19 is supported on the upper face of the center plate 14. The upper face of the latter has a pair of diametrically opposed radial grooves 20 extending substantially perpendicularly to the

projecting guide portions 16 and grooves 15. The block 19 has downwardly projecting guide portions engaged within the grooves 20.

A pair of upstanding bosses 21 are provided on the upper face of the center plate 14 and have tapped bores therethrough substantially radially aligned with the grooves 20. A stud 22 is threadedly engaged in the bore of each boss 21 to secure the block 19 in adjusted position on the center plate 14.

The upper face of the block 19 has an aperture 23 adapted to receive and support the base of the pitchometer shaft 6.

Operation

The support is secured to the hub of a rough casting of a propeller. The studs 12 are rotated into clamping engagement with the peripheral face of the hub. The legs 13 are rotated into engagement with the upper face of the hub and the support leveled with respect to the propeller by adjustment of the legs. The center plate 14 is adjusted across the base plate 9 and the block 19 is adjusted across the center plate 14 until the center axis of the pitchometer shaft 6 is approximately aligned with the center axis of the hub 4.

Measurements are taken with the pitchometer to determine approximately the amount of material that must be removed from each blade. Ordinarily it will be found that a considerably greater amount of material must be removed from some blades than others. The position of the pitchometer shaft with respect to the hub is then adjusted laterally to balance as nearly as possible the amount of material to be removed from each blade.

It is seen that by balancing the material to be removed in this manner less machining is necessary than was the case with practices heretofore employed.

While we have shown but one embodiment of our invention, it is susceptible to modification without departing from the spirit of the invention. We do not wish, therefore, to be limited by the disclosures set forth, but only by the scope of the appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

We claim:

1. A pitchometer support comprising a base plate having substantially planar faces on opposite sides thereof, a plurality of clamp brackets secured to one of said faces, means on said brackets for engaging a propeller hub, a plurality of legs secured to said plate and being perpendicularly disposed to a planar face thereof and adjustable as to effective length, a center plate having substantially planar faces on opposite sides thereof supported on the opposite face of said base plate for adjustment in the plane of said opposite face in a substantially straight line, means securing said center plate in adjusted position on said base plate, a block adapted to receive a pitchometer shaft supported on said center plate for adjustment in the plane of the face of said center plate in a substantially straight line substantially perpendicular to said first named straight line, and means securing said block in adjusted position with respect to said center plate.

2. A pitchometer support comprising a base plate, a plurality of clamp brackets secured to said base plate, a plurality of legs secured to said base plate and being adjustable as to effective length, a center plate supported on said base plate for adjustment thereon in a substantially straight line, means securing said center plate in adjusted position on said base plate, a block adapted to receive a pitchometer shaft supported on said center plate for adjustment in a substantially straight line substantially perpendicular to said first named straight line, and means securing said block in adjusted position with respect to said center plate.

3. A support comprising a base plate, vertically adjustable means for leveling said plate on a hub, laterally adjustable means for securing said plate to said hub for lateral adjustment thereon, means supported on said base plate for receiving an object to be carried thereby, means laterally adjustable in two substantially mutually perpendicular directions for laterally adjusting said object-receiving means on said base plate, and means securing said supported means in adjusted position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
507,047	Strickland	Oct. 17, 1893
720,844	Rafferty	Feb. 17, 1903
918,190	Van Nagy	Apr. 13, 1909
1,736,247	Bodenlos	Nov. 19, 1929
2,132,170	Langsner	Oct. 4, 1938
2,132,407	Fowler	Oct. 11, 1938
2,172,368	Eby	Sept. 12, 1939
2,414,777	Thomas	Jan. 21, 1947

FOREIGN PATENTS

Number	Country	Date
632,261	France	Oct. 1, 1927