April 1, 1969 D. F. LINSLEY 3,435,799

RUDDER ATTACHMENT FOR OUTBOARD ENGINES

Filed Aug. 23, 1967 Sheet 1 of 3

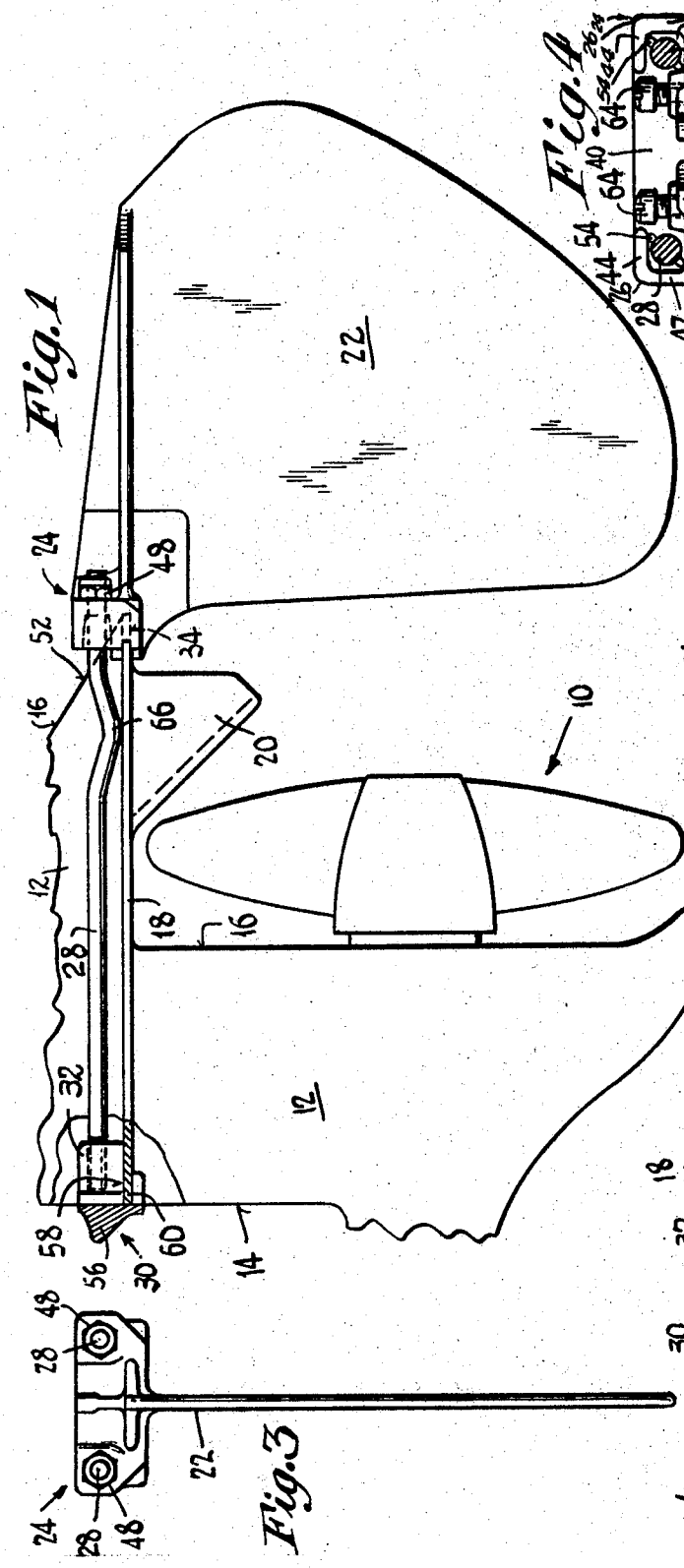
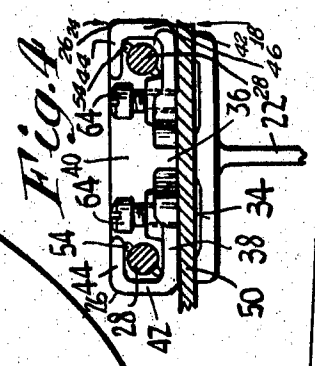


Fig. 3



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Fig. 5

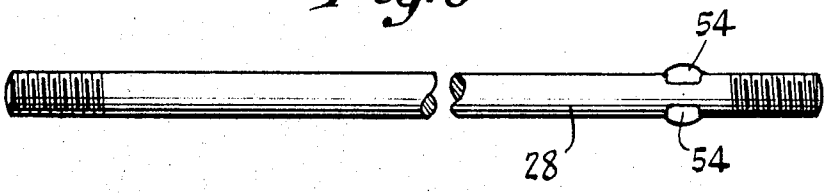
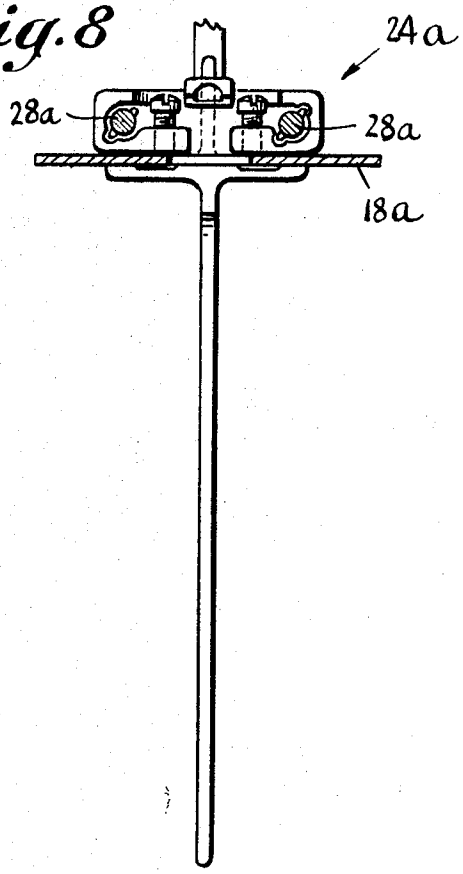


Fig. 8



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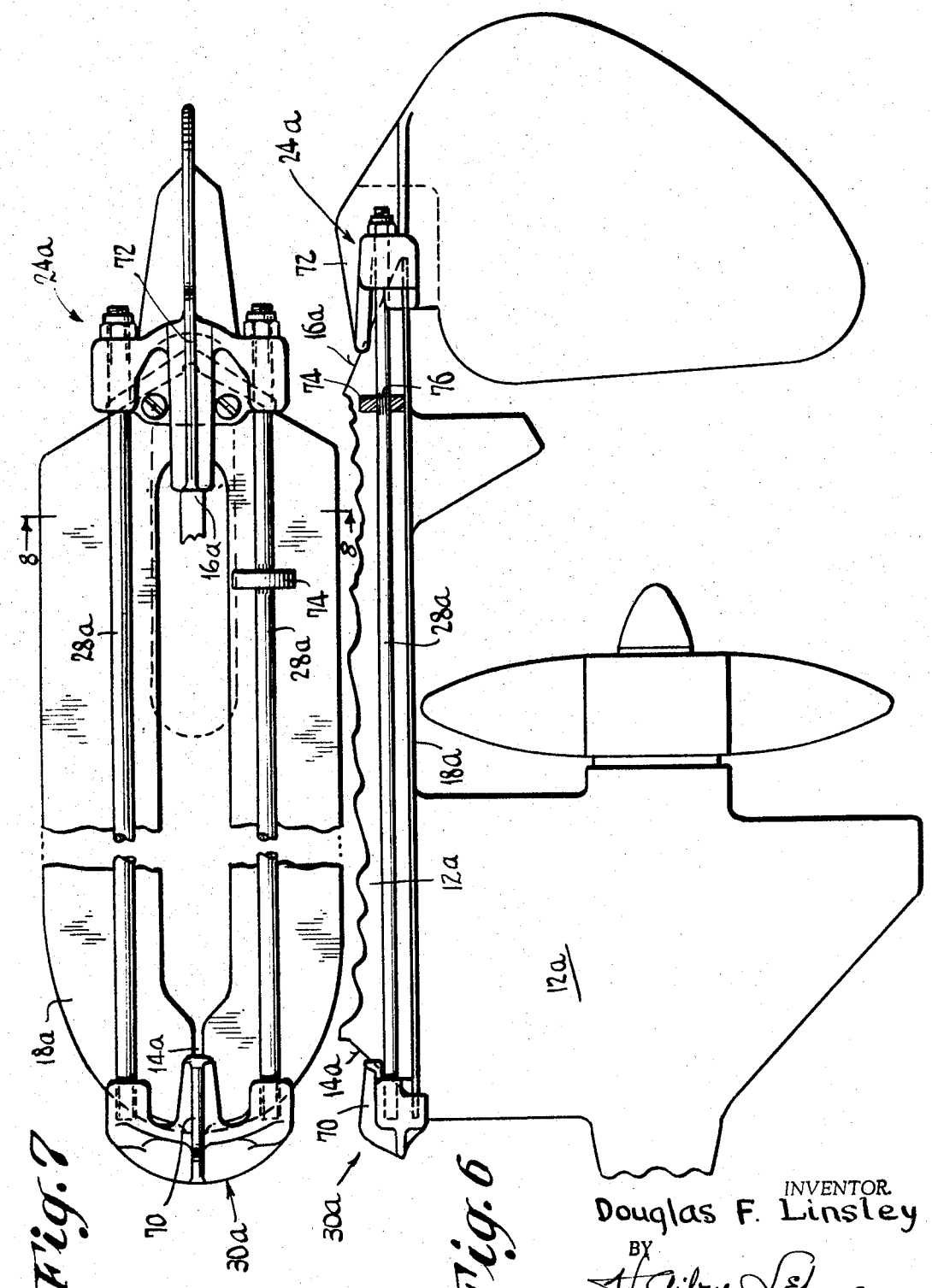


Fig. 7

Fig. 6

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RUDDER ATTACHMENT FOR OUTBOARD ENGINES

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Int. Cl. B63h 21/26, 25/06
U.S. Cl. 115—18 12 Claims

ABSTRACT OF THE DISCLOSURE

A rudder attachment for outboard marine drives of either outboard or inboard engines, comprising a cast rudder blade and first clamp head, and a separate, second clamp head. The clamp heads have sockets receiving fore and aft portions of the lower, fin-like housing of the drive. A pair of elongate draft screws extend on opposite sides of the drive housing and are acommodated in receptacle formations of the clamp heads, the screws passing through one clamp head and having nuts by which the clamp heads are pulled toward each other, clamping between them the drive housing and thereby rigidly supporting the rudder blade aft of the housing.

Background

This invention relates to rudder attachments for outboard marine drives of outboard or inboard engines, and more particularly to attachments of this type which can be quickly installed with a minimum of tools and difficulty.

In some prior rudder attachments it was necessary to drill holes through the existing structures to effect the installation. In other attachments of the kind referred to a clamping action was utilized to effect the attachment. The prior devices had drawbacks in that the installation required machining procedures and quite considerable mechanical skill, or else the devices themselves were large and cumbersome, as well as not sufficiently sturdy to withstand successfully all the various conditions of use encountered in boating. In some cases as well, there was the likelihood of damaging the housing or adjoining structures of the drive being worked on.

Summary

The present invention obviates the above drawbacks of prior attachments for outboard drives of outboard or inboard engines, and one object of the invention is to provide a novel and improved rudder attachment which does not require drilling or machining operations but instead enables a tight and secure failure-proof clamping mounting of the rudder blace to be effected with the use of small and compact components not likely to fail or to damage existing engine structures.

This is accomplished by the provision of small clamping blocks or heads which are engageable with fore and aft portions of the lower fin-like housing of the drive, and of elongate clamping screws extending on opposite sides of the fin-like housing and received in receptacle formations of the blocks. The screws pass through one block and have nuts by which the blocks are pulled toward each other and against said fore and aft portions. The rear clamp head or block carries the rudder blade. The blocks can be metal castings, and the fin-like drive housing withstands considerable fore-and-aft forces whereby the clamp means can be drawn up tightly, providing a sturdy, failure-resistant assemblage while involving small parts in a compact arrangement.

Other objects and advantages of the invention are to provide an improved clamp-on rudder attachment in accordance with the foregoing, which can be clamped directly onto the cavitation plate of the drive housing; to provide an improved clamping-type attachment which has great strength, resistance to corrosion, which is especially simple, low in cost of components, and is inexpensive to tool and produce.

Other features and advantages will hereinafter appear.

In the drawings:

FIG. 1 is a side elevational view of the improved clamp-on rudder attachment of the invention, mounted on the lower housing portion of an outboard drive.

FIG. 2 is a top plan view of the rudder attachment of FIG. 1.

FIG. 3 is a rear elevational view of the rudder attachment.

FIG. 4 is a fragmentary sectional view, taken on the line 4—4 of FIG. 2.

FIG. 5 is a top plan view of one of the elongate draft screws of the attachment.

FIG. 6 is a side elevational view of a clamp-on rudder attachment illustrating another form of the invention.

FIG. 7 is a top plan view of the rudder attachment of FIG. 6.

FIG. 8 is a vertical sectional view, taken on the line 8—8 of FIG. 7.

Considering first FIGS. 1 and 2, there is illustrated a lower portion of an outboard drive of either an outboard engine or an inboard engine, comprising a propeller **10** having a bearing in lower housing **12** of fin-like configuration, said housing including a fore portion or edge **14** and an aft portion or edge **16**. The lower housing portion **12** also includes a horizontal cavitation plate **18** shown as having a generally oval configuration in top plan, as seen in FIG. 2. The drive housing **12** also includes an exhaust duct **20** of usual type.

In accordance with the present invention there is provided an improved, clamping-type rudder attachment for the drive structure illustrated in FIGS. 1 and 2, which attachment is relatively small and compact, comprising clamping heads engageable with the fore and aft portions **14, 16** of the drive housing, said attachment being further characterized by elongate clamping screws which extend along but do not bear against the opposite broad sides of the housing, and which pull the clamping heads tightly against said fore and aft housing portions. The attachment has the special advantage of providing an extremely sturdy, failure-resistant assemblage while still involving small parts in a compact arrangement that can be economically produced and quickly installed without requiring drilling or machining operations.

As shown, the improved rudder attachment comprises essentially a rudder blade **22** and a first clamp head **24** which is rigid with the rudder blade **22**, said clamp head comprising a block preferably constituted as a metal casting integral with the rudder blade **22**. The clamp head or block **24** has a pair of spaced-apart receptacle formations **26** adapted to receive a pair of elongate draft screws **28**. The rudder attachment further comprises a second clamp head or block **30** which is separate from the rudder blade **22** and first clamp head **24**, and which also has a pair of spaced-apart receptacle formations **32** adapted to receive the draft screws **28**.

The elongate screws **28** extend along the opposite broad sides of the lower drive housing **12** and are so constituted as to forcibly pull the clamp heads **24, 30** toward each other and against the aft and fore portions **16** and **14** respectively of the housing. For this purpose, the clamp heads **24, 30** are provided with sockets especially arranged to receive the said fore and aft housing portions, and particularly to receive the fore and aft ends or edges of the cavitation plate **18** of the housing.

Considering FIGS. 2 and 4, the socket of the clamp

head 24 comprises a horizontal slot 34 in the lower portion of the head, joining a V-shaped central notch 36 disposed in an intermediate horizontal wall 38. Above the intermediate wall 38 the clamp head 24 has an arcuate or semicircular recess 40. The intermediate wall 38 joins end wall 42 of the clamp head, and these latter adjoin relatively small top walls 44. The clamp head 24 has a pair of spaced rear walls 46 provided with apertures through which the draft screws 28 pass. The said screws also pass through a space defined by the walls 38, 42 and 44, which space and apertures in the walls 46 constitute what I term "receptacle formations" of the clamp head 24, for accommodating the draft screws 28. Nuts 48 are provided on the screws 28, by which the clamp head 24 may be pulled up tight when securing the attachment in place.

The horizontal slot 34 of the clamp head 24 is arranged to accommodate the rear edge portion 50 of the cavitation plate 18, such rear edge portion being herein also considered, as part of the rear or aft portion 16 of the drive housing 12. The V-notch 36 of the clamp head 24 accommodates the trailing edge, designated 52, of that portion of the drive housing 12 which is located immediately above the cavitation plate 18. Preferably a relatively snug fit is provided between the trailing edge 50 of the cavitation plate 18 and the clamp head 24.

In order to prevent turning of the draft screws 28 when the nuts 48 are being tightened, the said screws may be provided with drifted or struck ears 54, FIGS. 4 and 5, which have a clearance fit in the receptacle formation of the clamp heads 24, as may be seen from an inspection of FIG. 4.

The forward clamp head 30 is also preferably a metal casting, and the receptacle formations 32 are preferably threaded to enable the draft screws 28 to be screwed into the formations tightly and to be thereby anchored to the clamp head. Referring to FIG. 2, the clamp head 30 is somewhat in the shape of the letter U, with a central bridge or yoke portion 56 of curved shape, having a horizontal slot 58 in which the front edge portion 60 of the cavitation plate 18 is accommodated. The lower portion of the clamp head 30 has notches 62 above and below the horizontal slot 58, to enable a fit to be had to the fore portion 14 of the fin-like drive housing 12 in the vicinity of the cavitation plate 18.

For the purpose of taking up slack in the socket 34 and minimizing vertical tilting of the aft clamp head 24 and rudder blade 22, the intermediate wall 38 of the clamp head is provided with screw holes, in which clamping screws 64 are disposed and arranged to engage the upper surface of the cavitation plate 18. Also, to minimize the likelihood of such vertical tilting, the draft screws 28 are provided with antitilt means, this being in the form of vertical downwardly offset portions 66 adapted to engage the upper side of the cavitation plate 18. Accordingly, when the nuts 48 are pulled up tight, with the clamping screws 64 partially tightened, there is greatly minimized any tilting effect on the rear clamp head 24 and rudder blade 22.

Another embodiment of the invention is illustrated in FIGS. 7 and 8. The drive housing 12*a* in these figures has a slightly different configuration, with a sloping front edge portion 14*a* directly above the horizontal cavitation plate 18*a*. There is also a sloping rear edge portion 16*a* of the drive housing 12*a*, disposed immediately above the cavitation plate 18*a*.

In the form of the invention illustrated in FIGS. 7 and 8, antitilt arms are provided on the clamp heads. The forward clamp head 30*a* has a rearwardly extending arm 70 engageable with the portion 14*a* of the drive housing, and the rear clamp head 24*a* has a forwardly extending antitilt arm 72 engageable with the rear edge portion 16*a* of the drive housing. Additionally, the draft screws 28*a* have different antitilt means, comprising annuli or washer-like members 74 which are press-fitted on knurled portions 76 of the draft screws and arranged to engage the upper surfaces of the cavitation plate 18*a*.

Otherwise, in general, the clamp-on rudder attachment illustrated in FIGS. 6, 7 and 8 is mostly similar to that described in connection with FIGS. 1–5, and any variations therefrom are of a minor nature.

It will now be understood from the foregoing that I have provided a novel and improved clamp-on type rudder attachment for outboard marine drives, which is characterized by relatively small yet sturdy and powerful components arranged in a compact organization, the attachment being easily and quickly secured to the outboard drive without requiring machining, drilling or like operations. The specific clamp means enables a tight and secure, failure-proof mounting of the rudder blade to be effected, and there is not present the likelihood of damage to the drive housing when the draft screws are pulled up tightly, for the reason that the clamping forces are exerted fore and aft, between the narrow end portions of the fin-like housing as distinguished from forces applied broadside thereto. Accordingly, the fin-like housing and particularly the cavitation plate thereof is well able to withstand powerful clamping forces without deformation or failure. The rudder attachment involves relatively few parts, which may be economically fabricated and assembled, and the entire organization may be easily and quickly applied to existing drive structures without requiring appreciable skill or know-how. The location of the rudder blade to the rear or aft of the propeller provides an advantageous steering control of the craft on which the outboard drive is being used.

Variations and modifications may be made within the scope of the claims, and portions of the improvement may be used without others.

I claim:

1. A clamping-type rudder attachment for an outboard marine drive housing comprising, in combination:
   (a) a rudder blade,
   (b) a first clamp head rigid with the rudder blade, wherein the improvement comprises:
   (c) said clamp head comprising a block having a pair of spaced-apart receptacle formations,
   (d) a second clamp head, separate from said rudder blade and first clamp head and having pair of spaced-apart receptacle formations,
   (e) said first and second clamp heads having sockets for receiving respectively the narrow aft and fore portions of the fin-like lower housing of the outboard drive, and
   (f) means including a pair of draft screws adapted to extend along the opposite broad sides of said lower housing and receivable in the receptacle formations of said clamp heads, for forcibly pulling the heads toward each other and clamping edgewise the lower housing between the heads with fore and aft forces applied to said aft and fore portions whereby the rudder blade is rigidly mounted aft of said fin-like lower housing and constitutes a rearward continuation of the same.

2. A clamping-type rudder attachment as in claim 1, wherein:
   (a) means are provided on the draft screws intermediate the ends thereof, engageable with portions of said lower housing to limit bending of the screws when under tensile and bending stress.

3. A clamping-type rudder attachment as in claim 2, wherein:
   (a) the means on the draft screws comprises laterally offset portions thereof.

4. A clamping-type rudder attachment as in claim 2, wherein:
   (a) the means on the draft screws comprises apertured members carried by the screws and engaged with the lower housing.

5. A clamping-type rudder attachment as in claim 4, wherein:
   (a) the draft screws have knurling engaged with the

apertured members to secure the same against movement.

6. A clamping-type rudder attachment as in claim **1**, wherein:

(a) the draft screws are anchored in the said second clamp head,

(b) said screws passing through the first clamp head and having nuts to pull the heads toward each other.

7. A clamping-type rudder attachment as in claim **6**, wherein:

(a) tilt-restraining means are provided on the said first clamp head, engageable with the drive housing to prevent vertical tilting of the head and rudder blade.

8. A clamping-type rudder attachment as in claim **7**, wherein:

(a) the tilt-restraining means comprises an arm on and extending forwardly of the first clamp head.

9. A clamping-type rudder attachment as in claim **7**, wherein:

(a) the tilt-restraining means are adjustable and comprise set screws threaded into the first clamp head and engageable with the cavitation plate of the drive housing.

10. A clamping-type rudder attachment as in claim **6**, wherein:

(a) cooperable means are provided on the first clamp head and draft screws, preventing turning of the screws when the nuts are turned.

11. A clamping-type rudder attachment as in claim **10**, wherein:

(a) the draft screws have laterally extending ears struck from them, comprising said cooperable means.

12. A clamping-type rudder attachment as in claim **1**, wherein:

(a) the first clamp head and rudder blade comprise a single casting.

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U.S. Cl. X.R.

114—165; 115—28