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SEAPLANE TOWING AND REFUELING APPARATUS

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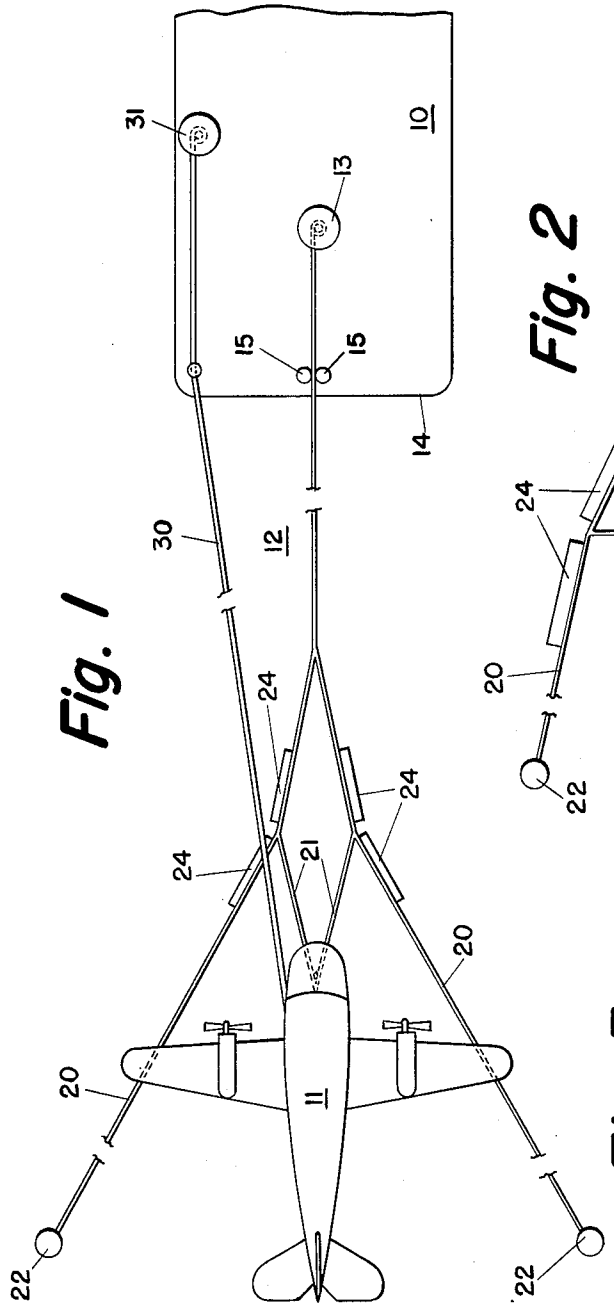


Fig. 1

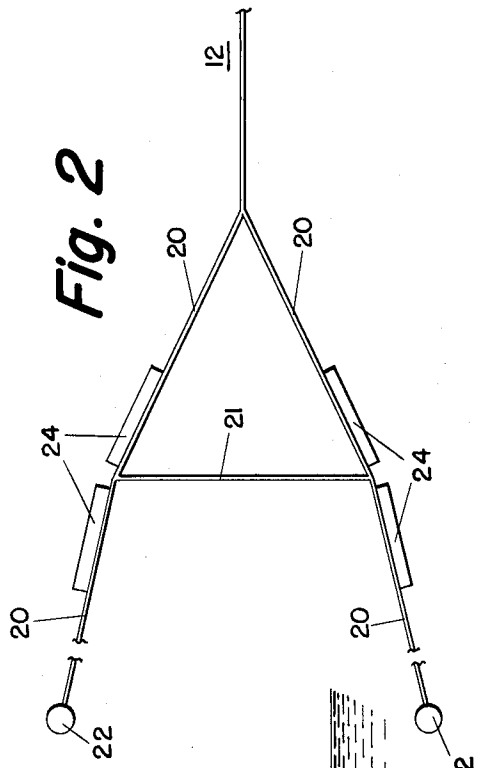


Fig. 2

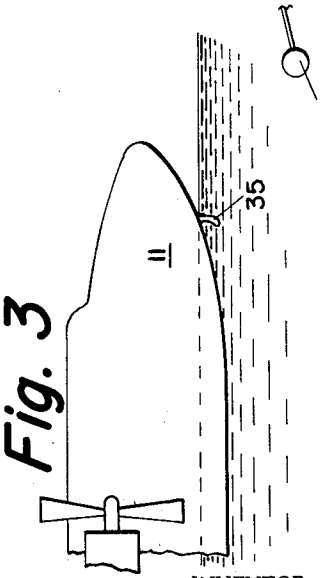


Fig. 3

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SEAPLANE TOWING AND REFUELING APPARATUS

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1 Claim. (Cl. 114—235)

(Granted under Title 35, U.S. Code (1952), sec. 266)

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.

This invention relates to a system or apparatus for towing and refueling seaplanes and particularly concerns the simultaneous towing and refueling of a seaplane by a refueling vessel which is maintaining seaway.

When it is necessary by reasons of fuel exhaustion for a seaplane to come to rest on the surface of the sea, its wings, pontoons, etc. are likely to be rapidly demolished especially if the sea is rough or to sink unless it can be towed in some manner to keep it surfaced while it is being refueled.

The present invention is directed to the provision of equipment on an ocean vessel which can be payed out to trail the vessel and attach itself to a seaplane and refuel the plane while both are in motion.

Seaplanes are usually refuelled by tankers, submarines or other vessels which are at anchor but this presents a dangerous operation under war conditions since both the vessel and the seaplane are stationary and at the mercy of the enemy.

It is an object of this invention to provide equipment which is arranged to assemble a seaplane and refueling vessel together to permit the simultaneous towing and refueling of the seaplane.

Another object of this invention is to provide towing equipment which is arranged to permit ready attachment to the seaplane while both the ship and plane are in motion.

A further object of the invention is to provide towing equipment which is arranged to float on or near the ocean surface and in position to be attached to the seaplane while both the ship and plane are in motion.

Other objects and features of the invention will become apparent from the following description of the invention taken in connection with drawings wherein:

Fig. 1 is a diagrammatic view of a vessel with both its towing and refueling equipment payed out and attached to a seaplane; and

Fig. 2 is a plan view of a portion of the towing equipment shown in Fig. 1; and

Fig. 3 is an elevational view of a portion of a seaplane showing an attachment for receiving the towing equipment of Figs. 1 and 2.

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, there is shown in Fig. 1, for example, a refueling vessel 10 having mounted thereon both towing and refueling equipment which is used for effecting the simultaneous refueling and towing of a seaplane shown at 11. The towing equipment is indicated generally at 12 and is carried by a reel 13 from which it is released and payed out over the end 14 of the vessel to be received by or attached to the seaplane 11. The towing equipment 12 is preferably wire rope, nylon, or other flexible cable and the reel 13 can be power operated if desired by

motor means which is not shown and may be located within the hull of the vessel. The towing equipment 12 is received between a pair of guide rollers 15—15 and as the vessel moves the towing equipment will trail the vessel.

The towing equipment 12 provides a main line and an attaching portion made up of a pair of branch or stabilizing lines 20—20 which are of substantially equal length and are interconnected by a cross-strand or ladder rung 21 generally intermediate their inner and outer ends.

Each branch line 20 is provided at its outer end with a buoyant otterboard 22 which functions to maintain the branch stabilizing lines 20—20 in extended condition or generally taut as the towing equipment is moved through or over the water surface and as the towing equipment becomes unreeled from reel 13. Adjacent each juncture of the ladder rung 21 with pendants or lines 20 there is provided pairs of floats 24—24 which as shown are disposed at either side of the juncture of the ladder rung 21 with the pendants or branch lines 20. The floats 24 are of suitable size to function in maintaining the ladder rung or strand 21 a suitable or selected distance below the surface of the sea or in a position to physically contact the seaplane 11 and become attached to the hook 35 shown in Fig. 3. The floats 24 may extend a substantial distance along the lines or pendants 20 to provide rigidity and coact with the buoyant otterboards 22 in maintaining the pendants or lines 20 extended or taut.

A refueling hose 30 of suitable size and length is carried by a second reel 31 and may, like the reel 13, be power operated. The hose 30 will be payed out to reach the seaplane 11 in a manner similar to the towing equipment 12 and will be manually connected to the fueling manifold of the fuel reservoir of the seaplane.

In utilizing the equipment for towing and refueling the seaplane, the pilot of the seaplane 11 will, while in the air, communicate with the commander of the vessel 10 and the towing and refueling equipment will be payed out rearwardly of the vessel 10. The towing equipment 12 and the fuel hose 30 will be carried or floated to the vicinity of the seaplane 11 which will have landed on the ocean surface and the buoyant otterboards 22 and float members 24 will maintain the towing equipment in the stabilized condition shown in Fig. 1 and in the extended condition of Fig. 2. The attaching hook 35 of the seaplane which, as shown, extends below the fueslage of the plane and below the ocean surface will attach itself to the cross-strand 21 when the seaplane proceeds toward cross-strand 21 at a slightly greater speed than that maintained by fueling vessel 10. Floats 24 will as heretofore mentioned be designed to maintain the cross-strand in a position to be received by the seaplane attaching hook 35.

The towing equipment 12 will be upwardly of 400 feet in length and the fuel hose 30 will be of equivalent length so that both may be payed out simultaneously from reels 13 and 31 and after the cross-strand or ladder rung 21 is attached to the seaplane the fuel hose 30 will be manually attached to the fueling manifold of the fuel reservoir of the seaplane.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

Apparatus for towing seaplanes along the sea surface by a towing vessel which comprises towing equipment formed of a flexible wire cable mounted on a reel carried by the towing vessel and terminating at its free end in a pair of flexible branch wire cables of substantial length, buoyant otterboard means adjacent the outer end of each of said branch cables for maintaining the branch cables in divergent relation and for maintaining the branch ca-

bles taut as the towing equipment is payed out from the reel when the vessel is in motion, a flexible wire cable cross-strand disposed between and having a connection with each of the branch cables intermediate their ends and float means secured to each of said branch cables adjacent each connection with the cross-strand for positioning the cross-strand adjacent the sea surface whereby hook means depending from a moving seaplane as it approaches the towing vessel may intercept the cross-strand and permit the seaplane to be towed by the vessel.

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