

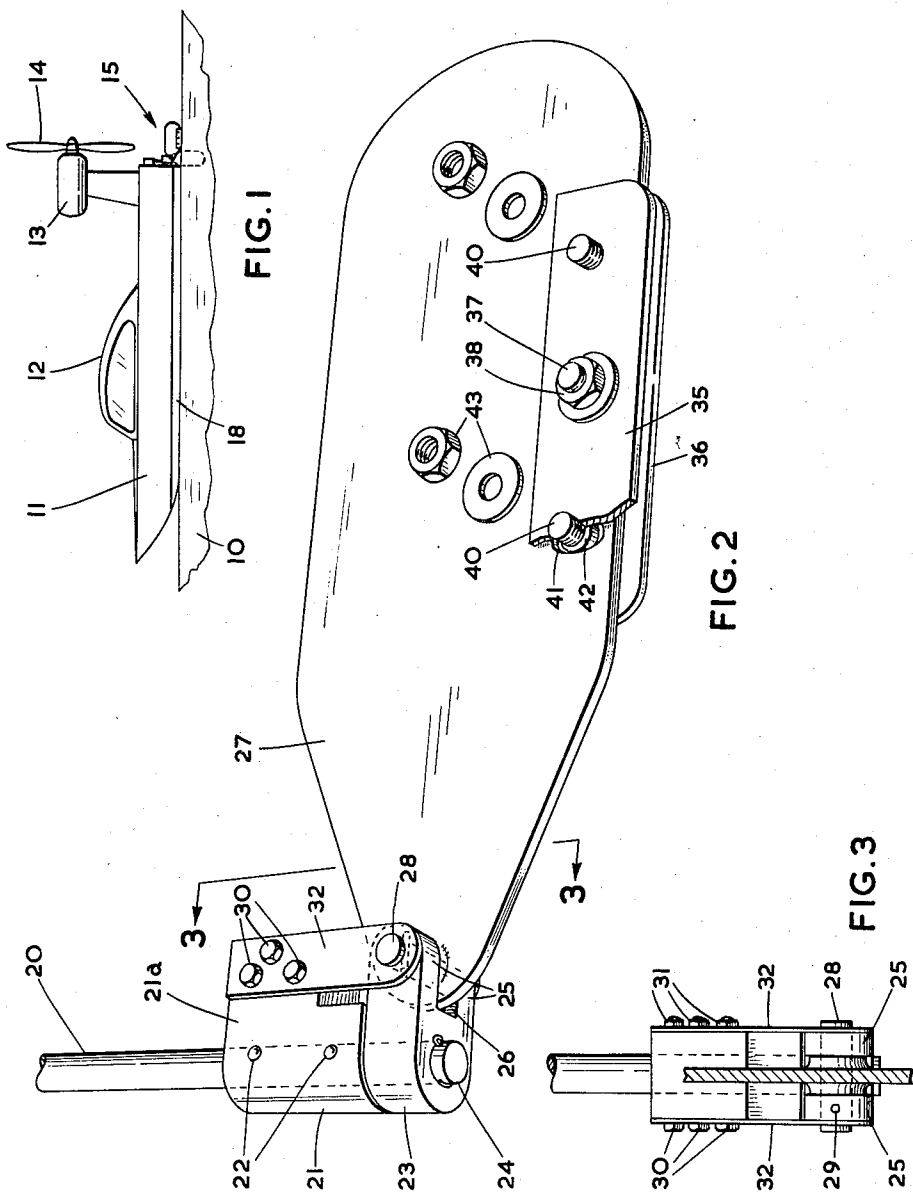
Nov. 25, 1958

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2,861,533

RUDDER

Filed May 31, 1956



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2,861,533

RUDDER

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Application May 31, 1956, Serial No. 588,453

9 Claims. (Cl. 114—162)

This invention relates to a vehicle commonly known as a "scoot," by which term is meant an amphibious, power driven vehicle which can be used as a boat, or which can alternatively be used as a sleigh for traversing over ice or snow.

As will be appreciated, it is necessary to guide or steer the scoot both when it is functioning as a boat and when it is functioning as a sleigh, the guiding or steering being effected by a rudder, and it has previously been necessary to modify the structure of the rudder when the scoot has been operating in water and is to operate on ice or snow, or vice versa. Also, great difficulty has been experienced in providing a rudder which is compatible to the alternative media upon which the rudder is to operate.

An object of the invention is to provide for a scoot a rudder which can operate in water or upon ice or snow without modification of its structure.

A further object of the invention is to provide for a scoot a rudder which can absorb forces applied laterally of the rudder by underwater obstructions or by obstructions projecting from the surface of ice or snow, and thus lessen torsional shocks applied to a shaft supporting the rudder.

A still further object of the invention is to provide for a scoot a rudder which can move out of the path of an underwater obstruction or an obstruction projecting from the surface of ice, should it encounter such an obstruction.

A still further object of the invention is to provide for a scoot a rudder which is of simple and sturdy construction, and which can operate with equal efficiency in water or upon ice or snow.

According to the invention, the rudder comprises a rudder shaft, a rudder plate, a resilient member interposed between the shaft and the plate, a rigid interconnection between the resilient member and the shaft, and a pivotal interconnection between the resilient member and the plate permitting swinging movement of the plate in a plane parallel to the longitudinal axis of the shaft, the resilient member normally restraining the plate against lateral movement relatively to the shaft but permitting such movement in the event of the plate being subjected to lateral forces.

The foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in conjunction with the accompanying drawings, in which like reference characters indicate corresponding parts throughout the several views, and in which:

Figure 1 is a diagrammatic side elevation of a scoot, the rudder being indicated in two alternative positions;

Figure 2 is a perspective view of the rudder in the position it would assume when operating on ice or snow; and

Figure 3 is a section on the line 3—3 of Figure 2.

Referring to Figure 1, 10 is the media upon which the scoot is to operate, i. e. either water, ice or snow, 11

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is the body of the scoot, 12 is a passenger compartment, 13 is a prime mover of any known kind and 14 is a propeller driven by the prime mover for moving the scoot across the water, ice or snow. The rudder is indicated generally at 15 and is shown in the position it would assume when the scoot was operating on ice or snow, the dotted lines showing the position of the rudder when the scoot was operating on water. The scoot is provided with runners 18 which act as skis when the scoot is operating on ice or snow.

Referring now to Figures 2 and 3, 20 is a rudder shaft which can be rotated by any known means to adjust the angle of the rudder relatively to the runners 18.

A block 21 is mounted on the shaft 20 and is pinned thereto by dowels 22 to prevent relative movement between the block and the shaft. Journalled on the shaft 20 below the block 21 is a collar 23, the collar being located against movement axially of the rod by a split pin 24.

The collar is integral with a lug 25 which is bifurcated to define a slot 26 in which a plate 27 forming the rudder can be positioned. The lug 25 and rudder plate 27 are provided with bores which can be axially aligned and through which a pin 28 can be passed for pivotally connecting the rudder plate to the lug of the collar, which in turn is pivotable about the axis of the shaft 20. The pin 28 is located in the lug by means of a dowel 29 which passes through the lug and through a bore in the pin 28.

Rigidly secured to a projection 21a of the block 21, by means of bolts 30 having nuts 31, are two leaf springs 32, the leaf springs extending downwardly to embrace opposite sides of the lug. The leaf springs have apertures at their lower ends through which the ends of the pin 28 extend.

The rudder plate 27 carries skate blades 35, 36 which can rock about the longitudinal axis of a bolt 37 by means of which they are secured to the plate 27. The bolt 37 is provided with a nut 38 of any known self-locking type.

The skate blades are secured together near their ends by bolts 40 which pass through the blades and through the apertures 41 in the rudder plate 27 which are arcuate about the axis of the bolt 37. The skate blades are held correctly spaced by sleeves 42 positioned over the bolts, the bolts being provided with nuts and washers 43 for clamping the blades onto the ends of the sleeves.

The operation of the rudder when the scoot is in use is as follows:

When the scoot is floating on water, the weight of the rudder plate 27 is sufficient to cause it to pivot about the pin 28 for it to depend from the shaft 20 as is indicated in dotted lines in Figure 1, the weight of the plate being sufficient to maintain it in that position when the scoot is driven across the water. Additionally, and if required, the rudder plate can be spring biased towards the position it occupies when the scoot is floating on water. When the scoot is placed on ice or snow the rudder plate 27 assumes the position shown in full lines in Figure 1 and in Figure 2 in which it is extending radially of the shaft with the skates 35 and 36 in contact with the ice or snow, the weight of the plate 27 being sufficient to ensure that the skates 35, 36 will bite into the ice or snow. When the shaft 20 is turned, the turning movement is applied to the rudder plate through the leaf springs 32 to adjust the angle of the rudder relatively to the runners 16 to steer the scoot.

Should the rudder plate meet an obstruction, for example, a submerged or protruding rock, the rudder plate will be pivoted about the axis of the pin 28 by the obstruction to raise the rudder plate out of its path. Should

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the rudder plate meet an obstruction which applies a lateral force to the plate, the rudder plate 27 and the collar 23 will pivot about the axis of the shaft 20, the leaf springs 32, which normally restrain the plate from such lateral movement, permitting such movement. If the rudder plate meets an obstruction, movement about the pin 28 and the axis of the shaft 20 may occur in combination.

The engagement of the leaf springs 32 with the pin 28 carried by the collar permits lateral movement of the lower end of the leaf springs, the collar absorbing the forces applied to the leaf springs in a direction which is radial of the shaft 20.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of the parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

What I claim as my invention is:

1. A rudder for a scoot, comprising a rudder shaft, a rudder plate, a resilient member interposed between the shaft and the plate, a rigid connection between the resilient member and the shaft, and a pivotal connection between the resilient member and the plate permitting swinging movement of the plate in a plane parallel to the longitudinal axis of the shaft, the resilient member normally restraining the plate against lateral movement relatively to the shaft but permitting such movement in the event of the plate being subjected to lateral forces, and a collar journaled on the shaft and connected to the resilient member to absorb forces applied to the resilient member by the rudder plate in a direction radial of the rudder shaft while permitting lateral movement of the resilient member relative to the shaft in response to lateral movement of the rudder plate.

2. A rudder for a scoot, comprising a rudder shaft, a rudder plate, a leaf spring interposed between the shaft and the plate, a rigid connection between one end of the leaf spring and the shaft, and a pivotal connection between an opposite end of the leaf spring and the plate permitting swinging movement of the plate in a plane parallel to the longitudinal axis of the shaft, the leaf spring normally restraining the plate from movement in a lateral direction relatively to the shaft but permitting such movement in the event of the plate being subjected to lateral forces.

3. A rudder for a scoot, comprising a rudder shaft, a rudder plate, a leaf spring interposed between the shaft and the plate, a rigid connection between one end of the leaf spring and the shaft, a pivotal connection between an opposite end of the leaf spring and the plate permitting swinging movement of the plate in a plane parallel to the longitudinal axis of the shaft, the leaf spring normally restraining the plate from lateral movement relatively to the shaft but permitting such movement in the event of the plate being subjected to lateral forces, and a collar journaled on the shaft and connected to the resilient member to absorb forces applied to the resilient member by the rudder plate in a direction radial of the shaft while permitting lateral movement of the said opposite end of the leaf spring relative to the shaft in response to lateral movement of the rudder plate.

4. A rudder for a scoot, comprising a rudder shaft, a rudder plate, two spaced leaf springs interposed between the shaft and the plate, a rigid connection between one end of the leaf springs and the shaft, and a pivotal connection between the opposite ends of the leaf springs and the plate, the plate being positioned between the said opposite ends, the pivotal connection permitting swinging movement of the plate in a plane parallel to the longitudinal axis of the shaft, the leaf springs normally restraining the plate from lateral movement relatively to the shaft but permitting such movement in the event of the plate being subjected to lateral forces.

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5. A rudder for a scoot, comprising a rudder shaft, a rudder plate, a leaf spring, a rigid connection between one end of the leaf spring and the shaft, a collar rotatably mounted on the shaft, a connection between the collar and the opposite end of the leaf spring, the leaf spring supporting the collar against axial displacement along the shaft, a pivot pin providing a pivotal connection between the said opposite end of the leaf spring and the plate permitting swinging movement of the plate in a plane parallel to the longitudinal axis of the shaft, the leaf spring normally restraining the plate from lateral movement relatively to the shaft but permitting such movement in the event of the plate being subjected to lateral forces, the collar absorbing forces applied to the leaf spring by the rudder plate in a direction radial of the rudder shaft while permitting lateral movement of the leaf spring relative to the shaft in response to lateral movement of the rudder plate.

6. A rudder for a scoot, comprising a rudder shaft, a rudder plate, two spaced leaf springs, a rigid connection between one end of the leaf springs and the shaft, a collar rotatably mounted on the shaft, a bifurcated lug on the collar, a connection between the lug and the opposite ends of the leaf springs, the leaf springs through the intermediary of the lug supporting the collar against axial displacement along the shaft, a pivot pin forming a pivotal connection between the said opposite ends of the leaf springs and the plate permitting swinging movement of the plate in a plane parallel to the longitudinal axis of the shaft, the pin passing through the lug and the plate being positioned within the bifurcation of the lug, the leaf springs normally restraining the plate from lateral movement relatively to the shaft but permitting such movement in the event of the plate being subjected to lateral forces, the collar absorbing forces applied to the leaf springs by the rudder plate in a direction radial of the rudder shaft while permitting lateral movement of the leaf springs relative to the shaft in response to lateral movement of the rudder plate.

7. A rudder for a scoot, comprising a rudder shaft, a rudder plate, a resilient member interposed between the shaft and the plate, a rigid connection between the resilient member and the shaft, a pivotal connection between the resilient member and the plate permitting swinging movement of the plate in a plane parallel to the longitudinal axis of the shaft, the resilient member normally restraining the plate from lateral movement relatively to the shaft but permitting such movement in the event of the plate being subjected to lateral forces, a skate blade, and a pivotal connection between the skate blade and the rudder plate for swinging movement of the skate blade in a plane parallel to the plate.

8. A rudder for a scoot, comprising a rudder shaft, a rudder plate, two spaced leaf springs, a rigid connection between one end of the leaf springs and the shaft, a collar rotatably mounted on a shaft, a bifurcated lug of the collar, a connection between the lug and opposite ends of the leaf springs, the leaf springs through the intermediary of the lug supporting the collar against axial displacement along the shaft, a pivot pin forming a pivotal connection between the said opposite ends of the leaf springs and the plate, the pin passing through the lug and the plate being positioned within the bifurcation of the lug, the pivotal connection permitting swinging movement of the plate parallel to the longitudinal axis of the shaft, the leaf springs normally restraining plate from lateral movement relatively to the shaft but permitting such movement in the event of the plate being subjected to lateral forces, the collar absorbing forces applied to the leaf springs by the rudder plate which are radial of the rudder shaft while permitting lateral movement of the leaf springs relative to the shaft in response to lateral movement of the rudder plate, a skate blade at each side of the rudder plate, and a pivot by which the

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blades can be mounted on the plate for swinging movement relatively to the plate and parallel thereto.

9. A rudder for a scoot, comprising a rudder shaft, a rudder plate, two spaced leaf springs, a rigid connection between one end of the leaf springs and the shaft, a collar rotatably mounted on the shaft, a bifurcated lug of the collar, a connection between the lug and the opposite ends of the leaf springs, the leaf springs through the intermediary of the lug supporting the collar against axial displacement along the shaft, a pivotal connection between the said opposite ends of the leaf springs and the plate, the pin passing through the lug and the plate being positioned within the bifurcation of the lug, the pivotal connection permitting swinging movement of the plate in a plane parallel to the longitudinal axis of the shaft, the leaf springs normally restraining the plate from lateral movement relatively to the shaft but permitting such

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movement in the event of the plate being subjected to lateral forces, the collar absorbing forces applied to the leaf springs by the rudder plate which are radial of the rudder shaft while permitting lateral movement of the leaf springs relative to the shaft in response to lateral movement of the rudder plate, a skate blade at each side of the plate, a pivot by which the blades can be mounted for swinging movement parallel to the plate, and at least one post interconnecting the blades and passing through an aperture in the plate.

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