Dec. 21, 1926. 1,611,613

G. STEVENSON

TOY OR MODEL BOAT

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Fig. 1.

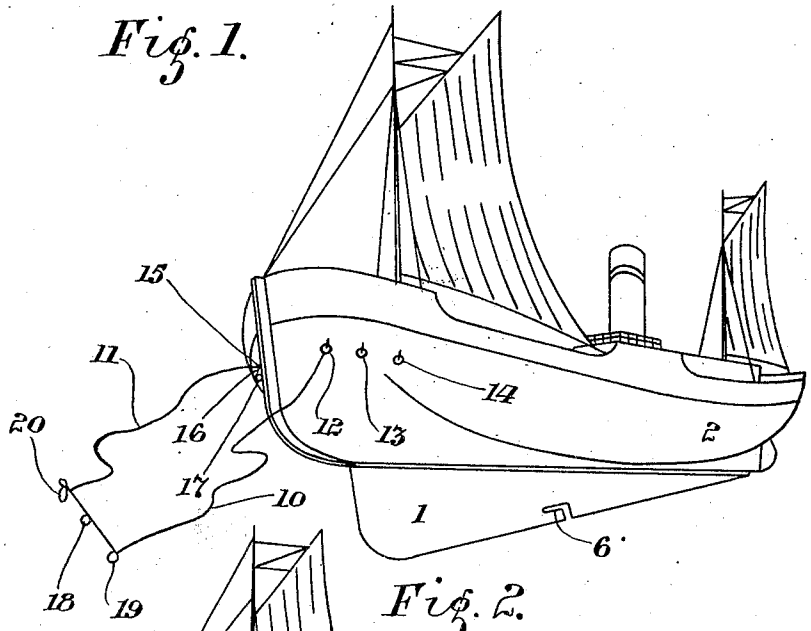


Fig. 2.

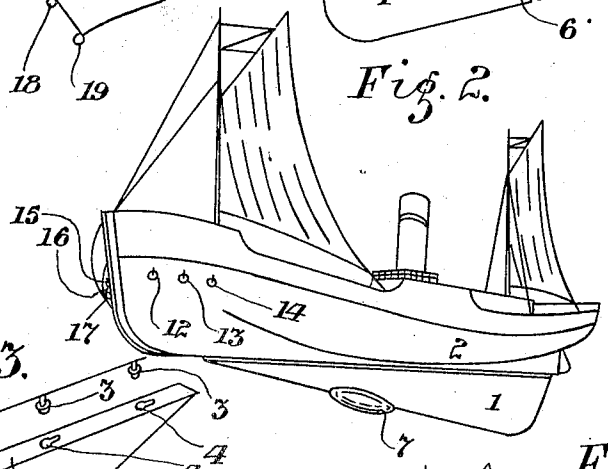


Fig. 3.

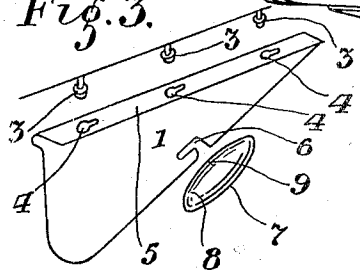
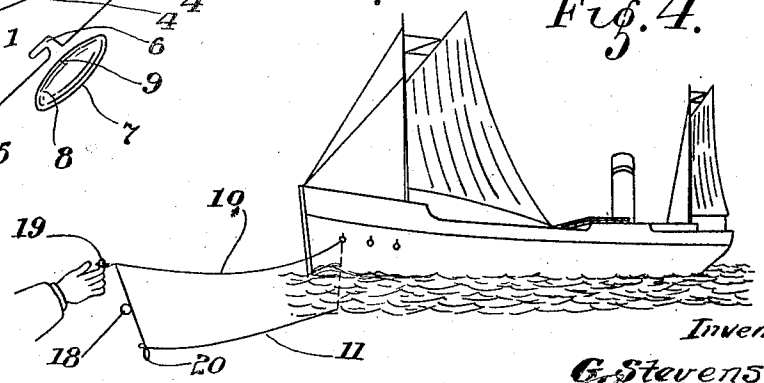


Fig. 4.



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Fig. 5.

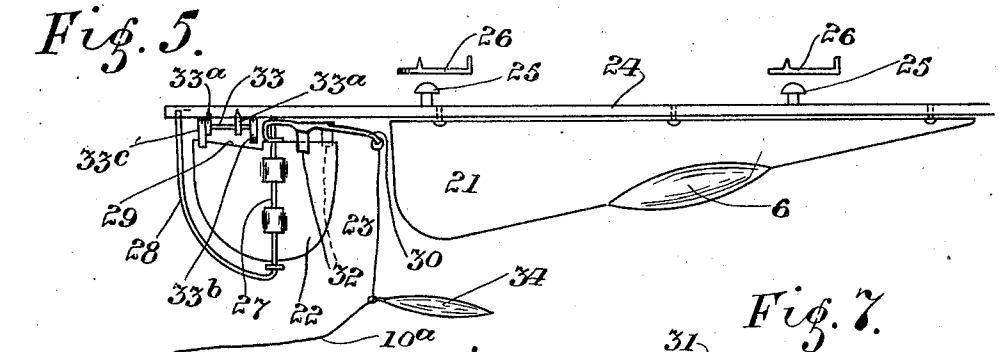


Fig. 6.

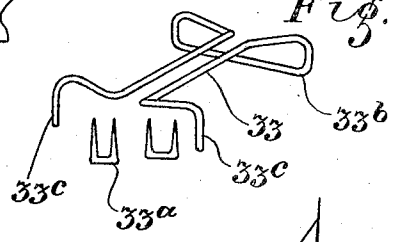


Fig. 7.

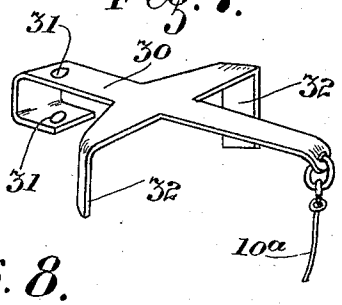


Fig. 8.

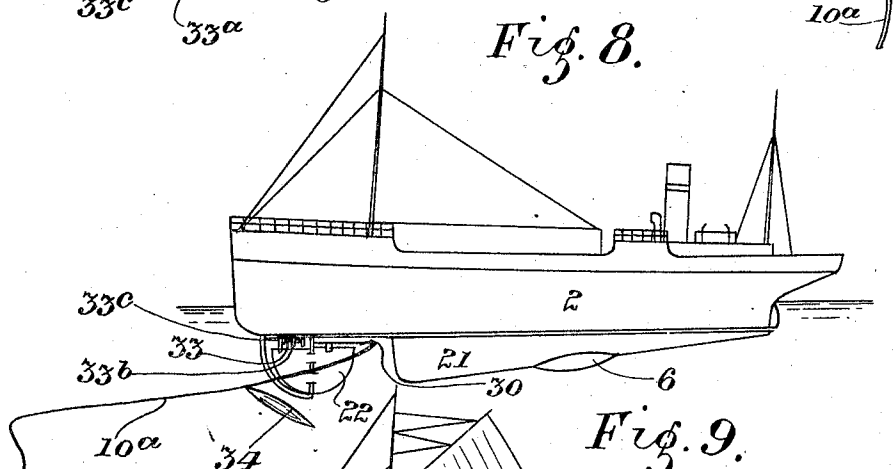
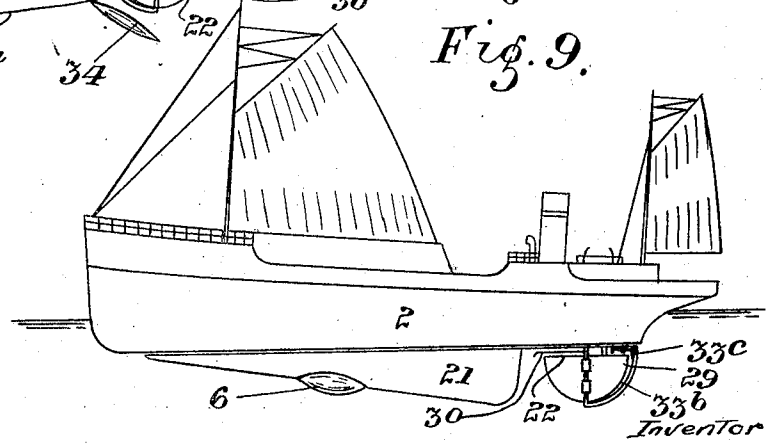


Fig. 9.



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Patented Dec. 21, 1926. 1,611,613

UNITED STATES PATENT OFFICE.

GEORGE STEVENSON, OF RUTHERGLEN, SCOTLAND.

TOY OR MODEL BOAT.

Application filed May 18, 1925, Serial No. 31,222, and in Great Britain May 22, 1924.

This invention relates to toy or model vessels of all kinds.

According to the invention a toy or model vessel has means combined therewith whereby it may be towed by a person on the shore or bank and at the same time caused to perform certain manœuvres, such as proceeding outwards from the shore, moving parallel to the shore, turning and proceeding towards the shore, or turning away from the shore and tracing a course parallel thereto, or following a course in the form of a figure 8 or a combination of these manœuvres, at the will of the operator.

The toy or model vessel has in combination therewith a manœuvring line, a keel, centreboard, dagger, or the like; and means for attaching the line to the vessel, the line being so attached to the vessel, and the keel or equivalent being so shaped and so disposed, that, in virtue of the co-operation of the line with the keel or equivalent, the vessel may be manœuvred from the bank or shore.

Notwithstanding the provision of these manœuvring arrangements, the sailing, steering and stability qualities of the vessel are maintained and even improved.

Convenient embodiments of the invention will now be described by way of example and with reference to the accompanying drawings whereon:—

Fig. 1 is a general view of a vessel having a keel and towing line according to the invention;

Fig. 2 shows a vessel with the keel reversed;

Fig. 3 shows a detachable keel therefor;

Fig. 4 shows the method of manœuvring a vessel so fitted.

Fig. 5 shows a detachable keel and steering gear according to a modification of the invention;

Figs. 6 and 7 show details of the steering gear;

Fig. 8 shows the method of manœuvring a vessel fitted with the modified keel and steering gear.

Fig. 9 shows a vessel with the keel reversed and under sail.

Referring to Fig. 1, the numeral 1 denotes a fin keel secured to the hull 2 of a vessel which it is desired to manœuvre. It is essential that the centre of lateral resistance of the vessel (i. e. the point at which the resultant force of the water resisting lateral movement of the vessel may be considered as acting) should be well forward, and it will be apparent that, to effect this with various ship forms, various shapes and sizes of keels corresponding thereto will have to be used. With many types of vessel the triangular shape shown, with the greater part of its area forward has been found suitable. This location of the centre of lateral resistance causes a tendency for the stern to swing round out of the line of motion.

Fig. 3 shows convenient means of attaching the keel to the hull by means of studs 3 on the hull adapted to engage slots 4 cut on a flange 5 on the top edge of the keel 1. Such an arrangement allows of the keel being readily detached from the hull or being reversed as shown in Fig. 2 for a purpose which will hereafter appear.

To provide the necessary stability for the vessel it may be necessary to load the keel. To this end a slot 6 is cut in the keel as shown in Figs. 1 and 3, with which a streamlined weight 7 having a groove 8 and catch 9 is adapted to engage. Preferably the centre of gravity of the keel occupies the same fore-and-aft position whether the keel is in its normal or in its reversed position. Furthermore, the keel or equivalent may be folding, hinged, pivoted or otherwise movably arranged.

In conjunction with the keel as above described, a manœuvring or towing line 10, 11 is used, each end of the line being attached to the hull by means of any one of a series of rings 12, 13, 14 or 15, 16, 17 on each of the ship's bows, to which they may be secured by spring clips, sister hooks or spiral hooks or otherwise.

The two parts 10 and 11 are preferably in one length or are joined together at their landward ends to make a single length.

At the middle of the length of the line a handle, ring or the like 18 is secured and, on each side of the handle 18 and equidistant therefrom, a side handle is fixed, these being denoted by the numerals 19 and 20. To render these side handles 19 and 20 more readily distinguishable the one from the other, they are preferably of different shapes and (or) differently coloured.

The following is the operation of the arrangement.

If, as shown in Fig. 4, the part 10 of the line is grasped by the handle 19, its other end being attached to one of the rings 12, 13 or

14 and the direction and point of application of the pull are such that the line of the pull passes through the centre of lateral resistance located on the centre line, the pull may be resolved into two rectangular components acting through the centre of lateral resistance, the one transversely of the vessel and the other along its centre line in an ahead direction. If, then, the area of the keel be great enough, this transverse component will be balanced by the lateral resistance offered by the water and the resultant force will be ahead. Hence the vessel will move parallel to the bank or shore.

If, however, the position of attachment of the cord and the direction of the pull are such that the line of the pull intersects the centre line of the vessel ahead of, or abaft, the centre of lateral resistance, there will be, in addition to the ahead component, an inwardly or outwardly turning moment and the vessel will approach or leave the bank.

In the meantime the part 11 of the line will be slack, passing under the hull to one of the rings 15, 16 or 17 and will have little or no effect on the vessel's progress.

Hence, if the vessel is at the bank or shore and it is desired that it should proceed outwards, the part 10 (or 11 as the case may be) is affixed to the hull in a position to give the desired result as above. It is to be noticed, however, that to give outward motion, the point of attachment of the line need not be abaft the centre of lateral resistance, but only the point of intersection of the line of the pull and the centre line need be so situated. In the majority of cases the point of attachment of the line will be before the centre of lateral resistance. By pulling with the handle 20 the outward motion may be checked or the vessel turned shorewards.

When the vessel is to be towed directly behind the operator the handle 18 is grasped, equal towing forces being then applied to both sides of the vessel.

It will be apparent that the further the point of intersection of the line of the pull and the centre line is from the centre of lateral resistance, the more sharply will the vessel turn. Hence, for working in confined water, the point of attachment of the line should be more nearly abeam of, or even abaft, the centre of lateral resistance, than when working in open water.

If it is desired to tow the vessel in one direction alongshore or behind a boat without manœuvring, and to increase the radius of action, one end of the towing line may be detached from the hull and held in the hand, the portions 10 and 11 then forming a single length.

Referring now to the modified construction shown in Figs. 5 to 9, the keel is in two parts 21 and 22 with a space 23 left between the parts. For convenience, both parts 21 and 22 of the keel are mounted on a base 24 which can be readily attached to the hull by means of studs 25, 25, engaging members 26, 26 on the hull having slots in them similar to the slots 4 shown in Fig. 3.

The forward part 22 of the keel is pivoted to the base 24 by a vertical rod or pin 27 which may be supported at its lower end by a curved bracket 28. The upper edge of the part 22, which may be termed a rudder, has a sloping recess 29 formed in it on one side of the pivot pin 27.

Also pivotally mounted on the pin 27 is a lever, radius rod or tiller 30, shown in detail in Fig. 7. The pin 27 passes through holes 31, 31 and to the other end a single manœuvring cord 10^a is attached. The tiller 30 has two lateral extensions 32, 32 adapted to engage and actuate the rudder 22, when turned.

A spring member 33, as shown on an enlarged scale in Fig. 6, is slidably secured to the base 24 by means of staples or the like 33^a above the recess 29 in the rudder 22. The spring member 33 has a transverse part or loop 33^b at one end, and two prongs 33^c at its other, and can slide in the staples 33^a in contact with the under side of the base 24, the two prongs 33^c depending on either side of the rudder and limiting its motion.

To ensure the manœuvring line 10^a passing, without fouling between the rudder 22 and the keel 21 a weight 34 is attached to it. For the same purpose, the lower fore corner of the keel 21 is rounded.

The working of this arrangement is as follows.

The vessel, starting from the shore or bank, receives a pull through the line 10^a which causes the tiller 30 to swing over and turn the rudder 22 till arrested by one of the prongs 33^c. The towing force is now in effect applied to one bow or shoulder of the vessel and if matters are arranged as before explained, the vessel will proceed outwards from the shore, this movement being aided by the skew position of the rudder 22. This it will continue to do for a certain distance depending on the shape and size of the keel, the length of the tiller and the form of the vessel, after which it will follow a course parallel to the shore, owing to the line of the applied pull altering.

If, now, when the vessel has some way on, the towing force be suddenly relaxed, the vessel will, on account of the skew position of the rudder, turn outwards sharply, and if the operator, while the vessel is turning, retraces his steps along the shore, and shortly afterwards re-applies the towing force, the tiller 30 will swing over to the other side carrying with it the rudder 22. the line 20^a passing through the space 23 and the vessel will again recede from the shore in the other direction when the ma-

nœuvre may be repeated, the course being zig-zag.

If, again, the operator pulls in the line steadily, the vessel will describe a substantially circular course shorewards and if desired, may be caused to turn round and pursue a course parallel to the shore in the opposite direction.

In this way the vessel may be caused to perform practically any manœuvre.

If it is desired to propel the vessel by sails without the towing line, the spring member 33 is moved forward so that the loop 33^b jams against the inclined edge of the recess 29 as shown in Fig. 9, allowing the rudder to be fixed in any desired position. In both the embodiments as shown with reference to Figs. 1 to 4 or Figs. 5 to 9 the sailing qualities of the vessel are enhanced by detaching the keel and attaching it in the reverse position, with the greater part of its area aft.

In the modification shown in Figs. 5 to 9 the forward part 22 of the keel may be rigid with the base or hull, the spring member 33 being dispensed with and the extensions 32 of the tiller 30 merely acting as stops for the tiller.

The action is precisely the same, the vessel turning outwards when released suddenly. The reason for this is that, when moving parallel to the shore, the vessel's motion is not exactly along or parallel to its centre line but its bow is turned slightly outwards. Hence there is a tendency for the vessel to turn outwards on account of the comparatively large underwater area forward, which tendency is resisted by the towing cord. When, however, this is released the vessel swings outwards as before described.

The invention may obviously be applied to mechanically propelled vessels, for manœuvring purposes only.

Having now fully described my invention what I claim and desire to secure by Letters Patent is:—

1. A model vessel designed so that its centre of lateral resistance is located forward of amidships thereby causing a tendency for the stern to swing round to one side or the other, and, in conjunction therewith, a manœuvring line and means for attaching said line to the vessel, so that forces variable in direction may be applied by an operator to the vessel through said line, which forces in coaction with the force of lateral resistance cause the vessel to follow a course depending on the line of action of the said applied forces.

2. The combination with a model of a keel of triangular shape adapted to be attached to the vessel with the major part of its area forward so as to bring the centre of lateral resistance forward of amidships and thereby to cause a tendency for the stern to swing round to one side or the other, a manœuvring line and means for attaching said line to the vessel, so that forces variable in direction may be applied by an operator to the vessel through said line, which forces in coaction with the force of lateral resistance cause the vessel to follow a course depending on the line of action of the said applied forces.

3. The combination with a model vessel of a manœuvring line adapted to be manipulated by an operator on the shore, a rudder adapted to be actuated by said line, means co-operating with said line and said rudder to produce turning forces tending to turn the vessel in a direction different from that of forces applied through said line to the vessel, said means comprising a keel having a maximum area portion located forward of the midships.

4. The combination with a model vessel of a manœuvring line adapted to be manipulated by an operator on the shore, a rudder, a tiller loosely pivoted on the rudder pivot and having two laterally and downwardly extending projections one on either side of the rudder to engage said rudder, the manœuvring line being attached to said tiller to actuate the rudder, a slidable spring member having means co-acting with said rudder to prevent, and depending prongs to limit, the rotation of the rudder, and means co-operating with said line and said rudder to produce turning forces tending to turn the vessel in a direction different from that of forces applied to the vessel through said line, said means comprising a keel whose shape is such, and whose area is so disposed as to cause the centre of lateral resistance of the vessel to be located forward of amidships.

In testimony whereof I affix my signature.

GEORGE STEVENSON.