April 15, 1941. W. G. FLETCHER 2,238,464

CONVERTIBLE SAILING VESSEL

Filed Jan. 23, 1939 3 Sheets-Sheet 1

FIG. 1

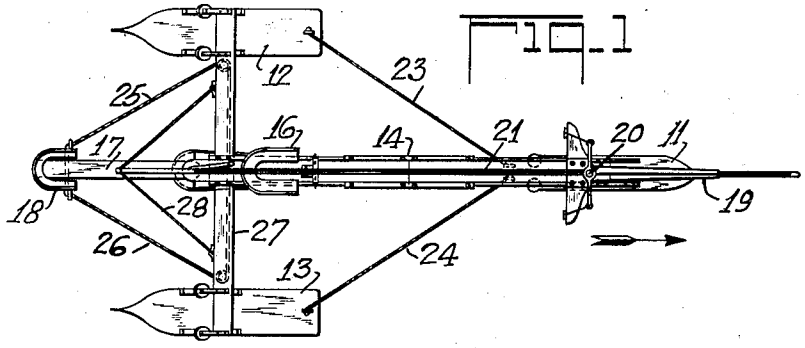


FIG. 2

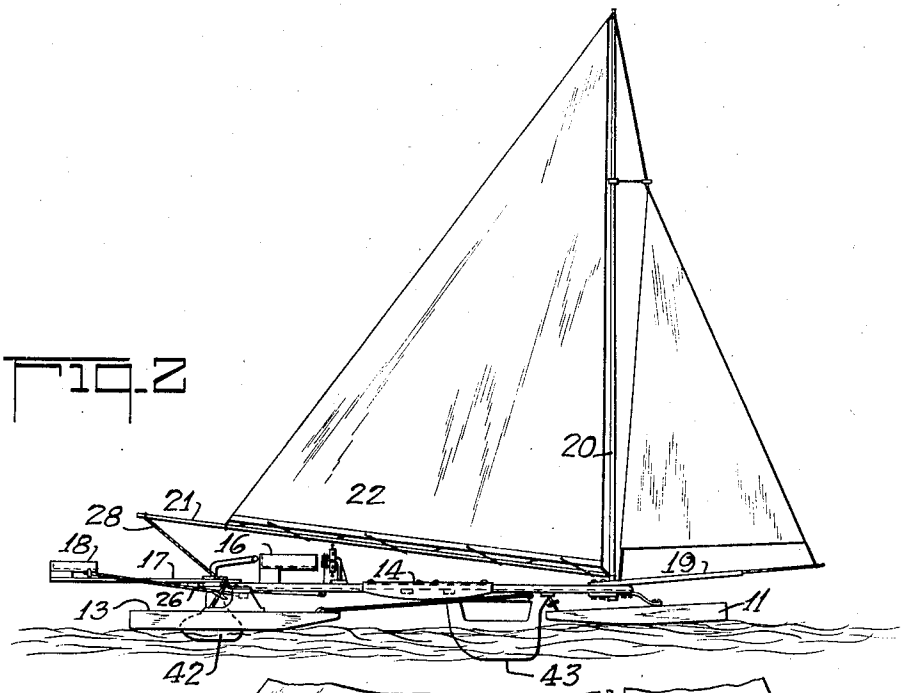


FIG. 13

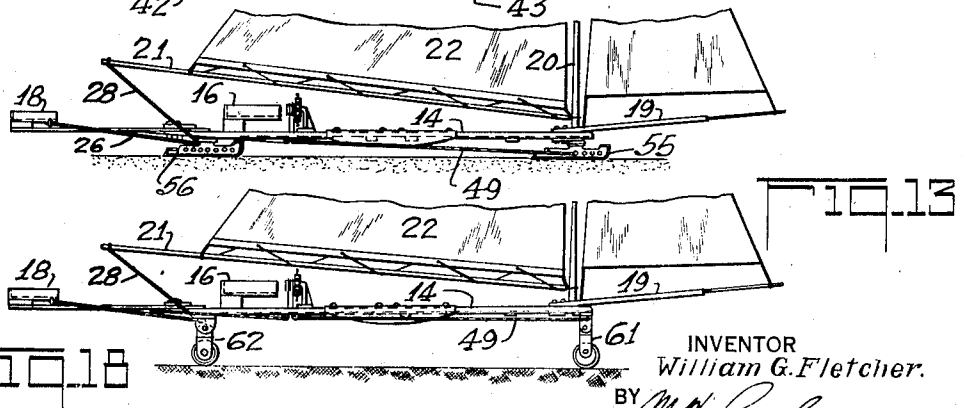


FIG. 18

INVENTOR
William G. Fletcher.
BY M. K. Laughridge
ATTORNEY

April 15, 1941. W. G. FLETCHER 2,238,464

CONVERTIBLE SAILING VESSEL

Filed Jan. 23, 1939 3 Sheets-Sheet 2

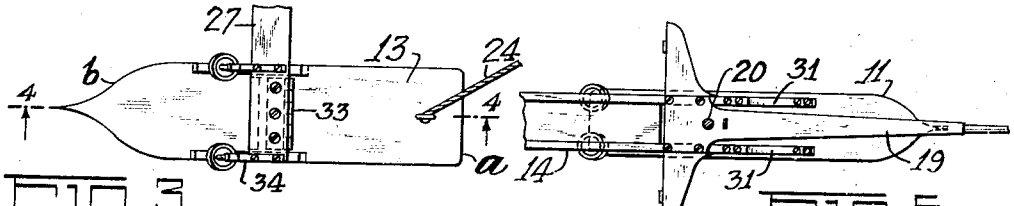


FIG. 3

FIG. 5

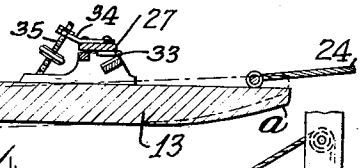


FIG. 4

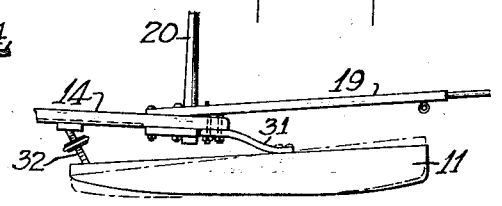


FIG. 6

FIG. 9

FIG. 7

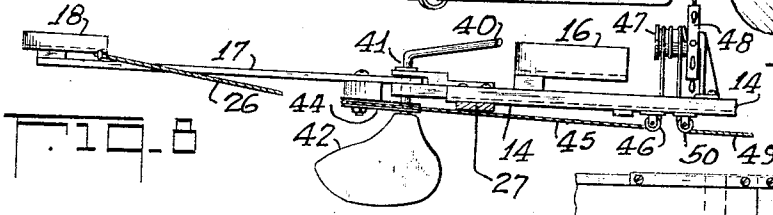
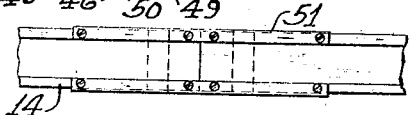


FIG. 10

FIG. 8



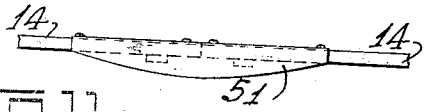


FIG. 12

FIG. 11

INVENTOR
William G. Fletcher.
BY
M. V. Laughridge
ATTORNEY

April 15, 1941. W. G. FLETCHER 2,238,464

CONVERTIBLE SAILING VESSEL

Filed Jan. 23, 1939 3 Sheets-Sheet 3

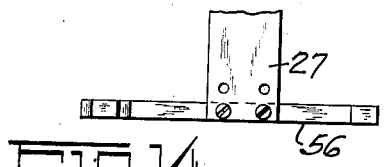


FIG. 14

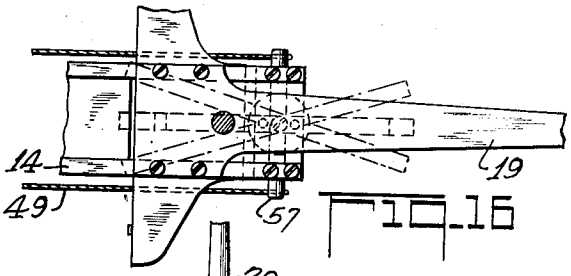


FIG. 16

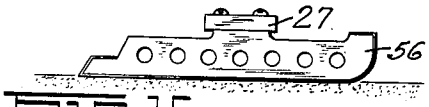


FIG. 15

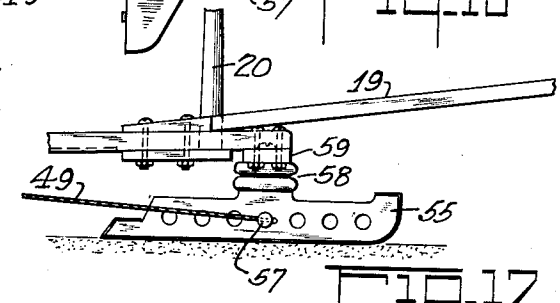


FIG. 17

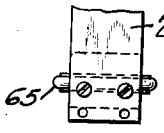


FIG. 19

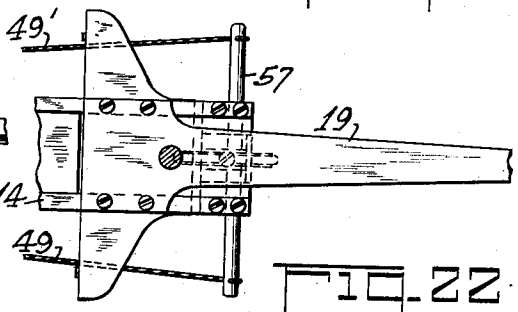


FIG. 22

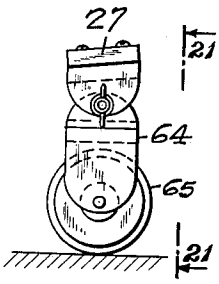


FIG. 20

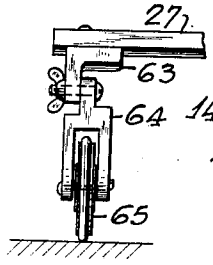


FIG. 21

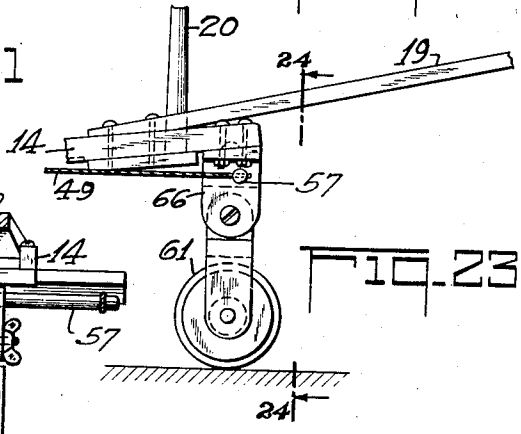


FIG. 23

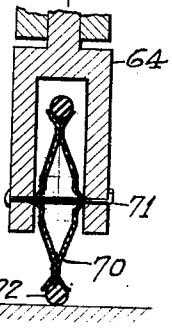


FIG. 25

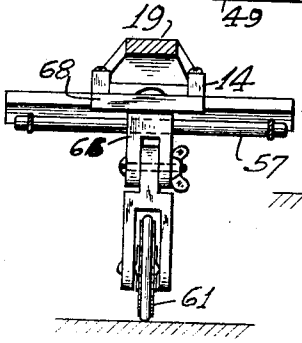


FIG. 24

INVENTOR
William G. Fletcher.
BY
W. N. Laughridge
ATTORNEY

Patented Apr. 15, 1941

2,238,464

UNITED STATES PATENT OFFICE

2,238,464

CONVERTIBLE SAILING VESSEL

William G. Fletcher, Bogota, N. J.

Application January 23, 1939, Serial No. 252,369

5 Claims. (Cl. 114—39)

This invention relates to sailing vessels that are propelled by a sail mounted on a common type of rigging and is light in weight, of shallow draft and is capable of developing high speeds. The invention may be applied to a toy from which the art of sailing can be simulated, or it may be applied to a full sized sailing vessel manned by a crew. An object of the invention is to provide a vessel having a frame on its center line supporting the mast and supporting a front pontoon and a cross frame supporting a pontoon at each end spaced from the center frame; another object of the invention is to provide a sailing vessel supported by three pontoons in triangular formation with the front end of the rear pontoons formed in a water plane; another object of the invention is to provide an adjustable weight for changing the center of gravity of the body of the vessel; another object of the invention is to provide an adjustable weight for the rear of the vessel, operating in cooperation with the steering mechanism; another object of the invention is to provide a spring support between the pontoons and the body of the vessel and another object of the invention is to adjust the vertical angle of the pontoons relative to the body of the vessel.

A further object of the invention is to provide a convertible sailing vessel which may be adapted for sailing on water, for sailing on ice or for sailing on land and another object of the invention is to provide a sailing vessel having three mobile points of support comprising a body which is collapsible and foldable into relatively small space.

These and other objects of the invention will be understood from the following specification and the accompanying drawings, in which

Fig. 1 is a top plan view of the sailing vessel with the triangularly arranged pontoons;

Fig. 2 is a side elevation corresponding to Fig. 1;

Fig. 3 is a plan view of one of the rear pontoons with part of the supporting frame;

Fig. 4 is a sectional elevation of the pontoon shown in Fig. 3; taken on line 4—4;

Fig. 5 is a top plan view of the front pontoon and part of the frame or body of the vessel, and

Fig. 6 is a side elevation corresponding to Fig. 5;

Fig. 7 is a plan view of the rear of the vessel showing the frame and the adjustable swinging weight;

Fig. 8 is a side elevation on line 8—8 of Fig. 7;

Fig. 9 is an elevation of the steering mechanism taken on line 9—9 of Fig. 7;

Fig. 10 is an enlarged, fragmentary view, partially sectioned, of means for adjusting the angle of the pontoons relative to the frame;

Fig. 11 is a side view and Fig. 12 is a plan view of part of the frame showing how it may be taken apart and packed into smaller space;

Fig. 13 is an elevation of a vessel corresponding to Fig. 1 but fitted with runners for sailing on ice;

Fig. 14 is a plan view of the attachment of one of the ice runners to the cross frame;

Fig. 15 is an elevation corresponding to Fig. 14;

Fig. 16 is a plan view of the front of the frame with an ice runner applied thereto, and

Fig. 17 is a side elevation of the front runner corresponding to Fig. 16;

Fig. 18 is an elevation of a sailing vessel corresponding to Fig. 1 but fitted with wheels or rollers for sailing on land;

Fig. 19 is a top plan view of the rear frame with a wheel attached thereto;

Fig. 20 is a side view of one end of the cross frame with the wheel attached thereto;

Fig. 21 is an elevation taken on line 21—21 of Fig. 20;

Fig. 22 is a plan view of a portion of the front frame with a wheel and steering mechanism attached thereto;

Fig. 23 is a side elevation corresponding to Fig. 22;

Fig. 24 is a front elevation taken on line 24—24 of Fig. 24, and

Fig. 25 is a vertical section through one of the wheels and its support.

In the present invention a frame or body is provided with three mobile points of support and with a mast and sail so that it may be driven by the wind. The body or frame of the vessel is T-shaped, having a main frame on the longitudinal center of the vessel and a transverse frame at the rear. The front point of support is secured to the front end of the main frame and the rear supports are secured one at each end of the transverse frame. A mast is provided near the front end of the frame with a boom to which a sail is secured in the usual manner. A swinging arm is provided at the rear end of the main frame and is weighted at its outer end. This arm can be swung in either direction to align with the cross frame and to bring the weight into close proximity to the outer supports. The spread of the rear support on the cross frame corresponds to the beam of the vessel and the stability is increased in proportion to the spread of these supports. In addition to this the stability of the

vessel is regulated by moving the weighted arm so that in rounding a curve or in opposing the wind in tacking this weight increases the stability of the vessel and opposes the overturning effect from the sail.

This construction enables a vessel of shallow draft to carry a fairly large sail and to develop high speed and in order to increase the speed characteristics of the vessel the frame and the supporting members are made as light as possible and when sailing on the water the pontoons are shaped like a water plane so that when running at speed they skim over the surface. Under certain conditions when tacking or when the water surface is rough, it may be desirable to adjust the angle of the pontoons relative to the frame, a screw adjustment is provided for this purpose and on large outfits this adjustment may be made by the crew while sailing.

The riding qualities of the vessel is materially improved especially on rough water when the front pontoon is secured to the frame by a spring mounting which acts in the capacity of a shock absorber. In the larger models the frame is constructed in sections so that it can readily be taken apart, the pontoons can be removed and the mast can be reduced to sections so that the outfit may be brought within a clearance of eight or ten feet for transportation.

In the drawings, **11** is the front pontoon and **12** and **13** are the rear pontoons, **14** is the main frame which is supported at the front end by the pontoon **11** and is supported at the rear end by the transverse frame **27**, one end of which is supported by the pontoon **12** and the opposite end is supported by the pontoon **13**. These pontoons may be braced to the main frame **14** as indicated by the cables **23** and **24**. The operator may occupy the seat **16** at the rear where he can manipulate the rudder lever **40** and the capstan **48**. A swinging arm **17** is pivotally secured to the rear of the main frame **14** and is provided with a weight **18**, which weight may take the form of a member of the crew occupying the seat **18**. The arm **17** is connected by the cables **25** and **26** with the cross frame **27** so that its position can be adjusted from the frame **27**.

A bowsprit **19** is secured to the front of frame **14** and the mast **20** is raised from this end of the frame and in rear of the front pontoon **11**. A boom **21** is secured to the mast **20** and is laced by the cable **28** to the frame **27** so that it may be braced in any position desired. The sail **22** is a typical form of a variety of sails that may be applied to this construction. The shallow keel is provided at **43** and the rudder **42**, through the rudder post **41**, connects with **40**.

The construction in Figs. 3 and 4 shows the rear pontoon **13** secured by the hinge **33** to the cross frame **27** and adjusted by the screw adjustment **35**, Fig. 10, which connects to the supporting member **38** of the pontoon through a ball and socket connection at **37** and connects by the pivotal screw socket **36** to the member **34**, secured to frame **27**. This screw adjustment enables the angle of the pontoon to be varied as indicated by the dotted lines in Fig. 4. The rear pontoons are streamlined at *b* as indicated in Fig. 3 and the tapering end of the pontoon points away from the direction of sailing. The front end of each rear pontoon is broad, being substantially the width of the pontoon and tapers on an incline plane as indicated at *a* so that it tends to "plane" on the surface of the water. If the pontoons tend to submerge instead of planing on the surface the vertical angle of the pontoon relative to the frame is adjusted by the screw **35**. The pontoons are applied to form a water plane in the direction of sailing.

The front pontoon **11**, Figs. 5 and 6, is secured to the frame **14** by a pair of springs **31** which have sufficient resiliency to absorb shocks incidental to an irregular sailing surface. The front pontoon is pointed at the front and is wide at the rear end and the vertical angle is adjusted by the screw **32** as indicated by the dotted outline in Fig. 6, corresponding with the adjustment of the rear pontoons.

The weighted arm **17** may be rigidly mounted on the steering post **41** so that as the steering lever **40** is operated the weighted arm is swung therewith. This arm may also be operated by the quadrant **44**, secured thereto, and having the cable **45** extending therefrom over the pulley **46** and the drum **47** operated by the capstan wheel **48**. This enables the arm **17** to be swung in either direction.

The main frame **14** comprises a pair of spaced members which may be connected by sheet material or by lattice construction. A splice is shown at **51**, Figs. 11 and 12, for this frame in which an angular plate, having a projecting rib is bolted to the abutting ends of the frame to hold these ends in alignment and to give rigidity to the structure. A splice of this type may be used on the middle of the main frame as shown in Fig. 2 and it may be used on the middle of the cross frame. When these parts are disassembled they correspond somewhat is length with the pontoons and with the bowsprit, thus facilitating the shipment of the structure.

The vessel is converted from the water type to sail on ice by substituting ice runners for the pontoons, the attachment of the runners to the frame corresponding with the attachment of the pontoons to the frame. The runners are shown at **55** and **56** in Fig. 13 and the atachment to the cross frame of the rear runners is shown in Figs. 14 and 15. Instead of steering by a rudder, the steering in this case is obtained by directing the front runner **55**, which is pivotally mounted at **58** on the cross bar **59**, secured to the frame **14**, Fig. 17. A horizontal steering bar **57** is provided in the runner **55** and is connected by the cables **49**, **49'** which pass over a pulley **50** and engages the drum **47** operated by the capstan **48**.

When the vessel is to operate on land, wheels are substituted for the pontoons, as indicated at **61** and **62** in Fig. 18. The wheel **65** is mounted in the jaw **64**, adjustably clamped to bracket **63**, secured to the cross frame **27**. The adjustment of bracket **64** at each end of frame **27** enables this cross frame to be inclined as desired.

The steering arrangement is obtained by deflecting the front wheel through the mechanism shown in Figs. 22, 23 and 24. The wheel **61** is supported by the crown **66** which is pivotally mounted on the bridge piece **68**, connected to the frame members **14**. The horizontal steering rod **57** turns the crown member **66** in response to the cables **49**, **49'**, to direct the course of the vessel as desired.

The wheels are preferably constructed as shown in section in Fig. 25 from a pair of plates of sheet metal **70** which are formed with a groove to receive the rubber tire **72** and are spread at the center to receive the bearing pin **71** which

pivotally secures the wheel in the jaw **64**.

When the device is operated as a toy the weighted arm **17** and the steering mechanism has to be adjusted at starting and when conditions require, weights may be applied to either of the rear pontoons by loading them with washers or other objects contributing to the weight. The invention may be applied with the movement of the boom **21** coupled with the arm **17** so that this arm will be swung to oppose the overturning effect of the sail as the boom swings into its extreme position. If the vessel is intended to operate under some unbalanced conditions then the frame **14** may be moved away from the center of frame **27** to an extent that will compensate for the unbalanced condition.

The details of the invention may be applied in a variety of forms other than those illustrated to meet the conditions at hand.

Having thus described my invention, I claim:

1. A sailing vessel having a frame with a mast and a sail thereon, a streamlined pontoon mounted at the front in the centre of said frame and a pair of rear pontoons mounted on said frame and spaced from the centre of said frame, said rear pontoons being streamlined having a pointed end at the rear and being substantially wider than they are deep and having a wide, horizontal end towards the direction of movement, said wide end being inclined upwardly to form a water plane.

2. A sailing vessel having a frame with a mast and a sail thereon, said frame having a mobile point of support at the front end and having a pair of mobile supports spaced from the centre of the frame at the rear, an adjustable weight mounted on said frame, and means for steering said vessel and means coupled with said steering means for adjusting said weight to resist the overturning effect from the sail.

3. A sailing vessel having a frame with a mast and a sail thereon, said frame having a mobile point of support at the front end and having a pair of mobile supports spaced from the centre of the frame at the rear, a rudder, a steering mechanism for said rudder, a weighted arm pivoted to the centre of said frame at the rear and means interconnecting the steering mechanism and the arm for shifting said arm to change the centre of gravity of said vessel by said steering mechanism.

4. A sailing vessel having a frame with a mast and sail thereon, said frame having a mobile point of support at the front end and having a pair of mobile supports spaced from the centre of said frame at the rear, a weighted arm pivoted to said frame at the rear and projecting from the frame, a rudder including a tiller, a steering mechanism operated by said tiller and means connected with said steering mechanism for cooperatively operating said weighted arm with said rudder.

5. A sailing vessel having a frame with a mast and a sail thereon, a streamlined pontoon mounted at the front in the centre of said frame and a pair of rear pontoons mounted on said frame and spaced from the centre of said frame, said rear pontoons being streamlined having a pointed end at the rear and having a wide end towards the direction of movement, said wide end being inclined upwardly to form a water plane, and means for adjusting the vertical angle of said rear pontoons.

WILLIAM G. FLETCHER.