(No Model.) 2 Sheets—Sheet 1.

J. H. HUNT.

STEERING CENTER BOARD.

No. 404,626. Patented June 4, 1889.

Fig. 1.

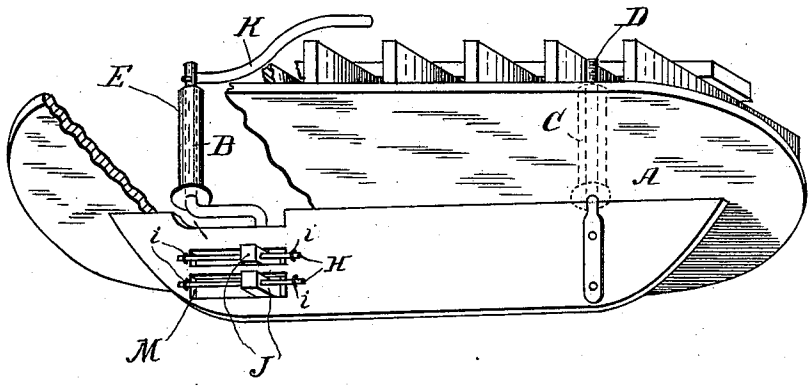
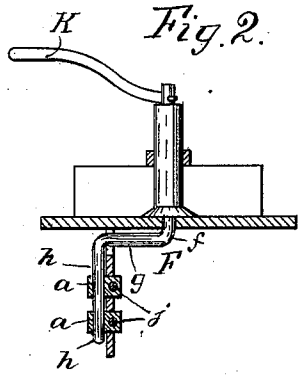


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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STEERING CENTER BOARD.

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Fig. 3.

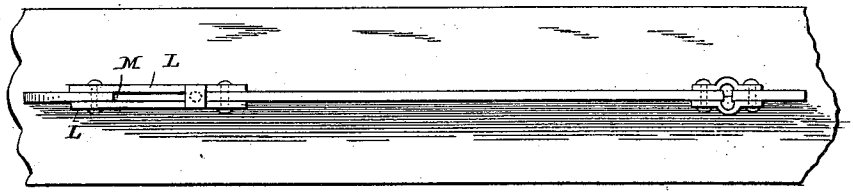


Fig. 4.

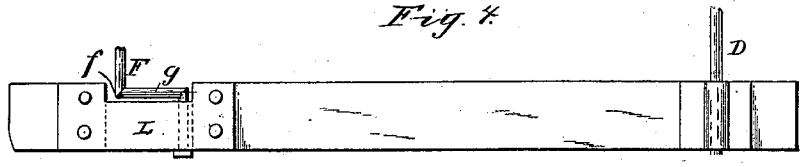
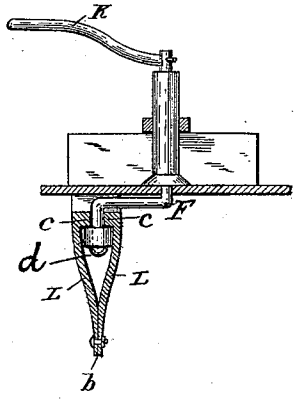


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH H. HUNT, OF WEST TROY, NEW YORK.

STEERING CENTER-BOARD.

SPECIFICATION forming part of Letters Patent No. 404,626, dated June 4, 1889.

Application filed January 30, 1889. Serial No. 298,130. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. HUNT, a citizen of the United States, residing at West Troy, in the county of Albany, State of New York, have invented certain new and useful Improvements in Steering Center-Boards, of which the following is so full, clear, and exact a description as will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the bottom of a boat, partly in section, provided with my improved center-board extending at an angle to the line of the center of the boat. Fig. 2 is a vertical section of a part of Fig. 1, showing the shifting mechanism in section. Fig. 3 is a bottom plan view of part of the bottom of a boat and center-board, showing the center-board provided with two oppositely-disposed plates, between which the shifting-lever works as the center-board is operated. Fig. 4 is a side elevation of the center-board constructed as shown in Fig. 3. Fig. 5 is a transverse vertical section of the center-board and shifting mechanism, showing projections or shoulders on the inner upper surfaces of the plates.

My invention relates to that class of center-boards which are movable in the horizontal plane of the bottom of the boat.

This invention relates particularly to that class of center-boards which are pivotally secured to the bottoms of the boats, and it is designed more especially for use with flat-bottom boats—such as canal-boats, canoes, &c. It is evident, however, that the center-board might be used to advantage with some crafts the bottoms of which are slightly convex.

In the provision of a center-board of the kind which I will now proceed to describe in connection with the accompanying drawings I had in mind for solution the following problem, to wit: how to construct and equip a pivotal center-board for flat or approximately flat bottomed boats, by the use of which the action of the forces of the wind or tide, or both, could be most effectually counteracted to facilitate the greatest ease in steering the craft with the greatest degree of accuracy in the shortest possible time and with the least expense of material and the least complexity in the construction of the center-board, and one which could be operated in the shortest possible time consistent with safety and with the least expense of physical force. I accomplish this result by a succession of steps, the first of which consists in pivoting the center-board to the forward part of the bottom of the boat and by providing the rear of the center-board with a floating pivotal shifting-lever, which extends up through the bottom of the boat and is provided with a hand-lever which may be operated by one of the deck-hands to shift the center-board in either direction to any desired extent at an angle to the line of the center of the boat; second, the shifting-lever at the rear of the center-board is provided with a metallic bearing, which reduces the friction to a minimum; third, I construct the device in the simplest possible manner and with as few pieces as possible, thus avoiding complication and liability to dislocation of parts and consequent obstruction to the practical operation of my device; fourth, the metallic bearing of the shifting-lever being located between the pivotal point of the center-board and the pivotal point of the lever when the center-board is in its normal position. It is evident that upon rotating the center-board to one side or the other the distance of this bearing from the pivotal point of the center-board increases with the angle of the center-board to the middle line of the boat, and the lever-arm through which the power is exerted is therefore increased with this angle; but it is a well-known property of surfaces in motion under water that the resistance of the water to their motion is the greater the nearer the line of motion is to the normal of the surface. The resistance of the water then increases with the length of the lever-arm *g*, through which the power is exerted to revolve the center-board about its pivot. It is evident, therefore, that, the force exerted remaining the same, the increase of water-resistance will be immaterial, since the effect of the force increases at the same time; but there is another feature in my construction which renders this balancing of forces even

more decided, to wit: As the center-board deviates from its normal position the tendency to return to that position created by the resistance of the water, although it increases in force, will decrease in effect, inasmuch as the moment of its line of direction about the pivot of the shifting-lever is decreasing even faster than is the lever-arm of the power applied through the metal bearing to revolve the center-board about its pivot. Indeed, when at last the horizontal arm of the shifting-lever is turned so far as to be perpendicular to the direction of the center-board the moment of the water-resistance about the pivot of the shifting-lever will become zero, and an infinite resistance may be held in check without any exertion of force by the operator, provided the material holds together.

In the accompanying drawings, the boat A is provided with two vertical perforations B and C, through which extend pivotal rods D and E, which form the pivotal supports of the forward end of the center-board and the shifting-lever at the rear of the center-board, respectively. The shifting-lever F consists of a rod bent at *f*, forming a horizontal portion *g* and a second vertical shifting portion *h*, which shifting portion *h* operates within the metal bearings on the center-board and facilitates the shifting of the center-board from left to right, and vice versa.

In Fig. 1 I show two metal rods H H, which are secured by staples *i i* to the center-board, and upon which rods H H slide two metal friction-blocks J J, which blocks are each provided with vertical perforations *a a*, in which is loosely journaled the shifting portion *h* of the lever F. The lever F is also provided with a hand-lever K, by which the lever and center-board are shifted at will.

In Fig. 3 I show two metal plates L L, secured to the center-board, a part of which is cut away, as at M, leaving an uninterrupted space, through which moves the shifting portion *h* of the shifting-lever F.

In Fig. 5 I show the plates L L ending in a sharp bottom edge *b*. The inner upper surfaces of these plates L L is provided with a horizontal inwardly-projecting shoulder or rib *c*, which extends down into the space between the plates, forming a shoulder, against which bears the friction ring or roller above the head *d* of the shifting portion *h* of the lever F, thus preventing possible accidental vertical displacement of the rear portion of the center-board and preventing the possibility of its accidental displacement out of connection with the shifting portion *h* of the lever F. The lower portions of the plates L L may be riveted together, or they may be securely fastened together in any well-known manner.

By the use of a device constructed as shown and described canal-boats and canoes can be steered with great comfort, and the disadvantages now incident to the management of such boats, occasioned by tides, current, and wind, will be greatly lessened if not entirely avoided.

It is quite evident that a foot steering apparatus might be provided and combined with this type of pivotal center-board, and the same could be used to advantage by canoeists, whether paddling or sailing.

I do not wish to be understood as limiting myself to the exact construction shown, as many of the minor details of construction may be altered and well-known mechanical equivalents substituted therefor at will without departing from the general spirit of my invention and without in any way interfering with its usefulness.

Having now described the objects, uses, and advantages of my device, what I believe to be new, and desire to secure by Letters Patent of the United States, and what I therefore claim, is—

1. The herein-described improvement in center-boards, consisting of a pivotal board provided with a permanent pivotal bearing at its forward portion, in combination with a pivotal shifting lever or crank at its rear portion, substantially as and for the purposes set forth.

2. The herein-described improvement in center-boards, which consists of a center-board pivoted near its forward end, in combination with a shifting lever or crank and a pivotal support for the center-board, said crank being provided with friction-bearings and connected to the rear portion of the center-board, substantially as and for the purposes described.

3. The herein-described improvement in center-boards, consisting of a board pivoted near its forward end, provided with metallic friction-bars secured to said board at their ends, in combination with a pivotal shifting lever and crank provided with friction-bearings and connected to said center-board back of the permanent pivotal-point support, substantially as and for the purposes set forth.

4. The herein-described improvement in center-boards, consisting of a board pivoted near its forward end and provided with metallic friction-bars secured to said board at their ends, said board partly cut away at its top to make room for the movement of the shifting-lever, in combination with a pivotal shifting lever and crank provided with friction-blocks and secured to said bars and located back of the permanent pivotal point of the board, substantially as described.

5. The herein-described improvement in center-boards, consisting of a board pivoted near its forward end and provided with metallic friction-bars secured to said board at their ends and partly cut away at its top to make room for the movement of the shifting-

lever, in combination with pivotal shifting lever and crank secured to the rear portion of the center-board and metallic bearing-blocks pivoted thereto, said blocks being provided with perforations embracing said friction-bars and shifting-lever, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

JOSEPH H. HUNT.

Witnesses:
JAMES DUFFEY,
ALFRED PASSONNO.