

No. 768,085.

PATENTED AUG. 23, 1904.

F. O. STROMBORG.
SAFETY KEEL FOR VESSELS.

APPLICATION FILED APR. 18, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

FIG. 1.

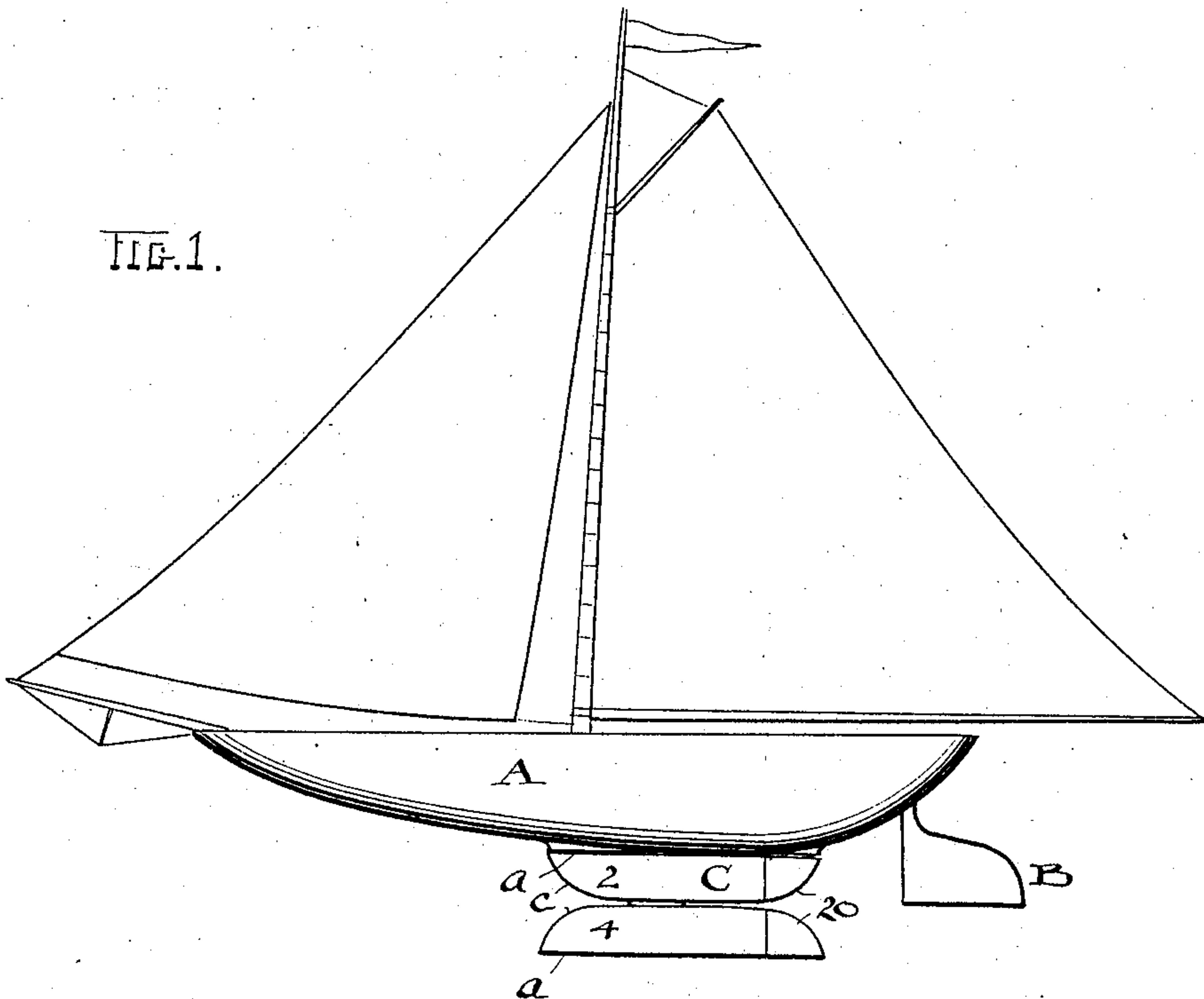


FIG. 2.

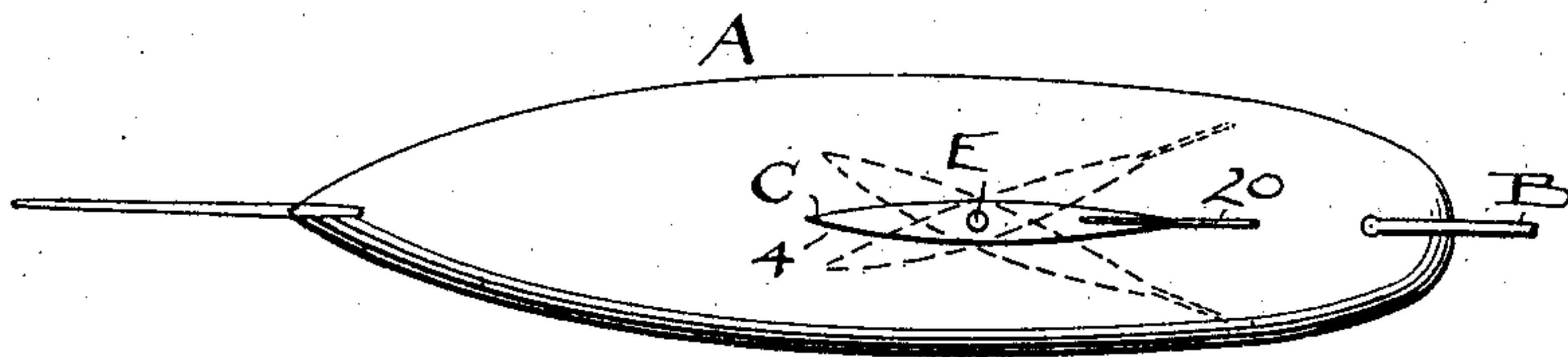


FIG. 3.

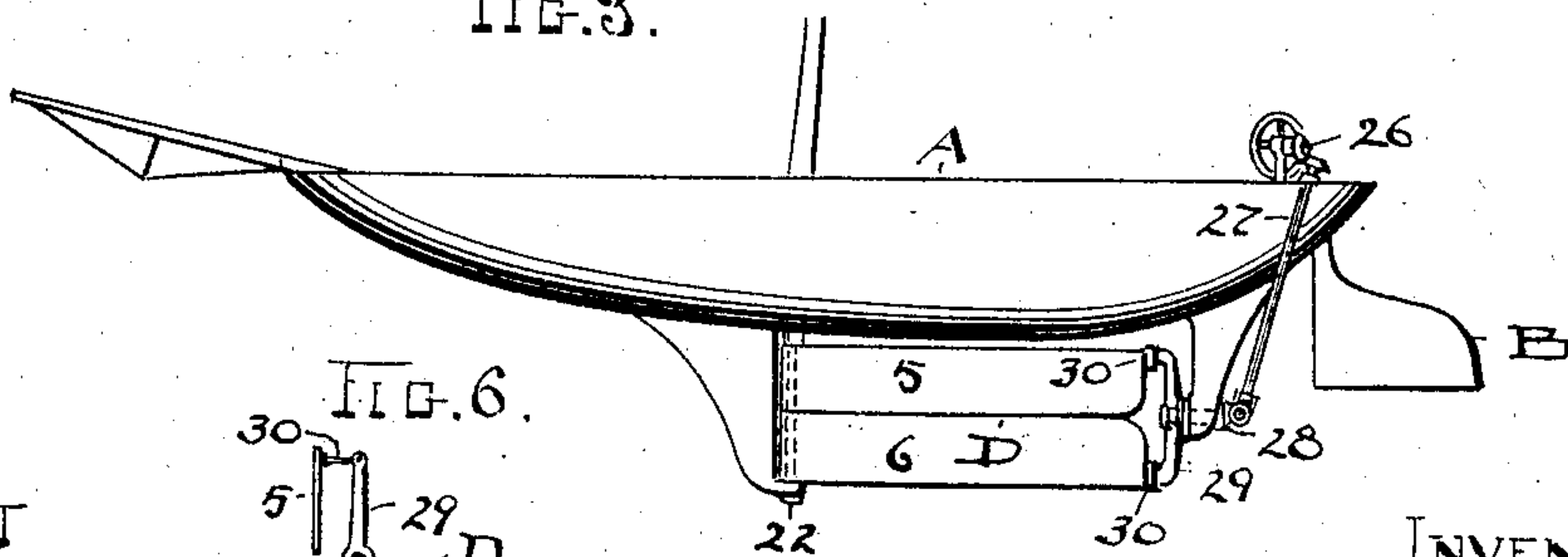
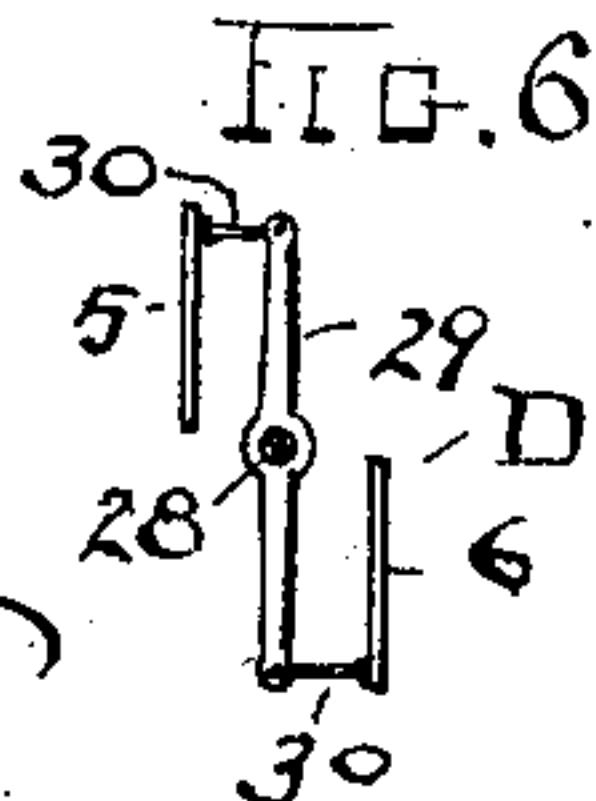


FIG. 6.



ATTEST

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2 SHEETS—SHEET 2.

FIG. 4.

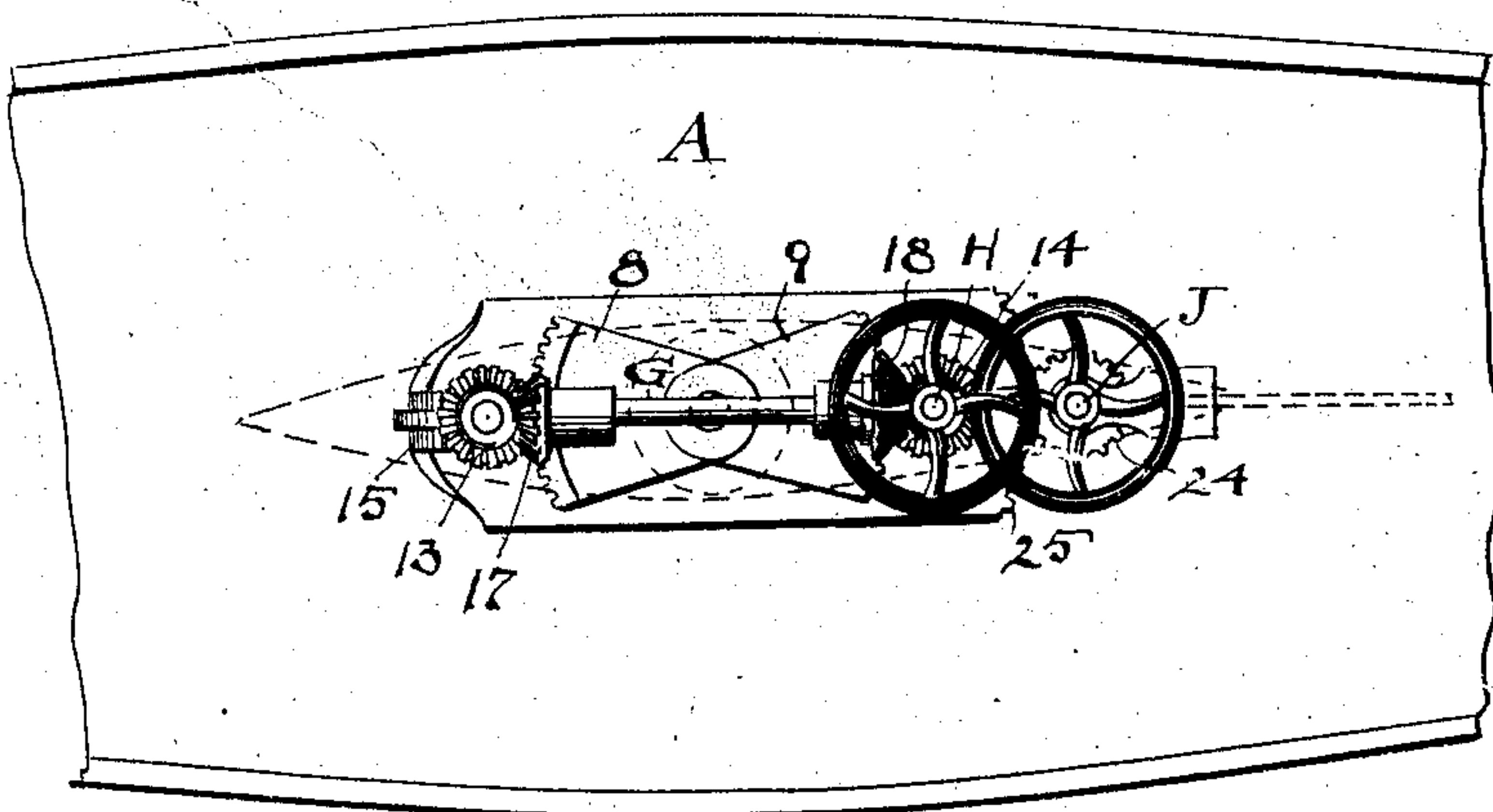
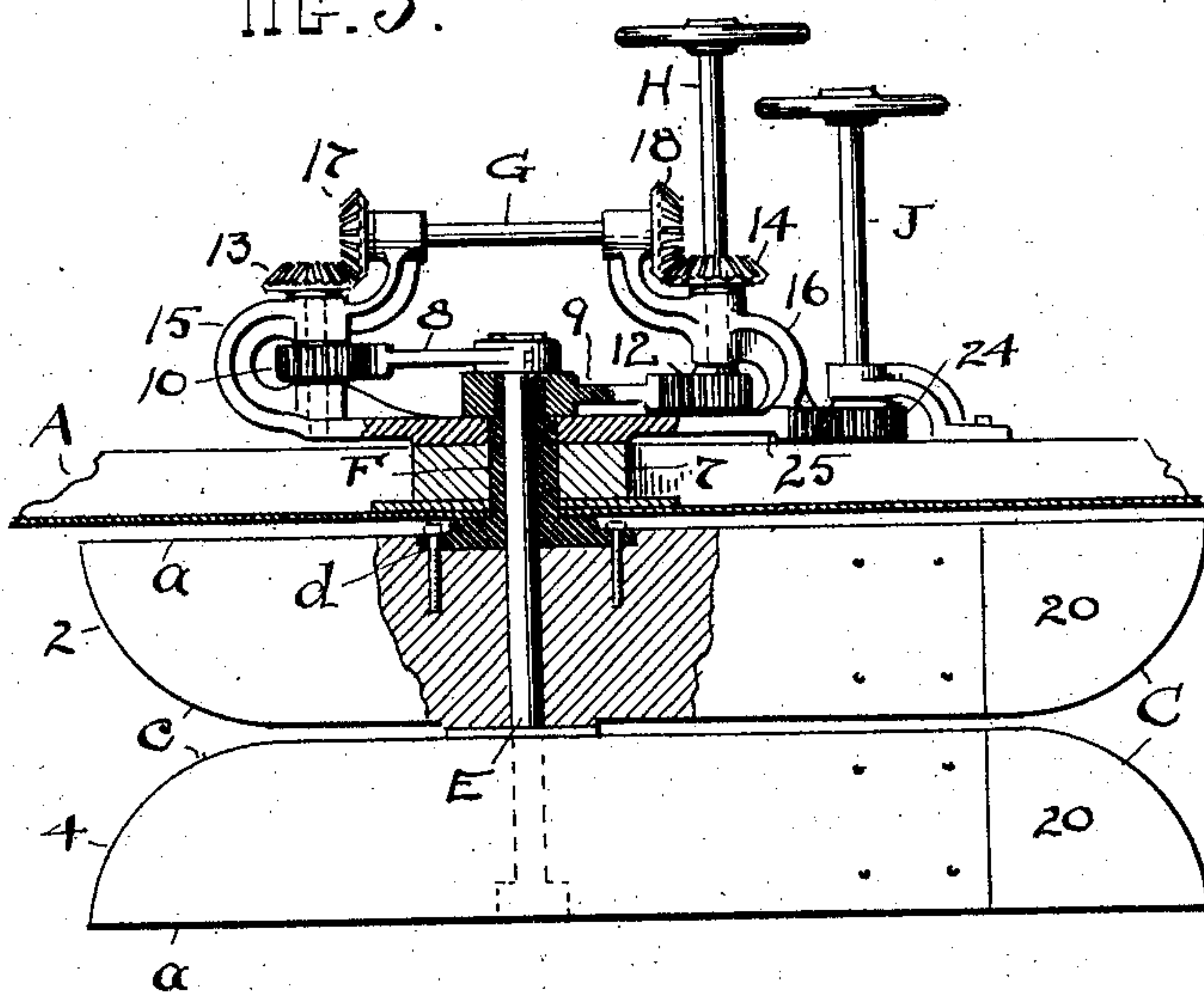


FIG. 5.



ATTEST

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FRITZ OSCAR STROMBORG, OF CLEVELAND, OHIO.

SAFETY-KEEL FOR VESSELS.

SPECIFICATION forming part of Letters Patent No. 768,085, dated August 23, 1904.

Application filed April 18, 1903. Serial No. 153,297. (No model.)

To all whom it may concern:

Be it known that I, FRITZ OSCAR STROMBORG, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Safety-Keels for Vessels; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in sailing vessels; and the invention consists in a vessel provided with a safety-keel substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a vessel carrying my new improvement in safety or balancing keels in one of its more desirable forms, and Fig. 2 is a bottom plan of Fig. 1. Fig. 3 is a view of a vessel with a modified form of my invention, as hereinafter more fully described. Fig. 4 is a top plan view of Fig. 1, showing certain controlling mechanism for the said safety-keel; and Fig. 5 is an enlarged elevation of the said keel and of the controlling mechanism therefor. Fig. 6 is a rear end elevation of the members 5 and 6 shown in Fig. 3 and showing the links and rocking arms for operating same.

Ordinarily and especially in the smaller sailing craft there is used a plain keel-board or centerboard to prevent drifting, and this board is sustained in a slot or space lengthwise in the keel, in which it has a limited up-and-down play, and sometimes these boards are rigid with the bottom of the boat and weighted to counterbalance pressure on sails; but all such boards have the objection of being impediments to short or speedy turning of the direction of the vessel, and their value as a balancing medium decreases proportionally as the vessel is tilted and they come nearer to the surface of the water where the weight or resistance of the water grows less as the surface thereof is approached.

My invention is therefore made in view of these and other well-known objections to keel-boards as hitherto known and is designed to

obviate said objections and to provide a substitute which possesses certain original and material advantages peculiar to itself and not hitherto known, as will now appear.

A represents a sailing vessel which may be of any improved type—such, for example, as a yacht; but the invention is not necessarily limited to a vessel with sails and may be placed on boats of different kinds.

B is the usual rudder at the stern of the vessel.

C represents a double balancing safety-keel, also referred to herein as "fins" or "blades," shown in Figs. 1, 2, and 5 as pivoted on a vertical axis approximately at the longitudinal center of the vessel or farther back in some cases and with said axis itself of a dual character to provide for the individual freedom and movement of the keel sections or members 2 and 4, comprised under designation C. In the modification, Fig. 3, the corresponding members are indicated by 5 and 6 under the general designation of D. The said members or sections 2 and 4 are shown here as duplicates of each other with straight outer edges *a* lengthwise and keel-shaped or rounded inner portions *c*, especially at their ends. Member 4 is fixed rigidly upon upright shaft E, which extends loosely through member 2 up into the vessel and has its bearing in a bushing or sleeve F, which is secured rigidly to the top of member 2 through its flange *d* and also projects up into the vessel somewhat, as seen in Fig. 5. Said sleeve F is rotatable in a bearing block or piece 7, and thus each keel member 2 and 4, respectively, may be horizontally rotated on its axis independently of the other or both may be rotated or turned on their axes together, as will now appear.

An arm or sector 8 is rigid with the upper end of shaft E, and an arm or sector 9 is rigid with the upper end of sleeve F, and both arms are provided with teeth adapted to be engaged by pinions 10 and 12, respectively. These pinions are supported on shafts carrying beveled gears 13 and 14, respectively, at their upper ends outside of supporting-brackets 15 and 16. Transverse shaft G has beveled gears 17 and 18 on its ends meshing with gears 13 and 14, and gear 14 is on a hand-controlled

shaft H, through which both pinions 10 and 12 and sectors 8 and 9 are simultaneously and equally actuated, but in reverse directions. This depends on conditions and according as more or less rotation is needed to counteract the tilting tendency of the vessel in a gale. If the pressure upon the sails be excessive and the danger imminent, an extreme throw of said safety members will greatly multiply the water-pressure against them and their own safety values, because in this case I obtain not only the submerged broadside value of the members, but the pressure induced by running the member more or less broadside against the water as the vessel speeds forward. This converts the resistance the said members encounter into a positive means of safety far in excess of the dip and surface value alone of said members, as would be the case in an ordinary keel-board. Then again these safety-keels are available for emergencies and can be thrown into action immediately and positively, whereas it takes time to tack sails, and in sudden squalls this often cannot be done until the danger has culminated. Each safety member also has a flexible tail or extremity 20, of sheet-steel or the like, which has the advantage of substantially preventing the swirl of water behind said members and whereby the displacement is accommodated and a comparatively quiet movement of the water at the ends of said members is assured.

If it be desired to throw said members together to any desired inclination as to the direction of travel, the same can be done through hand-controlled shaft J and pinion 24 thereon, which meshes with teeth on the end of plate 25. This plate carries brackets 15 and 16 and the gear mechanism above described and is horizontally rotatable about sleeve F as its axis. By these means I can utilize the said safety-keel members as auxiliaries to the rudder to facilitate the turning of the vessel within the smallest area possible, and this is an important function in the said members.

Obviously when the vessel tilts the safety-keels will tilt also correspondingly, which will bring them into a compound inclination in the water, as this occurs in addition to the longitudinal inclination already described, and thus they are still more effective than otherwise, because this turn of the blades puts them under the tendency to run down deeper into the water.

In the modification, Fig. 3, the keel sections or members 5 and 6 are pivoted or supported together on vertical axis 22 and are

adapted to be swung laterally in opposite directions at their rear ends through a line of mechanism comprising hand-controlled shaft 26, gear-actuated shaft 27, and rock-shaft 28, having opposite arms 29 connected by links 30 with said safety members 5 and 6. This or any equivalent mechanism may be used for operating said members 5 and 6.

What I claim is—

1. A vessel and a safety-keel on the bottom thereof consisting of two independent sections one above the other, a shaft on which said sections are mounted and mechanism for operating each section separately, substantially as described.

2. A vessel and a safety-keel therefor beneath its bottom consisting of two separate members one above the other, a single shaft on which said members are mounted, and actuating mechanism for said members constructed to operate the same conjointly, substantially as described.

3. A vessel and a safety-keel thereon comprising two members arranged one above the other on a vertical axis, and means connected with each member to turn it on its axis, substantially as described.

4. A vessel and a two-part safety-keel on its bottom, said parts arranged one above the other in the same vertical plane and each having a vertical axis, and connections with said parts to rotate them in opposite directions, substantially as described.

5. A vessel and a double safety-keel thereon, said keel divided front to rear at its middle horizontally, and means to rotate the parts thereof reversely to each other, substantially as described.

6. A vessel and a safety-keel thereon comprising members rotatably supported on a common vertical axis, and provided with flexible blade-like extremities, substantially as described.

7. A vessel and a rotatable safety-keel on its bottom provided with a flexible rear extremity, substantially as described.

8. A vessel having fins or blades on the bottom thereof consisting of two members one above the other on a vertical axis, and mechanism for operating each member to turn it on its axis.

Witness my hand to the foregoing specification this 3d day of April, 1903.

FRITZ OSCAR STROMBORG.

Witnesses:

R. B. MOSER,
H. T. FISHER.