No. 662,829. Patented Nov. 27, 1900.

H. SIMPSON.

APPARATUS FOR ARRESTING MOTION OF NAVIGABLE VESSELS.

(Application filed Aug. 23, 1900.)

(No Model.) 2 Sheets—Sheet 1.

FIG III

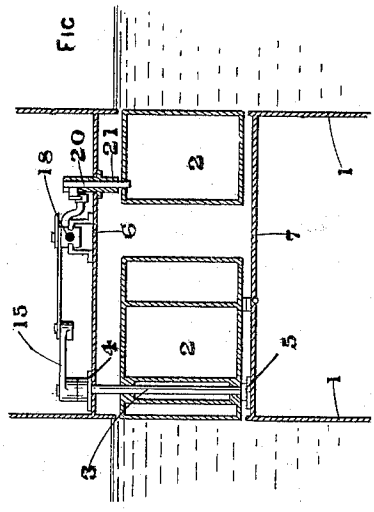


FIG IV

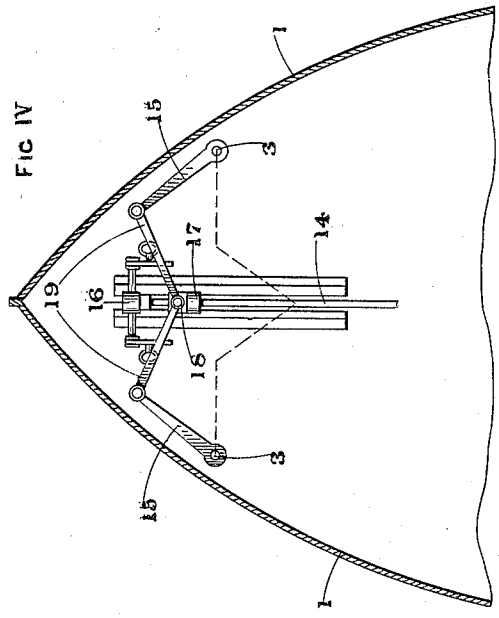


FIG II

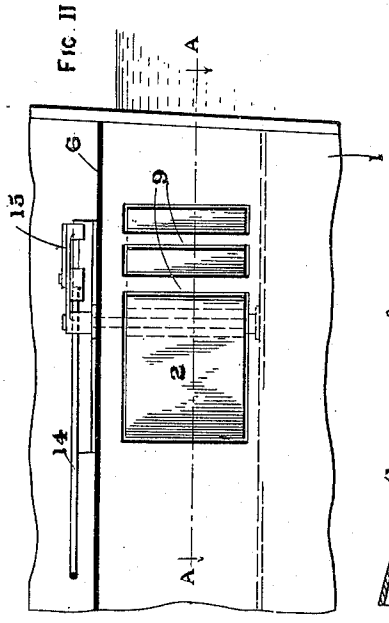
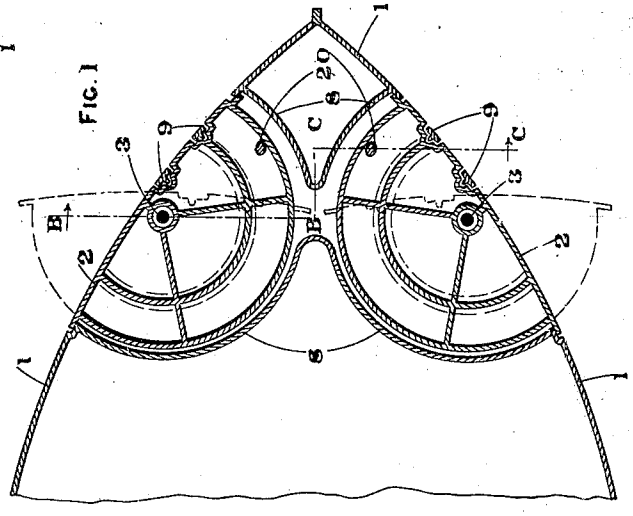


FIG I



Attest
Wm. F. Hall.
F. L. Middleton

Inventor
Henry Simpson
by Ellis Spear
Atty.

No. 662,829. Patented Nov. 27, 1900.

H. SIMPSON.

APPARATUS FOR ARRESTING MOTION OF NAVIGABLE VESSELS.

(Application filed Aug. 23, 1900.)

(No Model.) 2 Sheets—Sheet 2.

FIG. VII

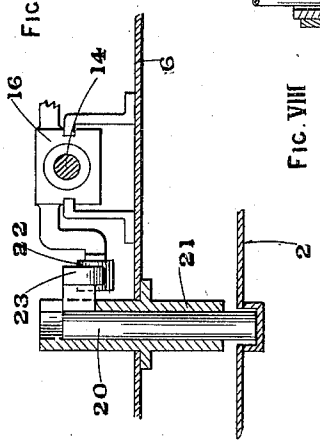


FIG. VIII

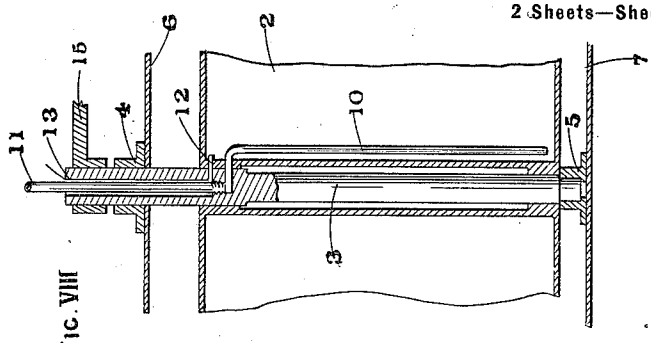


FIG. VI

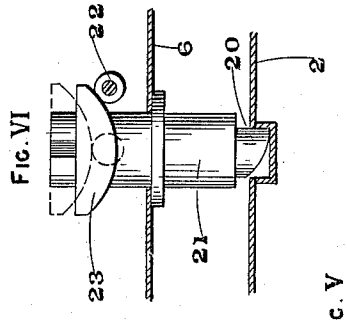
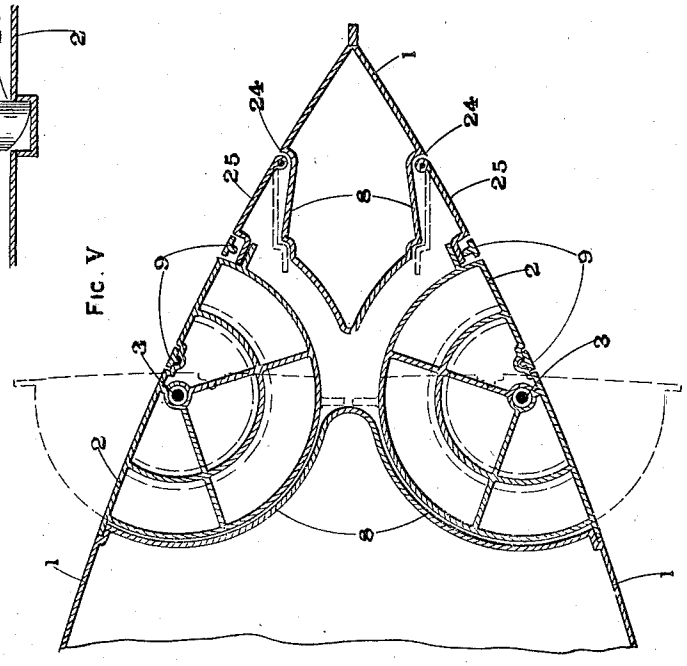


FIG. V



Attest

Wm. F. Hall

F. L. Winchester

Inventor

Henry Simpson

by Ellis Spear Atty.

UNITED STATES PATENT OFFICE.

HENRY SIMPSON, OF LIVERPOOL, ENGLAND.

APPARATUS FOR ARRESTING MOTION OF NAVIGABLE VESSELS.

SPECIFICATION forming part of Letters Patent No. 662,829, dated November 27, 1900.

Application filed August 23, 1900. Serial No. 27,801. (No model.)

To all whom it may concern:

Be it known that I, HENRY SIMPSON, a subject of the Queen of Great Britain, residing in Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in Apparatus for Arresting the Motion of Navigable Vessels, of which the following is a specification.

This invention comprises certain improvements relating to my prior invention of apparatus for arresting the motion of navigable vessels, for which I have obtained British Letters Patent, dated November 24, 1892, and numbered 21,427. As will be seen on reference to the specification to the said Letters Patent, the arresters overlap in plan, so that it is necessary to arrange them in two or more levels, and in vessels with bluff lines it is necessary in the case of each arrester to close one side of the cavity in which it works by means of a hinged door.

Now the object of my present invention, broadly, is to improve the apparatus in this respect, and in carrying it into practice I arrange the arresters on the same level and place their spindles at such a distance apart that the arresters clear each other when swung athwartships, and as the face of each when in normal position conforms with the side of the vessel the necessity for the doors referred to is obviated.

I have illustrated my invention in the accompanying drawings, in which—

Figures I to IV show the application to a vessel with very bluff lines. Fig. I is a plan in section on the line A A of Fig. II. Fig. II is an elevation with the near side of the vessel above the deck removed. Fig. III is a sectional elevation, the left and right hand portions being taken on the respective lines B B and C C of Fig. I. Fig. IV is a deck plan showing the gear for operating the arresters and the locking-bolts. Fig. V is a view analogous to Fig. I, showing the application to a vessel the lines of which are less bluff than in the previous example. Figs. VI and VII are detail views to larger scale of the locking-bolts, and Fig. VIII is a detail view of the spindle, showing pumping connections.

Referring in the first instance to Figs. I to IV, 1 is the skin of the vessel, 2 indicates the arresters, and 3 indicates the spindles carried in the bearings 4 and 5, firmly secured to the water-tight decks 6 and 7, between which the arresters are located. The arresters are on the same level, the bluffness of the bow permitting their spindles (which are on the center lines of the arresters) to be separated sufficiently to allow the arresters to clear each other when swung athwartships, as indicated in dotted lines.

8 indicates fixed water-tight bulkheads brought as close as practicable to the space swept out by the arresters, and 9 indicates ties or struts extending across the openings in the ship's side with the object of strengthening the latter. The faces of the arresters are recessed, as shown, in order to clear these ties.

As the arresters have considerable displacement, they are preferably made water-tight, so that their buoyancy can be taken advantage of. In this case a pump connection is made with the interiors of the arresters through the upper ends of their spindles, so that they can be pumped dry or filled with water to serve as water ballast, if desired. The arrangement is shown in Fig. VIII. The pipe 10, leading from the bottom of the arrester, is fixed air-tight in the spindle 3 and communicates with the pipe 11, which is coupled to the pump in such a manner as to permit of the partial rotation of the spindle.

12 is an air-vent communicating with the outer air by the annular space 13, surrounding the pipe 11.

The arrangement for operating the arresters is shown in Figs. II, III, and IV and is substantially the same as in my British specification aforesaid, except that, for a reason to be presently explained, the operating-bar 14 is not positively connected to the arrester-levers 15. The bar 14, which is preferably actuated by hydraulic power, has firmly fixed to it the head 16 and the collar 17, and between the two is located the head 18, which is linked to the levers 15 by the links 19 and slides freely over the bar for a short distance, limited by the head 16 and the collar 17.

The arrangement for locking and unlocking the arresters is shown in Figs. III and IV and in detail in Figs. VI and VII. Each bolt 20 slides vertically in a tubular bracket

21, secured to the deck, and drops into a hole in the arrester when the latter is closed or in normal position. It is obvious that the bolts must be withdrawn before the arresters can be opened, and this is effected during the first part of the stroke of the bar 14 by the rollers 22, carried from the head 16, which engage with the lower curved edges of the cam-plates 23, secured to the bolts, and so lift the latter. By the time this has been effected the head 16 abuts against the loose head 18, and the further motion of the bar 14 swings the arresters athwartships, as shown in dotted lines, the links and levers assuming the positions indicated by the dotted center lines in Fig. IV and the bolts dropping to their lower position. In closing the arresters the bolts are lifted by the edges of the arresters engaging with their backed-off ends, and they drop into position when the arresters are closed, their descent being aided by springs or weights, if desired.

In the arrangement shown in Fig. V the vessel being sharper the arrester-spindles have to be placed relatively farther aft, and in order to give better access for the water when the arresters are opened the openings in the ship's side are extended forward to the points 24, and these extensions are closed by the hinged doors 25. When the arresters are swung athwartships, the water-pressure opens the doors, as indicated in dotted lines, and when the arresters are closed they engage with the ends of the doors 25, closing them and holding them closed.

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

1. Apparatus for arresting the motion of navigable vessels consisting of a pair of arresters of approximately semicylindrical shape located side by side in similarly-shaped cavities formed in the bow of the vessel, and pivotally connected thereto centrally of the arc forming the semicylindrical side, the approximately flat sides of which arresters form, when closed, a continuation of the vessel's skin, and when open, retarding-surfaces on opposite sides of the vessel, and means for operating and holding the said arresters; substantially as described.

2. In combination, a pair of arresters located in cavities lying side by side in the bow of the vessel, and automatically-operating hinged doors closing a part of said cavities, the said doors and arresters forming when closed a continuation of the vessel's skin.

3. In combination, the arresters located side by side at the same level, the holding devices, and the operating-bar adapted to give angular movement to the arresters and to release the holding devices; substantially as described.

4. In combination, the arresters, the means for holding and rotating them, and the hinged side doors of the cavities in which the arresters are located which are adapted to be closed and held closed by projections on the arresters; substantially as described.

5. In combination, the arresters, the holding devices, and the operating-bar adapted to give angular movement to the arresters, said bar being capable of limited movement from its extreme position prior to its operation of the arresters, during which movement it is adapted to release the holding devices; substantially as described.

6. In combination, the arresters, the holding-bolts capable of axial movement and provided with cam-plates, and the operating-bar connected to the arrester-levers by links pivoted to a head capable of limited axial movement relatively to the bar, said bar being also provided with a fixed head carrying rollers which by contact with the cam-plates raise the bolts before the arresters are operated; substantially as described.

7. In combination with the holding and rotating devices, the hollow water-tight buoyant arresters whose interiors are in communication with a pump by means of a passage through their spindles; substantially as described.

8. In combination with the ship having the cavities therein side by side or at the same level and the arresters pivoted centrally of their length in the said cavities, the inner arms of said arresters extending part way across the vessel's bow when the arresters are in operation and each with its end opposite the inner end of the other arrester, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY SIMPSON.

Witnesses:
J. S. LLOYD BARNES,
JOSEPH E. HERST.