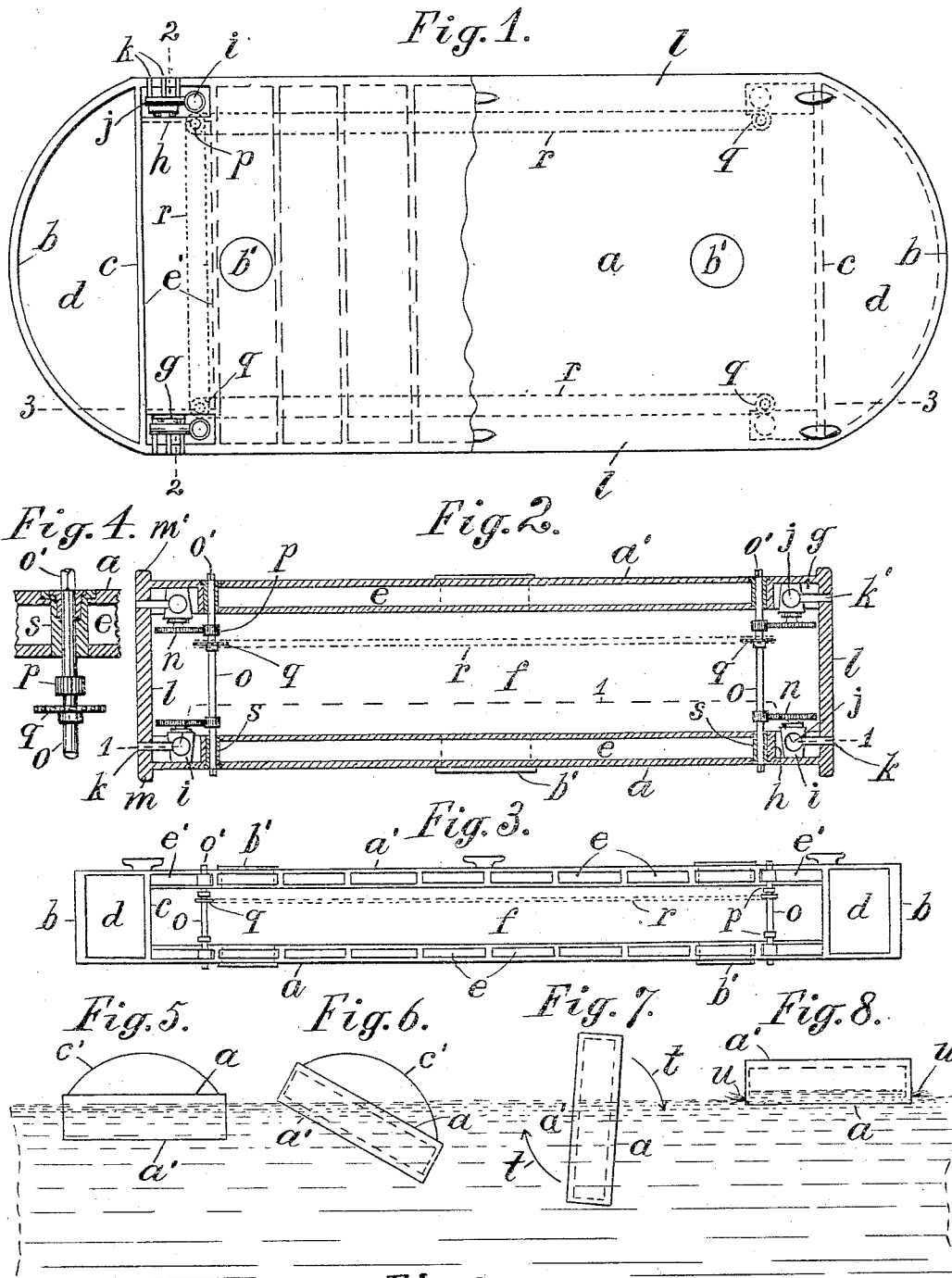


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 SELF DUMPING AND AUTOMATIC BAILING SCOW.
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UNITED STATES PATENT OFFICE.

GARRETT V. MITCHELL, OF BAYONNE, NEW JERSEY.

SELF-DUMPING AND AUTOMATIC BAILING SCOW.

933,657.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GARRETT V. MITCHELL, a citizen of the United States, residing at 67 West Thirty-third street, Bayonne, 5 county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Self-Dumping and Automatic Bailing Scows, fully described and represented in the following specification 10 and the accompanying drawings, forming a part of the same.

This invention relates to a scow having similar decks upon its opposite flat sides which may, by the introduction of water- 15 ballast, be rendered self-dumping when loaded, and capable when unloaded of rising out of the water so far as to clear itself of the water-ballast. In the present invention I furnish the under side of each deck 20 with a series of transverse air-chambers adapted to raise a great proportion of the scow's height out of the water, the space between the two sets of air-chambers serving as a water-chamber for the introduction 25 of water-ballast. The series of air-chambers forms a cellular structure which greatly strengthens each of the decks. A valve is located in each corner of the water-chamber close beneath each deck and connected 30 with inlets and outlets through the side of the scow near the gunwale, and is also in communication with the water-chamber. These eight valves are connected by suitable gearing, with spindles which extend through 35 both of the decks, so that the application of a wrench operates to open and close all the valves at once. When the scow is loaded the upper gunwale is but a short distance above the water-level and the lower inlets 40 are far below the surface of the water, so that when the valves are opened the water flows through the lower inlets into the water-chamber, and when the scow becomes over-ballasted, tips it one side or the other, 45 causing the water-ballast to immediately flow in that direction. This dumps the scow instantly, discharging its load and causing it to entirely turn over, or to right itself with the same deck upward. The buoyancy 50 of the scow operates when the load is discharged to raise it wholly out of the water except the air-chamber, so that the water-ballast within the scow is raised above the level of the water outside and flows out-

wardly through the water-outlets. Such 55 discharge of the water-ballast lightens the scow still further so that it is gradually raised and the water-ballast all discharged. The valves are then closed and the scow is in 60 readiness to receive another load.

The invention will be understood by reference to the annexed drawing, in which—

Figure 1 is a plan of the scow with the upper deck and its attachments removed 65 upon the line 1—1 in Fig. 2; Fig. 2 is a cross section on line 2—2 in Fig. 1, upon a scale twice the size of Fig. 1. Fig. 3 is a longitudinal section on line 3—3 in Fig. 1 and upon the same scale as that figure. Fig. 4 70 is a section of one of the decks with one of the gear-spindles where it passes through the same, the view being greatly enlarged above Fig. 3. Figs. 5 to 8 are diagrams showing the operation of the invention upon a loaded and unloaded scow; Fig. 5 showing 75 the scow loaded and in condition for towing; Fig. 6 shows the scow loaded, with water-ballast sufficient to dump it; Fig. 7 shows the position of the scow when rotating in the water; Fig. 8 shows the position of the 80 scow upon the water when unloaded, and the water-ballast discharging. Fig. 9 is a plan, in section where hatched, of one of the valves and its inlet branch.

a designates one of the decks of the scow, 85 and *a'* the opposite deck.

b represents curved ends upon the scow, and *c* partitions adjacent to such ends forming large air-chambers *d*, between the decks.

Air-chambers *e* and *e'* are shown formed 90 beneath both of the decks with a water-space *f* between the same. A pocket *g* is shown at each corner of the chamber *f* under the deck, boxed off from the end air-chamber *e'* by means of partition *h*, and a valve *i* is 95 located in each of such pockets and connected by a branch *j* with a group of pipes *k*, *k'*, which are extended through the side *l* of the scow as near as possible to the gunwale *m*, or *m'*. 100

Tapering plug-valves are shown, with a cogwheel *n* secured upon the plug of each, and a spindle *o* is extended vertically through both the decks adjacent to each of the valves and geared thereto by a pinion *p*. 105

Fig. 9, which is partly in section, shows a valve with a foot *v* for attachment to the side of the pocket *g*, and a port *w* which

opens directly into the pocket, thus discharging the water inwardly or outwardly from the water-chamber *f*.

Sprocket-wheels *g* are provided upon the
5 spindles *o* and all of the sprocket-wheels are connected by sprocket-chains *r* which thus connect all the spindles and valves together. The end of each spindle where projected above the deck is shown with a square *o'*
10 by which it may be turned, and the deck is provided with a stuffing-box *s*, as shown in Fig. 4, adjacent to such square. The valves can, therefore, all be opened by turning any one of the squares *o'*. When the valves are
15 closed and the water-space *f* is empty, the scow floats sufficiently high in the water as shown in Fig. 8, to bring the pipes *k* at least up to the water-level. When the valves are closed, the scow may be loaded and is then
20 depressed in the water, as shown in Fig. 5, by then opening the valves the water flows into the water-space *f*, entering the lower inlets and discharging air from the upper inlets *k'*, and the water-ballast then introduced operates to sink the scow lower in the
25 water. The inequalities of level which result throw the water-ballast to one side of the scow as shown in Fig. 6, which shifts the center of gravity of the load *c'* and causes the scow to upset and discharge the load, the
30 scow turning with the load, and revolving in the water as indicated by the arrows *t* in Fig. 7. The air-chambers operate immediately to right the scow and to raise it
35 above the water sufficiently for the water-ballast to flow out of the water-inlets, as indicated by the jets of the water *u* in Fig. 8. When the water-ballast is all discharged, the valves may be closed and the scow is
40 ready for re-loading.

From the above description it will be seen that the operation of the water-ballast is entirely automatic when the valves are opened, as the opening of the valves not
45 only introduces sufficient water to upset the scow but leaves outlets through which the water-ballast is automatically discharged when the load is dumped and the scow rises in the water.

The operation of the entire apparatus is dependent upon a suitable proportion between the volume of the air-chambers *d*, *e* and *e'*, to the total weight of the scow unloaded, so that the buoyancy of these air
50 chambers in the lower part of the scow may be sufficient when the scow is crowded downward by the load to lift the scow as soon as it is unloaded out of the water sufficiently to discharge the water-ballast. Such proportions are readily calculated and as the
55 water-ballast lies on the air-chambers *e* it is not, in fact, necessary for the total discharge of such water-ballast that the water-outlets should be raised above the water-level, but only that the tops of the water-

chamber *e* should be raised to the water-level, as such position causes all the water in the water-chamber *f* to drain from the outlets, even if they are under the surface of the water.

Having thus set forth the nature of the invention what is claimed herein is:

1. A self-dumping scow having a series of air-chambers extended within the opposite decks, thereby forming cellular decks, such
75 air-chambers proportioned to raise the entire scow except such air-chambers out of the water when unloaded, an intermediate water-chamber extended across the entire width of the scow, two sets of water-inlets in the
80 edges of the scow near the gunwales, and valves connecting such inlets with the water-chamber, to dump the scow when loaded.

2. A self-dumping scow having a series of air-chambers extended within the opposite
85 side decks, thereby forming cellular decks, such air-chambers proportioned to raise the entire scow except such air-chambers out of the water when unloaded, an intermediate water-chamber extended across the entire
90 width of the scow, water-inlets near the water-level when the scow is thus elevated, and valves connecting such inlets with the water-chamber, the location of the inlets permitting the water-ballast to drain from the
95 water-chamber automatically when the scow is unloaded.

3. A self-dumping scow having air-chambers within its opposite decks adapted to raise a great proportion of its height out of
100 the water when unloaded, an intermediate water-chamber, water-inlets near the water-level when the scow is thus elevated, valves connecting such inlets with the water-chamber, spindles extended through both decks of
105 the scow for actuating the valves, and connections from such spindles to all the valves for operating them simultaneously.

4. A self-dumping scow having air-chambers within its opposite decks adapted to
110 raise a great proportion of its height out of the water when unloaded, an intermediate water-chamber, water-inlets near the water-level when the scow is thus elevated, valves under both decks in the corners of the scow
115 and connected with such inlets and the water-chamber, and means for connecting all the valves together and operating them simultaneously from either of the decks.

5. A self-dumping scow having air-chambers within its opposite decks adapted to
120 raise a great proportion of its height out of the water when unloaded, an intermediate water-chamber, water-inlets near the water-level when the scow is thus elevated, valves
125 under both decks in the corners of the water-chamber and connected with such inlets and the water-chamber, spindles extended through the decks adjacent to the valves with stuffing-boxes upon the spindles in the
130

said decks, and gearing connecting all the spindles and the valves, whereby all of the valves may be turned by any of the spindles from either of the decks.

- 5 6. A self-dumping scow having two similar opposite decks, air-chambers *d* within the ends of the scow and air-chambers *e*, *e'*, be-
10 neath each of the decks with pockets partitioned off from the said chambers in each end of the scow, and a water-chamber between the air-chambers communicating with said pockets, a valve located in each of the said pockets and opening into the water-

chamber, and having inlets extended through the edges of the scow near the gunwale, and 13
gearing connecting all of the valves, with mechanism extending through both the decks for actuating the same.

In testimony whereof I have hereunto set my hand in the presence of two subscribing 20 witnesses.

GARRETT V. MITCHELL.

Witnesses:

WILLIAM CARSWELL,
SHERMAN S. MITCHELL.