No. 755,064. PATENTED MAR. 22, 1904.

H. SHOOSMITH.

APPARATUS FOR DISCHARGING LOOSE CARGO FROM VESSELS.

APPLICATION FILED OCT. 10, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

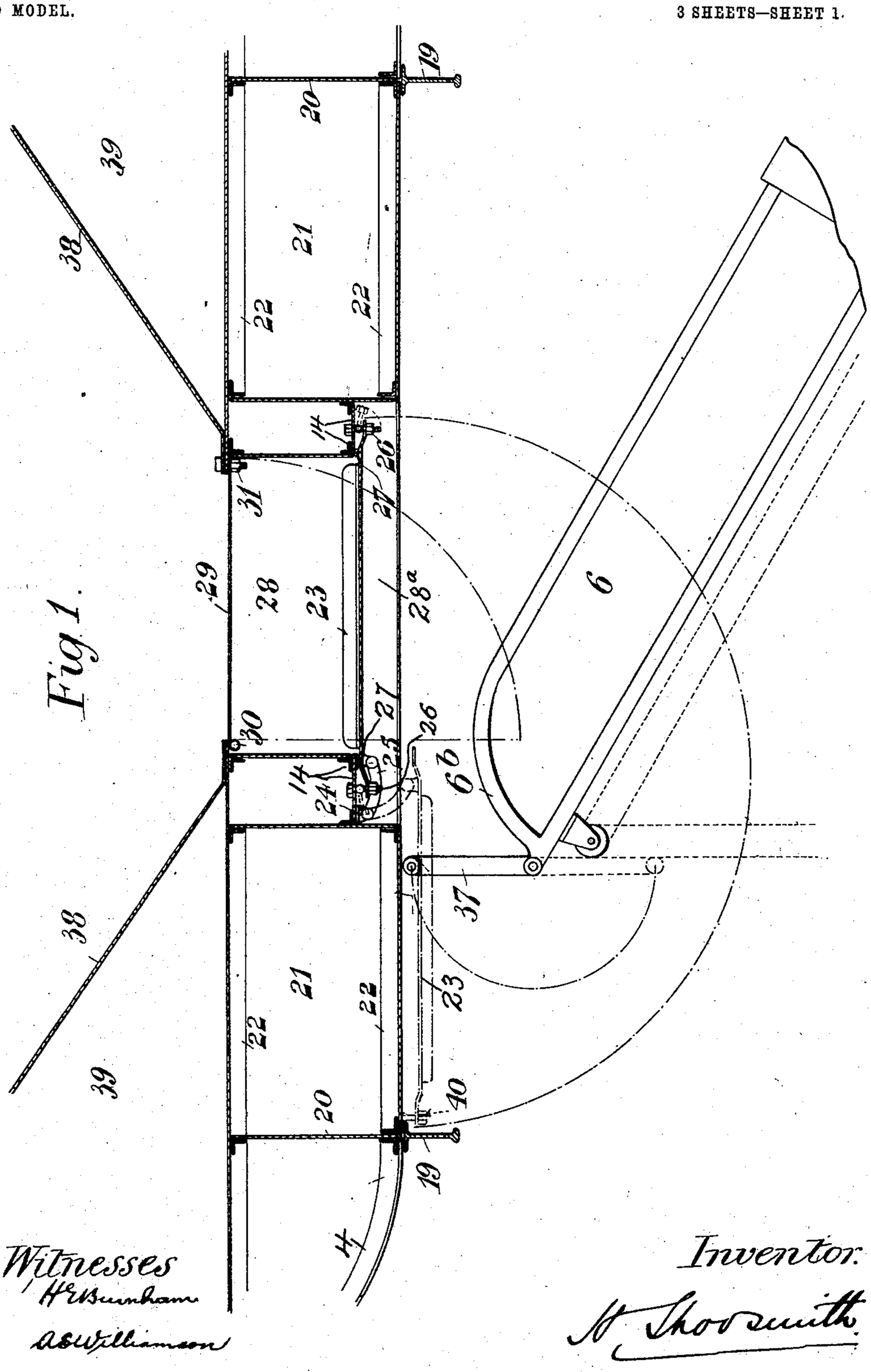


Fig. 1.

Witnesses
H. B. Burnham
A. S. Williamson

Inventor:
H. Shoosmith.

No. 755,064. PATENTED MAR. 22, 1904.

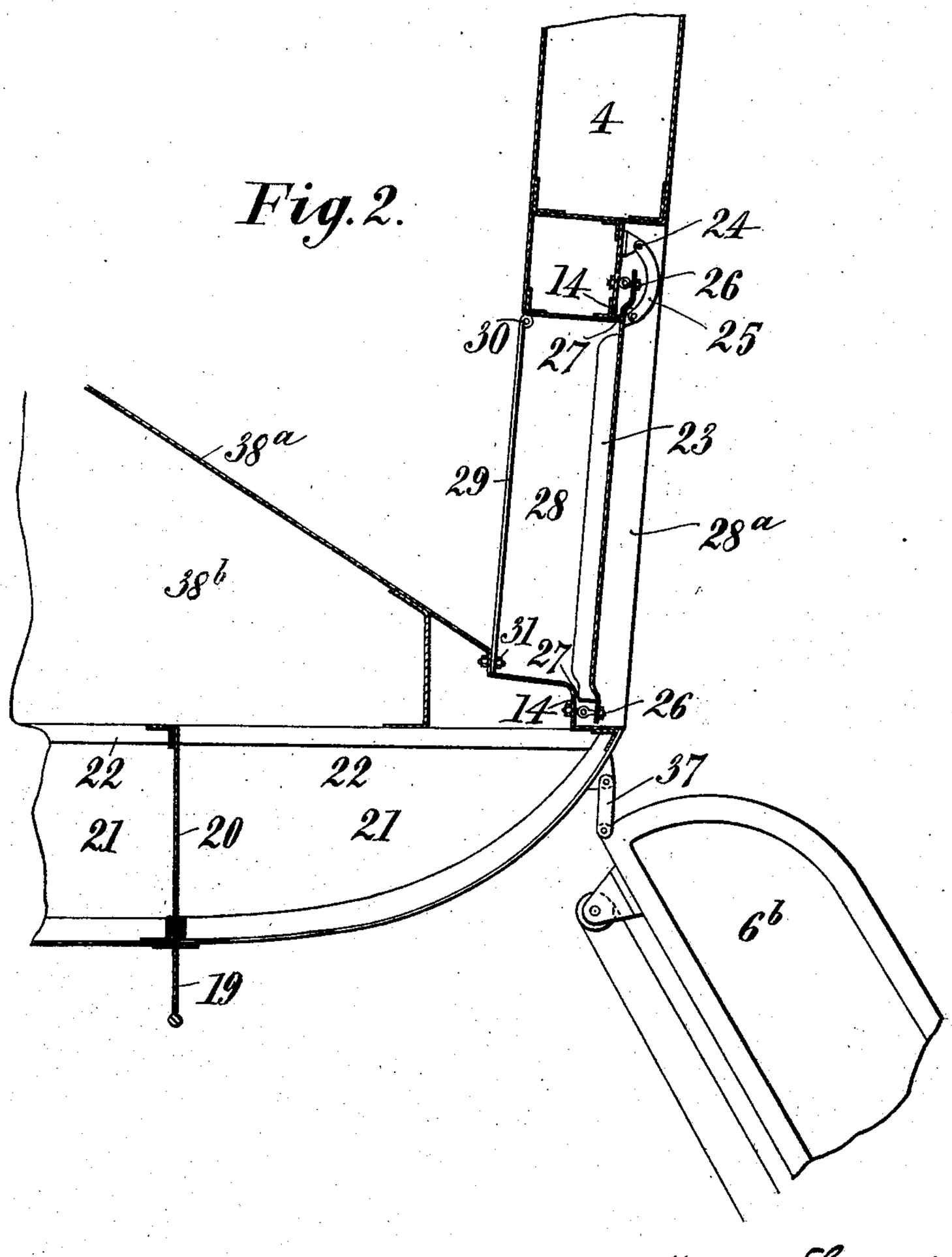
H. SHOOSMITH.

APPARATUS FOR DISCHARGING LOOSE CARGO FROM VESSELS.

APPLICATION FILED OCT. 10, 1902.

NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
Edwin L. Jewell.
R. H. Bishop.

Harry Shoosmith,
Inventor,
By Daniel Davis,
Attorneys.

No. 755,064. PATENTED MAR. 22, 1904.

H. SHOOSMITH.

APPARATUS FOR DISCHARGING LOOSE CARGO FROM VESSELS.

APPLICATION FILED OCT. 10, 1902.

NO MODEL. 3 SHEETS—SHEET 3.

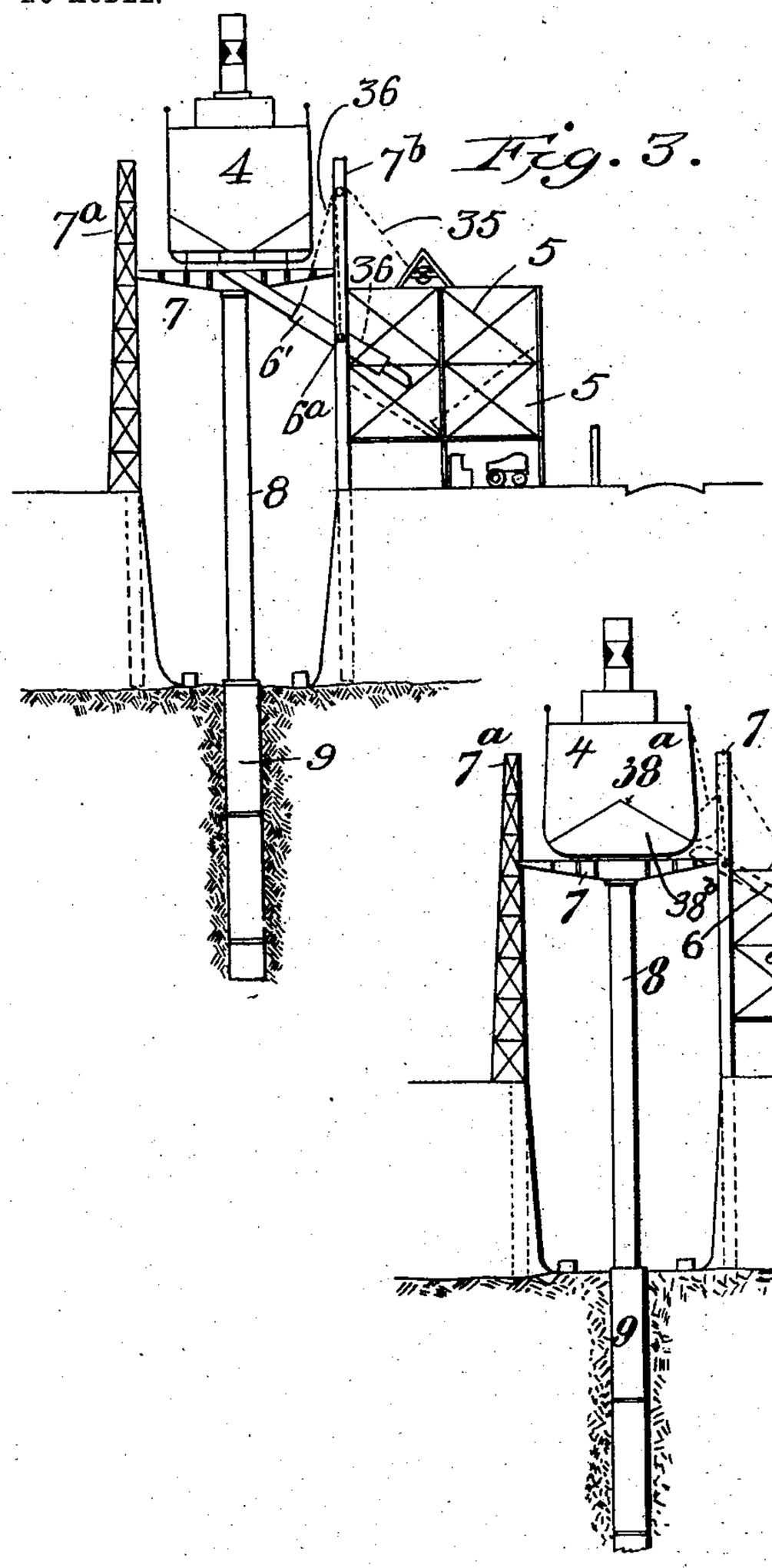


Fig. 3.

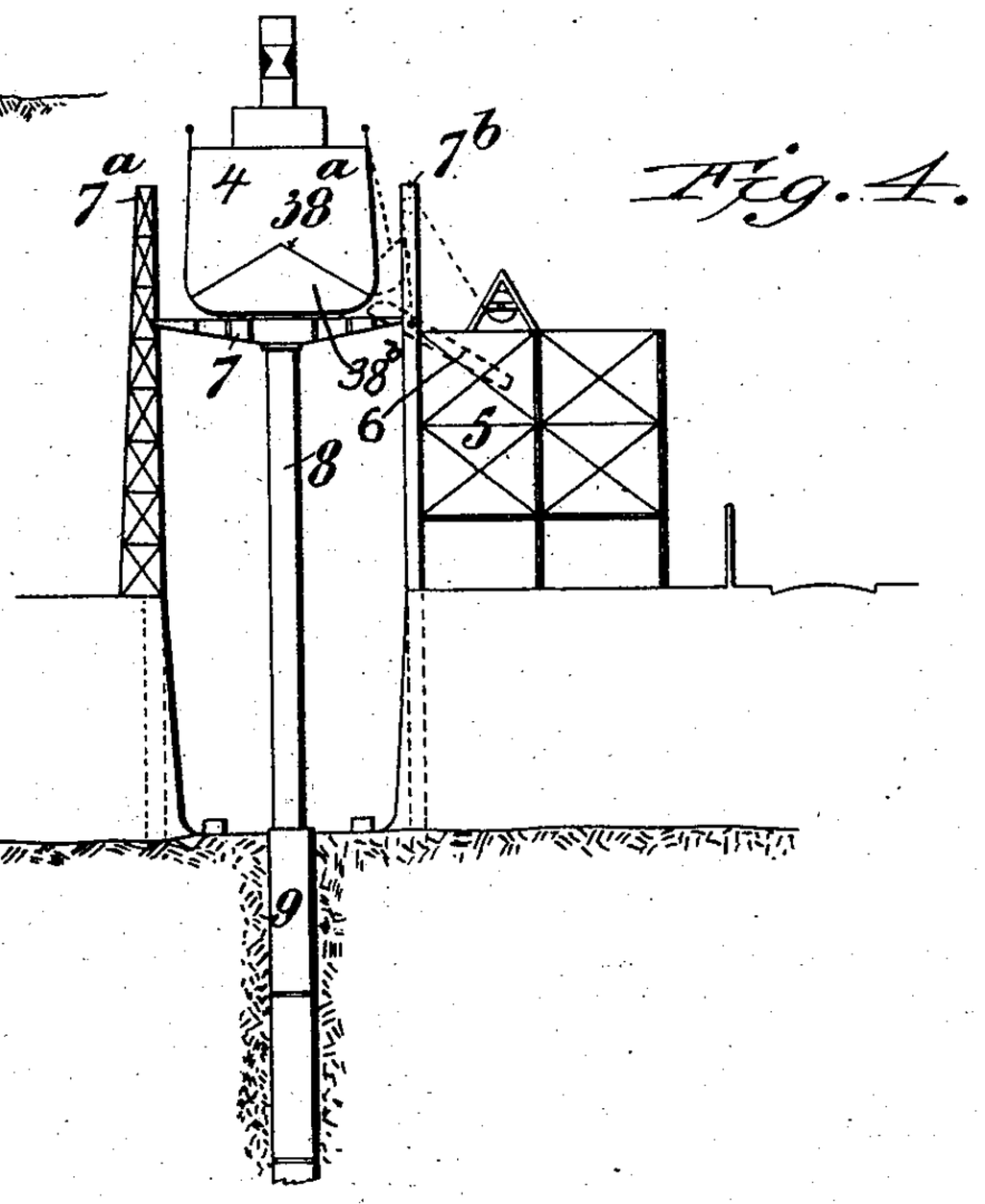


Fig. 4.

Witnesses.
H. C. Burnham
A. S. Williamson

Inventor.
H. Shoosmith

No. 755,064. Patented March 22, 1904.

UNITED STATES PATENT OFFICE.

HARRY SHOOSMITH, OF ORMISTON, ERITH, ENGLAND.

APPARATUS FOR DISCHARGING LOOSE CARGO FROM VESSELS.

SPECIFICATION forming part of Letters Patent No. 755,064, dated March 22, 1904.

Application filed October 10, 1902. Serial No. 126,770. (No model.)

To all whom it may concern:

Be it known that I, HARRY SHOOSMITH, a subject of the King of Great Britain and Ireland, residing at Ormiston, Erith, county of Kent, England, have invented Improvements in and Means or Apparatus for Discharging Loose Cargo from Navigable Vessels, of which the following is a specification.

It has heretofore been proposed to discharge loose cargo which is capable of running or flowing—such as coal, grain, and the like—from a navigable vessel by raising the vessel out of the water, as by hydraulic rams or a pontoon, and allowing the cargo to flow through openings formed in the bottom or sides of the vessel and controlled by doors or the like, the material on leaving the vessel being directed in any desired direction by chutes, guideways, or conveyers and deposited in bins or hoppers or otherwise dealt with according to circumstances.

Now the present invention has reference to improvements in the construction of navigable vessels designed to be discharged in the manner set forth; and it has for objects to allow of the openings in the bottom or sides of the vessel being closed in a better and easier manner than heretofore and so that the doors for closing such openings shall be protected against damage from impact of the cargo when loading the vessel, to facilitate the complete discharge of the cargo without trimming, and to strengthen such vessels, so as to enable them to better withstand the strains to which they will be subjected when placed in a loaded condition upon a rigid platform.

The invention consists in novel features of construction and in combinations and arrangements of parts, all as hereinafter more fully described, and pointed out in the claims.

In the accompanying illustrative drawings, Figure 1 shows in cross-section part of the lower portion of a navigable vessel constructed according to the present invention and designed to be discharged through openings in the bottom thereof. Fig. 2 is a similar view of part of a navigable vessel designed to be discharged through openings in the sides thereof. Figs. 3 and 4 are end elevations to a smaller scale, showing vessels constructed according to Figs. 1 and 2, respectively, raised out of the water and in position to have their cargoes discharged into hoppers.

Referring to Figs. 3 and 4, 1 is a wharf; 2, a dock open at one end to the river and designed to receive a navigable vessel 4, whose cargo is to be discharged. 8 is one of a series of rams working in hydraulic cylinders 9 and connected to a platform 7 for raising the vessel out of the water. 5 represents storage-hoppers arranged at one side of the dock. 6 is one of a series of chutes by which the cargo can be conducted from the bottom or side of the navigable vessel to the hoppers 5, and 7^a and 7^b are vertical guides for the platform 7.

To enable loose cargo to be discharged from the vessel, the latter is constructed according to the arrangement illustrated in Fig. 1, with discharge-openings 28 extending through its bottom, each of such openings being closed at its outer end in a water-tight manner by a hinged main door 23. To allow of each door 23 taking an effective bearing against the lower edge portion or seat 14, surrounding the opening 28, it is jointed at one edge to the vessel at 24 by means of links 25 and is adapted to be secured around its edges against the said seat 14 by suitable means—such, for example, as hinged bolts 26—that are jointed to the seat 14 and are arranged to take into notches or recesses at the edge of the door, packing means 27, such as strips of india-rubber on the door, being used to insure a water-tight joint being formed between the door and the seat 14.

To protect the main water-tight doors 23 externally, the lower edge portion of seat 14 of each discharge-opening 12 is arranged to terminate above the bottom of the vessel, so that the corresponding door when in its closed position will be wholly within a recess 28^a, formed between the said lower portion or seat 14 and the bottom of the vessel.

To protect the main water-tight doors 23 from the impact of the cargo when loading the vessel, there is provided above each of such doors a supplementary door 29, that can be secured in any suitable manner, so as to admit of its being opened from below, and which need not be made water-tight. In the example each supplementary door 29 is hinged to

the vessel at 30 and secured in the closed position by bolts 31.

As the cargo flows out of a discharge-opening 28 it is received in a chute 6 and conducted thereby to the place where it is to be stored or dealt with—for example, into the hoppers 5, Figs. 3 and 4. The chutes are suspended from the top of the hoppers by suitable means, such as ropes or chains 35, and ropes or chains 36 are led to the chutes to alter their inclination. The upper end portion 6^b of each chute may conveniently be detachably connected by links 37, Fig. 1, to the bottom of the vessel 4 during the discharge of cargo therefrom, so as to be kept in proper position for use.

To facilitate the complete discharge of the cargo of the vessel without trimming, it is desirable to construct the vessel with false sides 38, sloping toward the center. The spaces 39 between the sides of the vessel and the false sides 38 may serve to contain water-ballast when required.

The operation of discharging a vessel constructed as described is as follows: The vessel 4 after being floated into the dock 2 and onto the platform 7 is raised, as shown in Fig. 3, by operating the hydraulic rams 8. The bolts 26 are then detached from the main doors 23, which are turned back into the inoperative position (shown in dotted lines in Fig. 1) and secured in that position by other hinged bolts 40, after which the upper ends of the chutes 6 are brought below the discharge-openings 28 in the bottom of the vessel and held in position, as by connecting them to the links 37. The supplementary doors 29 are then unfastened and allowed to fall into the open position, (shown in dotted lines in Fig. 1,) whereupon the cargo will commence to fall into the chutes by which it will be conducted to the hoppers 5, the vessel and chutes being raised from time to time as the lower portions of the hoppers become filled with material. After the cargo has been discharged the rams 8 are allowed to descend by opening the hydraulic cylinders 9 to exhaust. When the discharge-openings extend through the sides of the vessel, as in the example shown in Fig. 2, the said discharge-openings and the main and supplementary doors are, as shown, constructed substantially like those in the bottom of the vessel, the said doors being arranged to turn outward and upward. In this case it is desirable to construct the ceiling 38^a of the vessel so that it slopes from the center toward the sides, as shown. The space 38^b between the ceiling 38^a and the bottom of the vessel can then be used for water-ballast. A vessel having doors at the sides, as in Fig. 2, is discharged in a similar manner to the other hereinbefore described.

To strengthen a vessel constructed as described and better adapt it to withstand the strains to which it will be subjected when supported in a loaded condition upon a platform, such as 7, there may advantageously be incorporated with such vessel a pair or more of longitudinal girders or stiffeners. These may be placed outside the vessel, like bilge-keels, or inside on the floor, or they may be built into the sides of the vessel and connected by cross-beams, or may be partly inside and partly outside. In the example shown in Fig. 1 a pair of longitudinal girders or stiffeners 19 are shown at the bottom of the vessel, other longitudinal girders or stiffeners 20 being arranged in the water-ballast tanks 21 and supported by horizontal cross members 22.

What I claim is—

1. For facilitating the discharge of loose cargo, a navigable vessel having a cargo-discharge opening through the lower portion of its hull, a water-tight door secured to said vessel and adapted to close said opening, a supplementary door secured to said vessel inside said water-tight door, said two doors being independently attached and supported, whereby the weight of the loose cargo on the inner door will not be transmitted to the outer water-tight door.

2. For facilitating the discharge of loose cargo, a navigable vessel having cargo-discharge openings through the lower portion of its hull, water-tight doors hinged at one side to said vessel so as to open outward, hinge-bolts attached to said vessel and adapted to hold said doors in a position to close said openings in a water-tight manner, and supplementary doors hinged to said vessel at the inner portion of said openings and arranged to open outward.

3. For facilitating the discharge of loose cargo, a navigable vessel having discharge-openings through the lower portion of its hull, false sides arranged to incline outward toward the said openings, water-tight doors adapted to be secured to said vessel so as to close said openings, and supplementary doors secured to said vessel at the inner side of said water-tight doors.

4. For facilitating the discharge of loose cargo, a navigable vessel having cargo-discharge openings through the lower portion of its hull, seats surrounding the outer ends of the openings and located between said openings and the outer surface of the vessel's hull, water-tight doors secured to said vessel so as to close against said seats and be located inside the outer surface of said hull, and supplementary doors located at the inner ends of said openings.

5. A navigable vessel having a cargo-discharge opening through the lower portion of its hull, a pair of independently supported and fastened doors secured over said opening, one of said doors being secured at the inner portion of said opening and the other being made water-tight and secured at the outer portion of said opening, and means whereby both said doors may be opened outwardly.

6. For facilitating the discharge of loose

cargo, a navigable vessel having cargo-discharge openings through its bottom, water-tight doors hinged at one side to the bottom of said vessel so as to open downward and adapted to be held in the position to close said openings in a water-tight manner by hinge-bolts attached to the vessel, and supplementary doors hinged to the bottom of said vessel at the upper part of said openings and arranged to open downward.

7. For facilitating the discharge of loose cargo, a navigable vessel having discharge-openings through its bottom, false sides arranged to incline downward toward the said openings, water-tight doors secured to the bottom of said vessel and adapted to close said openings, and supplementary doors secured to the bottom of said vessel above said water-tight doors.

8. For facilitating the discharge of loose cargo, a navigable vessel having cargo-discharge openings through the lower portion of its hull, outer main doors for closing said openings in a water-tight manner, links for jointing each of said doors at one edge to said vessel, means for detachably securing the outer edge of each door to said vessel, and supplementary doors arranged at the inner side of said main doors and at a distance therefrom.

9. A navigable vessel having cargo-discharge openings through the lower portion of its hull, separate main and supplementary doors adapted to close and open said openings, and longitudinal stiffening means adapted to strengthen the lower portion of said vessel, substantially as described.

10. A navigable vessel having cargo-discharge openings through the lower portion of its hull, separate main and supplementary doors adapted to close and open said openings, a pair of longitudinal girders arranged like bilge-keels at the under side of the vessel, longitudinal girders arranged inside the vessel, and cross members connected to said longitudinal girders, substantially as described.

Signed at 75 to 77 Cornhill, London, England, this 29th day of September, 1902.

HARRY SHOOSMITH.

Witnesses:
PERCY E. MATTOCKS,
H. MAYKELS.