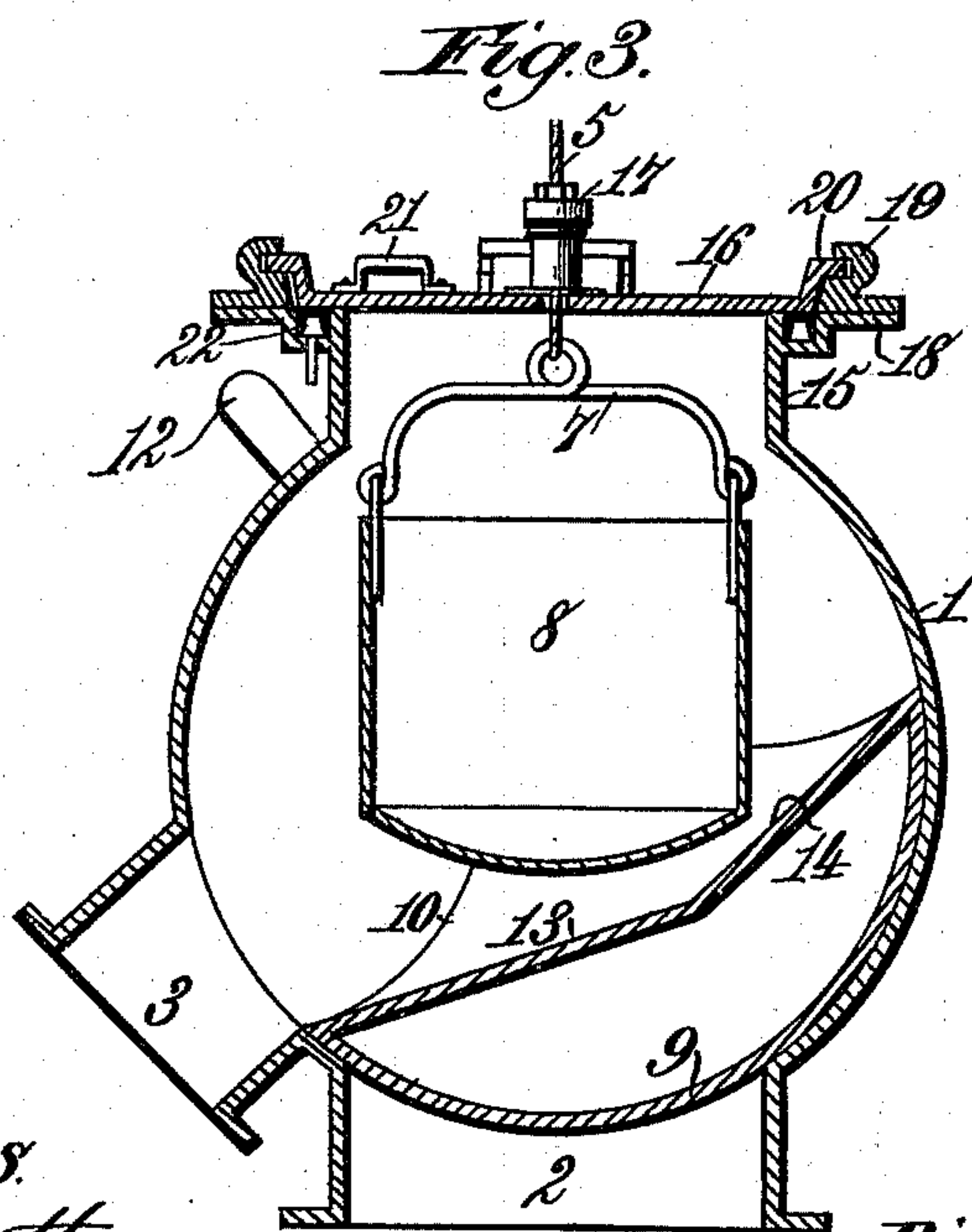
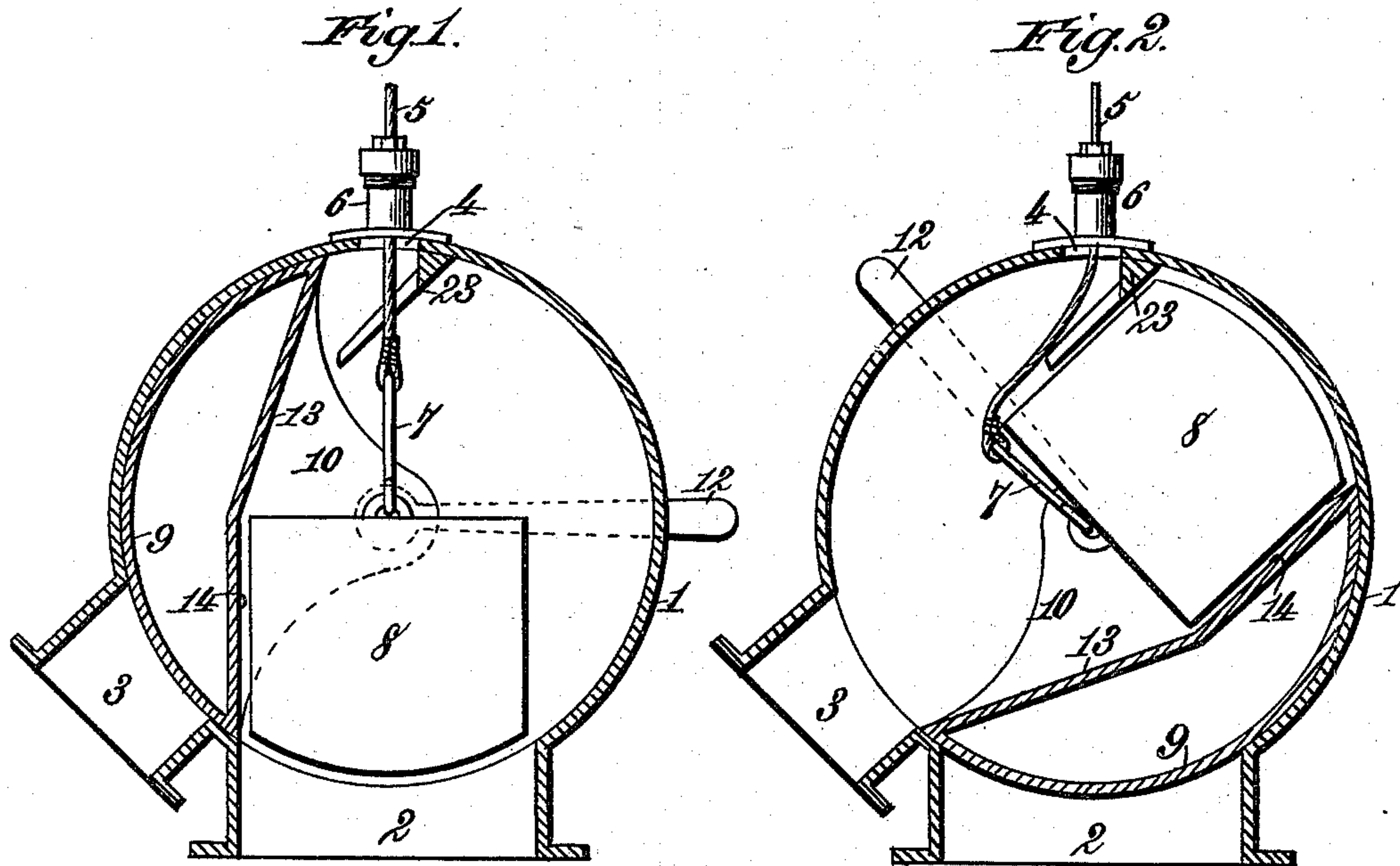


(No Model.)

R. S. GILLESPIE.
AIR LOCK FOR CAISSONS, &c.

No. 573,406.

Patented Dec. 15, 1896.



Witnesses:
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UNITED STATES PATENT OFFICE.

RICHARD S. GILLESPIE, OF NEW YORK, N. Y.

AIR-LOCK FOR CAISSONS, &c.

SPECIFICATION forming part of Letters Patent No. 573,406, dated December 15, 1896.

Application filed July 29, 1896. Serial No. 600,943. (No model.)

To all whom it may concern:

Be it known that I, RICHARD S. GILLESPIE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Air-Locks for Caissons, &c., of which the following is a specification.

This invention relates to air-locks which are connected with or mounted upon the upper or outer ends of caissons or tunneling apparatus designed for building subaqueous or other foundations or for constructing tunnels.

In ordinary air-locks independent doors or valves are arranged at the upper and lower ends of a cylindrical air-lock casing in such manner that the bucket usually employed can be raised from the caisson into the air-lock, while the upper doors or valves are closed and the lower doors or valves are open, after which the latter are closed and the former are opened for withdrawing the bucket from the air-lock.

The object of the present invention is to avoid the use of the upper and lower sets of doors or valves, to provide new and improved means for opening and closing the air-lock, and to provide a device which subserves the functions or purposes of the two sets of doors or valves ordinarily used at the upper and lower ends of the air-lock casing.

My invention also has for its object to provide a novel device which serves to open and close the air-lock and also to tilt the bucket for discharging it of its contents.

The chief feature of my present invention consists in the combination, with an air-lock casing having a passage to communicate with a caisson or tunneling apparatus and a passage for discharging the usual bucket, of a pivoted rotating door or valve mounted in the casing and movable over either of said passages to alternately open and close the same.

My invention also consists in certain other features of construction and in the combination or arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a central vertical sectional view of an air-lock embodying my invention and showing the door or valve in a position to close the bucket-discharging passage. Fig.

2 is a similar view showing the door or valve adjusted to close the passage which communicates with the caisson or tunneling apparatus, and Fig. 3 is a similar view showing a modification of my invention.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates the casing of an air-lock which in practice is connected with or mounted upon the upper or outer end of a caisson or tunneling apparatus designed for building or erecting subaqueous and other foundations or for constructing tunnels.

The air-lock casing 1 is in the form of a cylinder closed at the ends or sides and provided at its lower portion with a passage 2 for communicating with the caisson or tunneling apparatus, and the casing is also constructed with a bucket-discharging passage 3, which, as shown in the drawings, is arranged at an angle of inclination to a perpendicular line passing through the air-lock. I do not, however, confine myself to the particular relative arrangement of the passages 2 and 3, as this arrangement may be varied without altering the spirit of my invention.

The upper side of the casing is provided with an orifice 4, for the passage of the bucket-hoisting cable 5, which extends through a stuffing-box 6 and connects with a bail 7, which is pivotally connected to the bucket 8. The stuffing-box 6 is preferably secured to the casing in proper position relative to the cable-passage 4, and the bucket 8 is of such dimensions that it can pass through the passage 2 as it is moved into or raised out of the caisson or tunneling apparatus.

The passages 2 and 3 are alternately opened and closed through the medium of a door or valve-body 9, which is approximately or substantially segment-shaped or made as the section of a sphere, so that its convex outer surface accurately fits the concave inner surface of the cylindrical air-lock casing. The ends or sides of the door or valve-body 9 are provided with cheeks or plates, as at 10, mounted upon an axle or shaft having a suitable handle or lever 12, by which the shaft can be rocked or turned for the purpose of rotating the door or valve in the casing. I do

not deem it necessary to more fully describe and show the mounting or supporting of the axle or shaft and means for operating the same, as these may be of any construction
5 suitable for the purpose in hand, and therefore I do not wish to be understood as limiting myself to the specific cheeks or plates 10 and handle or lever 12.

The dimensions of the segmental-shaped
10 door or valve 9 are such that in one position the door or valve will close the bucket-discharging passage 3, as in Fig. 1, and in another position will open said bucket-discharging passage and close the passage which leads
15 to the air-lock or tunneling apparatus, as will be understood by reference to Fig. 2.

I believe myself to be the first to provide an air-lock with a rotary device which will alternately open and close two passages, one
20 leading to a caisson or tunneling apparatus and the other serving for the discharge of the bucket ordinarily employed to raise material from the caisson or tunneling apparatus.

The inner side of the door or valve 9 is of
25 angular construction, so as to present two surfaces 13 and 14, which are angularly arranged with relation to each other, the construction being such that when the door or valve 9 is adjusted to close the passage 3, as
30 in Fig. 1, the surface 14 will stand approximately perpendicular and may serve to guide the bucket 8 as it is raised or lowered through the passage 2, and when the door or valve is shifted to close the passage 2 and open the
35 passage 3 the inclined surface 14 will strike the side of the bucket and tilt or upset the same, as shown in Fig. 2, whereby the contents of the bucket will pass down the inclined surface 13 to the discharging-passage
40 3. Obviously if the material is such that it will not freely run out of the bucket through the discharging-passage 3 a suitable instrument can be introduced for withdrawing the contents of the bucket. When the bucket is
45 discharged, the door or valve 9 is rotated to close the discharging-passage 3 and open the passage 2, whereby the bucket resumes its normal upright position and may be passed through the passage 2 into the caisson or tunneling apparatus.
50

The bucket 8 may be introduced into the air-lock casing (shown in Figs. 1 and 2) through the passage 2 prior to attaching the casing to the caisson or tunneling apparatus, but in
55 many instances it may be desired to withdraw the bucket entirely from the air-lock casing for the purpose of loading or unloading the bucket, and to accomplish this I provide the air-lock casing with a suitable manhole, one
60 form of which is illustrated in the modified construction, Fig. 3. Referring to this figure, the reference-numerals corresponding to those found on Figs. 1 and 2 represent similar parts, and therefore I simply describe what
65 I term the "manhole." The manhole is simply a tubular extension 15, formed on or attached to the air-lock casing and adapted to be

opened and closed through the medium of a suitable lid 16, on which the stuffing-box 17 is adapted to rest. The upper end of the tubular extension 15 is provided with a horizontal flange 18, having overhanging flanges or
70 hooks 19 to engage outwardly-projecting lugs 20 on the lid 16.

The lid may be provided with a handle 21,
75 one or more, so that the lid can be engaged with and disengaged from the overhanging flanges or hooks 19.

When the door or valve 9 is in the position shown in Fig. 3 and closes the passage 2, the
80 bucket may be discharged through the discharging-passage 3, or the bucket may be raised out of the air-lock casing by first detaching the lid 16.

To secure an air-tight connection between
85 the tubular extension 15 and the lid 16, I provide a suitable packing-ring 22, which is preferably seated in the flange 18 and bears against the under side of the lid 16. The packing-ring is preferably trough-shaped or
90 tubular, so that it can be expanded and caused to press tightly against the lid.

It will be obvious that the door or valve 9 not only serves to alternately open and close
95 the passages 2 and 3, but that it also serves to tilt or upset the bucket, which I believe desirable and advantageous.

The air-lock casing is provided interiorly at its upper portion with an inclined fixed abutment or stop 23, against which the bucket
100 8 is adapted to bear when it is tilted or upset by the action of the door or valve 9. The abutment or stop 23 therefore serves to limit the motion of the bucket as it is carried around and tilted or upset by the door or valve, as
105 will be obvious.

My invention provides an air-lock wherein a single device takes the place of the usual upper and lower sets of doors or valves of an
110 air-lock, and therefore provides a more simple and economical construction.

Having thus described my invention, what I claim is—

1. The combination with an air-lock casing having a passage to communicate with a caisson, or tunneling apparatus, and another passage for unloading the usual bucket, of a pivoted, rotating door or valve mounted in the casing and movable over either of said passages to alternately open and close the same,
115 substantially as described.

2. The combination with a cylindrical air-lock casing having a passage to communicate with a caisson, or tunneling apparatus, and an inclined bucket-discharging passage, of a
125 rotary device journaled in the casing and movable in a circular path over either of said passages to alternately open and close the same, substantially as described.

3. The combination with an air-lock casing
130 having a passage to communicate with a caisson, or tunneling apparatus, and a passage for unloading the usual bucket, of a rotary device journaled in the casing and movable over

either of said passages to alternately open and close the same, said rotary device being constructed to tilt or upset the bucket as said device moves into position to cover the passage which leads to the caisson, or tunneling apparatus, substantially as described.

4. The combination with an air-lock casing having a passage to communicate with a caisson, or tunneling apparatus and a passage for unloading the usual bucket, of a rotary device journaled in the casing and movable over either of said passages to alternately open and close the same, said rotary device being constructed to tilt or upset the bucket as said device is turned, and an abutment or stop

against which the bucket is adapted to bear when it is tilted or upset, substantially as described.

5. The combination with an air-lock casing, of a rotary door or valve constructed to open and close the air-lock and tilt or upset the air-lock bucket, substantially as described.

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

RICHARD S. GILLESPIE.

Witnesses:

ALBERT H. NORRIS,
THOS. A. GREEN.