(No Model.)

R. S. GILLESPIE.

AIR LOCK FOR CAISSONS, &c.

No. 570,794. Patented Nov. 3, 1896.

Fig. 1.

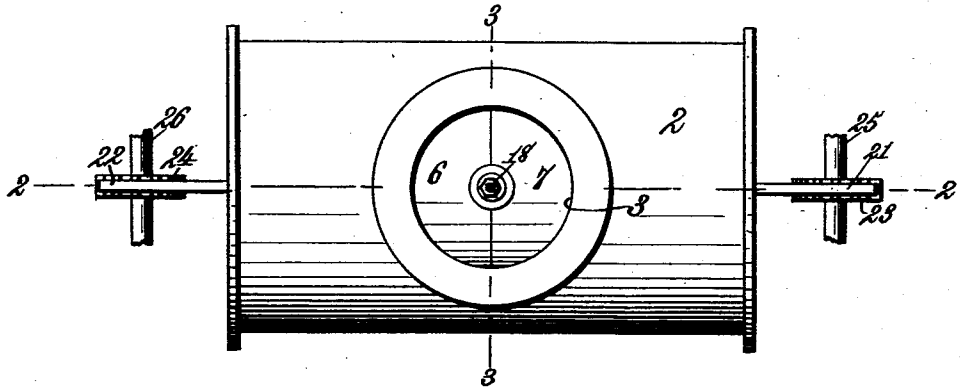


Fig. 2.

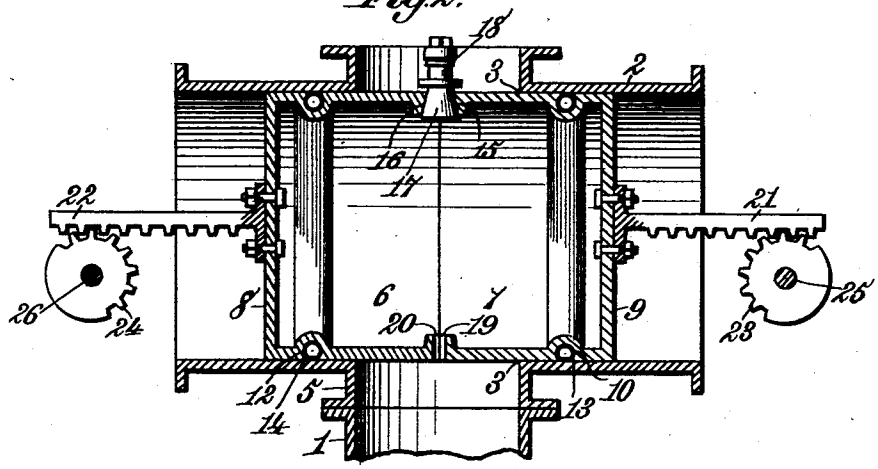
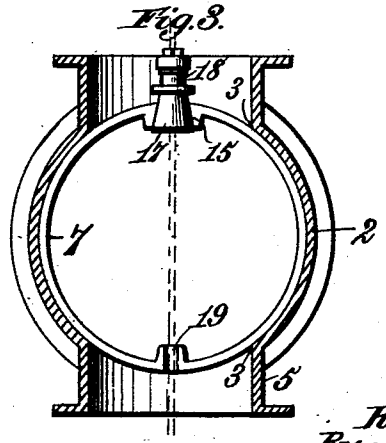


Fig. 3.



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. 570,794, dated November 3, 1896.

Application filed July 29, 1896. Serial No. 600,945. (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 has for its object to provide an air-lock with novel, simple, and efficient means for opening and closing the same.

To accomplish this object my present invention consists, essentially, in the combination, with an air-lock casing, of a horizontal cylinder mounted on a part of said casing, means for opening and closing the air-lock casing, composed of two pistons movable to and fro within said cylinder, and suitable means for operating the pistons.

The invention is illustrated by the accompanying drawings, in which—

Figure 1 is a top plan view of an air-lock embodying my invention. Fig. 2 is a vertical sectional view taken on the line 2 2, Fig. 1; and Fig. 3 is a vertical central sectional view taken on the line 3 3, Fig. 1.

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 may be in the form of a cylinder or of any other shape in cross-section suitable for the purpose in hand. The upper end of the air-lock casing is surmounted by and rigidly connected to a horizontal cylinder 2, having diametrically-arranged openings 3 at the center of its upper and lower sides of such construction that the usual bucket employed in connection with an air-lock can be moved through the cylinder to introduce it into or remove it from the air-lock casing. This casing is designed to be connected with the upper or outer end of a caisson or tuneling apparatus, and in practice the lower end of the casing is provided with any suitable doors or valves whereby its lower end may be opened and closed in the usual manner.

Inasmuch as the lower doors or valves do not constitute any part of my present invention, and as such doors or valves may be constructed and operated in any ordinary manner, I do not deem it necessary to illustrate the same in the drawings.

The lower side of the horizontal cylinder 2 is provided with a central tubular extension 5, by means of which the cylinder can be bolted or otherwise attached to the upper ends of the air-lock casing. The central vertical passage-way through the horizontal cylinder is adapted to be opened and closed through the medium of two horizontally-movable pistons 6 and 7, which, as herein shown, are in the form of hollow cylinders closed at their outer ends by disk-shaped heads 8 and 9 and open at their inner ends. These inner ends are adapted to be brought together when the two pistons are slid toward each other to the position shown in Fig. 2, the construction being such that when the two cylindrical pistons are brought together at their inner ends an air-tight closure of the upper end of the air-lock casing is effected.

The peripheries of the cylindrical pistons are provided with annular grooves 10 and 12, in which tubular or other suitable packing-rings 13 and 14 are arranged for the purpose of providing a tight joint between the peripheries of the pistons and the internal surface of the cylinder.

The packing-rings 13 and 14 may be of any construction and material suitable for the purpose; but I prefer to make them in the form of tubes adapted to be filled with some fluid, so that they will be expanded and caused to bear tightly against the internal surface of the cylinder.

The inner edges of the two pistons are provided at their upper sides with semicircular recesses 15 and 16, adapted to be brought against and form an air-tight connection with the taper portion 17 of a stuffing-box 18, through which the bucket-hoisting cable is adapted to move as usual.

I do not deem it necessary to illustrate the bucket or the cable, as these features are well known.

The inner edges of the two pistons are provided at their lower sides, at points coincident with the semicircular recesses 15 and 16, with recesses 19 and 20, adapted to make a tight connection, by any suitable packing or otherwise, with the bucket-hoisting cable, so that when the two pistons are closed together

against the stuffing-box and cable an air-tight closure of the upper end of the air-lock casing is obtained.

I have illustrated the two pistons as made in the form of hollow cylinders closed at their outer ends and open at their inner ends; but I do not wish to be understood as confining myself to this particular construction of two cylindrical pistons.

The two pistons may be moved toward and from each other through the medium of any mechanism suitable for the purpose in hand; but as herein illustrated this is accomplished by providing the disk-shaped heads 8 and 9 with rack-bars 21 and 22, which engage gears 23 and 24, mounted on suitable shafts 25 and 26, so that by rocking the shafts and gears the rack-bars are reciprocated and the two pistons are moved back and forth.

When the two pistons are closed together, their meeting edges lie coincident with the center of the air-lock casing; but this point of meeting may be more or less varied.

My invention provides new and improved means for opening and closing an air-lock, and the construction of parts is such that a very desirable air-lock, efficient in operation, can be economically produced.

Having thus described my invention, what I claim is—

1. The combination with an air-lock casing, of a horizontal cylinder forming a part of said casing, means for opening and closing the air-lock casing, composed of two pistons movable to and from each other within said cylinder and adapted to come together approximately at the center of the air-lock casing, and suitable means for operating the two pistons, substantially as and for the purposes described.

2. The combination of an air-lock casing having a horizontal cylinder mounted on its upper or outer end, means for opening and closing the air-lock, composed of two pistons movable to and from each other within said cylinder, and suitable means for operating the pistons, substantially as and for the purposes described.

3. The combination with an air-lock casing, of a horizontal cylinder mounted upon said casing and provided at its center with upper and lower passage-ways, two pistons movable toward and from each other between said upper and lower passage-ways of the cylinder and adapted to open and close the air-lock casing, and means for operating the pistons, substantially as and for the purposes described.

4. The combination with an air-lock casing, of a horizontal cylinder connected with said casing and provided with upper and lower passage-ways, two hollow cylindrical pistons movable back and forth in said cylinder and provided at their inner edges with recesses to engage a stuffing-box and with recesses for the passage of the bucket-hoisting cable of the air-lock, and means for operating the two pistons, substantially as and for the purposes 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.