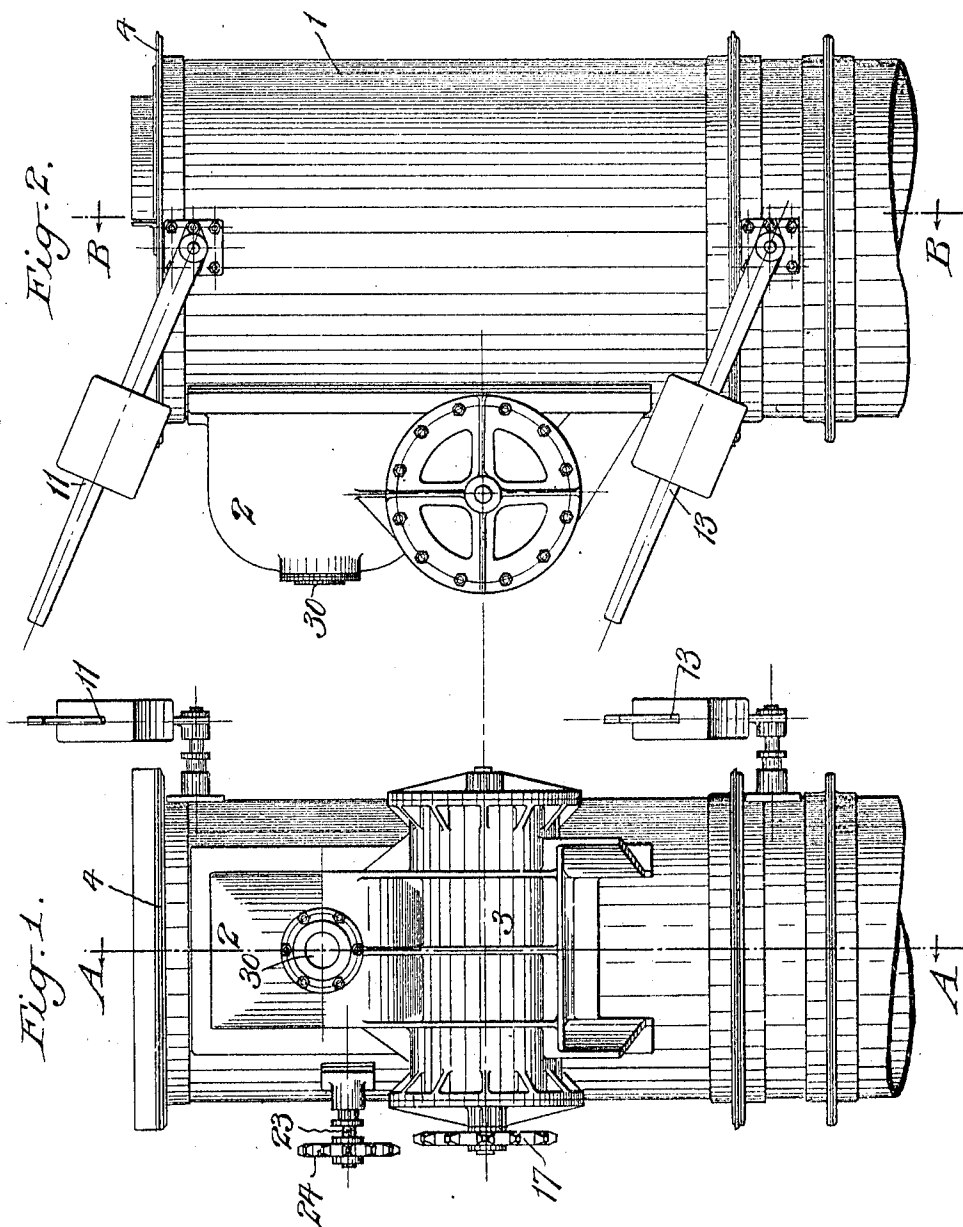


J. H. GRAY.
AIR LOCK FOR EXCAVATING APPARATUS.
APPLICATION FILED MAR. 19, 1909.

950,388.

Patented Feb. 22, 1910.

3 SHEETS—SHEET 1.



WITNESSES:
Henry Thiele.
J. George Barry

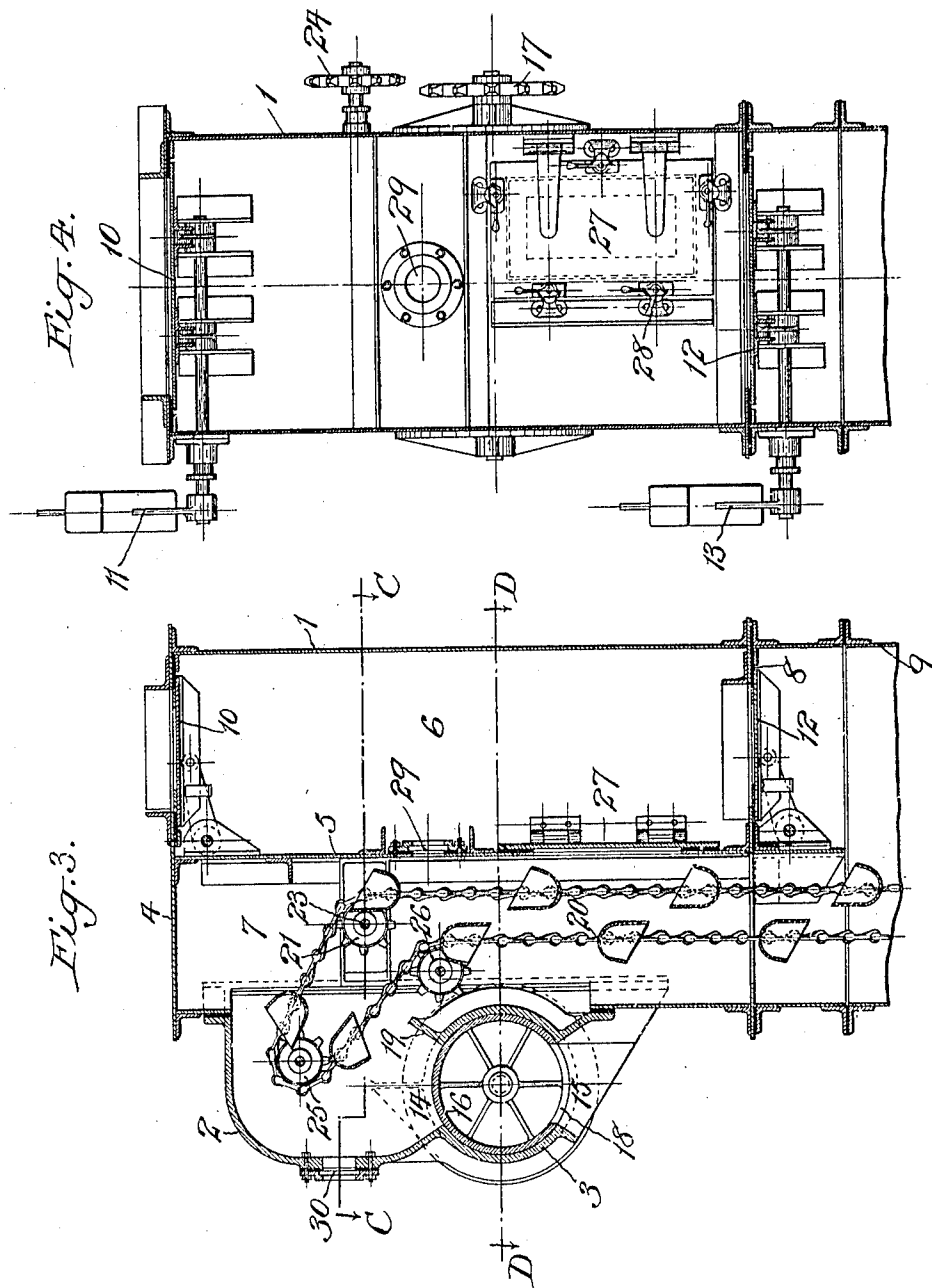
INVENTOR.
John H. Gray
BY Brown & Davis
his ATTORNEYS.

J. H. GRAY.
AIR LOCK FOR EXCAVATING APPARATUS.
APPLICATION FILED MAR. 19, 1909.

950,388.

Patented Feb. 22, 1910.

3 SHEETS—SHEET 2.



WITNESSES:
Henry Thorne.
J. George Barry

INVENTOR.
John H. Gray
BY Brown & Ward
his ATTORNEYS.

J. H. GRAY.
AIR LOCK FOR EXCAVATING APPARATUS.
APPLICATION FILED MAR. 19, 1909.

950,388.

Patented Feb. 22, 1910.

3 SHEETS—SHEET 3.

Fig. 6.

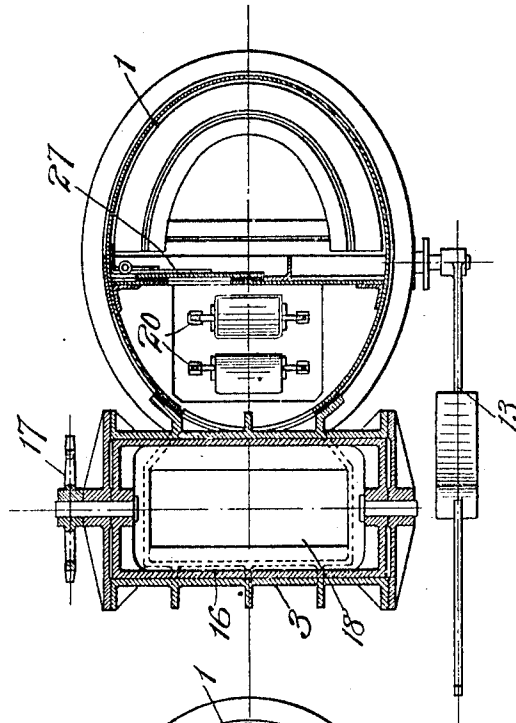
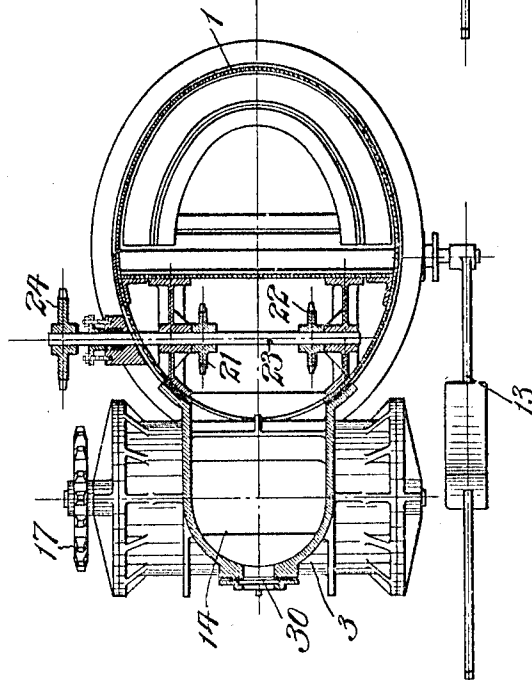


Fig. 5.



WITNESSES:

Henry Thieme.

J. George Barry.

INVENTOR.

John H. Gray
BY Brown & Ward
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN H. GRAY, OF EAST ORANGE, NEW JERSEY.

AIR-LOCK FOR EXCAVATING APPARATUS.

950,388.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed March 19, 1909. Serial No. 484,541.

To all whom it may concern:

Be it known that I, JOHN H. GRAY, a citizen of the United States, and resident of East Orange, in the county of Essex and State of New Jersey, have invented a new and useful Air-Lock for Excavating Apparatus, of which the following is a specification.

My invention relates to air locks for excavating apparatus, with the object in view of providing efficient means for removing the excavated material from within the caisson to the external air without materially interfering with the air pressure within and at the same time providing for the passage of workmen into and out of the caisson without interrupting the removal of the excavated material.

A practical embodiment of my invention is illustrated in the accompanying drawings in which,

Figure 1 is a view of the lock in front elevation, Fig. 2 is a view of the same in side elevation, Fig. 3 is a vertical central section from front to rear, in the plane of the line A—A, Fig. 1, Fig. 4 is a vertical section in the plane of the line B—B, Fig. 2, Fig. 5 is a horizontal section in the plane of the line C, C, Fig. 3, and Fig. 6 is a horizontal section in the plane of the line D—D, Fig. 3.

The casing of the air lock which is an upward extension of the caisson, consists of a main or body portion 1, here shown as oval in cross section and provided at the front with a hollow projection 2, conveniently U-shaped in horizontal section, the bottom of which projection opens into a transverse cylindrical casing 3, also at the front of the main casing 1.

The main casing 1 is provided with an air tight top or cover 4, and a vertical air tight partition 5, separating the interior of the main casing into two compartments 6 and 7, the former having an air tight bottom 8 and the latter open at the bottom to the interior of the caisson proper 9, or tube leading to the caisson proper, and also open to the interior of the hollow projection 2.

The compartment 6 is employed for the passage of workmen to and from the caisson proper and is provided at its top with a trap door 10, opened and closed by a weighted lever 11 which may be swung past center in each of two ways to hold the door closed and opened. In like manner the bottom 8 is pro-

vided with a trap door 12 operated by a weighted lever 13.

The cylindrical casing 3 has an opening 14 at its top at the base of the hollow projection 2 and also an opening 15 at its bottom. Within the cylindrical casing 3, a hollow cylinder 16 fits with a tight rotary fit, the said cylinder 16 being journaled in the ends of the cylindrical casing 3 and one of its journals provided with a sprocket wheel 17, located exterior to the end of the casing 3 for applying power to rotate the cylinder. The said cylinder 16 is provided with an opening 18 in its wall, the extent of said opening preferably corresponding to the openings 14 and 15 in the casing 3. The wall of the casing 3, particularly the inner wall at the margin of the opening 14, is extended upwardly and inwardly as shown at 19, forming between it and the front wall of the projection 2, a funnel-shaped pocket for the reception of the excavated material as the latter is dumped from the endless chain of buckets.

An endless chain of buckets, denoted by 20, passes up from within the caisson, or tube leading to the caisson 9, into the compartment 7 to and over a pair of sprocket wheels 21, 22, on a shaft 23 carrying a driving sprocket wheel 24, exterior to the casing, to which driving sprocket wheel power is applied from any suitable source. Thence the bucket chains extend to and over guide sprocket wheels 25, (one only being shown), mounted within the projection 2, over the opening 14 in the casing 3, and thence downwardly and inwardly to guide sprocket wheels 26, (one only being shown), and thence down into the caisson 9.

The operation is as follows: The workmen at the bottom of the caisson 9, fill the buckets on the endless chain as they begin their upward travel and the buckets are dumped as they pass over the wheels 25, the excavated material falling into the opening 14 and accumulating there until the dumping cylinder 16 is rotated into position to present its mouth 18 beneath the opening 14, when the excavated material will drop into the cylinder 16 and as the latter is rotated to present its mouth to the opening 15, will fall into the exterior air, either in a pile or onto some suitable carrier as may be desired.

It will be observed that the work of the

endless chain of buckets may be continuous, and that in passing their loads from within the air lock compartment 7 into the open air, the compartment 7 is not opened to the
 5 external air, the dumping cylinder 16 forming a cut-off valve between the interior of the compartment 7 and the external air at all times. It will further be observed that
 10 passage to and from the caisson is not interfered with by the continuous work of the endless chain of buckets.

Access to the several working parts may be had by a door 27 in the partition 5, which door is held closed air tight by means of
 15 clamp locks 28 at its sides and ends. Peep holes 29 and 30 are provided, the one in the partition 5 and the other in the wall of the projection 2, for observing the work of the endless chain of buckets, the peep
 20 holes being closed air tight by transparent material, for instance, glass.

It is to be understood that well known or approved means are to be provided for
 25 maintaining the necessary air pressure in the caisson as usual.

It is obvious that changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention; hence
 30 I do not wish to limit myself strictly to the structure herein shown and described, but

What I claim is:

1. An air lock for excavating apparatus, including a dumping valve provided with
 35 a load receiving opening in its wall and arranged to close the lock to the external air while permitting the passage of the excavated material and means for depositing the excavated material in the valve.

40 2. An air lock for excavating apparatus, including a rotary dumping valve provided with a load receiving opening in its wall and arranged to close the lock to the external air while permitting the passage of the
 45 excavated material and means for depositing the excavated material in the valve.

50 3. An air lock for excavating apparatus, including a rotary hollow cylindrical valve provided with a load receiving opening in its wall and arranged to close the lock to the external air while permitting the excavated material to enter and pass out of the

valve and means for depositing the excavated material in the valve.

4. An air lock for excavating apparatus 55 provided with a cylindrical valve seat in its wall provided with openings, a rotary hollow cylinder fitted in the seat and provided with an opening in its wall and means for depositing the excavated material in said
 60 rotary cylinder.

5. An air lock for excavating apparatus provided with a cylindrical valve seat in its wall provided with an opening to the interior of the lock and an opening to the exterior 65 air, the opening to the interior of the lock having retaining walls extending upwardly therefrom, a rotary hollow cylinder fitted in said seat and provided with an opening in its wall and means for depositing
 70 the excavated material in said rotary cylinder.

6. An air lock for excavating apparatus provided with a hollow air tight projection offset from the main or body portion, a
 75 dumping valve provided with a load receiving opening in its wall and located at the lower portion of said offset, the said valve being arranged to maintain the lock closed to the external air while permitting the excavated material to pass and means for
 80 raising the excavated material into said offset above the dumping valve and depositing the material in the valve.

7. An air lock for excavating apparatus 85 provided with a vertical partition separating the lock into two compartments, one of said compartments having a closed top and bottom provided with trap doors and the other compartment having a closed top and
 90 open at the bottom to the caisson, an endless chain elevator extending from the caisson up into the latter compartment and a dumping valve for passing the excavated material through the wall of the compartment.
 95

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this seventeenth day of March 1909.

JOHN H. GRAY.

Witnesses:

F. GEORGE BARRY.
 HENRY THIEME.