

July 3, 1923.

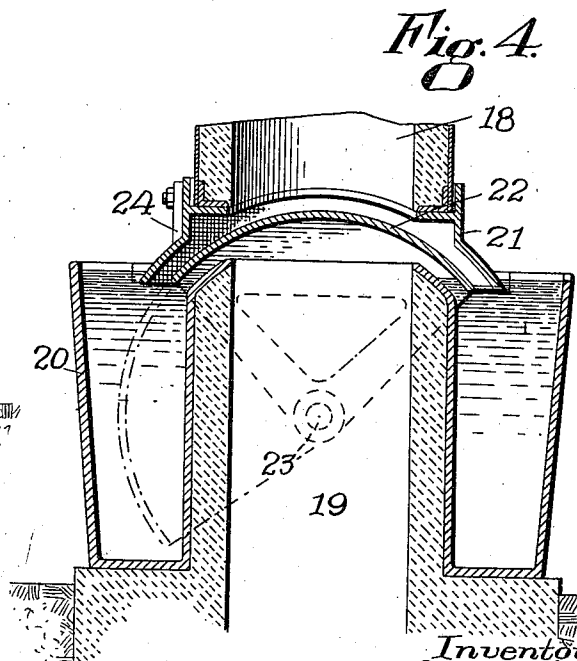
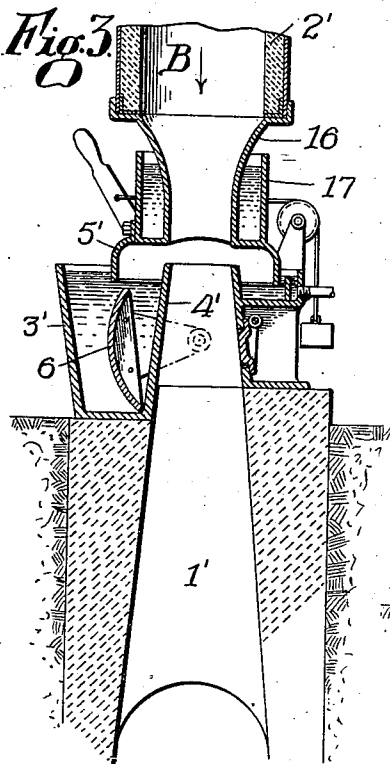
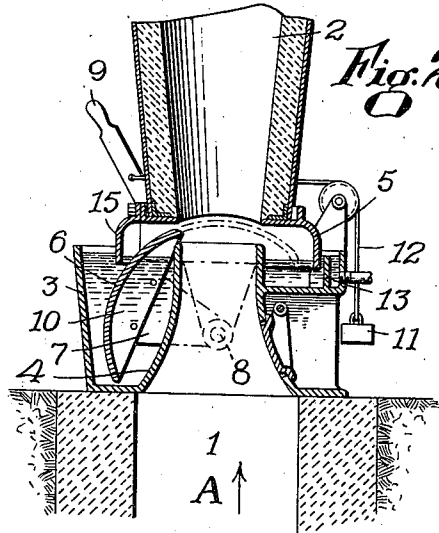
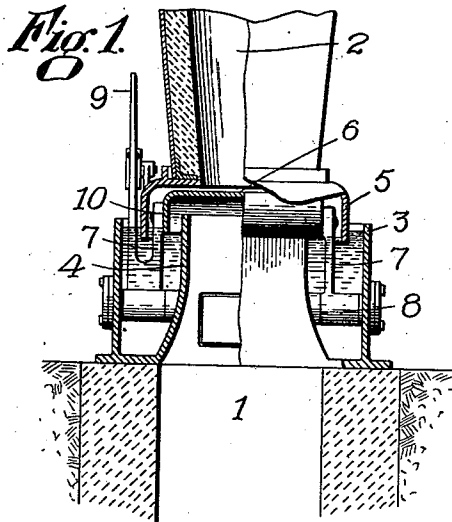
G. H. ISLEY

1,460,587

VALVE

Filed Feb. 19, 1919

2 Sheets-Sheet 1



Inventor
G. H. Isley
By Attorney
Geo. H. Kennedy

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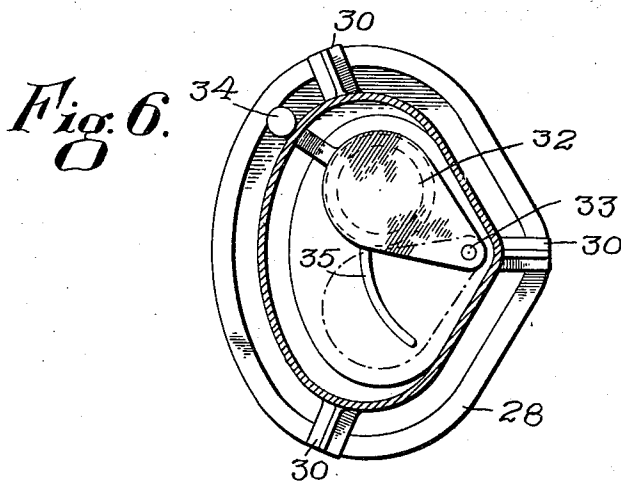
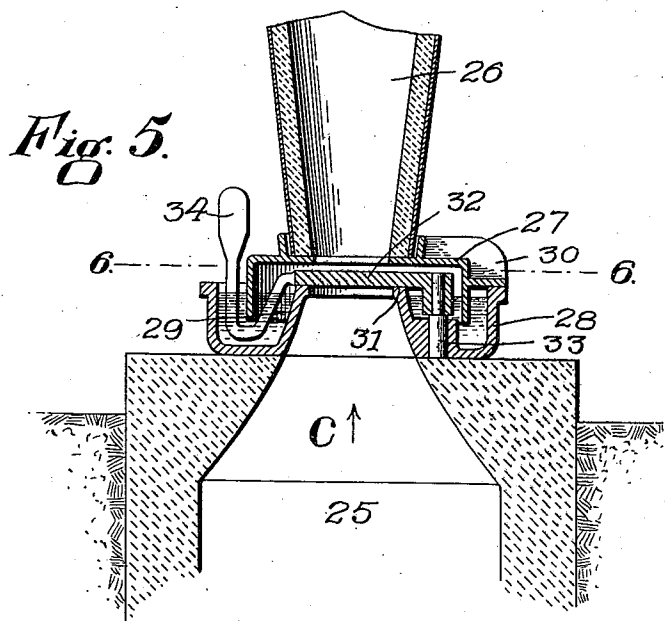
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G. H. ISLEY

VALVE

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2 Sheets-Sheet 2



Inventor
G. H. Isley
By Attorney,
Geo. H. Kennedy & Co.

UNITED STATES PATENT OFFICE.

GEORGE H. ISLEY, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO MORGAN CONSTRUCTION COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

VALVE.

Application filed February 19, 1919. Serial No. 277,952.

To all whom it may concern:

Be it known that I, GEORGE H. ISLEY, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in a Valve, of which the following, together with accompanying drawings, is a specification.

The present invention relates generally to valves or dampers such as are used in flues or conduits for the passage of gases, as for instance furnace flues or the like. The invention relates particularly to the provision of a valve or damper which, in closed position, is adapted more effectually than the valves or dampers now in ordinary use to shut off the flue or conduit and prevent the passage of gas therethrough. To this end the valve structure is adapted to cooperate with a body of water in such a manner as to constitute, in its closed position, an effective water seal against the escape of gases past that point in the flue where the valve is located, thus affording marked advantages over the sand seal and other cut off devices or valves which are now in ordinary use.

The principles of the invention are fully set forth hereinafter, reference being had to the accompanying drawings which illustrate several embodiments thereof, and in which drawings

Fig. 1 is a view in elevation of a flue or conduit with the invention applied thereto, said view being partially in section to disclose the interior construction.

Fig. 2 is a sectional view at right angles to the section of Fig. 1.

Fig. 3 is a similar sectional view illustrating a modified construction.

Fig. 4 is a similar sectional view illustrating further modifications.

Fig. 5 is a sectional view of another type of valve which partakes of certain of the principles of the invention.

Fig. 6 is a sectional view of the same, the section being taken approximately on the line 6—6 of Fig. 5.

Like reference characters refer to like parts in the different figures.

Referring to Figs. 1 and 2, the numeral 1 indicates a flue or conduit, which, as herein shown for purposes of illustration, terminates at or near the ground level, although obviously any other arrangement of this flue may be adopted. The continuation of flue

1 is embodied in a suitably supported conduit or passage 2 directly above the same, the arrangement being such that normally there will be a continuous flow of gas through the flues 1 and 2, in the direction of arrow A.

To this end there is disposed between the adjacent ends of the flues 1 and 2 a receptacle or casting 3, having an interior passage 4 that takes the gas directly from the flue 1. The passage 4 terminates just short of the passage or flue 2, for a purpose hereinafter described.

The end of passage or flue 2 has a depending skirt or flange 5, which at all times dips below the surface of a body of water carried by the receptacle 3 and completely surrounding the upper end of passage 4. In this way, in spite of the gap left between the passages 2 and 4, there is always a gas tight connection between them, since there is no possibility for any gas to escape past the skirt 5 as long as the latter dips into the annular body of water in receptacle 3.

The gap between the passages 2 and 4 allows the free movement between said passages of a valve or damper 6, which is here shown as supported by rocking arms 7 that are journaled at 8 between the passage 4 and the outer wall of receptacle 3. The valve 6 is thus adapted to move in an oscillatory manner about the axis of arms 7, this movement being effected by any suitable means such as a lever arm 9 which may be connected to the arm 7 for this purpose.

In the open or inoperative position of valve 6, said valve, as shown in Fig. 2, is disposed wholly at one side of the passage 4, so as not to obstruct the travel of gas from the flue 1 to the flue 2, the valve 6 being immersed, for the most part, in the water at one side of the receptacle 3. When the lever 9 is moved to the right in Fig. 2, the arms 7 are swung about their pivots into an upright position, thus carrying the valve 6 into the gap between the passages 2 and 4, directly over the outlet of passage 4. In this position the valve 6, by reason of its curvature and by reason of its depending skirt 10, provides a water seal entirely surrounding the open end of passage 4, and within the water seal provided by the skirt or flange 5. As a result, the exit of gas from the passage 4 is effectually and positively cut off, and all communication between the flues 1 and 2 is closed.

It is to be noted that the travel of the valve is in a circular path, about the axis of the arms 7, and that this path, where it intersects the surface of the water in receptacle 3, is within the space inclosed by the depending water seal skirt 5. To render easier the movement of the valve to its closing position, the weight of the same may be partially counterbalanced, if desired, by a counterweight 11 attached by a flexible connection 12 to the lever 9. To insure the maintenance of sufficient water in the receptacle 3, an overflow partition 13 thereof is extended well above the lower edge of skirt 5, and also well above the edge of valve 6 when the latter is in closed position. Such position may be determined by the engagement of arm 7 with a stop 14, or in any other suitable manner.

To permit access to the valve 6, for the purpose of withdrawing or repairing the same, the flange or skirt 5 has a removable section 15 disposed above that part of the receptacle 3 which the valve occupies when in open position. By removing this section 15, the valve may be withdrawn bodily without difficulty, and if desired, a new valve may be put in its place. As an alternative to this arrangement, the construction of Fig. 3 may be adopted, this construction involving a water receptacle 3' of sufficient depth to allow the valve 6 in its inoperative position, to be lowered entirely past the flange or skirt 5'. In the construction of Fig. 3, the flow of gas is in the opposite direction to that illustrated in Figs. 1 and 2, being in the direction of arrow B, from the flue 2' into the flue 1'. The principle of operation, however, of the valve 6 and its cooperating water seal instrumentalities is precisely the same in the two cases, as will be apparent. Said valve 6 of Fig. 3 when moved into closing position, forms a water seal around the end of interior passage 4' and effectually prevents the entrance of any gas into said passage. The surrounding skirt 5' of flue extension 16 cooperates with the water in receptacle 3' to prevent any escape of gas outwardly. In Figs. 1 and 2 the flue extension of passage 4 is effectually water cooled by the surrounding water of receptacle 3; in Fig. 3, the flue extension 16 may be correspondingly cooled by a surrounding water chamber 17.

The size of the parts entering into the construction of the valve is reduced in Figs. 1 and 2 by contracting the passage 4 in the direction of travel of the gas, and thereafter expanding to normal cross section in the passage 2. The same principle is involved in the construction of Fig. 3, by contracting the flue extension 16 and then allowing the gas to expand in the passage 4' and in the flue 1'. However, this arrangement of parts is not essential to the invention, since obviously the

arrangement of flue passages shown in Fig. 4 may readily be adopted, without greatly increasing the size of the valve. In the construction of Fig. 4, the flue passages 18 and 19 are uniform in cross section throughout, the passage 19 being surrounded by water receptacle 20 into which dips the skirt 21. The water receptacle 20 is made deep enough to receive the valve 22 on either side of its axis 23, and consequently said valve is adapted to be opened to establish communication between the flues 18 and 19 by movement in either direction about its axis. Access to the valve is obtained by removing the section 24 of the skirt 23.

The several constructions shown are obviously susceptible of wide variation in the manner of adapting them to different types of flues or conduits, without departing from the spirit of the invention as set forth in the annexed claims. It will be seen that the valve or damper in every instance is operable, in all positions between full-open and full-closed, to throttle and control the flow of gases through the conduit, precisely the same as an ordinary damper; when entirely closed, all possibility of gas leakage past the valve is eliminated.

A modified form of valve, which is applicable under certain conditions, is illustrated in Figs. 5 and 6, wherein a flue or passage 25, through which the gas flows in the direction of arrow C, is shown as provided with an extension 26. The sections 25 and 26 are spaced apart and connected by a water seal, the latter embodying a skirt 27 depending from the section 26 and dipping into a substantially annular water chamber provided by a water seal casting 28, which provides an interior passage 29 that takes the gas directly from flue 25. As herein shown, the skirt 27 has a plurality of feet or lugs 30, 30, which rest on the rim of casting 28 and thereby support the extension 26 in spaced relation to the passage 29.

The upper edge of passage 29 presents a smooth finished annular surface or seat 31; for cooperation with this seat, a flat valve 32, having a finished under surface, is provided, said valve being pivoted on a pin 33 which projects upwardly from the bottom of casting 28. The valve 32 has secured thereto a handle 34, which is curved downwardly beneath the skirt 27, and thence passes upwardly in position to be seized by the operator. When in closed position, the valve effectually shuts off the passage of gases through the flues 25, 26, and when moved into open position, as shown by dotted lines in Fig. 6, a clear passage through said flues is afforded. The manipulation of the valve is accomplished by the handle 34 which projects through and beyond the water seal elements, and it is ob-

vious that the contraction of the passage and the cooling of the valve seat by the surrounding water enables the valve to operate with entire satisfaction under the conditions assumed, viz, with the gas flowing in the direction of the arrow C. The casting 28 provides a bearing lug 35 for the support of valve 32, when the latter is moved into open position.

10 I claim,

1. A conduit comprising spaced registering sections, a water-seal between said sections, a valve operable in the space between said sections, and adapted to provide a water-seal against the flow of gases through said conduit and valve operating means projecting through said water seal.

2. A conduit providing spaced registering sections, a water chamber surrounding one of said sections, a skirt on the other section making a seal with the water in said chamber, and a valve in said conduit adapted in closed position to make a seal with the water in said chamber.

3. The combination with a conduit, of a surrounding water chamber, and a valve in said conduit adapted in closed position to make a seal with the water in said chamber, said valve in open position being submerged in said water chamber and operating means for said valve disposed in said water cham-

ber and projecting above the surface of the water therein.

4. The combination, with communicating conduit sections, of a water chamber open at the top, and providing a water seal between said sections, a pivoted valve adapted to seal with the water in said chamber, and a valve operating lever projecting out of said chamber through the upper open end thereof.

5. The combination, with communicating conduit sections, of a water chamber surrounding one of said sections, a skirt on the other section making a seal with the water in said chamber, a valve adapted to close off communication between said sections within the water seal provided by said skirt, and an operating means for said valve disposed outside of said skirt but within the wall of said chamber.

6. A conduit comprising two spaced registering sections, a water seal between said sections, a valve operable in the space between said sections, and means extending through said water seal for operating said valve.

Dated this twelfth day of February 1919.

GEORGE H. ISLEY.

Witnesses:—

RUFUS R. FOWLER,
NELLIE WHALEN.