

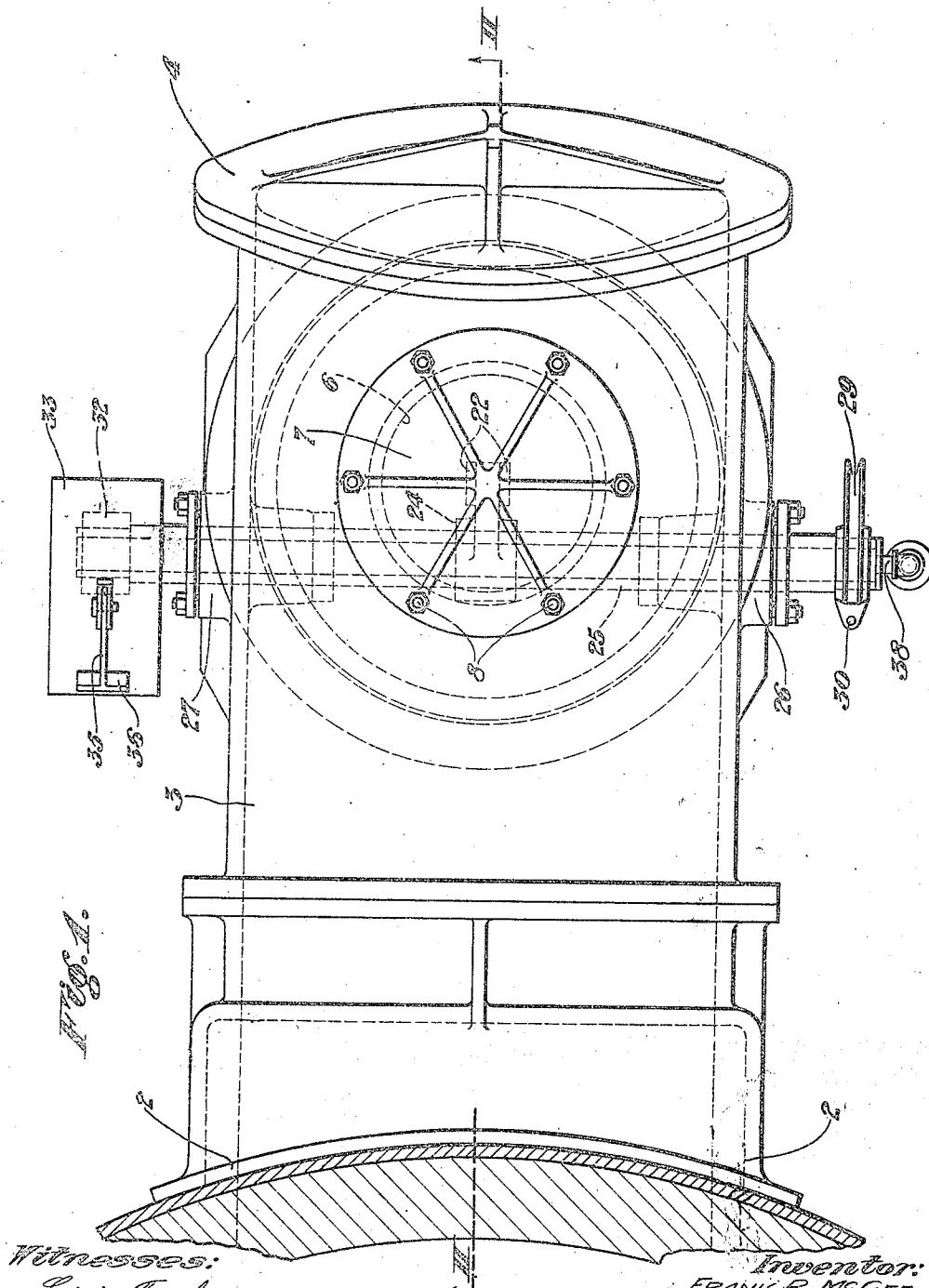
Feb. 6, 1923.

1,444,767

F. R. McGEE
CHIMNEY VALVE

Filed Jan. 12, 1922

3 sheets-sheet 1



Witnesses:
Edwin Trueb

Inventor:
FRANK R. McGEE,
by: *Anthony Usina*
his Attorney.

Feb. 6. 1923.

F. R. McGEE

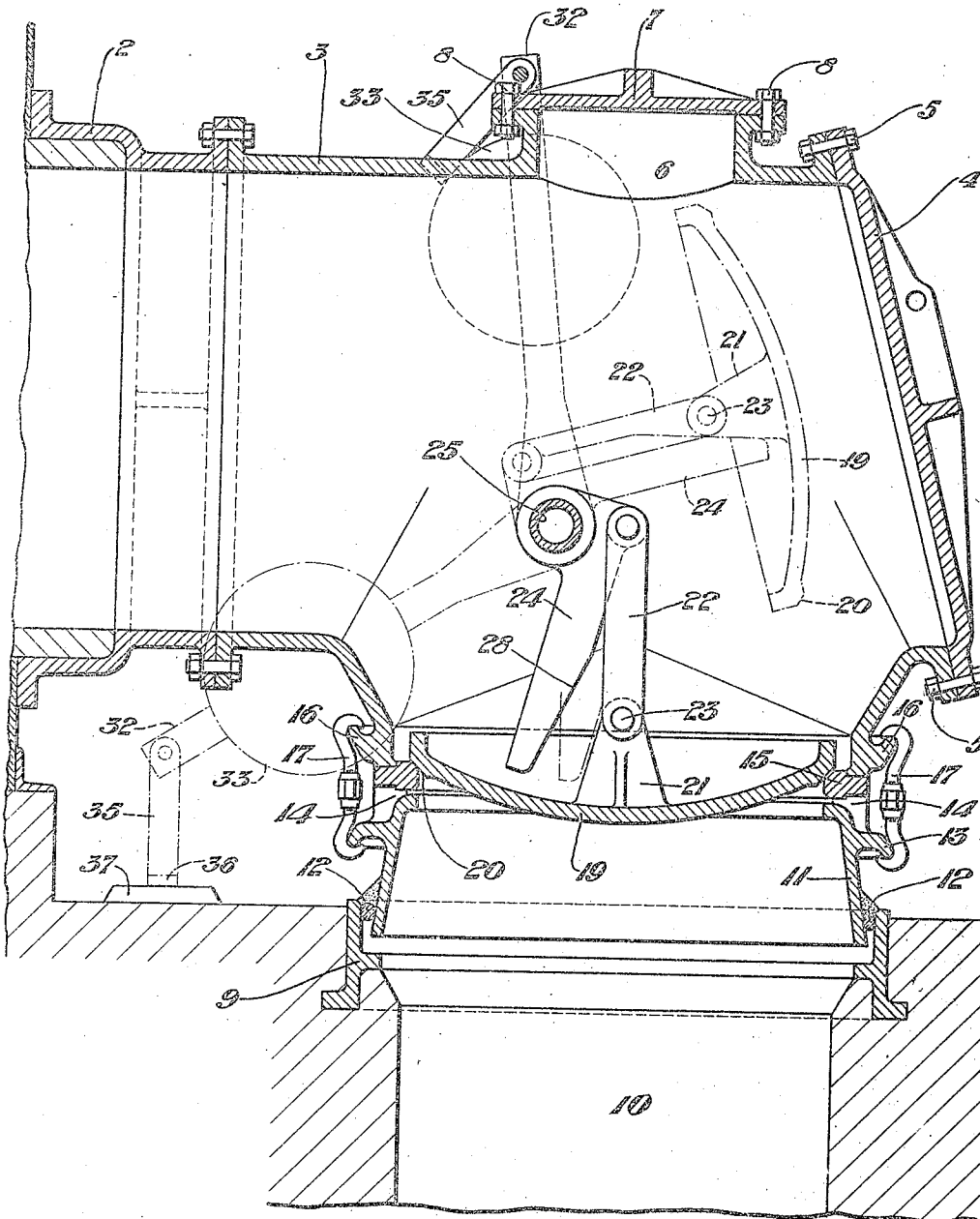
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CHIMNEY VALVE

Filed Jan. 12, 1922

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Fig. 2.



Witnesses:
Edwin T. Pugh

Inventor:
FRANK R. MCGEE,
by:
S. Anthony Devia
his Attorney.

Feb. 6, 1923.

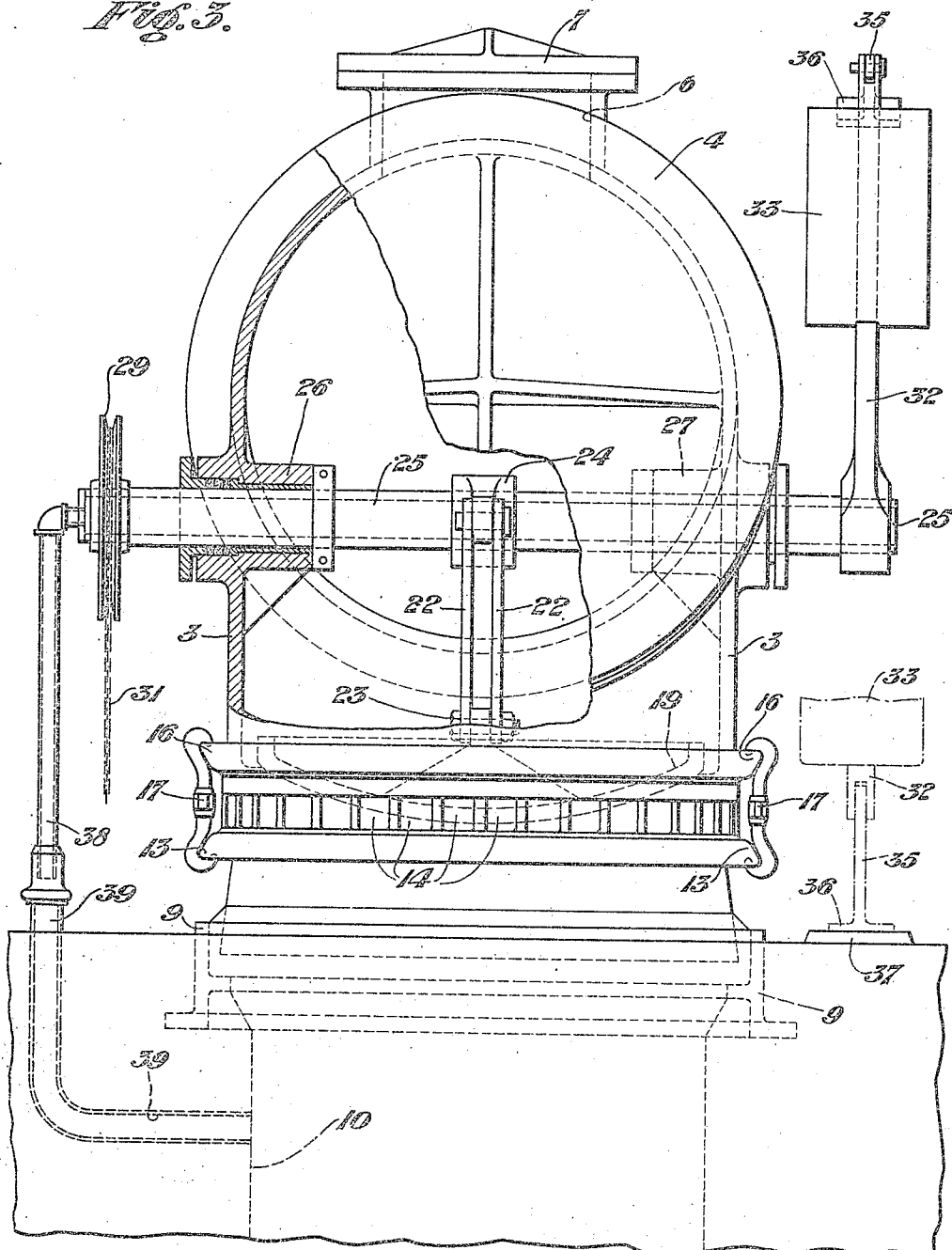
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F. R. McGEE
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Fig. 3.



Witnesses:
Edwin Trust

Inventor:
FRANK R. McGEE,
by:
Anthony J. J. J.
Attorney.

UNITED STATES PATENT OFFICE.

FRANK R. MCGEE, OF STEUBENVILLE, OHIO.

CHIMNEY VALVE.

Application filed January 12, 1922. Serial No. 528,756.

To all whom it may concern:

Be it known that I, FRANK R. MCGEE, a citizen of the United States, and resident of Steubenville, in the county of Jefferson and State of Ohio, have invented certain new and useful Improvements in Chimney Valves, of which the following is a specification.

This invention relates to valves and while not limited thereto relates more particularly to chimney valves for hot blast stoves and the like having an underground chimney flue, and has for one of its objects the provision of such a valve which will permit an unobstructed flow of gases when open.

Another object is to provide a novel form of operating mechanism for the valve whereby the operation of a single shaft will raise the valve member vertically and swing it about a horizontal axis.

Another object is to provide novel means for providing a flow of air about portions of said valve to cool the same.

A still further object is to provide a valve having the construction and combination of parts described in the following specification and illustrated in the accompanying drawings.

In the drawings, Figure 1 is a top plan view of my improved valve.

Figure 2 is a sectional elevation on the line II—II of Figure 1.

Figure 3 is a front end elevation of the valve.

Referring particularly to the drawings, the numeral 2 designates a hot blast stove shell saddle to which the valve body 3 is bolted or otherwise secured.

The body 3 is substantially cylindrical in shape and has one end opening into the stove through the saddle 2 and its opposite end closed by a cover plate 4, which is bolted into place by a series of bolts 5.

A manhole 6 is formed in the top of the body 3 and is closed by a manhole cover plate 7 which is fastened in position by bolts 8.

A foundation ring or plate 9 is mounted on the upper face of the underground chimney flue 10 and a skirt ring 11 is mounted within the foundation ring 10 and held in position by a seal formed of a ring of asbestos rope 12 and pitch or tar packing.

The skirt ring 11 is provided with a peripheral downwardly directed hook flange 13 at a point intermediate its ends, and the por-

tion above said flange is provided with a series of vertically extending slots 14 for a purpose hereinafter described.

A valve seat ring 15 is mounted between the upper face of said skirt ring 11 and the lower face of the valve body 3. The valve seat ring 15 has duplicate upper and lower faces, so that when one face becomes worn it may be reversed and thus have double life.

The valve body 3 is provided with an upwardly directed peripheral hook flange 16 adjacent its lower end. A series of clamp members 17 are arranged around the flanges 13 and 16 to detachably hold the skirt 11 and valve body 3 together, so that they may be readily separated to allow removal of the valve seat when it is desired to reverse or replace it.

A dish-shaped valve disk 19 having a convex lower face and provided with a seating ring surface 20 adapted to bear against the seat 15 is mounted within the valve body. The valve disk 19 is provided with a pair of centrally disposed upstanding ears or lugs 21, and a pair of links 22 are mounted between and pivotally secured to the ears 21 by a pin 23. The upper ends of the links 22 are pivotally secured to the short upper arm of a bell crank lever 24 which has an eccentric mounting intermediate its ends on a horizontal hollow shaft 25. The hollow shaft is mounted in bearings 26, 27 in the valve body 3 and has its ends projecting beyond the valve body.

The long lower arm of the bell crank lever 24 has its forward face 28 adjacent the lugs 21, cut away on a rearwardly directed angle and is adapted to engage against the lugs 21 after the shaft 25 has rotated a predetermined amount.

One end of the shaft 25 is provided with a sheave 29 which is keyed or otherwise locked on the shaft and has an apertured lug 30 projecting therefrom which is adapted to have an operating cable 31 secured thereto. A counterweight lever 32, secured to the other end of shaft 25, carries a counterweight 33 of sufficient weight to counterbalance the valve disk 19, link 22, and lever 24, thereby rendering the operation of the valve smooth and easy.

A stop arm 35, pivotally mounted on the free end of counterweight lever 32, is pro-

vided with a foot portion 36 which is adapted to engage stop plate 37 when the valve is opened, thereby limiting the movement of said valve.

5 A pipe or conduit 38 has its upper end communicating with the hollow interior of the shaft 25 and its lower end communicating with a pipe or conduit 39 which opens into the chimney flue 10, in this way enabling the chimney or stack draft by suction to draw cooling air through the hollow shaft.

10 The vertically extending slots 14 in the upper portion of the skirt ring 11 open directly into the chimney flue 10, and, therefore, cooling air will be sucked in through these slots to cool the valve disk 19 and valve seat 15. It will readily be understood that the cooling of the valve seat 15, valve 19 and the shaft 25 by sucking or drawing cool air through the shaft and around the seat and valve disk will aid in preventing warping and distortion of these parts.

The operation of the valve is as follows:

Assuming that the valve is closed and it is desired to open the same, the operator will pull the cable 31 secured to the sheave 29, thus rotating the shaft 25. As the shaft 25 rotates it will rock the bell crank lever 24 thus raising links 22 and valve disk 19 substantially vertically until the valve disk clears the seat 15 sufficiently for it to be rocked horizontally without striking it, and when the valve disk 19 has reached this position the lower arm of the lever 24 will have swung around sufficiently to engage the lugs 21 on the valve. Continued rotation of the shaft 25 will now cause the lower arm of the lever 24 to bear against the lugs 21 and lift the valve disk 19 with a horizontal swinging movement until it is clear of the flow path through said valve body. That is to say, continued movement of the shaft 25 after the lower arm of lever 24 has engaged the lugs 21, will cause the valve disk to swing about the longitudinal axis of the shaft 25 until the valve disk is in a position sufficiently above the valve seat as to permit an unobstructed flow of gases into the chimney flue 10.

50 When it is desired to close the valve the operator will pull the cable 31 in the reverse direction, thus reversely rotating the shaft 25 until the bell crank lever 24 is rocked clear of the lugs 24 at which time the valve disk will be suspended by the links 22 and as thus suspended will be free to find its center when seated and be perfectly seated at all times.

While I have shown and described only one specific embodiment of my invention, it will be understood that various changes in design and combination of parts may be made without departing from the scope of my invention as defined in the appended 65 claims.

I claim:—

1. A valve comprising a valve body, a valve disk, a seat for said valve disk, and means for first moving said valve disk vertically and then swinging said valve disk 70 about a horizontal axis until it is clear of the flow path through said valve body.

2. A valve comprising a valve body, a valve disk, a seat for said valve disk, a horizontal shaft journaled in suitable bearings 75 in said casing, and means operated by said shaft adapted to first move said valve disk vertically and then swinging said valve disk about the axis of said shaft until it is clear of the flow path through said valve body. 80

3. A valve comprising a valve body, a valve disk, a seat for said valve disk, a horizontal shaft journaled in suitable bearings in said casing, a bell crank lever secured intermediate its ends on said shaft, at least one 85 link pivotally connected to the short upper arm of said lever and to said valve disk, said lever being so positioned on said shaft that the long lower end thereof will engage said valve disk after said shaft is rotated a 90 predetermined distance, a counterbalanced lever secured on one end of said shaft, and means for rotating said shaft, said bell crank lever and said link being adapted to first move said valve disk vertically and then 95 swinging said valve disk about the horizontal axis of said shaft when said shaft is rotated.

4. A valve comprising a valve body, a valve disk, a seat for said valve disk, a 100 horizontal shaft journaled in suitable bearings in said casing, a bell crank lever secured intermediate its ends on said shaft, a pair of ears projecting upwardly from the top face of said valve disk, at least one link 105 pivotally connected to the short upper arm of said lever and to said ears on said valve disk, said lever being eccentrically positioned on said shaft so that the long lower end thereof will engage said ears after said 110 shaft has been rotated a predetermined distance, and means for rotating said shaft, said bell crank lever and said link being adapted to first move said valve disk vertically so as to clear said seat and then swing 115 said valve disk about the horizontal axis of said shaft, substantially as described.

5. A valve comprising a valve body, a valve disk mounted in said body, a valve seat for said valve disk, a horizontal hollow 120 shaft journaled in suitable bearings in said casing, means operated by said shaft for opening and closing said valve, means for causing a flow of air through said shaft to cool said shaft, and means causing a flow of 125 air around said valve and valve seat to cool said parts.

In testimony whereof I have hereunto set my hand.

FRANK R. McGEE.