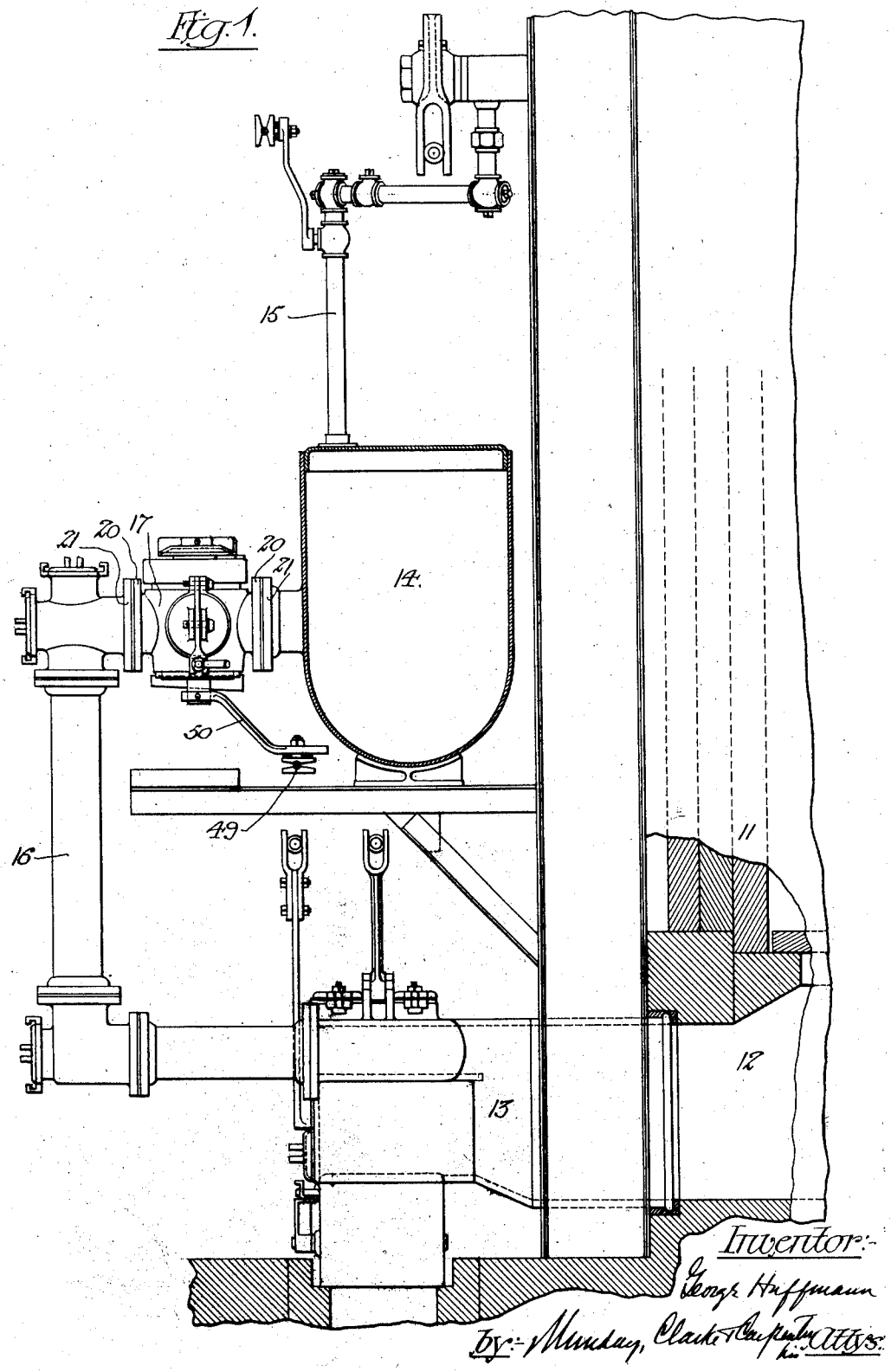
Jan. 17, 1928. 1,656,355

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COKE OVEN VALVE CONSTRUCTION

Filed April 21, 1921 3 Sheets-Sheet 1

Fig. 1.



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Filed April 21, 1921 3 Sheets-Sheet 2

Fig. 2.

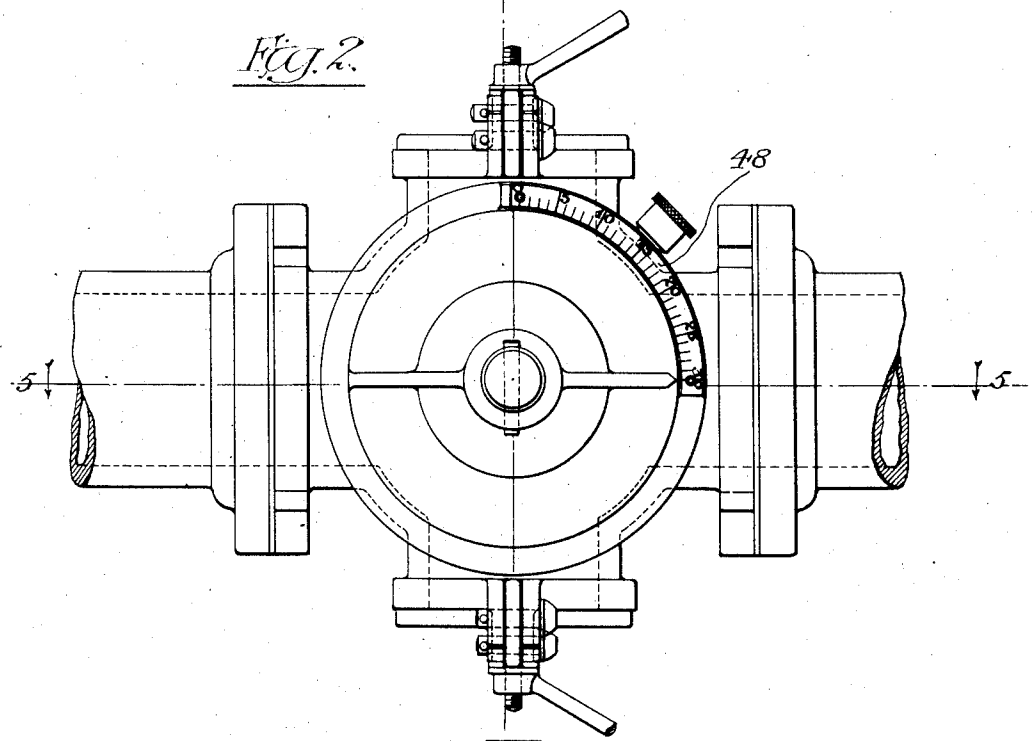
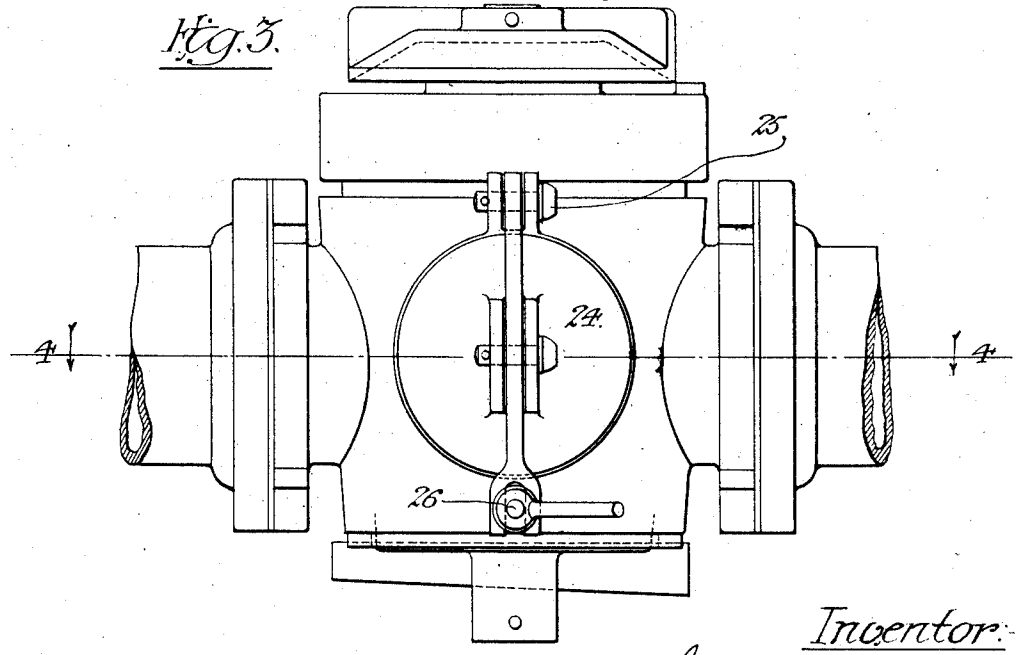


Fig. 3.



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3 Sheets-Sheet 3

Fig. 4.

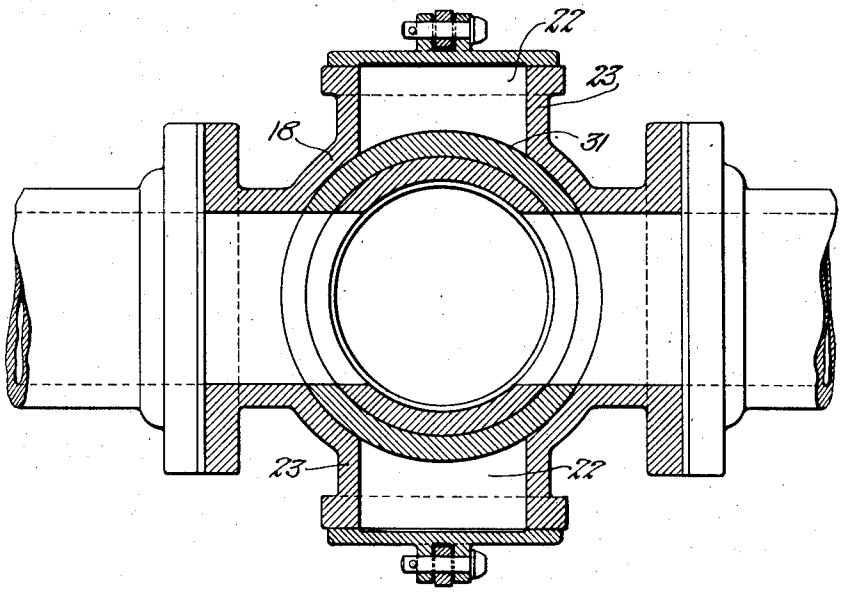
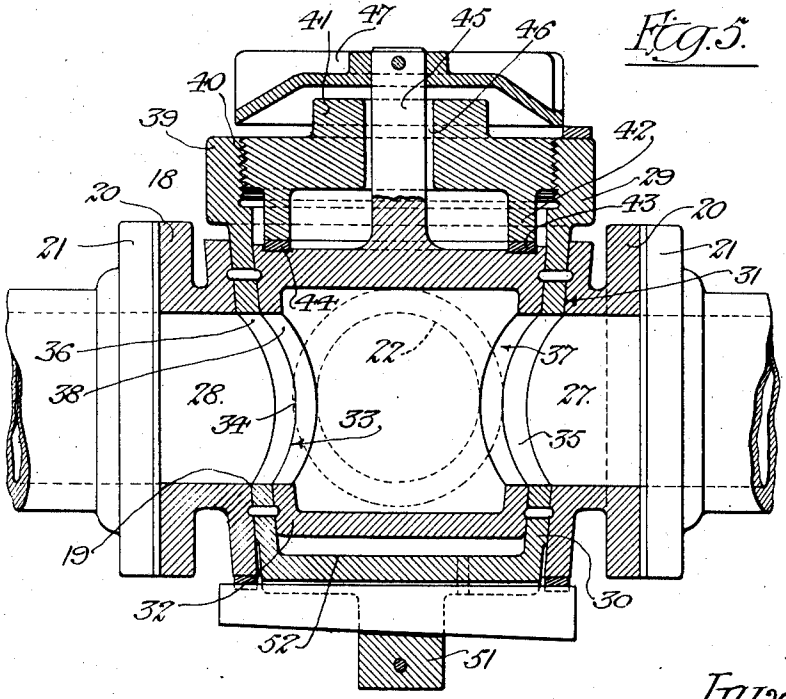


Fig. 5.



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UNITED STATES PATENT OFFICE.

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COKE-OVEN VALVE CONSTRUCTION.

Application filed April 21, 1921. Serial No. 463,419.

This invention relates to an improved valve construction that is of especial utility in conjunction with by-product coke ovens. The invention has for an object to provide a valve that combines simplicity and economy in construction with a capacity for being readily adjusted to vary the quantity of the medium which flows through the valve and to permit accurate regulation of the quantity of the medium flowing from the valve, in order, for example, to insure the supply of a proper quantity of a gaseous medium, such as fuel gas, air or waste gas, to the regenerative or fuel areas of a by-product coke oven.

In addition to the general objects recited above, the invention has for other objects such other improvements or advantages in construction and operation as are found to obtain in the structures and devices hereinafter described or claimed.

In the accompanying drawings, forming a part of this specification and showing, for purposes of exemplification, a preferred form and manner in which the invention may be embodied and practiced, but without limiting the claimed invention to such illustrative instance or instances.

Figure 1 is a fragmentary sectional elevation of a coking plant or battery, showing a portion of the mechanism for controlling the flow of the gaseous mediums through the flue and regenerative areas of the battery, said mechanism being equipped with an improved valve constructed in accordance with the present invention;

Fig. 2 is a detail plan view of the valve;

Fig. 3 is a side elevation of the same;

Fig. 4 is a horizontal section taken in a plane indicated by the line 4—4 of Fig. 3; and

Fig. 5 is a vertical section taken in a plane indicated by the line 5—5 of Fig. 2.

The same characters of reference designate the same parts in each of the several views of the drawings.

In its present embodiment, the invention is especially designed for use in connection with the flow control mechanism of a coking plant.

For convenience, the present description will be confined to this use of the invention; features of construction and operation are, however, capable of other valuable applications; consequently, the scope of the invention is by no means confined to the specific use and specific embodiment herein described as an illustrative example.

Referring to Fig. 1 of the drawing, there is illustrated a fragment of a coke oven battery or plant of the by-product type, which plant embodies in its construction regenerators designated generally at 11 and having sole channels 12 that communicate at their outer ends with flow boxes 13. Extending lengthwise of the battery is a main 14 which is adapted, during coke oven gas operation to supply coke oven gas through the valve controlled connections 15, to such of the flame flues of the battery as are burning, or alternatively, during producer gas operation, to supply producer gas to the sole channels of the inflow operating air regenerators. For the latter purpose the aforesaid main 14 is communicably connected by means of gas pipe assemblies 16 with the flow boxes 13 of such regenerators as operate to introduce air into the flues of the heating walls.

The present invention is chiefly concerned with the valve 17, that is embodied in each pipe assembly 16 and is especially constructed to insure the delivery of regulable quantities of gas into the sole channels of the regenerators communicably connected with such pipe assemblies. This valve 17 embodies in its construction a hollow casing 18 provided with a central valve chamber 19, preferably of inverted frustro-conical shape as shown in Figs. 3 and 5 and provided at its opposite ends with flanges 20 which are respectively secured to flange members 21 of the pipe assembly 16 in which the valve 17 is incorporated. As shown in Fig. 4 clean-out or inspection ports 22 are provided in extensions 23 of the opposite sides of the valve casing 18, the outer ends of such ports being normally closed by doors 24. These doors 24 are respectively hinged at 25 to the valve casing and are each provided with suitable latches 26 for maintaining them normally in closed position over the mouths of the ports 22.

The opposite ends of the valve chamber 19 respectively communicate with an inlet port 27 and an outlet port 28, and when the valve is open, as shown in Figs. 4 and 5, gaseous medium such as air flows from the supply main 14 through the valve and ex-

tended parts of the pipe assembly 16 to the flow box 13 of the communicably connected regenerator 11. The flow of gaseous medium from the inlet port 27 of the valve casing to the outlet port 28 thereof is controlled by means of the valve body 29. The valve body 29 is constituted of a hollow outer member 30 the working surface 31 of which is of inverted frustro-conical shape to correspond with and make a tight fit with the inverted frustro-conical wall of the valve chamber 19 and of an inner hollow member 32 mounted within the aforesaid outer member 30 and with its outer wall face 33 in close frictional contact with the inner wall face 34 of the said outer member 30. The outer member 30 is provided with an inlet port 35 and an outlet port 36, which respectively register with the inlet 27 and outlet 28 of the valve chamber 18, when the valve is in open position; similarly the inner valve member 32 is provided with an inlet port 37 and an outlet port 38 which are adapted, on turning the inner member 32 relatively to the outer member 30 in the manner hereinafter described, to register more or less with the inlet and outlet ports 35 and 36 of the outer member 30, thereby to regulate the quantity of medium permitted to flow through the valve.

The upper end of the outer member 30 is provided with a vertically-extended flange 39 the inner face of which is screw threaded, as shown at 40, to receive a screw threaded cap 41 having a downwardly projected flange 42 which bears on a ring washer 43 seated in an annular groove 44 formed in the top of the inner member 32. The cap 41 is screwed tightly into the flange 39 of the outer member 30 and bears on the washer 43 to insure movement of the inner member 32 along with the outer member 30 of the valve body, during the normal operation of opening and closing the valve. Movement of the inner member 32 relatively to the outer member 30 is utilized only for the purpose of regulating the effective size of the ports 35 and 36, when it is necessary to regulate the quantity of medium to flow through the valve. For permitting such adjustment of the inner member 32, the latter is provided with an upwardly projecting stem 45, which extends through a hole 46 in the cap 41 and is provided at its upper end with an indicator handle 47 adapted to cooperate with a scale 48 mounted on top of the flange 39 of the outer member 30. By turning the handle 47 the inner member 32 may be turned relatively to the outer member 30 to move the ports 37, 38 out of or into registry with the ports 35 and 36 of the outer member 30 and thus restrict or enlarge the size of said ports 35 and 36, with the result that the quantity of medium flowing through the valve may be regulated by turning the pointer handle 47 to the desired graduation of the scale 48.

In its present embodiment, the valve is opened or closed by means of the usual reversing cable 49. This cable co-operates with a valve-operating arm 50 that is secured to a shank 51 which depends from the bottom closed end 52 of the outer member 30 of the valve body 29. On movement of the cable 49 in one direction the outer and inner members 30 and 32 are turned in unison to open the valve to an extent determined by the adjustment of the inner valve member relatively to the outer one; whereas, on movement of the cable 49 in the opposite direction both said members 30 and 32 are turned in unison to close the valve.

The invention as hereinabove set forth is embodied in a particular form of construction but may be variously embodied within the scope of the claims hereinafter made.

I claim:

1. A valve construction for the purpose herein set forth, comprising: a casing constituted of a valve chamber and having an inlet and an outlet; a valve body seated within said chamber, said valve body comprising an outer member having ports respectively co-operable with said inlet and outlet, and an inner member mounted within said outer member and also provided with ports which control the passageway between ports of the outer member and which, on adjustment of the inner member relatively to the outer member, may be placed into or out of registry with respect to the ports of the outer member to adjust the capacity of the valve as a whole; a cap secured to said outer member and bearing with pressure on the inner member for insuring movement of the inner member in unison with the outer member, during the normal operation of the valve and regardless of the application of abrupt forces thereto; a stem extending from the top of said inner member and projecting through said cap, said stem having provision for turning the inner member relatively to the outer member; and means secured to said outer member for normally operating the valve; substantially as specified.

2. A valve construction for the purpose herein set forth, comprising: a casing constituted of a valve chamber and having an inlet and an outlet; a valve body seated within said chamber, said valve body comprising an outer member having ports respectively co-operable with said inlet and outlet, and an inner member mounted within said outer member and also provided with ports which control the passageway between the ports of the outer member and which, on movement of the inner member relatively to the outer member, may be moved into and out of registry with respect

to the ports of the outer member to adjust the capacity of the valve as a whole; means carried by the outer member for insuring a fixed position of the inner member with respect to the outer member, during the normal operation of the valve and regardless of the application of abrupt forces thereto; means operable at will for turning the inner member respectively to the outer member; and means secured to said outer member for normally operating the valve; substantially as specified.

3. A valve construction for the purpose herein set forth, comprising: a casing constituted of a valve chamber and having an inlet and an outlet; a valve body seated within said chamber, said valve body comprising an outer member having ports respectively co-operable with said inlet and outlet, and an inner member mounted within said outer member and also provided with ports which control the passageway between the ports of the outer member and which, on movement of the inner member relatively to the outer member, may be moved into or out of registry with respect to the ports of the outer member to adjust the capacity of the valve as a whole; means carried by one of said members for frictional engagement with the other of said members for insuring movement of the inner member in unison with the outer member, during the normal operation of the valve and regardless of the application of abrupt forces thereto; means operable at will for turnig the inner member relatively to the outer member; and means secured to one of said members for normally operating the valve; substantially as specified.

4. A valve construction for the purpose herein set forth, comprising: a casing constituted of a valve chamber; a valve body seated within said chamber, said valve body comprising inner and outer hollow members, both provided with ports co-operating to control the passageway through the valve as a whole; means for insuring a fixed position of the inner member with respect to the outer member during the normal operation of the valve and regardless of the application of abrupt forces thereto; means operable at will for turning the inner member relatively to the outer member to adjust the capacity of the valve to any desired degree; and means secured to one of said members for normally operating the valve; substantially as specified.

5. A valve construction for the purpose herein set forth, comprising: a casing constituted of a valve chamber; a valve body seated within said chamber; said valve body provided with ports, regulating means within said valve body for varying the size of said ports; means for locking said regulating means in adjusted position regardless of the application of abrupt forces thereto: and means secured to said valve body for normally operating the valve; substantially as specified.

6. A valve construction for the purpose herein set forth, comprising: a casing constituted of a valve chamber; a valve body seated within said chamber and provided with ports; regulating means controllable exteriorly of the casing for varying the size of the ports of said valve body; means for frictionally locking said regulating means in adjusted position regardless of the application of abrupt forces thereto; and means secured to said valve body for normally operating the valve; substantially as specified.

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