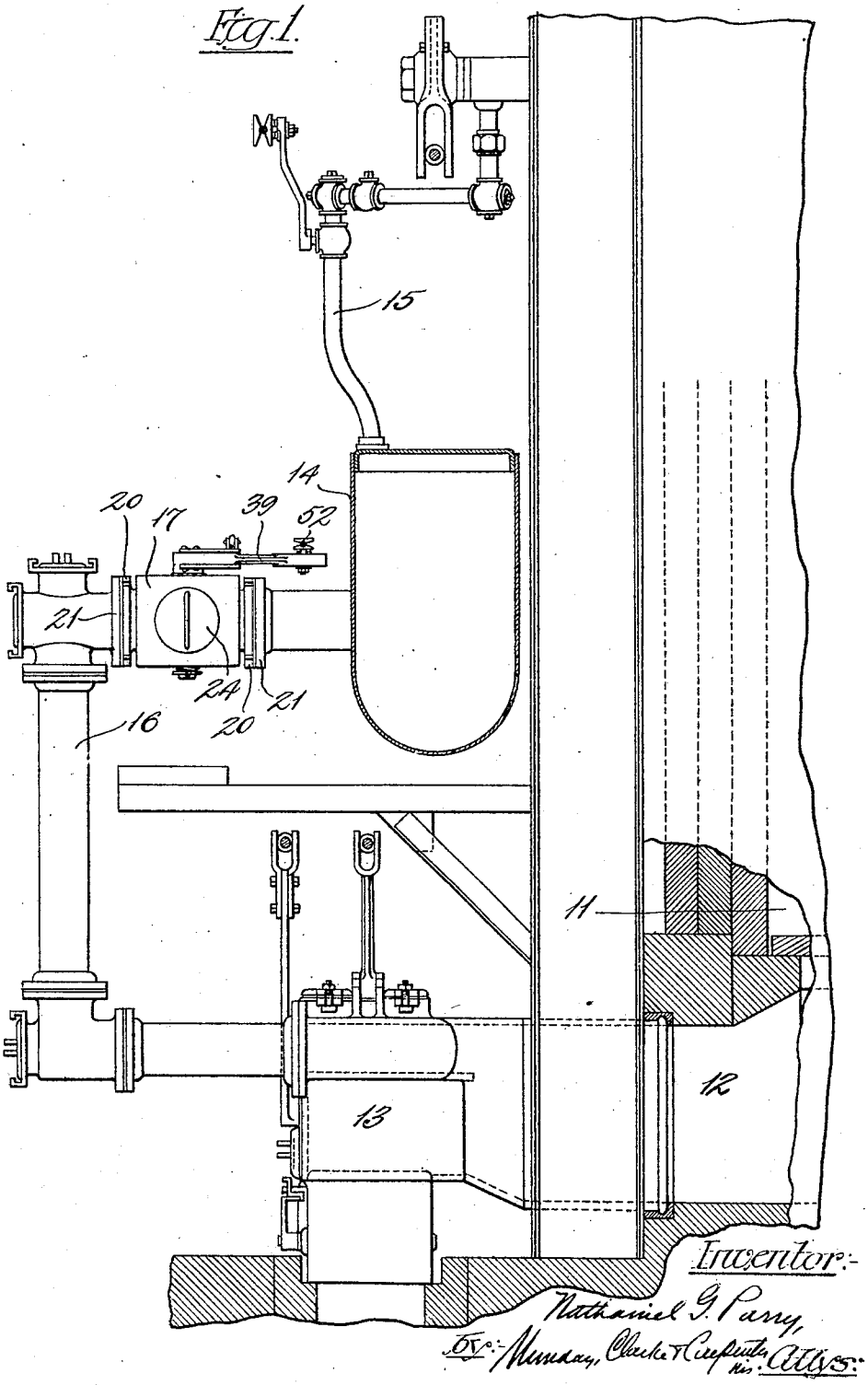
March 5, 1929. N. G. PARRY 1,704,209

COKE OVEN VALVE CONSTRUCTION

Filed Sept. 6, 1921 3 Sheets-Sheet 1

Fig. 1.



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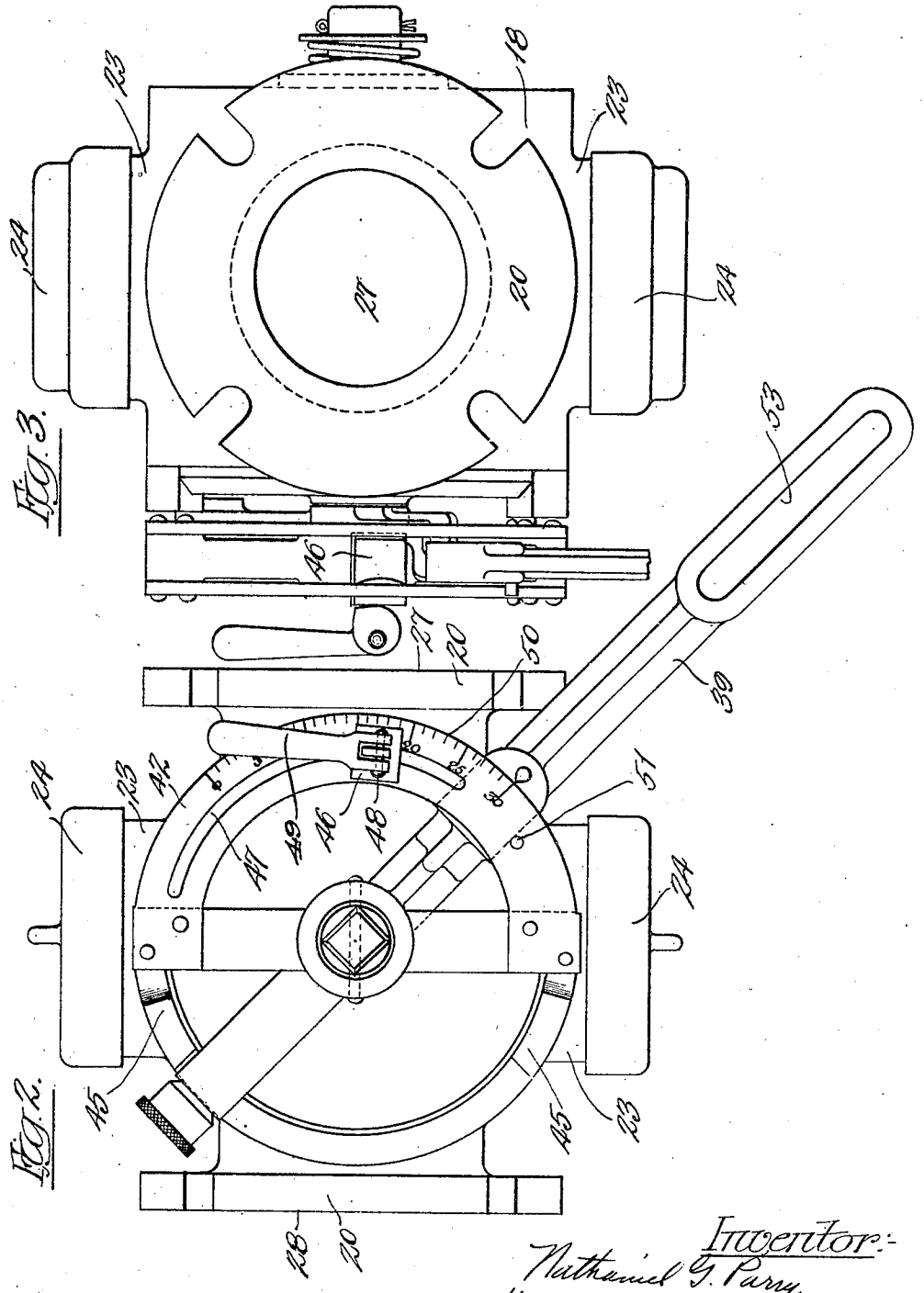


Fig. 3.

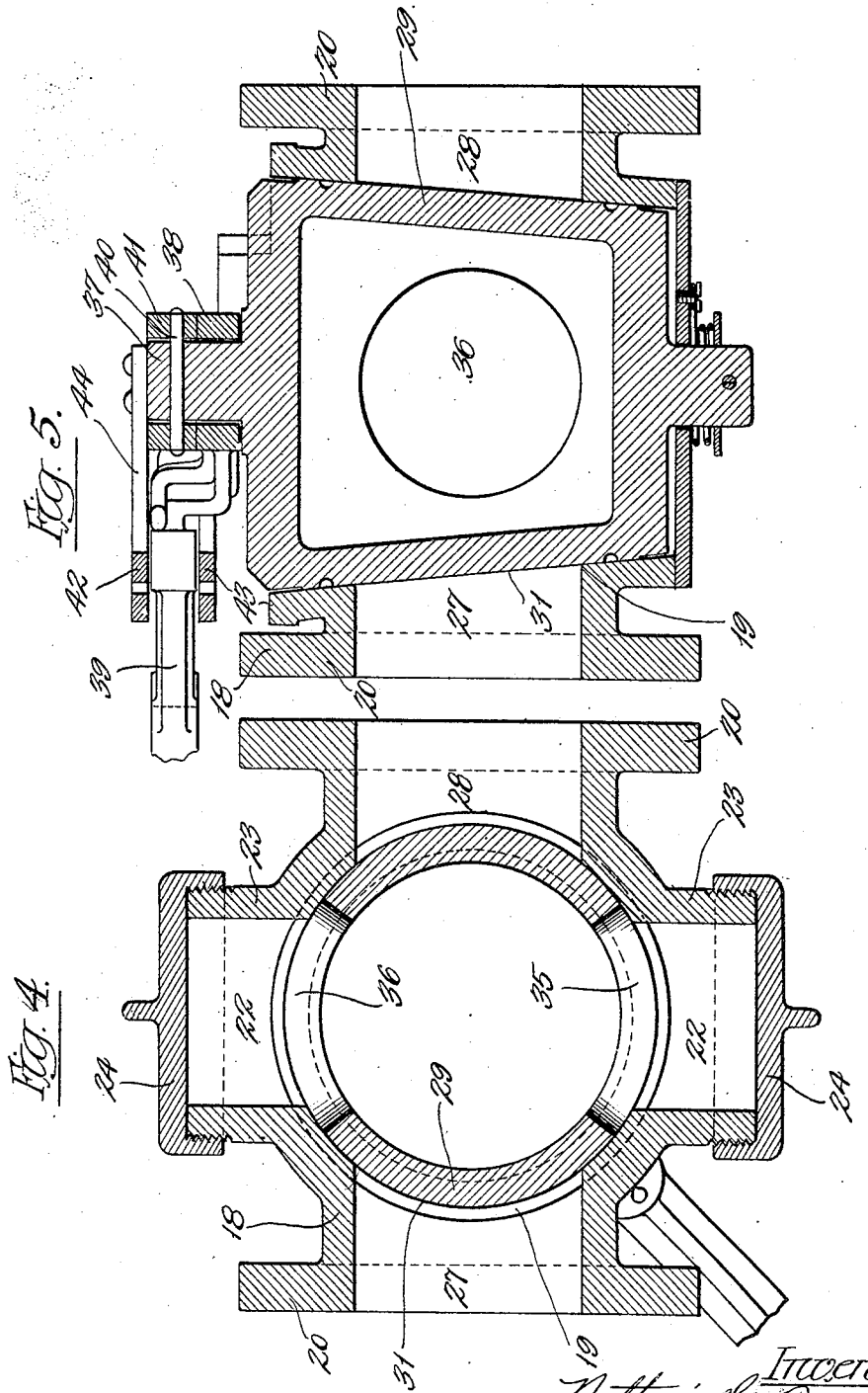
Fig. 2.

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COKE OVEN VALVE CONSTRUCTION

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UNITED STATES PATENT OFFICE.

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COKE-OVEN-VALVE CONSTRUCTION.

Application filed September 6, 1921. Serial No. 498,871.

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 of construction with a capacity for being readily adjusted to vary the quantity of the media which flows through the valve and to permit accurate regulation of the media 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 flue areas of a by-product coke oven.

In addition to the general objects recited above, the invention has for further objects such other improvements and advantages in construction or 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 exemplication, 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 by-product coking plant or battery, showing a portion of the mechanism for controlling the flow of the gaseous media 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 detailed plan view of the valve;

Fig. 3 is an elevation of the same;

Fig. 4 is a horizontal section of the valve; and

Fig. 5 is a vertical section of the valve.

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 by-product coking plant, such as is illustrated in the accompanying drawings, and having features exemplified in the co-pending application of Joseph Becker for Letters Patent of the United States for a coking retort oven, filed November 18, 1920, Serial No. 424,846.

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 application; consequently, the scope of the invention is not confined to the specific use and specific embodiment herein described as an illustrative example.

Referring to Figure 1 of the drawings, 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, as explained in the hereinabove mentioned co-pending application of Joseph Becker, Serial No. 424,846, 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 the employment of an extraneously derived gas such as producer gas, to supply such extraneously derived gas to the sole channels of the in-flow operating regenerators that are used for heating the gas prior to its delivery to the flame or combustion flues. For the latter purpose, the aforesaid main 14 is communicably connected by means of a plurality of gas pipe assemblies 16 respectively with the flow boxes 13 of the said regenerators.

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 gaseous media into the sole channels of the regenerators communicably connected with such pipe assemblies. This valve embodies in its construction a hollow casing 18 provided with a central valve chamber 19, preferably of inverted frusto-conical shape, as shown in Fig. 5 and provided at its opposite ends with flanges 20 for being secured to similar flanges 21 of the pipe assembly 16 in which the valve 17 is incorporated. As shown more particularly in Fig. 4, clean-out or inspection ports 22 are provided in extensions 23 on the opposite sides of the valve casing 18, the outer ends of such ports being normally closed by caps 24. These caps 24 respectively have a threaded engagement, as shown in Fig. 4, with the extensions 23 of the valve casing. 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 opened, gaseous media, such as producer gas, for example, flows from the supply main 14 through the valve and extended parts of the pipe assembly 16 to the flow box 13 to the communicably connected regenerator 11. The flow of gaseous media through the valve is controlled by means of the valve body 29. The valve body 29 is constituted of a hollow member, the working surface 31 of which is of inverted frusto-conical shape to correspond with and to make a tight fit with the inverted frusto-conical wall of the valve chamber 19. Said valve body 29 is provided with an inlet port 35 and an outlet port 36, which are respectively moved more or less into registry with the inlet and outlet of the valve chamber 18, when the valve is in open position.

In accordance with the invention, the degree of movement of the valve body 19 is made regulable, so as to vary the amount of registration of the ports 35 and 36 with the inlet 27 and outlet 28 and thus to control the quantity of gaseous medium which flows per unit of time through the valve. This regulation, moreover, is effected in such manner that, although the degree of movement of the valve body itself may be varied, nevertheless the valve body is operated by a member of which the degree of movement is constant, with the result that the adjustment of the valve body is substantially independent of the operating means and a plurality of valves may be employed in the coke oven structure and all operated from a central control, the throw of which is the same at its point of connection with each valve.

As shown, the valve body 29 is provided with a concentric upstanding shank 37 on which is mounted, for movement relatively to the valve body, the collar 38 of the valve-operating arm 39. Secured to the shank 37, by means of a pin 40 is a fixed collar 41 which supports the upper and lower semi-circular plates 42 and 43 of a segment 44 that moves with the valve body 29. As shown, the valve-operating arm 39 is extended between the upper and lower plates 42 and 43 of the segment 44, and the movement of said valve-operating arm is limited by a pair of fixed stops 45 projecting upwardly from the top of the valve casing. For the purpose of transmitting the movement of the valve-operating arm 39 to the valve body 29, there is provided an adjustable abutment 46 that is extended through a curvilinear slot 47 provided in the upper plate member 42. Mounted on the top face of the abutment 46 is a pin 48 which supports a cam lever 49. The cam lever 49 may be operated to apply pressure to the abutment 46 to press its upper horizontal face into engagement with the lower face of the upper plate member 42, in order to retain the abutment 46 in fixed position. By a reverse operation of the cam 49 such pressure may be released in order to permit a sliding movement of the abutment 46 in the slot 47. As shown, in Fig. 2, the upper plate member 42, is provided with a scale 50 for indicating the amount of opening of the valve in any position of the abutment 46. As the abutment 46 constitutes the means of transmitting the power to operate the valve from the valve-operating arm 39, the position of said abutment 46 prior to the operation of said arm 39 will determine the amount of lost motion which must take place before the arm 39 engages the abutment and starts the valve on its opening movement. The position of the abutment 46 thus determines the extent of opening of the valve. By moving the abutment 46 toward the arm 39, the lost motion will be reduced with the result that the valve will be opened to a greater extent. On the other hand, an adjustment of the abutment 46 away from the normal position of the arm 39 will increase the amount of lost motion, with the result that the complete stroke of the arm 39 will impart only a partial stroke to the valve body to open the latter only part way. On its return movement, after the valve has been opened, the arm 39 engages a fixed abutment 51 to restore the valve body to its normal position, the lost motion in the return or closing movement of the valve body being the same as that in the forward or opening movement.

In its present embodiment, the valve is opened or closed, by means of the usual reversing cable 52. This cable is provided with a connection adjustable in a slot 53 of the valve-operating arm 39. On movement of the cable 52 in one direction, the valve body 29 is turned to open the valve to an extent determined by the adjustment of the abutment 46 relatively to the original position of the arm 39; whereas, on movement of the cable 52 in the opposite direction, the valve body 29 is turned 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 and having ports respectively co-operable with said inlet and said outlet; a valve operating member rotatably mounted relatively to said valve body and having a relatively constant opening and closing movement; a segment secured to said valve body; and an adjustable abutment carried by said segment for engagement with said valve-operating member, the abutment being movable toward or away from the valve-operating member to cause the valve body to be opened to a regulatable extent by the constant opera-

tive movement of said valve-operating member; 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 and having ports respectively co-operable with said inlet and said outlet; a valve-operating member rotatably mounted relatively to said valve body, and having a relatively constant opening and closing movement; and an adjustable means carried by said valve body for transmitting the motion of the valve-operating member to the valve body to cause the valve body to be opened to a regulatable extent by the constant operative movement of said valve-operating member; substantially as specified.

3. 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; a swinging valve-operating member having a relative constant opening and closing movement; and means carried by said valve body for varying the degree of motion imparted by said valve-operating member to said valve body to cause the valve body to be opened to a regulatable extent by said valve-operating member; substantially as specified.

4. In valve constructions for the purpose herein set forth, casings constituted of valve chambers; ported valve bodies for said chambers; common valve-operating means; and means for regulating the extent of movement of said valve bodies independently of the extent of movement of said valve-operating means and independently of each other; substantially as specified.

5. In valve constructions for the purpose herein set forth, casings provided with chambers; valve members associated with said chambers; means for operating said valve members in common, said means having lost motion connections with said valve members; and means for independently regulating the degree of lost motion between said respective valve members and said operating means.

6. In valve constructions for the purpose herein set forth, casings provided with chambers; valve members associated with said chambers; independently operating means for said valve members; means carried by said valve members for actuating said valve operating means in common; and means for regulating the extent of movement of said respective valve operating means with respect to that of said actuating means and with respect to each other.

7. In a valve controlling mechanism, the combination of a valve having adjustable means mounted thereon for controlling the degree of opening of said valve, and valve operating means having a constant swinging movement adapted to engage said adjustable means to open said valve to the degree determined by said adjustable means.

8. In a valve controlling mechanism, the combination of a valve having adjustable means mounted thereon for controlling the degree of opening of said valve, valve operating means having a constant swinging movement adapted to engage said adjustable means to open said valve to the degree determined by said adjustable means, and means carried by said valve and engaged by said valve operating means for moving said valve to closed position when said operating means are moved in reverse direction.

9. In a valve controlling mechanism, the combination of a valve having adjustable means carried thereby and adapted to be rigidly connected therewith for determining the extent of opening of said valve, and valve operating means having a swinging movement of constant magnitude in opposite directions in a path substantially coincident with the range of adjustment of said adjustable means and engaging said adjustable means to open said valve to the degree determined by said adjustable means.

10. In a valve controlling mechanism, the combination of a valve having adjustable means carried thereby and adapted to be rigidly connected therewith for determining the extent of opening of said valve, and valve operating means having a swinging movement of constant magnitude in opposite directions in a path substantially coincident with the range of adjustment of said adjustable means and engaging said adjustable means to open said valve to the degree determined by said adjustable means, and means carried by said valve and engaged by said valve operating means for moving said valve to closed position when said operating means are moved in a direction opposite to that employed in opening said valve.

In testimony whereof I affix my signature, this 26th day of August, 1921.

NATHANIEL G. PARRY.