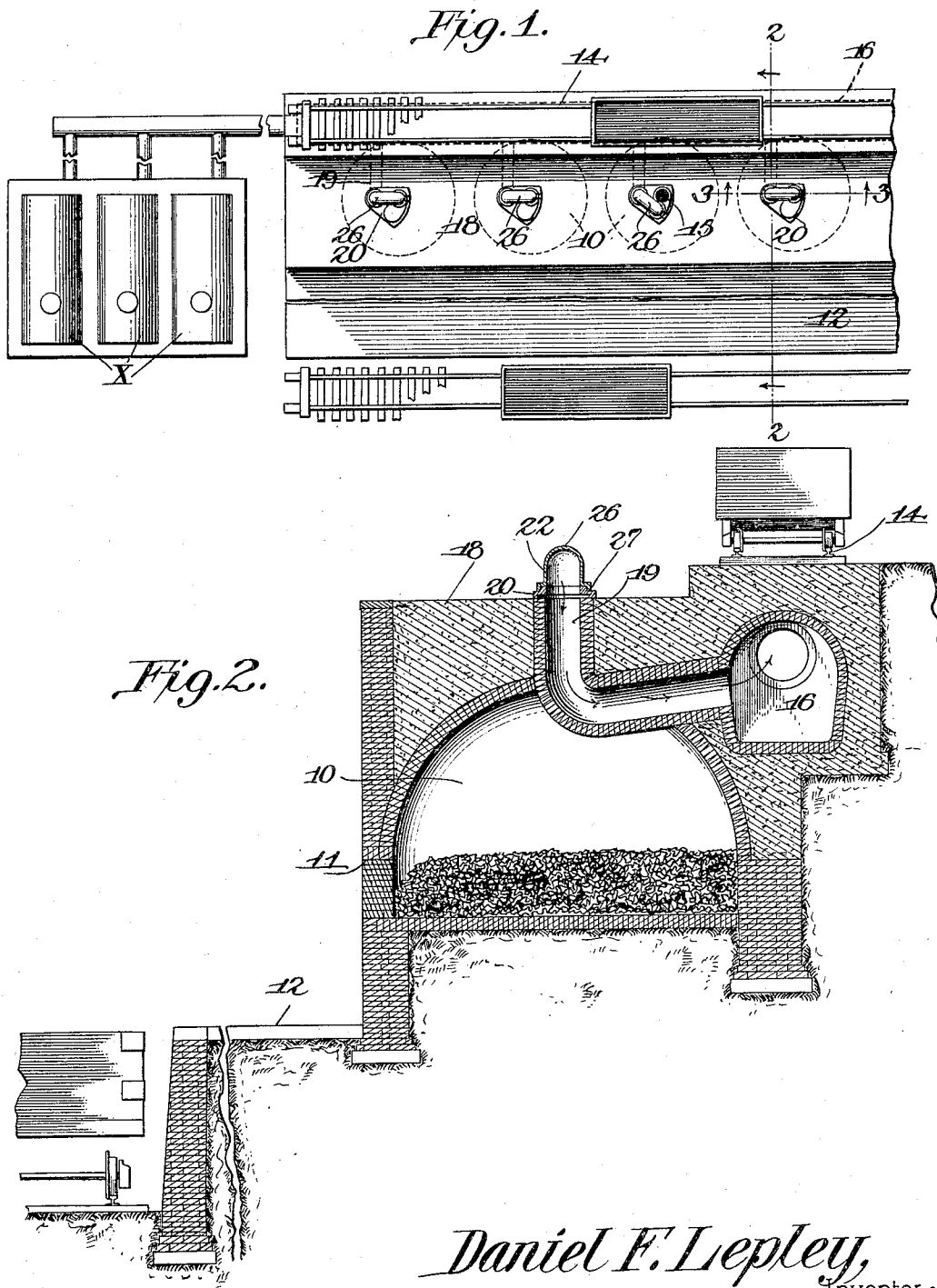


No. 793,668.

PATENTED JULY 4, 1905.

D. F. LEPLEY.
COKE OVEN ATTACHMENT.
APPLICATION FILED DEC. 3, 1904.

2 SHEETS—SHEET 1.

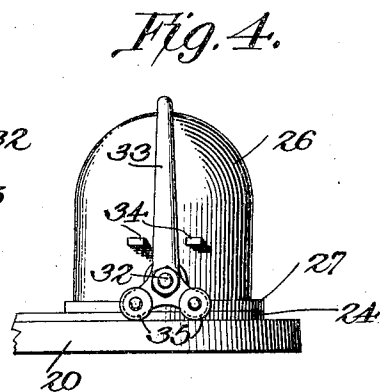
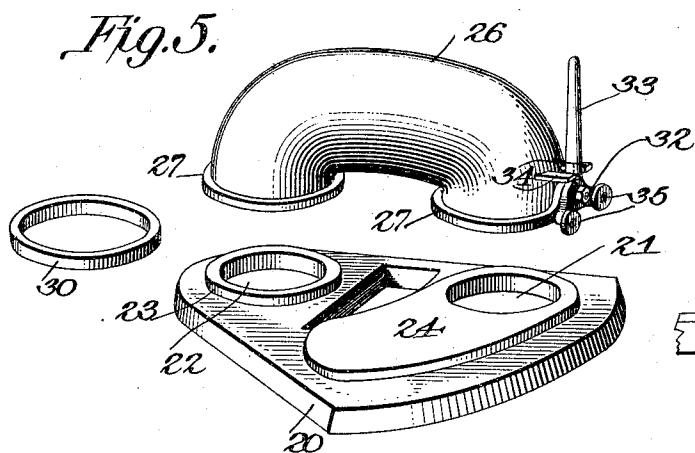
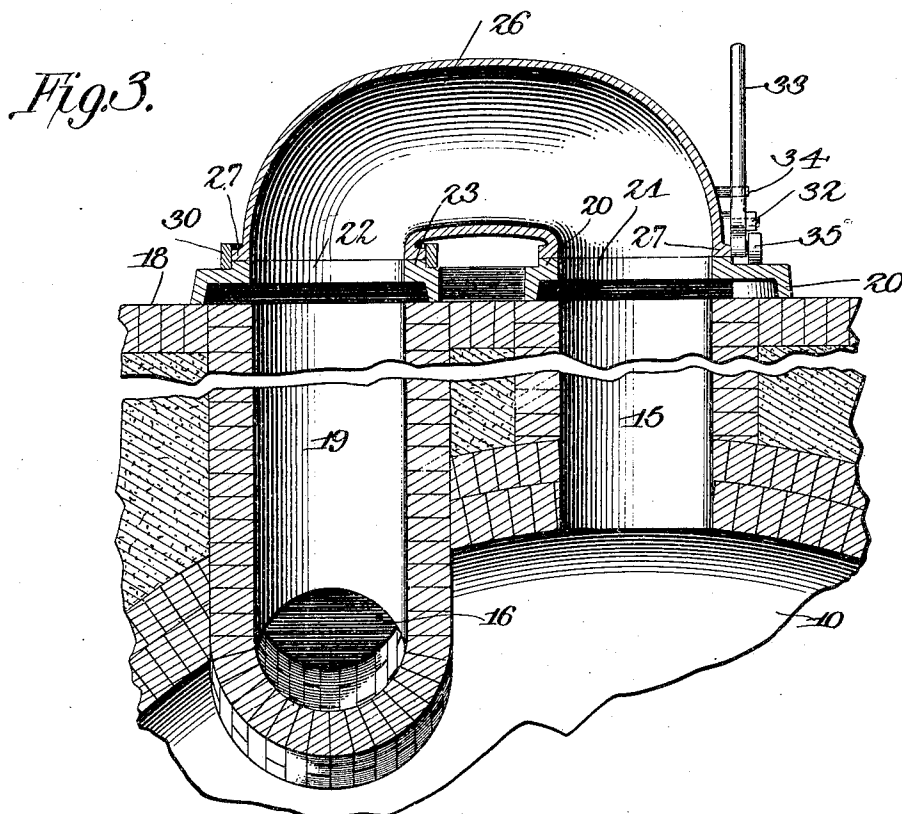


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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COKE-OVEN ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 793,668, dated July 4, 1905.

Application filed December 3, 1904. Serial No. 235,358.

To all whom it may concern:

Be it known that I, DANIEL F. LEPLEY, a citizen of the United States, residing at Connellsville, in the county of Fayette and State of Pennsylvania, have invented a new and useful Coke-Oven Attachment, of which the following is a specification.

This invention relates to coke-ovens, and has for its principal object to provide a novel construction of oven whereby a portion of the waste gases formed during the coking operation may be utilized for the generation of steam or heating or other purposes.

A further object of the invention is to provide a novel means whereby a battery of ovens may be connected to a single gas-main through which the gases are led to a point of consumption and any one or more of the ovens disconnected from the main without danger of admitting air thereto.

A still further object of the invention is to provide a coke-oven so arranged and constructed that the opening of the charging-hole at the top of the oven will result in closing communication with the gas-main.

A still further object of the invention is to provide an oven of this class in which all valves and similar controlling devices in the gas-ducts are dispensed with.

A still further object of the invention is to provide a coke-oven in which the mechanism for closing and opening the charging-hole and controlling the flow of gas from the oven may be manipulated with ease and rapidity by a single workman.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a plan view illustrating a battery of coke-ovens connected to a steam-boiler furnace for

the purpose of utilizing the waste gases of the coke-oven for heating the boiler. Fig. 2 is a vertical section of the same on the line 2 2 of Fig. 1, the view being on an enlarged scale. Fig. 3 is a detail transverse section of the upper portion of one of the ovens on the line 3 3 of Fig. 1. Fig. 4 is an end view of the movable portion of the gas-duct. Fig. 5 is a detail perspective view of the several members arranged at the top of each oven, the parts being detached in order to better illustrate their construction.

Similar characters of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

In the manufacture of coke a considerable quantity of gas is incidentally made and attempts have been made to utilize this gas for power and other purposes. The present invention is intended to provide a thoroughly practical and efficient means whereby the gas may be conducted from the oven to a point of consumption without increasing the labor of the workmen and without the employment of interior controlling-valves, as are employed in ordinary ovens of this class, it being found that valves of any character exposed to the intense heat are not reliable and require frequent repair and renewal.

The ovens 10 are of the usual shape and size and are provided with drawing-off doors 11, through which the coke is discharged onto a wharf 12 and thence loaded into cars or other vehicles for transportation. Above the level of the battery of ovens and at one side thereof is a railway 14, on which the coal-laden cars may travel to supply the coal, the latter being fed into the ovens through the usual charging-holes 15. Extending along the rear of the battery of ovens is a conduit 16, which may be placed under the railway 14, this conduit leading to the point where the gas is to be consumed—in the present instance a battery of boilers *x*, although the gas may be employed for any desired purpose. Extending between the conduit 16 and the top or the coal-floor 18 of each oven is a duct 19, preferably formed of or lined with fire-brick, the mouth of the duct being disposed adjacent to the charging-hole 15.

On top of each of the ovens is placed a flue-plate 20, said plate having bottom flanges to be embedded in the cement or concrete top of the oven, and in said plate are formed two openings 21 and 22, that are in alinement, respectively, with the charging-hole 15 and the mouth of the duct or tube 19. The wall of the opening 22 is formed by an annular flange 23, the top of which is faced, and the opening 21 extends through an elongated boss 24, the opposite edges of which are formed on curved lines struck from the center of the opening 22, and the top of the boss 24 is also faced, the castings being so made that the boss and flange 23 may be finished at minimum expense. On top of the flue-plate 20 is placed a conducting-flue in the form of a tube 26, the opposite ends of which are provided with flanges 27, also faced, said flanges resting, respectively, in contact with the flange 23 and boss 24, and when the intermediate conducting-flue is in the position shown in Fig. 3 a continuous passage will be formed between the charging-hole 15 and the escape-duct 19, through which the gases may pass from the oven to the conduit 16. By finishing the faces of the flanges a joint is formed that will be sufficiently tight to answer all practical purposes and luting is unnecessary. After being in use for a short time there will be an accumulation of tarry deposits at the joints, and this will serve to make a practically gas-tight joint. Over the flanges 23 and one of the flanges 27 is slipped a ring 30, serving to prevent displacement of the flue 26 and holding the end of the flue in position so that it may be turned in order to move its opposite end from alinement with the charging-hole 15, the flanged end of the flue being slipped over the boss 24 until the charging-hole is exposed, in order to permit recharging of the ovens or the escape of the smoke and gases resulting from preliminary combustion.

In order to permit ready adjustment of the flue member, the latter is provided at one end with a stud or pin 32, on which is pivoted a lever 33, the vertical arm of said lever forming an operating-handle and its movement being limited by stops 34. The lower end of the lever is extended to form two arms on which are mounted rollers 35, the rollers being disposed, respectively, on opposite sides of the vertical plane of the pivot-pin 32.

When the parts are in the position shown in Fig. 3, gases evolved during the manufacture of the coke will pass up through the charging-hole 15, thence through the flue member 26, duct 19, and conduit 16, being led to the steam-boiler furnace or other point of consumption. After the manufacture of the coke has been completed the workman pulls on the lever 33 and one of the rollers 35 will exert a cam-like action on the upper face of the flue-plate 20, and as the distance between the pivot-pin 32 and the contacting sur-

face of the roller 35 is greater than the distance between said pivot-pin and the nearest point of the flue-sheet the flue member will be slightly raised and may be readily moved to expose the charging-hole 15, the apparatus being manipulated with ease by a single workman. The usual processes of cooling off, drawing the coke, and recharging are now accomplished, and the charging-hole remains open until the fresh charge of coal has been ignited or until the character of the smoke and gases passing from the charging-hole warns the operator that the latter should be closed. The workman will then again operate the lever 33, but in the opposite direction, and move the conducting-flue 26 until the latter again places the charging-hole and the duct in communication with each other.

It will be observed that during movement of the flue member 26 from its position over the charging-hole and during all the time the drawing and charging operations are being carried on the mouth of the flue will be closed and the entrance of air to the duct will be positively prevented, so that there can be no danger of admitting air to the flue 16, this being found highly dangerous and resulting in explosions in the conduit and waste of the gases by premature combustion. The operation, moreover, is accomplished without the necessity of adding to the labor of the workman, the opening of the charging-hole being accomplished in much less time and with less exertion than the opening of the charging-hole of coke-ovens in ordinary use, even where the utilization of the waste gases is not attempted.

Having thus described the invention, what is claimed is—

1. In an apparatus for the utilization of waste gases from coke-ovens, a gas-conduit, and an adjustable flue member movable to a position to place the charging-hole of the coke-oven in communication with said conduit, or to open the same to the outer air.

2. The combination with a stationary coke-oven, of a gas-conduit, a stationary duct leading from a position adjacent to the oven to said conduit, and a removable flue member having one end communicating with the duct, the opposite end of said member being movable to place the charging-hole of the oven in communication with the duct, or to open said charging-hole to the outer air.

3. A coke-oven having a gas-escape opening, a gas-duct the mouth of which is adjacent said opening, and an adjustable flue member having one end in communication with the duct, and its opposite end being movable to a position over the gas-escape opening, or to a position out of alinement with said opening.

4. The combination with a stationary coke-oven, of a charging-hole opening at the top of the oven and through which a charge of coal may be deposited in the oven, a gas-conduit, a duct leading from the conduit toward the

oven and opening at the top of the oven, and an adjustable flue member movable to a position to place the charging-hole in communication with the mouth of the duct, or to open said charging-hole to the outer air.

5. In apparatus for the utilization of waste gases from coke-ovens, a stationary coke-oven having a charging-hole at the top of the oven, and through which a charge of coal may be deposited in said oven, a gas-conduit, a valveless duct leading from the conduit toward the oven and opening at the top of the oven, and a pivotally-mounted flue member movable to establish communication between the hole and duct, and for closing communication between the duct and the outer air.

6. In apparatus for the utilization of waste gases from coke-ovens, an oven having a charging-hole, a gas-duct terminating at the top of the oven, a swinging flue member for placing the opening and duct in communication with each other, said flue member being adjustable to expose the charging-hole, and means for supporting the end of the flue member when removed from alinement with the charging-hole.

7. In apparatus for the utilization of waste gases from coke-ovens, a coke-oven having a gas-discharge opening, a gas-duct having its mouth adjacent to said opening, a flue-plate having openings in communication with both the gas-escape opening and the duct, and a flue member for placing the opening and duct in communication with each other, said flue member being pivotally mounted with relation to the duct, and being adjustable to expose the gas-discharge opening.

8. In apparatus for the utilization of waste gases from coke-ovens, an oven having a charging-hole, a gas-duct terminating at the top of the oven, a flue-plate having a flanged opening in alinement with the duct and a similar

opening in alinement with the charging-hole, an elongated boss formed in the upper surface of the plate, both the boss and the top of the flange being faced, a flue member having end flanges resting on the flange and boss, and a ring surrounding the flanges adjacent to the duct thereby to permit swinging movement of the opposite end of said flue member.

9. In apparatus for the utilization of waste gases from coke-ovens, a coke-oven having a charging-hole, a gas-duct opening at the top of the oven and adjacent to said hole, a flue-plate mounted on top of the oven and provided with a pair of openings, a pivotally-mounted flue member for placing said openings in communication with each other, and a cam-lever carried by said flue member and provided with antifriction-rollers for contact with the flue-plate.

10. In apparatus for the utilization of waste gases from coke-ovens, a coke-oven having a charging-hole, a gas-duct terminating at the top of the oven, a flue-plate mounted on top of the oven and provided with openings in communication with the charging-hole, and the duct, a boss formed on said flue-plate, an adjustable flue member for placing the openings in communication with each other, a pivotally-mounted lever arranged at one end of the flue member, said lever having its lower end extended respectively in opposite directions, antifriction-rollers carried by the lower ends of said lever, and stops for limiting swinging movement of the lever.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

DANIEL F. LEPLEY.

Witnesses:

WILLIAM H. SOISSON,
JAS. B. RUTH.