No. 706,412. Patented Aug. 5, 1902.

J. A. HERRICK.

GAS PRODUCER.

(Application filed Apr. 10, 1902.)

(No Model.)

Fig. 1.

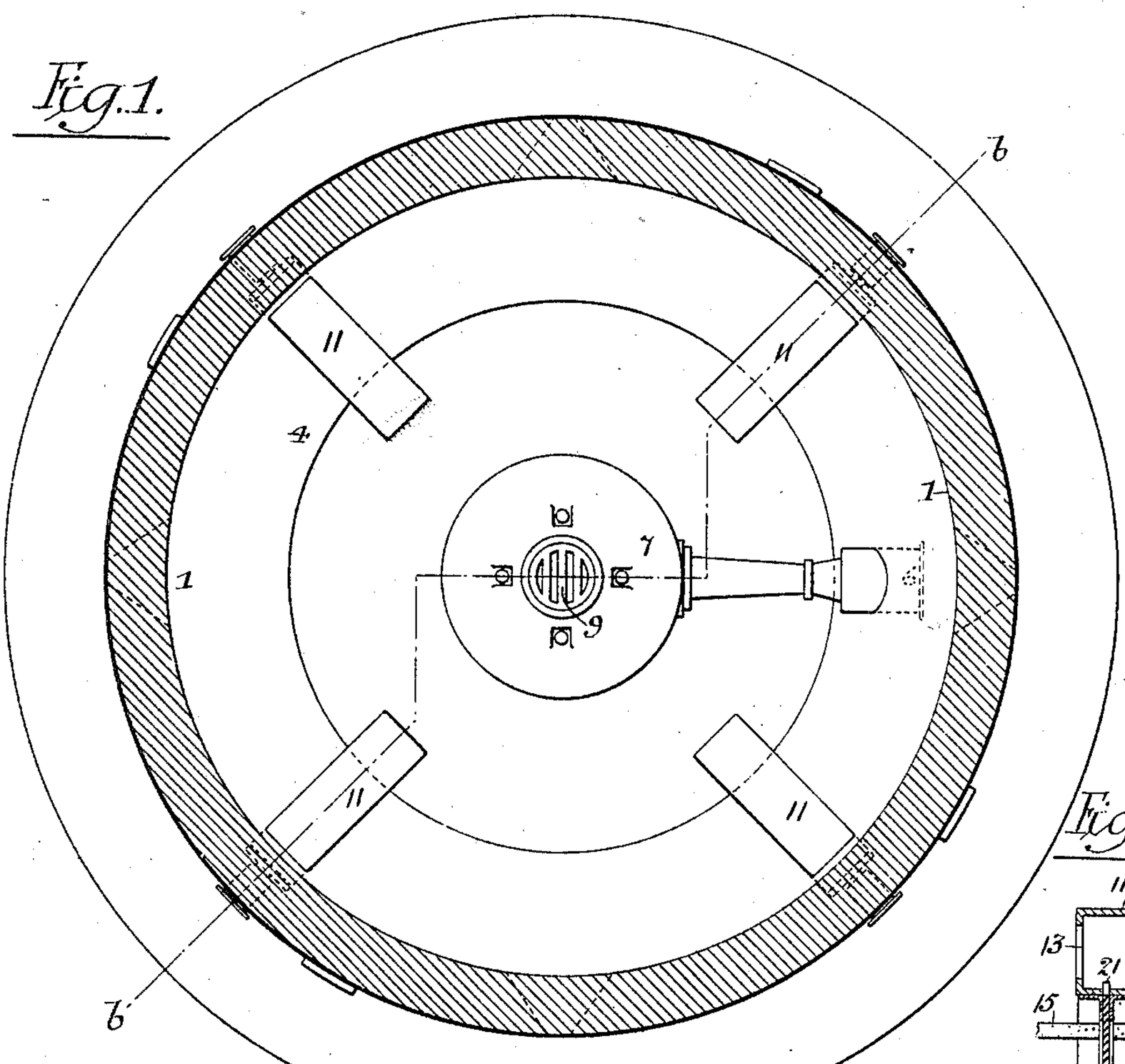


Fig. 2.

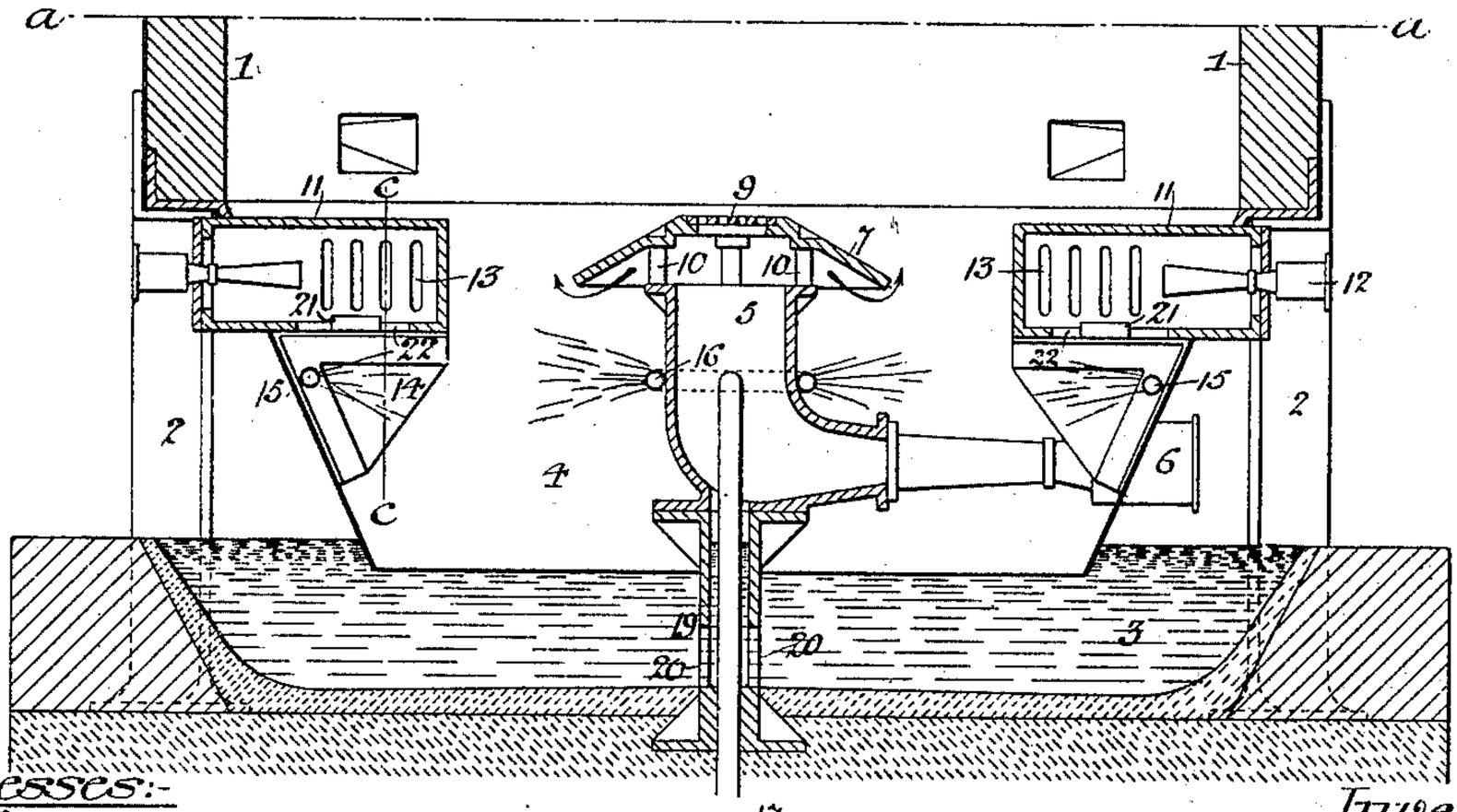
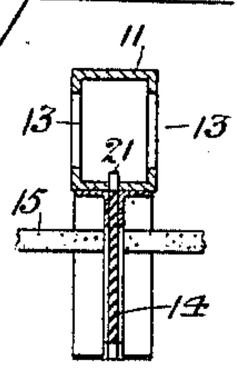


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES A. HERRICK, OF PHILADELPHIA, PENNSYLVANIA.

GAS-PRODUCER.

SPECIFICATION forming part of Letters Patent No. 706,412, dated August 5, 1902.

Application filed April 10, 1902. Serial No. 102,238. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. HERRICK, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Gas-Producers, of which the following is a specification.

The object of my invention is to provide for the uniform distribution of air throughout all portions of the mass of fuel in the producer, to provide for proper admixture of steam with the air, to aid or supplant the water seal at the bottom of the ash-hopper as a means of preventing the escape of air or gas at that point, and to prevent clinkers of large size from choking the producer by lodging in the ash-hopper. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional plan view on the line *a a*, Fig. 2, of the lower portion of a gas-producer constructed in accordance with my invention. Fig. 2 is a vertical section on the line *b b*, Fig. 1; and Fig. 3 is a transverse section on the line *c c*, Fig. 2.

1 represents the body of the producer, mounted upon suitable legs 2 above the sealing-pit 3, into which depends the tapering ash-hopper 4, the lower edge of the latter extending below the level of water in the sealing-pit, so as to be trapped or sealed thereby.

In the present instance the body of the producer is of cylindrical cross-section; but this is immaterial, as my invention is applicable to producers of any desired shape.

Occupying a central position in the ash-hopper is an elbow-pipe 5, which receives a supply of air under pressure from any available source, being in the present instance provided with a blower 6, preferably of that class which is actuated by a steam-jet, so as to provide for the admixture of a certain volume of steam with the air directed into the pipe 5. Above the upper end or mouth of the pipe 5 is a conical hood 7, with flat top, provided with a grating 9, through which the air can escape upwardly into the center of the mass of ashes and fuel contained in the producer, the hood 7 being so mounted upon studs 10 above the top of the pipe 5 that there is in addition to the escape of air upwardly through the grate 9 an escape of air outwardly around the edges of the hood, this air supplying the zone of fuel between the central or core portion supplied by the grate 9 and the outer zone of fuel adjacent to the walls of the producer. In order to supply air to this latter zone of fuel, I use a series of inwardly-projecting twyer-boxes 11, of which four are shown in the present instance, although more or less than this may be used, as desired, these twyer-boxes being equidistantly disposed around the upper portion of the ash-hopper 4 and being supplied with air by blowers 12, preferably steam-actuated, for the same reason as the blower which supplies the central pipe 5. The twyer-boxes 11 have slotted sides 13, and through these side slots the air issues in jets or streams, so as to reach all portions of the mass of fuel located adjacent to the outer wall of the producer and between the adjoining twyer-boxes.

By dispersing the air-supply in the manner described uniform distribution of said air throughout all portions of the fuel contained in the producer is insured and the air is delivered to all portions of said mass of fuel in quantity sufficient to effect the conversion of the same into gas.

The twyer-boxes 11 are supported upon brackets 14, secured to the shell of the ash-hopper 4 and located directly beneath the twyer-boxes, so as not to interfere with the downward passage of ashes through the ash-hopper, and these brackets also serve to support an annular pipe 15, which is intended to communicate with a supply of water under pressure and is perforated on the inner side, so as to project jets of water into and through the mass of ashes in the ash-hopper and toward the center of said mass. A similar pipe 16, perforated on its outer side, surrounds the central air-blast pipe 5 and is supplied with water conveyed through a central pipe 17, which extends down through the central hollow column 19, centrally mounted in the sealing-pit 3 and serving as a support for the central blast-pipe 5, the opening in said column 19 being of greater diameter than the pipe 17, so as to provide for the downward passage of dust and ashes which may enter the pipe 5, the ashes being removed from the column 19 through openings 20 therein located adjacent to the bottom of the sealing-pit, so as to prevent clogging of the pipe.

The jets of water discharged into the hot ashes from the pipes 15 and 16 serve a double purpose, being by contact with said hot ashes converted into steam, which rises into the mass of incandescent fuel in the body of the producer and is decomposed thereby, the hydrogen being mixed with the carbonic oxid produced by the burning of the coal, and thereby increasing the heating value of the gas when the latter is finally burned. Moreover, the action of the water upon the hot ashes tends to render the mass less porous, and thus aids the water seal in preventing the downward flow of air or gas through the ashes and the escape of the same around the lower edge of the ash-hopper, or in some cases it may even supplant the water seal as a means of attaining this result. The action of the water-jets upon hot masses of clinker or cinder also has the effect of disintegrating the same, so as to prevent them from lodging in the ash-hopper and obstructing the descent of the ashes through the latter.

The twyer-boxes can be moved radially upon the brackets 14, so that if the coal is of such character as to form clinkers too large to pass downward between the inner end of a twyer-box and the hood 7 the twyer-box can be withdrawn to such an extent as to enlarge said space sufficiently to overcome the difficulty, and thus prevent choking of the ash-hopper by clinkers lodging in the same above the twyers.

In order to guide the twyer-boxes and prevent lateral displacement of the same, a lug 21 on each supporting-bracket 14 projects upwardly through a longitudinal slot 22 in the bottom of the corresponding twyer-box, as shown in Figs. 2 and 3.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination in a gas-producer, of a central blast-pipe for supplying air to the mass of fuel in the producer, with inwardly-projecting twyer-boxes independent of said central blast-pipe and having openings, inwardly beyond the wall or casing of the producer, for supplying air to the fuel between said wall or casing, and the central blast-pipe, substantially as specified.

2. The combination in a gas-producer, of a central blast-pipe having a top grating and a hood for supplying air independently to the central portion or core of the mass of fuel in the producer and to the zone of fuel surrounding said central core, with inwardly-projecting twyer-boxes independent of said central blast-pipe for supplying air to the outer zone of fuel adjacent to the wall or casing of the producer, substantially as specified.

3. The combination in a gas-producer, of an ash-hopper, air-blast pipes for supplying air to the fuel in the producer, and pipes disposed so as to project water laterally into the mass of ashes in the ash-hopper below the air-blast openings, substantially as specified.

4. The combination in a gas-producer, of an ash-hopper, air-blast pipes for supplying air to the fuel in the producer, and inner and outer pipes for supplying water to the ashes in the ash-hopper below the air-blast openings, substantially as specified.

5. The combination in a gas-producer, of a water-sealed ash-hopper, air-blast pipes for supplying air to the fuel in the producer, and pipes disposed so as to project water laterally into the mass of ashes in the ash-hopper between the air-blast openings and the water seal, substantially as specified.

6. The combination in a gas-producer, of a water-sealed ash-hopper, air-blast pipes for supplying air to the fuel in the producer, and inner and outer pipes for supplying water to the ashes in the ash-hopper between the air-blast openings and the water seal, substantially as specified.

7. The combination in a gas-producer, of an ash-hopper having inwardly-projecting twyer-boxes, and brackets secured to the ash-hopper and serving as supports for said twyer-boxes substantially as specified.

8. The combination in a gas-producer, of the main body or casing, and the ash-hopper with inwardly-projecting twyer-boxes adjustable from and toward the centre of the producer, substantially as specified.

9. The combination in a gas-producer, of the main body or casing, and the ash-hopper with a central blast-pipe and inwardly-projecting twyer-boxes adjustable from and toward said central blast-pipe, substantially as specified.

10. The combination in a gas-producer, of the ash-hopper having inwardly-projecting twyer-boxes, and supporting-brackets therefor having projecting portions serving to engage the twyer-boxes and prevent lateral displacement of the same, substantially as specified.

11. The combination in a gas-producer, of the ash-hopper having inwardly-projecting twyer-boxes with central longitudinal slots in the bottom portions thereof, and supporting-brackets for said twyer-boxes having guiding lugs or fingers projecting into said slots, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES A. HERRICK.

Witnesses:
F. E. BECHTOLD,
JOS. H. KLEIN.