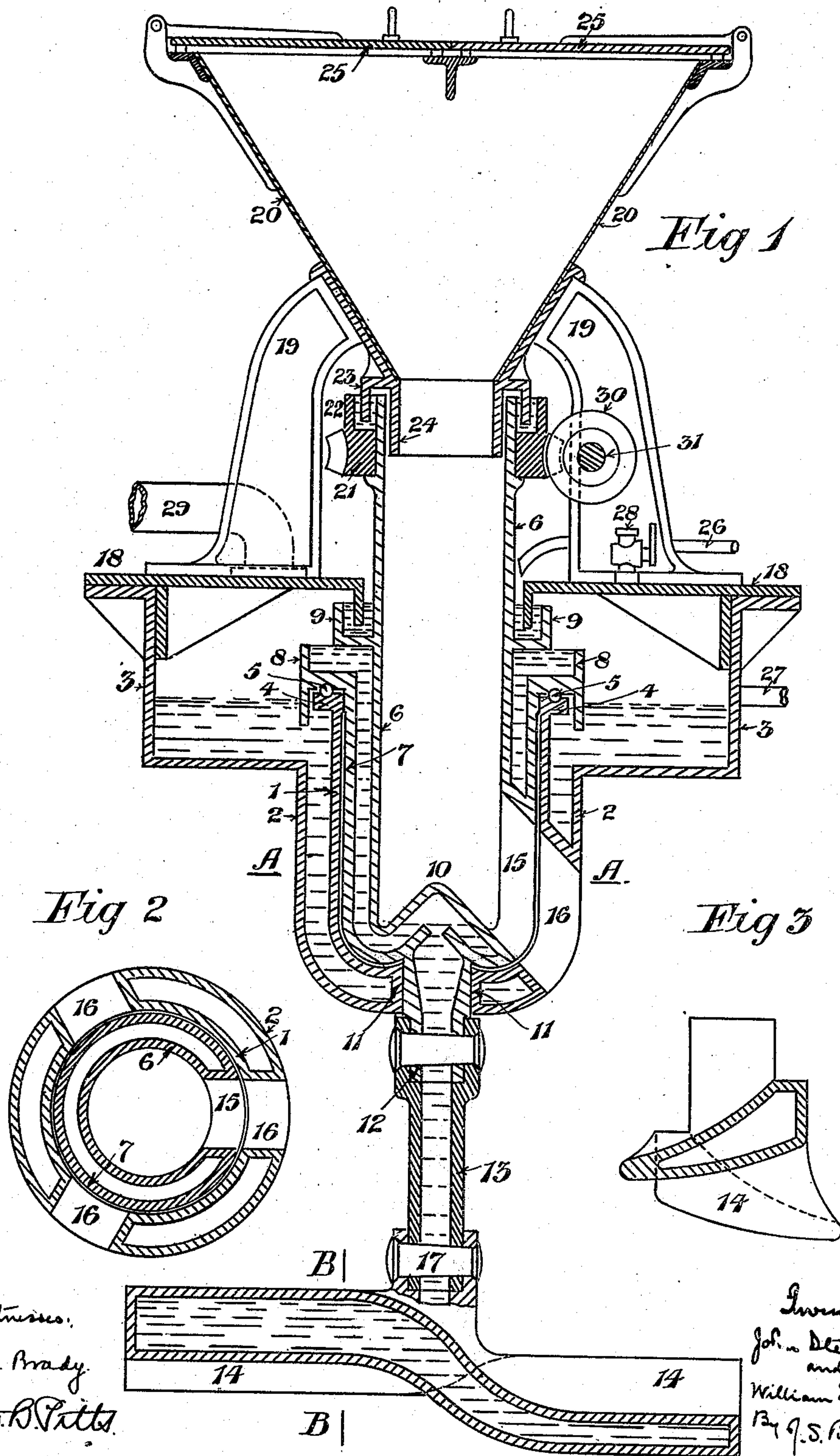


J. & W. STEWART.
FUEL FEEDER FOR GAS PRODUCERS.
APPLICATION FILED JAN. 12, 1909.

930,899.

Patented Aug. 10, 1909.



Witnesses:
L. C. Brady
Geo. B. Pitts

Inventors
John Stewart
and
William Stewart
By J. S. Barker
Atty.

UNITED STATES PATENT OFFICE.

JOHN STEWART, OF CODNOR PARK, ENGLAND, AND WILLIAM STEWART, OF MOTHERWELL, SCOTLAND.

FUEL-FEEDER FOR GAS-PRODUCERS.

No. 930,899.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed January 12, 1909. Serial No. 471,871.

To all whom it may concern:

Be it known that we, JOHN STEWART, a subject of the King of Great Britain, and resident of Codnor Park, in the county of Derby, England, and WILLIAM STEWART, a subject of the King of Great Britain, and resident of Motherwell, in the county of Lanark, Scotland, have invented new and useful Improvements in Fuel-Feeders for Gas-Producers, of which the following is a specification.

This invention relates to improvements in and applicable to pressure and suction gas producers, and has for its object the provision of means for automatically and intermittently feeding the fuel to a producer, means for evenly distributing the fuel so fed to the producer, and the construction of such means whereby the exposed parts inside the producer are water cooled.

In the accompanying drawings:—Figure 1 is a sectional elevation of a combined fuel feeder and spreader. Fig. 2 is a section on the line A. A. Fig. 1. and, Fig. 3. is a section on the line B. B. Fig. 1.

According to this invention the improved feeder comprises an outer circular casing which is fixed in the upper part of the producer and is provided with an inner wall or lining 1 and also with an outer wall or lining 2 which latter is enlarged at its upper end as shown to form a water tank 3. The upper edge of the inner wall is made with a flange 4 which is grooved to form a race for a ring of balls 5 on which the rotatable inner casing is fitted to revolve. This inner casing comprises an inner wall or lining 6 and an outer wall or lining 7 which latter is provided with a tee shaped flange 8 which is grooved for the balls 5 and is shaped to catch the water which overflows from the water trough 9 and to form a seal to the space between the inner and outer casings. The bottom of the inner wall 6 of the inner casing is in the form of an inverted cone 10 and the bottom of the outer wall 7 of the inner casing is shaped to form a neck which rotates in a bearing formed by the connecting ring 11 between the walls 1 and 2, and below the neck there is a squared portion 12 for the coupling pipe 13 between the feeder and the spreader 14. The inner rotatable casing is provided with one or more side outlet openings 15, and as the frame rotates these register with other openings 16 in the

outer fixed casing, the openings in the two casings being so arranged relatively to each other that once or oftener during each revolution of the inner casing all the openings in the outer casing are closed. The spreader 14, of substantially the section shown in the drawings, is connected by cotter 17 to the coupling pipe 13 and is fitted to revolve at about the working level of the fuel in the producer.

The water tank 3 is closed by a cover 18 which is flanged to form a water seal in connection with the trough 9 and acts as a base plate for the brackets 19 by which the hopper 20 is carried. The inner wall 6 is extended upward beyond the cover 18 and is fitted with a worm wheel 21 which is provided with a vertical ring 22 to form part of a water trough, and in connection with this trough there is a ring 23 on the hopper ring 24 and by which a water seal is provided between the rotatable feeder and the fixed hopper. The top of the hopper is provided with hinged doors 25 which can be closed on to suitable packing to make a gas tight joint. Water is supplied through a pipe 26 to the trough 9 and overflows from this trough to the trough 8 and supplies water to the space between the walls 6 and 7, and to the spreader 14 through the coupling pipe 13. The water then overflows into the tank 3 and after circulating through the space between the walls 1 and 2 runs away through the overflow pipe 27, this pipe being so placed that the level of the water in the tank 3 is below the balls 5 and therefore allows of these balls being efficiently lubricated. The top of the trough 3 is provided with an air inlet tap 28 and with a vapor outlet pipe 29 by which the vapor can be conveyed to any position clear of the producer or by which the vapor can be conveyed to the inside of the producer as is usual in suction gas producers. For rotating the inner casing of the feeder the worm wheel 21 engages with a wheel 30 mounted on a shaft 31 which has its bearings in the brackets 19 and is driven by chain, belt, ratchet or other suitable gearing which may be arranged to rotate the inner casing continuously in the same direction or to rotate the casing first in one direction and then in the other.

The sizes and proportions of the various parts are varied according to the type, size and requirements of the producer to which

the invention is applied, and for a small producer the hopper 20 may be attached to and rotate with the inner feeder casing.

When an apparatus of the kind herein described is at work all the parts exposed to the action of heat of the producer are kept cool by the circulation of water through such parts and as the inner feeder casing rotates its opening 15 is brought to register with the openings in the fixed outer frame casing and a certain quantity of fuel falls into the producer and such fuel is distributed and spread evenly over the surface of the fuel in the producer by the action of the spreader 14, the speed at which the inner casing is rotated depending upon the number and size of the openings and the requirements of the producer. When the hopper is empty the rotation of the inner casing is stopped when the opening 15 is between two of the openings 16 so that the opening to the inside of the producer is closed and the escape of gas cut off by the arrangement of the parts. The hopper doors are then opened and the hopper filled after which the hopper doors are closed and the apparatus set in motion again.

What we claim is:

1. In a fuel feeder, the combination of a double walled, fixed, outer casing, with openings through the said casing, and a double walled inner rotatable casing, having a fuel feed passage through its center and one or more openings through its walls arranged to register with the openings in the fixed casing as it is rotated, substantially as herein set forth.

2. In a fuel feeder, the combination of a fixed, outer casing having a vertically disposed double walled portion with openings through the walls of its vertically disposed part, a rotatable inner casing, concentrically arranged within the outer casing and having a central fuel passage, an opening through the casing arranged to register successively with the openings in the outer casing as it is rotated, and means for causing a circulation of water in the space between the walls of the outer casing.

3. In a fuel feeder, the combination of an outer-fixed casing, having a substantially cylindrical vertically disposed portion with openings through the same, a rotatable inner casing concentrically disposed within the vertical portion of the outer casing and having a central feed passage and an opening arranged to register with the openings in the outer casing as the inner casing is rotated, and a spreader connected to and rotatable with the inner casing and arranged to operate upon and to level the top surface of the bed of fuel, substantially as herein set forth.

4. In a fuel feeder, the combination of a double walled, fixed, outer casing, a double

walled, rotatable, inner casing concentrically disposed with reference to the outer casing, and having a central fuel passage, the casings being provided with discharge openings through their walls, that of the inner casing registering successively with the openings in the outer casing as the former is rotated, a feed hopper connected with the fuel passage of the inner casing, and means for causing a circulation of water in the spaces between the double walls of the casing.

5. In a fuel feeder, the combination of a double walled fixed, outer casing, having a vertically disposed cylindrical portion and a water tank above the vertically disposed part, an inner rotatable casing through which the fuel is fed concentrically disposed within the vertical portion of the outer casing, a ball-bearing between the said frames arranged within the water tank but above the water level, and means for causing a circulation of water in the space between the double walls of the outer casing and the water tank thereof, and for maintaining a fixed water level in the latter, substantially as herein set forth.

6. In a fuel feeder, the combination of a double walled, fixed, outer casing, having a vertically disposed cylindrical portion with openings through its walls, a double walled, inner, rotatable casing, concentrically disposed with reference to the fixed outer casing, having a central fuel passage and an opening near its lower end arranged to register with the openings in the outer casing as it is revolved, bearings between the casings, one at the lower ends thereof and the other at a higher level, gearing for rotating the inner casing, and means for causing a circulation of water in the spaces between the double walls of the casings, substantially as set forth.

7. In a fuel feeder, the combination of an outer, fixed casing, having a water tank or box at its upper end and a double walled portion extending downward from the water tank, there being side openings through the walls of the said depending portion of the casing, an inner, rotatable, casing concentrically mounted within the depending part of the outer casing, having a central fuel passage and a discharge opening arranged to register with the openings in the outer casing as the former is rotated, means for maintaining a circulation of water through the said water tank and the space between the double walls of the outer casing, a cover for the water tank and water seals arranged between the rotatable casing and the outer casing, and the cover for the water tank thereof, respectively.

8. In a fuel feeder, the combination of a fixed, outer casing, having a vertically disposed, substantially cylindrical portion in which are formed a plurality of fuel dis-

charge openings disposed about the vertical axis of the said cylindrical part of the casing, a rotatable inner casing mounted within the vertically disposed portion of the outer casing, and having a central fuel passage and a fuel discharge opening therefrom arranged to register successively with the said discharge openings in the outer casing as the inner casing is rotated, or to occupy a position between the said discharge openings when the inner casing is at rest, thereby completely cutting off the fuel passage from a discharge opening, a feed hopper and doors for tightly closing the hopper, substantially as herein set forth.

9. In a fuel feeder, the combination of an outer casing, an inner, rotatable casing hav-

ing a fuel passage through it, means for discharging the fuel around the axis of rotation of the inner casing, and a spreader for acting on the fuel after it is discharged arranged to level the surface of the bed thereof, substantially as herein described.

JOHN STEWART.

WILLIAM STEWART.

Witnesses to the signature of John Stewart:

WILLIAM H. POTTER,
HARRY ROPER.

Witnesses to the signature of William Stewart:

EDWARD HOGE,
ROBERT EDWARD JENNINGS.