Sept. 14, 1926. 1,599,587

J. F. ROGERS ET AL

POKER MECHANISM FOR GAS PRODUCERS

Original Filed Feb. 28, 1920 2 Sheets Sheet 1

Fig. 1.

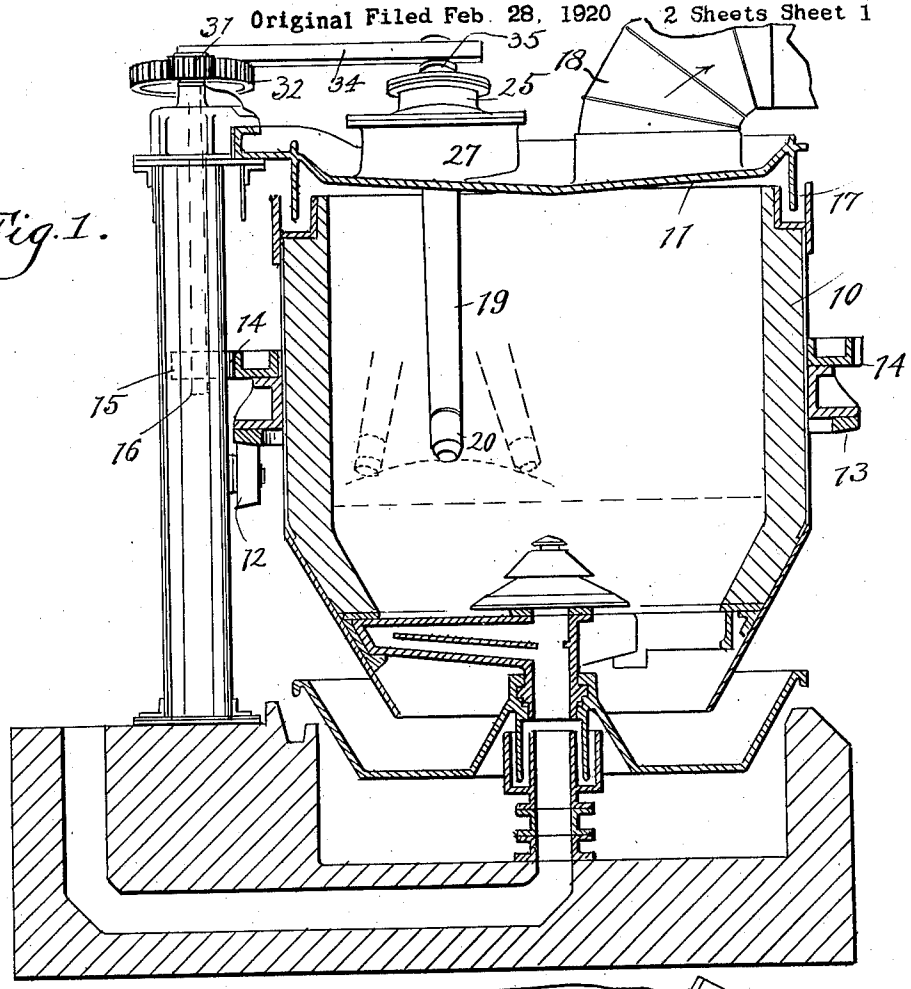
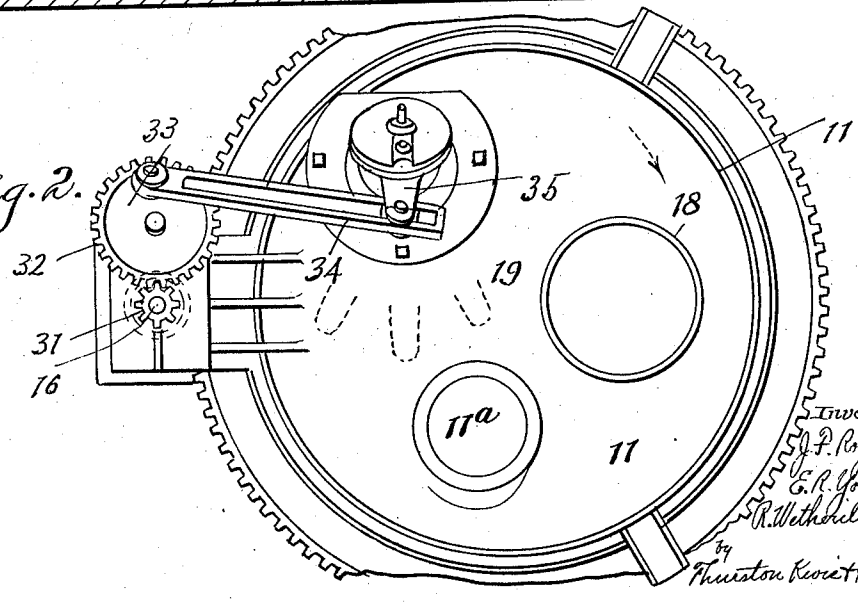


Fig. 2.



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Original Filed Feb. 28, 1920 2 Sheets-Sheet 2

Fig. 3.

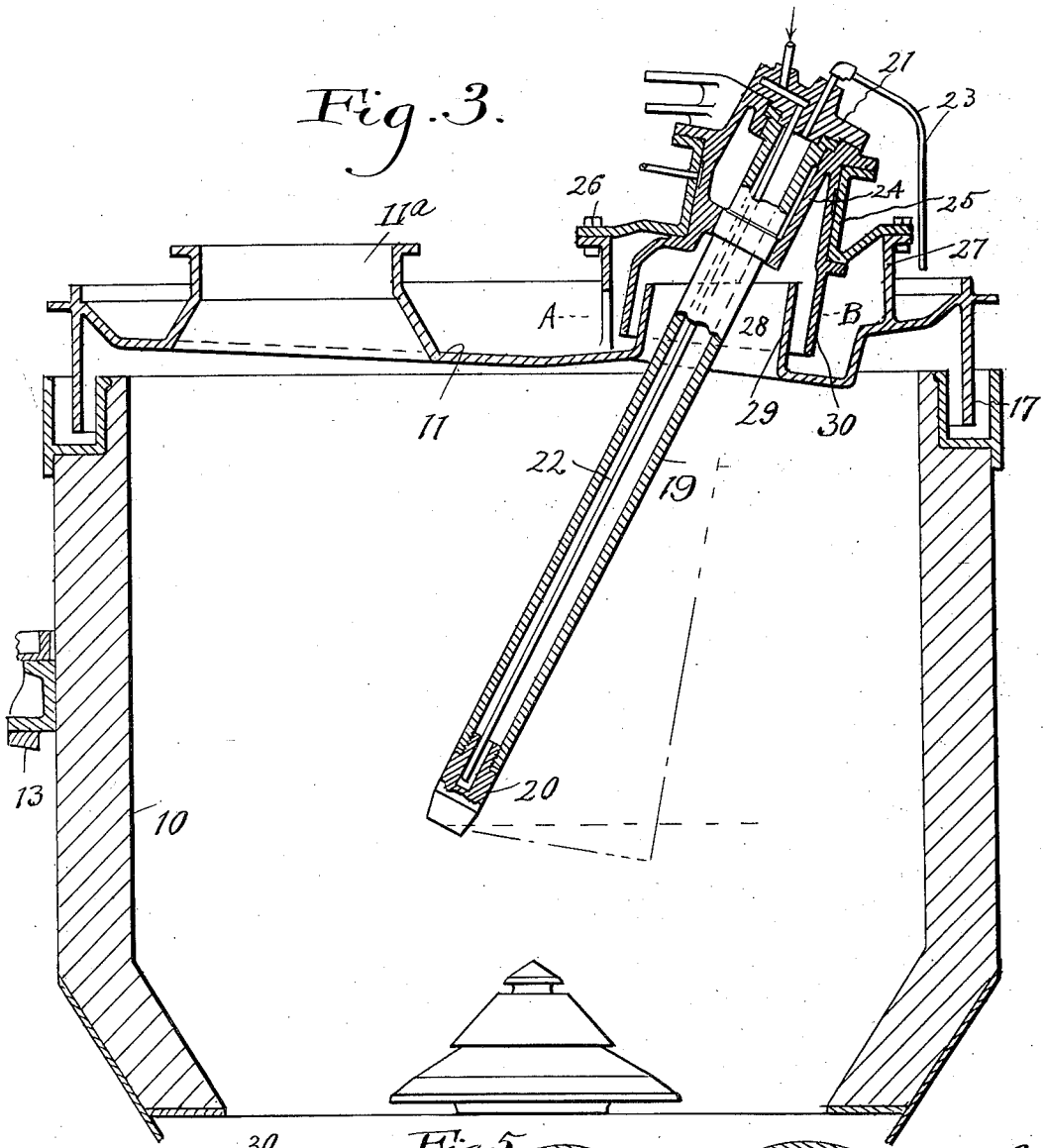


Fig. 4.

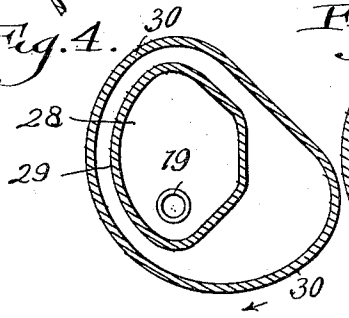


Fig. 5.

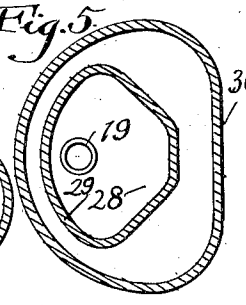
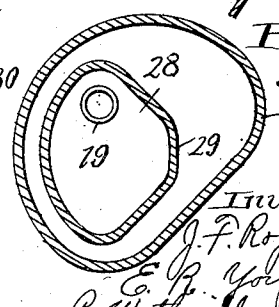


Fig. 6.



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UNITED STATES PATENT OFFICE.

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POKER MECHANISM FOR GAS PRODUCERS.

Application filed February 28, 1920, Serial No. 361,961. Renewed February 26, 1926.

This invention relates to an improved poker mechanism for gas producers, and has for its object to provide a construction wherein the poker covers the bed of fuel more uniformly than pokers heretofore used. Further the invention aims to mount and operate the poker in such a way that there is a slicing or plowing action and a slight packing effect without causing the point or lower end of the poker to have excessive differences in level in the fuel bed.

A further object is to provide a construction such that the poker mechanism can be effectively water sealed and thus made absolutely gas tight.

The poker most generally used heretofore, known as the Hughes poker, is mounted on trunnions, and the poker proper is oscillated or swung back and forth through an arc of a circle lying in a vertical plane. The oscillatory movement is a very desirable one, and the present poker mechanism is preferably such that an oscillatory movement is utilized but the movement of the poker is other than in a vertical plane. Preferably the poker is mounted and oscillated in such a manner that the point of the poker travels back and forth in an arc of a circle lying in a plane which is nearer the horizontal than the vertical, but inclined with respect to both so that as the poker is swung back and forth, toward the wall of the producer body and then toward the center or axis of the producer body, it will thoroughly over the bed of fuel as the body and cover of the producer are rotated relatively, and at the same time the point of the poker will be slightly lower when the poker is in its extreme positions than in the mid position thus producing the desirable packing effect.

The invention may be further briefly summarized as consisting in certain novel details of construction, and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

In the accompanying sheets of drawings, Fig. 1 is a vertical sectional view through a producer equipped with the poker mechanism embodying the present invention; Fig. 2 is a top plan view of the same; Fig. 3 is an enlarged vertical sectional view taken at substantially right angles to the section of Fig. 1; and Figs. 4, 5 and 6 are sectional views substantially along the line A—B of Fig. 3, with the poker in its two extreme and mid positions.

Referring now to the drawings, 10 represents the producer body, and 11 the top or cover of the producer. One of the parts 10 and 11 is rotated relatively to the other, and in this instance the cover is stationary and the producer body is rotated, the body being supported on rollers, one of which is shown at 12 engaging a track 13 surrounding the producer body. The producer body may be rotated by any suitable mechanism, but in this instance it is surrounded by a gear 14 which is engaged by and rotated by a pinion 15 on a vertical shaft 16 alongside the producer body.

The top of the producer body and the peripheral portion of the cover are water-sealed in the customary manner as shown at 17. Additionally any suitable charging apparatus may be used for supplying fuel to the producer, the fuel being introduced through an opening 11^a in the cover 11, and the gas generated in the producer may be conducted from the producer in any suitable way as by means of a pipe or conduit 18.

The poker 19 with which the present invention is involved, is preferably straight from end to end, and as here shown, includes a main hollow body portion with a removable tip 20 at its lower end, and with a cap 21 at its upper or outer end. The poker is preferably water-cooled, the water being conducted down to the lower end or tip of the poker by a pipe 22, and being conducted from the body portion of the poker by a discharge pipe 23 which discharges into the cover, and from which there will be one or more overflow outlets to the trough of the main water seal at the top of the producer body.

The upper part of the poker is seated and fixed in a suitably formed socket of an oscillatory head 24, though the poker can be readily removed from the head by slipping it in an endwise direction out therefrom for repairs and the like. The head 24 is journaled in a cylindrical normally fixed bearing 25 which likewise can be removed but is normally secured by a series of bolts 26 to an annular or substantially

annular upstanding seat 27 of the producer cover 11.

The body portion of the poker extends down through an irregular and somewhat elongated opening 28 in the cover (see Figs. 4, 5 and 6) and through a correspondingly shaped water seal flange 29 projecting up from the cover. This flange is surrounded by a larger and somewhat similarly shaped depending flange 30 on the head 24 carrying the poker. Inasmuch as the shape of the cover, clearly shown in Fig. 3, is such as to provide a depression around the flange 29, it is apparent that a very effective water seal is thus provided, and that gas will not escape from the producer around the poker.

It is to be noted, particularly by reference to Fig. 3, that the poker is set into the oscillatory head 24 at an angle to the latter's axis so that when the head is oscillated, the point of the poker will swing through an arc of a circle in a plane normal to the axis of the head 24. It will be noted also, that the axis of the head, and likewise the axis of the bearing 25 are inclined to the vertical or to the axis of the producer, that is, the axis about which the head 24 turns lies in a plane other than the horizontal. By reason of this novel construction and arrangement not only will the point of the poker swing through the arc of a circle when the head is oscillated, but the plane containing the arc of the circle being normal to the inclined axis of the head is inclined both to the horizontal and the vertical, the inclination with respect to the horizontal being equal to the inclination of the oscillatory head with respect to the vertical.

By reference to Figs. 1, 2 and 3 it will be observed that the point of the poker swings through an arm of a circle extending from a point near the producer axis to a point near the upright wall of the producer body. As the poker is oscillated in this fashion at the same time that the producer body and bed of fuel are rotated in the direction indicated by the arrow of Fig. 2, it is obvious that the fuel bed will be very completely covered by the poker, a slicing or plowing action being obtained due to the inclination of the poker. In this respect the present invention is an improvement over poker mechanisms heretofore contemplated wherein the poker is given a complete rotation about a vertical axis.

Likewise it will be noted that inasmuch as the plane of movement of the point of the poker is inclined to the horizontal and the point of the poker oscillates through an arc in the upper portion of a circle in said plane, the point of the poker will be slightly deeper when at the limits of its movement rather than at any intermediate point, so that as the poker is oscillated, the plowing or slicing action is obtained in the fuel bed, and a slight packing effect is obtained as the poker swings in each direction from its mid position, though the point of the poker in traveling from one extreme position to another does not have excessive differences of level in the fuel bed, which is believed to be an advantage over mechanism wherein the poker is oscillated in a vertical plane. In other words, the present construction embodies to a maximum degree the advantages of prior constructions, and possesses to a minimum extent their disadvantages.

The poker may be oscillated in different ways, but in this instance the shaft 16 which rotates the producer body is provided at its upper end with a pinion 31 which meshes with, and rotates a gear 32 having a crank pin 33 connected by a connecting rod 34 to a crank arm 35 extending laterally from the poker head 24. The pinion 31 and gear 32 are slightly beveled, and the gear 32 is set at an angle with reference to the axis of the pinion 31, which angle corresponds to the inclination of the poker head 24 in its bearing 25, in consequence of which the gear 32, connecting rod 34 and crank arm 35 lie in the same plane, and freedom of movement is obtained.

Modifications may, of course, be made not only in the construction of the poker mechanism, but in the degree of movement which is imparted to the poker proper. For a poker designed to have the extent of arcuate movement illustrated, a water seal flange 29 of the shape illustrated in Figs. 4, 5 and 6 may be employed, but if the poker be given a greater arcuate movement than that contemplated by the present design, the inner water seal flange 29, and, of course, also the outer water seal flange 30 will be shaped so as to permit the full movement desired.

Having described our invention, we claim:

1. In a gas producer, a producer body and cover, one adapted to be rotated with respect to the other, a poker supported by the cover, and means for shifting said poker so that the point or lower end thereof travels in an arc of a circle lying in a plane other than a vertical plane and inclined with respect to the horizontal.

2. In a gas producer, a producer body and cover, one adapted to be rotated with respect to the other, a poker supported by the cover, and means for shifting said poker so that the point or lower end thereof travels in an arc of a circle lying in a plane other than a vertical plane and inclined with respect to the vertical, said plane having a lesser inclination with respect to the horizontal than with respect to the vertical.

3. In a gas producer, a producer body and cover, one adapted to be rotated with respect to the other, a poker supported by the cover, and means for shifting said poker

so that the point or lower end thereof travels in an arc of a circle in a plane which is inclined both with respect to the vertical and to the horizontal, said arc lying in the uppermost portion of the circle.

4. In a gas producer, a producer body having a cover, one adapted to be rotated with respect to the other, a poker supported by the cover and extending downwardly therethrough, and means for oscillating the poker so that the point thereof travels back and forth in opposite directions in an arc of a circle which lies in a plane other than the vertical plane.

5. In a gas producer, a producer body having a cover, one adapted to be rotated with respect to the other, a poker having a head journaled in the cover, the lower end of the poker adapted to travel back and forth in opposite direction in an arc of a circle lying in a plane other than a vertical plane, and operating mechanism connected to the head so as to impart an oscillatory movement to the poker.

6. In a gas producer, a producer body having a cover, means for rotating the one with respect to the other, a poker extending into the producer and provided with a head journaled in the cover, the axis about which said head turns lying in a plane other than the horizontal and the poker being inclined with respect to said axis, and poker operating mechanism connected to the head for shifting the poker so that its lower end travels back and forth in the arc of a circle.

7. In a gas producer, a producer body and cover, one adapted to be rotated with respect to the other, a poker extending through the cover into the producer body, a head carrying the poker, said head having a bearing in the cover the axis of which is inclined with respect to the producer axis, and said poker being inclined with respect to the axis of the bearing.

8. In a gas producer, a producer body and cover, one adapted to be rotated with respect to the other, a poker extending through the cover into the producer body, a head carrying the poker, the head having a bearing in the cover the axis of which is inclined with respect to the producer axis, said poker being inclined with respect to the axis of the bearing, and operating mechanism connected to the head for causing the point of the poker to travel through an arc of a circle.

9. In a gas producer, a producer body and cover, one adapted to be rotated with respect to the other, a poker extending through the cover into the producer body, a head carrying the poker, the head having a bearing in the cover the axis of which is inclined with respect to the producer axis, said poker being inclined with respect to the axis of the bearing, and operating mechanism connected to the head for imparting an oscillatory movement to the head and to the poker.

10. In a gas producer, a producer body and a cover, one rotatable with respect to the other, a poker head journaled in the cover, means for oscillating said head, a poker extending through the head and cover into the producer body, the axis of the poker being at an angle to the axis of the head, and so mounted in the head that the point thereof swings through an arc of a circle lying in a plane displaced from the vertical, and means at the outer end of the poker for retaining the poker in the head and removable to permit the poker to be slipped outwardly in an endwise direction through the head.

11. In a gas producer, a producer body and cover, one rotatable with respect to the other, a poker head rotatably supported by the cover, means forming a water seal between the poker head and cover, a poker seated in the head so that the point thereof swings through an arc of a circle lying in a plane displaced from the vertical, and the poker being endwise removable through the head.

12. In a gas producer, a cover, a poker extending into the producer through the cover thereof, a head to which the poker is rigidly secured, said head having a bearing in the cover the axis of which is inclined at an acute angle with respect to the vertical, and said poker being inclined with respect to the axis of said bearing.

In testimony whereof, we hereunto affix our signatures.

JOHN F. ROGERS.
ELKINS R. YOUNG.
ROBERT WETHERILL, JR.

DISCLAIMER

1,599,587.—*John F. Rogers*, Cleveland Heights, and *Elkins R. Young* and *Robert Wetherill, jr.*, Cleveland, Ohio. POKER MECHANISM FOR GAS PRODUCERS. Patent dated September 14, 1926. Disclaimer filed January 15, 1932, by the assignee, *The Wellman Engineering Company*.

Hereby enters this disclaimer to claims 4 and 5 in said specification, which claims read as follows:

"4. In a gas producer, a producer body having a cover, one adapted to be rotated with respect to the other, a poker supported by the cover and extending downwardly therethrough, and means for oscillating the poker so that the point thereof travels back and forth in opposite directions in an arc of a circle which lies in a plane other than the vertical plane.

5. In a gas producer, a producer body having a cover, one adapted to be rotated with respect to the other, a poker having a head journaled in the cover, the lower end of the poker adapted to travel back and forth in opposite direction in an arc of a circle lying in a plane other than a vertical plane, and operating mechanism connected to the head so as to impart an oscillatory movement to the poker."

[*Official Gazette February 9, 1932.*]