G. C. STONE & R. H. DODD.

GAS PRODUCER.

APPLICATION FILED JULY 27, 1909.

955,614.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

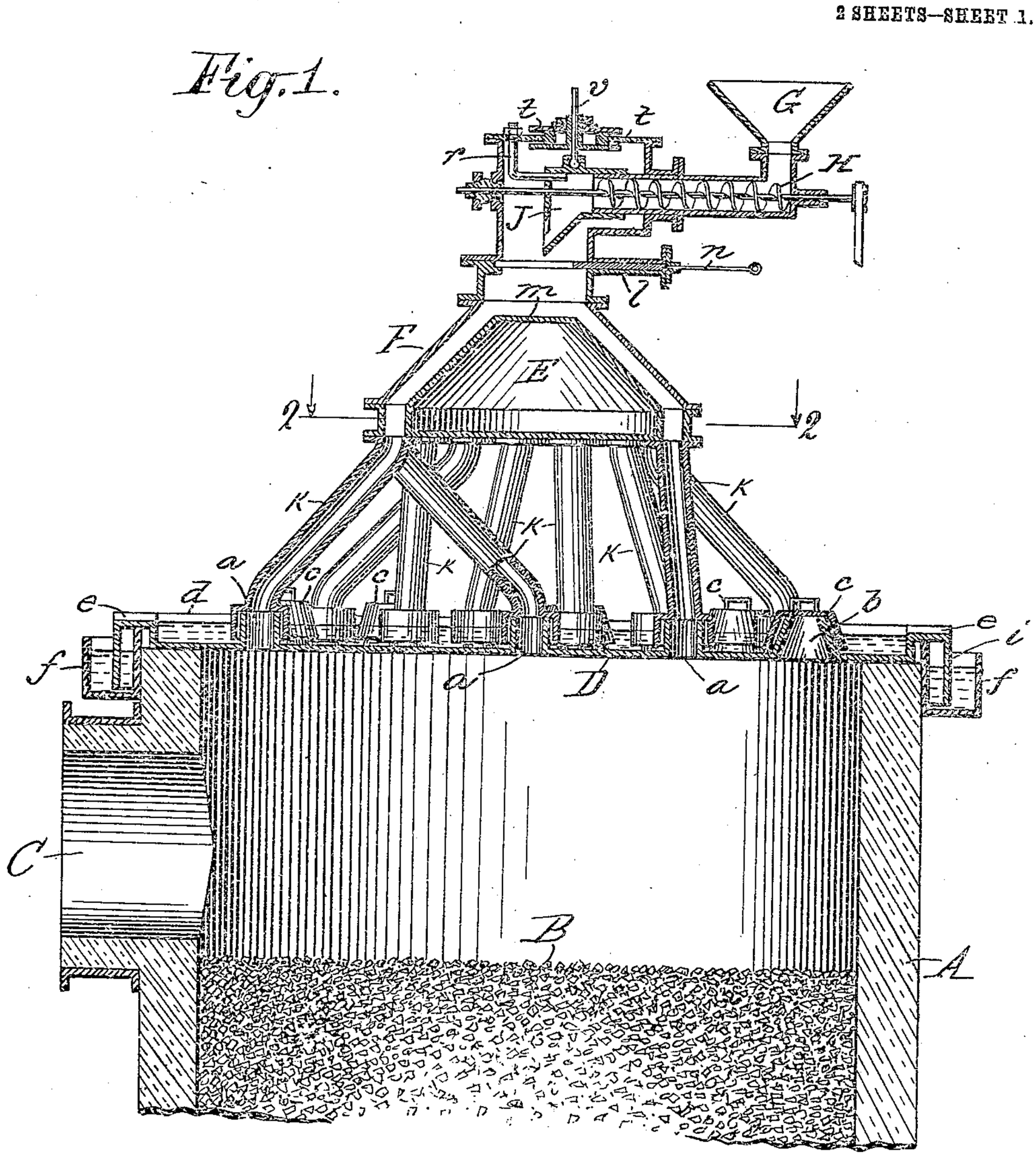
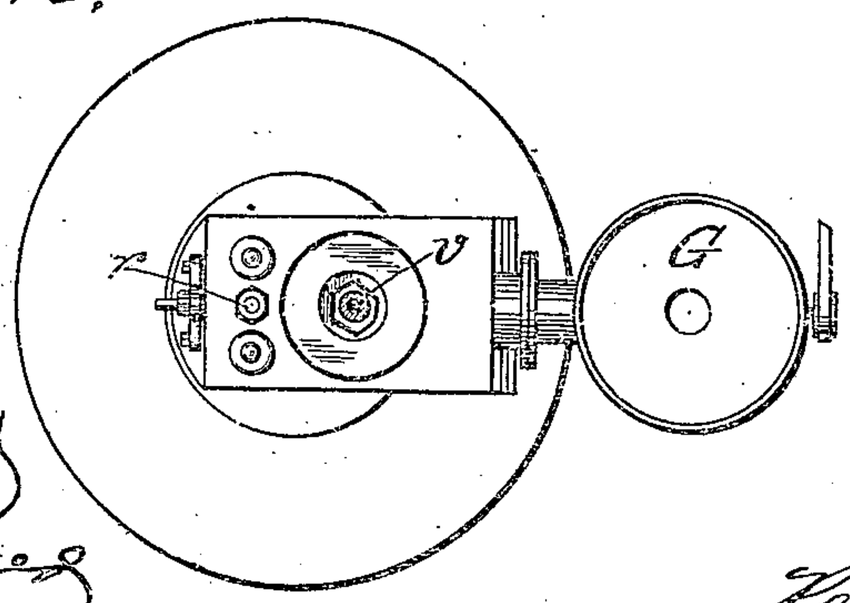


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 2.

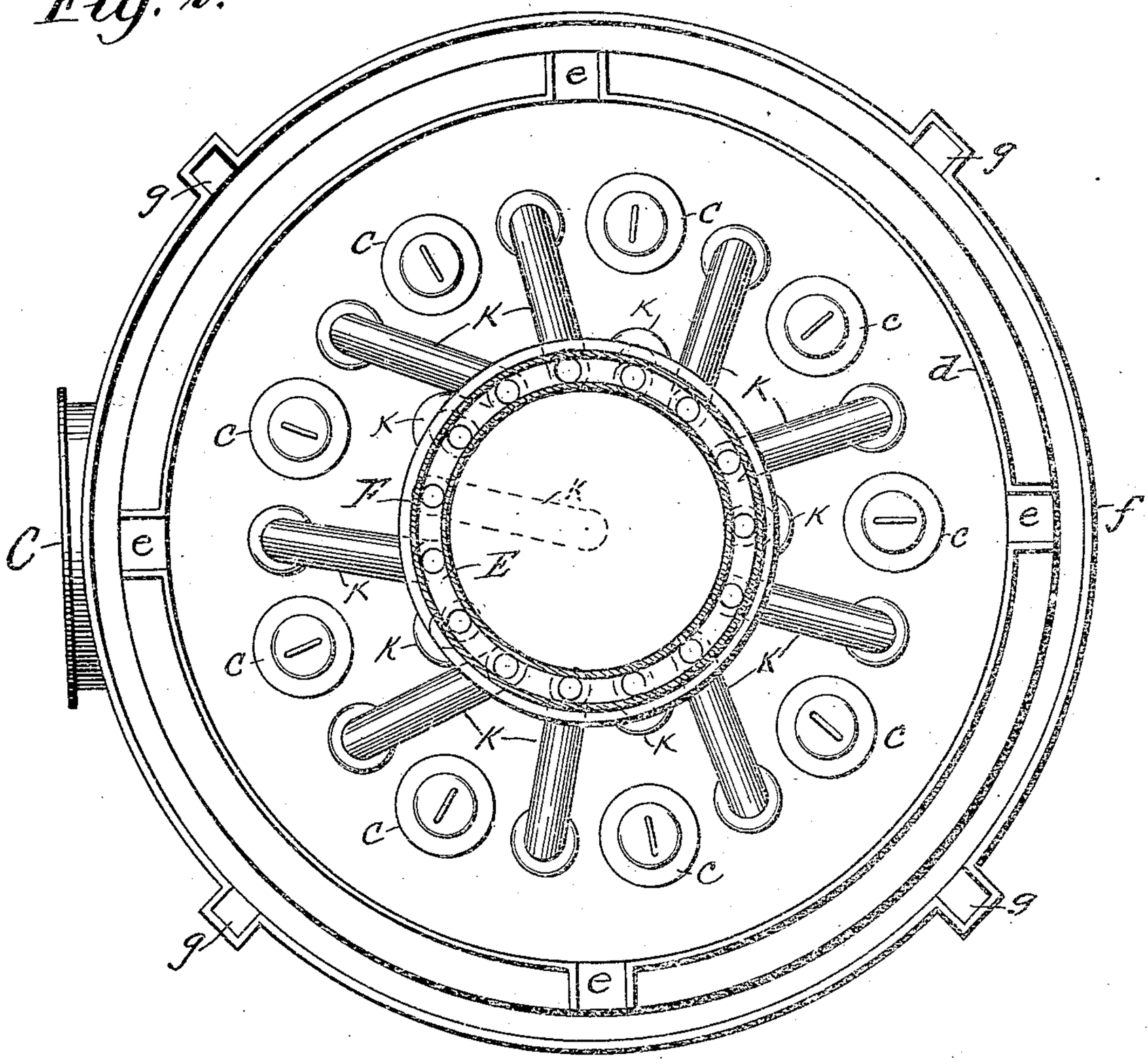
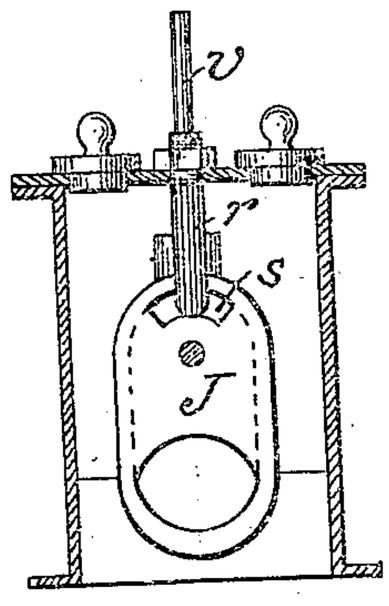


Fig. 4.



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GAS-PRODUCER.

955,614. Specification of Letters Patent. **Patented Apr. 19, 1910.**

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To all whom it may concern:

Be it known that we, GEORGE C. STONE and ROBERT H. DODD, citizens of the United States, residing at New York city, in the county and State of New York, and at Palmerton, county of Carbon, State of Pennsylvania, respectively, have invented certain new and useful Improvements in Gas-Producers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to certain new and useful improvements in gas producers and more particularly to the devices employed for feeding fuel thereto.

The purpose of the invention is to provide means for obtaining a substantially uniform distribution of the fuel over the entire upper surface of the charge in the producer, the arrangement and disposition of the parts being such that the moving parts of the feeding devices are protected against excessive heat, on account of their remoteness from the interior of the producer. At the same time, the combined structure is such that there is no tendency for the feed pipes to become clogged at their discharge ends, which is likely to occur in devices of this general character.

In carrying out our invention, we provide the top of the gas producer with a multiplicity of fuel feed openings, distributed with substantial uniformity over the surface of the cover, as, for instance, a plurality of concentric rows surrounding a centrally located port. In practice, it will be found convenient to make these ports in the form of nipples cast integral with a cover plate, these nipples receiving the spigot ends of a corresponding series of fuel feed pipes, which latter extend upwardly and have their inlet ends arranged in a row and in proximity to each other. The row of inlet ends is preferably of circular arrangement, so as to facilitate the discharge of the fuel into the pipes.

In so far as we are aware, it is broadly new to arrange a series of pipes with respect to the cover of a gas producer in such manner that their discharge ends will be distributed with substantial uniformity over the cover, and their inlet ends will be arranged in proximity to each other and in a row so that they may the more readily be supplied with fuel. The devices employed for supplying the inlet ends of these pipes with fuel may be varied within considerable limits. Thus, in the specific form shown in the drawings accompanying this specification, the supply of fuel to the inlet ends is effected through the intermediacy of an incline, of general conical form having at its upper end a fuel-receiving ledge upon which is dropped through an adjustable spout the fuel supplied to said spout through a hopper and feed screw, or the like. The fuel from the adjustable spout is received upon the ledge, and after accumulating in a mound thereon, slides down the incline into the inlet ends of the several pipes, an outer hood being provided to prevent scattering of the material and to guide and direct it into the pipe inlets. By varying the adjustment of the spout, the feed to different portions of the incline can be correspondingly varied to vary the distribution of the fuel into the several pipes, as circumstances may require. A cut-off is provided which may be closed during intervals of feed. Furthermore, the cover plate itself may be provided with stoking ports, preferably arranged intermediate of the outer row of fuel feed ports and which may be provided with removable covers, and both the stoking ports and the fuel inlet ports may be water sealed by the expedient of providing the cover with a raised outer flange having an overflow into an external water-trough, the water employed for sealing, having also the function of keeping the cover plate at such a low temperature as to obviate all danger of coking of the fuel in the inlet ports and causing their obstruction.

In the accompanying drawings, Figure 1 represents the upper portion of a gas producer, provided with our improvements, the parts being shown mainly in section; Fig. 2 represents a sectional top plan view taken on a plane indicated by the line 2—2 of Fig. 1. Fig. 3 represents a top plan view of the parts above the line 2—2 of Fig. 1, and Fig. 4 represents a vertical sectional view and partial elevation of the uppermost portion of the structure, on a somewhat larger scale.

Similar letters of reference indicate similar parts throughout the several views.

Referring to the drawings, A indicates the gas producer, which may be, for instance,

of the usual Taylor type. B indicates the charge of fuel therein, and C the outlet for the gases generated in the producer. We have not thought it necessary or essential to illustrate the construction of the lower part of the producer, as it may be of any suitable or desired type commonly used in large operations, and wherein it is desirable to maintain substantially uniform conditions.

The cover of the producer is preferably a cast iron plate D, having cast integrally therewith a multiplicity of upwardly projecting nipples or inlet ports *a*, distributed with substantial uniformity over the surface of the plate, as, for instance, in a plurality of concentric rows surrounding a central nipple. Conveniently interspersed with the outer row of these fuel inlet ports or nipples is arranged a row of stoking ports *b* having removable covers *c*, so that the surface of the charge is readily accessible through the stoking ports, for the insertion of the usual stoking tool. The cover is further provided with an outlying raised flange *d* having overflows *e* which discharge into an outer trough *f* having take-offs *g* into which trough a dip flange *i* of the cover plate projects. In this manner, the stoking ports may be readily sealed by water, as indicated, and the water will likewise serve to keep down the temperature of the fuel inlet ports so as to prevent any possible obstruction thereof by coking of the fuel. The inlet ports or nipples *a* further serve as a spigot connection to the socket ends of a series of fuel feed pipes *k*, the socket and spigot joints being likewise water-sealed. These fuel feed pipes *k* extend upwardly in such manner that their inlet ends are in proximity to each other and in a row. The arrangement of the inlet ends is annular and preferably circular, so that they may the more readily be supplied with fuel from above. Moreover, the diameter of the circular row is preferably less than the diameter of the cover and within the row is located an incline E, in the general form of the frustum of a cone having a top ledge *m* for receiving the fuel and permitting it to flow down the incline into the inlet ends of the pipes *k*. An outer hood F is provided to prevent scattering of the fuel and to assist in guiding it into the inlet ends of the pipes *k* and this hood has an upper continuation in which is located the cut-off *l* having an operating rod *n*, so that the portions of the device above the cut-off may be protected against any up-flow of gases, during intervals between feeding operations. The upper portion of the hood, above the cut-off, is provided with a hopper G and a feed screw H, whose shaft may be rotated from any suitable source of power. At the inner end of the pipe within which the feed screw operates is located an adjustable spout J, having a capacity for adjustment longitudinally and axially. The weight of the spout is sustained at its outer end by means of the bent rod *r* which engages a circular slot *s* of the spout, without interfering with the capacity of the spout for longitudinal adjustment. The longitudinal adjustment of the spout is effected through the intermediacy of the slidable plates *t* and the rod *v*, whose lower end forms a ball and socket joint with the spout, permitting its axial adjustment. It will be evident that by reason of its capacity for adjustment the spout has the capacity to discharge its contents upon practically any part of the ledge *m*, thereby varying the distribution from the ledge to the incline E, and consequently to the inlet end of the pipes *k*.

From the foregoing description, the mode of operation of the invention will be apparent; the fuel fed to the producer from the hopper G is conveyed by the feed screw H and discharged through the adjustable spout J upon the ledge *m*, accumulating thereon at the angle of repose, whereupon the falling accretions slide down the incline E, enter the inlet ends of the pipes *k* and finally discharge through the feed ports *a* upon the upper surface of the charge B in the producer. When the adjustment of the spout J is so chosen that the falling fuel would discharge over the center of the ledge the distribution to the several pipes will be practically uniform; but, as hereinbefore indicated, the distribution can be varied by suitable adjustment of the spout so as to direct a greater quantity of fuel into some of the pipes *k* than into others, according as the conditions of combustion of the upper surface of the charge vary.

In another application for Letters Patent of the United States, filed of even date herewith, we have shown a different or modified means for supplying the inlet ends of the pipes *k* with fuel. In the construction shown in our said co-pending application, however, the same construction of cover in its relation to the producer and to the pipes *k* is illustrated as in the present application. It will, therefore, be understood that the broad claims of the present case are intended to be correspondingly generic, that is, to cover the features referred to, common to the two constructions.

Having thus described our invention, what we claim is:—

1. A gas producer, provided at its top with a cover having a multiplicity of fuel feed ports distributed over its surface, a corresponding series of fuel feed pipes communicating with said ports and having their inlet ends arranged in an annular row in proximity to each other, and means for supplying said inlet ends with fuel said

ports and pipes being so constructed and arranged with relation to the means of supply as to simultaneously distribute the fuel with substantial uniformity over the top surface of the bed of fuel; substantially as described.

2. A gas producer, provided at its top with a cover having a multiplicity of fuel feed ports distributed over its surface, a corresponding series of fuel feed pipes whose inlet ends are arranged in an annular row of less diameter than the cover, and means for supplying the annular row of inlet ends with fuel said ports and pipes being so constructed and arranged with relation to the means of supply as to simultaneously distribute a fuel with substantial uniformity over the top surface of the bed of fuel; substantially as described.

3. A gas producer, provided at its top with a cover having a multiplicity of fuel feed ports distributed over its surface, a corresponding series of fuel feed pipes communicating with said ports and having their inlet ends arranged in an annular row in proximity to each other, means for supplying said inlet ends with fuel, said ports and pipes being so constructed and arranged with relation to the means of supply as to simultaneously distribute the fuel with substantial uniformity over the top surface of the bed of fuel, and auxiliary means for varying the relation of the means of supply to the said ports and pipes so as to vary the distribution when desired; substantially as described.

4. A gas producer, provided at its top with a cover having a multiplicity of fuel feed ports distributed over its surface, a corresponding series of fuel feed pipes communicating with said ports and having their inlet ends arranged in an annular row in proximity to each other, and means for supplying said inlet ends with fuel, said means consisting in part of a fuel-receiving ledge communicating by an incline with said inlet ends; substantially as described.

5. A gas producer, provided at its top with a cover having a multiplicity of fuel feed ports distributed over its surface, a corresponding series of fuel feed pipes communicating with said ports and having their inlet ends arranged in an annular row in proximity to each other, and means for supplying said inlet ends with fuel, said means consisting in part of a fuel-receiving ledge of smaller diameter than that of the annular row in which the inlet ends of the pipes are located and an incline from the ledge to said inlet ends; substantially as described.

6. A gas producer provided at its top with a cover plate having a multiplicity of fuel feed ports distributed over its surface, a corresponding series of fuel feed pipes communicating with said ports and having their inlet ends arranged in an annular row in proximity to each other and an incline arranged within the row of pipe inlets, a fuel receiving ledge discharging upon the incline, and an outer hood for the incline forming therewith a protected chute to the pipe inlets; substantially as described.

7. A gas producer provided at its top with a cover plate having a multiplicity of fuel feed ports distributed over its surface, a corresponding series of fuel feed pipes communicating with said ports and having their inlet ends arranged in an annular row in proximity to each other and an incline arranged within the row of pipe inlets, a fuel receiving ledge discharging upon the incline, an outer hood for the incline forming therewith a protected chute to the pipe inlets, a fuel supply pipe discharging upon the ledge, and a cut-off between the ledge and the supply pipe; substantially as described.

8. A gas producer, provided at its top with a cover having a multiplicity of fuel feed ports distributed over its surface, a corresponding series of fuel feed pipes communicating with said ports and having their inlet ends arranged in an annular row in proximity to each other, and means for supplying said inlet ends with fuel, said means consisting in part of a fuel-receiving ledge of smaller diameter than that of the annular row in which the inlet ends of the pipes are located, an incline from said ledge to the inlet ends, and a fuel supply pipe discharging upon the ledge and having a spout adjustable transversely of the ledge; substantially as described.

9. A gas producer, provided at its top with a cover having a multiplicity of fuel feed ports distributed over its surface, a corresponding series of fuel feed pipes communicating with said ports and having their inlet ends arranged in an annular row in proximity to each other, and means for supplying said inlet ends with fuel, said means consisting in part of a fuel-receiving ledge of smaller diameter than that of the annular row in which the inlet ends of the pipes are located, an incline from said ledge to the inlet ends, and a fuel supply pipe discharging upon the ledge and having a spout adjustable transversely of the ledge and also axially; substantially as described.

In testimony whereof we affix our signatures, in presence of two witnesses.

GEORGE C. STONE.
ROBERT H. DODD.

Witnesses:
JOHN C. PENNIE,
LAURA B. PENFIELD.