R. V. FARNHAM.

GAS PRODUCER.

APPLICATION FILED DEC. 19, 1910.

996,628.

Patented July 4, 1911.

2 SHEETS—SHEET 1.

Fig. 3.

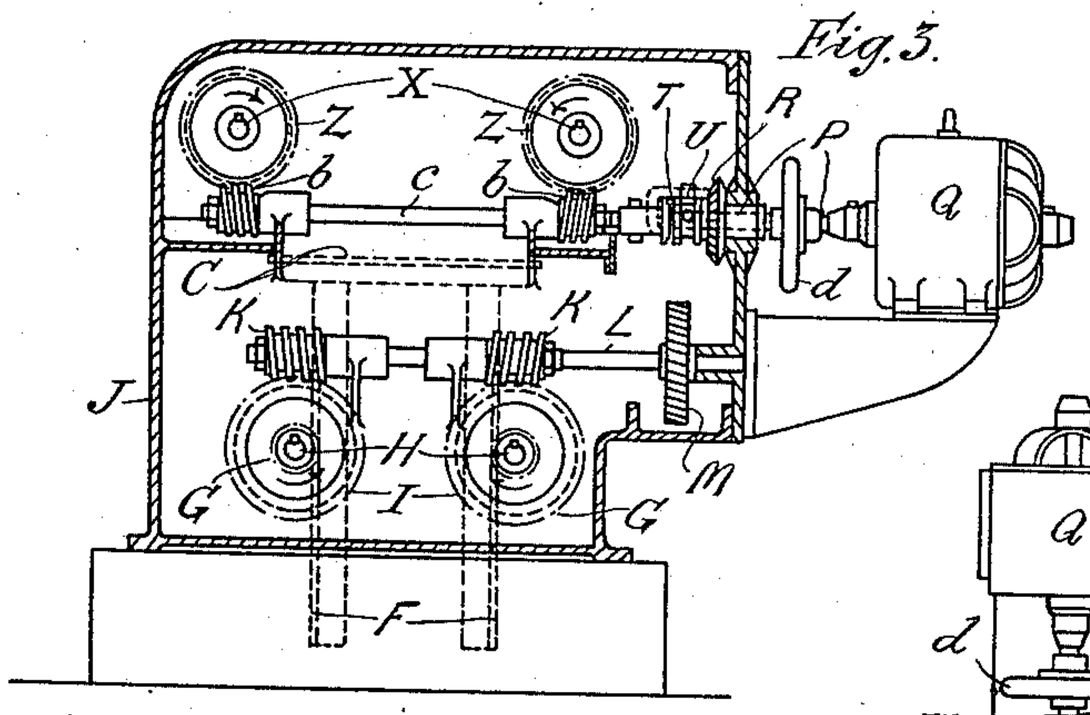


Fig. 2.

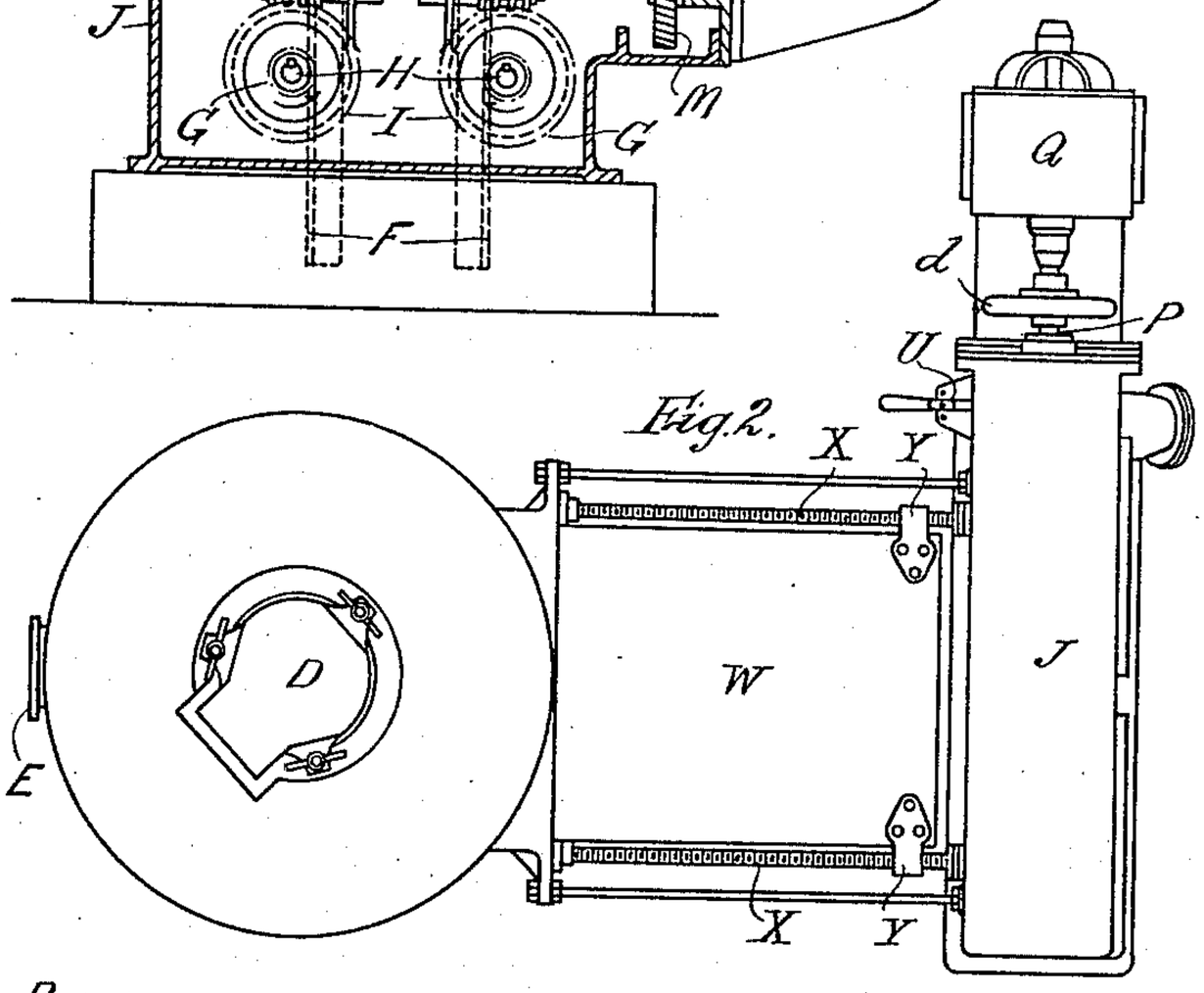
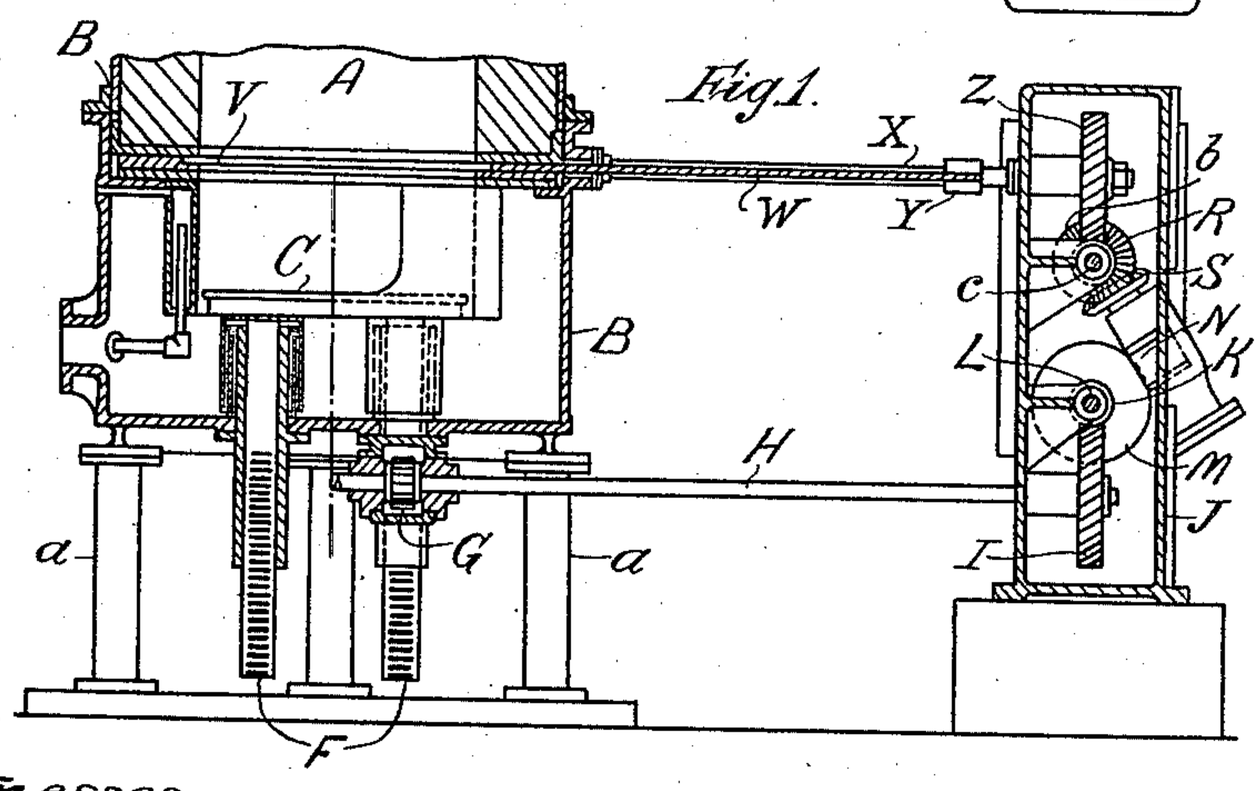


Fig. 1.



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2 SHEETS—SHEET 2.

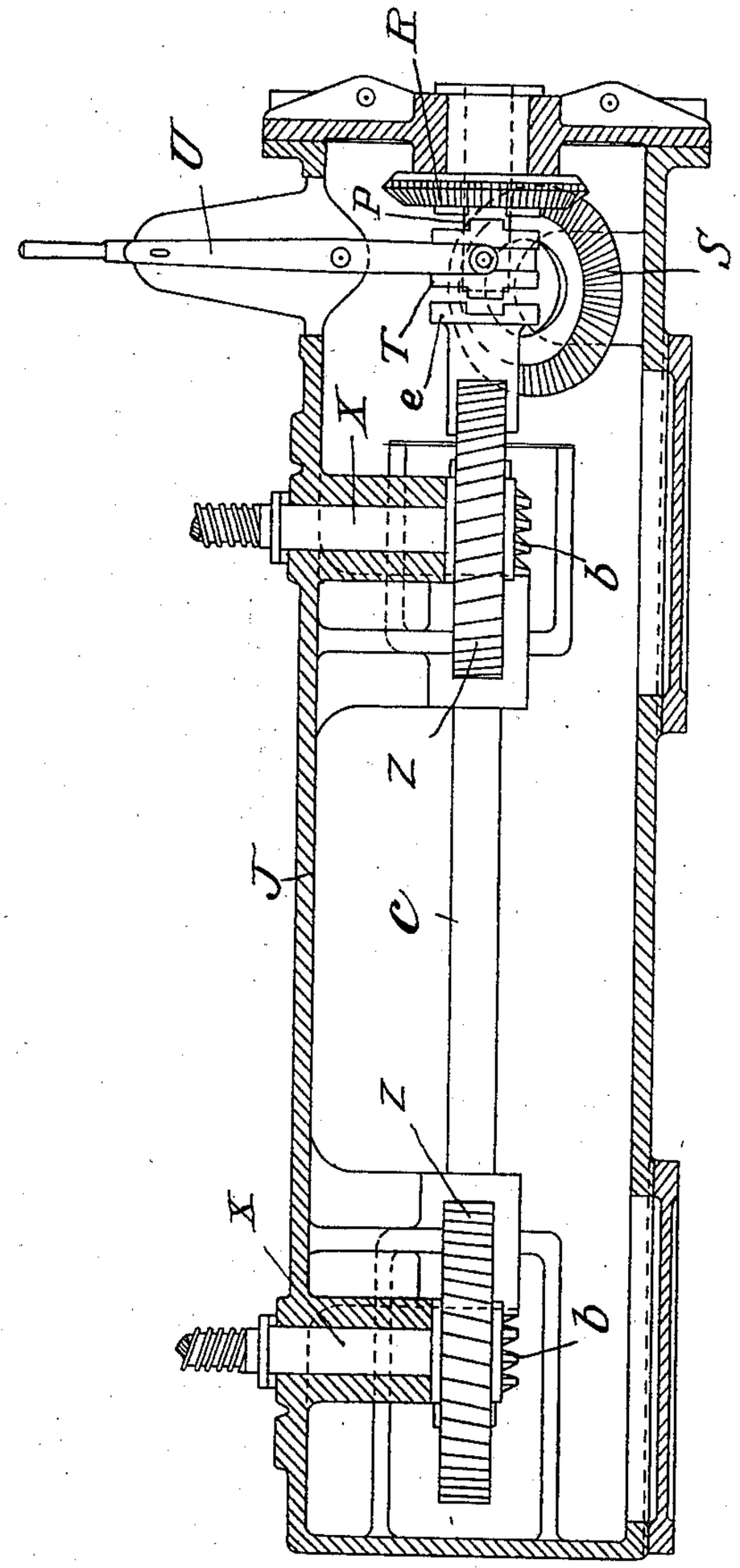

FIG. 4.

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UNITED STATES PATENT OFFICE.

REGINALD VANDEZEE FARNHAM, OF SKELMORLIE, SCOTLAND.

GAS-PRODUCER.

996,628. Specification of Letters Patent. Patented July 4, 1911.

Application filed December 19, 1910. Serial No. 598,193.

To all whom it may concern:

Be it known that I, REGINALD VANDEZEE FARNHAM, of Audley End, Skelmorlie, Ayrshire, Scotland, engineer, have invented a certain new and useful Improvement in Gas-Producers; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to gas producers of the suction or pressure type wherein the fuel is fed at each fresh charge on to a vertically movable grate immovable horizontally and coöperating with an independent horizontally movable support disposed above said vertically movable grate, the vertically movable grate serving in its upward movement to compress the mass above, while the gases arising from the fresh charge are caused to pass through the incandescent mass resting above the fresh charge, and the volatile matters and hydrocarbons are resolved into fixed gases.

The invention consists in the arrangement of gearing hereinafter particularly described for operating the horizontally and vertically movable supports.

In the drawings Figure 1 is a part elevation part vertical section, and Fig. 2 is a plan of a gas producer equipped with the improved arrangement of gearing. Fig. 3 is a vertical section taken substantially at right angles to Fig. 1 of the gearing shown at the right in the latter figure. Fig. 4 is a horizontal section, on an enlarged scale, taken substantially on the plane of the spindles X, X, Figs. 1 and 3.

Referring to the drawings, the producer comprises a central combustion chamber A of firebrick located within a metal casing B which rests on columns or supports *a*, the upper end of the combustion chamber being surmounted by a hopper D (Fig. 2), through which is fed the fuel at starting, the gases generated being led from the combustion chamber by way of the outlet E (Fig. 2).

The devices for lifting the grate C are fitted below the same, these devices being operated from outside the casing B and comprising toothed racks F secured to the grate C, and pinions G secured to shafts H and in gear with said racks F which racks extend through the base of the casing B and are preferably circular in cross section. The shafts H are mounted in bearings on the base of the casing B and to each shaft is secured a worm wheel I which is located within a casing J and is adapted to be operated by a worm K on a shaft L provided with a worm wheel M in gear with a worm N on a shaft which is operated from the shaft P of an electric motor Q, as by means of bevel gear wheels R and S and a clutch member T having two clutch faces and slidably mounted at the inner end of the shaft P, and operated by a pivoted lever U (Figs. 2 and 4); said bevel wheel R being freely mounted on the shaft P and being provided with a clutch face adapted to be engaged by one face of said clutch T.

At about the height to which the grate C is intended to be raised there is provided a guide V in which a perforated metal plate W is arranged to be slid horizontally so as to pass through the incandescent fuel and to support all the fuel in the combustion chamber temporarily and thus permit the grate to be lowered. The plate W is operated by means of screw-threaded spindles X engaging nuts Y secured to said plate, each of said spindles X being adapted to be rotated by means of a worm wheel Z and worm *b* which are also located within said casing J, the worms *b* being secured to a shaft *c* co-axial with the motor shaft P and adapted to be connected to said shaft P by means of the clutch T engaging a corresponding clutch face *e* at the inner end of the shaft *c*. If desired, the shaft P may be rotated by a hand wheel *d* secured thereto.

It will be understood that the member T is adapted to engage alternately the clutch face on the bevel gear R and so couple the bevel gear R to the shaft P, and to engage a clutch face at the inner end of the shaft *c* and so couple the shaft *c* with the shaft P so that when the shaft *c* is in rotative engagement with the clutch T the bevel gear will be disengaged from the shaft P, and vice versa. The clutch T thus serves to connect the motor shaft P with the gearing which operates the shaft H, and with the shaft *c* which operates the screw-shafts X, X alternatively, so that when the shaft H is in geared engagement with the shaft P, through the bevel gear R, the shaft *c* will be disengaged from the said motor shaft; and when the said shaft *c* is connected with the shaft P through the clutch T the bevel gear R will be disengaged from the shaft

P, so that the gearing connecting said bevel gear R with the shaft H will be thrown out of operation. It will also be understood that by the described construction of gearing which controls the movement of the grate and the sliding plate a compact and protected arrangement of gearing is provided; and the grate and the sliding plate being interconnected as described they cannot be operated simultaneously.

What I claim is:—

1. In a gas producer, the combination with a grate movable only in a vertical plane, of an independent horizontally movable fuel support disposed above said vertically movable grate, means for operating said grate, means for operating said support, and devices for actuating said grate and said support-operating means, said devices being so arranged that only one of said operating means can be actuated by said devices at a time.

2. In a gas producer, the combination with a grate movable only in a vertical plane, of an independent horizontally movable fuel support disposed above said vertically movable grate, means including worm gearing for operating said grate, means including worm gearing for operating said support; a motor shaft and a clutch adapted to couple the motor shaft with said grate-operating means and with said support-operating means alternatively.

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

REGINALD VANDEZEE FARNHAM.

Witnesses:

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