

No. 725,369.

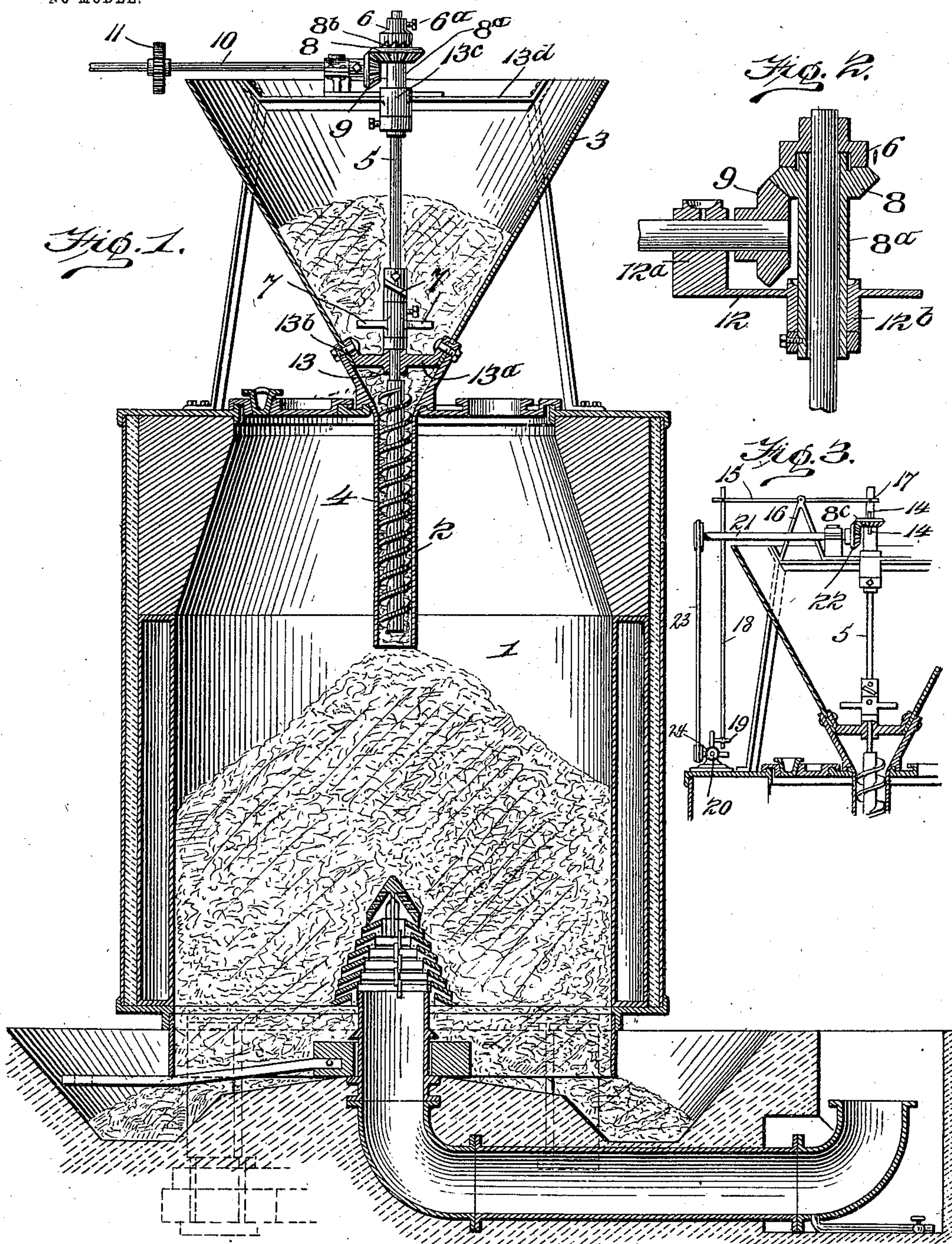
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J. G. SANDERSON.

AUTOMATIC FUEL FEEDING DEVICE FOR GAS PRODUCERS.

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NO MODEL.



Witnesses

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JAMES GARDNER SANDERSON, OF SCRANTON, PENNSYLVANIA.

AUTOMATIC FUEL-FEEDING DEVICE FOR GAS-PRODUCERS.

SPECIFICATION forming part of Letters Patent No. 725,369, dated April 14, 1903.

Application filed March 22, 1902. Serial No. 99,478. (No model.)

To all whom it may concern:

Be it known that I, JAMES GARDNER SANDERSON, a citizen of the United States, and a resident of Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Fuel-Feeding Devices for Gas-Prod-
5 ucers, of which the following is a specification.

10 My invention relates to a device for feeding solid fuels into the combustion-chamber of a gas-producer and automatically regulating the supply.

The object of my invention is to feed the
15 fuel, especially small coals, such as coal-waste and anthracite culm, also larger fuel, directly into the combustion-chamber and at the same time prevent the escape of gas during such feeding; also, to regulate automatically the
20 supply of fuel; and with these and minor objects my invention consists of the parts and combination of parts, as will be hereinafter more fully set out.

In the drawings, Figure 1 is a vertical cen-
25 tral section of a gas-producer embodying the automatic feeding device. Fig. 2 is a detail sectional view of a controlling mechanism for the feeding device. Fig. 3 is a detail sectional view of a slightly-modified construction of
30 controlling device.

1 represents a combustion-chamber in which the fuel-line is indicated as shown.

2 is the feed pipe or tube, connected with
35 and leading from a hopper 3 and extending into the combustion-chamber to the desired fuel-line.

4 represents a screw conveyer secured with-
in the tube 2 and mounted upon the lower
40 end of the shaft 5, said shaft being journaled in the journal-bearing 13, which is attached by suitable arms 13^a within the hopper 3 by means of the bolts 13^b, the upper end of the shaft being journaled in the bearing 13^c, which
45 is attached, by means of suitable arms 13^d, to the top of the hopper, as shown in Fig. 1.

6 is a clutch member secured, by means of the set-screws 6^a, to the upper end of the shaft 5.

7 represents agitators secured to the shaft
50 5 within the hopper 3 above the journal-bearing 13.

8 is a bevel-pinion provided with an elon-

gated hub 8^a, which is loosely secured upon the upper end of the shaft 5, as shown in Fig. 2. The pinion 8 is provided with the crown-
55 clutch member 8^b, adapted to engage with the clutch member 6.

9 is a bevel driving gear-wheel adapted to gear with the pinion 8, said gear-wheel being mounted upon the shaft 10, said shaft being
60 provided on its outer end with a power-wheel 11.

12 is a plate secured on the arms 13^d, provided with journal-bearing 12^a, in which the shaft 10 is journaled. This plate is provided
65 with another journal-bearing 12^b, in which the elongated hub 8^a of the pinion 8 is journaled, as clearly shown in Fig. 2.

In Fig. 3 I have shown a slightly-modified construction of clutch wherein 14 is an elon-
70 gated key or feather fixed to the shaft 5, said feather being adapted to move vertically within a groove formed on the inner side of the pinion 8^c. 15 is a lever fulcrumed on the support 16, one end of said lever being piv-
75 oted at 17 to the shaft 5. 18 is a rod, the upper end of which is pivotally secured to the lever 15, while its lower end is pivotally secured to an arm 19 of the valve 20, controlling the supply of power. The shaft 21 is
80 provided with a bevel-gear 22, adapted to mesh with the pinion 8^c, said shaft being connected to the motor 24 by means of the belt 23, as shown.

The operation of the device is as follows:
85 It will be assumed that the hopper 3 is supplied with fuel intended for combustion, a large percentage of the fuel being of finely granulated or pulverized material. The weight of the shaft 5, with its attachments,
90 will cause the clutch member 6 to engage with the clutch member 8^b, whereupon the motion of the shaft 10 is conveyed through the gear 9 and pinion 8 to the shaft 5. The revolution of shaft 5 and attached screw con-
95 veyer 4 conveys the fuel through the pipe or tube 2 into the combustion-chamber. When the combustion-chamber is filled to the mouth of the tube, the resistance to further supply
100 will cause the screw conveyer, with the shaft 5, to climb or move upward on the material within the tube 2, thereby disengaging the clutch members, and thus stopping the revolution of the shaft and screw, and conse-

quently the fuel-feed. In this position the gear 9 and pinion 8 continue to revolve. When the fuel in the chamber 1 is lowered by consumption, the material within the tube 2 below the conveyer drops into the combustion-chamber, and at the same time the shaft, with the conveyer, will also drop down until the clutch member 6 is again in engagement with the clutch member 8^b, whereupon the motion of the shaft 10 is conveyed to the shaft 5 through the gear and pinion above referred to, whereupon the shaft 5, with its conveyer, is again put in operation and the fuel fed until the combustion-chamber is filled. The speed of the conveyer will be regulated to supply the necessary fuel for rapid as well as slow combustion, inasmuch as the feeding device is automatic in its operation in keeping up the supply of fuel.

There may be various modifications in the details of the device without departing from the spirit of my invention. For instance, there may be other forms of clutch than the one shown. A pawl-and-ratchet mechanism may be used or the device shown in Fig. 3, where the upward-and-downward movement of the shaft 5, acting upon the lever 15 and rod 18 on the valve or switch 19, regulates the supply of power to the motor 24.

If it is desired to use a coarse fuel with my improved feed device or fuel such as would permit the products of combustion to pass through the conveyer and hopper, it will be necessary to cover the hopper and supply the fuel to it through a valve in the usual way.

The agitators 7 are adapted to loosen up the fuel within the hopper 3 in order to facilitate feeding of the same into the chute 2, as will be readily understood.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a gas-tight feeding device of the class described, the combination with a combustion-chamber, a fuel-feeding hopper, and a chute depending from the hopper into the

said chamber to the fuel-line, of conveying means movable within said chute, so as to be supported by the fuel in the furnace when inoperative, and to drop by its own weight to throw it into operative connection with a suitable source of power.

2. In a feeding device of the class described, the combination of the combustion-chamber, a fuel-hopper mounted above the combustion-chamber, a chute extending downwardly from the hopper to the fuel-line in the combustion-chamber, a feed-screw mounted entirely within the chute and movable in the plane of its axis, and held in an inoperative position by the fuel in the combustion-chamber, and means for operating the feed-screw only when unsupported by the fuel in the combustion-chamber.

3. The combination with the combustion-chamber, a fuel-feeding hopper and a feed-screw, of a clutch member rigidly keyed to the upper end of the feed-screw shaft, a second clutch member loosely journaled around said shaft, and provided with a pinion adapted to be engaged by a gear-wheel connected to a source of power.

4. The combination with a combustion-chamber, a fuel-feeding hopper above said chamber, a chute leading from said hopper into the combustion-chamber, of a feed-screw mounted in the said chute, a clutch member rigidly keyed to the upper end of the feed-screw shaft, a second clutch member loosely journaled around said shaft and provided with a bevel-pinion adapted to be engaged by a bevel gear-wheel connected to a suitable source of power and agitators secured on the shaft of the feed-screw near the bottom of the hopper.

The foregoing specification signed this 17th day of March, 1902.

JAMES GARDNER SANDERSON.

In presence of—

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