May 25, 1926. W. B. CHAPMAN 1,586,176

FUEL FEEDING MECHANISM FOR GAS PRODUCERS

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Fig. 1.

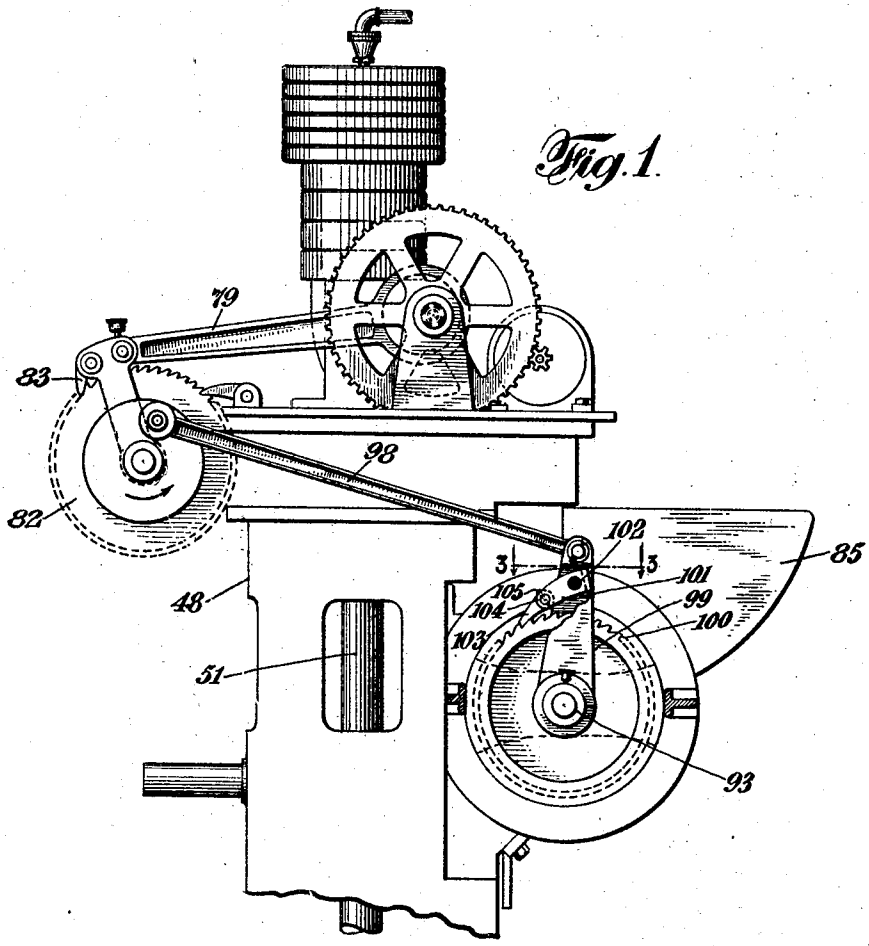


Fig. 2.

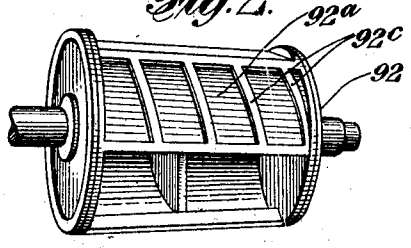
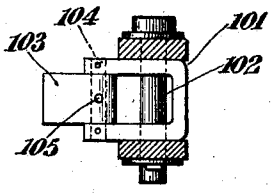


Fig. 3.



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FUEL FEEDING MECHANISM FOR GAS PRODUCERS

Filed Sept. 9, 1922 2 Sheets-Sheet 2

Fig. 4.

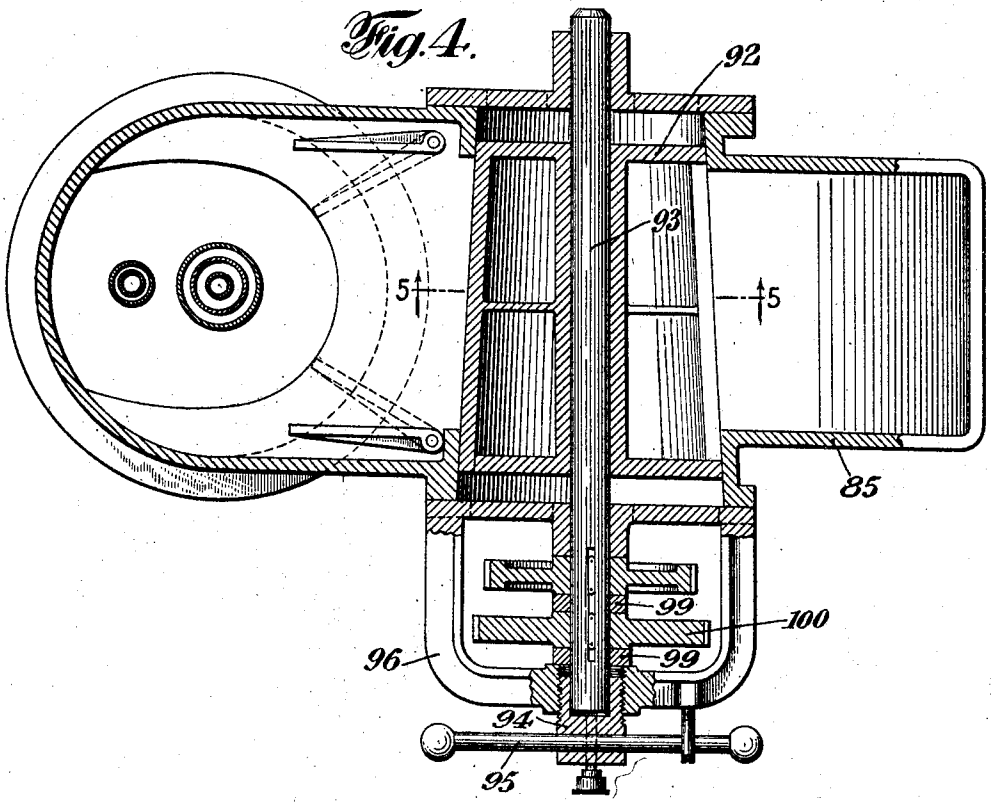
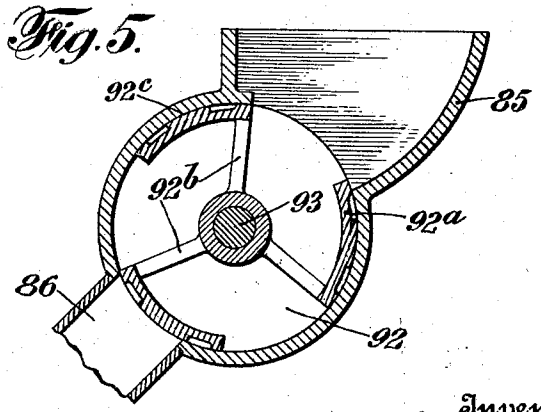


Fig. 5.



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UNITED STATES PATENT OFFICE.

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FUEL-FEEDING MECHANISM FOR GAS PRODUCERS.

Application filed September 9, 1922. Serial No. 587,037.

The invention relates to a fuel feeding mechanism embodying a drum rotatably mounted in a hopper, the drum being provided with chambers therein adapted to feed fuel to gas producers or the like, in measured quantities from the hopper, as the drum is rotated.

One object of the invention is to provide a fuel feeding mechanism of the above character, wherein the distance or clearance between the drum and its surrounding casing, may be readily adjusted to suit the requirements of proper operation.

Another object is to construct the fuel feeding mechanism in such a manner that the space between the drum and its casing will be automatically cleaned from deposits of soot, coal dust, tar or the like, which tend to accumulate between the drum and its casing.

Another object of the invention is to provide a driving means for the fuel feeding mechanism which will be released upon the passage into the mechanism of any unusual obstruction which otherwise might damage the parts thereof.

Further objects and advantages of the invention will be in part obvious and in part specifically pointed out in the description hereinafter contained, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof; such embodiment, however, is to be considered merely as illustrative of its principle. In the drawings:

Fig. 1 is a side elevation with certain parts broken away, of the upper portion of a gas producer equipped with a fuel feeding mechanism constructed in accordance with the invention.

Fig. 2 is a perspective view showing detached a fuel feeding drum which forms a part of said mechanism.

Fig. 3 is a detail section taken on line 3—3 of Fig. 1, looking in the direction of the arrows.

Fig. 4 is a horizontal section of the fuel feeding mechanism, taken through the axis of rotation of the feeding drum.

Fig. 5 is a section taken on line 5—5 of Fig. 4, looking in the direction of the arrows.

Fig. 1 of the drawings illustrates the upper portion of the pedestal 48 of a gas producer, such pedestal in the present instance containing the stem 51 of a fuel bed agitator and being hollow to permit the passage downwardly therethrough of fuel to be fed to the fire bed. In the illustrated embodiment of the invention the fuel is fed from a hopper 85 located at one side of the pedestal and provided with a chute 86 (Fig. 5) adjacent its bottom, and which leads to the interior of the pedestal 48. A fuel feeding drum 92 is carried by a shaft 93, the latter being suitably journaled in the hopper and the surface of the drum being cut away at certain portions to provide a plurality of arcuately shaped flanges 92^a which, in conjunction with the radial partitions 92^b, divide the interior of the feeding drum up into a plurality of chambers which as the drum is rotated, are successively filled with fuel from the upper portion of hopper 85, and which are successively emptied of fuel as flanges 92^a move to open communication between the chambers and the chute 86 above mentioned. The fuel feeding drum will be understood as rotated at the desired rate of speed from any suitable source of power and transmission mechanism, including for example a ratchet wheel 82 operated by an eccentric rod 79 and pawl 83. A suitable driving mechanism for feeding drums of the type herein involved, is described in co-pending application Serial Number 229,746, filed April 20, 1918, and entitled Gas producer, which application contains subject matter in common with the present application, and to which reference is made for a fuller description of parts of the complete installation which it is not considered essential to describe at greater length herein.

In the operation of fuel feeding drums of the above character it is desirable to have the drum fit as tightly as possible within its casing in order to cut down leakage past the drum of the gases contained in the interior of the producer, but on the other hand if the drum fits too tightly it cannot be rotated properly, particularly after continued operation of the producer, which may cause a certain accumulation of soot and tar between the drum and its casing. One feature of the present invention is to enable the clearance between the drum and its casing to be adjusted to the position necessary for proper operation; in the present embodiment, this is accomplished by employing a drum and casing of frustro-con-

ical shape so that the drum can be moved endwise to separate it from the casing as much as is necessary. As shown in Fig. 4, a screw 94 on the end of shaft 93 and having an operating handle 95, may be threaded into engagement with a bracket 96, in order to force the drum as close as desired to the walls of the casing. Shaft 93 preferably projects somewhat beyond the smaller end of the casing so that if the drum should stick, screw 94 may be turned back from engagement with the opposite end of shaft 93, and the projecting end of the shaft struck with a hammer to dislodge it. Thus the screw 94 may be regulated to fit the drum as closely within the casing as is consistent with proper rotation of the drum.

I also prefer to provide between the drum and its casing, means for removing the soot, coal dust, tar, etc., which tends to accumulate between these parts during the operation of the producer; this accumulation otherwise would necessitate a loose adjustment of the drum, which would permit more gas to leak past the same, and cause more deposit to be formed.

This deposit may be scraped off by means of inclined ribs 92^e interposed between the drum and its casing; in the present embodiment these ribs are formed on the arcuate flanges 92^a of the drum and during the rotation of the latter they scrape over the walls of the casing and progressively crowd the accumulated soot, tar, etc., past the smaller end of the drum, from whence the same may be easily removed or ejected. It will be understood that the engagement between the ribs 92^e and the walls of the casing is not so tight as to prevent the deposited material from being pushed by the material behind it past the several ribs on its way to the smaller end of the casing. Thus the drum cleans itself automatically to enable it to be adjusted at all times into comparatively close engagement with its casing.

In the illustrated form of the invention, the fuel feeding drum 92 is rotated from ratchet wheel 82 by means of a driving rod 98 extending between said ratchet wheel and a crank 99 pivoted on shaft 93 above mentioned. The crank is forked and encloses a ratchet wheel 100 fixed to shaft 93, a pawl 101 being pivoted on a pin 102 in the crank, whereby as the latter is rocked back and forth by the driving rod 98, the pawl engages the teeth of ratchet wheel 100 to turn the drum step by step.

During the operation of the fuel feeding mechanism it may happen that rotation of drum 92 will be prevented by some unusual obstruction fed in with the coal, and to prevent damage to the parts in case this should happen, I have arranged the driving means so that it will be released under the above conditions. This is accomplished by providing certain elements in the drive which normally move together, but are permitted to move relative to each other when the strain on the driving mechanism exceeds a predetermined amount; thus when the coal feed is clogged, these elements move relative to each other, instead of transmitting their motion to the drum.

In the present instance, the pawl 101 is provided with a dog 103, adapted to engage the ratchet teeth on wheel 100, this dog being mounted upon a spindle 104 fixed in the body of the pawl. A shear member 105 extends through the above mentioned dog and pawl, normally preventing these parts from moving angularly relative to each other, but this shear member is designed to fail when the force necessary to turn wheel 100 exceeds a predetermined amount. The relative positions of spindle 104, pin 101, and the active end of dog 103, may be so arranged as to exert a stress on shear member 105, which will enable a nail of one of the commercial sizes, or similar readily obtainable member, to be employed for this purpose, and fail under the desired conditions. There is a tendency of operatives to avoid replacements or adjustments wherever possible in machinery of this type, even though risk of substantial injury to the machinery be involved by so doing; but if a nail or similar readily replaceable part be employed as a shear member, the ease of replacing this part is sufficient to remove the temptation to substitute for the shear member some part which will not function as desired; in other words, it will be less trouble for the operative to replace the nail than it would be for him to attempt to tamper with the machine in such a way as to make the drive non-releasable.

When the illustrated embodiment of the invention is applied to a gas producer (as shown in Fig. 5) the chute or outlet 86 of which is located at one side of the casing 85, as is desirable with certain types of producers wherein the space above the centre of the fire bed is occupied by other parts and it is nevertheless desired to feed fuel to the central portion of the fire bed, under such conditions the accumulation of soot or tar between the drum and its casing is liable to be increased, so that the self-cleaning features of the drum are all the more desirable.

While a specific embodiment of the invention has been described, it is obvious that many changes may be made therein without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. In a gas producer, a fuel receiving casing having conically shaped walls adapted

to enclose more than one-half of the circumference of a fuel-feeding drum, a tapering feeding drum revolubly mounted therein, means permitting lengthwise movement of the drum within the casing to vary the distance between the periphery of the drum and the walls of the casing, and means interposed between said drum and casing for removing deposits from the space therebetween.

2. A fuel-feeding mechanism comprising a fuel receiving casing, a feeding drum revolubly mounted therein, and means interposed between said drum and casing for removing deposits from the space therebetween, said means being constituted by ridges oblique to the axis of rotation of the drum.

3. A fuel-feeding mechanism comprising a fuel receiving casing, a feeding drum revolubly mounted therein, and means interposed between said drum and casing for removing deposits from the space therebetween, said means being constituted by ridges oblique to the axis of rotation of the drum and mounted on the periphery of the drum.

4. In a gas producer, a fuel receiving casing, a feeding drum revolubly mounted therein, and means acting between said drum and casing for moving deposits therebetween axially of said drum toward one end of the casing.

5. In a gas producer, a fuel receiving casing, having conically shaped walls, a tapering feeding drum revolubly mounted therein, means permitting lengthwise movement of the drum within the casing to vary the distance between the periphery of the drum and the walls of the casing, and inclined ridges on the surface of the drum acting to move deposits between the drum and casing toward one end of the casing.

In testimony that I claim the foregoing, I have hereunto set my hand this 7th day of September, 1922.

WILLIAM B. CHAPMAN.