Aug. 3, 1943. A. K. BRADLEY 2,326,005

FEEDING MECHANISM

Filed June 17, 1941 2 Sheets-Sheet 1

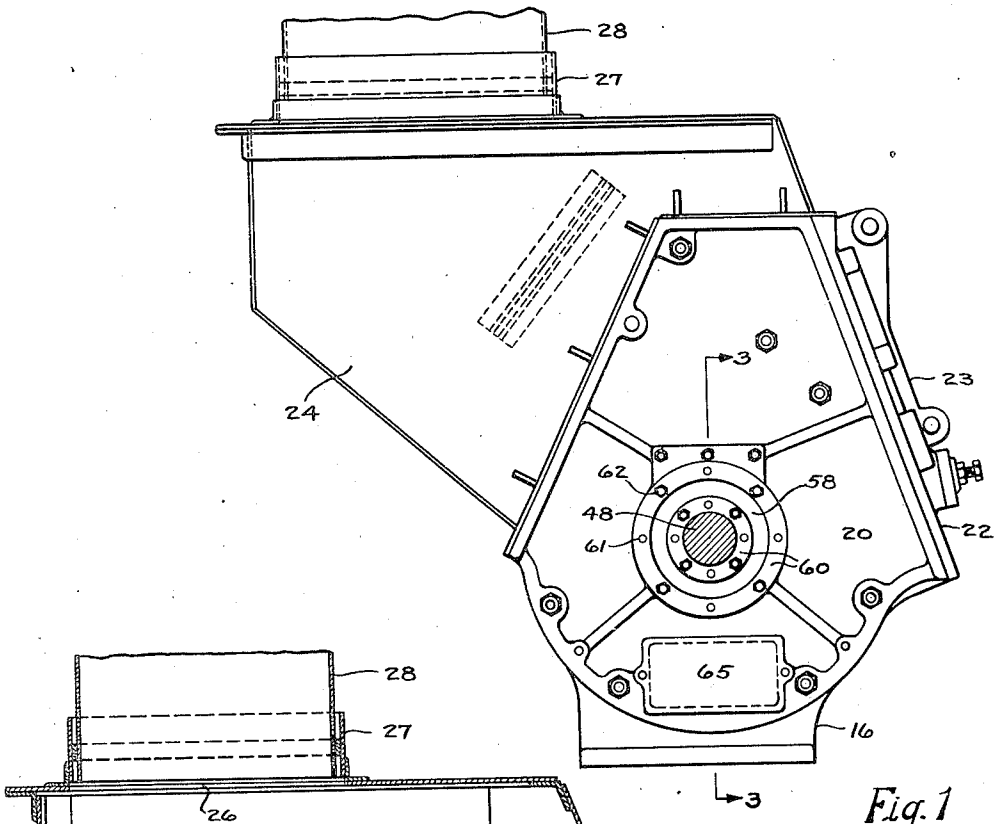

Fig. 1

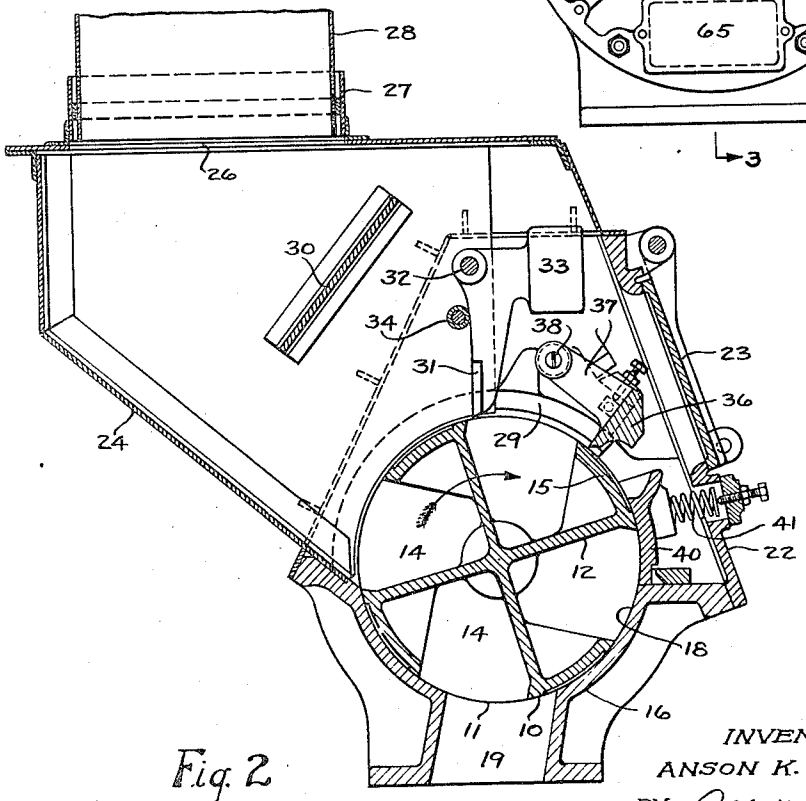

Fig. 2

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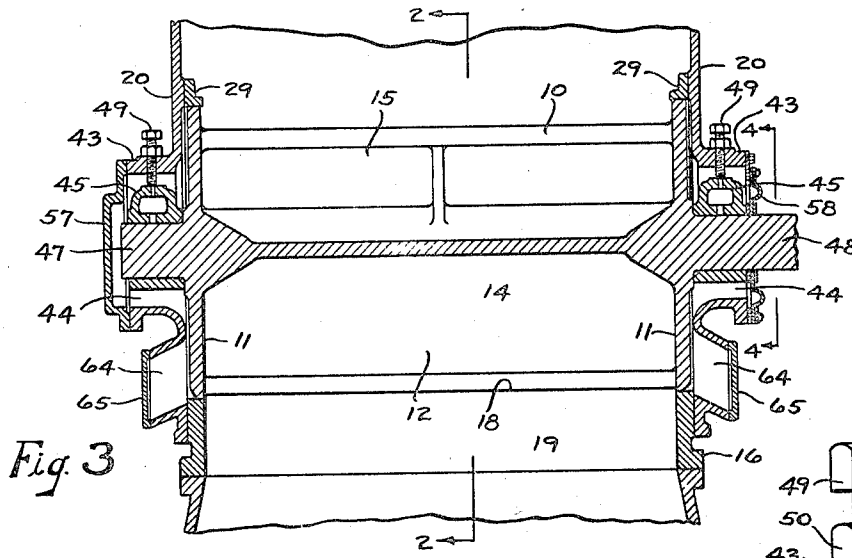

Fig. 3

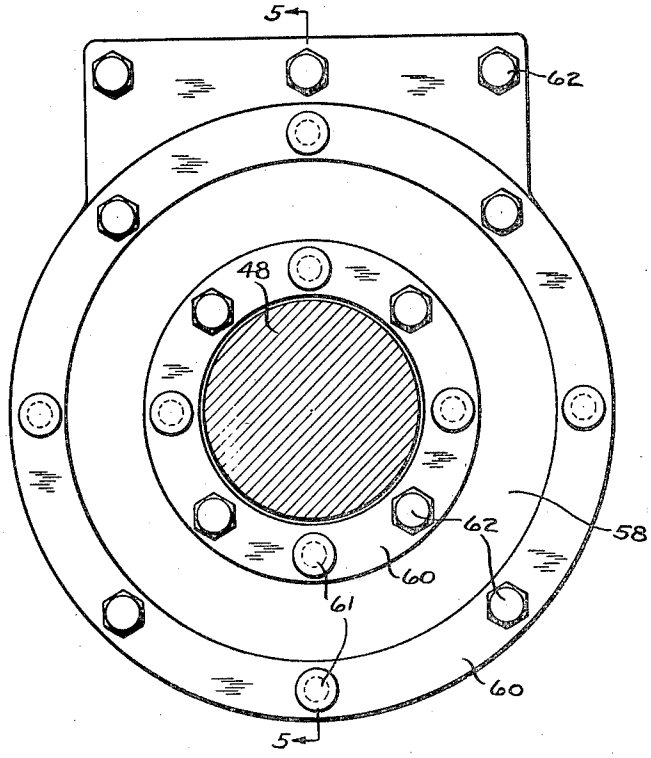

Fig. 4

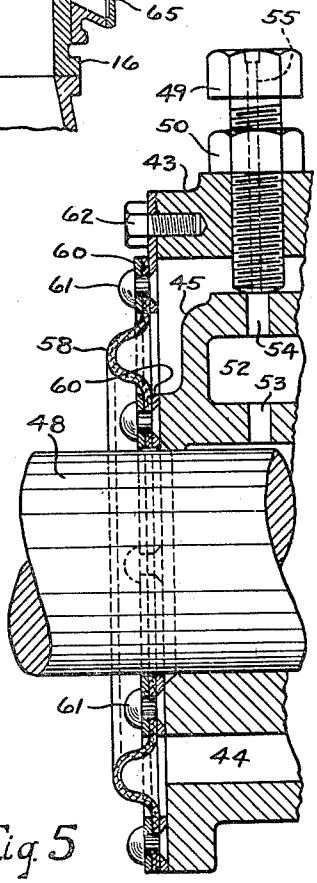

Fig. 5

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UNITED STATES PATENT OFFICE

2,326,005

FEEDING MECHANISM

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Application June 17, 1941, Serial No. 398,369

3 Claims. (Cl. 214—35)

This invention relates to feeding mechanisms, and more particularly to mechanisms of the rotary type adapted to feed granular material at a controlled rate.

Feeders of this type comprise a drum rotatable about a horizontal axis and formed with pockets in its periphery to receive the material from a hopper above the drum, the pockets being emptied by gravity as they reach the lower portion of their path of travel. The drum is supported in a suitable casing. Such feeders are commonly used for feeding coal to gas producers, and they are subject to certain difficulties which are to a considerable extent peculiar to this service. For example, the gas beneath the feeder is at a substantial pressure, and some of this gas leaks through the feeder into the surrounding atmosphere, resulting in disagreeable or even dangerous working conditions. Furthermore, wires or other foreign bodies often enter the feeder with the coal and cause the various parts to jam.

It is accordingly one object of the invention to provide a rotary feeder particularly adapted for use with a gas producer and so arranged as to prevent leakage of gas from the producer.

It is a further object of the invention to provide a rotary feeder for gas producers which will permit wires or similar small foreign bodies to pass therethrough readily and yet prevent leakage of gas from the producer into the atmosphere.

With these and other objects in view, as will be apparent to those skilled in the art, the invention resides in the combination of parts set forth in the specification and covered by the claims appended hereto.

Referring to the drawings illustrating one embodiment of the invention and in which like reference numerals indicate like parts,

Fig. 1 is a side elevation of a rotary feeder suitable for feeding coal to a gas producer;

Fig. 2 is a section on the line 2—2 of Fig. 3;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged section on the line 4—4 of Fig. 3; and

Fig. 5 is a section on the line 5—5 of Fig. 4.

The embodiment illustrated comprises a horizontal rotary drum 10 having two end disks 11 which are connected by radial partitions 12 to form a series of pockets 14. A wall 15 extends circumferentially from the outer margin of each partition 12 in a direction opposite the direction of rotation, these walls 15 forming shields which partially enclose the pockets. Beneath the drum there is provided a supporting member 16 having an upwardly concave pocket or cradle 18 within which the drum is placed. As shown in Fig. 2, this cradle 18 extends for somewhat less than 180 degrees. A passage or opening 19 is formed in the member 16 and extends downwardly from the center of the cradle 18. At each end of the drum 10 there is provided an upright side plate 20, the lower portions of these plates being bolted to the member 16 and their front portions being connected by an upwardly and rearwardly inclined plate 22 having an access door 23 therein. An enclosed hopper 24 is mounted on the upper edges of the side plates 20, the front plate 22, and the rear wall of the supporting member 16, this hopper having an opening 26 at the top which is connected by a substantially gas tight slip joint 27 to a downspout 28 leading from an overhead bunker (not shown). An arcuate sealing member 29 rests loosely upon the upper edge of each end disk 11 to aid in excluding the coal from the space between the disk and the adjacent side plate 20.

As shown particularly in Fig. 2, a downwardly and rearwardly inclined baffle 30 is mounted within the hopper 24 to assist in directing the descending column of coal toward the rear or uprunning portion of the drum 10. Above the drum there is provided a transverse row of fingers 31 which are pivotally supported at their upper ends by a transverse rod 32. At the front of each finger and integral therewith is a weight 33, these weights yieldingly holding the fingers against a transverse rod 34, with their lower ends close to the periphery of the drum. These fingers hold back any lumps of coal which may project upwardly from the drum pockets 14 and thus prevent such pieces from becoming caught between the drum and the stationary parts of the apparatus. In front of the fingers 31 there is provided a transverse bar 36 having two rearwardly extending ears 37, these ears being pivotally secured to the side plates 20 by means of bolts 38. The bar 36 is arranged to rest against the peripheral surface of the rotating drum and scrape any deposits of tar therefrom. In front of and beneath the bar 36 there is provided a transverse sealing plate 40 which is yieldably held against the peripheral surface of the drum by means of a coiled spring 41.

Referring now to Fig. 3, it will be seen that each side plate 20 is formed with an outwardly extending flange 43 to provide a recess 44 for the reception of a bearing 45. A comparatively short stub shaft 47 extends axially from one end of the drum 10 into one of the bearings 45, while a longer shaft 48 extends axially from the other

end of the drum and through the other bearing 45. The shaft 48 is connected to a suitable driving means (not shown) whereby rotation is imparted to the drum. Each bearing 45 is mounted for vertical movement within its recess 44, but upward movement is limited by an adjustable vertical screw 49 mounted in the flange 43 and provided with a lock nut 50. (Fig. 5.) A lubricant chamber 52 is formed in the upper portion of each bearing, this chamber having an outlet opening 53 leading to the internal bore of the bearing and an inlet opening 54 which connects with a passage 55 through the center of the screw 49. The recess 44 corresponding with the stub shaft 47 is closed at its outer end by a removable plate 57. The other recess 44, corresponding with the drive shaft 48, is closed at its outer end by an annular sealing device 58 of leather or other suitable flexible material which surrounds the drive shaft and connects the outer portion of the bearing 45 with the outer portion of the flange 43. Preferably this sealing device is reinforced at its inner and outer margins by means of metal rings 60 secured thereto by rivets 61. The rings and seal are fastened to the bearing and flange by means of screws 62 (Fig. 4). As shown in Fig. 3, each side plate 20 is shaped to provide a pocket 64 adjacent the lower portion of the adjacent disk 11 of the drum, in order to collect any tar which may escape between this disk and the supporting member 16. A removable cover plate 65 is provided for each pocket so that the accumulated tar may be removed when desired.

The operation of the invention will now be apparent from the above disclosure. The shaft 48 is driven by a suitable source of power, and the drum 10 is thereby rotated in a clockwise direction as viewed in Fig. 2. The downspout 28 is completely filled with a column of coal supplied from an overhead bunker, and this coal is deflected by the plate 30 and rests at its angle of repose against the rear or up-running portion of the drum, filling the pockets 14 successively as they move past. If any lumps of coal project above the drum they will be held back by the fingers 31 and dropped into the next pocket. Any accumulated tar on the drum periphery is scraped off by the bar 36. As each pocket passes the opening 19, the coal will be dropped through this opening into the gas producer therebeneath. The gas in the producer will be under pressure, and a small quantity of this gas may escape upwardly between the supporting member 16 and the drum, despite the presence of the sealing plate 40. However, the space above the drum is entirely enclosed by the hopper 24, side plates 20 and the front plate 22, so that none of this gas can escape to the atmosphere. In addition, a small quantity of gas may pass between the supporting member 16 and the end disks 11 into the bearing recesses 44, but further escape of this gas will be prevented by the plate 57 at one end and by the flexible seal 58 at the other end. The screws 49 bear lightly against the bearings 45, these screws preferably being tightened only with the fingers so that if a piece of wire becomes caught between the drum and the cradle 18, the drum may spring upwardly enough to allow the wire to pass through. In the event the wire is so kinked that it will not pass through, and the rotation of the drum is blocked, the operator will loosen the screws 49 so that the drum will be free to move upwardly out of the cradle 18, since the latter extends for less than 180 degrees. Ordinarily this will allow the wire to pass through, but if not it can usually be reached for removal after opening the door 23.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. Feeding mechanism comprising a horizontal rotatable drum having pockets in its periphery, a supporting member beneath the drum having a passage therein for the downward flow of material discharged from the pockets, means to supply material by gravity to the pockets, upright plates located adjacent the ends of the drum and formed with recesses, bearings mounted for vertical movement within the recesses, adjustable means limiting upward movement of the bearings, shafts extending outwardly from the drum and rotatably supported in the bearings, and means closing the outer ends of the recesses to prevent the escape of gas therefrom.

2. Feeding mechanism comprising a horizontal rotatable drum having pockets in its periphery, a supporting member beneath the drum having a passage therein for the downward flow of material discharged from the pockets, means to supply material by gravity to the pockets, an upright plate located adjacent one end of the drum and provided with an outwardly projecting flange shaped to form a recess, a bearing mounted for vertical movement within the recess, adjustable means limiting upward movement of the bearing, a drive shaft extending from the said end of the drum and through the bearing, and a flexible annular seal surrounding the drive shaft and connecting the bearing with the flange.

3. Feeding mechanism comprising a horizontal rotatable drum having pockets in its periphery, a supporting member beneath the drum having a passage therein for the downward flow of material discharged from the pockets, means to supply material by gravity to the pockets, upright plates located adjacent the ends of the drum and each provided with an outwardly projecting flange shaped to form a recess, a bearing mounted for vertical movement within each recess, adjustable means limiting upward movement of the bearings, a stub shaft extending from one end of the drum and into one of the bearings, a plate secured to the flange adjacent the stub shaft to close the outer end of the corresponding recess, a drive shaft extending from the other end of the drum and through the other of said bearings, and a flexible annular seal surrounding the drive shaft and connecting the corresponding bearing with the adjacent flange.

ANSON K. BRADLEY.