

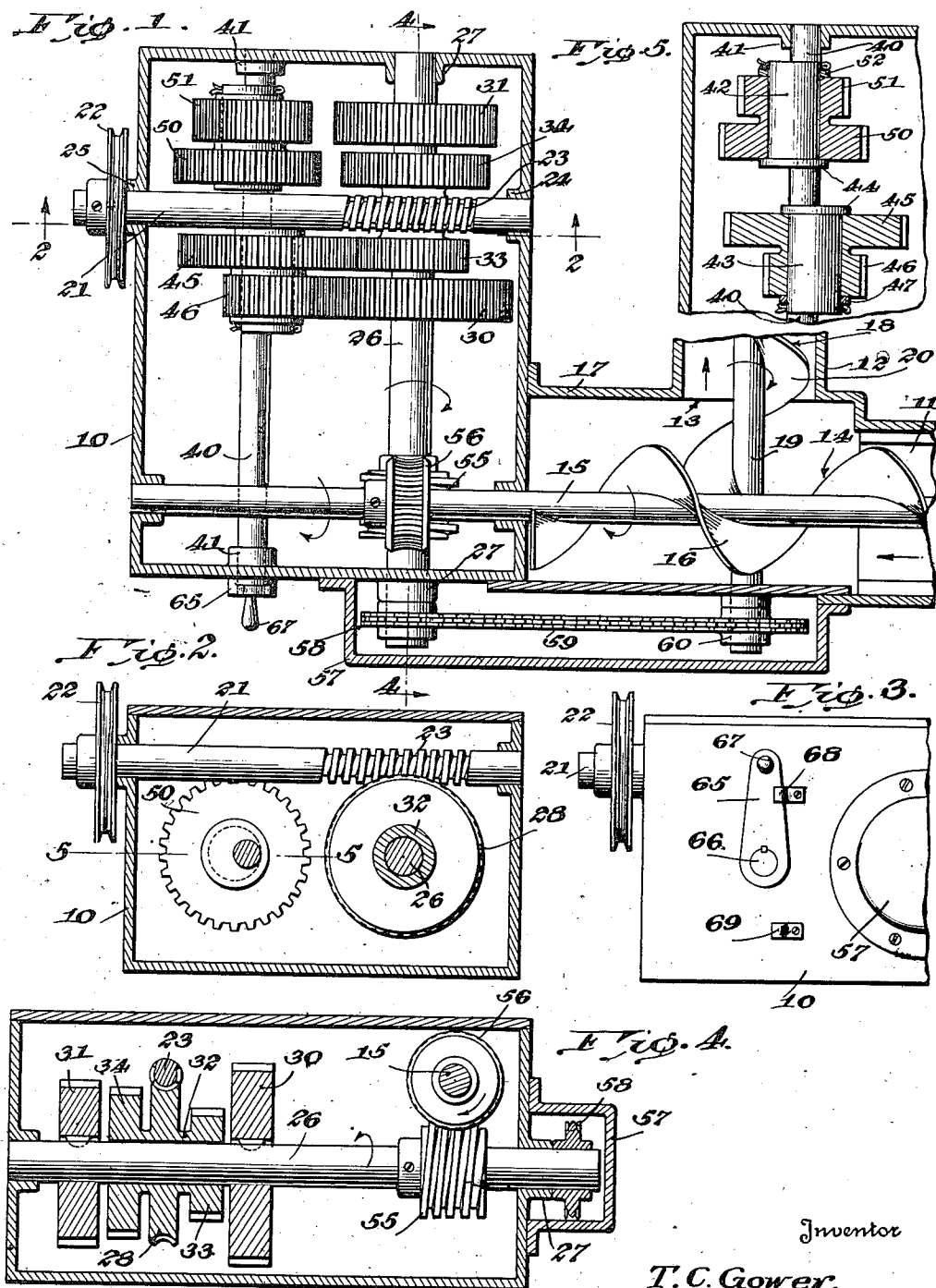
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AUTOMATIC STOKER FOR COAL BURNERS

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AUTOMATIC STOKER FOR COAL BURNERS

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4 Claims. (Cl. 74—352)

This invention relates to stokers for coal burn-
ers.

An object of the invention is the provision of a stoker including a transmission having a pair of eccentrics rotatably mounted and carrying pairs of gears which are shifted into meshing relation with alternate pairs of gears on another shaft.

Another object of the invention is the provision of a stoker in which a pair of worm conveyors are located at right angles to each other with one conveyor feeding fuel from a hopper to the other conveyor and with means for regulating at will the speed of the conveyor.

A further object of the invention is the provision of a stoker for coal burners in which worm conveyors that deliver coal to the furnace are operated at selective speeds which are most suitable for the purpose.

This invention will be best understood from a consideration of the following detailed description, in view of the accompanying drawing forming part of the specification; nevertheless, it is to be understood that the invention is not confined to the disclosure, being susceptible of such changes and modifications as define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Figure 1 is a horizontal section of an automatic stoker and speed controlling device,

Figure 2 is a transverse vertical section taken along the line 2—2 of Figure 1,

Figure 3 is a fragmentary front view in elevation of a stoker,

Figure 4 is a longitudinal vertical section taken along the line 4—4 of Figure 1, and

Figure 5 is a fragmentary vertical section taken along the line 5—5 of Figure 2.

Referring more particularly to the drawing, 10 designates a transmission casing to which is connected a conveyor casing 11 while the numeral 12 designates a screw conveyor casing which is in open communication at 13 with the conveyor casing 11.

A screw conveyor, generally designated by the numeral 14, consists of a shaft 15 and a spiral fin 16 which moves the coal from a hopper (not shown) in the direction indicated by the arrow in Figure 2 to the auxiliary casing 17.

A screw conveyor, generally designated by the numeral 18, includes a shaft 19 and a spirally arranged fin 20.

A drive shaft 21 is provided with a pulley 22 located exteriorly of the casing 10 and is driven by means of a belt from an electric motor (not shown) at a predetermined speed. The shaft 21 is provided with a worm 23 intermediate its ends. The shaft is mounted in bearings 24 and 25 formed in the side walls of the housing 10.

A shaft 36 is mounted in bearings 27 in the end walls of the housing 10 and has a worm wheel 28 in mesh with the worm 23 whereby the shaft 26 is driven from the shaft 21.

A pair of spaced gears 30 and 31 are keyed to the shaft 26 and are therefore revolved by the same.

A sleeve 32 is loose on the shaft 26 and is formed integrally with the worm gear 28. A pair of gears 33 and 34 located at opposite sides of the worm gear 28 are also integrally formed with the sleeve so that the gears 28, 33 and 34 revolve as a unit freely on the shaft 26.

A shaft 40 is mounted in bearings 41 formed on the end walls of the housing 10. This shaft is adapted to be rocked for a purpose which will be presently explained. It will be noted from Fig. 6 that this shaft is provided with a pair of eccentrics 42 and 43 spaced from each other by collars 44.

A gear 45 is mounted on the eccentric 43 as is a gear 46, the last-mentioned gear being integrally connected with the gear 45. A collar 47 maintains the gears 45 and 46 on the eccentric 43.

A gear 50 is integrally connected with a gear 51 and both gears are mounted upon the eccentric 42. A collar 52 maintains the gears 50 and 51 as a unit on the eccentric. While the gears 45 and 46 are integrally connected, as are gears 50 and 51, these gears may be made separately and connected together in any approved manner.

A worm 55 is secured to a shaft 26 and this worm meshes with a worm gear 56 secured to the driven shaft 15 of the conveyor 14.

An auxiliary housing 56 is secured to the front wall of the housing 10 and of the auxiliary casing 17. A sprocket 58 is located in this auxiliary housing and is secured to the projecting end of the shaft 26. A chain 59 is trained on the sprocket 58 and also on a sprocket 60 which is secured to the conveyor shaft 19 where said shaft projects through the front wall of the auxiliary casing 17.

A rock lever 65 is keyed to a projecting end 66 of the shaft 40. The lever is provided with a hand grip 67 adjacent its free end for rocking the lever and likewise the shaft 40. A clip 68 acting as a stop is adapted to be engaged by the lever 65 when it is in its uppermost vertical position. A second clip 69 acting as a stop engages the lever 65 when said lever is in its lowermost vertical position.

The operation of my device is as follows: Power is applied to the pulley 22 by means of a belt preferably driven by an electric motor at a predetermined speed. Since the pulley is secured to the shaft 21 the worm 23 is revolved which drives the intermeshing worm wheel 28 which is loose on shaft 26.

As shown in Fig. 1 gear 33, which is loose on the shaft 26 and connected with the worm wheel 28, meshes with gear 45 which is loose on the eccentric 43. The gear 46 being connected to the gear 45 is in mesh with the gear 30 and it will be noted that gear 30 is keyed to the shaft 26. Therefore, the worm causes rotation of the shaft 26 through the worm wheel 28, its connected gear 33, thence through the intermeshing gear 45 and its connected gear 46 thence through the gear 30 which meshes with the gear 46 so that a predetermined speed of the shaft 26 is had. The shaft 26 is thus driven at low speed.

The shaft 26 revolves the sprocket 58 which in turn drives the chain 59 and the sprocket 60. Since the last-mentioned sprocket is directly connected to the shaft 19, the screw conveyor 18 is revolved in the same direction as the shaft 19 and the sprocket 60.

The screw conveyor 14 carries the coal through the casing 11 from the hopper (not shown) into the auxiliary casing 17 and this coal is then carried by the screw conveyor 18 through the casing 12 to the furnace (not shown).

As shown in Fig. 1 the gear 45 is in mesh with the gear 43 and the gear 46 is in mesh with the gear 30. The other pairs of gears upon the opposite sides of the shaft 21 are out of mesh.

When it is desired to change the speed of the conveyor shafts 15 and 19 the lever 65 is rocked by the hand grip 67 from the stop or clip 68 to the stop or clip 69. In view of the diametrically and oppositely positioned eccentrics 42 and 43 the rocking of the shaft 40 causes the gears 45 and 46 to be moved out of mesh with the respective gears 33 and 30. At the same time, however, gears 50 and 51 are moved into meshing relation respectively with the gears 34 and 31. The shaft 26 is now driven through the revolving gear 34, its intermeshing gear 50 and since gear 51 is connected to gear 50, the gear 51 transmits rotation to its intermeshing gear 31. This gear is keyed to the shaft 26 whereby said shaft is revolved. Gears 34 and 50 being of substantially the same diameter the speed of gear 51 will therefore be of substantially the same speed as gear 34. However, the gear 31 is larger than the gear 35 so that the speed of shaft 26 will be slightly under that of the shaft 21 although the speed of the shaft 26 at this time is greater than it had been when the lever 65 was in the position shown in Fig. 3.

When the shaft 40 is rocked it may move a pair of the gears 45 and 46 on the eccentric 43 into meshing relation with a fixed gear on the driven shaft and a gear connected to the sleeve while moving the gears 50 and 51 on the eccentric 42 out of meshing relation with the associated gears on the driven shaft. On the other hand when the lever 65 is rocked to a point intermediate the stops 68 and 69 all of the gears on the eccentrics 42 and 43 will be moved out of meshing relation with the associated gears on the driven shaft. Some form of stop means well known in the art may be employed for retaining the lever 65 in this intermediate position.

I claim:

1. In a stoker for coal burners in which a rotary conveyor for the coal is operated by a driven shaft, means for varying the speed of the driven shaft and comprising a rock shaft having a pair

of oppositely disposed eccentrics thereon, a pair of connected gears on each eccentric, a pair of spaced gears keyed to the driven shaft, each of the last-mentioned gears being in substantially the same vertical plane with one of the eccentrically mounted gears, a worm gear loosely mounted on the driven shaft, gears on opposite sides of the worm gear and connected thereto, means for rotating the worm gear, the last-mentioned gears being in meshing alignment with one each of the other gears on the rock shaft, means for actuating the rock shaft so that a pair of the gears on the shaft will be moved into mesh with the similarly disposed gears on the driven shaft while the other pair of gears on the rock shaft will be moved out of mesh with similarly disposed gears on the driven shaft.

2. In a stoker for coal burners in which a rotary conveyor for the coal, is operated at varying speeds by a driven shaft, means for varying the speed of the driven shaft and comprising a pair of connected gears loose on the driven shaft, a pair of gears secured to said shaft, a rock shaft provided with a pair of oppositely disposed eccentrics, a pair of connected gears on one eccentric meshing with a fixed gear and a loose gear on the driven shaft, a pair of connected gears on the other eccentric normally out of mesh with the other fixed gear and the other loose gear, means for actuating the rock shaft for moving one set of gears thereon away from meshing relation with gears on the driven shaft and for moving the gears on the other eccentric into meshing relation with the other gears on the driven shaft, and means for rotating the connected gears which are loose on the shaft.

3. In a stoker for coal burners in which a rotary conveyor for the coal, is operated at varying speeds by a driven shaft, means for varying the speed of the driven shaft and comprising a sleeve loose on the shaft and provided with a pair of spaced integrally formed gears, a gear at each side of the sleeve and secured to said shaft, a rock shaft provided with spaced eccentrics, a pair of connected gears on each eccentric, means for actuating the rock shaft for causing one eccentric to move its associated gears into meshing relation with a fixed gear and a gear on the sleeve while moving the pair of gears on the other eccentric out of meshing relation with the other fixed gear and gear connected to the sleeve on the driven shaft, and means for rotating the sleeve.

4. In a stoker for coal burners in which a rotary conveyor for the coal, is operated at varying speeds by a driven shaft, means for varying the speed of the driven shaft and comprising a sleeve loose on said shaft and provided with spaced gears connected to the sleeve, a worm wheel between said gears and connected to the sleeve, a drive shaft having a worm meshing with the worm wheel, a rock shaft provided with spaced eccentrics, a pair of connected gears on each eccentric, a gear on the driven shaft at each side of the sleeve and fixed to said shaft, means for operating the rock shaft and causing one eccentric to move the gears thereon into meshing relation with one of the fixed gears on the driven shaft and a gear secured to the sleeve while moving the gears on the other eccentric out of meshing relation with the other fixed gear on the driven shaft and the other gear on the sleeve.

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