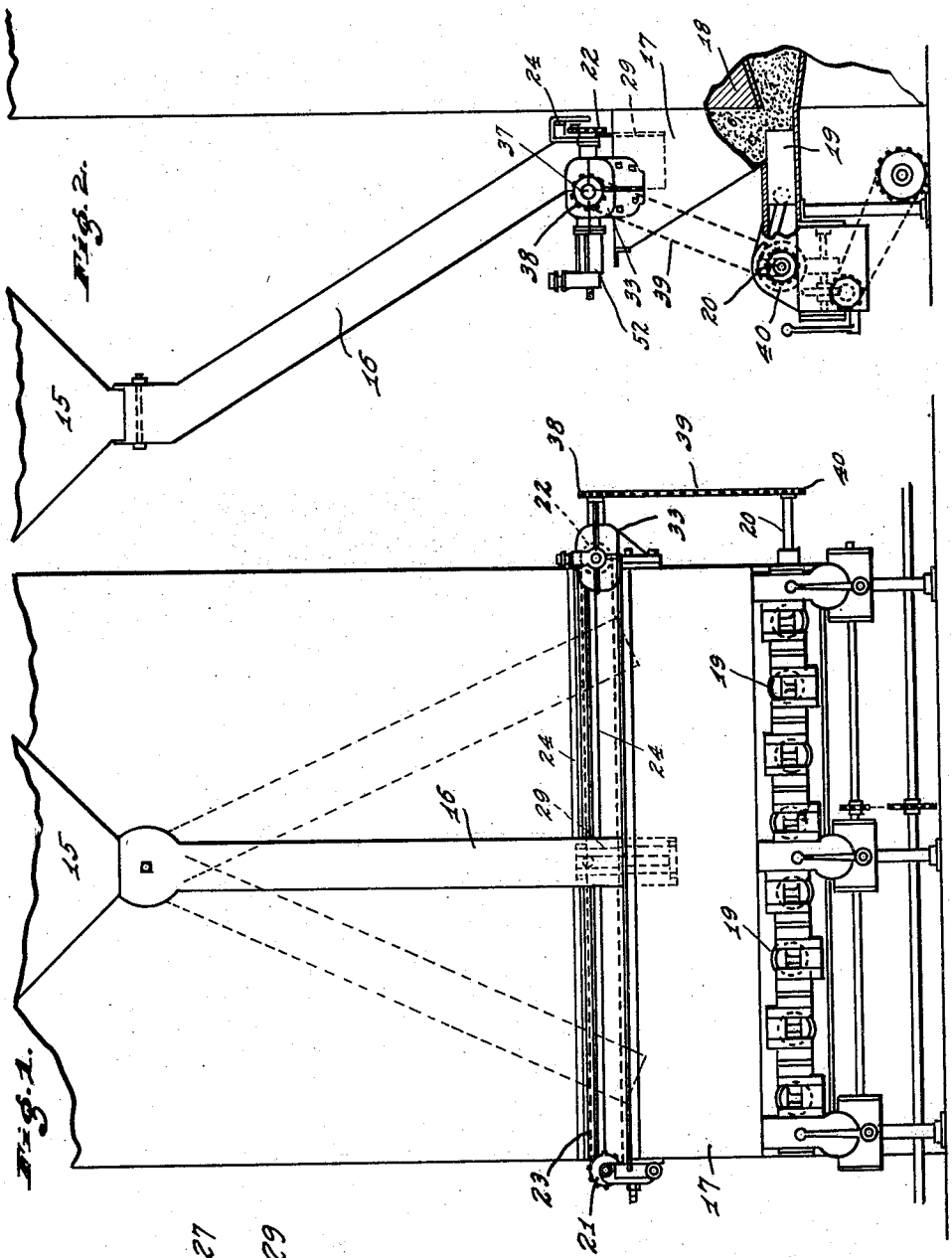
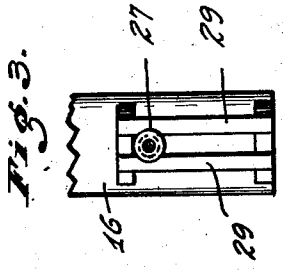
May 27, 1930. T. N. WYNNE 1,759,877

COAL SPREADER

Filed Dec. 31, 1926 3 Sheets-Sheet 1





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May 27, 1930. T. N. WYNNE 1,759,877

COAL SPREADER

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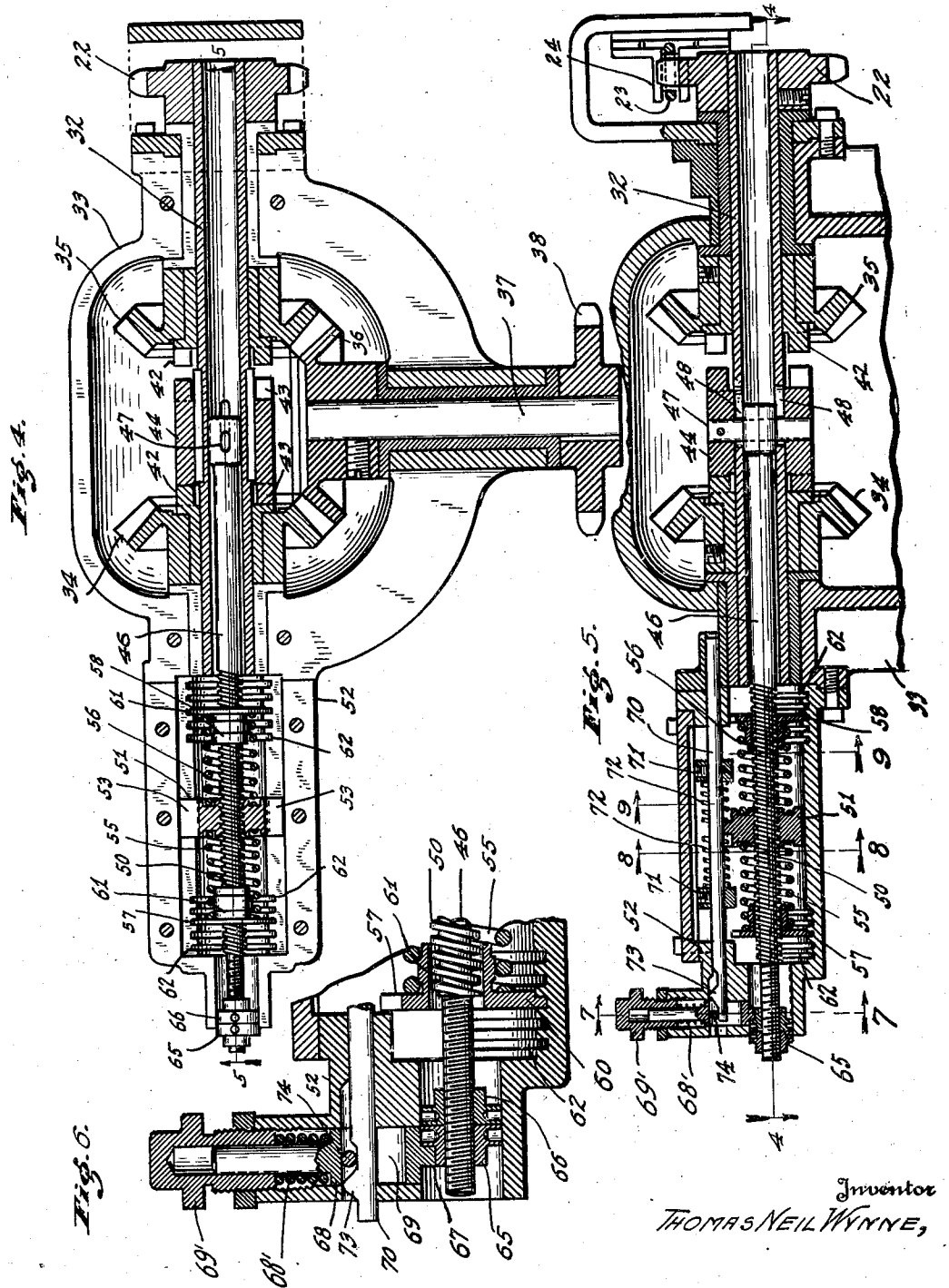


Fig. 4.

Fig. 5.

Fig. 6.

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Fig. 7.

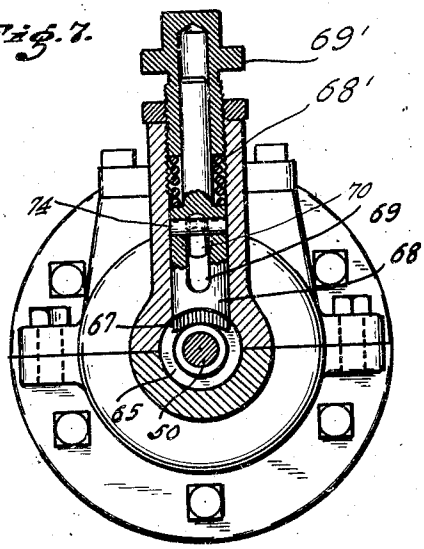


Fig. 8.

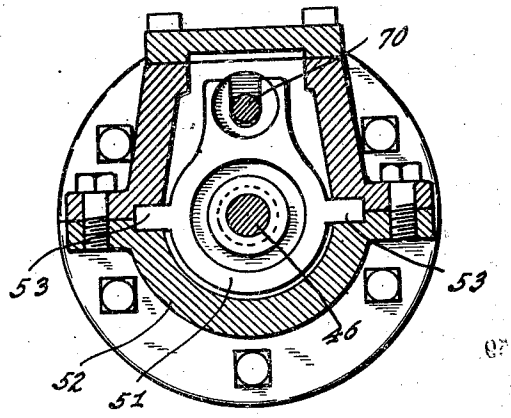


Fig. 9.

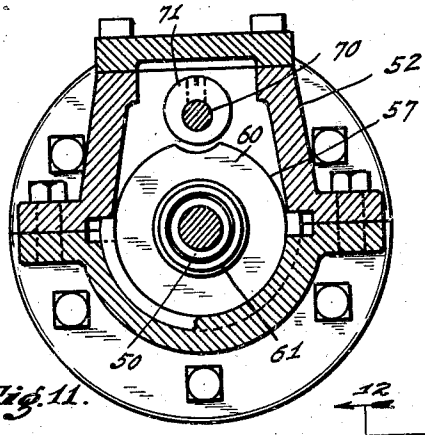


Fig. 10.

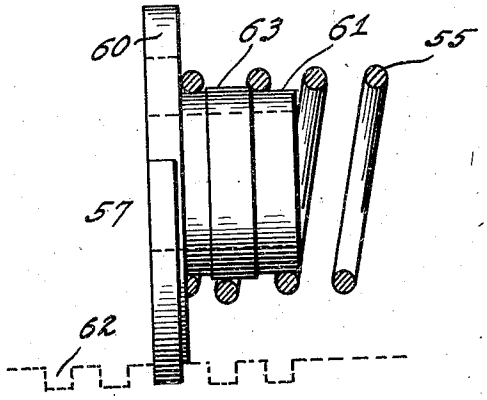


Fig. 11.

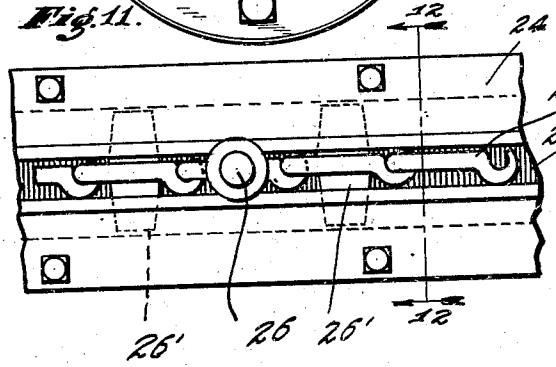
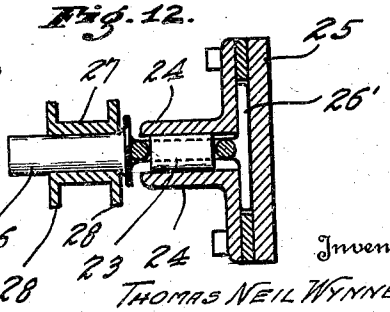


Fig. 12.



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Patented May 27, 1930 1,759,877

UNITED STATES PATENT OFFICE

THOMAS N. WYNNE, OF INDIANAPOLIS, INDIANA

COAL SPREADER

Application filed December 31, 1926. Serial No. 158,250.

It is the object of my invention to provide a device for automatically feeding and distributing coal into the hopper of an automatic stoker so as to distribute such coal uniformly along the length of the hopper in order that all parts of the stoker will be amply supplied with coal. A further object of my invention is to produce a device in which the distance through which the discharge end of the chute moves may be readily varied to suit different lengths of hoppers. A still further object of my invention is to produce a device in which the feed chute will not remain stationary at the ends of its movement, and thus I avoid supplying a disproportionate amount of coal to the ends of the hopper.

I accomplish the above objects by pivoting the upper end of the coal-feeding chute in order that it may swing longitudinally of the hopper, and I provide means for reciprocating the lower end of the chute along the hopper, such means being adjustable to vary the arc through which the chute swings.

The accompanying drawings illustrate my invention: Fig. 1 is a front elevation of a furnace equipped with a stoker and my improved coal-feeding device; Fig. 2 is a side elevation of the mechanism shown in Fig. 1 with parts of the stoker broken away to show the interior construction thereof; Fig. 3 is a fragmental elevation of the lower end of a coal-feeding chute; Fig. 4 is a horizontal section through the driving means by which movement of the chute is effected; Fig. 5 is a fragmental section on the line 5—5 of Fig. 4; Fig. 6 is a fragmental section similar to Fig. 5 but on a somewhat larger scale; Figs. 7, 8, and 9 are transverse sections respectively on the lines 7—7, 8—8, and 9—9 of Fig. 5; Fig. 10 is an elevation of one of the spring-abutments shown in section in Fig. 5; Fig. 11 is a front elevation of the chute-moving chain and its associated guides; and Fig. 12 is a transverse section on the line 12—12 of Fig. 11.

The coal for the furnace is stored in an overhead bin 15 to the lower end of which is pivotally attached a coal-chute 16 the lower end of which is adapted to move along the hopper 17 of the stoker as the chute swings about its axis of pivotal mounting. The stoker, with which my invention is not directly concerned, may be of any desired type. In the stoker illustrated, coal is fed through the front wall 18 of the furnace by means of reciprocating plungers 19 which are reciprocated in the rotation of a shaft 20 extending along the front of the stoker.

Mounted near each end of the hopper 17 are sprockets 21 and 22 which are engaged by a chain 23. One of the stretches of the chain 23, preferably the upper stretch, runs between two longitudinally extending guides 24 which are conveniently formed of two pieces of angle iron supported in spaced relation from a plate 25 which extends longitudinally of the hopper 17 parallel to the plane in which the lower end of the chute 16 swings. One of the links in the upper stretch of the chain 23 is provided with a laterally extending stud 26 which projects outwardly beyond the guides 24 and rotatably supports a roller 27. The roller 27 is provided with two spaced flanges 28 between which are received two parallel bars 29 mounted on the lower end of the chute 16 and extending longitudinally thereof. If desired, the chain links adjacent to that bearing the stud 26 may be provided with flanges 26′ which slide freely between the guides 24 and plate 25.

One of the sprockets, here shown as the sprocket 22, is arranged to be driven to produce movement of the chain 23 back and forth along the guides 24. To this end, the sprocket 22 may be mounted on one end of a shaft 32 which is supported by and extends through a gear housing 33. Within the gear housing 33, there are rotatably mounted on the shaft 32 two bevel gears 34 and 35 both of which mesh with a driving bevel gear 36 rotatable with a shaft 37. The shaft 37 is rotatably mounted in the gear-casing 33 and on the outside thereof is provided with a sprocket 38 adapted to be driven by a chain 39 from a second sprocket 40 mounted on the shaft 20.

The adjacent faces of the gears 34 and 35 are provided with clutch teeth 42 which are adapted to be engaged by similar clutch teeth 43 on an axially slidable clutch member 44 which may be moved to engage either of the gears 34 and 35. The clutch member 44, al-

though slidable along the shaft 32, is rotatable therewith, so that the shaft 32 may be driven by either of the gears 34 and 35. Suitable means are provided for shifting the clutch member 44 along the shaft 32. This means may take the form of a rod 46 located within the bore of the shaft 32 and provided near one end with a transverse pin 47 which extends through slots 48 in the shaft 32 and is received in the clutch member 44. By moving the rod 46, the clutch member 44 can be disengaged from one of the gears 34 and 35 and engaged with the other gear to reverse the direction of movement of the sprocket 22, chain 23, and chute 16.

To provide for automatically moving the rod 46 to produce periodic reversal of the direction of movement of the chute 16, I provide the outer end of the rod 46 with screw-threads 50 on which is mounted a nut 51. The nut 51 and the screw-threaded portion 50 of the rod 46 are enclosed within an extension 52 of the gear housing 33, the nut 51 being prevented from rotating in such housing by being provided with lugs 53 which slide in longitudinal grooves in the housing extension. The treaded portion 50 of the rod 46 is surrounded by two coil springs 55 and 56 which engage opposite faces of the nut 51 and which are in turn engaged by spring-abutments 57 and 58 respectively. The abutments 57 and 58 are in the form of annular flanges 60 on sleeves 61 which loosely surround the screw-threaded portion 50 of the rod 46. Preferably the lower part of the housing-extension 52 is provided interiorly near each end with a series of grooves 62 any one of which may receive the flange 60 of the adjacent abutment. By this means the position of the abutment may be varied. The springs 55 and 56 are held in engagement with the respective abutments by forcing the end of each of such springs over an annular ridge 63 on the sleeve 61, such ridge having an exterior diameter slightly larger than the normal interior diameter of the spring.

It will be evident that as the shaft 32 and rod 46 rotate the nut 51 will be moved longitudinally of the rod to compress one of the springs 55 and 56. To prevent axial movement of the rod 46 under the spring-pressure thus produced, the outer end of the rod 46 is provided with two flanged nuts 65 and 66 each of which serves as a lock-nut for the other. The flanges of these nuts are arranged to be engaged by the tooth 67 of a latch 68 which is mounted in the housing extension 52 to be slidable transversely of the rod 46. The latch 68 is provided with a transverse slot 69 through which passes a latch-operating rod 70. A compression spring 68′ acting between the latch 68 and an adjustable abutment 69′ serves normally to hold the latch-tooth 67 in engagement with one or the other of the nuts 65 and 66. The rod 70 extends through the housing-extension 52 and is provided on opposite sides of the nut 51 with adjustable abutments 71 between each of which and the nut 51 there acts a coiled compression spring 72. Where it passes through the slot 69 in the latch, the rod 70 is provided with a cam 73 co-operating with a cross pin 74 carried by the latch.

With the parts in the positions illustrated in Figs. 4 and 5 and in full lines in Fig. 1, the chute 16 is at the midpoint of its travel, the clutch member 44 is engaged with the bevel gear 34, and the shaft 32 and rod 46 are rotating to produce leftward movement (Figs. 4 and 5) of the nut 51. As the sprocket 22 rotates to move the chute from its central position, the nut 51 moves to the left (Figs. 4 and 5) and compresses the spring 55. The reaction of the spring 55 on the nut 51 tends to move the nut and the rod 46 to the right to disengage the clutch member 44 from the gear 34, but such movement of the rod 46 to the right is prevented because of the engagement of the tooth 67 with the nut 66. As the shaft 32 and sprocket 22 rotate to bring the chute 16 near the end of the hopper 17, the nut 51 compresses the left-hand one of the springs 72 and produces a leftward movement of the rod 70, which movement causes the latch 68 to be raised against the pressure of the spring 68′ and the tooth 67 to be disengaged from the nut 66. The compressed spring 72, after the latch 68 has been raised, forces the rod 70 to the left until the cam 73 has passed under the pin 74 to the position shown in Fig. 6. When the tooth 67 becomes disengaged from the nut 66, the spring 55 forces the rod 46 to the right, disengages the clutch member 44 from the gear 34, and engages it with the gear 35. As the gears 34 and 35 rotate in opposite directions, engagement of the clutch member 44 with the gear 35 immediately causes a reversal in the direction of rotation of the shaft 32 and the sprocket 22. The reversal of the direction of rotation of the sprocket 22 causes a reversal of the direction of movement of the chute 16 which starts a new stroke along the hopper. The rod 46, which rotates with the shaft 32, is now rotating in a direction to cause rightward movement of the nut 51 which eventually causes compression of the spring 56. The compression of the spring 56 tends to move the rod 46 and clutch member 44 to the left, but such movement is prevented by reason of the engagement of the latch tooth 67 with the nut 65 as shown in Fig. 6. Rightward movement of the nut 51 continues until it engages the abutment 72 and moves the rod 70 sufficiently to raise the latch 68 and disengage the tooth 67 from the nut 65. The spring 56 then acts to move the rod 46 to the left, to disengage the clutch member 44 from the gear 35 and to engage such clutch member with the gear 34.

The positions of the abutments 71 and 72

can be regulated to cause reversal of the chute 16 at any desired points. A further adjustment of the points of reversal of the chute 16 can be effected by regulation of the spring abutment 69'.

The gear housing 33 and the extension 52 thereof are preferably separable and so constructed that the shaft 32 and the parts it carries and the housing-extension 52 and the parts within it can be reversed on the housing 33 so that the reversing mechanism can be located at either end of the hopper 17.

I claim as my invention:—

1. In combination with an automatic stoker having a hopper, a swinging coal-feeding chute for feeding coal into and distributing it along said hopper, two sprockets rotatably mounted near the ends of said hopper in a plane parallel to the path of movement of the lower end of said chute, a chain surrounding said sprockets, said chute being connected to said chain, a rotatable shaft, means for driving said shaft constantly in one direction, and periodically reversible power-transmission mechanism inter-connecting said shaft and one of said sprockets.

2. In combination with an automatic stoker having a hopper, a swinging coal-feeding chute for feeding coal into and distributing it along said hopper, two sprockets rotatably mounted near the ends of said hopper in a plane parallel to the path of movement of the lower end of said chute, a chain surrounding said sprockets, said chute being connected to said chain, a rotatable shaft, driving means for rotating said shaft constantly in one direction, reversible power-transmission mechanism interconnecting said shaft and one of said sprockets, and control means for said power-transmission mechanism, said control means being adjustable to vary the points in the movement of the chute at which reversal of the power-transmission mechanism occurs.

3. In combination with an automatic stoker having a hopper, a swinging coal-feeding chute for feeding coal into and distributing it along said hopper, a member movable along said hopper, said member being connected to said chute, a rotatable shaft, driving means for rotating said shaft constantly in one direction, and periodically reversible power-transmission mechanism operatively interconnecting said shaft and said member to cause reciprocation of said member and chute along the hopper.

4. In combination with an automatic stoker having a hopper, a swinging coal-feeding chute for feeding coal into and distributing it along said hopper, two sprockets rotatably mounted near the ends of said hopper in a plane parallel to the path of movement of the lower end of said chute, a chain surrounding said sprockets, said chute being connected to said chain, means for driving one of said sprockets, said driving means including a rotatable shaft, two shaft-rotating members rotatable relatively to said shaft, means for driving said shaft-rotating member in opposite directions, clutch means for clutching either of said shaft-rotating members to said shaft, and means for periodically operating said clutch means to cause reversal of said shaft.

5. A reversing drive, comprising a rotatable driven shaft, two shaft-rotating members rotatable relatively to said shaft, means for driving said two members in opposite directions, clutch means for clutching either of said rotatable members to said shaft, a rod for actuating said clutch means, said rod being longitudinally movable to control said clutch means, means for rotating said rod from said driven shaft, a nut screw-threadedly mounted on said rod and movable therealong as said rod rotates, two springs acting oppositely on said nut, said springs being arranged so that as said nut moves along said shaft one spring will be stressed tending to produce longitudinal movement of said nut and rod to cause actuation of said clutch means, a latch for preventing such movement of said rod, and means operative when said nut reaches predetermined positions in its movement for releasing said latch.

6. A reversing drive as set forth in claim 5 with the addition that said last named means is adustable to vary the positions of said nut at which release of said latch occurs.

7. The invention set forth in claim 3 with the addition of control means for said power-transmission mechanism, said control means being adjustable to vary the points in the movement of the chute at which reversal of the power-transmission mechanism occurs.

In witness whereof, I have hereunto set my hand at Indianapolis, Indiana, this 18th day of December, A. D., one thousand nine hundred and twenty-six.

THOMAS N. WYNNE.

DISCLAIMER

1,759,877.—*Thomas N. Wynne*, Indianapolis, Ind. COAL SPREADER. Patent dated May 27, 1930. Disclaimer filed May 20, 1931, by the patentee.

Hereby disclaim that part of the thing patented which is covered by said claim 3, which claim 3 reads as follows:

"3. In combination with an automatic stoker having a hopper, a swinging coal-feeding chute for feeding coal into and distributing it along said hopper, a member movable along said hopper, said member being connected to said chute, a rotatable shaft, driving means for rotating said shaft constantly in one direction, and periodically reversible power-transmission mechanism operatively interconnecting said shaft and said member to cause reciprocation of said member and chute along the hopper."

[*Official Gazette June 9, 1931.*]