March 1, 1949. F. A. GRUETJEN 2,463,103

MECHANICAL STOKER DRIVE

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Fig. 1

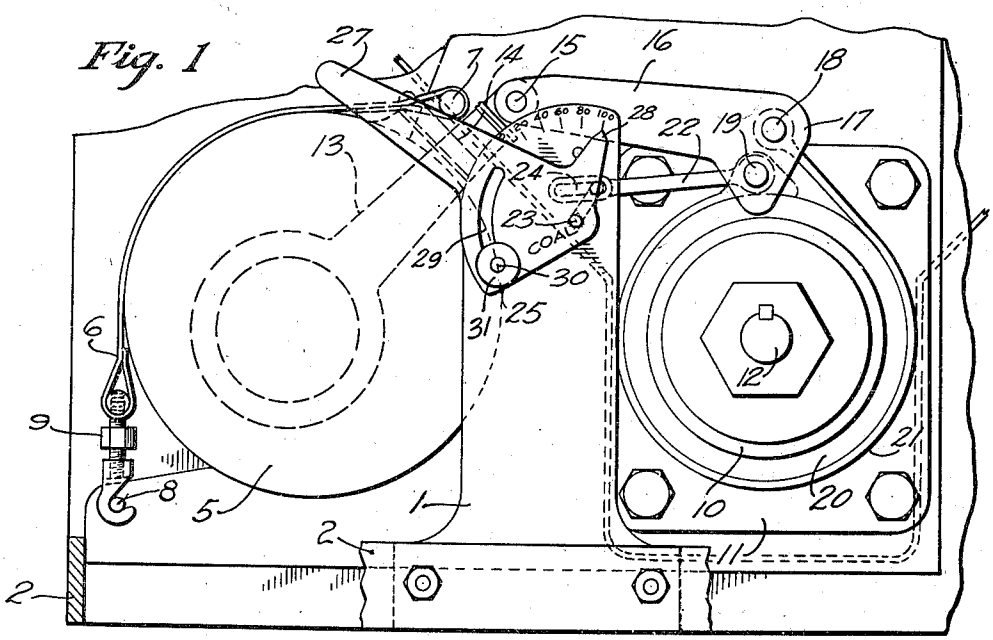
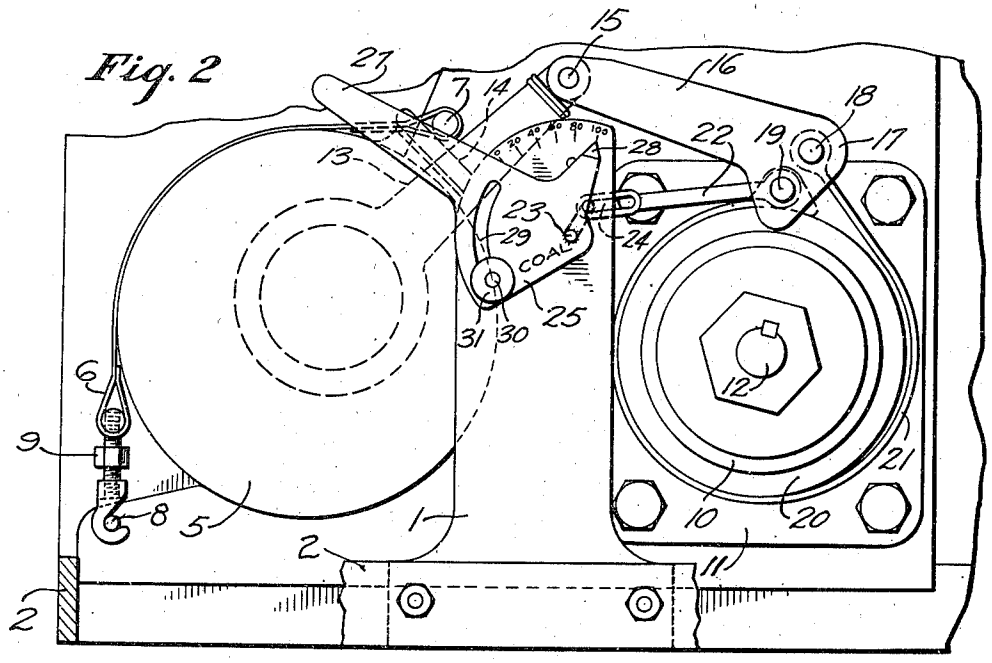


Fig. 2



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Fig. 3

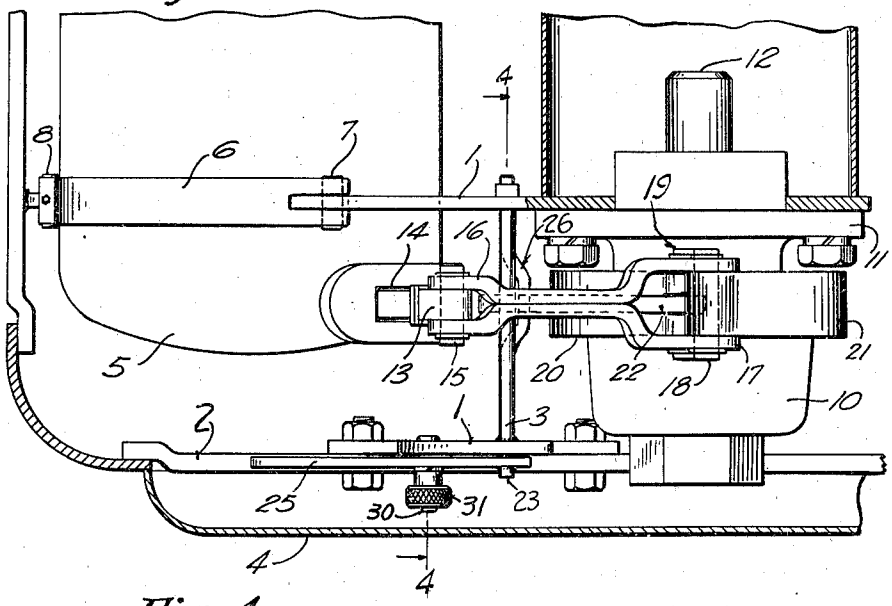
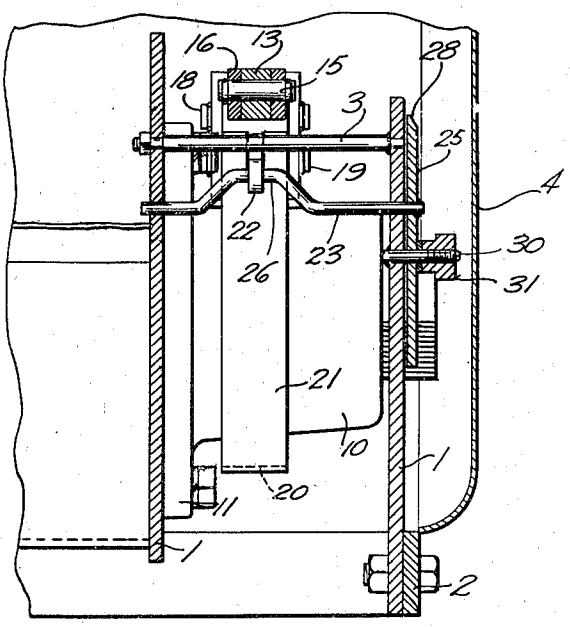


Fig. 4



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MECHANICAL STOKER DRIVE

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4 Claims. (Cl. 74—116)

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This invention relates to a mechanical stoker drive and has particular reference to the drive and control mechanism for driving the feed screw of the ordinary coal stoker for house furnaces.

One object of the invention is to provide a stoker drive in which the wear on drive parts is held at a minimum by elimination of substantial frictional engagement between parts.

Another object is to provide a stoker drive that has a novel means of adjusting the amount of rotational movement of the feed screw for each increment of intermittent movement.

A further object is to provide a stoker drive in which noise of operation is substantially eliminated.

Another object is to provide a stoker drive with a minimum of parts to lower the initial cost thereof and the cost on the replacement of parts.

Another object is to provide a stoker drive that can be readily removed from the stoker assembly.

These and other objects and advantages of the invention appear hereinafter in connection with the description of an embodiment of the invention illustrated in the accompanying drawing.

In the drawing:

Figure 1 is a front end view of the stoker drive embodying the features of the invention and with the cover removed and showing the parts in one extreme of feeding movement;

Fig. 2 is a similar view showing the parts in the opposite extreme of feeding movement;

Fig. 3 is a top plan view of the drive; and

Fig. 4 is a section taken on line 4—4 of Figure 3.

Referring to the drawings there is illustrated an embodiment of the invention comprising a frame 1 having front and rear parts secured at the lower end portion thereof to rectangular base 2 and joined at the upper portions thereof by a rod 3. An outer cover 4 is provided to cover the front of the frame.

At one side of frame 1, the driving motor 5, only a portion of which is shown, is supported by cradles and secured in place by the restraining strap 6. Strap 6 extends around the end of motor 5 from a pin 7 secured to the rear of frame 1 in the upper middle portion thereof to pin 8 secured to the lower end portion of the frame at the side thereof. A turnbuckle 9 is employed to tighten strap 6 around motor 5.

The bearing housing 10 extends laterally within the other side of frame 1. A flange 11 is carried by the rear portion of the housing and is bolted or otherwise secured to frame 1 to hold housing 10 in place. A drive shaft 12 extends longitudinally of housing 10 and is journalled for rotation therein by drive motor 5 through the drive mechanism of the invention as described hereinafter. Shaft 12 serves to drive the feed screw, not shown, of the stoker.

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A crank 13 extends diagonally upwardly through reinforced opening 14 of the end head of the driving motor 5 and is driven in an oscillating manner by an eccentric on the shaft of motor 5. Opening 14 in the end head of the driving motor housing receives the extended end of crank 13 and is of sufficient dimensions to permit oscillating movement of the crank.

A shear pin 15 joins the upper end of crank 13 to the arms of one end of the operating lever 16. The lever 16 extends laterally within frame 1 from the upper end of crank 13 to a position above drive shaft 12. The end of arms 17 of lever 16 at the position above shaft 12 are substantially enlarged. The pin 18 extends longitudinally of frame 1 through the upper portion of the enlarged end of arms 17. The pin 19 extends longitudinally of frame 1 through the lower portion of the enlarged end of arms 17.

A drum 20 is keyed to drive shaft 12 within frame 1. A drive band 21 extends around the circumference of drum 20 and one end of the band is pivoted to arm 17 of operating lever 16 by the upper pin 18 and the other end is similarly pivoted to arm 17 by lower pin 19. The band and drum serve to convert the reciprocatory motion of the crank 13 and lever 16 to rotary motion, to drive shaft 12.

One end of a retaining link 22 is also secured to operating lever 16 by pin 19 to constitute the latter a fulcrum about which lever 16 operates. The link 22 extends laterally within frame 1 at a horizontal position below operating lever 16 and is adjustable longitudinally to provide for shifting of the fulcrum of lever 16.

A rod 23 passes through a horizontal slot 24 in the outer end of link 22. Rod 23 extends longitudinally of frame 1 and is supported by the front and rear parts thereof. The outer end of rod 23 is welded to the crank or lever 25 which is employed to rotate the rod to the position desired for adjustment of the position of link 22.

That portion of rod 23 lying in and adjacent slot 24 is outwardly curved as at 26 to form a crank and the rotation of the rod by lever 25 locates curved crank portion 26 of rod 23 at different horizontal positions within slot 24 to limit the horizontal movement of link 22.

Lever 25 is marked "coal" and is manually adjusted by handle 27 to the position desired as indicated by locating pointer 28 thereof at the

degree setting desired, the degree settings being defined on the forward frame plate 1 by degree marks from zero to one hundred.

Lever 25 is provided in the body portion thereof with an arcuate slot 29 concentric to the end of rod 23 which pivotally supports the lever. A pin 30 extends through slot 29 and is welded at one end to frame 1. The slot 29 limits the radial movement of lever 25. A lock nut 31 is disposed on the outer end of pin 30 and is tightened against lever 25 to hold it in place after the pointer 28 has been located at the setting desired, in order to limit the horizontal movement of link 22 under the reciprocal influence of band 21 and lever 16.

In the operation of the stoker drive, at each forward stroke of crank 13 operating lever 16 is raised and pushed forward to the right carrying upper pivot pin 18 and lower pivot pin 19 with it. During the forward stroke lever 16 tilts in a manner to loosen drive band 21 and permit it to slip clockwise around drum 20. Upon the return stroke of crank 13 and lever 16 the band is tightened around drum 20 resulting in counterclockwise rotation of the drum and the drive shaft 12 to which the drum is keyed.

The clockwise rotation of band 21 about the drum 20 is limited by retaining link 22 when the outer end of slot 24 reaches rod 23 in the forward movement of the link. This limitation determines the counterclockwise rotation of the drum 20 upon return of the band 21.

When the coal adjustment lever 25 has pointer 28 located at zero, no motion clockwise of band 21 can take place and therefore zero amount of feed of coal occurs since drum 20 is not rotated on the return stroke of operating lever 16. The stroke is consumed in merely tilting lever 16 around lower pivot pin 19 as its fulcrum.

When pointer 28 of coal adjustment lever 25 is located at one hundred, the greatest amount of the stroke of crank 13 is utilized since the setting of the pointer in this manner permits maximum movement of link 22 to the right before the end of the slot reaches rod 23. Upon the return stroke of crank 13 the maximum counterclockwise rotation of drum 20 is obtained with the maximum feed of coal to the stoker.

The drum drive portion of the mechanical stoker drive of the invention is readily separated from the motor unit by removing shear pin 15 joining the upper end of crank 13 to operating lever 16. Pin 15 is of a construction to shear off in the event of any operational difficulties arising in the mechanism.

The invention provides a compact stoker drive that substantially eliminates wear on parts and which provides a simple device for adjusting the amount of coal fed to the stoker.

Various embodiments of the invention may be employed within the scope of the accompanying claims.

I claim:

1. A mechanical stoker drive comprising a drive shaft to drive a coal feed screw, a cylindrical drum secured to said shaft and rotatable therewith, a drive band encircling said drum and pivoted at one end to an operating lever and at the other end to a retaining link also pivoted to said operating lever, and means to tilt said operating lever upon said retaining link to move the pivot line of the retaining link and band in one direction to loosen the band out of frictional engagement with the drum and thereafter to return the lever to normal position and move the pivot line of the retaining link and band in the opposite direction to tighten the band on said drum and thereby rotate the same in the latter direction.

2. A mechanical stoker drive comprising a drive shaft to drive a coal feed screw, a cylindrical drum secured to said shaft and rotatable therewith, a drive band encircling said drum and pivoted at one end to an operating lever and at the other end to a retaining link also pivoted to said operating lever, means to tilt said operating lever upon said retaining link to move the pivot line of the retaining link and band in one direction to loosen the band out of frictional engagement with the drum and thereafter to return the lever to normal position and move the pivot line of the retaining link and band in the opposite direction to tighten the band on said drum and rotate the same in the latter direction, and means to adjust the position of the retaining link circumferentially of the drum to limit the rotation of the cylindrical drum when the drive band is disposed in frictional engagement therewith.

3. A mechanical stoker drive, comprising a drive shaft to drive a coal feed screw, a cylindrical drum secured to said shaft and rotatable therewith, a drive band encircling said drum and pivoted at one end to an operating lever and at the other end to a retaining link also pivoted to said operating lever, a drive motor, a crank member oscillated by the motor shaft and connected to said operating lever to tilt the same and move the pivot line of the retaining link and band clockwise of the drum to loosen the band out of frictional engagement therewith and thereafter to return the lever to normal position and move the pivot line of the retaining link and band in a counter-clockwise direction to tighten the band on said drum nad rotate the same in a counterclockwise direction, a slot in the end of the retaining link opposite said drive band, a rod extending through said slot, and a lever to move said rod to different horizontal positions to regulate the horizontal movement of the retaining link and limit the rotation of said drum by said drive band when the latter is disposed in frictional engagement therewith.

4. In a mechanical stoker drive having a drum rotated by a drive band to drive a coal feed screw, a retaining link pivoted at one end to one end of said drive band, a slot in the other end of said link having a rod extending therethrough, and a crank member to move said rod to different horizontal positions to regulate the horizontal movement of the retaining link and limit the rotation of said drum by said drive band when the latter is disposed in frictional engagement therewith.

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