

March 19, 1940.

H. C. CARTER

2,194,006

BIN CONVEYER

Filed Sept. 27, 1937

2 Sheets-Sheet 1

FIG. 1.

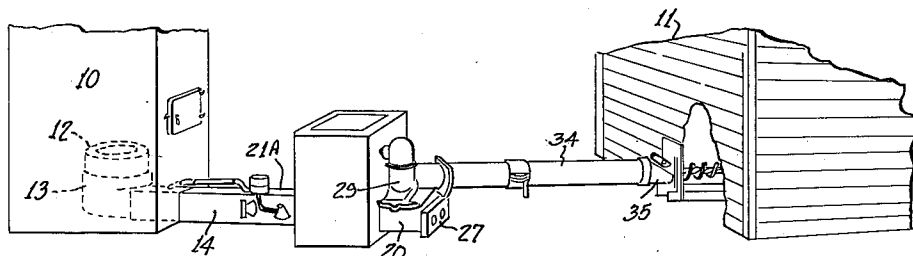


FIG. 2.

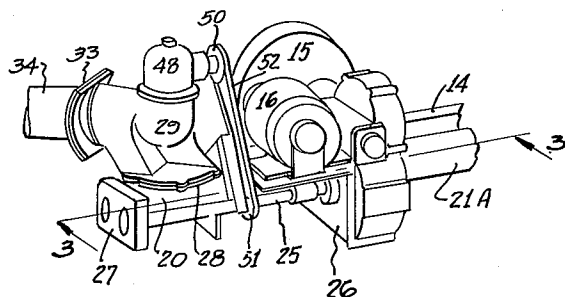


FIG. 3.

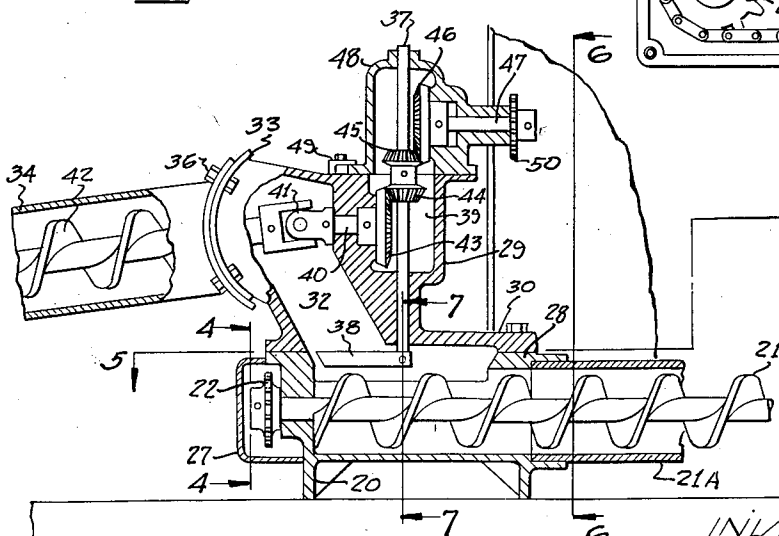
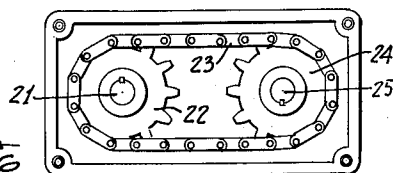


FIG. 4.



INVENTOR  
H.C. CARTER

BY *E. J. Birkenhead*  
ATTORNEY

March 19, 1940.

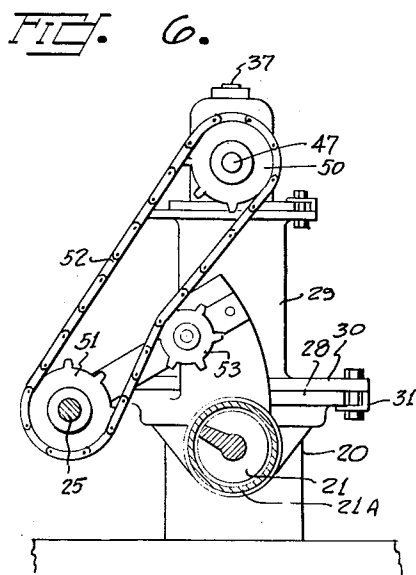
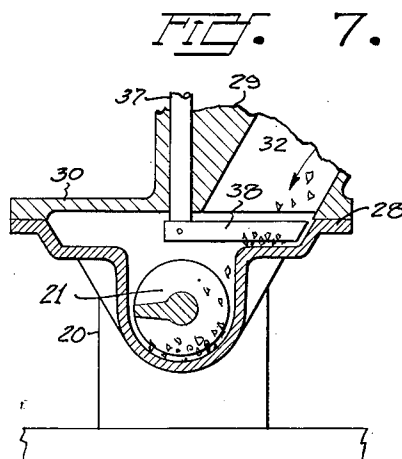
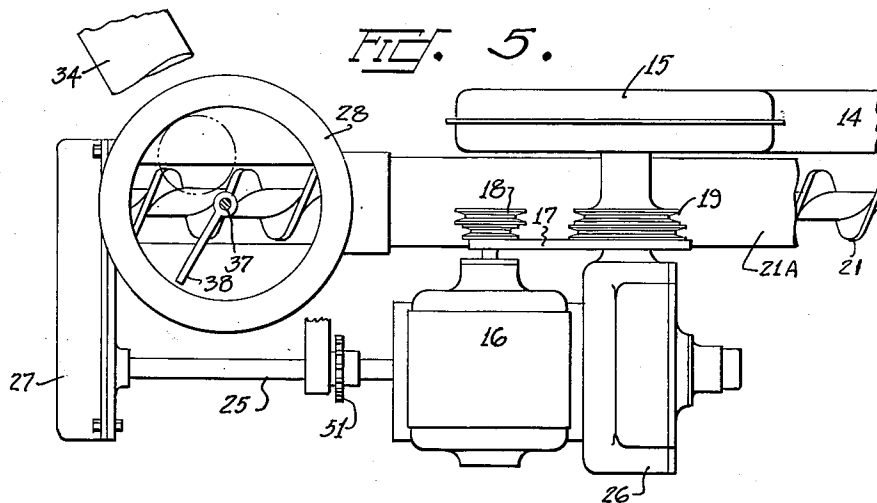
H. C. CARTER

2,194,006

BIN CONVEYER

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2 Sheets-Sheet 2



INVENTOR  
H.C. CARTER  
BY *C. B. Pinkham*  
ATTORNEY

## UNITED STATES PATENT OFFICE

2,194,006

## BIN CONVEYER

Haskell C. Carter, Portland, Oreg., assignor to  
Iron Fireman Manufacturing Company, Port-  
land, Oreg.

Application September 27, 1937, Serial No. 165,853

8 Claims. (Cl. 198—93)

This invention relates generally to underfeed stokers, and particularly to stokers wherein the fuel is drawn from a storage bin as distinguished from the usual form of hopper of very limited capacity.

The main object of this invention is the provision of an exceedingly simple and efficient form of conveyer which adapts itself to use in stokers wherein one coal worm is employed to draw coal from a bin and deliver it to a second worm which carries the coal on to the retort.

The second object is to provide an improved form of coal transferring and power applying mechanism between the adjacent ends of the coal feeding worms.

The third object is to improve the form of bin conveyer illustrated in my Patent 2,027,958, dated January 14, 1936, by reducing the vertical height of the transfer mechanism and rendering more positive the transferring action when used in connection with wet coals.

I accomplish these and other objects in the manner set forth in the following specification as illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary perspective view showing the complete installation.

Fig. 2 is a fragmentary view showing the perspective view of the transfer mechanism with the casing removed.

Fig. 3 is a section taken along the line 3—3 in Fig. 2.

Fig. 4 is a view of the end of the coal worm drive with the cover pipe removed.

Fig. 5 is a section taken along the line 5—5 in Fig. 3.

Fig. 6 is a section taken along the line 6—6 in Fig. 3.

Fig. 7 is a section taken along the line 7—7 in Fig. 3.

Similar numerals refer to similar parts throughout the several views.

Referring to the drawings there is shown a furnace 10 to which coal is to be delivered from bin 11. In the furnace 10 is disposed a fire pot 12 and retort base 13 which contains a plenum chamber to which air is delivered through a duct 14 from a fan 15. The fan 15 is driven by the motor 16 through the belt 17 which passes around the motor sheave 18 and the fan sheave 19.

Disposed between the furnace 10 and the bin 11 is a turret base 20 into which extends the coal feeding worm 21 which is disposed within the coal feeding tube 21A which projects into the

retort base 13. The worm 21 is provided on one end with the sprocket wheel 22 which meshes with a chain 23 which passes around the sprocket wheel 24 which in turn is secured on the drive shaft 25. The drive shaft 25 extends into the transmission casing 26 from which it is driven by gearing not shown.

It is desirable to provide a cover plate 27 for the sprocket wheels 22 and 24. The upper side 28 of the turret base 20 is circular in form and has mounted thereon a turret 29 whose lower end 30 forms a cover for the base 20 and is secured thereto by means of the clamps 31. The turret 29 is provided with an inclined opening 32 having a curved flanged inlet opening 33.

The coal conveying tube 34 which extends to the coal bin 11 through the clean-out box 35 is held in its proper relation to the turret 29 by means of the bolts 36.

Also mounted in the turret 29 is the vertical shaft 37 whose lower end has secured thereon an agitating arm 38. The upper end of the turret 29 is provided with a recess 39 through which the shaft 37 extends. A short shaft 40 also journals in the turret 29 and has secured on one end thereof a universal coupling 41 which is connected to the inclined coal conveying worm 42 which is disposed within the tube 34. The shaft 40 has also secured thereon a bevel gear 43 which meshes with the bevel pinion 44 which is secured on the shaft 37. The pinion 45 is also secured on the shaft 37, and meshes with the bevel gear 46 whose shaft 47 journals in the turret head 48 which is rotatable with relation to the turret 29 but may be held in any desired position by means of the clamps 49. The shaft 47 is also provided with a sprocket wheel 50.

On the shaft 25 is secured a sprocket wheel 51 and the chain 52 passes around the sprocket wheels 50 and 51. It is desirable to provide an idler sprocket 53 for the purpose of tightening the chain 52.

The operation of the device is as follows:

When the stoker is installed the relative positions of the furnace 10 and the bin 11 are immaterial since the angularity between the tubes 21A and 34 may be varied by loosening the clamps 31 and 49. Once the parts are in position the clamps 31 and 49 are secured.

When the stoker is operated the motor 16 causes the fan 15 to be operated and the drive shaft 25 to rotate and through the chain 23 to rotate the worm 21. The shaft 25 also serves to drive the shaft 37 through the chain 52 and bevel pinion 45 and gear 46 while the pinion 44

through the gear 43 drives the inclined coal conveying worm 42 causing coal to move from the bin 11 into the inclined opening 32 which communicates with the inlet end of the worm 21.

5 A dry and clean coal will ordinarily pass through the opening 32 but very moist coals or coal with a large percentage of dirt will be apt to arch over the worm 21 within the opening 32. It is for this purpose that I have provided the  
10 agitating arm 38. With this construction it is practical to feed coal with a higher moisture content than would otherwise be possible.

I claim:

1. A bin conveyer having in combination a  
15 trough, an inclined neck mounted over said trough and communicating therewith, a coal feeding worm within said trough, a tube communicating with the upper end of said neck, a worm within said tube, a driving connection on  
20 the upper side of said neck for rotating said last mentioned worm, an adjustable connection between said inclined tube and neck whereby said tube can be selectively fixed with relation to said trough, and an agitator arm at the lower end of  
25 said neck on the upper side of said trough.

2. A bin conveyer having in combination a horizontal trough, a coal feeding worm disposed within said trough having means for rotating same for the purpose of conveying fuel from said  
30 trough to a stoker retort, a sloping fuel conveying worm having its upper discharge end disposed above said trough, an inclined neck communicating between the upper end of said sloping worm and said trough, gearing on the upper side  
35 of said neck for driving said sloping fuel conveying worm, a distributor arm actuated by said gearing adapted to sweep across the lower end of said neck, said gearing having a pivotal axis passing substantially through the intersection of  
40 the axes of said neck and trough.

3. A bin conveyer for transporting coal from a bin to the retort of an underfeed stoker having in combination a horizontal coal tube communicating with the retort and having a worm therein  
45 extending into said retort, a sloping coal tube disposed above said horizontal coal tube, an inclined neck communicating between the upper end of said sloping coal tube and the horizontal coal tube, a worm within said sloping coal tube  
50 extending into said bin, a drive gear on the upper end of said neck having a vertical pivotal axis passing substantially through the intersection of the axes of said neck and the horizontal tube, said neck and horizontal coal tube being capable  
55 of a limited relative rotation, and an agitator disposed between said worms adapted to sweep across the path of communication between the inclined neck and the horizontal coal tube.

4. A bin conveyer consisting of a coal feeding  
60 worm adapted to feed coal to a retort, a coal elevating worm adapted to draw coal from a bin

and discharge it above the loading end of said first mentioned worm, a turret forming an adjustable hinged connection between the two worms, said turret having a passageway there-  
5 through by means of which coal may fall from one worm to the other and an arm revolvable about the turret axis for agitating the coal at the loading end of the other worm.

5. The combination of an inclined coal elevating worm, a coal conveying worm having its  
10 loading end disposed below the upper end of said elevating worm and spaced therefrom, a turret forming an adjustable coal conveying connection between the adjacent ends of said worms, said turret having a head thereon which is revolvable  
15 with relation to the turret, means for driving said inclined worm through said turret head, and an agitator operated by said driving means adapted to operate between the adjacent ends of the two worms.  
20

6. A bin conveyer having in combination a trough, a worm within said trough, a turret forming a cover for said trough, a drive mechanism mounted on said turret, an inclined coal convey-  
25 ing worm supported by said turret and driven from said drive mechanism, said turret having a passageway therein communicating between the adjacent ends of said worms and an agitator arm disposed between said turret and trough adapted to sweep across the lower end of the  
30 turret passageway.

7. In a device of the class described the combination of a trough containing a coal feeding worm, a turret revolvably mounted on said  
35 trough, a turret head revolvably mounted on said turret, an inclined coal conveyer adjustably attached to said turret, said turret having an inclined passageway formed therein communicating between said worms, means for driving said inclined worm from said turret head through  
40 said turret and a revolvable arm for agitating coal passing through said passageway.

8. In a device of the class described the combination of a trough, a horizontal worm disposed within said trough, a turret mounted over said  
45 worm having a coal passageway formed there-through and discharging into said trough, a coal elevating worm adapted to discharge coal into said passageway, a vertical shaft along the axis of said turret having an agitator arm at the  
50 lower end thereof, means for fixing the angular relation between said turret and trough, a head rotatably mounted on said turret through which power may be delivered to the vertical shaft, a chain drive for applying power to said turret,  
55 gearing driven by said vertical shaft for rotating said elevating worm and a drive shaft on the side of said trough for supplying power to said turret head and to said first mentioned worm.

HASKELL C. CARTER.