

O. C. WOOLSON.

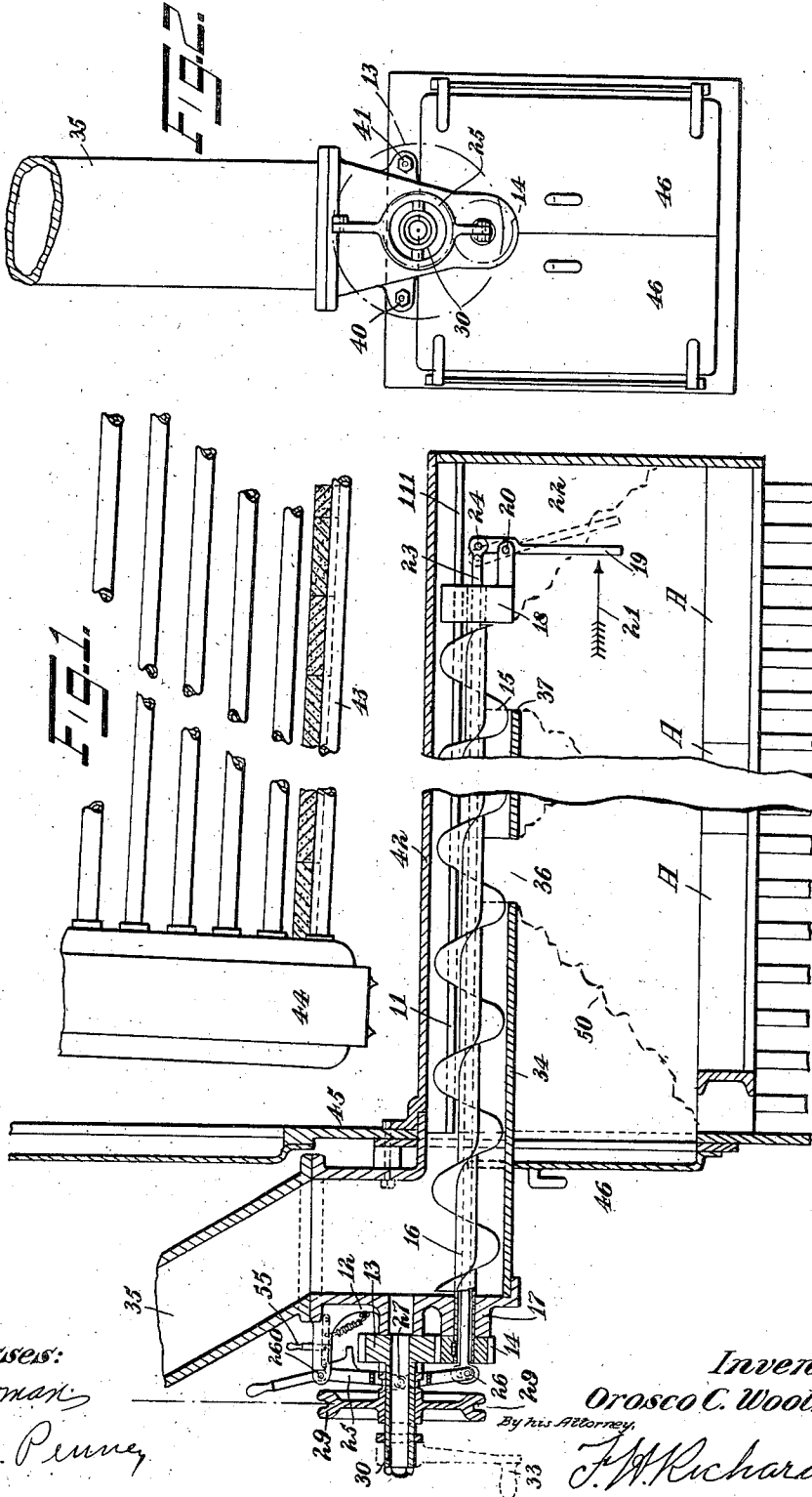
COAL FEEDING MECHANISM FOR MAGAZINE FURNACES.

APPLICATION FILED DEC. 16, 1908. RENEWED MAR. 27, 1916.

1,203,167.

Patented Oct. 31, 1916.

2 SHEETS—SHEET 1.



Witnesses:

Skuman

H. D. Penny

Inventor:

Orosco C. Woolson,

By his Attorney,

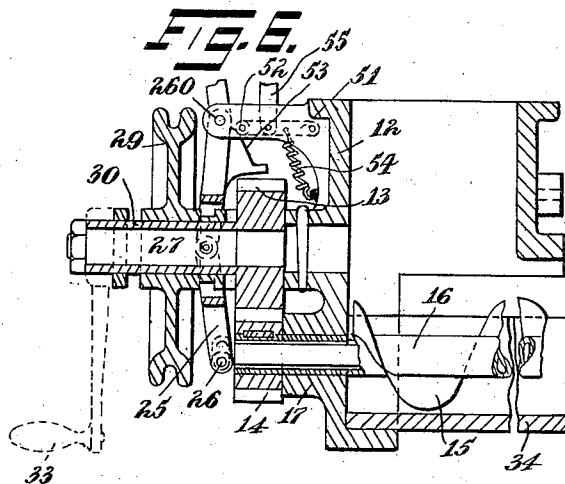
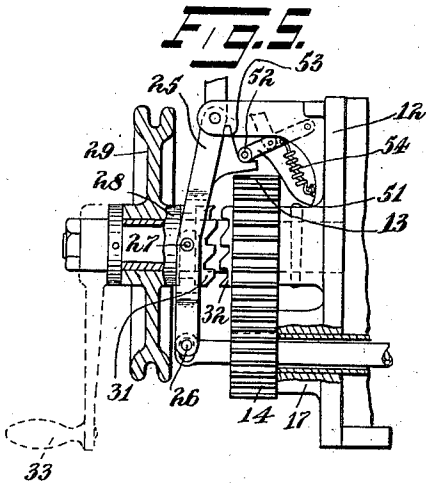
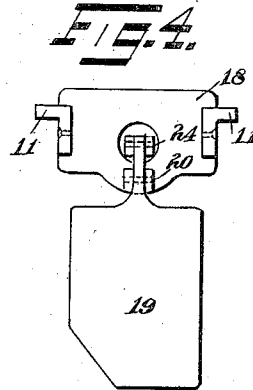
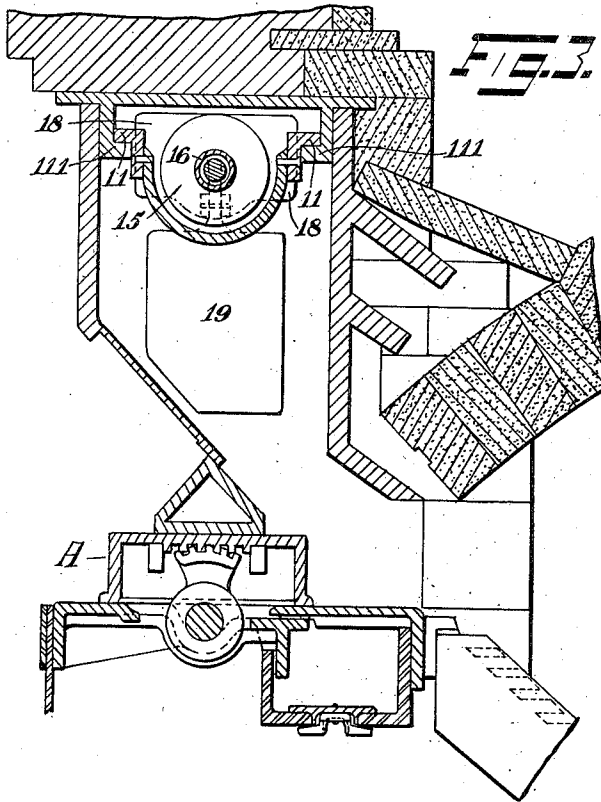
F. W. Richards

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UNITED STATES PATENT OFFICE.

OROSCO C. WOOLSON, OF NEWARK, NEW JERSEY.

COAL-FEEDING MECHANISM FOR MAGAZINE-FURNACES.

1,203,167.

Specification of Letters Patent.

Patented Oct. 31, 1916.

Application filed December 16, 1908, Serial No. 467,895. Renewed March 27, 1916. Serial No. 87,130.

To all whom it may concern:

Be it known that I, Orosco C. Woolson, a citizen of the United States, residing in Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Coal-Feeding Mechanism for Magazine-Furnaces, of which the following is a specification.

My present improvement relates to mechanism for supplying coal to furnaces, and particularly to boiler furnaces of the type in which the coal is fed in at either side from magazines located above and at the sides of the furnace chamber. This general type of boiler furnace being well known I have not fully illustrated the same herein, except such portions, shown in a fragmentary way, as more directly relate to my present improvements.

One of the principal objects of my improved coal feeding apparatus is to supply coal from a chute located forward or outside of the front wall of the furnace housing, and to carry the coal horizontally and backwardly along the top of the magazine until the coal shall be properly supplied to the magazine, even to the rear end thereof; a further object being to provide this apparatus so organized that it can be readily removed for inspection and repair, and for renewal from time to time as required. For this purpose I have organized several component members of the apparatus upon a connecting framework in the nature of a carrier, and have arranged this to be slid out upon suitable lugs or supports at the sides of the magazine, preferably near the upper portion thereof, and have also arranged the several details in such manner that these are supported and carried upon the said carrier whereby the whole operative mechanism can be withdrawn in the manner and for the purposes above indicated.

In the drawings accompanying and forming a part of this specification, Figure 1 is a partly sectional and partly elevational view illustrating a practicable application of my improvements to a stoker magazine connected with a furnace grate situated below a boiler. Fig. 2 is a front elevation of a furnace equipped with my improvement. Fig. 3 is a cross sectional view of the feeder

and also of portions of the magazine grate, arched roof and stoker. Fig. 4 is a detail of an actuator for the clutch. Fig. 5 is a detail partly in section of the driving mechanism showing the clutch disengaged; and Fig. 6 is a sectional view of the same parts showing the clutch engaged.

In these drawings two guide rails or frame members are illustrated, designated by the reference characters 11—11, which are slidably supported upon the fixed guides 111—111, all of said members being shown as extending from the front to the extreme rear end of the feed mechanism. At the front end these guide members carry a front plate or frame of some suitable construction, as for instance the frame 12, and forwardly of said frame I have shown gearing 13, 14 suitable for operating a screw indicated in a general way by 15 whose shaft 16 is journaled at 17 in the said front plate or member, and whose rearward end is journaled in a bearing 18 attached to and between the said rails 11—11.

A regulator device, in the present instance shown in the form of a swinging plate 19 is suitably supported for movement to and fro, preferably by means of a pivot 20, by which it may be hinged to the said removable framework of the apparatus. The relation of this regulator device should be such that when the coal is pushed along, as indicated by the arrow 21 in Fig. 1, the backward movement of the regulator when thus pushed or operated by the coal excessively accumulating at the rear end of the magazine chamber 22 will operate through some suitable connection, as for instance the rod 23 shown pivoted to said regulator at 24 for controlling or disengaging the screw driving mechanism shown at the left hand in Fig. 1. In the present instance, I have shown this accomplished by means of a suitable connection to the said rod, as for instance the lever 25, pivoted at 26 to the rod and at 260 to the frame, carrying a pair of pins 27 running in a groove in the hub of the sprocket wheel 29. The result of this arrangement when organized in the manner illustrated, is to cause the said regulator, when it is pushed backwardly at its lower end, to push forward the said sprocket wheel on the sleeve 30 of the pinion 13, and

thereby disengage the clutch teeth 31 by which the said sprocket wheel when in its working position engages with the teeth 32 on said pinion for driving the pinion 13 and through it the pinion 14 which is fixed to the end of the shaft 16. It will, of course, be understood in practice that these details may be modified within the scope and limit of my invention.

The projecting end of the pinion shaft 30 may be provided with an angularly formed end for the engagement of a suitable manual actuator when the sprocket wheel is disengaged as above set forth. A suitable crank for this purpose is illustrated in the drawings by the dotted line 33, so that an operator or attendant may turn the feed screw by hand. This can be readily done under ordinary circumstances when the driving connection is disengaged.

At the forward end of the apparatus a floor surface, preferably in a concave form, or trough shaped, indicated by 34, is fixed in place under the feed screw. This receives the coal which comes down from the supply chute 35 into the spaces between the turns of the feed screw. The sides of this trough 34 are shown carried up to join the aforesaid guide rails 11 to which the edges of the trough are shown attached by riveting. The said trough 34 is carried backward to a point proper for regulating the position of the forward part of the mass of coal which is ordinarily contained within the magazine while the furnace is in operation. In the present illustration the trough is provided with two discharge mouths 36, 37, for the more even distribution of the coal from the screw.

For indicating the manner in which the coal is ordinarily, or frequently in practice, supplied from the bottom of the magazine to the grate of the furnace, I have indicated the usual reciprocatory feed device, indicated in a general way by A, and also the oscillating segment by which this device is sometimes actuated; but as these features are already well known in the art it is deemed unnecessary to further illustrate or describe the operation of those details in this application.

For retaining the feed mechanism in place two bolts are shown at 40 and 41, by removing which the said front plate or bearing piece (this being securely fixed to the aforesaid guide rails) permits the entire mechanism to be drawn out at the front of the furnace, including the feed screw, its rear bearing, and the regulator carried on the rearward end of the said framework.

In Fig. 1, by way of illustrating the usual relation of the top plate 42 of the magazine to the tubes of a water tube boiler, the position of the latter is indicated at 43. A standard form of water tube of a water tube

boiler is illustrated at 44, and a standard boiler front is illustrated at 45.

At the front end of the magazine chamber the usual door or doors, indicated at 46 are shown for closing the front of the magazine chamber below the feed mechanism for closing the front end of the magazine chamber. It will be remembered that in this class of furnaces it is occasionally necessary to open this door and withdraw the coal which may have been accumulated in the chamber. During this operation the said feed trough underneath the screw at the front end of the feed screw serves to hold back the supply of coal in the supply chute leaving the apparatus in condition to be promptly started again when it is required to put the furnace into operation, and thus the said feed trough serves the additional purpose of a gate for the supply chute under these conditions.

If the coal, represented at 50, accumulates excessively at the rear portion, and its action on the clutch actuator effects a slow and even movement of the lever 25, and through it a slow disengagement of the clutch teeth 31—32, these will unduly wear away at their ends. For effecting a rapid and positive disengagement of clutch members after they have been moved a predetermined distance, I have illustrated a lever 51 pivoted to the frame 12, and having a roller 52 riding upon a cam face 53 carried by the lever 25, a coil spring 54 is employed for drawing the roller 52 over the cam face after the lever 25 has been moved far enough to permit the roller to pass off of the detaining portion 53 of the cam. When the lever 25 is moved either by the actuator 19, or by the handle 55 on the lever 25 far enough to move the detaining portion 53 of the cam out of engagement with the roller 52 the spring will cause such roller to traverse the cam and force the clutch members apart and thus cut off the supply of coal, when it is desired to resume the feeding the lever 51 will be returned to its normal or idle position, this may be done by a handle 56, carried by the lever 51; and if the actuator 19 is not sufficiently overbalanced to drop when the parts are released the handle 55 may be employed for restoring the actuator to position and placing the clutch members in engagement.

In the present illustration there are three stoke boxes A working transversely of the magazine and of the guide rails which support the feeder trough. When there are a plurality of stokers, which in the present illustration are illustrated as stoke boxes A, it is desirable that the coal should be fed to the same evenly and uniformly, and this invention is particularly adapted for accomplishing this result. In some instances, however, a single stoking device, 130

as for instance a single stoke box will be employed, and it is even then desirable that the coal should be evenly and uniformly fed to this stoking device. This present improvement is particularly adapted for distributing the accumulation of coal evenly throughout the magazine and carrying this well to the back end.

Having described my invention I claim:

1. The combination with a stoker magazine having a pair of longitudinally disposed supporting members and an opening in line with the supporting members, of a coal chute, a feeder comprising a chute connection and a coal distributor trough, said trough having a portion below the mouth of said chute, said portion constituting one part of the front closure for the furnace thereof and a portion constructed and adapted for passing through such opening, and a conveyer in such trough for passing coal therethrough and constituting the other part of the front closure, such trough having on opposite sides thereof means for engaging said supporting means.

2. The combination with a stoker magazine having a pair of horizontally disposed guide rails and an opening in line with the rails, of a plurality of stokers disposed at various positions longitudinally of the magazine and acting in the magazine transversely of such guide rails, a feeder having a frame, means for connecting the same to a coal chute, a trough carried by the frame and constructed and adapted for engaging the guide rails and being supported in a horizontal position thereby, the lower portion of said trough being provided with a number of openings, a bearing in the frame, a bearing carried by the inner end of the trough, a hollow shaft journaled in said bearings, a screw upon the shaft and in said trough, gearing for driving said shaft, a pulley, a pair of clutch members between the pulley and the gearing, a lever connected to one of the clutch members, a bar traversing the hollow shaft, a fuel actuated plate dependent in the magazine and pivoted to the trough beyond the shaft-bearing and also pivoted to the bar, means for connecting said bar to the clutch-connected lever, said clutch connected-lever being provided with a releasing face and a cam face, a spring actuated lever having a roller for engaging said faces for accelerating the clutch disengagement after a predetermined movement of the said fuel actuated plate, and means for manually actuating the said levers and gearing.

3. In a device of the character set forth the combination with a stoker magazine, of a plurality of stokers disposed at various positions longitudinally of the magazine, a coal chute, a feeder having a frame, means for connecting the same to the coal chute,

a trough carried by the frame and having a portion below the mouth of the chute and a portion supported in a horizontal position within the magazine, the portion of said trough within the magazine being provided with a number of openings, a screw in said trough, gearing for driving said screw, a pulley, a pair of clutch members between the pulley and the gearing, a lever connected to one of the clutch members, a bar, a fuel actuated plate pivotally supported in the magazine and pivoted to the bar for causing the disengagement of the clutch upon a predetermined movement of the said members.

4. The combination with stoker feeding means, of driving means for the feeding means, a pair of clutch members between the driving means and the feeding means, coal engaging means, connecting means between said coal engaging means and one of the clutch members for effecting the disengagement of the clutch upon accumulation of coal, and means constructed and adapted for release upon the inauguration of the clutch disengagement for accelerating such clutch disengagement, substantially as and for the purposes specified.

5. The combination with a stoker feed screw, of driving means for the screw, a pair of clutch members between the said screw and the said driving means, a lever connected to one of the clutch members, a coal engaging plate connected to the clutch connected-lever, said clutch connected-lever being provided with a releasing face and a cam face, and a spring actuated lever having a roller for engaging said faces for accelerating the clutch disengagement after a predetermined movement of the said plate.

6. The combination with a stoker magazine, of a trough, a screw in said trough, driving means for the said screw, a pair of clutch members between the driving means and the screw, a lever connected to one of the clutch members, a bar, a plate pivotally supported in the magazine and pivoted to the bar, means for connecting said bar to the clutch connected-lever, and means active upon said clutch connected-lever for accelerating the clutch disengagement upon a predetermined movement of the said plate.

7. The combination with a stoker magazine having a trough carried by the frame, the lower portion of said trough being provided with an opening, a hollow shaft, a screw upon the shaft and located in said trough, gearing for driving said shaft, a pulley, a pair of clutch members between the pulley and the gearing, a lever connected to one of the clutch members, a bar traversing the hollow shaft, a dependent plate pivoted to the trough and also pivoted to the bar, means for connecting said bar to the clutch connected-lever, said clutch con-

nected-lever being provided with a releasing
face and a cam face, and a spring actuated
lever having a roller for engaging said faces
for accelerating the clutch disengagement
5 after a predetermined movement of the said
plate.

Signed at Nos. 9-15 Murray St., New

York, N. Y., this eleventh day of December,
1908.

OROSCO C. WOOLSON.

Witnesses:

CHAS. LYON RUSSELL,
FRED. J. DOLE.