P. MOLSTAD.

FURNACE CLEANER.

APPLICATION FILED DEC. 20, 1913.

1,109,451.

Patented Sept. 1, 1914.

2 SHEETS—SHEET 1.

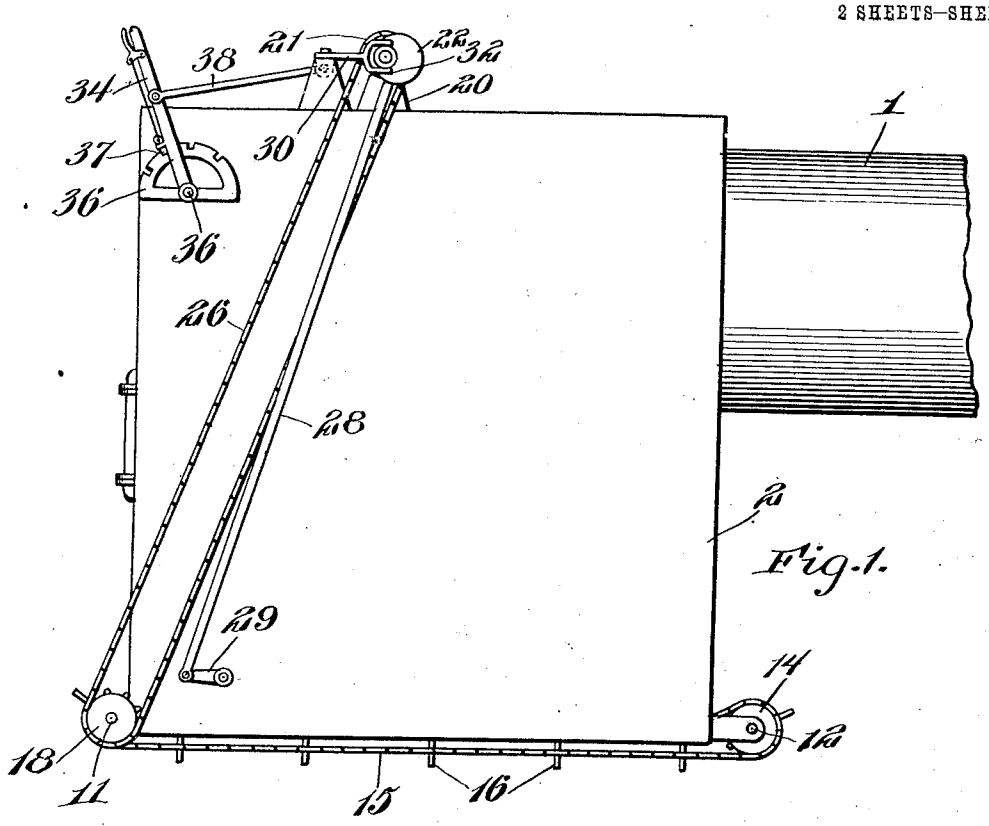


Fig. 1.

Fig. 2.

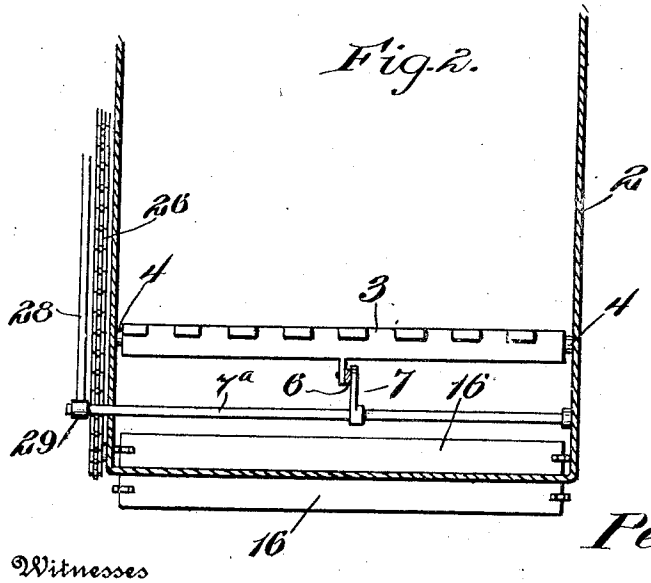
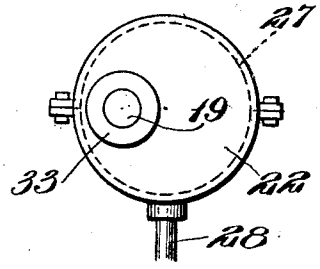


Fig. 4.



Witnesses

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2 SHEETS—SHEET 2.

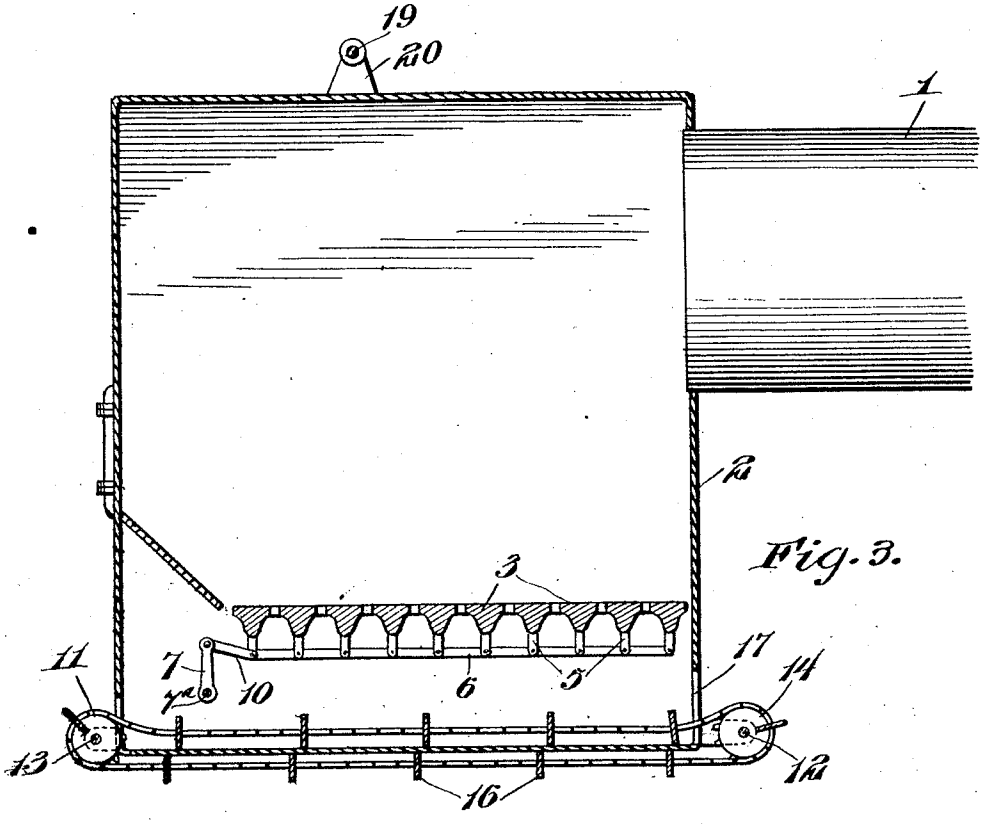


Fig. 3.

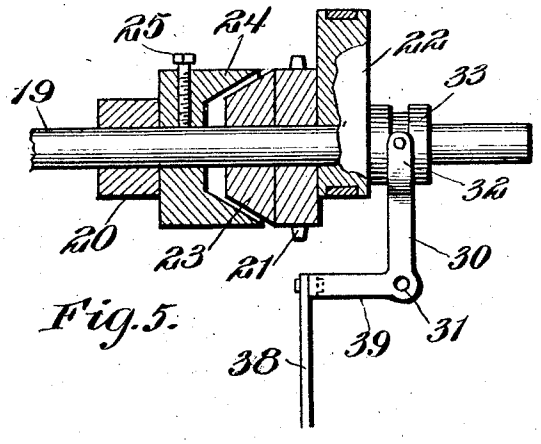


Fig. 5.

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UNITED STATES PATENT OFFICE.

PETER MOLSTAD, OF MACOUN, SASKATCHEWAN, CANADA.

FURNACE-CLEANER.

1,109,451. Specification of Letters Patent. Patented Sept. 1, 1914.

Application filed December 20, 1913. Serial No. 808,041.

To all whom it may concern:

Be it known that I, PETER MOLSTAD, a citizen of Canada, residing at Macoun, in the Province of Saskatchewan and Dominion of Canada, have invented new and useful Improvements in Furnace-Cleaners, of which the following is a specification.

This invention relates to improvements in steam boiler furnaces and especially with reference to improved means for shaking the grate bars and also for simultaneously removing the ashes from the ash pit below the grate bars, so as to clean out the ash pit at the same time that the grate bars are shaken or rocked, the object of the invention being to provide improved devices of this character which may be readily installed in a steam boiler furnace, readily controlled and operated and which may be manufactured at moderate cost.

The invention consists in the construction, combination and arrangement of devices hereinafter described and claimed.

In the accompanying drawings: Figure 1 is a side elevation of a portion of a steam boiler furnace provided with grate shaking and ash cleaning or removing means constructed in accordance with my invention. Fig. 2 is a vertical transverse sectional view of the same. Fig. 3 is a vertical longitudinal sectional view of the same. Figs. 4 and 5 are detail views.

For the purposes of this specification a steam boiler is indicated at 1 and its furnace at 2. The boiler and furnace may be of any suitable type and of any desired construction. The furnace is provided with grate bars 3 which have bearings as at 4 and are adapted to rock or oscillate and each grate bar is provided with a downwardly extending rock arm 5. These rock arms are connected together by a rod 6. A rock shaft 7ª has its bearings in the sides of the furnace and is arranged at a point in the front portion of the ash pit, below the grate bars. This rock shaft has a crank arm 7 which is connected by a pitman 10 to the rod 6. At one end of the said rock shaft is a crank arm 29 which is at substantially right angles to the arm 7.

An endless rake and conveyer is arranged so that its upper lead is adapted to move rearwardly on the bottom of the ash pit. This endless rake and conveyer comprises a pair of shafts 11—12, mounted in bearings respectively at the front and rear sides of the furnace and respectively provided with sprocket wheels 13—14. Endless sprocket chains 15 engage the said sprocket wheels and these chains are connected together by transversely arranged rakes and flights 16 which, on the upper leads of the chains, are arranged to move rearwardly and to bear on the upper surfaces of the bottom of the ash pit, the lower leads of said chains being arranged below the bottom of the ash pit. In the rear side of the ash pit is a discharge opening 17 through which the endless rake and carrier extends. The shaft 11 is also provided at one end with a sprocket wheel 18. A driving shaft 19 is here shown as arranged at the upper side of the furnace and mounted in bearings 20. This shaft has a sprocket wheel 21 which is loose thereon and fast to and on opposite sides of said sprocket wheel 21 are an eccentric 22 and a cone pulley 23. The sprocket wheel 21, eccentric and cone pulley are movable longitudinally on the shaft 19 a slight distance and the cone pulley is adapted to be engaged with or disengaged from a friction driving pulley 24 which is firmly secured to the shaft 19 as by means of a keybolt 25. An endless sprocket chain 26 connects the pulleys 21 and 18. An eccentric strap 27 operates on the eccentric 22 and is connected by a rod 28 to the arm 29 of the rock shaft 7ª. A shifter lever 30 is pivotally mounted as at 31 and has a fork 32 which is engaged with an annular groove on a hub 33 which projects from the eccentric. An operating lever 34 is also provided which is pivotally connected as at 35 to a segment 36 and may be locked to the segment by means of a dog 37 of usual construction. This lever is connected by a rod 38 to the arm 39 of the shifter lever.

It will be understood from the foregoing description and by reference to the drawings that the shifter lever may be actuated by the lever 34 to engage the cone pulley 23 with the friction cone pulley 24 or disengage the same therefrom. The shaft 19 being in operation when the pulley 23 is engaged with the pulley 24 the chain 26 is operated by the sprocket wheel 21 and hence imparts motion to the endless rake and conveyer and at the same time the rotation of the eccentric with the said wheel 21 causes the rod 28 to reciprocate and impart rocking motion to the rock shaft 7ª through the crank arm 29. The rocking motion of the

rock shaft causes the crank arm 7, pitman 10 and rod 6 to rock and shake the grate bars and thus cause the ashes to fall from the fire. As the ashes drop from between the grate bars they are caught and carried out of the ash pit by the endless rake and conveyer and hence the furnace is kept clean.

Having thus described my invention, I claim:—

In a furnace, movable grate bars, an ash pit below the grate bars, an endless rake and conveyer arranged with its upper lead on the bottom of and extending through the ash pit, said endless rake and conveyer having an actuating shaft provided with a sprocket wheel, a driving shaft, a sprocket wheel and an eccentric loose on said driving shaft and secured together for simultaneous rotation, means to connect said sprocket wheel and eccentric to said driving shaft for rotation therewith, an endless sprocket chain connecting the said sprocket wheels, a rocking element connected to the movable grate bars and an eccentric strap on the eccentric wheel and provided with a rod connected to said rocking element to actuate the latter.

In testimony whereof I affix my signature in presence of two witnesses.

PETER MOLSTAD.

Witnesses:
G. W. SENSMITH,
ARTHUR H. GRIFFITHS.