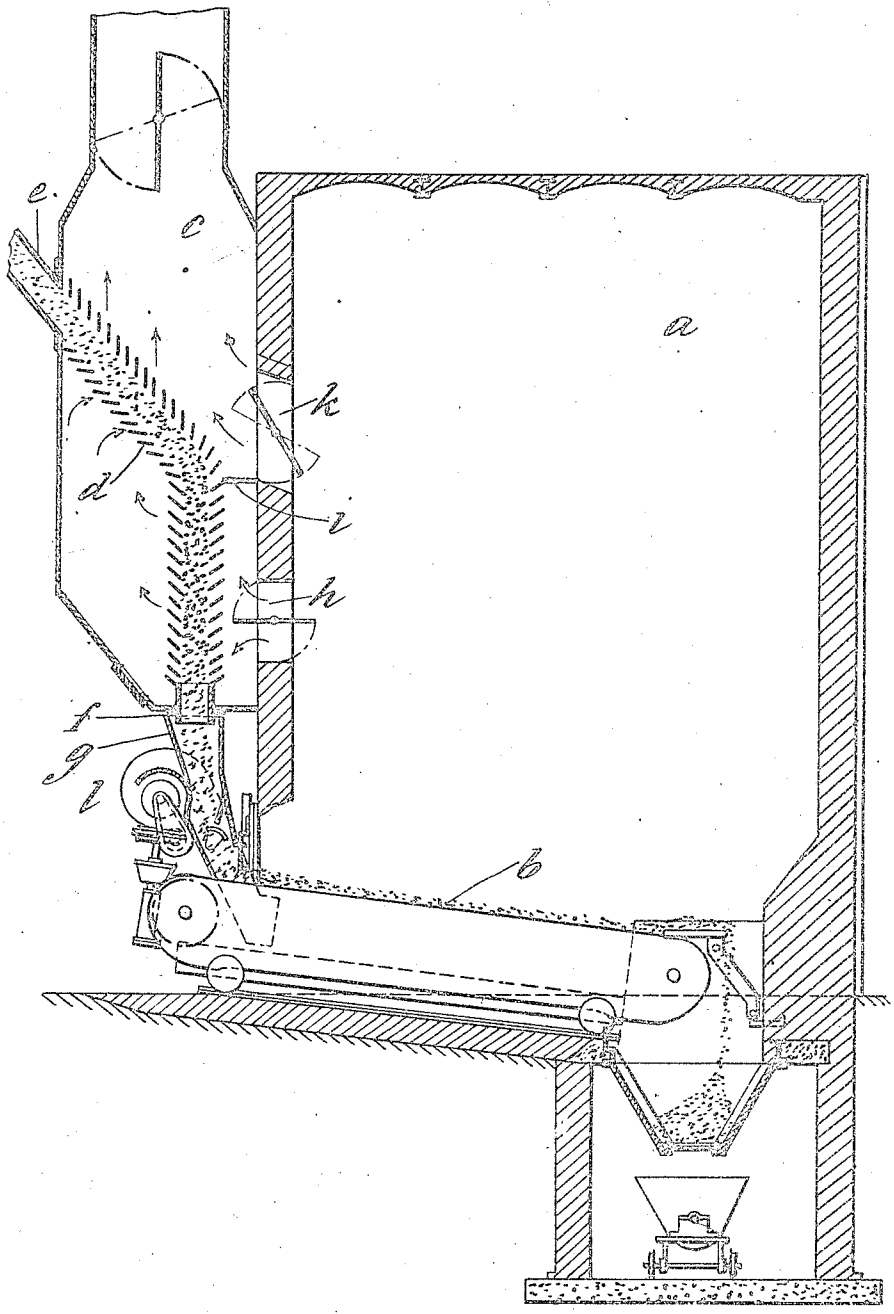
W. R. WOOD.

DRYING FUEL SUPPLIED TO FURNACES OR THE LIKE.

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1,427,045. Patented Aug. 22, 1922.



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UNITED STATES PATENT OFFICE.

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DRYING FUEL SUPPLIED TO FURNACES OR THE LIKE.

1,427,045. Specification of Letters Patent. Patented Aug. 22, 1922.

Application filed March 25, 1919. Serial No. 285,016.

To all whom it may concern:

Be it known that I, WILFRED ROTHERY WOOD, a citizen of the United States of America, residing in London, England, have invented certain new and useful Improvements in Drying Fuel Supplied to Furnaces or the like, of which the following is a specification.

Fuels containing much water cannot be profitably burnt in a boiler furnace unless they are first dried. It has been proposed to dry such fuel and at the same time partially to distil it destructively by causing it to fall down a shaft constructed as a chute for feeding the fuel on to the grate and surrounded by flues which conduct away the waste gases of the furnace. In this manner the fuel is dried and partially distilled, the steam and products of distillation passing into the combustion chamber of the furnace while the partially carbonized fuel is burnt on the grate.

To such an arrangement there are considerable objections. In the first place, the whole of the water vapour passes with the products of distillation into the combustion chamber where it unnecessarily absorbs heat. Secondly, either the furnace must be complicated by admission of secondary air sufficient for burning the products of distillation, or sufficient air for this purpose must be drawn through the grate, which, as is well-known, is an uneconomical proceeding. Thirdly, there is the objection when a travelling grate is used that the partially coked fuel does not ignite sufficiently rapidly and the fire is liable to be extinguished.

The present invention overcomes these objections by arranging that the fuel shall be heated, as it falls to the grate, only sufficiently to expel the water from it and that the water vapour leaves the chute either by ascending through the fuel in the chute or by being carried away by the waste gases of the furnace. In this manner, no alteration of the combustion chamber of the furnace is required and the fuel retains its readily ignited character suitable for use on a travelling grate.

The object of the invention is attained by causing the fuel to descend by gravity along a chute which extends through the uptake or flue of the furnace and terminates at the charging place of the furnace, and so arranging the proportion of the hot waste gases which pass up the uptake or flue that the temperature to which the fuel is heated is not high enough to distil the fuel but is above that necessary to dry the fuel.

A construction of this kind is shown in the accompanying drawing, which represents a vertical section through the furnace chamber *a* of a water-tube boiler having a well-known mechanical stoker *b*. As usual, the furnace gases pass from the chamber *a* to the chimney by way of an uptake *c*. By my invention there is contained in this uptake a coal chute *d* which together with the baffle *i* divides the uptake into an upper and a lower compartment; it is continued outside the uptake by an upper extension *e* and a lower extension *f*. Within the uptake the chute is constructed of bars so that the gases can pass freely through it. Coal is suitably fed into the hopper *g* of the mechanical stoker at a rate corresponding with that at which the stoker feeds the fuel.

Thus the chute *d* constitutes a partition in the uptake through which the furnace gases, or a portion thereof, entering the uptake through the port *h*, must pass twice on their way to the chimney, the baffle *i* in the uptake compelling this course.

It is preferred to arrange a second port *k* for passage of furnace gases into the uptake, above the baffle *i*, so that any desired proportion, determined by controlling the dampers placed in the two ports, of the gases may pass to the chimney without passing through the chute.

The chute preferably widens in a downward direction as indicated to ensure free descent of the coal, and this descent may be continuous or intermittent as required by the kind of stoking used.

Leakage of air longitudinally through the chute may be hindered or prevented by making the extension *e* of considerable length, whereby the coal contained in this extension offers much resistance to the passage of air.

When, as here shown, the chute discharges into a stoking hopper *l*, the discharge end of the chute should not form a tight fit in the mouth of the hopper lest the draught draw fire gases longitudinally through the chute.

Having thus described the nature of the said invention and the best means I know of carrying the same into practical effect, I claim:—

The process for heating fuel by the waste gases of a boiler furnace in a chute down

which the fuel falls on to the grate of the furnace, which consists in passing the waste gases over and through the fuel in the chute, and in so proportioning the waste gases passing over or through the chute that the temperature to which the fuel is heated is not high enough to distil the fuel but exceeds that necessary to dry the fuel, the water vapour produced either escaping upwards through the fuel or being carried away with the waste gases.

In testimony whereof I have signed my name to this specification.

WILFRED R. WOOD.