

No. 762,345.

PATENTED JUNE 14, 1904.

H. E. PARSON.

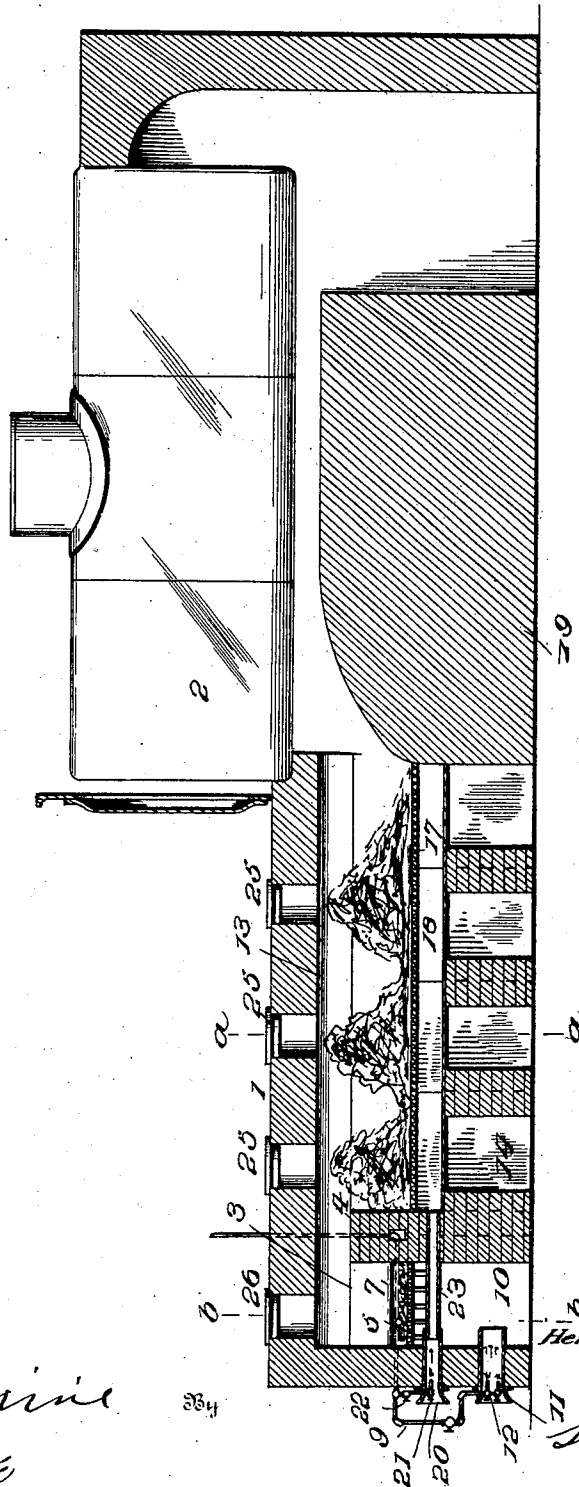
METHOD OF BURNING WET AND SLOWLY COMBUSTIBLE FUEL.

APPLICATION FILED DEC. 16, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

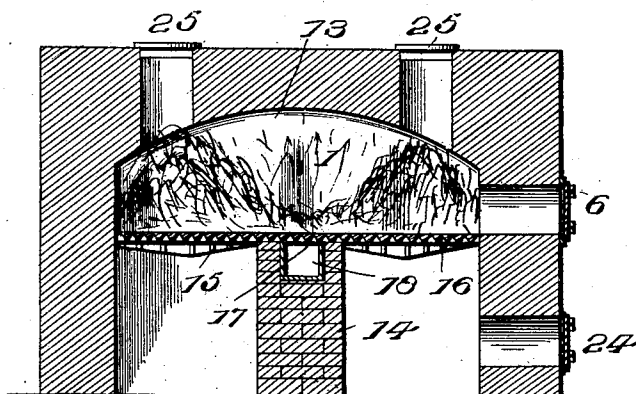
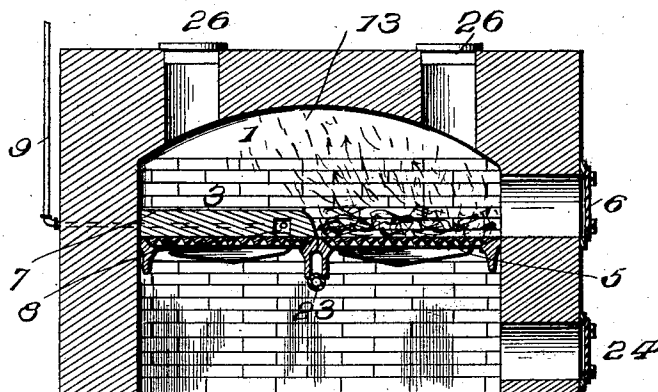


Fig. 3.



Witnesses

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HENRY E. PARSON, OF BROOKLYN, NEW YORK.

METHOD OF BURNING WET AND SLOWLY-COMBUSTIBLE FUEL.

SPECIFICATION forming part of Letters Patent No. 762,345, dated June 14, 1904.

Application filed December 16, 1902. Serial No. 135,439. (No specimens.)

To all whom it may concern:

Be it known that I, HENRY E. PARSON, a citizen of the United States of America, and a resident of the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Methods of Burning Wet and Slowly-Combustible Fuel, of which the following is a specification.

My invention relates to a method of burning wet and slowly-combustible fuel, and is particularly applicable to burning wet tanbark, so as to make it possible to employ it for the generation of steam and the maintenance of a fire of uniform intensity and steam of uniform pressure.

The method consists of disposing the material in distinct masses, subjecting the masses to the action of intense heat, preferably in the shape of fire or fire and the products of combustion alone, and a blast of air or air and steam. The fire is preferably applied to the top surface of the material, while the blast of air and steam is forced through from below. The fire or the products of combustion, both or either, are produced from an independent fire, preferably maintained by a blast. This fire should be produced by a highly-combustible fuel, such as coal, in order that a sufficient heat be attained with which to dry a small quantity of the slow-burning fuel and convert it into a condition where its own combustion will produce heat enough to dry more of the slow-burning fuel. The combustion of the slow-burning fuel is augmented by a supply of air, which is preferably supplied by a blast driven through from below. If the quantity of flame employed in this process were applied directly to an overbalancing amount of wet fuel, it would be extinguished and its capacity for work absorbed before any quantity of the slow-burning material would be dried to an extent sufficient to become a quick-acting fuel. If, however, a small quantity of the slow-burning fuel be subjected to heat enough to dry it sufficiently for it to burn freely, then it will itself supply a part of the heat necessary to dry succeeding quantities of the slow-burning fuel and at the same time heat the boiler which it is desired shall be heated. I maintain, therefore, a small coal fire at one

end of my furnace, which is blown to any desired degree of intensity by a combined air and steam blower. The flame and products of combustion are then carried over a grate-surface on which is spread into a thin layer a quantity of the slowly-combustible material, the material being disposed in distinct masses, between which is the thin layer and a blast of air, and steam of any desired intensity forced up through the grate on which the slowly-combustible material lies. Conditions are thus created which will dry the slowly-combustible material disposed in masses until it is in a condition to burn, when it will pass onto the zones of combustion maintained adjacent to the masses, where it will be ignited and burn, and as it disappears by being converted into gases its place will be supplied by fresh quantities of the slowly-combustible material, which will fall by gravity from the outside of the masses onto the zones of combustion by rolling down the inclined surface of the mass and onto the grate. By these means a regular and constant consumption of slowly-combustible material will be maintained under the boiler, so that a boiler of minimum size may be used and a constant pressure of steam be maintained.

Many forms of apparatus might be employed for the purpose of carrying my method into operation; but I have shown and described herein one in which I have successfully carried out the method. This apparatus will now be described.

In the drawings, Figure 1 is a vertical longitudinal section of a boiler-furnace adapted to burn wet bark by my method. Fig. 2 is a vertical transverse section through the line *aa* of Fig. 1. Fig. 3 is a vertical transverse section through the line *bb* of Fig. 1.

In the drawings similar numerals of reference indicate the same parts in all figures.

1 is a furnace-chamber; 2, a boiler. The furnace-chamber is divided into two parts. 3 is a front portion of the furnace-chamber, which is separated from the rear portion by a bridge-wall 4.

Referring to Fig. 3, which is a vertical transverse section through the front portion of the furnace-chamber, 5 is a grate suitably

mounted on supports on one side of the chamber 3 next to the furnace-door. 6 is a front door or stoke-hole for the grate 5. Opposite the grate 5 is a banking-platform 7, occupying the other half of the furnace-chamber 3. 8 is a channel through the banking-platform 7, into which passes a steam-pipe 9, by which steam is supplied to the blowers and which steam is superheated by the heat of the banking-platform.

The banking-platform 7 serves the purpose of enabling me to clean the fire by raking the live part of the fire onto the banking-platform while withdrawing the ash off the grate and out of the door 6. The live part of the fire is then restored to the grate, fresh coal applied, and the door closed. The grate 5 is preferably of that form of construction in which conical apertures pass therethrough, forming twyers, through which the blast in the ash-pit is delivered to the fire on the grate. 10 is the ash-pit below the grate in chamber 3. It is closed, and into it projects a forced-draft device 11, which is provided with steam-jet nozzles 12, connected to the steam-pipe 9, supplied with steam from the boiler.

The rear portion of the fire-chamber (marked 13) is constructed as shown in Fig. 2 and is provided with two grates 15 and 16, supported upon the side walls and the central pier 14, and these grates are preferably of the same construction as that used in the chamber 3. Between them is another grate 17, which covers the air-channel 18, which runs through the full length of the chamber 13, which is the tanbark-chamber, from the bridge-wall 4 to the deflecting-bed 19 under the boiler.

20 is a forced-draft device provided with a steam-injector 21, supplied with steam by the pipe 9 and provided with a suitable stop-cock 22 for turning the steam off or on. The injector 21 is connected with the channel 18 by a pipe 23, which crosses the ash-pit 10 and delivers its blast into the channel 18. The space below the grates 15 and 16 is supplied with air through the medium of draft-doors 24 or in any other suitable manner.

25 25 are a series of charging or stoke holes in the top of the furnace-chamber through which wet bark may be charged into the furnace upon the grates.

26 is a stoke-hole through which coal may, if desired, be charged onto the grate 5, and a similar stoke-hole is located over the banking-platform 7.

The operation of the device is as follows: When wet tanbark is stoked into the holes 25 25, it will fall upon the grates 15 and 16 in piles under the stoke-holes and extending up as far as the roof of the furnace-chamber. These piles will run off to a thin edge and meet one another over the grate 17, which is in the center of the chamber and over the channel 18. The piles of tanbark will thus leave an open channel-way between them over

channel 18 and under the roof of the fire-chamber. If now a coal fire be ignited upon the grate 5 and the forced-draft device 11 be started and the coal fire blown up to a high temperature, the products of combustion will pass over the bridge-wall 4 into the channel-way between the piles of wet tanbark and over the thin layer of tanbark which overlies the grate 17, covering the channel 18, and will impinge upon the thin layer of bark. If now the forced-draft device 20 is started and a blast of air mixed with dry steam be driven into the channel 18, this blast will rise through the twyers in the grate 17 and unite with the products of combustion passing through the grate 17 and produce at that point an intense fire. Thus a strata of intense heat will be maintained in the center of the fire-chamber, which will be constantly supplied with fuel, both gaseous and solid, from the piles of tanbark on either side. By this means a fire of uniform intensity may be maintained and uniform steam-pressure maintained. Hence a minimum boiler may be used to do the work desired.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method of burning slowly-combustible material which consists in disposing said material in distinct masses, subjecting said masses to the action of intense heat supplied from an independent source for drying the same, producing and maintaining zones of combustion adjacent the bases of said masses by feeding in small quantities the dried material from said masses and supplying air to said zones of combustion.

2. The method of burning slowly-combustible material, which consists in disposing said material in distinct masses, subjecting said masses to the action of a flame and gases from an independent source of combustion for drying the same, producing and maintaining zones of combustion adjacent the bases of said masses by feeding in small quantities the dried material from said masses and supplying air to said zones of combustion.

3. The method of burning slowly-combustible material, which consists in disposing said material in distinct masses, subjecting said masses to the action of a flame and gases from an independent source of combustion for drying the same, producing and maintaining zones of combustion adjacent the bases of said masses by feeding in small quantities the dried material from said masses and directing an air-blast to said zones of combustion.

Signed by me, in the city, county, and State of New York, this 8th day of December, 1902.

HENRY E. PARSON.

Witnesses:

SIDNEY R. PERRY,
EMMA W. FINLAYSON.