

No. 754,933.

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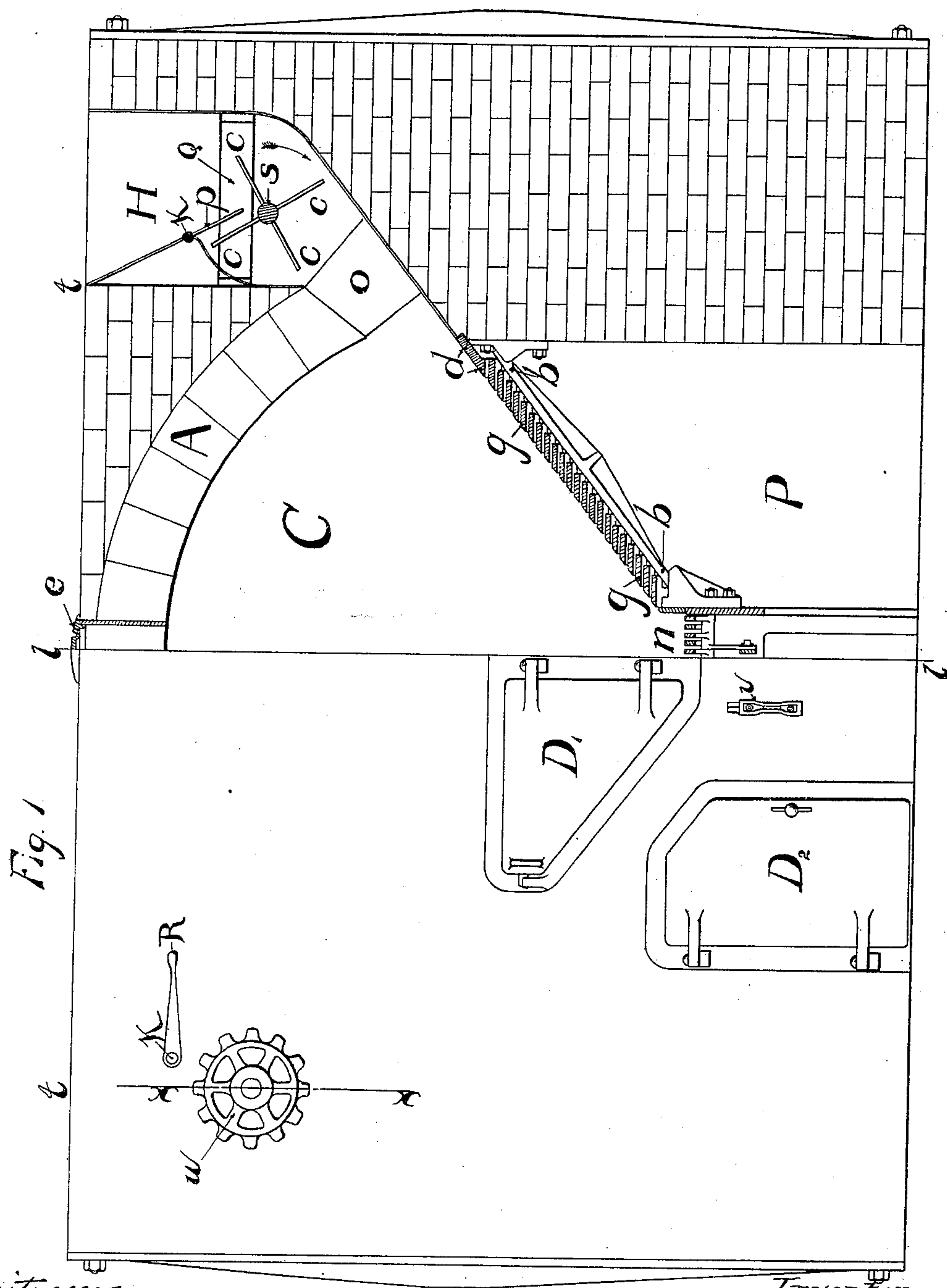
D. M. MYERS.

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APPLICATION FILED MAR. 2, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



witnesses  
Burtin E. Emory  
Harry H. Walton.

Inventor  
David M. Myers  
by his Attorney  
Alexander C. Bondy

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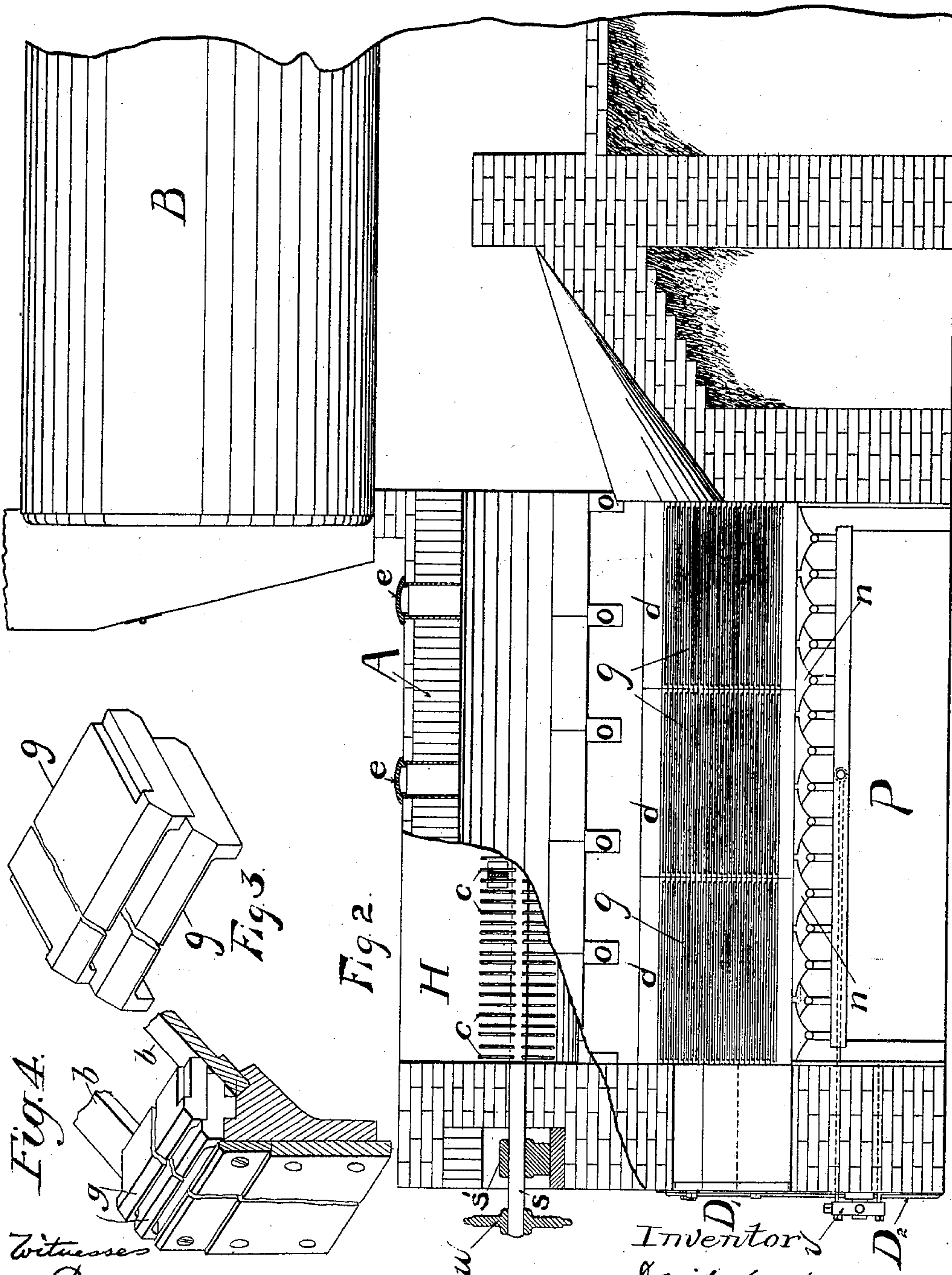


Fig. 4.

Witnesses

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# UNITED STATES PATENT OFFICE.

DAVID MOFFAT MYERS, OF NEW YORK, N. Y.

## FURNACE FOR BURNING TAN OR LIKE FUEL.

SPECIFICATION forming part of Letters Patent No. 754,933, dated March 15, 1904.

Application filed March 2, 1903. Serial No. 145,688. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID MOFFAT MYERS, of New York, State of New York, have invented certain Improvements in Furnaces for Burning Tan or Like Fuel, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings designating like parts.

This invention relates to furnaces, and has for its object the provision of a furnace especially adapted for use in the consumption of tanbark and the like as fuel, although it will be understood that I contemplate the utilization of my improvements in any field for which they are adapted by reason of their nature.

Tanbark as a fuel is capable of use with great efficiency, especially at the tannery; but heretofore lack of suitable devices for feeding the tanbark for such use as fuel has prevented the attainment of a degree of economy easily accomplished by my improvements, which are directed principally to the drying and uniform feeding of the tanbark, rendering possible the use of the latter immediately after its rejection as an active agent in the process of tanning.

Among the important features of my invention contributing to the novel technological effect attained by my improvements is the toothed rotating device placed in the feed-chute to which the wet tanbark is delivered, the feed-chute extending, preferably, parallel with the length of the grate, toward which the continuous rotation of the device feeds the tanbark, a secondary set of teeth being preferably arranged in adjustably-supported position adjacent the stoker device and somewhat in the form of a comb secured to the walls of the chute to hold the fuel in position for feeding in a manner to be described more fully in the accompanying specification. The homogeneous sheet of tanbark delivered from the feeding device passes over a dead-plate, where it is heated and dried before it reaches the fire, and is then in condition to serve as practically an ideal fuel in the highest degree combustible, ready for swift ignition and to burn with the fierce heat characteristic of a thin sheet of fuel, but little of

which will be lost through the smoke-flue. For further enhancement of this desirable effect I have devised a grate-bar of the inclined type, but in which the spaces for the draft are substantially horizontal, so that the finely-divided fuel cannot fall through the air-spaces, and the latter may be made of a size and shape to provide for a draft of the greatest efficiency, either natural or forced. These, with the various features of my invention, will be illustrated and described fully in the accompanying drawings and specification and pointed out in the claims.

In the drawings, Figure 1 illustrates in vertical section a furnace in the construction of which my improvements have been embodied, half of the front being shown in elevation. Fig. 2 is a longitudinal section on the line 11, Fig. 1, partly broken away to the line *x x*, Fig. 1, to show a detail of the feeding device; and Fig. 3 shows in isometric perspective two of the grating members *g* and their relative position one to the other, Fig. 4 being a similar view of the means of support of the grate-bars *g* by the bar *b*.

In the embodiment of my invention selected for illustration and description as a convenient form to enable ready and complete understanding of my improvements the part designated by the reference-letter A is the arch of a furnace built somewhat on the lines of an inclosed oven, B indicating the boiler, C the combustion-space, and D' and D" suitable doors furnishing access for repairs or cleaning. These parts and the general arrangement of the furnace may be of any suitable and convenient construction, and in accordance with my invention I provide in the walls one or more feed-chutes H of suitable proportions and contour, preferably a relatively long, straight, and narrow chute being provided on each side of the surface. I prefer to have the chutes relatively large at their upper ends to act as hoppers and inclined at their lower ends to direct the fuel material toward the combustion-space in which are the inclined grate-bar supports *b*, carrying the combustion grating members *g*, which consist, preferably, of single grate-bars, one set on top of the other, like a flight of steps, feet



at the ends of the respective bars resting in corresponding receptacles in the bar below each one, so that long horizontal draft-apertures are left between the bars, a construction best illustrated in Fig. 3. The spent tan or other fuel immediately upon its introduction to the chutes is subjected to the action of the rotating stoker device, which in the instance illustrated takes the form of a shaft *s*, provided with teeth *c*, an arrangement which may be varied as found desirable. When such a form of stoking device is used, the fuel will be entered by the teeth and fed forward in a sheet passing down the incline of the chute through openings between supports *o* of the arch into the combustion-space. I prefer to provide coöperating teeth *p*, between which the other teeth rotate, receiving therefrom the spent tan or other fuel material, which is held in suitable position to be picked forward by the stoker, and to provide for adjustment the coöperating teeth *p* may swing about an axis *k*, thus regulating the rate of feed by allowing the stoker-teeth to pick off more or less fuel, depending on the angle at which said teeth are set. Suitable means may be provided to govern this adjustment, as a lever *R*, attached to axis *k* and rotatable to adjust the angle of the coöperating teeth, thus regulating rate of feed of fuel. Thus by raising the lever *R* the rate of feed is increased, and vice versa.

*Q* is a brace thrown across the chute to prevent collapse of its walls under the compressing action of the usual tie-rods.

The stoker-shaft *s* will be supported in suitable fashion, as by pillow-blocks *s'*, and a sprocket wheel or other means for rotation will be provided, as indicated by the reference-letter *w*.

Before reaching the combustion-grating *g* I prefer to pass the sheet of fuel over a dead-plate *d*, heated by the reverberatory draft, to be referred to hereinafter, and which serves to evaporate the moisture and distil the volatile gases and direct the latter into the combustion-space for ignition. Thence the dried material passes onto the combustion-grating dry and ready to ignite quickly, and the horizontal draft passing through it from between the bars carries the flames toward the center of the combustion-space, where they meet those from the other side, making a very fierce heat at the focus of combustion, from which there is a powerful recoil or reverberatory draft back upon the dead-plate. The fuel cannot escape through the horizontal draft-openings; but the ashes immediately on their formation pass upon the shaking-grate *n*, supported above the ash-pit *P* and provided with a suitable agitating device *v*, upon agitation of which, preferably carried on at proper intervals proportional to the rate of combustion, the ashes pass from beneath the lower end of the combustion-grating and are

discharged into ash-pit below, thus permitting continuous and steady flow of the fuel.

The reference-letter *e* designates covers for inspection-holes in the top of the furnace.

Having thus illustrated and described fully my novel method of preparing and utilizing spent tan, it will be understood that such other materials as dyewood-chips, extract wood-chips, bagasse, wood-shavings, and similar fuel materials may be utilized, nor do I limit myself to the specific construction of furnace illustrated, nor in general otherwise than as set forth in my claims read in connection with this specification.

What I claim, and desire to secure by Letters Patent, is—

1. In a furnace for burning spent tan and like fuel, and in combination; inclined grate devices having horizontal apertures from which opposed drafts may be directed through said fuel to a focus of combustion; an inclined dead-plate in upper continuation of said grate devices and over which dead-plate said fuel passes subject to the drying and distilling influence of the reverberatory draft recoiling toward said dead-plate from said focus; and means to enter said fuel and feed the same over said dead-plate to said grate devices in a uniform supply; said instrumentalities coöperating for the continuous delivery and perfect combustion of said fuel, substantially in the manner set forth.

2. In a furnace, a grate device having oppositely-inclined grate-surfaces presenting substantially horizontal draft-apertures to produce a concentrated draft and combustion of high consequent efficiency, substantially as described.

3. In a furnace, oppositely-inclined grates down which the fuel is to be fed, said grates presenting elongated, shallow, horizontal draft-apertures arranged to direct the drafts from said grate-surfaces in vigorous opposition to each other so that a powerful, reverberatory draft is produced and acts upon the fresh fuel at or near the region of its entrance to said grate-surfaces, to heat the same, substantially as described.

4. In a furnace, oppositely-inclined grate-surfaces, and a dead-plate over which the fuel is fed to said surfaces, said grate-surfaces having substantially horizontal draft-apertures arranged to produce a reverberatory draft reacting from the center of combustion back toward said dead-plate to heat the latter and the fresh fuel passing thereover, substantially as described.

5. A furnace of the class described, comprising an inclined combustion-grating; a relatively long and narrow feed-chute the bottom of which is adjacent said grating, and the upper part whereof serves as a hopper to receive the fuel, different portions of said grating being inclined in opposition to each other toward a center or focus of combustion and



having substantially horizontal draft-openings to produce a reverberatory draft; and rotating stoker devices in said feed-chute to enter said fuel and feed the same down through  
5 said chute and over said inclined grating toward said focus of combustion, substantially in the manner and for the purpose set forth.

Signed at New York, in the county of New York and State of New York, this 28th day of February, A. D. 1903.

DAVID MOFFAT MYERS.

Witnesses:

ALEXANDER C. PROUDFIT,

HARRY H. WALTON.