

F. WALKER.
DISINTEGRATING FURNACE.

No. 464,642.

Patented Dec. 8, 1891.

Fig. 2.

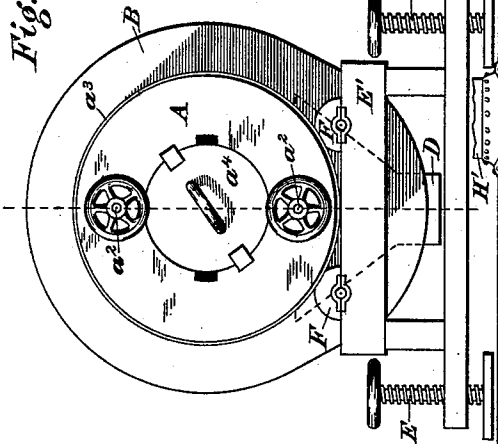


Fig. 3.

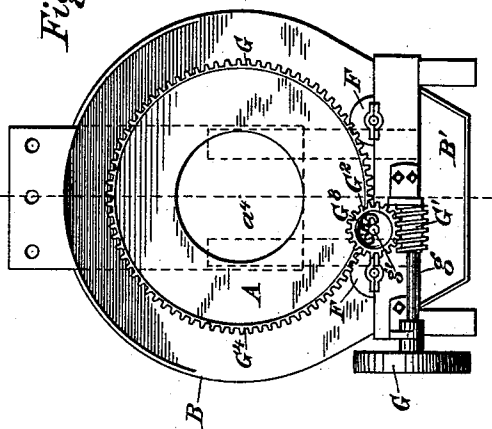
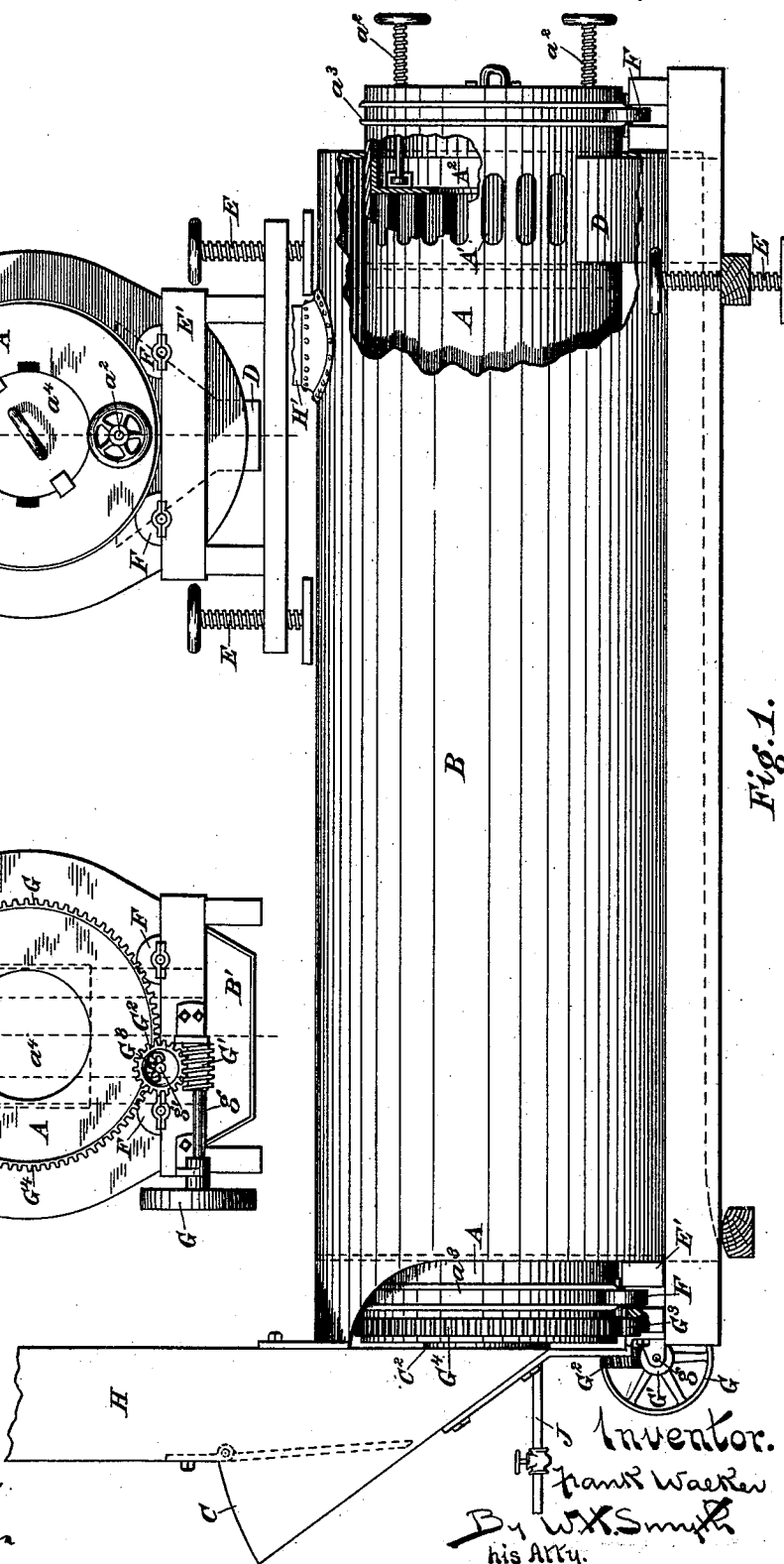


Fig. 1.



Witnesses:

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L. Peterson

Inventor.

F. Walker

By W. X. Smith
his Atty.

(No Model.)

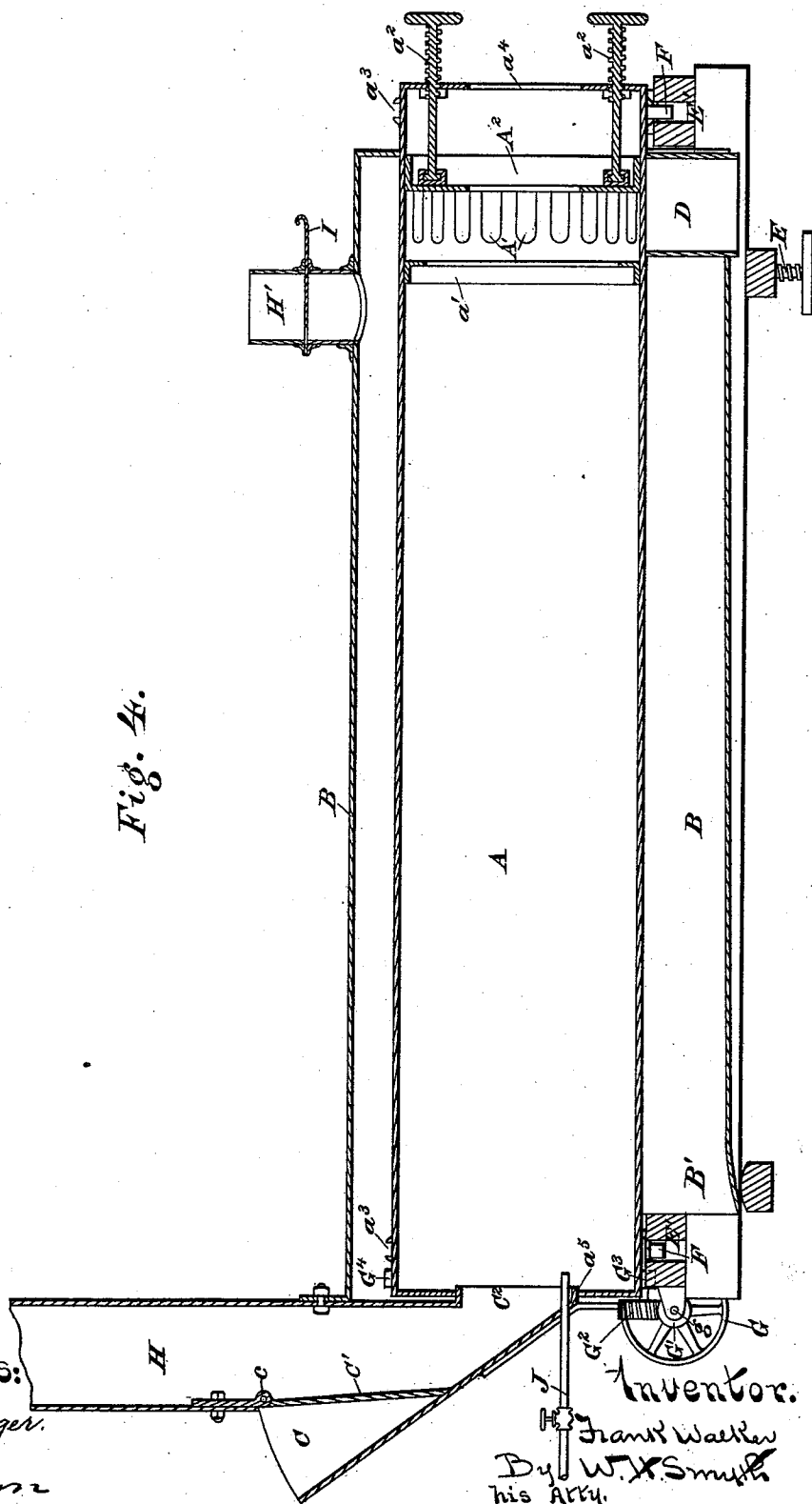
2 Sheets—Sheet 2.

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Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK WALKER, OF LOS ANGELES, ASSIGNOR OF ONE-HALF TO GEORGE M. PERINE, OF SAN FRANCISCO, CALIFORNIA.

DISINTEGRATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 464,642, dated December 8, 1891.

Application filed April 2, 1889. Serial No. 305,743. (No model.)

To all whom it may concern:

Be it known that I, FRANK WALKER, a citizen of the United States, residing in the city and county of Los Angeles, and State of California, have invented an Improved Disintegrating-Furnace, of which the following is a specification.

My invention relates to that class of apparatus used to disintegrate certain classes of material by the aid of heat, particularly bituminous rock and asphaltum.

The objects of my invention are, first, to provide a machine simple in construction, rapid, and efficient for the preparation of material disintegratable by heat; second, to so arrange it that the heat may be applied to the material direct without the intervention of steam, as heretofore used in the disintegration of bituminous rock; third, to so make the machine that it may be continuous in operation; fourth, to so arrange it that it may be adjustable with regard to the amount passing through in a given time to provide for variations in the character of the material; fifth, to provide means in the apparatus for controlling the intensity of the heat applied to the material in course of preparation in the machine. I attain these objects by means of the device illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my device, portions being broken away to more clearly illustrate my invention. Fig. 2 is a rear elevation. Fig. 3 is a front elevation of the machine with the smoke-stack and feed-hopper removed. Fig. 4 is a sectional elevation.

Referring to the accompanying drawings, A is a cylindrical vessel adapted to be rotated; A', discharge-openings in A; a', circular rib; A², discharge-regulator; a², adjusting-screws of discharge-regulator; a³, friction-roller guide-track on A; a⁴, manhole in end of A; a⁵, feed-inlet in A; B, fire-chamber; B', fire-door opening in B; C, charging hopper or chute; C', hanging door of charging-hopper; C², inlet-spout; D, discharge outlet or hopper; E, incline adjusting-screw; E', supporting-frame; F, friction-rollers supporting A; G, driving or belt pulley; G', worm of driving-gear; G², worm-wheel; G³, driving-pinion; G⁴,

circular gear-rack on A; H', supplementary smoke-stack; I, damper in H'; J, water-supply pipe; H, smoke-stack.

The construction of the device is as follows: The cylindrical vessel A is set within a shell or casing B of somewhat larger size, an annular space being thus provided between the vessels A and B. The cylinder A is adapted to be rotated, for which purpose it is supplied at the forward end with a circular rack G⁴ and driving mechanism, consisting of the band-wheel G, worm G', suitably journaled in the supporting-frame, worm-gear G², driven by worm G', and pinion G³, secured upon the same shaft as G', meshing into and driving the circular rack, and consequently cylinder A, to which the rack is secured. To facilitate the rotation of the cylinder A, it is supported upon friction-rollers F F, guide-tracks a³ being provided to keep it in place.

Near the rear end of the cylinder A a series of openings is provided extending around the whole circumference of A. A short distance forward of these openings is placed a low circular rib or projection a, and in the portion of A rear of this rib is a circular sliding plate A², having an opening similar to the manhole in the rear end of A. To operate this plate are provided the screws a², attached to plate A' by means of socket, in which the enlarged ends of a² are adapted to turn, the threaded portion of a² passing through threaded holes or nuts in the rear end of A.

The front end of cylinder A is provided with a circular feed-aperture a⁵ concentric with A. The outer casing or shell B extends nearly the whole length of A, a short portion of A, carrying the rear friction-roller guide-track, projecting beyond B. The forward end of the outer shell B is provided with a feed chute or hopper C, having a hanging door C', and also a smoke-stack, the lower end of hopper and smoke-stack amalgamating in the form of a short circular pipe, which projects through the opening a⁵ into the interior of A.

The annular space formed by the cylinder A and the shell B is closed entirely at the rear end, a tapering discharge-spout being provided, which embraces the lower half of cylinder A in such a position as to receive the ma-

terial discharged from the openings A'. The front end of the annular space around A is also closed, with the exception of the lower side at B', which serves as a fire-door.

5 A water-pipe J is provided for conveying water to the interior of the revolving-cylinder A.

The whole apparatus is mounted upon suitable frame E, the forward end of which rests 10 and is pivoted upon a beam, and the rear end of the frame is provided with and rests upon jack-screws E.

The operation of my device is as follows: The cylinder A being set in rotation by means 15 of the driving mechanism, consisting of the pulley G, worm G', worm-gear G², and pinion G³, meshing into circular gear-rack G⁴ upon A, material is introduced into the interior of the cylinder A, through the hopper C, the door C' opening to allow the material to pass and closing 20 after it slides down the sloping back of the hopper to the inlet C², which projects into A. The rear end of the apparatus is set slightly lower than the front end, so that the 25 rotation of the cylinder A causes the material to move slowly toward the discharge end, being meanwhile turned and tumbled in the cylinder, and fire having been introduced into the case B beneath A every part of the material 30 is thoroughly mixed and brought into contact with the heated surface of cylinder A, and by the time it reaches the discharge-openings it is completely disintegrated and in proper condition for use. The heat and hot gases 35 from the fire completely envelop the cylinder A and pass into the interior through the openings A', then forward through A in contact with the material to the front aperture C², and thence escape up the smoke-stack, 40 carrying with them the moisture evaporated from the material. Should it at any time be undesirable for the heat and smoke to pass through A, the slide I is opened and they are allowed to escape through supplementary 45 stack H'. The time occupied by the material in traveling from the feed-inlet to the discharge is regulated by the incline at which the apparatus is set. This is varied to suit the requirements of the material by means of 50 the adjustable supporting-screws E and also by the discharge-regulator A².

It has been found in practice that the addition of water facilitates the disintegration of some classes of material, and so water is 55 admitted to the interior of the vessel by means of pipe J, when required.

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

1. In a disintegrating-furnace, the combination of a horizontally-inclined revolving 60 vessel having an inlet in one end and a series of apertures around its circumference near the other end, forming an outlet for the contents and an inlet, flue-openings for smoke 65 and heat from the fire-chamber, and having a circular stationary rib a' in front of the discharge-openings and a sliding adjustable ring A², the vessel being supported upon friction-rollers and provided with suitable power 70 connections for rotating it, a fire-chamber of approximately-cylindrical form surrounding and inclosing the revolving vessel and provided with a smoke-stack and charging hopper or chute opening into the interior of the 75 revolving vessel, and having a discharge hopper or chute so placed as to be adapted to receive the contents of the revolving vessel discharged through its outlet, and a suitable frame supporting the whole, said frame being 80 provided with an adjusting device for altering its inclination, substantially as described.

2. In a disintegrating-furnace, the combination of a horizontally-inclined revolving 85 vessel having an inlet in one end and a series of apertures around its circumference near the other and forming an outlet for the contents and an inlet, flue-openings for smoke and heat from the fire-chamber, and having 90 a circular stationary rib a' in front of the discharge-openings and a sliding adjustable ring A², the vessel being supported upon friction-rollers and provided with suitable power 95 supply pipe suitably connected to convey water into its interior, a fire-chamber of approximately-cylindrical form surrounding and inclosing the revolving vessel and provided with a smoke-stack and charging hopper or chute opening into the interior of the revolving 100 vessel and having a discharge hopper or chute so placed as to be adapted to receive the contents of the revolving vessel discharged through its outlet, and a suitable frame supporting the whole, said frame being provided 105 with an adjusting device for altering its inclination, substantially as described.

FRANK WALKER.

Witnesses:

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