

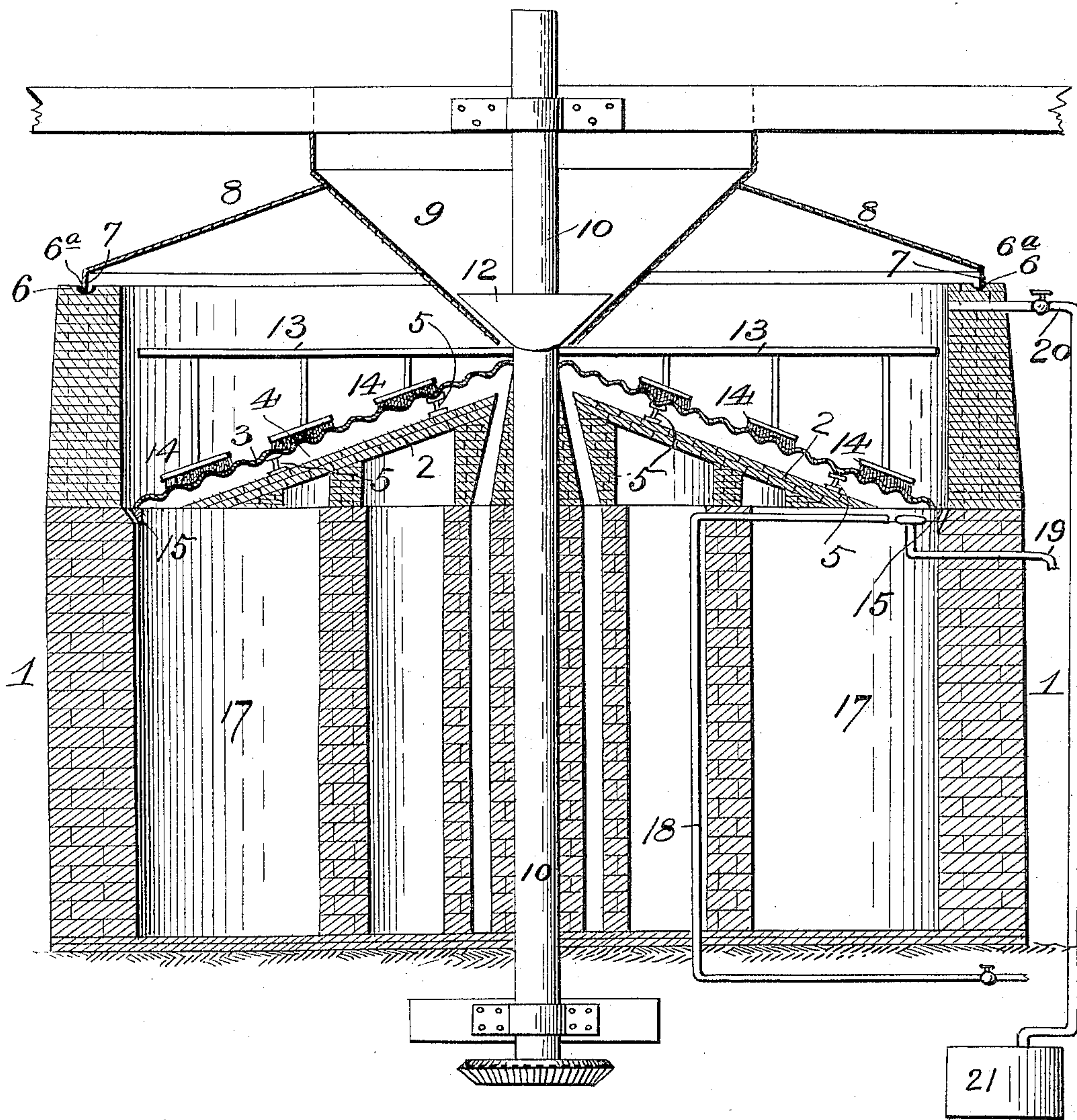
(No Model.)

C. W. SMITH.

APPARATUS FOR PRODUCING ARTIFICIAL FUEL.

No. 599,264.

Patented Feb. 15, 1898.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR PRODUCING ARTIFICIAL FUEL.

SPECIFICATION forming part of Letters Patent No. 599,264, dated February 15, 1898.

Application filed August 6, 1897. Serial No. 647,342. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. SMITH, a citizen of the United States, and a resident of Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Apparatus for Producing Artificial Fuel; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification.

My invention relates to an improved apparatus for producing artificial fuel or hard coal from bituminous or soft coal, sawdust, anthracite-coal dust, and other similar material.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawing the figure represents a vertical sectional view of an apparatus constructed in accordance with my invention.

In the said drawing the reference-numeral 1 designates a circular furnace formed with a convex top 2 and a corrugated hearth 3, of fire-clay or metal, as found most convenient. There is a space 4 between said top and hearth, which forms a fire box or chamber. The numeral 5 designates supports for said hearth. The wall of the furnace extends up above said top and is formed with an annular groove 6, in which is seated a metallic gutter 6<sup>a</sup> to receive the downwardly-turned flange 7 of a cover 8. This gutter is then filled with water to make a tight joint.

The numeral 9 designates a hopper through which and the furnace extends a vertical rotatable shaft 10, which is operated by any suitable motive power. Secured to this shaft and located in the hopper is a feeder 12, with a space between it and the walls of the hopper for the coal to pass to the hearth. Also secured to said shaft are radial arms 13, provided with brushes 14, which sweep the coal toward the lower edge of the hearth, where there is formed a passage or chute 15, through which the coal escapes to a cooling-chamber 17.

The numeral 18 designates a pipe for conveying gaseous fuel to the fire-chamber, while 19 designates an air-pipe for supplying the air necessary for combustion.

Connected with the upper portion of the furnace is a pipe 20 for carrying away the gases evolved from the coal, which gases may be used for heating the furnace. The numeral 21 designates a tar-receptacle with which said pipe is connected.

The operation is as follows: The furnace is heated to a temperature sufficient to expel the gases, and the coal, which has been previously crushed and dried, is supplied to the hopper. The shaft is then set in motion and the feeder will feed the coal to the hearth. The coal will now be brushed toward the edge of the hearth by means of the brushes, in the course of which it will be subjected to a very high degree of heat, causing the gases and other volatile matters to be expelled. The coal will now escape to the cooling-chamber through the chute or passage at the edge of the hearth and is allowed to cool down to a temperature of about 200° Fahrenheit. It is then drawn off into a mixing-pan and about eight per cent. of pitch or any other binder mixed therewith and is compressed into lumps or blocks of any convenient size or shape. The fuel then produced will have the appearance of hard or anthracite coal, as the coal is not coked during the process, retaining its black color and not being porous. During the said operation after the hearth is once heated it provides its own heat by burning the gas drawn from the furnace, thus forming a continuous self-sustaining feed. The gas can also be withdrawn and stored into a gasometer for other use. I may also treat sawdust in the same manner, increasing, however, the temperature of the hearth.

Having thus fully described my invention, what I claim is—

1. In an apparatus for manufacturing artificial fuel consisting of a furnace having a surrounding wall provided with a groove or gutter in the upper end, a convex top, an interior cooling-chamber, a convex corrugated hearth located above said top and forming a fire-box therebetween and chutes adjacent to the lower end of the hearth and leading to

the cooling-chamber, a central vertical rotatable shaft provided with radial arms, brushes on said arms, a hopper at the upper end of said shaft, a feeder secured to said shaft, a  
5 cover seated in said groove or gutter and the air and gas pipes communicating with the fire-box, substantially as described.

2. In an apparatus for manufacturing artificial fuel, consisting of a furnace having a  
10 surrounding wall, a convex top, an interior cooling-chamber, a convex corrugated hearth located above said top and forming a fire-box therebetween, and chutes adjacent to the lower end of the hearth and leading to the

cooling-chamber, a central vertical rotatable shaft provided with radial arms, brushes on said arms, a hopper at the upper end of said shaft, a cover seated on said surrounding wall and the air and gas pipes communicating with the fire-box, substantially as described. 20

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

CHARLES W. SMITH.

Witnesses:

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E. OLTMANN.