(No Model.)

T. BROWN.

COMBUSTION MECHANISM.

No. 459,518. Patented Sept. 15, 1891.

Fig. 1.

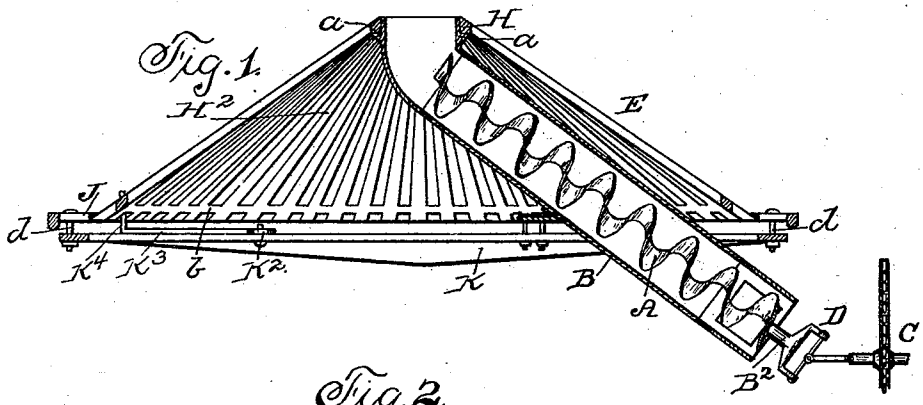


Fig. 2.

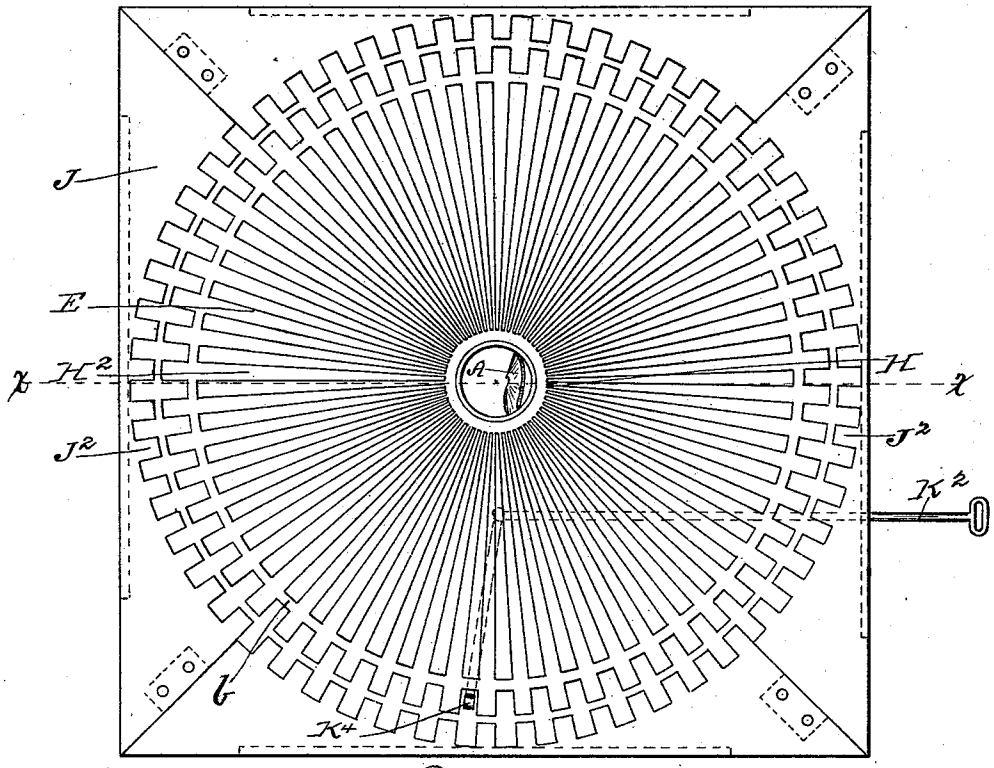
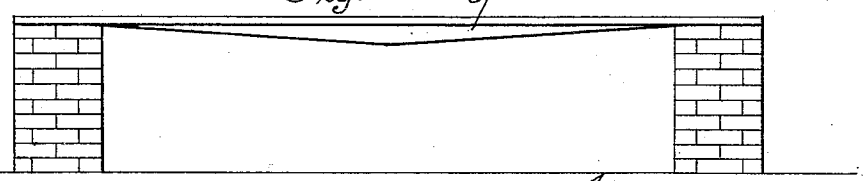


Fig. 3.



Witnesses,
Frank. Pierce
C. C. Bulkley.

Inventor
Thomas Brown

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS BROWN, OF DES MOINES, IOWA, ASSIGNOR OF ONE-HALF TO FRANK PIERCE, OF SAME PLACE.

COMBUSTION MECHANISM.

SPECIFICATION forming part of Letters Patent No. 459,518, dated September 15, 1891.

Application filed January 20, 1891. Serial No. 378,489. (No model.)

To all whom it may concern:

Be it known that I, THOMAS BROWN, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a new and useful Device for Combustion Mechanism, of which the following is a specification.

My invention has for its object the provision of means by which the fuel may be conveniently and readily conveyed from any desired point to and upon the grate, by which the fuel, when deposited upon the grate and in process of consumption, may fall along the grate to a point where, when entirely consumed, the ashes or clinkers thereof may be comminuted and deposited in the ash-pit, by this means maintaining the fire-grate clean, insuring a steady and complete circulation of the draft through the grate, providing entire combustion of the fuel, so that the products of combustion are also completely consumed, no smoke or soot being generated or formed, and the dangerous or offensive gases also consumed, resulting in a great saving of the fuel, and also permitting the use of the same grate indefinitely, since the grate-bars are in no wise damaged by burning.

My invention further has for its object the provision of a fuel-conveyer simple and cheap in construction, of the maximum strength, and which shall reduce the space necessary to be employed in mounting the conveyer.

My invention consists in a screw conveyer operated within a conducting boxing or tubing formed in a connected section or sections and an opening in its lower end for the admission of the fuel, together with means by which said conveyer may be operated, the boxing or tubing surrounding the conveyer having communication with the grate.

My invention consists, further, in a grate of conoidal form, in the apex of which is an opening, at which opening the conductor-boxing is located and through which the fuel elevated by a conveyer within the boxing is delivered upon the grate, a dead-plate arranged at and disposed about the lower circumference of the grate, having a number of projections or teeth which, when the grate is rotated on its axis by any suitable means, in conjunction with the ends of the grate-bars, serve to comminute the clinkers or ashes before the latter are deposited in the ash-pit.

My invention consists, further, in certain details of construction and arrangement of parts, hereinafter more particularly described, and pointed out in my claims, reference being now had to the accompanying drawings, in which—

Figure 1 represents a sectional elevation on the line X X, Fig. 2. Fig. 2 is a plan view of my improved device. Fig. 3 is a detail elevation showing a side view of the dead-plate placed upon side or corner walls.

A designates a conveyer which, as shown, is extended within the hollow interior of the conductor B, which latter is preferably a length of piping and has an opening at its lower end, (indicated by the dotted lines in Fig. 1,) the lower closed end of the conductor B constituting a bearing for the shaft B^2, secured to the lower end of the conveyer A, a movement of rotation being imparted to the shaft B^2, and hence to the conveyer B, by means of the driving mechanism C and the universal or knuckle joint connection D. The conductor B, as shown, in this instance is extended obliquely upward underneath the conoidal grate E, its upper portion being elbow-shaped and its extreme upper and open end terminating at an annular opening in the center or apex of the conoidal grate E. At a point just below its upper end, and on the outer side of the conductor B, a plurality of engaging lugs *a a* are formed, the grate E being so cast as that a ring H is provided about the opening at its apex, from which ring the grate-bars H^2 radiate downwardly, forming an incline at all points relatively to the said opening at the apex of the grate E. The grate E is also so cast as that the bars H^2 thereof, near their lower ends, are connected by means of the intermediate pieces *b*.

The dead-plate J is made in sections connected together by means of studs and bolts and has a large central circular opening, so that said plate J may be disposed about the ends of the grate-bars H^2, which latter, as is apparent, are also arranged in a circle. In every instance the grate need not be circular; but where circumstances demand its circularity may be changed to other forms, and

the dead-plate and the opening therein also changed to conform to that of the grate, without departing from the spirit of my invention, the grate being preferably circular, since it is then capable of complete rotation on its axis, thus more effectually comminuting the products of combustion. The edge of the circular opening in the dead-plate is serrated, forming projections or teeth J^2.

K is a cross-bar, Fig. 1, secured to the dead-plate J by the bolts *d*, the conductor B being also secured to said cross-bar K.

The means for operating or rotating the grate E upon the lugs *a a* consists in a shaker-rod K^2, extending to the side of the furnace and pivoted under the grate E, as shown by the dotted lines, Fig. 2, a rod K^3, also extending from said pivot, having an upturned end K^4 engaged between the grate-bars, the rods K^2 and K^3 thus forming a bell-crank lever.

The operation of my device is as follows: The fuel entering the opening in the lower end of the conductor is fed by the conveyer to and through the opening in the apex of the grate, and from thence falls toward the dead-plate along the inclined grate-bars, being meanwhile in process of combustion. The operator by moving laterally the shaker-rod rotates the grate upon its pivot at the apex, and the ends of the dead-plate, in conjunction with the teeth of the grate-bars, serve to comminute the products of combustion before deposition in the ash-pit.

I do not desire to be understood as limiting myself to the form and position of the conductor and conveyer, as it is obvious that a horizontal, vertical, angular, or other position of feed may be adopted.

The grate need not in each case be composed of radiating grate-bars, but, if desired, may be cast integral and perforated, its lower edge, however, being provided with teeth to operate in conjunction with those of the dead-plate.

The conductor B may be formed in sections removably jointed or connected together to permit ready access to the conveyer A.

In the use of the conveyer complete combustion is obtained by not permitting the entrance of air over the burning fuel while feeding, and thus avoiding smoking intervals.

It will be observed from the foregoing description that the conveyer, conductor, or boxing being extended to a point coincident with the apex-opening in the conoidal grate, which latter is pivoted directly upon the upper end of said conductor, the fuel fed by the conveyer is delivered and deposited immediately and directly upon the grate through the apex-opening, and from thence descends along the downwardly-radiating grate-bars. By this means no previous coking of the fuel occurs prior to delivery upon the grate, and by reason of the fact that the grate is pivoted directly upon the end of the conveyer the point of jointure is freed from excessive heating, since at this point there is practically no draft.

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

1. In a stove or furnace, a conoidal grate having an opening at its apex, a conductor or boxing having at its lower end openings to admit the fuel, its upper end terminating at the apex-opening of the grate, an annular ring at said apex-opening, and an extension or extensions on the upper end of said conductor, whereby the grate is rotatably and detachably mounted upon said conductor, together with a screw conveyer operated with said conductor, as set forth.

2. In a stove or furnace, the combination of a rotatably-mounted conoidal grate pivotally mounted upon the upper end of a fuel-conductor, an opening at its apex through which the fuel is fed upon the said grate, the grate-bars of which latter radiate and incline outwardly and downwardly from said opening, and a stationary dead-plate located at and disposed about the lower portion of the grate-bars, said dead-plate having a circular opening and serrations forming teeth, said teeth being in juxtaposition to the ends of the grate-bars, together with means for rotating the grate, as set forth.

3. In a stove or furnace, the combination of a conductor having an opening at its lower portion for the admission of the fuel, a screw conveyer within said conductor rotated by suitable driving mechanism, a conoidal grate rotatably mounted upon the upper open end of the conductor, said open end coinciding with an opening in the apex of the said grate, through which the fuel is fed, the bars of the grate radiating and inclining downwardly from said opening in the grate, and a fixed dead-plate having an opening provided with teeth disposed about the lower portion or at the ends of the grate-bars, so that said teeth act conjunctively with the ends of grate-bars, together with means for rotating the grate, as set forth.

THOMAS BROWN.

Witnesses:
J. B. JOHNSON,
W. H. MCHENRY, Jr.