

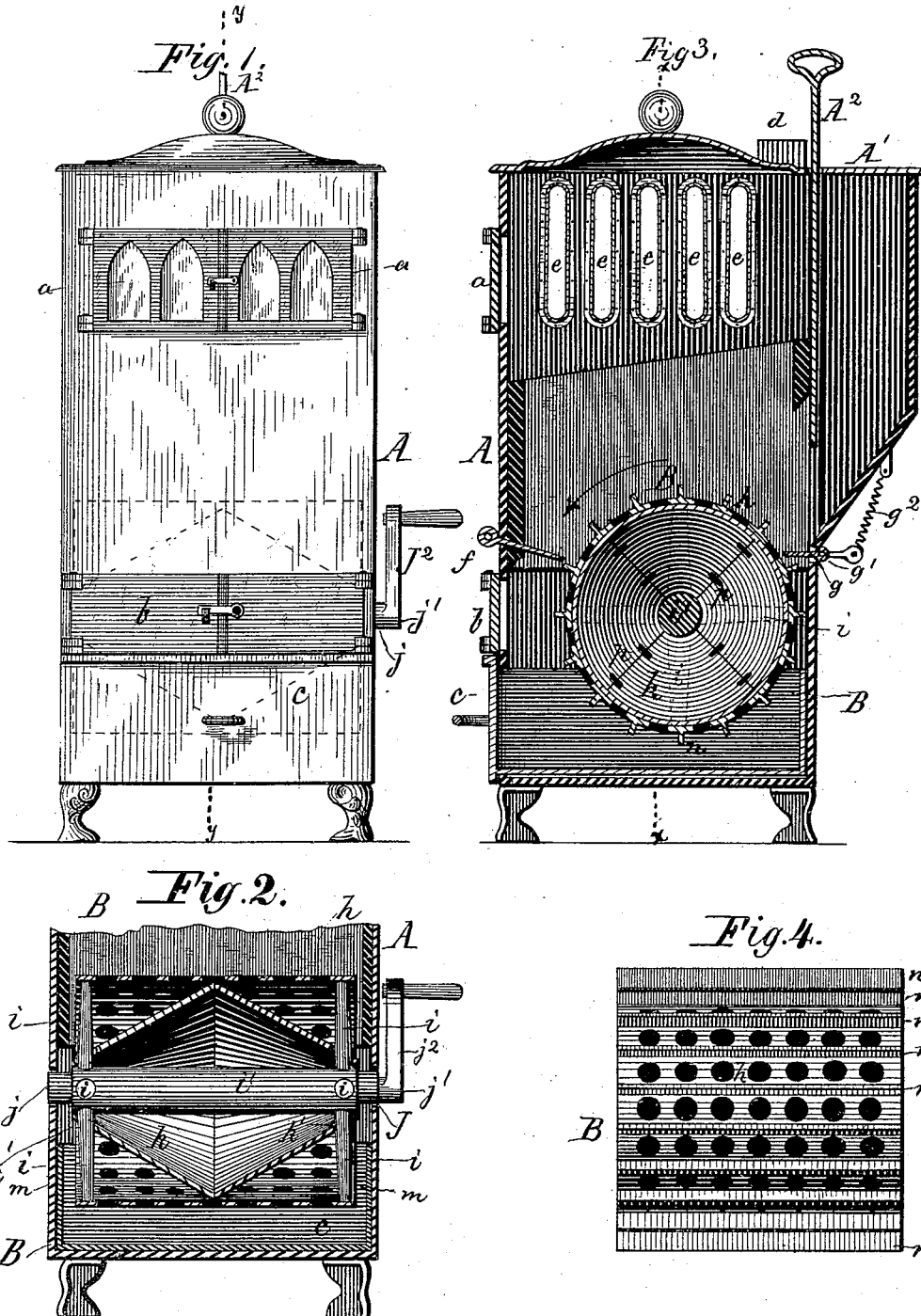
(No Model.)

T. POORE.

STOVE, HEATER, AND FURNACE.

No. 342,809.

Patented June 1, 1886.



Witnesses:

P. C. Fenwick
R. L. Fenwick

Townsend & Poore Inventor:
by Fenwick & Lawrence
his attorneys.

UNITED STATES PATENT OFFICE.

TOWNSEND POORE, OF SCRANTON, PENNSYLVANIA.

STOVE, HEATER, AND FURNACE.

SPECIFICATION forming part of Letters Patent No. 342,809, dated June 1, 1886.

Application filed May 25, 1885. Serial No. 166,559. (No model.)

To all whom it may concern:

Be it known that I, TOWNSEND POORE, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented a new and useful Improvement in Stoves, Heaters, and Furnaces, of which the following is a specification.

My invention consists in certain novel constructions and combinations of parts in heating structures, as will be hereinafter described and specifically claimed. By my invention a heating structure is secured which possesses many advantages, being very convenient of management, effective in its operation, and adapted for the use of culm or anthracite dust or particles as fuel, such fuel being supplied from a hopper or magazine, carried from the same to the opposite side of the combustion-chamber by revolving the grate, and when the mass of spent fuel is to be discharged it is effected by a further movement of the grate, which movement causes a fresh supply of fuel to be carried and spread in the combustion-chamber. The fuel on the grate can be agitated and the fire enlivened by vibrating the grate, and during this operation the fine ashes and cinders are discharged through the openings in its periphery. The construction is also such that clinkers can be readily broken up and discharged at the periphery of the grate into the sides of the ash-pit along with the refuse mass of spent fuel.

My improved stove differs from those having endless-chain-grates in its great simplicity and freedom from liability to bind, and also from those having cylindrical grates formed of rings, which are simply reversed in position when burned out on one portion, in order to bring into use a portion not impaired.

My stove depends upon the revolution of the grate, always in the same direction, for the supply and spread of the fuel in the combustion-chamber, as also for the discharge of the bed of spent fuel and clinkers; but while this is the case provision is also made for vibrating the grate for the agitation of the fire, and for the discharge of fine ashes through the apertures in the periphery of the grate.

In the drawings, Figure 1 is an outside front elevation of a stove with my invention. Fig. 2 is a broken vertical section in the line

xx of Fig. 3, the grate-shaft and a portion of its spiders or arms being shown in elevation. Fig. 3 is a vertical section in the line *yy* of Fig. 1; and Fig. 4 is a plan view of the ribbed and perforated hollow cylinder of the grate.

A represents the outer casing of a stove, heater, or furnace, provided with a magazine, *A'*, with feed-regulating slide-plate *A²*, and doors *a* in its fire-chamber section, and draft-doors *b* in front or side or both in front and side of its ash-pit section; also, having an ash-draw, *c*, a draft-flue, *d*, air-heating tubes *e e*, and partition-plates *f g* a short distance above the ash-pit doors.

The form of heating structure represented is one of many forms which may be adopted in the use of my invention.

B is a cylindrical revolving fire bed or grate. It may preferably be in the form of a perforated open-ended cylinder, *h*, either of metal, fire-brick, or other suitable durable material, and fastened to spiders or arms *i* of a shaft, *i'*, which has journals *j* and an extension, *j'*, for the reception of a crank-handle, *j²*, or other means by which the cylinder is revolved entirely around and vibrated in a circular path as occasion may demand.

Within the cylinder *h* a circular chute or apron, *k*, may be applied, said chute or apron being formed of two truncated cones, with their bases meeting each other and touching the inner circumference of the cylinder, and their truncated ends extending to the ends of the cylinder and fitting snugly around the shaft *i'*, and being notched at *k'* to receive the arms *i*, as shown. The cylinder and chute or apron are of less length transverse of the outer casing, *A*, than the space inclosed by said casing, while the shaft *i'* is longer than the said space, and is journaled suitably in the casing *A*, as represented. By this construction and arrangement of the grate *B* ash-spaces *m* are formed between the casing and the ends of the grate when it is applied within the stove, and ashes and small particles which pass through the holes in the cylindrical grate *B* and fall upon the inclined surfaces of the chute or apron *k* can flow through these passages and be deposited in the ash pit or drawer. The chute or apron and cylinder *h*, being united by means of the spider or arms *i*, turn with the shaft *i'*. On the periphery of the cylin-

der narrow ribs *n* may be affixed or constructed at suitable intervals, as shown, and between these ribs the perforations of the revolving fire-bed may always come. These ribs extend
 5 from end to end of the cylinder, and their function is to take hold of the lower or base portion of the culm or anthracite dust and carry it positively around from the feed to the discharging side of the fire-chamber.

10 The grate, when set in position, may nearly touch the partition-plates *f g*, and the fuel on the rotary grate cannot pass down into the ash-pit until these partitions are adjusted out of the way.

15 The partition *f* can be slid in and out so as to make the escape freer when clogging matter—such as clinkers—interfere with the revolution of the grate.

20 The partition *g* is hung on a pivot, *g'*, and connected by an arm to a spring, *g''*, attached to some part of the casing of the stove, and while it serves to shut off the downflow of fuel at the feed side of the stove, it is moved up out of the way by the ribs of the grate when
 25 the grate is revolved in the direction of the arrow.

30 In constructing the chute four separated quarter sections or segments may be placed within the cylinder around the shaft and united by fastenings *p*, and then four other quarter sections or segments may be placed in reverse position around the shaft and fastened together by fastenings similar to those designated by *p*.

35 The operation of the invention is as follows: A fire being kindled on the revolving cylindrical fire bed or grate B in the fire or combustion chamber, and the magazine A' filled with culm, when said fire begins to fail, as it
 40 will, first on the side farthest from the magazine, and near the middle, it is replenished with fresh culm by rotating the cylindrical fire bed or grate gently a short distance in the direction of the arrow, the fresh fuel being
 45 taken from the magazine, the regulating or cut-off slide-plate having been raised to allow the fuel to feed into the combustion-chamber. Simultaneously with the supply of fresh fuel a proper quantity of ashes will have
 50 been carried around and discharged into the ash-pan or other receptacle.

My invention will prove very useful in connection with stoves, furnaces, and other heating structures or cooking apparatus intended
 55 for burning culm, inasmuch as it avoids the necessity of raking the fire. A culm fire cannot be raked without a strong tendency to put it out, and as I agitate, enliven, and clean the fire by revolving the grate all necessity
 60 for raking such fires is avoided. With my grate the fire can remain undisturbed until the portions nearest the discharge side and middle are reduced to ashes, and the ashes can be rotated away without destroying or
 65 impairing the active portions, and simultaneously therewith fresh fuel supplied; and, further, the grate can always be kept clean and

supplied with fresh fuel without difficulty or liability of cooling down the heat of the stove.

The upper portion of the stove and the air-
 70 heating tubes may be made of sheet-iron, and thus serve as a quick and powerful heater. The air circulating from side to side through the tubes *e* will be heated and thrown into the room or conducted off by pipes at one side of
 75 the stove into apartments.

The intermediate portion of the stove may be lined with fire-brick, and be constructed of cast-iron or other metal, as deemed most
 80 suitable.

I do not claim under this application an endless-chain grate having ribs or projections on the links of its chains, that being claimed in my pending application No. 162,319, filed
 85 April 15, 1885.

In cases of large furnaces two revolving flanged cylinders might be placed side by side in an outer casing to form a fire-bed, and the fuel would be fed on each cylinder through
 90 supply-passages on different sides of the furnace. This specific construction will form the subject-matter of a subsequent application for a patent.

My invention is not confined to the precise construction and arrangement of parts herein
 95 shown and described, as other equivalent constructions and arrangements may be adopted without departing from the principle of the same.

What I claim as my invention is—

1. The combination, with a heating structure, of a revolving cylindrical fuel supporting, moving, and distributing grate provided with projections or ribs on and passages in
 100 its periphery and with an ash-chute on its inside, whereby it is adapted as an ash and clinker mover and discharger, substantially as described.

2. The combination, with a heating structure, of a hollow revolving open-ended cylindrical grate having an ash-chute within it for
 110 discharging the ashes into the ash-pit, substantially as described.

3. The combination, with a heating structure having partitions or cut-off plates, as *f* and
 115 *g*, of a revolving cylindrical fire-bed, substantially as and for the purpose described.

4. The combination, with a heating structure having a passage for ashes between its wall and the end of the grate, of a hollow revolving open-ended cylindrical grate having
 120 an ash-chute within it, substantially as described.

5. A hollow revolving cylindrical open-ended grate provided with journals to revolve
 125 upon and having a double inclined ash-chute on its inside adapted for discharging ashes in opposite directions into an ash-pit of a heating structure, substantially as described.

TOWNSEND POORE.

Witnesses:

CHAS. FRASER,
 WM. T. HACKETT.