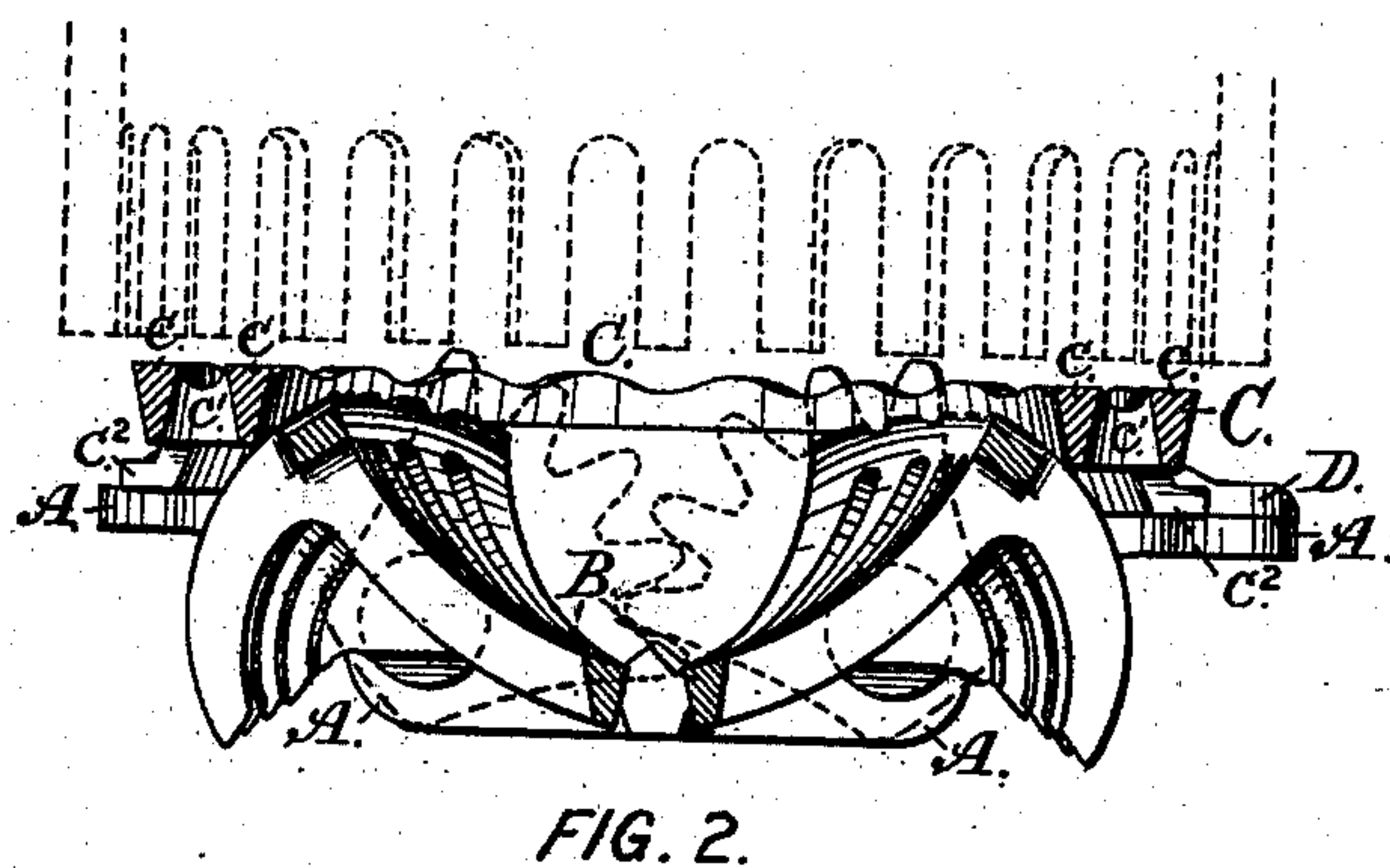
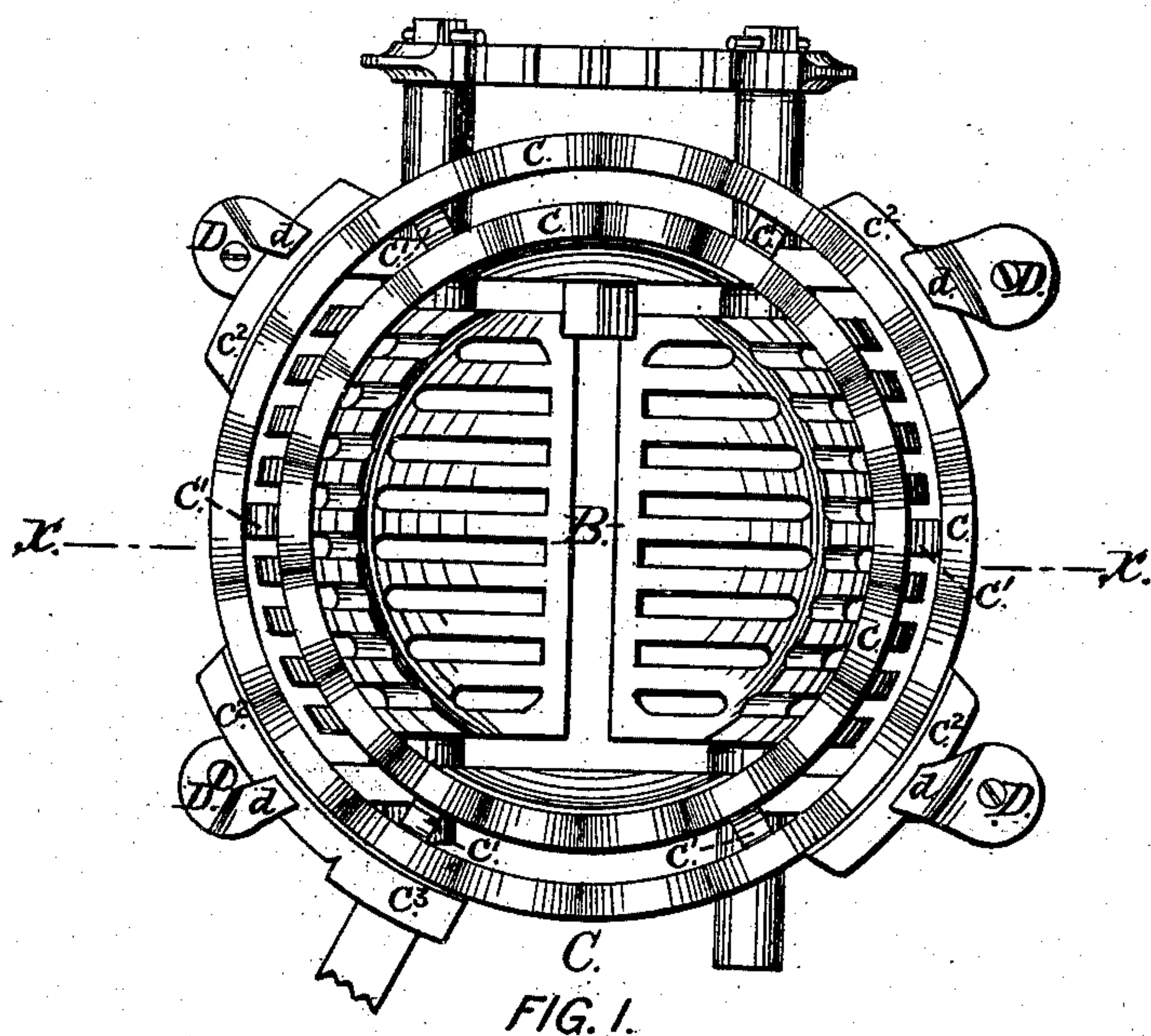


S. H. RANSOM & G. W. GRAVES.  
Stove-Grate.

No. 227,924.

Patented May 25, 1880.



Witnesses,

E. J. Benham,  
E. G. Day

Inventors,  
SAM<sup>l</sup> H. RANSOM,  
AND  
GE<sup>o</sup> W. GRAVES,

by William H. Low,  
Attorney.



# UNITED STATES PATENT OFFICE.

SAMUEL H. RANSOM AND GEORGE W. GRAVES, OF ALBANY, NEW YORK,  
ASSIGNORS TO RANSOM STOVE WORKS, OF SAME PLACE.

## STOVE-GRATE.

SPECIFICATION forming part of Letters Patent No. 227,924, dated May 25, 1880.

Application filed January 6, 1880.

*To all whom it may concern:*

Be it known that we, SAMUEL H. RANSOM and GEORGE W. GRAVES, of the city and county of Albany, and State of New York, have invented certain new and useful Improvements in Stove-Grates, of which the following is a full and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view of our improvement, and Fig. 2 a vertical section of same at the line *x x*.

This invention relates to stoves having circular fire-pots, and especially to the class known as "magazine" and "base" burners. In that class of stoves the fuel falls from the magazine onto the fire in coniform layers, which become successively ignited and are consumed while retaining that form. The ashes and lighter debris resulting from the burning of these layers of fuel naturally fall outward against the fire-pot, where they not only retard combustion at that part, but, by interposing a non-conducting body, they also intercept the passage of the heat from the burning fuel through the fire-pot. The clinkers and other heavy debris produced from the burned fuel remain in the central part of the fire and aid in maintaining the conical form of the layers of fuel before referred to. This central mass, while it is practically incombustible, becomes heated to such an intense degree that its heat assists in keeping up the combustion of the surrounding fuel. In order to produce a very active combustion of the fuel lying at the circumference of the fire, the accretion of ashes must be removed from that portion of the fire, which, from its proximity to the radiating-surface of the fire-pot, is the most effective for producing heat. The fuel at the center or core of the fire, from its remoteness from the radiating-surface of the fire-pot, fails to produce an effect of equal intensity to that of the outer portion, and if a tardy combustion, that will keep the mass heated, as hereinbefore described, can be maintained near the center, while an active combustion is kept up at the outer portion of the fire, the greatest degree of economy in the consumption of fuel will be obtained. To produce this effect it is indis-

pensable that the ashes should be removed from the outer portion of the fire to admit the air for supporting combustion freely thereto, and in effecting this removal the core of the fire must remain undisturbed, so that its dormant condition will be maintained.

The object of our invention is to effect the removal of the ashes from the outer portion of the fire in the manner above described, and, when necessary, to remove the heavy debris from the center without disturbing the outer portion of the fire; and to this end our invention consists in combining with a main or central grate having a cutting movement reaching above the lowest part of the fire, whereby the heavy debris can be taken out of the core of the fire by a positive movement of the central grate without affecting the fuel and ashes lying contiguous to the fire-pot, an annular grate which surrounds the said central grate, and by which the ashes may be removed from the fuel lying against the fire-pot, the two grates being adjoined to constitute one fire-bed, but so arranged that each shall be capable only of a separate movement entirely independent of the other—that is to say, the two are incapable of any conjunctive movement.

As shown in the drawings, A is the bed-piece or frame, adapted to receive both grates; B, the central or main grate, which, as illustrated in the drawings, consists of the grate patented by Samuel Smyth, October 21, 1873; but, as any other form of grate that is adapted to cut out the debris from the center of the fire in the manner hereinbefore described may be substituted therefor, we do not confine ourselves to this particular form. Said central grate forms a bed for supporting the central portion or core of the fire, and for that purpose it should be made about four inches less in diameter than the bottom of the fire-pot, and it should be constructed to take out the lower part of the central portion of the superincumbent mass with a positive cutting movement without affecting the outer portion of the fuel lying next to the fire-pot.

C is an annular grate surrounding the grate B and extending to the outer diameter of the lower end of the fire-pot. Said annular grate,



as shown in Fig. 2, lies slightly above the top of the central grate, and, as we preferably make it, is composed of concentric rings  $c$ , whose upper faces are cut into radial corrugations. Said rings are connected together by the radial bars  $c'$ , and the outer ring is provided with offset ears  $c^2$ , which support the grate C clear of the bed-piece A. A head,  $c^3$ , or other suitable appliance is cast on or attached to the grate C, for the purpose of receiving a handle for shaking the grate.

D denotes clips or snugs secured to the bed-piece A, and bearing against the outer edges of the ears  $c^2$  to maintain the centrality of the annular grate. Said clips are provided with lips  $d$ , that overlap the ears  $c^2$  and prevent the grate from rising from its place.

The dotted lines in Fig. 2 indicate the lower end of the circular fire-pot, and show the relative position of the said fire-pot and grates.

The mode of operating our improvement is as follows: As often as necessity requires, or about once in two or three days, the accumulation of heavy debris at the center or core of the fire should be removed by means of the grate B in the manner hereinbefore described. In effecting this the annular grate C and the fuel lying thereon remain undisturbed. The effect of this cleansing is to create a rapid combustion of the central mass of fuel, which continues until accretion of debris checks it. This intense combustion, while it rapidly consumes the fuel, does not produce an equivalent radiation of heat; but this occasional cleansing of the central part of the fire is required to prevent an over-accumulation of ashes and debris at that point. At more frequent intervals, or as often as it becomes necessary to produce an increase of heat, the annular grate C should be vibrated to clean out the ashes from the fuel lying against the fire-pot. In effecting this a thin layer of fresh fuel is fed down to fill the space left by the displaced ashes, and the cleansed fire at that part has ample spaces for the passage of air to support the high degree of combustion that is maintained in the outer stratum of fuel, which, from its contact with the fire-pot, keeps it (the fire-pot) in a highly-heated condition to radi-

ate an intense heat with a comparatively slight consumption of fuel.

We are aware that stove-grates have heretofore been made with a central grate adapted to cutting out the central portion of the spent fuel above the plane of a surrounding annular grate, with which the central grate was combined; but in that construction the central grate is alone capable of receiving an independent movement, the two grates being so connected together that in shaking the annular grate a like movement must be imparted to the central grate, thereby effecting an agitation of the entire mass of superincumbent fuel, and by so doing defeating the very object that our invention is designed to attain. Annular grates have also been used in combination with a flat supplemental grate placed beneath the central opening of the annular grate, and each of the grates arranged to receive an independent motion, the annular grate being adapted to vibrate in a horizontal plane with a partial rotatory movement, and the central one to move laterally in a horizontal plane from beneath the central opening of the annular grate. This latter construction is manifestly lacking in the important feature of the positive cutting movement of the central grate above the plane of the annular grate found in our invention.

We do not claim as our invention either the central grate, B, or the annular grate C when separately considered; but

We claim as our invention—

The combination, with a central grate, B, whereby the debris may be cut away from the central part of the fire by a positive movement of the parts of said grate in the manner herein set forth, of the annular grate C, arranged in relation to the grate B as herein described, both of said grates being adapted to move independently of each other, but not conjointly, as herein specified.

SAML. H. RANSOM.  
GEO. W. GRAVES.

Witnesses:

WILLIAM H. LOW,  
JOEL R. RANSOM.