

No. 716,922.

Patented Dec. 30, 1902.

M. MCINNEMY.
SMOKE CONSUMING HEATING STOVE.
(Application filed June 6, 1901.)

(No Model.)

Fig. 2

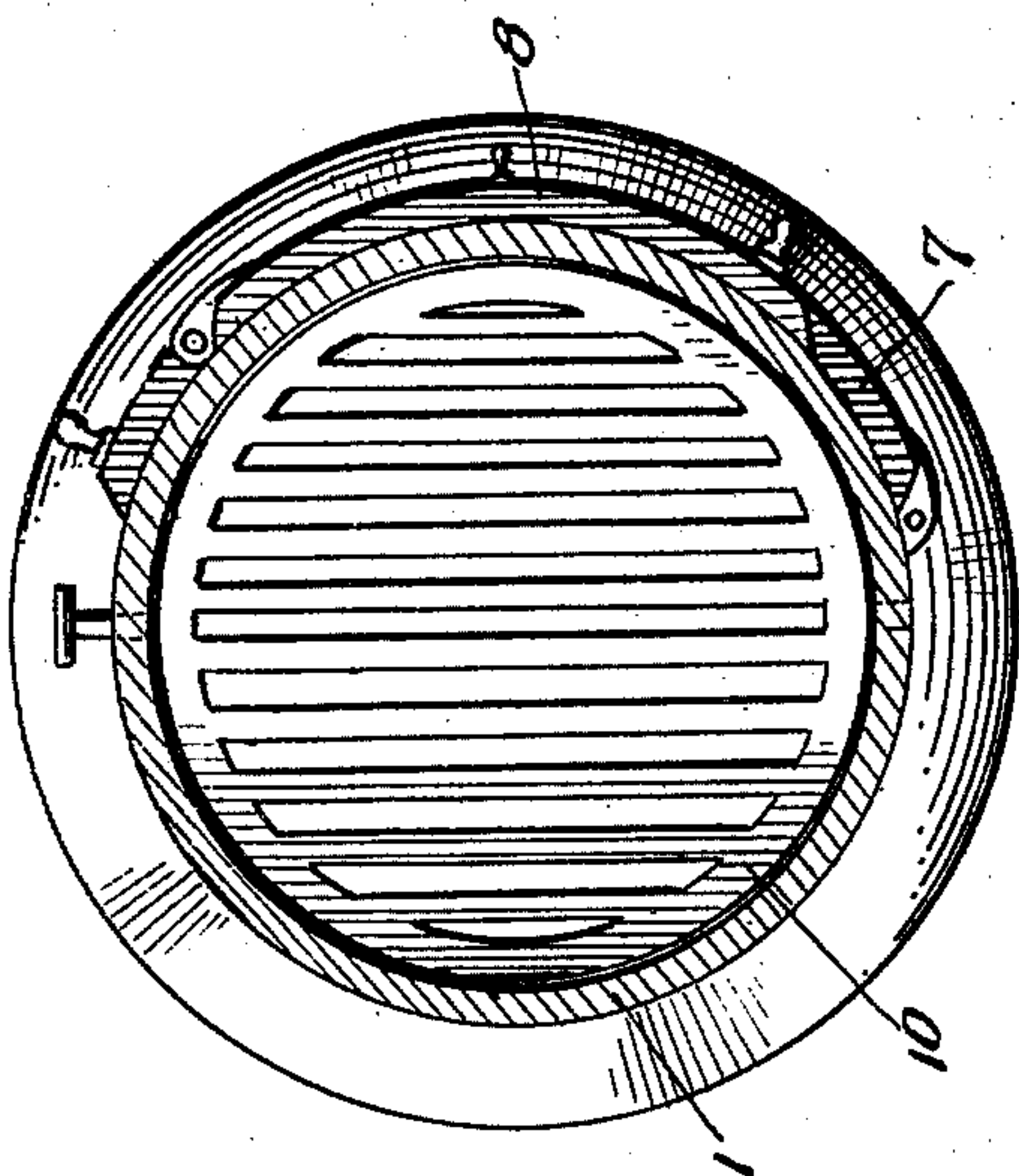


Fig. 3

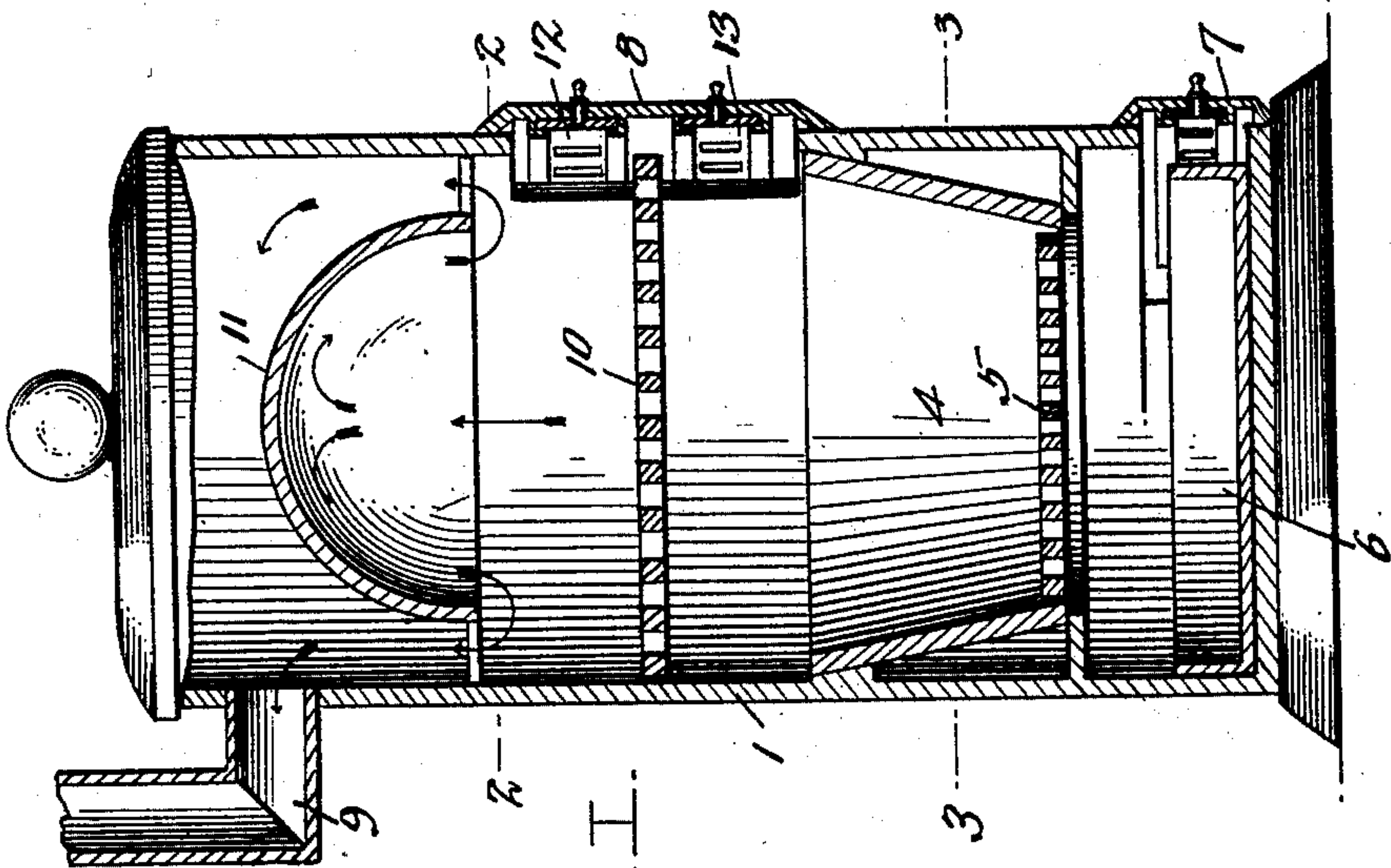
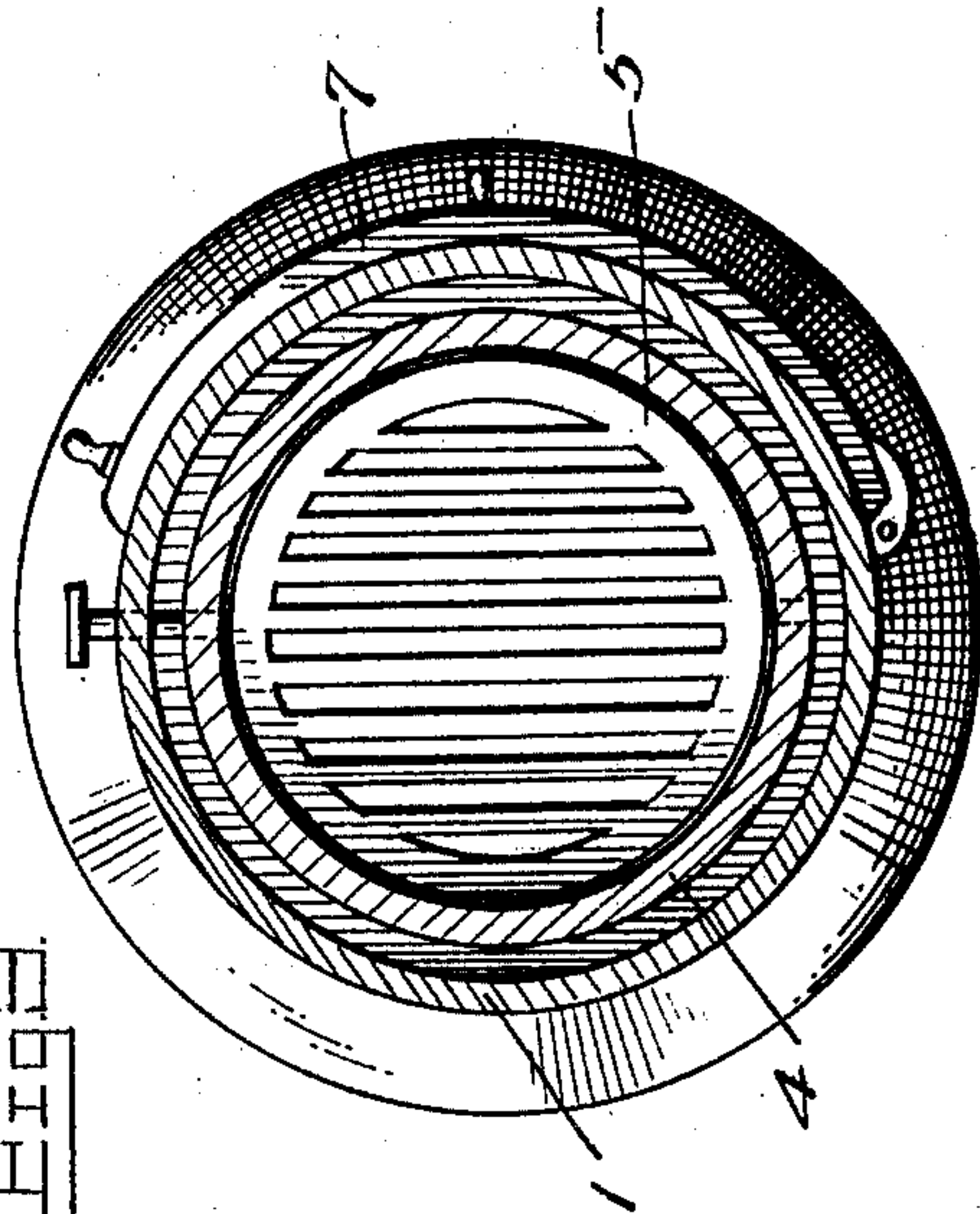


Fig. 1

Witnesses
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UNITED STATES PATENT OFFICE.

MICHAEL MCINNEMY, OF IOWA CITY, IOWA.

SMOKE-CONSUMING HEATING-STOVE.

SPECIFICATION forming part of Letters Patent No. 716,922, dated December 30, 1902.

Application filed June 6, 1901. Serial No. 63,434. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL MCINNEMY, a citizen of the United States, residing at Iowa City, in the county of Johnson and State of Iowa, have invented a new and useful Smoke-Consuming Heating-Stove, of which the following is a specification.

This invention relates to heating-stoves, and particularly to that class of heating-stoves which are adapted for the consumption of bituminous coal or similar fuel which is rich in carbon; and it has for its object to construct a heating-stove of this class in which the smoke and gases forming an important part of the products of combustion may be consumed and utilized in the generation of heat.

Wherever bituminous coal is used on a large scale, such as in boiler-furnaces, efforts are usually made to consume the smoke and gases arising from the process of combustion. Primarily this may have been done with a special view of abolishing the offensive black "smoke;" but it has also come to be recognized that this black smoke is rich in combustible gases and other combustible particles, so that by properly consuming said smoke not only a nuisance is abolished, but an important advantage is gained in the generation of heat from the combustion of the smoke. Heretofore, as stated, the efforts with this end in view have practically been confined to large plants where large quantities of fuel are consumed, while in the consumption of bituminous coal for household purposes practically no effort has been made to check the waste and to do away with the smoke, which may justly be considered the most noxious feature arising from the consumption of this class of fuel.

My present invention, therefore, has for its aim to construct a stove for household use which shall be eminently simple in construction and convenient to operate and in which the simplest and best principles hitherto applied only on a larger scale shall be availed of, thus producing a device which shall be simple, economical in its general construction, as well as in the use thereof, in which fuel rich in carbon may be economically consumed, and by which the obnoxious smoke feature shall be done away with. These re-

sults I attain by the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional side elevation of a heating-stove constructed in accordance with the principles of my invention. Fig. 2 is a horizontal sectional view taken on the line 2 2 in Fig. 1. Fig. 3 is a horizontal sectional view taken on the line 3 3, Fig. 1.

Corresponding parts in the several views are indicated by similar numerals of reference.

In the form of my invention illustrated in the drawings, 1 designates the stove shell or drum having the usual fire-pot 4, grate 5, ash-pit 6, ash-pit door 7, fuel-door 8, and smoke-outlet 9. The fire-pot 4 and grate 5 are adapted to burn soft or bituminous coal or other fuel which emits offensive smoke and gases. Disposed above the fire-pot at about midway of the fire-door 8 is another grate, 10, which forms an open-grated diaphragm across the interior of the drum 1 and which is accessible through the upper part of the door 8, so that fuel may be fed to both grates through the same door 8. Suitably supported in the stove drum or casing above the upper grate 10 is an arch-shaped or semispherical diaphragm or deflector 11, the under side of which is concave and adapted to retard and deflect the gases rising from the fuel on the grate 10 and to cause them to be held longer in proximity to the grate, so that the combustible gases and particles will be entirely consumed. By this construction all smoke, gases, and other products of combustion rising from the fuel in the fire-pot 4 must pass through the grate 10 and the fuel thereon. If, therefore, the fuel employed on the grate 10 be coke, hard or anthracite coal, or some equivalent smokeless fuel, it produces a very hot smokeless fire and the combustible particles in the smoke and other products of combustion passing upward from the grate 5 through the grate 10 will be entirely consumed.

The door 8 is formed to project above the grate 10, so that both grates 5 and 10 are accessible through the one door, which is a great convenience and greatly simplifies the construction.

In starting a fire the fire may first be started in the fire-pot 4 and then upon the grate 10, or both fires may be started at the same time, using the two different kinds of fuel on the grates, as above noted.

The door 8 is provided with two air-inlet dampers 12 and 13, one above and one below the grate 10, to assist in regulating the air-currents.

It will be observed that the door 8, or rather the opening for said door, is naturally and necessarily disposed above the upper edge of the fire-pot. The grate 10 being disposed about midway of the height of the door-opening is thus elevated a sufficient distance above the grate 5 and the fire in the fire-pot to avoid being injuriously affected thereby.

In a stove of this construction soft bituminous coal can be readily burned without producing any visible smoke or other visible products of combustion by the mere addition of a small amount of coke, anthracite coal, or other suitable smokeless fuel upon the grate 10. This smokeless fuel when ignited soon forms an incandescent mass, through which the products of combustion rising from the fire underneath are compelled to pass, being largely consumed by contact with the incandescent mass in such upward passage. Such smoke and gases, however, as escape above the upper grate will pass into the chamber formed by the concave under side of the deflector 11, whereby it is deflected upon the incandescent mass, so that practically every combustible particle will be consumed. It is obvious that by this construction I not merely do away with the obnoxious feature of the smoke, but that a very large percentage of heat-giving particles otherwise lost will be thoroughly utilized.

I am aware that that feature of my invention which consists in passing the combustible smoke and gases from one fire through the incandescent mass of another fire is not original with me, it having been heretofore employed in boiler-furnaces, garbage-consuming devices, and the like. I am also aware that the use of a deflector to retard the escape of the products of combustion is not new. I am not aware, however, that the two features combined have heretofore been employed in stoves for household purposes, the construction resorted to having usually been too complicated and expensive for such use. It will

also be observed that in a stove like that embodied in my present invention, where the draft is usually—in fact, necessarily—very free the employment of the arched deflector or equivalent means for retarding and deflecting the products of combustion is essentially important, inasmuch as without this feature the object of the invention will only be partially achieved. Again, by providing the fuel-door with two dampers or air-inlets, one disposed below and the other above the upper grate, I am enabled to supply an admixture of air to the products of combustion rising from the fire upon the lower grate before the said products pass through the incandescent mass of the superimposed fire, while through the upper one of the said dampers air is admitted above the said upper fire to form an admixture with the products of combustion precipitated by the deflector and insuring entire combustion.

The general construction of my improved device as described and illustrated is thoroughly simple and efficient for the purposes aimed at.

Having thus described my invention, I claim—

1. A smoke-consuming heating-stove comprising a casing, an ash-pit and ash-pit door at the bottom of said casing, a lower fire-pot having a grating at the bottom thereof, a fuel-door disposed above the fire-pot, an upper grate located in a plane between the top and bottom of the fuel-doorway, an arched deflector supported above the upper grate, dampers in the fuel-door above and below the upper grate, and a smoke-outlet.

2. A stove of the class described, comprising a casing, a fire-pot for the reception of fuel rich in carbon, a fuel-door opening into the casing above the upper edge of the fire-pot, an upper grate located in a plane between the top and bottom of the fuel-doorway, a superimposed arched deflector, draft-inlets below and above the upper grate, and a smoke-outlet.

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

MICHAEL MCINNEMY.

Witnesses:

A. R. OHL,
W. J. FREEMAN.