A. Knobel.

Coal-Stove

No. 76204 Patented Mar. 31, 1868

Fig. 1.

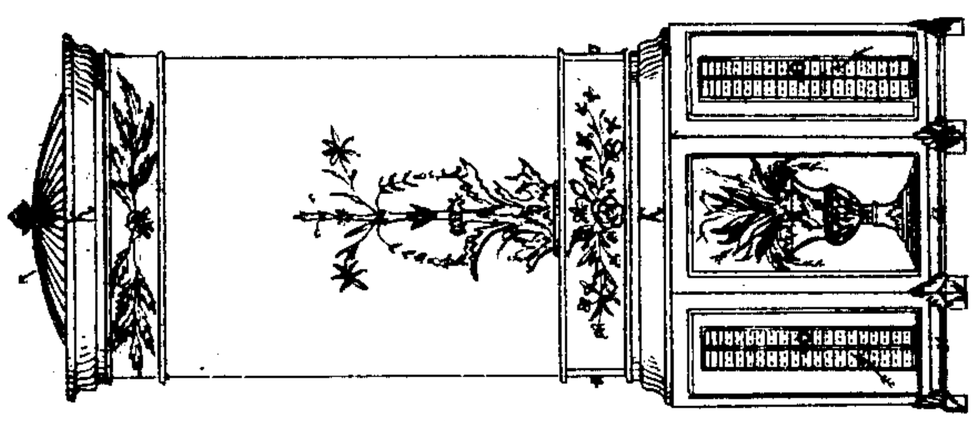


Fig. 2.

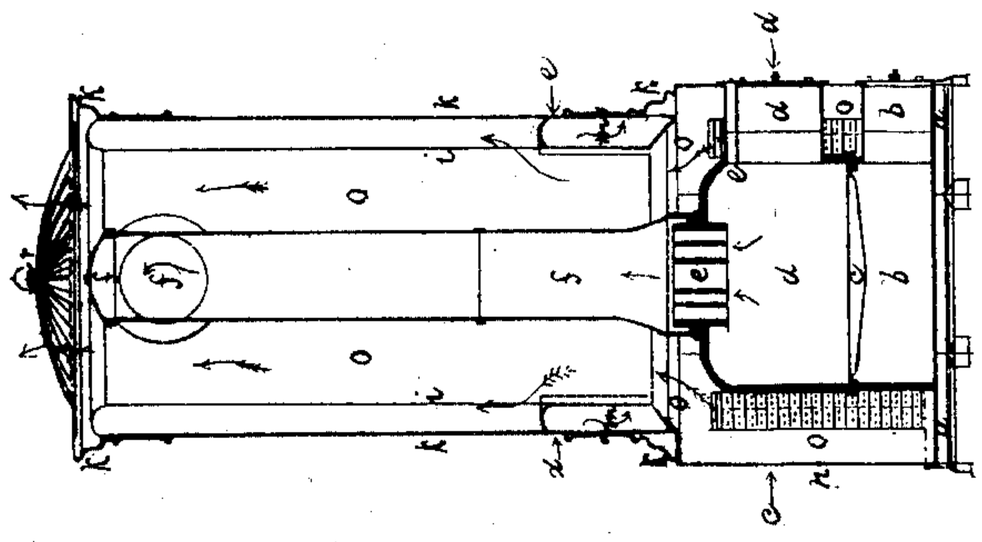


Fig. 3.

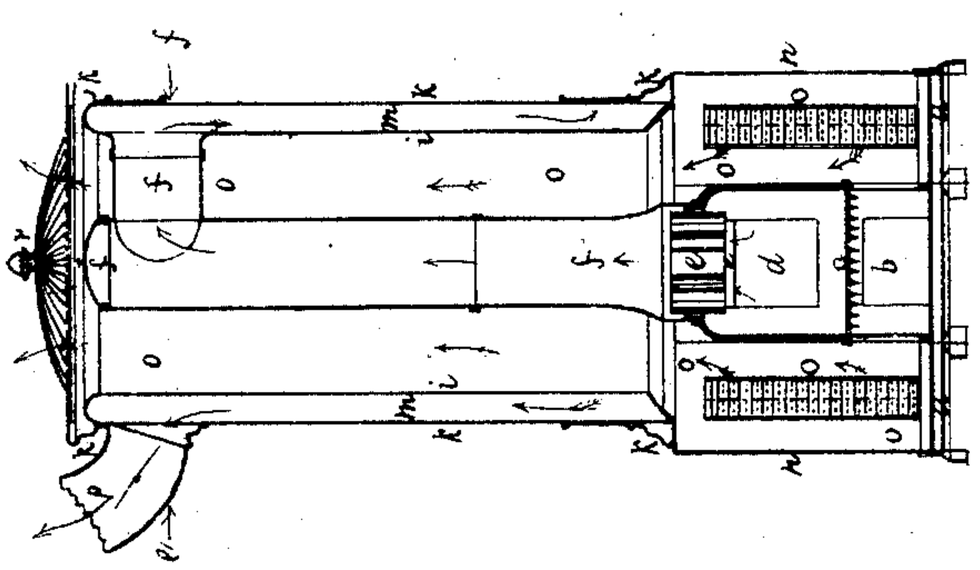


Fig. 4.

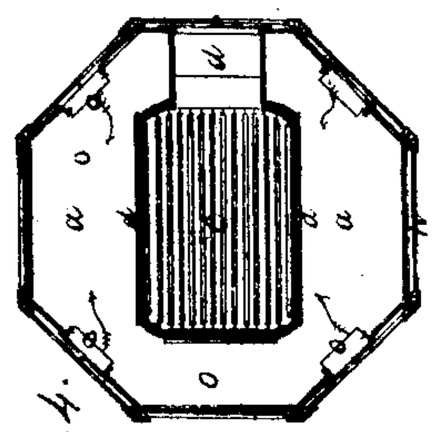


Fig. 5.

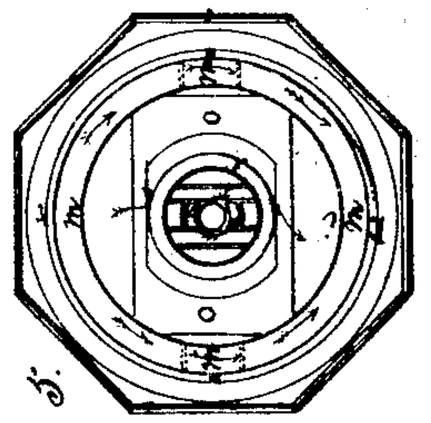
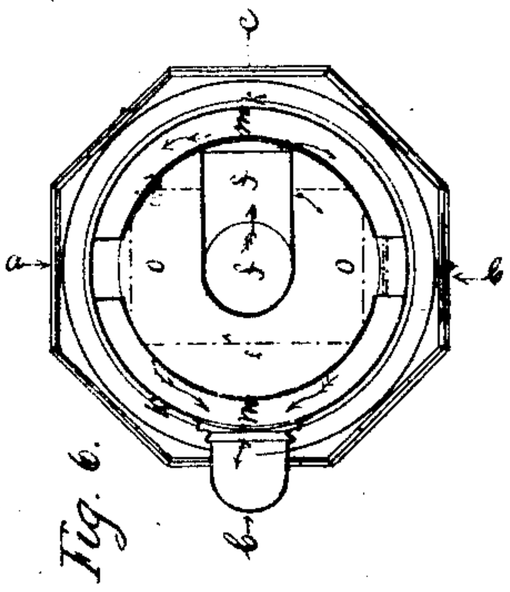


Fig. 6.



Witnesses.

E. A. Hill
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ANDREW KNOBEL OF MONROE, WISCONSIN.

Letters Patent No. 76,204, *dated March* 31, 1868.

IMPROVEMENT IN COAL-STOVES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ANDREW KNOBEL, of the town of Monroe, in the county of Green, and State of Wisconsin, have invented certain new and useful Improvements in Heating-Apparatus or Stoves; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view.

Figure 2, a vertical section.

Figure 3, a vertical section at right angles with the section shown at fig. 2.

Figure 4, a horizontal section, taken at *c' d'*.

Figure 5, a horizontal section, taken at *d'' c''*; and

Figure 6, a horizontal section taken at *e f* of fig. 3.

The nature and object of my invention consist in constructing a stove or heater with a central flue, passing from the fire-box up to or near the top of the same, with a descending flue on one side, and an ascending flue on the opposite side, so encased as to form a single air-heating chamber around the flues, and also around the fire-box, so that a powerful air-heater is formed; and in arranging the side-openings at the base, so that by closing the upper ports or air-registers, it can be used as a radiator; and in a novel construction of the parts, and arrangement of the same, as is hereinafter more fully set forth and claimed as new.

To enable others skilled in the art to make and use my improved stove or heater, I will describe its construction and operation.

The base-plate *a* is made of cast iron, and is supported by legs or supports, substantially as shown. Resting on plate *a* are two cylinders, or a cylinder and an octagon, made of separate plates. The outer cylinder or octagon *n*, in the form shown, is made of vertical plates fitting at their sides; four of them are simply ornamental, as shown at *n*, fig. 1, while the other four are provided with openings *o*. These openings *o* are made nearly as large as the base of the stove is high, and are provided with a corresponding register, which is made of slats hinged at the sides, so that when allowed to fall down, they will close the openings, and are operated by a rod attached similarly to the rods of Venetian blind, so that they can be adjusted to admit any desired quantity of air, or exclude it all. The interior cylinder of the base surrounds the fire-box *d* and the ash-box *b*, which are divided from each other by the grate *c*. This cylinder is curved inwards at the top, so as to contract it above the fire, and bring the products of combustion through a small space, and concentrate the gases which escape into a small gas-burner, *e*, when they are consumed, as shown in figs. 2 and 3. This cylinder may be made in sections, and it will be found convenient to make the ash-pit in one section and the fire-box in another. The ash-box is provided with a separate door, *b'*, and may be provided with an ash-pan, if desired. The fire-box *d* is provided with a door, *d'*, also with an air-passage, *e'*, above the door, for the purpose of furnishing the gas and carbon-burner *e* with a sufficient amount of oxygen to insure the perfect combustion of the gases and the escaped carbon. The gas-burner *e* projects down into the cylinder, so as to leave an annular air-space around it in the fire-chamber. The gas-burner *e* is made circular, or of such other form as may be convenient, and is provided with thin, flat plates, which may be made in concentric circles or interlaced, as desired. These flat plates soon become heated very hot, and, by the passage of the carbon of coals through the restricted space, it is burned with the gases, and the smoke passes off thin and clear, making the stove a great heater. The upper portion of the stove is contracted, and is supported upon the base by the disk shown at *k''*. It will be advisable to construct the upper portion of sheet metal, although it may be cast. The outer cylinder or casing *k* is made entire, and is provided inside with two semicircular vertical partitions, *i*, shown at fig. 6. These partitions separate the smoke-passages or flues *m* and *m''* from the central air-chamber *o'*. Just above the base, lateral flues *m'* are made to connect the flue *m* with *m''*, so that at that point the interior appears in form of two cylinders, as shown at fig. 5, the flues being more fully shown at fig. 2. A central flue, *f*, is placed over the gas-burner *e*, and extends up to the top of the stove, where it connects with the broad flue *m* by means of the shut-pipe or flue *f''*. It is provided on the top with a cap, *f'*, for cleaning it without removal. Caps may also be provided for the flues *m* and *m''*, or the stove-cap *k'* may be so fitted as to operate as caps for them as well

as for the stove. An open net-work, *r*, is provided for the top, which is usually made so as to register and cut off the passage of air, when it is desired to use the stove as a radiator instead of a heater. If desired, pipes for conveying hot air can be attached to the top.

In operation, the fire is built at *d*, and as soon as the fuel is well heated, the plates in *e* will be heated so as to consume the gases and smoke in the pipe *f* immediately above the burner *e*, the required air being furnished at *e'*. The heated products of combustion then rise and pass through *f* and *f''* into *m*, and down *m* through *m'* into *m''*, when they again rise and pass out at pipe *p*, their course being indicated by the black arrows. The pipe *p* is provided with a damper, and to facilitate kindling the fire, a pipe may be made to connect pipe *p* directly with flue *m''* at the upper end, by an additional cross-pipe provided with a damper, so as to be effectually closed as soon as the fire is started. The air-chamber and passages are indicated by the light-colored portions of the drawings and the red arrows. The air passes into the chamber through the registers *o*, and out at *r*. It will be seen that the air-chamber *o'* entirely surrounds the fire-box and the central flue, so that when used as a heater, there is no loss of heat, as all of the radiation is utilized, while, by confining the air, it can be used as a radiator, to warm the room in which it is placed.

Having thus fully described my improved stove and heater, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the vertical annular flues *f o'*, and the flue between the cylinders *i* and *k*, with the horizontal flues *m'* and *f''* and fire-box *d*, substantially as specified.

2. The removable cap *f'*, in combination with the pipe or flue *f* and register-cap *r*, so that all of the flues can be readily cleaned, substantially as specified.

3. The open passage *e'*, opening into the fire below the gas-burner, in combination with the grated gas-burner *e*, fire-box *d*, and opening *d'*, substantially as and for the purposes specified.

ANDREW KNOBEL.

Witnesses:
J. JACOB TSCHUDY,
WM. H. ALLEN.