No. 658,696. Patented Sept. 25, 1900.

F. C. BORMANN.

CONTINUOUS COMBUSTION STOVE.

(Application filed Jan. 18, 1900.)

(No Model.)

Fig. 1.

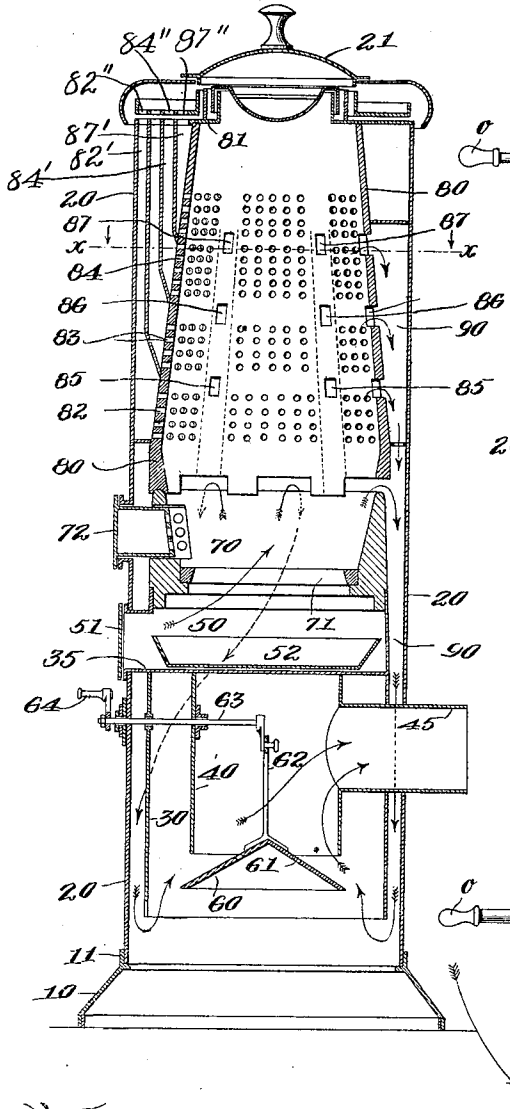


Fig. 3.

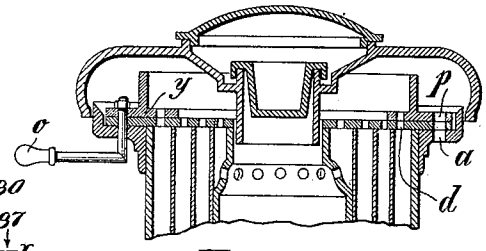


Fig. 2.

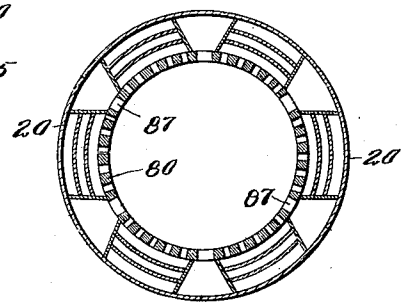
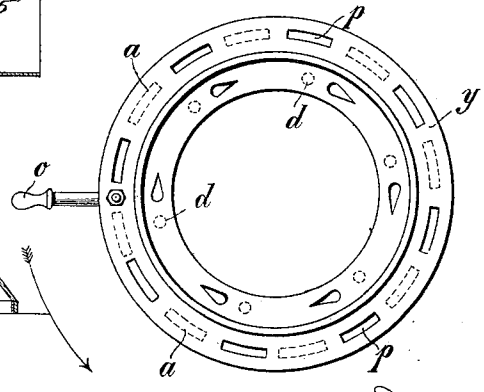


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANZ CHRISTOPF BORMANN, OF HAMBURG, GERMANY.

CONTINUOUS-COMBUSTION STOVE.

SPECIFICATION forming part of Letters Patent No. 658,696, dated September 25, 1900.

Application filed January 18, 1900. Serial No. 1,911. (No model.)

To all whom it may concern:

Be it known that I, FRANZ CHRISTOPF BORMANN, a citizen of Hamburg, residing at the free city of Hamburg, in the German Empire, have invented certain new and useful Improvements in Continuous-Combustion Stoves, (for which I have applied for a patent in Germany, dated October 25, 1898, and in England, No. 25,397, dated December 22, 1899,) of which the following is a specification.

This invention relates to a continuous-combustion stove in which the area of heating-surface is regulated by alteration of the draft.

The object of the invention is to provide a stove in which the heat-radiating surface may be increased or diminished, as desired, in a quick and efficient manner.

The same reference characters indicate corresponding parts in all the figures, in which—

Figure 1 is a longitudinal section of a stove constructed in accordance with my invention. Fig. 2 is a cross-section on the line $x\,x$ of Fig. 1. Fig. 3 is a section of a modified form of the top of the stove. Fig. 4 is a plan view of the top of the stove shown in Fig. 3, the cover being removed.

In the form of stove illustrated in the accompanying drawings a base-plate 10, provided with an upwardly-extending flange 11, supports a cylindrical casing 20. This casing 20 is closed at its top by a cover 21. A short cylinder 30, of smaller diameter, is suspended in the lower part of the cylinder 20 and is closed at its upper end by a flanged plate 35, which extends from the back of the cylinder 30 across the casing 20 to the front thereof and forms the bottom of an ash-box 50. A cylinder 40, of smaller diameter than the cylinder 30, is disposed therein and is supported at its upper end from the plate 35. This cylinder 40 constitutes a flue and is connected with a pipe 45, leading to a chimney. (Not shown.) A damper 60, preferably cone-shaped, is adapted to close the mouth of the cylinder 40. This damper 60 has perforations 61 therein, which permit the passage of the gases of combustion therethrough without creating a draft. As shown, this damper is connected at its apex to a vertical rod 62. This rod 62 connects with a horizontal rod 63, which extends through the walls of the cylinders 40, 30, and 20 and is provided on its outer end with a crank-handle 64, by means of which the damper 60 is operated. A fire-box 70 is supported in the casing 20 above the ash-box 50. This fire-box is provided with a grate 71 and a door 72. The rear wall of the ash-box 50 is preferably connected with the fire-box 70 and is provided at the front thereof with a door 51, having a damper for admitting air to the fire-box. In the drawings removable pan 52 is shown disposed in the ash-box below the grate for receiving the ashes and which may be inserted and withdrawn through the door 51. A dome 80 is disposed above the fire-pot 70 and extends to the top of the casing 20. This dome is preferably reduced at its upper end, and a flanged cover 81 fits over said reduced end and closes it tightly. The dome 80 is provided throughout its length with a series of groups of perforations 82, 83, and 84. These groups of perforations are provided with flue-openings 85, 86, and 87, respectively. For each of these groups of perforations 82 87 84 there is a vertical passage 82′ 87′ 84′, each of which open out under the cover 81. In this rotatable cover there are corresponding openings or air-inlets 82″ 87″ 84″, so arranged with regard to each other that the air admitted to the passages, and consequently to the group of perforations, can be regulated by rotating the cover. By reason of the arrangement of the holes 82″ 87″ 84″ with regard to each other it is possible to admit air to the one group of perforations and shut it off from another or to admit air to or shut it off from all the groups. The various groups of perforations and their respective flue-openings divide the dome 80 into a number of zones, each of which is thrown into and out of action quite independently of the others. Each of these groups of perforations is provided with one or more flue-openings, which are capable of being closed independent of the other groups. A channel 90 is formed between the cylinder 20 and the dome 80, into which the flues, as 85, 86, and 87, open. This channel 90 extends the full length of the stove and serves to convey the gases of combustion to the pipe 45, which leads to the chimney. The outer surface of the cylinder

20 constitutes the heating-surface of the stove, and the amount of heat radiated therefrom may be regulated by throwing into or out of action one or more of the groups of openings or air-inlets 82″ 87″ 84″. When all of the passages 82′ 87′ 84′ are open, the flames and exhausted gases of combustion are drawn up the full height of the dome and pass out through the flues into the channel 90 and pass in downward direction, as indicated by the arrows, around the cylinder 30 into the cylinder 40 and out through the pipe 45. To decrease the heating-surface, one or more of these passages 82′ 87′ 84′ may be closed, whereby the draft causes the flames to pass out through the flue next adjacent thereto into downward direction into the channel 90, and that part of the cylinder above the open channel is rendered inactive and is only slightly heated. The heating effect may be further decreased by shutting off all of the passages 82′ 87′ 84′. In this case the flames and products of combustion pass directly from the fire-pot in the direction of the arrows in downward direction out through the pipe 45, whereby only the lower part of the stove is strongly heated, and the amount of heat radiated therefrom is consequently very much decreased.

The closing of the damper, thereby closing the flues 85 86 87, also serves to reduce the heating effect by shutting off the draft and permitting the smoke to pass out through the perforations 61 therein.

In the construction shown in Figs. 3 and 4 besides the usual air-regulator the air entering from the room through the holes *a* in the top of the stove can be further throttled before passing out through *d*. This is effected by providing a number of holes *d* in the regulator-plate, which are covered by a movable disk *y*, having holes at parts, as shown in Figs. 3 and 4. On turning the disk *y* in the direction of the arrow, Fig. 4, by means of the handle *o* the pointed openings are suddenly opened and a full entrance of air is permitted, while on further rotating the disk the passage of the air is reduced according to the decrease in the size of the openings. The same relation exists between the openings *a* and the corresponding openings *p*.

I claim as my invention—

1. In a stove, the combination of a fire-box, a heating-shaft disposed thereover and provided with a series of groups of perforations, each group communicating with an air-passage, a casing surrounding said shaft and forming a channel, and means for closing said air-passages for diminishing the heat-radiating surface.

2. The combination of a fire-box, a shaft disposed thereover and provided with a series of groups of perforations, each group in communication with an air-passage, independent flues for each of said groups of perforations, and means for opening and closing said air-passage for regulating the radiation of the heat.

3. The combination of a fire-box, a dome-shaped shaft disposed thereover, said shaft having groups of perforations, flue-openings for each of said groups and through which the fire heats downwardly, and a damper for closing said openings.

4. In a continuous-combustion stove, a fire-box, a dome having a series of groups of perforations, each in communication with an air-passage, flue-openings for the said groups, means for opening and closing said air-passages to said groups, and a channel communicating with said flue-openings for conveying the products of combustion to a place of exit.

5. In a stove, a fire-box, a shaft disposed thereover and provided with a series of groups of perforations for admitting air thereto, flue-openings arranged in suitable relation to said groups of perforations and adapted to carry off the exhausted gases, means for supplying air to one group of perforations independent of the other, and means for closing said flue-openings.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

FRANZ CHRISTOPF BORMANN.

Witnesses:

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WALTER N. GOLDSCHMIDT.