

(No Model.)

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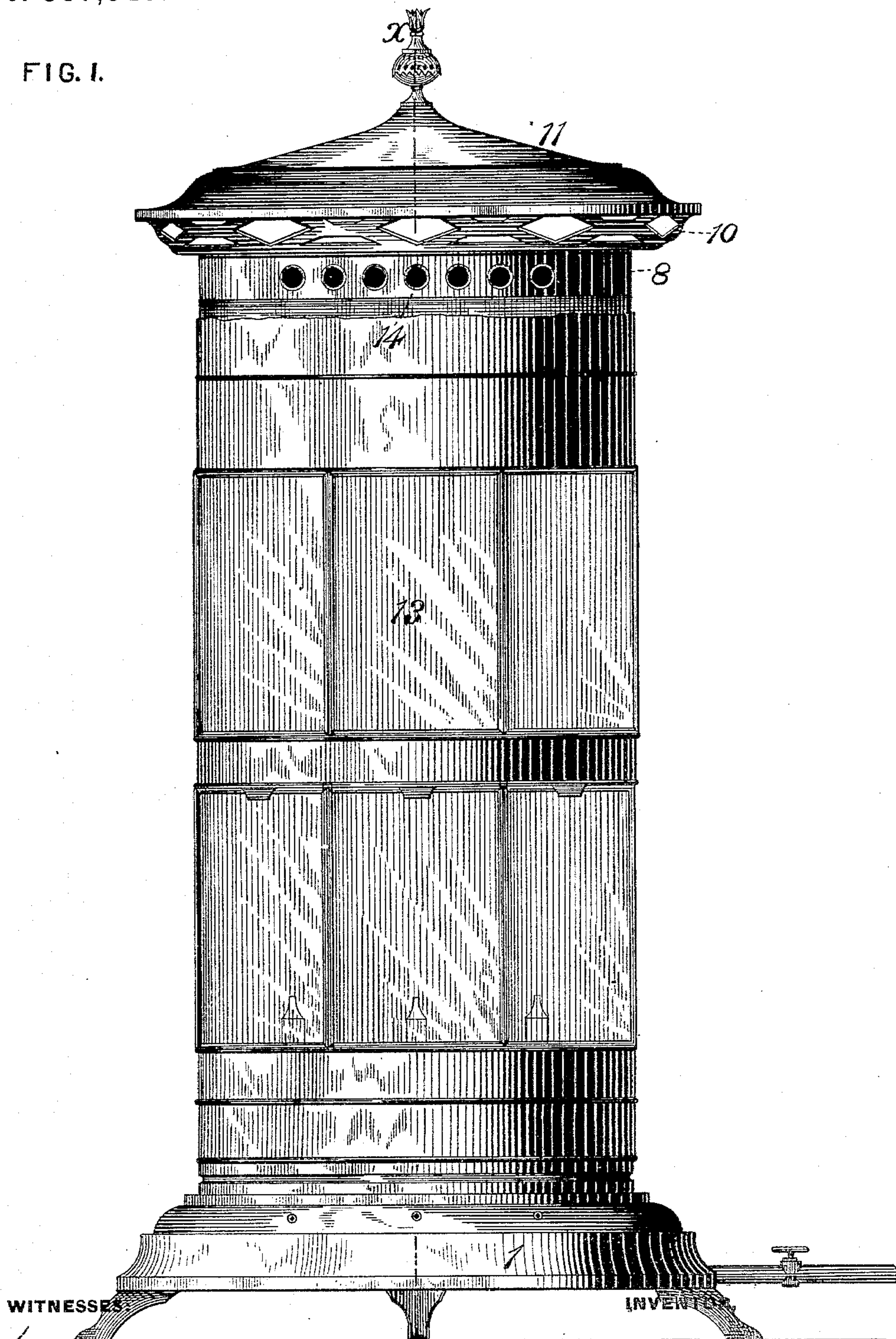
W. F. ZIMMERMANN.

STOVE.

No. 387,940.

Patented Aug. 14, 1888.

FIG. 1.



WITNESSES

INVENTOR

F. E. Gaither.
M. S. Murphy.

x

William F. Zimmermann.
by Daniel S. Wolcott.

Att'y.

(No Model.)

4 Sheets—Sheet 2.

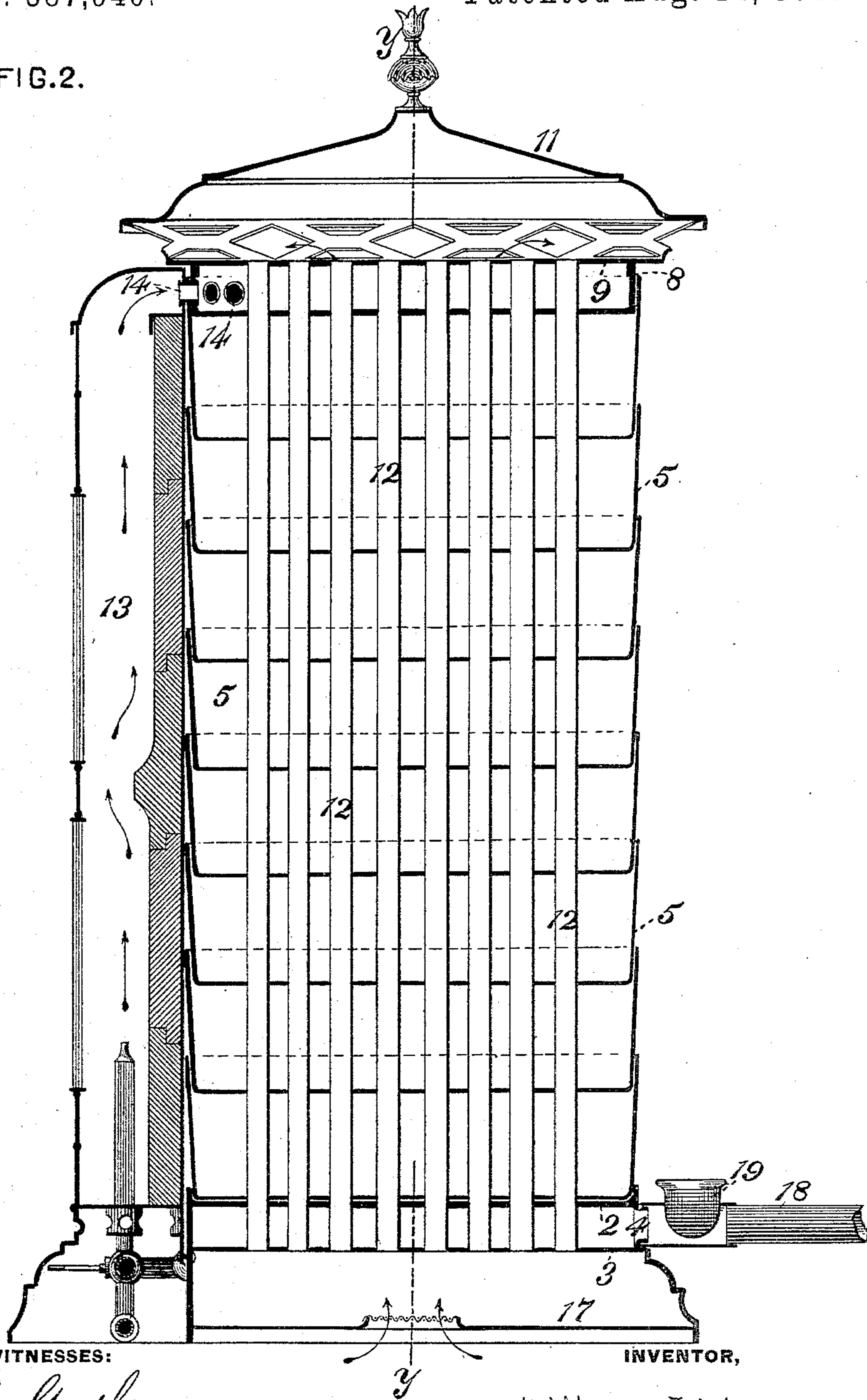
W. F. ZIMMERMANN.

STOVE.

No. 387,940.

Patented Aug. 14, 1888.

FIG. 2.



WITNESSES:

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4 Sheets—Sheet 3.

W. F. ZIMMERMANN.

STOVE.

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FIG. 3.

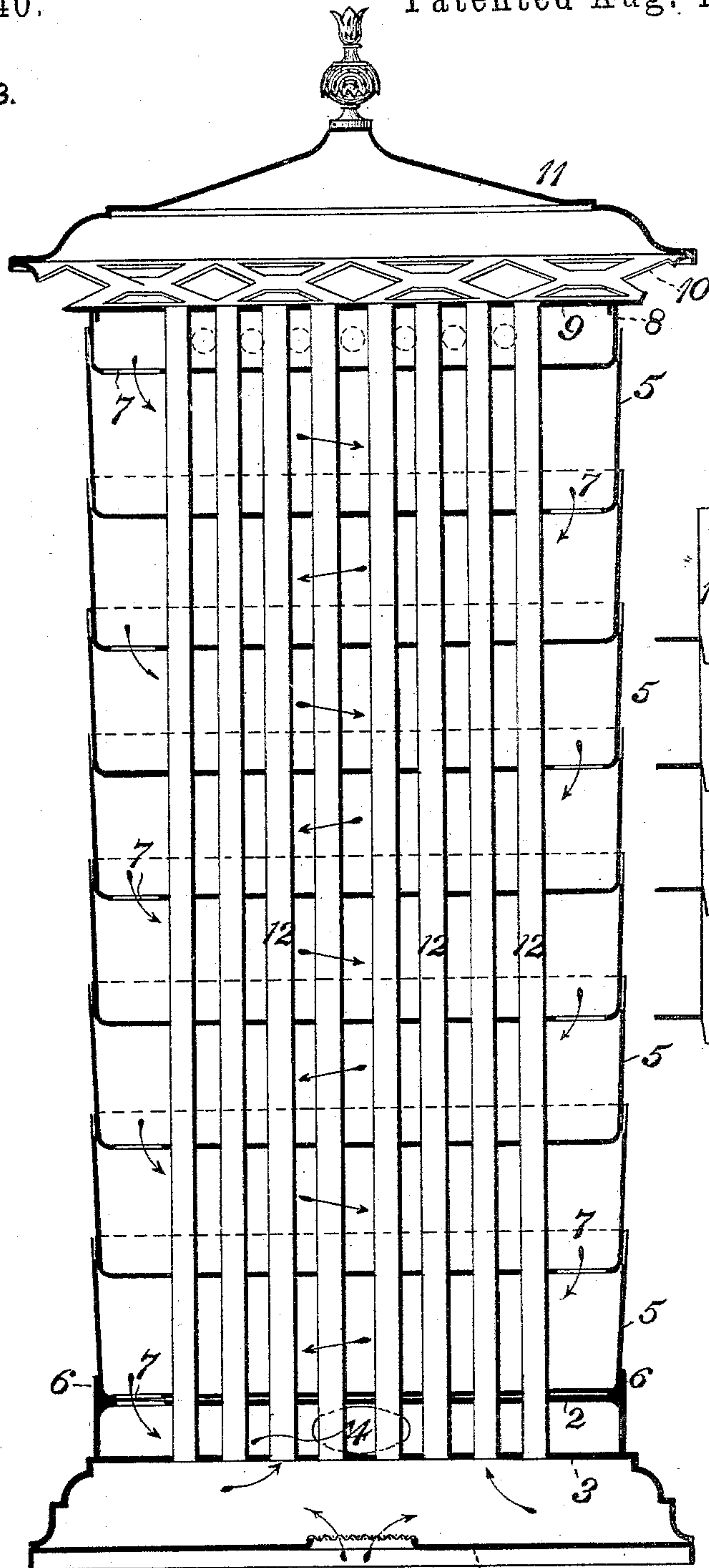
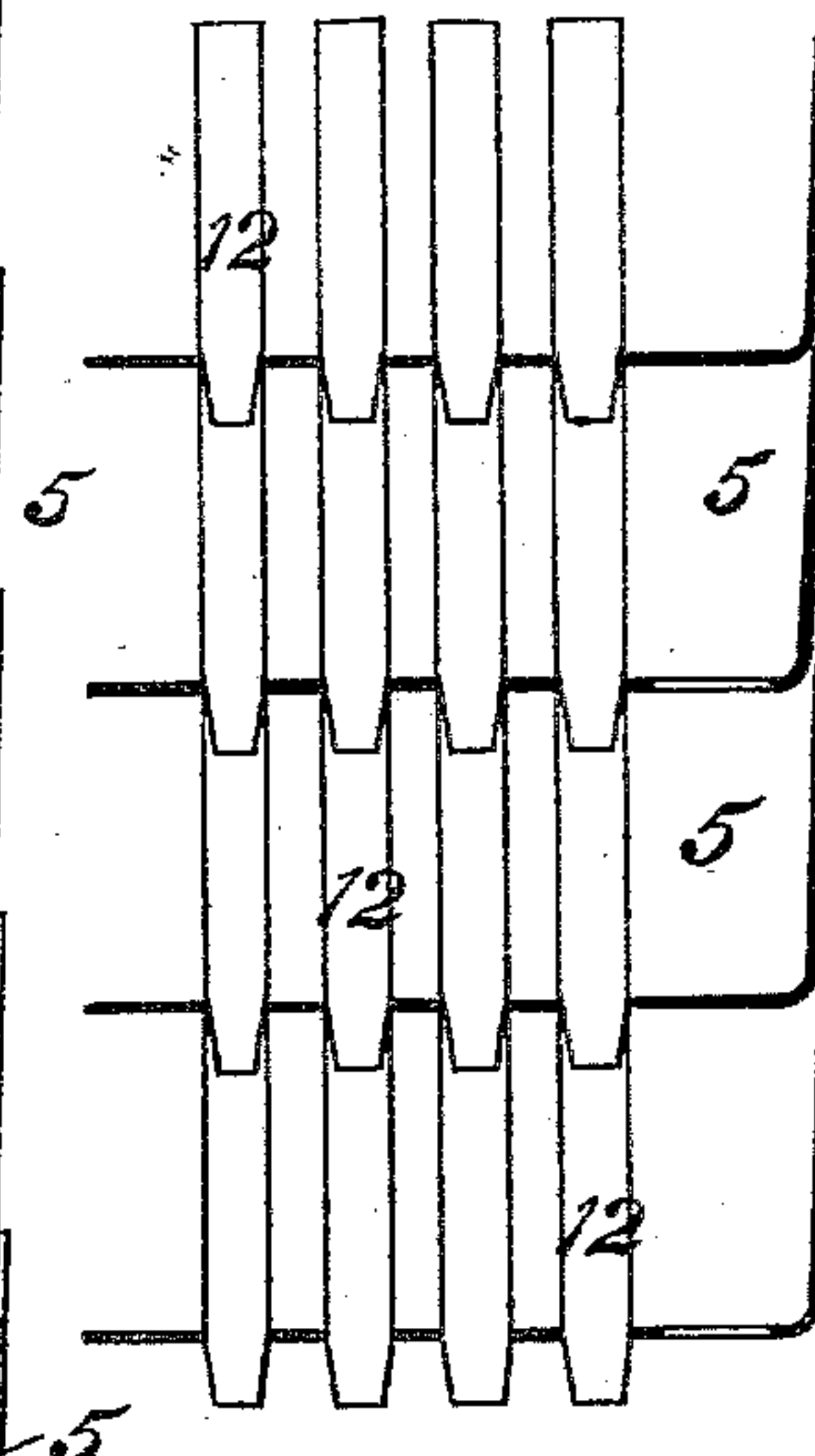


FIG. 5.



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F. E. Gaither.
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Att'y.

(No Model.)

4 Sheets—Sheet 4.

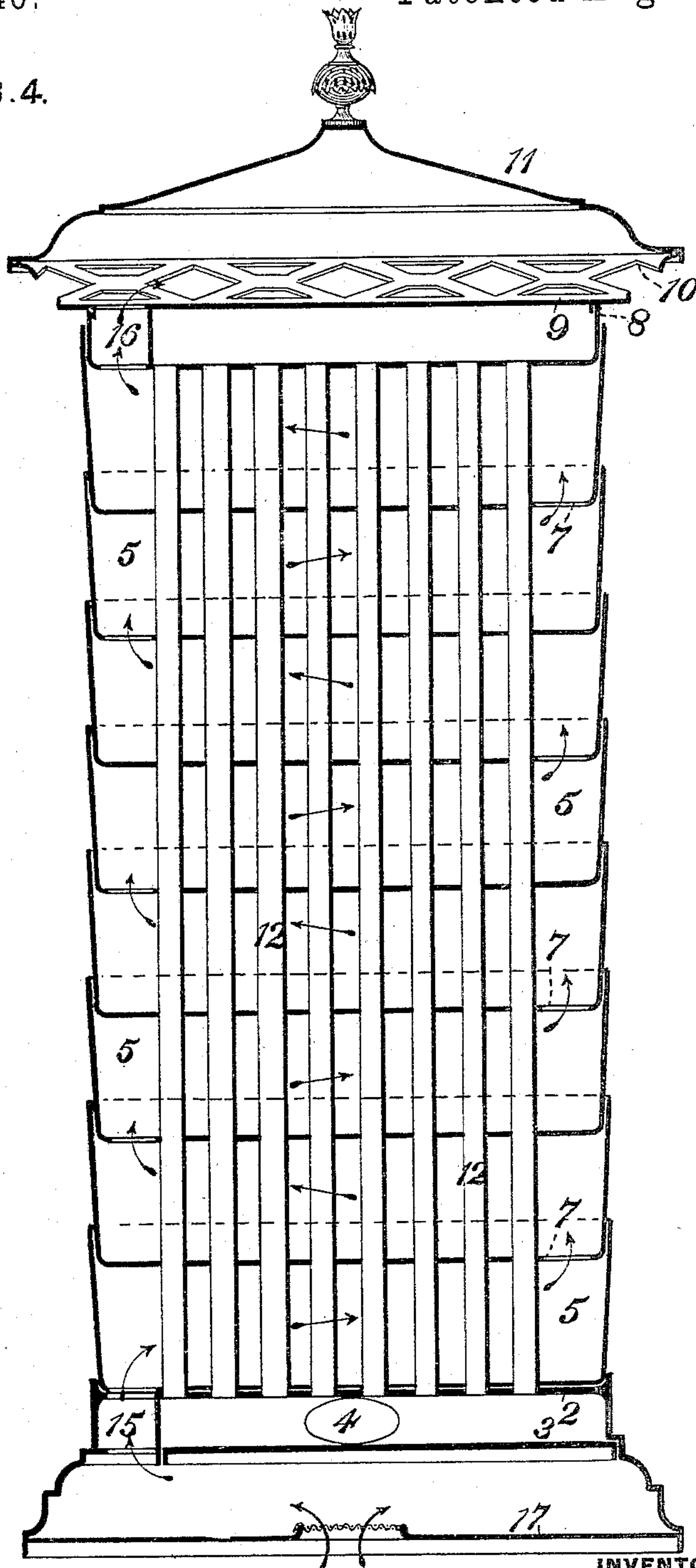
W. F. ZIMMERMANN.

STOVE.

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Patented Aug. 14, 1888.

FIG. 4.



WITNESSES:

M. S. Murphy.
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INVENTOR,

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UNITED STATES PATENT OFFICE.

WILLIAM F. ZIMMERMANN, OF SEWICKLEY, ASSIGNOR TO THE FUEL GAS AND ELECTRIC ENGINEERING COMPANY, (LIMITED,) OF PITTSBURG, PENNSYLVANIA.

STOVE.

SPECIFICATION forming part of Letters Patent No. 387,940, dated August 14, 1888.

Application filed November 2, 1887. Serial No. 254,092. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. ZIMMERMANN, residing at Sewickley borough, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Stoves, of which improvements the following is a specification.

The invention herein relates to certain improvements in stoves, whereby the heat of the products of combustion may be utilized, and has for its object a construction wherein the products of combustion or the air to be heated thereby is caused to traverse back and forth in contact with the heat-transmitting devices, thereby permitting of the transference of a great portion of the heat from the products of combustion to the air; and it is a further object of the invention herein described to provide for the simultaneous formation of the transverse baffle-plates and portions of the outer shell of the stove.

In general terms, the invention consists in the construction and combination of devices or elements, all as more fully hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation of my improved stove. Fig. 2 is a sectional elevation on the line $x x$, Fig. 1. Fig. 3 is a similar view on the line $y y$, Fig. 2; and Fig. 4 is a view, similar to Fig. 3, of a modification of the stove; and Fig. 5 is a sectional view of a portion of the stove, showing a modified construction.

The base 1 of the stove, preferably formed of cast-iron, has the plates 2 and 3 formed integral therewith, said plates forming a box, in one side of which is formed an opening, 4, for the escape of the products of combustion. The shell of the stove is formed of a series of two or more cup-like sections, 5, which are formed by stamping or otherwise shaping a sheet of steel. The lower cup-like section is supported in place by the plate 2, and held as against lateral movement by the flange 6, extending around said plate, and within which the lower section 5 is fitted. The succeeding sections fit one within the other, as shown, the number of sections employed being dependent

upon the height of stove desired. In the plate 3, near one edge thereof, is formed an opening, 7, and a similar opening is formed in the bottom of each of the cup-like sections, as shown. The cup-like sections are so arranged in putting the parts together that the openings of each section will be diametrically opposite, or approximately so, that of the preceding section, whereby the products of combustion are caused to traverse a distance approximately equal to the sum of the diameters of all the shells in passing through the series of chambers into which the stove is divided by the bottoms of the sections 5. The upper cup-like section of the body is preferably formed of cast-iron or of a heavier grade of sheet-steel than that of which the body-sections are formed, for a purpose to be hereinafter stated, and in this cast-iron section 8 is placed the top plate, 9, also formed by preference of cast-iron and provided with a perforated or open-work rim or flange, 10. On this rim or flange is placed the cap or top piece, 11. In Figs. 2 and 3, the bottoms of the sections 5 and 8, and the top plate, 9, are formed a series of holes through which are passed the tubes 12, the ends of said tubes being thimble or otherwise properly secured in the bottom plate, 2, and top plate, 9. (See Figs. 2 and 3.)

The combustion-chamber 13, preferably formed independent of the portion of the stove above described, is connected to the box or chamber formed by the section 8 and top plate by short sections of tubes 14, as clearly shown in Fig. 2. The rear wall of the chamber 13 is formed of fire-brick or tile, and the front wall consists of a metallic frame in which sheets of mica or other translucent material may be secured. The products of the combustion of the gas introduced into the chamber 13 by the burners 15 escape through the tube-sections 14 into the chamber formed by the plate 9 and section 8, and, passing around and between the tubes 12, escape by the opening 7 into the chamber next below, and so on, traversing each chamber diametrically to and through the chamber formed in the base, whence they escape by the opening 4.

In the above-described passage through the

stove the products of combustion will have parted with the major portion of the heat therein, which is transmitted by the walls of the tubes 12 to the air passing up through them. It will be observed that as the air is introduced into the tubes at or near the point where the products of combustion escape it will be progressively heated, and vice versa. The products of combustion will have their heat units progressively abstracted, thereby effecting a greater utilization of nearly all the heat units generated.

In lieu of passing the products of combustion around and between the tubes 12 they may be caused to pass through them, as shown in Fig. 4, wherein the tubes are shown as thimble in the plate 2 and the bottom of the section 8, and flues 15 and 16 are formed through the upper and lower chambers of the stove for the passage of the air into and from the interior of the stove. The air enters at the bottom of the stove in this case also and traverses each chamber diametrically, passing around and between the tubes. In order to permit of access to the lower ends of the tubes for the purpose of securing them in the plate 2, the bottom plate, 3, is made removable, as shown in Fig. 4.

A plate, 17, having an opening therein, is secured across the bottom of the stove below the plate 3, and over said opening is placed a wire-gauze diaphragm for the purpose of preventing dust or other light particles from being drawn up into the tubes or chambers.

The pipe or flue 18 is provided at a point near its connection with the stove with an opening for the reception of a water-vessel, 19. The evaporation of the water will produce sufficient moisture to prevent an undue dryness of the air in the room.

In lieu of making the tubes 12 in one piece,

as above described, they may be formed in sections, as shown in Fig. 5, said tubular sections being made of a length a little greater than the height of the cup-like sections and secured in said sections, as shown.

I am aware that stove-bodies have been formed of a series of bands or rings resting one upon the other, and also that stoves and heaters having a series of baffle-plates are old; but in my improved stove the body is formed of a series of cups having openings in their bottoms and of tubes passing through said bottoms.

I claim herein as my invention—

1. In a stove, a heating-chamber composed of two or more cup-like sections, the bottom of each being provided with an opening, said sections being adapted to be fitted together telescopically, whereby the sides of said sections form the walls of the chamber and the bottoms form baffle-plates, in combination with two or more open-ended tubes traversing the cup-like sections, substantially as set forth.

2. In a stove, a heating-chamber composed of two or more cup-like sections, the bottom of each section being provided with an opening, said sections being adapted to be fitted together telescopically, whereby the sides of said sections form the walls of the chamber and the bottoms form baffle-plates, in combination with a combustion-chamber connected to the top section and an escape-flue connected to the bottom section, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILLIAM F. ZIMMERMANN.

Witnesses:

W. B. CORWIN,

DARWIN S. WOLCOTT.