

(No Model.)

2 Sheets—Sheet 1.

C. S. DEAN.
HOT AIR HEATING STOVE.

No. 525,069.

Patented Aug. 28, 1894.

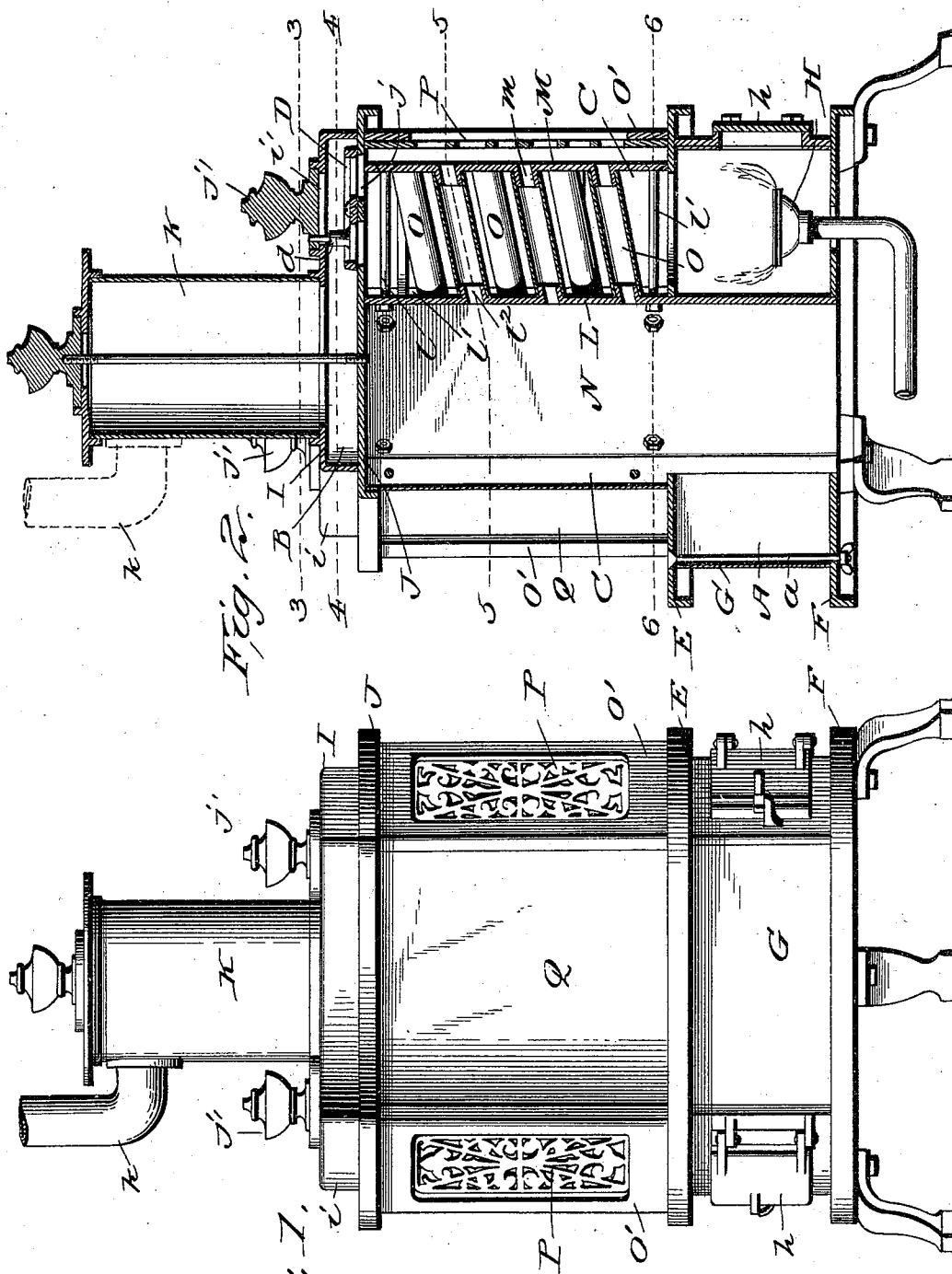


Fig. 2.

Fig. 1.

Witnesses
J. H. Hudson,
Van Buren Willard.

Inventor
Cyrus S. Dean
By Attorneys Robt. A. Lacey.

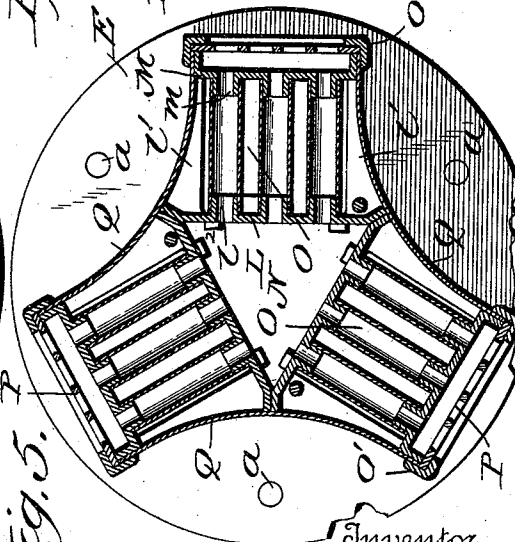
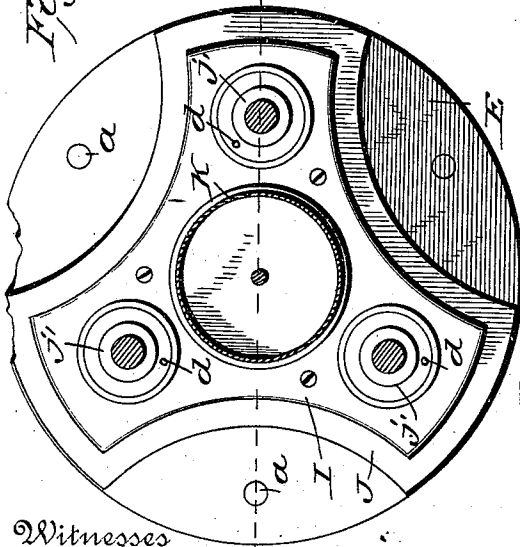
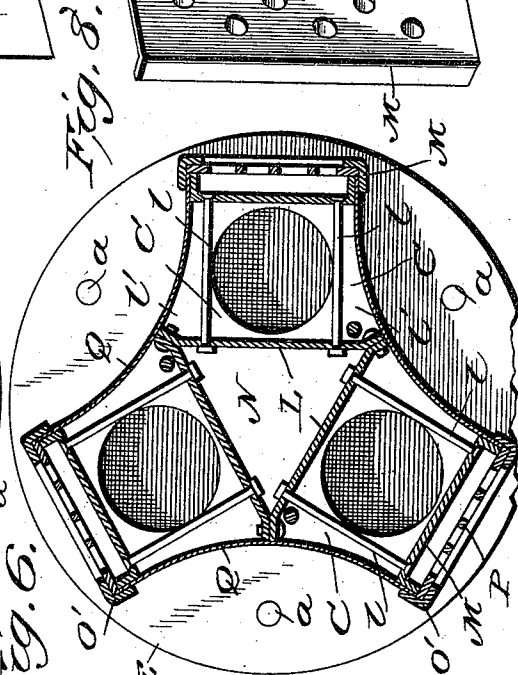
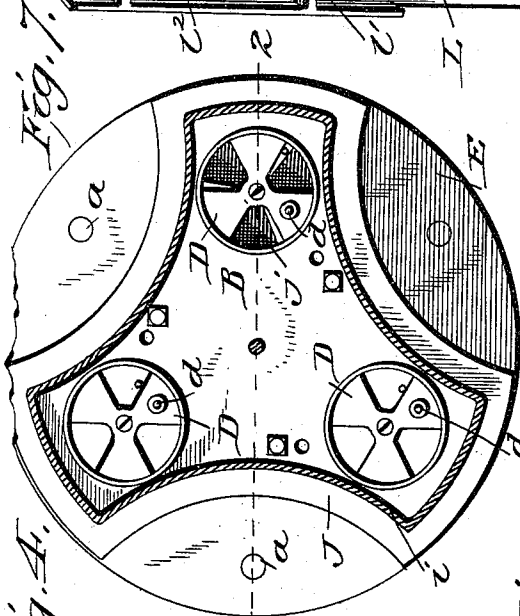
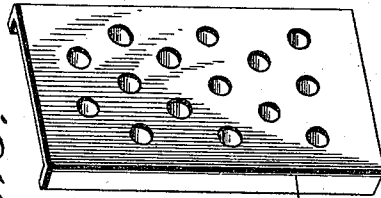
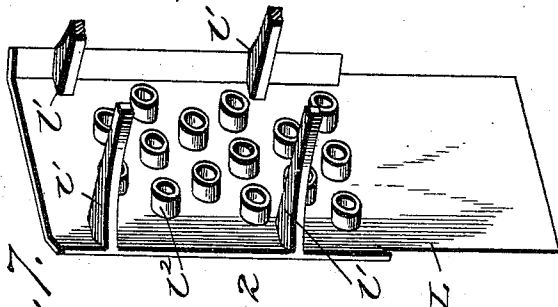
(No Model.)

2 Sheets—Sheet 2.

C. S. DEAN.
HOT AIR HEATING STOVE.

No. 525,069.

Patented Aug. 28, 1894.



Witnesses
Wm. H. Hayden,
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Fig. 3.

Fig. 5.

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UNITED STATES PATENT OFFICE.

CYRUS S. DEAN, OF FORT ERIE, CANADA, ASSIGNOR OF ONE-HALF TO
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HOT-AIR HEATING-STOVE.

SPECIFICATION forming part of Letters Patent No. 525,069, dated August 28, 1894.

Application filed November 3, 1893. Serial No. 489,900. (No model.)

To all whom it may concern:

Be it known that I, CYRUS S. DEAN, a subject of the Queen of Great Britain, residing at Fort Erie, in the county of Welland, Province of Ontario, Canada, have invented certain new and useful Improvements in Hot-Air Heating-Stoves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to heating stoves which are provided with tubes or flues to produce a circulation and heating of the air, the cool air being taken in at a low point, preferably near the floor of the apartment in which the heater is located, and discharged at a higher plane in the same apartment, the said air being heated in its passage through the flues or tubes of the heater.

The invention consists of a series of sections or drums arranged to provide a vertical central flue, each section or drum comprising a series or bank of tubes which are preferably inclined to the horizontal from the inner to the outer ends, the latter ends occupying, relatively, the higher level and the inner ends opening into the said central vertical flue to receive the air therefrom to be heated.

The invention further consists of a combustion chamber below the series of sections or drums common to all and from which the air, heated by means of a suitable heater, whether a hydrocarbon or gas burner, or, any of the usual forms of grate heaters, rises and passes around the space between the said banks of tubes to heat the air passing there-through.

The invention also consists of a smoke and gas chamber above the said series of sections or drums, having communication with the smoke pipe, and a damper to establish, cut off or control the passage of the smoke, gas and heated air from the spaces surrounding the bank of tubes of the said sections or drums, whereby the said smoke and heated gases may be caused to pass wholly through one of the said sections or drums, or differentially or uniformly through each as required.

The invention further consists of the novel

features and the peculiar construction and combination of the parts which will be hereinafter more fully described and claimed and which are shown in the annexed drawings, in which—

Figure 1 is a side elevation of a heater embodying the invention. Fig. 2 is a vertical section on the line 2—2 of Fig. 3 looking in the direction of the arrow. Figs. 3, 4, 5 and 6 are horizontal sections on, respectively, the lines 3, 4, 5 and 6 of Fig. 2. Fig. 7 is a detail view of the inner plate of a drum. Fig. 8 is a detail view of the outer plate of a drum.

The heater comprises, respectively, a combustion and a smoke chamber A, and B, a series of sections or drums C, and dampers D, one for each drum to effect or control the communication between the said drums and the smoke chamber.

The combustion chamber is composed of two parallel plates E and F and a shell G which are suitably held together by tie rods *a* in the usual manner. The heater, which may be of any required pattern, either a gas or hydrocarbon burner or any of the usual forms of grates for coal and like fuel, is located in the combustion chamber. As shown, this heater is a burner H for either gas or hydrocarbon. There may be as many heaters as required, usually one will be sufficient. Doors *h* are provided in the shell G by means of which access is had to the interior of the combustion chamber for any required purpose. These doors will be located opposite the heaters whereby the latter are readily accessible.

The smoke chamber is constructed in a similar manner to the combustion chamber, being comprised between parallel plates I and J and a rim or shell *i*, the latter forming preferably an integral part of the plate I. This latter plate is centrally apertured and surmounted by a dome K which receives the heated air, gases and smoke after leaving the smoke chamber B. A smoke pipe *k* communicates with the dome K to carry off the products of combustion. The plates I and J have co-incident openings *i'* and *j'*, respectively, opposite the drums C. The openings *j* are regulated by the dampers D, and the

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openings *v'* are closed by suitable devices *j'* for operating the said dampers. These devices *j'* are preferably ornaments being urns which are seated in circular recesses provided by an annular rib or flange surrounding the said openings *v'*. A pin *d* projects from each of the dampers across the smoke chamber and engages with the base of the ornament or damper operating device provided opposite the said damper to form a connection between the said damper and its operating device. By turning the devices *j'* in their seats the dampers can be opened or closed as will be readily understood.

The drums are each composed of an inner plate L and an outer plate M which are held together in any desired manner preferably by tie rods *l*. The plate L is longer than the plate M by a length corresponding to the distance between the plates E and F so as to extend across the space between the combustion chamber. Arms *l'* project from the plate L and touch the plate M to properly space the said plates. The inner plates have flanges along their edges by means of which the plates L are bolted together in series and form a flue N. In the present instance there are three drums, hence the flue is an equi-lateral triangle in cross section. Obviously, the form of the flue will depend upon the number of drums employed in the construction of the heater. While three drums are preferable the number may be increased without departing from the nature of the invention. A series of lateral tubes O connect at their ends with the plates L and M and preferably incline from the inner to the outer ends. The inner ends of the tubes communicate with the flue N and the outer ends with the air surrounding the heater. Co-incident openings are provided in the plates L and M to register with the ends of the tubes and nipples *l'* and *m* project from the inner faces of the plates to receive the ends of the tubes, the said nipples inclining to correspond with the inclination of the tubes. The outer plates M have flanged edges which are embraced by corresponding flanges of a frame O'. A suitable register P is located between the plate M and the frame O' and is held in place by the latter. Sheet metal plates Q curving inward between their edges, are arranged between the drums, the edges of the said plates Q being held between the flanges of the plates M and the frames O'. These plates Q touch the flanged edges of the plates L and form the end walls of the drums. The arms *l'* curve to conform to the curved plates Q and touch the latter near the ends to brace and strengthen them.

The lower plates E and F are circular and the upper plates I and J conform to the approximately triangular shape of the body of the heater. That portion of the plate E opposite the depressions formed by the curved plates Q can be utilized to form a support for suitable ornaments or for useful purposes as a warming shelf.

The operation of the invention is as follows: The burner or other form of heater being started the smoke, and products of combustion will rise and pass through the drums C. If one of the dampers D is opened full and the other closed, the smoke, &c., will pass entirely through the drum to which the said damper is opened. On the other hand if all the dampers are properly adjusted, the smoke and heated gases will pass uniformly through the drums and heat the same alike so that the pure air passing through the flue N and the tubes O will be evenly heated and discharged through the registers at about the same temperature. The pure air enters the lower end of the flue N below the combustion chamber and passes up through the same and laterally through the tubes O being heated its passage through the same in the manner well understood.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A heater comprising a combustion chamber, a series of drums arranged above and having communication with the said combustion chamber, a smoke chamber located above and common to all of the said drums, and dampers, one for each drum, to effect and control communication between the said drums and the smoke chamber, substantially as and for the purpose described.

2. A heater comprising a combustion and a smoke chamber located at relatively different elevations, a series of drums arranged between the said chambers around a vertical flue, and having lateral tubes which communicate with the said vertical flue at their inner ends, and dampers, one for each drum to effect and control communication between the said drums and the smoke chamber, substantially as described.

3. A heater comprising a combustion and a smoke chamber arranged at different relative levels, a series of drums located between the said chambers and disposed to form a vertical flue which extends entirely through the said combustion chamber, and dampers, one for each drum, to effect and control communication between the said drums and the smoke chamber, substantially as described for the purpose specified.

4. A heater comprising a combustion and a smoke chamber arranged at different relative levels, a series of drums located between the said smoke and combustion chambers to form a vertical flue which projects through the combustion chamber, each drum having a series of lateral tubes which lead from the said flue and incline upwardly, and dampers, one for each drum to effect and control communication between the said drums and the smoke chamber, substantially as described.

5. A heater comprising a combustion and a smoke chamber located at, relatively, different elevations, a series of drums located between the said chambers and arranged to

form a vertical flue, each drum being composed of inner and outer plates suitably connected together and having a series of corresponding openings, the inner plates being
5 longer than the outer plates and extended through the combustion chamber, a series of lateral tubes connecting the said plates, and dampers, one for each drum, to effect and control communication between the said drums

and the smoke chamber, substantially as is specified.

In testimony whereof I affix my signature in presence of two witnesses.

CYRUS S. DEAN.

Witnesses:

VAN BUREN HILLYARD,
LILLIE M. HILLYARD.