J. A. LAWSON.

Hot Air Furnace.

No. 46,250. Patented Feb. 7, 1865.

Fig: 1.

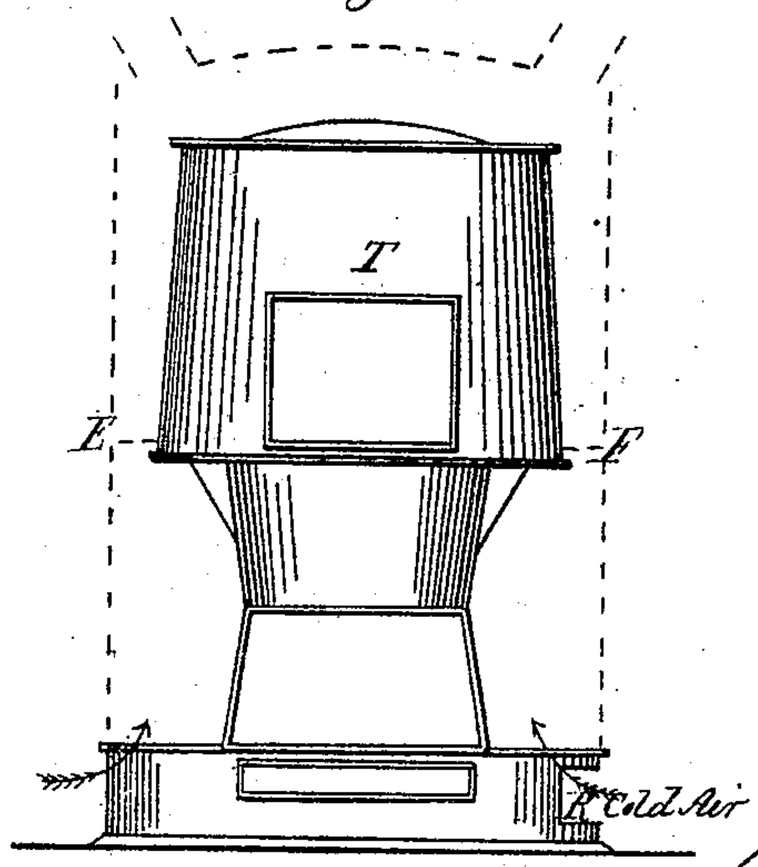



Fig: 2. A B

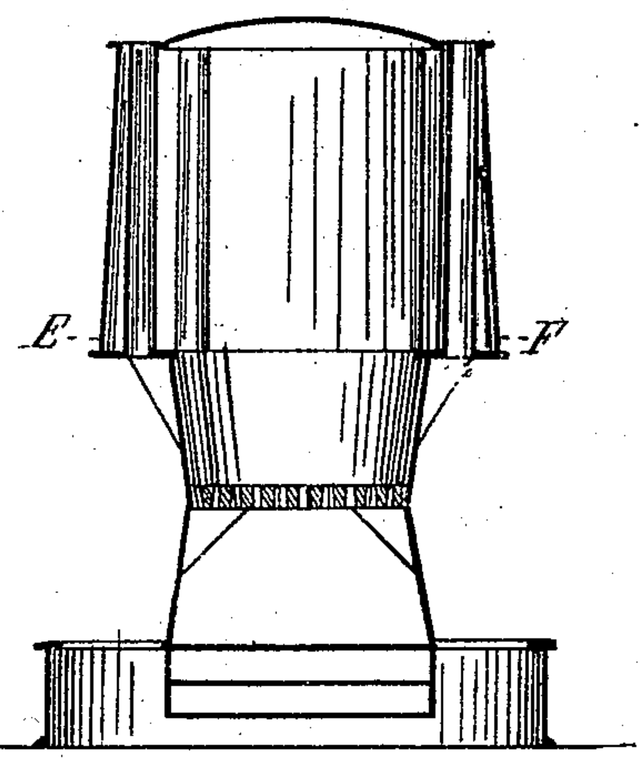



Fig: 5
Plan at E, F

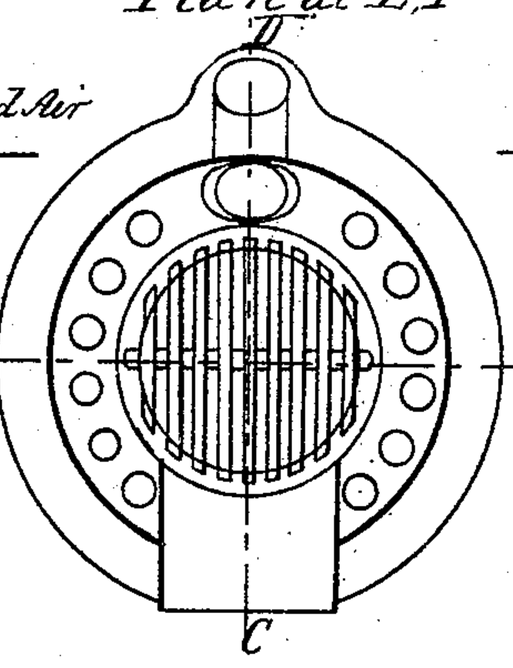



Fig: 3.

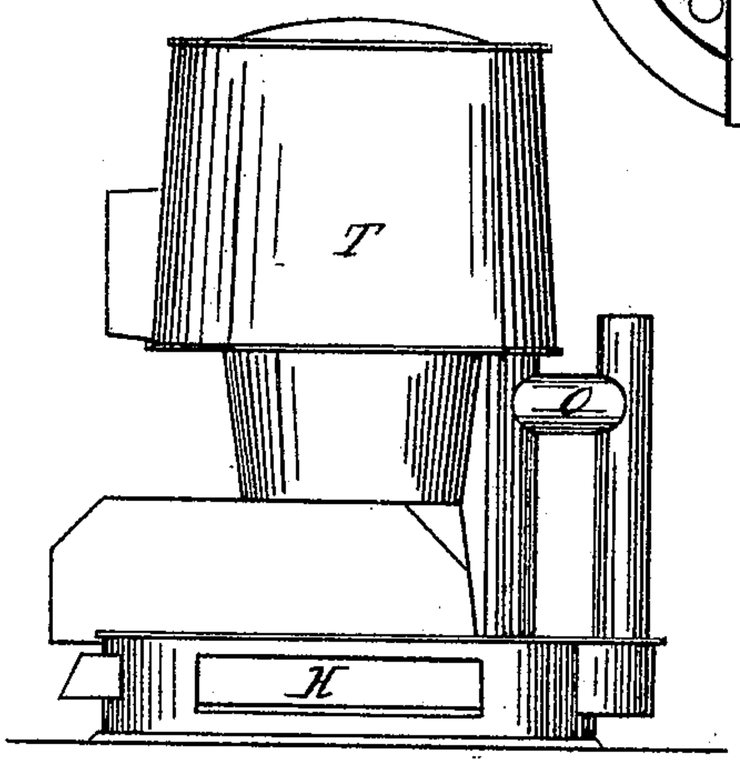
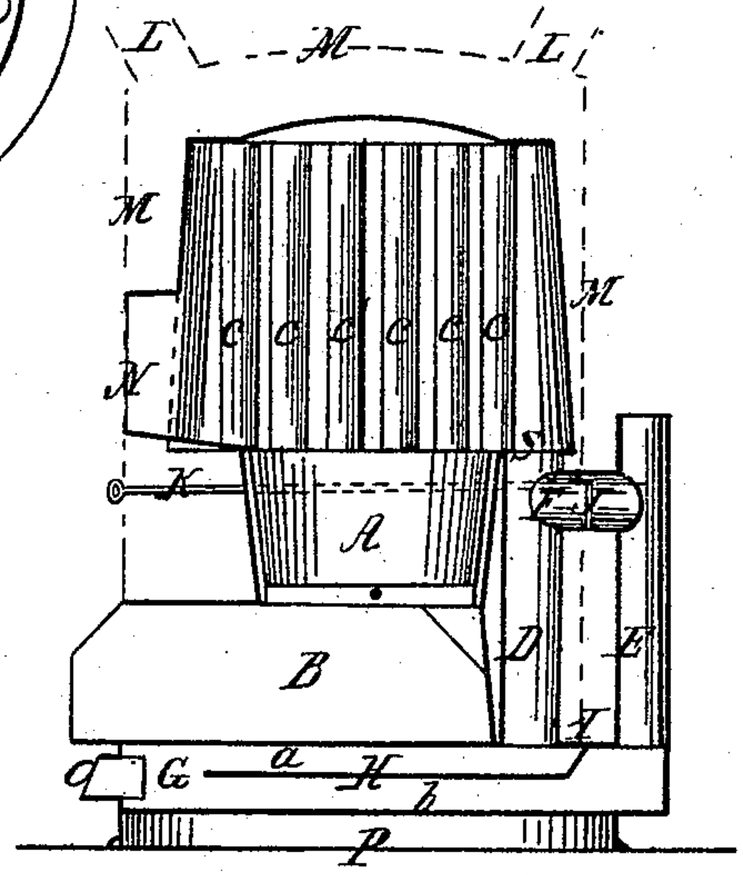



Fig: 4. C D.




Witnesses,
Marcus P Morton
W B MacGregor.

Inventor.
James A Lawson

# UNITED STATES PATENT OFFICE.

JAMES A. LAWSON, OF TROY, NEW YORK.

## IMPROVEMENT IN HEATERS FOR BUILDINGS.

Specification forming part of Letters Patent No. **46,250**, dated February 7, 1865; antedated November 15, 1864.

*To all whom it may concern:*

Be it known that I, JAMES A. LAWSON, of the city of Troy, county of Rensselaer, and State of New York, have invented certain new and useful improvements in furnaces or heaters for dwellings, stores, churches, &c., when the same may be used for heating or warming purposes; and I hereby declare that the following is a full, clear, and exact description of the same, reference being hereby had to the accompanying drawings, together with the letters of reference thereon marked.

Like letters represent and refer to like or corresponding parts.

Figure 1 is a front elevation; Fig. 2, a section on the line A B, Fig. 5. Fig. 3 is a side elevation. Fig. 4 is a section on the line C D, Fig. 5; and Fig. 5 is a cross-section on the line E F, Figs. 1 and 2. Fig. 4 is a vertical section showing the parts hereinafter more fully described.

The nature of my invention and improvement consists in the employment of return-flues directly underneath the ash pit or chamber, in combination with the vertical draft-pipes, hereinafter described, so that the cold air, on entering the heater at the lower part of the base, will become somewhat heated before passing into and through the heating-tubes, hereinafter described, by means of the return-flues, the fire pot or chamber, and upper cylinder or radiator, and each hereinafter fully described and set forth.

To enable others skilled in the art to make and use my said invention, I will here proceed to describe the construction and operation of the same.

A is the fire pot or chamber.

B is the ash pit or chamber, upon which rests the said fire-chamber, and which ash-chamber is directly upon the flue chamber or space G, which said space or chamber is divided into two parts by means of the partition-plate H, Fig. 4, which said plate joins the top plate of the said flue chamber at I, same figure, and between the pipes D and E, thus and thereby forming a return-flue, *a b*, Fig. 4.

F is a cross-pipe, connecting the vertical pipes D and E. In this cross-pipe is the damper J, which is for the purpose of regulating the draft and giving the same the direction through the said flue space or chamber above described, whereby and by means of which a greater or enlarged heating-surface is attained for the purpose of the heating of the air for distribution to and through the apartments to be warmed. When the said damper is closed, the draft will be down the vertical pipe D, along the flue *a* to the front of the said flue space or chamber, and thence along the said flue *b* to the rear end of the said flue-chamber, and thence up the vertical exit-pipe E. When the said damper is open, then the draft is direct, and there will of course be little or no circulation of the fire or heated air through the said flues hereinbefore described. The said damper is operated by means of the rod K, Fig. 4. The said fire pot or chamber may be of any shape or size deemed desirable. At the bottom of the said fire-chamber there is a fire-grate, of any construction deemed best. Upon the top of and surrounding the said fire-chamber I construct a cylinder, C, which contains the heating-tubes *c*, Fig. 4. These tubes are for the purpose of heating the air to be distributed to the apartments to be warmed by means of the pipes L. The fire-pot itself contributes largely to the heating of such air. The said air may be heated, first, by the flue space or chamber G; second, by the fire pot or chamber A; and, third, by passing upward through the said heating-tubes *c*. This is the usual manner of heating such air. There may be as many such heating-tubes as deemed best, and they may be of any size or material to answer the required purposes.

M M is the outside casing, which may be made of sheet-iron of any kind or quality, which is for the purpose of retaining the air while being forced into contact with the heating-surfaces hereinbefore described.

N is the door for supplying the fire-chamber with fresh coal. There may be a damper in the door which closes up the front of the said ash pit or chamber B, for the purpose of admitting the draft in the usual manner. The vertical exit-pipe E connects at its lower end with the rear end of the lower flue, *b*, while the vertical draft-pipe D connects the lower end with the first part of the return-flue *a* in the base of the heater and immediately below the said ash pit or chamber. The said return-flue may

be cleaned out entirely clean by means of the opening O directly in front of the same. This entire furnace or heater may rest upon a solid wall, P, of any desired height from the surface of the ground or floor on which the same may be placed. An air-chamber may, if desirable, be formed underneath the entire heater. The air to be heated is admitted through the opening R, Fig. 3, and then surrounding and passing the heating-surfaces aforesaid it is heated to the desired temperature and distributed to the apartments to be warmed in the manner aforesaid. If desirable to moisten the air thus to be heated, or heated by the evaporation of water, the same may be done without any difficulty. The said heating-pipes *c* are securely held in their respective places by means of a plate at each end thereof, having pipe-holes of the size to correspond with that of said heating-pipes, with a flange entirely around such pipe-hole of a size to receive the pipe aforesaid and hold them in their desired place, which when done the same may be secured together firmly in any way deemed best. The full size of the said heating pipes *c* will project over and beyond the top of the said fire pot or chamber A, so that the air passing upward alongside of the said fire-chamber will enter the lower ends of the said pipes, and passing upward through them will become heated to that temperature required. The said pipes are heated by the fire in the fire-chamber, to which the entire surface of the said pipes is exposed. The upper end of the vertical pipe D is connected to the fire-chamber at S.

T, Figs. 1 and 3, is a cylinder, entirely surrounding the said pipes *c*, which becomes heated by the same means which heat the said pipes *c*, which, when thus heated, contributes largely to heat the air to be used for warming purposes in addition to the other parts hereinbefore described.

Having thus described my said invention and improvement in furnaces or heaters, what I claim, and desire to secure by Letters Patent, is—

The employment of the return-flue space or chamber G, in combination with the vertical pipes D and E and with the fire-chamber A, in the manner and for the purposes substantially as herein described and set forth.

In testimony whereof I have, on this 20th day of April, A. D. 1864, hereto set my hand.

JAMES A. LAWSON.

Witnesses:

MARCUS P. NORTON,

B. MACGREGOR.