2 Sheets--Sheet 1.

JOHN S. SUMNER.

Air Heating Furnace.

No. 124,229. Patented March 5, 1872.

Fig 1.

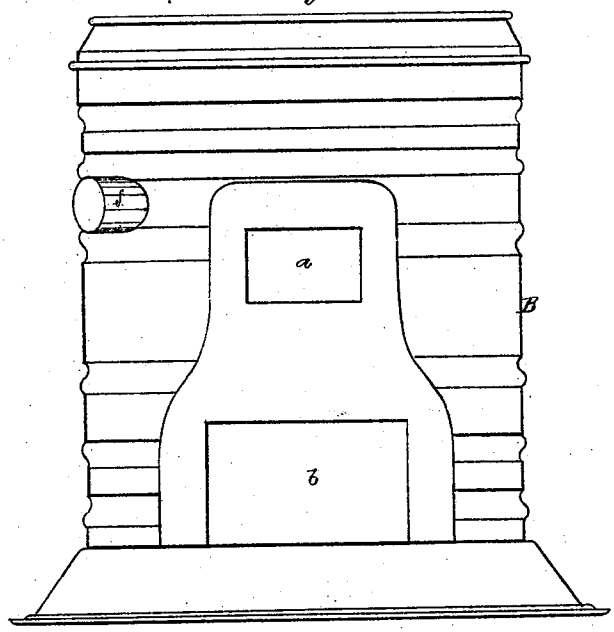
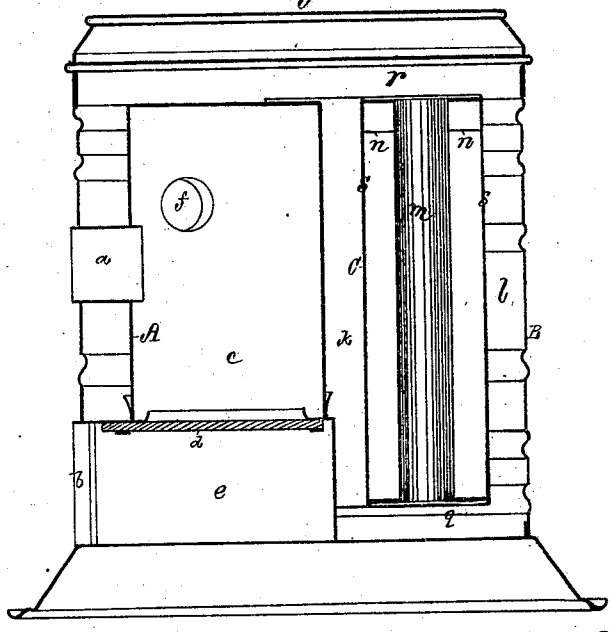


Fig 2.



Witnesses.

S. A. Piper

L. N. Möller

John S. Sumner.

by his attorney.

R. H. Eddy

AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

2 Sheets--Sheet 2.

JOHN S. SUMNER.

Air Heating Furnace.

No. 124,229. Patented March 5, 1872.

Fig 3.

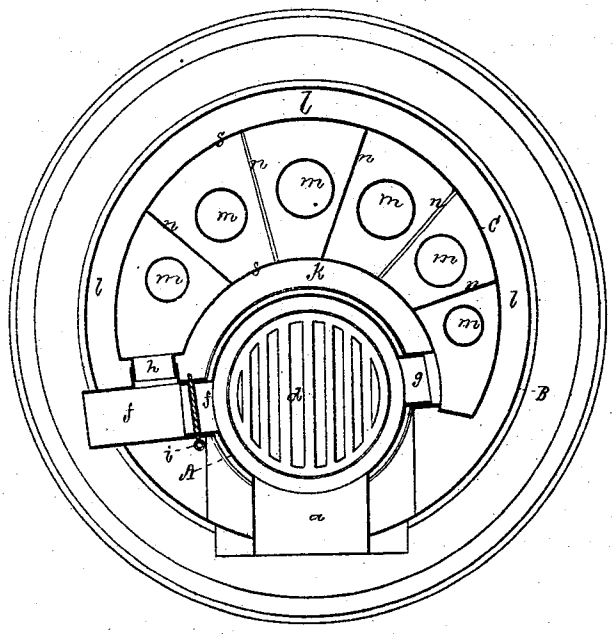
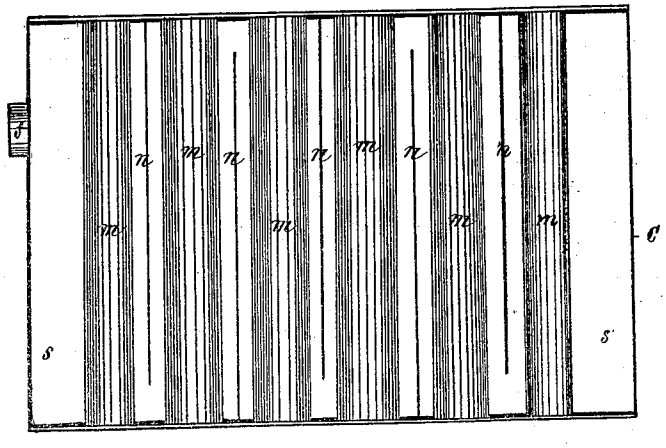


Fig 4.



Witnesses.

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R. K. Eddy.

AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

JOHN S. SUMNER, OF NEWTON, MASSACHUSETTS.

IMPROVEMENT IN AIR-HEATING FURNACES.

Specification forming part of Letters Patent No. 124,229, dated March 5, 1872.

To all persons to whom these presents may come:

Be it known that I, JOHN S. SUMNER, of Newton, of the county of Middlesex and State of Massachusetts, have invented a new and useful or Improved Air-Heating Furnace for Warming a Building; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing making part thereof.

Of such drawing, Figure 1 denotes a front elevation, Fig. 2 a vertical section, and Fig. 3 a horizontal section of it. Fig. 4 is a section taken longitudinally and vertically through the middle of the radiator, and going in a curve from one to the other end of it.

My invention or improvement has reference to the radiator of the furnace, and the arrangement and connection of such radiator with the stove and its exit-pipe.

In such drawing, A denotes a stove, arranged within a cylindrical case, B, and having its ash-chamber and fire-place throats *a b* opening through the said case, as shown. The fire-place or chamber of combustion of the stove is represented at *c*, the grate at *d*, the ash pit or chamber at *e*. There are two educts or smoke-pipes *f g* leading out of the stove in opposite directions. One of them, viz., that marked *g*, opens directly into the upper part of the radiator C at one end thereof. The other, *f*, extends to and through the case B, and is intended to lead to a chimney. An eduction-pipe, *h*, opens out of the other end of the radiator into the discharge-pipe *f*, there being in the pipe *f* a damper, *i*, arranged between the stove and the exit-pipe *h*. On opening this damper, the smoke, gases, and volatile products of combustion from the fire-place will pass off without going through the radiator; but, on closing the damper, the smoke and gases will be caused to enter the radiator and pass through it before escaping into the discharge-pipe *f*. The radiator extends partially or half way around the stove concentrically, there being between the two an air-space, *k*. There is, also, such another space, *l*, around the radiator, or between it and the inner periphery of the case B. There is also a space, *q*, between the bottom of the radiator and that of the case B, and there is another space, *r*, between the top of the radiator and the top of the case B, all being as shown. The said radiator consists not only of a curved box, *s*, and a series of pipes, *m m m*, arranged vertically therein, and extended from head to head of the radiator, and opening through such, but of a series of transverse vertical partitions, *n n n*, arranged between the said pipes in manner as shown, the partitions being extended alternately down from the upper head and up from the lower head of the radiator in manner as represented. Each partition terminates at a distance from the head which is opposite to that one from which such partition is projected. In consequence of this arrangement of the partitions with the box *s* and the pipes *m*, the smoke and hot gases, while coursing through the radiator, will be caused to pass alternately up and down therein, so as to go down around and against one pipe and up against and around the next, whereby not only will all the pipes be thoroughly heated, but the sides and top and bottom of the radiator will be heated. The air received into the case B through one or more openings will be free to circulate through the pipes or the radiator, as well as against its outer surfaces, and after deriving heat therefrom may be removed by one or more pipes leading from the case B to the room or apartments to be warmed.

I claim—

1. The radiator constructed as described, viz., of the curved box *s*, pipes *m*, and partitions *n*, arranged in manner as specified.

2. I also claim the curved radiator C, the stove A, and their connection, and discharge-pipes *f g h*, and damper *i*, arranged in manner and with the case B substantially as shown and explained.

JOHN S. SUMNER.

Witnesses:
R. H. EDDY,
J. R. SNOW.