(Model.)

W. H. THOMAS.

HOT AIR FURNACE.

No. 342,399. Patented May 25, 1886.

Fig. 1.

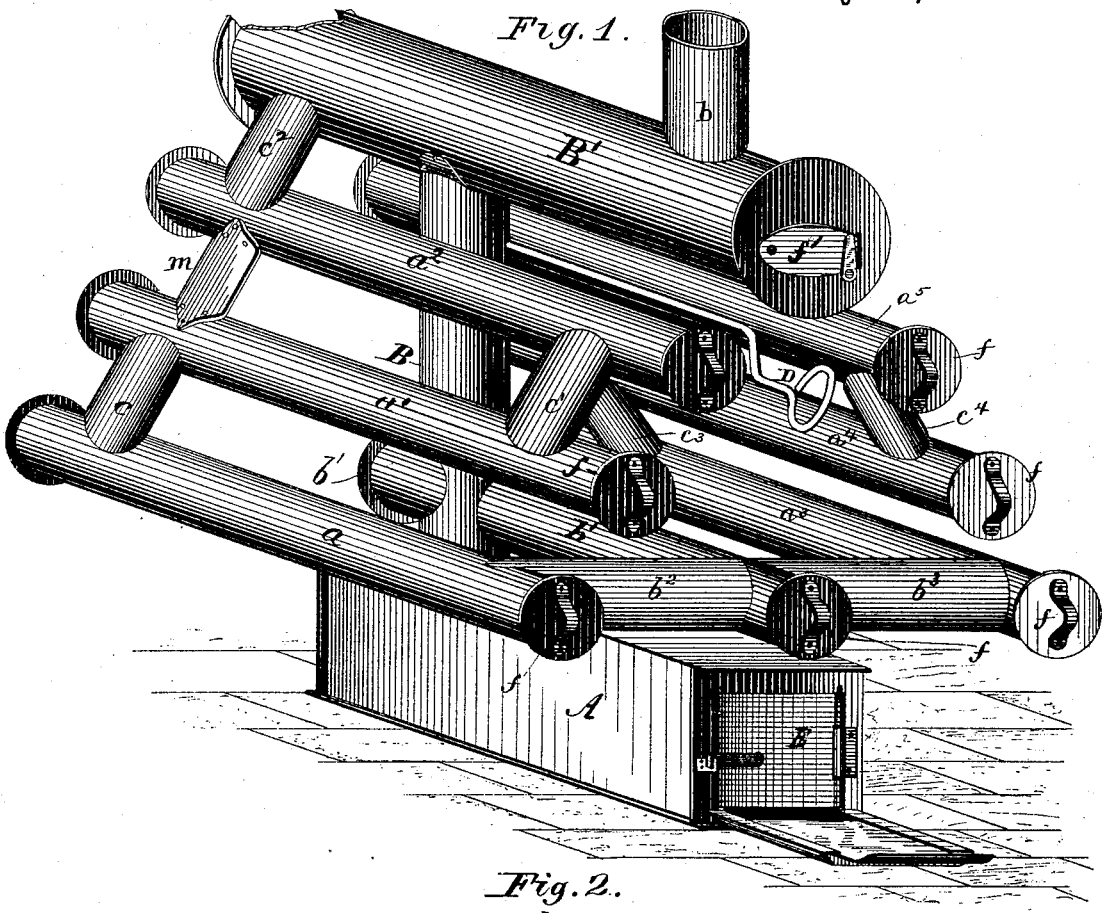
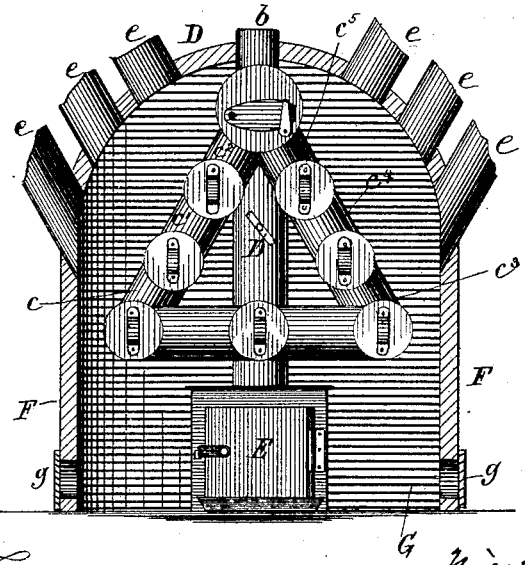


Fig. 2.



Witnesses:

B. Carlyle Fennick

Ph. Fennicke

Inventor

William H. Thomas

by Munn, Fennick & Thomas

his Attys.

UNITED STATES PATENT OFFICE.

WILLIAM HENRY THOMAS, OF EAU CLAIRE, WISCONSIN.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 342,399, dated May 25, 1886.

Application filed July 20, 1885. Serial No. 172,031. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY THOMAS, a citizen of the United States, residing at Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented certain new and useful Improvements in Wood-Burning Furnaces; 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.

Figure 1 is a perspective view of the furnace divested of its inclosing-wall or hot-air jacket; and Fig. 2, a transverse sectional view through the jacket, showing the hot-air conducting-pipes and the furnace proper in elevation.

The object of the invention is the production of a cheap and effective wood-burning furnace which shall be particularly adapted for burning slabs and the refuse of saw-mills or other wood of a highly-inflammable nature. To this end I employ a heavy cast-iron box-stove, A, of proper dimensions, the length being such as will take in, for instance, a slab when cut into the ordinary length of cord-wood—say four and a half feet. At the rear end the stove A is made to connect, in the usual manner, with a large draft-pipe, B, which at its upper end communicates with the apex pipe B′ of the triangular nest of pipes shown supported upon the stove A, the pipe *b* being the common exit-pipe for the passage to the chimney of the building of the products of combustion.

It will be seen that the nest of pipes supported upon the stove A consists of side pipes, *a a′ a²*, on one side of its longitudinal center, and pipes a^3 a^4 a^5 on the opposite side of said longitudinal center, while the apex pipe B′, from which the products of combustion finally escape, crowns the said nest of pipes, so as to form a complete triangle, and that they being thus angularly arranged over the stove A the radiation of heat from the stove will in its ascent come successively in almost direct contact with said pipes, thereby in an effective manner serving to heat the same in addition to the heating thereof by the products of combustion passing through them from the stove A to the common exit-pipe *b*. It will also be seen that the draft-pipe B, which is of greater diameter and strength than the longitudinal side pipes, *a a′ a²*, and a^3, a^4, and a^5, and b' b^2 b^3, is made to support the entire triangular nest of pipes by being near its bottom connected with said side pipes, as shown, and at its top with the apex pipe B′ at a point midway or nearly midway of its length, whereby the whole number of said pipes may rest in suspension or balanced upon the draft-pipe B, sufficient lengths of said longitudinal pipes extending in front and in rear of the draft-pipe B, to practically effect such result.

As indicated, the draft-pipe B is provided with a damper, D, whereby the entire draft of the furnace may be made to pass at once into the apex pipe B′, and thence out at *b*, and so prevent "smoking" during the act of kindling a fire in the furnace. This damper, after starting the fire, may be turned, thereby forcing the products of combustion from the pipe B into *b′*, and thence through b^2 into *a*, and thence through connecting-pipe *c* into *a′*, and thence through connecting-pipe *c′* into a^2, and thence through connecting-pipe c^2, all on one side of the stove A, into apex pipe B′, while at the same time products of combustion pass from the draft-pipe B into *b′*, and thence into corresponding pipes and connecting-pipes, as b^3, a^3, c^3, a^4, c^4, a^5, and c^5, on the opposite side of the stove A, until the divided currents finally meet in the enlarged apex pipe B′, from whence they discharge through pipe *b* into the chimney. At proper points between the pipes *a′* a^2 and a^4 a^5 stays, as *m*, to the said pipes may be provided. There may also be suitable legs or standards provided for supporting the nest of pipes at one or both ends within the furnace wall or jacket. As indicated in Fig. 2, all these pipes and the stove A are inclosed in a proper hot-air jacket, F, but with the front end and fuel-door E of the stove and with the front ends of the pipes *a*, *a′*, a^2, a^3, a^4, a^5, *b′*, and B′ extending out from the inclosing-jacket, and thus the entire pipe system of the furnace will remain protected while fuel is being inserted through the door E into the stove, and while at the same time the said longitudinal pipes, except B′, are each provided with a removable cap, *f*, to facilitate the cleaning of the pipes, and B′ with a check-draft door, *f′*, which may be opened to "deaden" the draft when desired.

The stove-door E may be provided with requisite passages for air to promote combustion, and into the interior G of the furnace air to be

heated may be admitted through proper air-passages, *g g*.

As indicated in Fig. 2, *e* are hot-air-conveying pipes for distributing heated air to the rooms of a building in which the furnace is used.

It will be seen that the products of combustion circulate on each side of the central longitudinal pipe, *b'*, in a long zigzag course, and thus nearly the whole effective heat of the same in their passage to the apex pipe B' and exit-pipe *b* will be utilized for heating the surrounding air within the jacket F. It is practicable to thus employ a nest of radiation-pipes forming zigzag circulation-passages with a stove which is heated by wood, as a large amount of flame is produced from such fuel, and the same flows rapidly and a long distance before its direct heating-power is exhausted.

What I claim is—

In combination with a stove, a pipe, B, a damper, D, and a nest of circulation and radiation pipes forming zigzag passages, and arranged triangularly above the stove upon the pipe B, and its apex pipe B', having a draft-pipe, *b*, and the pipe *b'*, extended from the pipe B along the top of the stove, and connected by pipes b^2 b^3 with the forward portions of pipes *a* a^3, forming a part of the triangular nest, substantially as described.

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

WILLIAM HENRY THOMAS.

Witnesses:
MILTON D. BARTLETT,
SAMUEL C. BROOKS.