W. M. WRIGHT.

Hot-Air Furnace.

No. 15,791. Patented Sept. 23, 1856.

Fig: 8

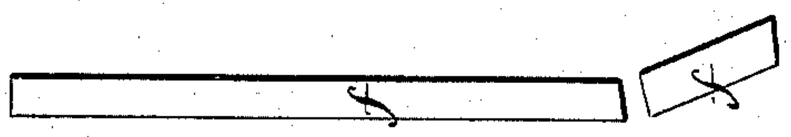


Fig: 2.

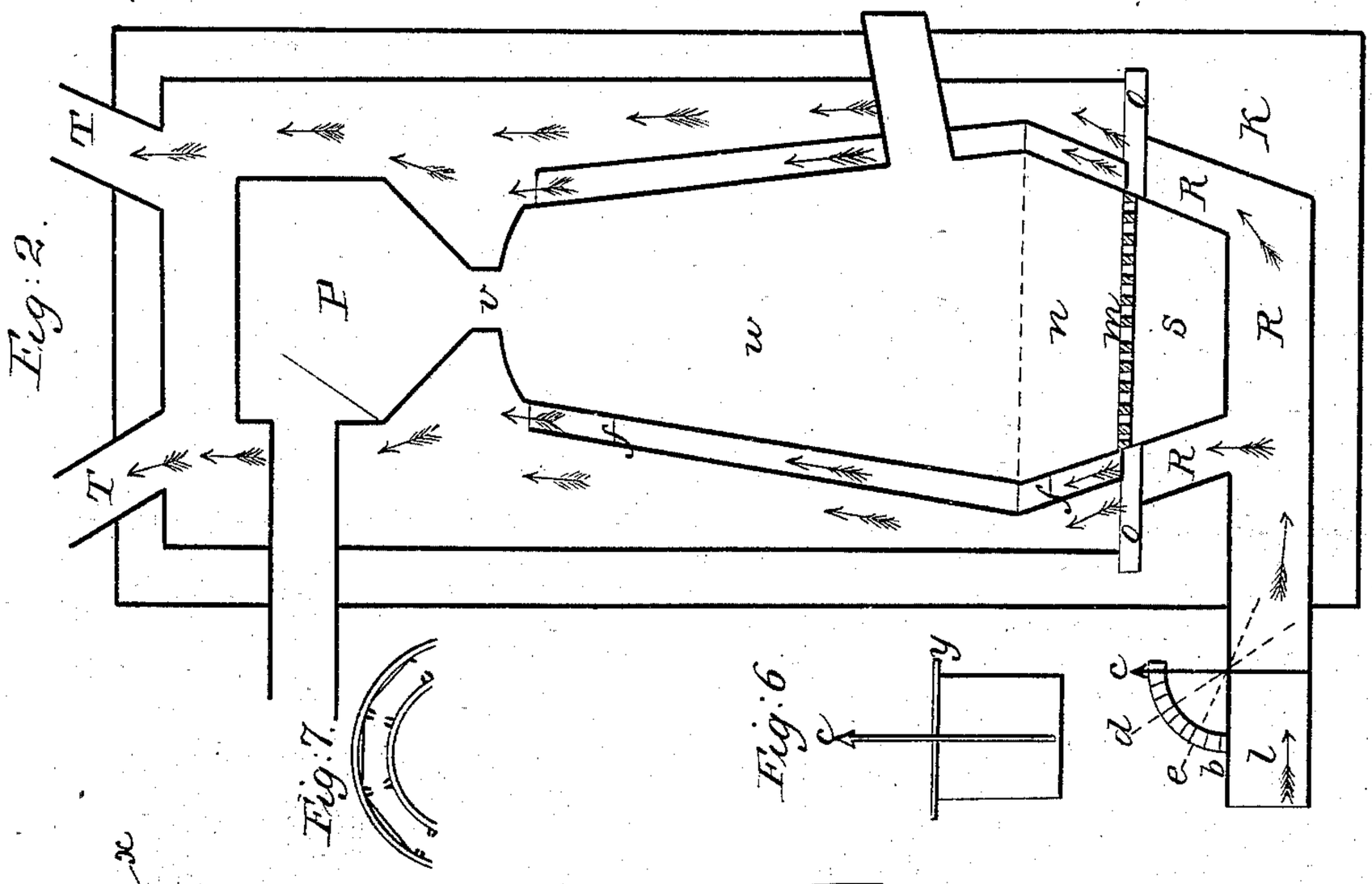


Fig: 7.

Fig: 6

Fig: 1.

Fig: 4.

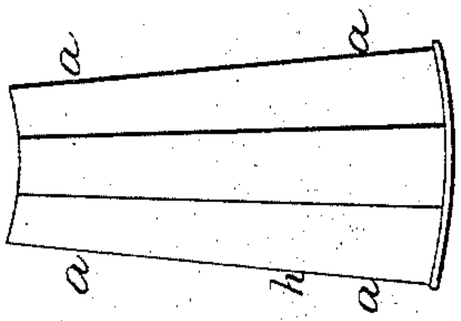


Fig: 3.

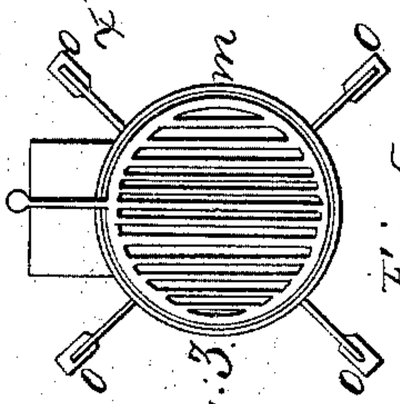
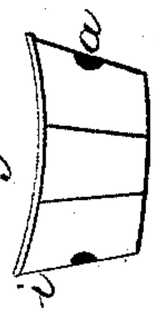


Fig: 5.



UNITED STATES PATENT OFFICE.

WILLIAM M. WRIGHT, OF PITTSBURGH, PENNSYLVANIA.

WARM-AIR FURNACE.

Specification of Letters Patent No. 15,791, dated September 23, 1856.

To all whom it may concern:

Be it known that I, WM. M. WRIGHT, of the city of Pittsburgh, county of Allegheny, and State of Pennsylvania, have invented a new and Improved Warm-Air Furnace for Warming Dwellings, Public Buildings, &c.; and I do hereby declare that the following is a full, clear, and exact description of its construction and of its operation, reference being had to the annexed drawings of the same, making part of this specification, in which—

Figure 1 is a perspective view of the furnace with a portion of the brick casing cut away. Fig. 2 is a vertical section through X X of Fig. 1. Fig. 3 is a cast iron rim with projecting arms. Fig. 4 is an upper section of the jacket which holds the radiating plates in their position. Fig. 5 is an under section of the same. Fig. 7 shows the slots on the jacket and furnace to secure the radiating plates in their position. Fig. 8, radiating plates.

The same letters indicate the same parts in all the figures.

My improvement consists in the manner of supporting the furnace on the foundation, the manner of increasing the radiating surface, by means of radiating plates.

In the accompanying drawing (K) is the foundation, built of brick, or any other material of equal strength and durability. It may be built round, as is shown in the drawing. The walls should be at the least from 12 to 18 inches in thickness, leaving an opening in the center (R) deep and wide enough for the ash pit to be suspended in, with from 4 to 6 inches of space (R R) around the ash pit for the passage of cold air up to the body of the furnace. This center opening, or cold air chamber, has two openings, one for the mouth of the ash pit (Z), and the other (*l*) for the entrance of the cold air.

The foundation being of the proper height, the cast-iron rim (in Fig. 3) is placed on it. This rim holds the grate (made in the usual form) and the ash box (S) and has four projecting arms (*o o o o* Fig. 3) from 2 to 3 inches broad, ½ inch wide and long enough to reach to the middle of the foundation wall. The ends that rest upon the foundation have a square piece cast upon them to make them rest firm and solid. The upper face of this rim has a groove made to receive the fire pot. The under face holds the ash box, which is cast with the rim. This arrangement simplifies and cheapens the cost of the furnace, while it forms a substantial support for the castings which all rest immovably upon it. The ash-box being cast with the rim prevents the possibility of any smoke or ashes entering the heated-air chamber.

The rim (*m*) with the ash pit is then placed on the foundation, care being taken to have it level and firm, and the mouth of the ash pit (*z*) built in its proper position. The rim (*m*) by its arms (*o o o o*) supports the entire furnace. The first section (*n* Fig. 2) may now be placed in its position on the rim. The cast-iron jacket is fastened around it by means of screws which pass through lugs (*a* Fig. 5) cast upon each section of the jacket. This jacket is made in four sections, and these sections are divided into planes of 6 or 8 inches, according to the diameter of the furnace. On the inside of the jackets and on the outside of the first and second sections of the furnace (*w* and *n* Fig. 2) slots are cast (Fig. 7) at such distances as are required by the size and capacity of the furnace. The short plates (*f*) are slipped into the slots (Fig. 7). The upper section (*w*) is now placed on top of the fire pot with the chute to receive the coal over the mouth of the ash pit. The jacket (*h* Fig. 4) for the upper part is then placed around and fastened as the lower ones, and the radiating plates (Fig. 8) are slid down. The number and size of these plates to be regulated by the size of the furnace.

The radiating plates (Fig. 8) are cast from a plain pattern and should be made to fit close to the sides of the furnace and jacket and of sufficient thickness to retain the heat after it has been imparted to them by contact with the furnace. The same may be said in reference to the jacket. The whole may be surmounted by a drum (P), made of cast or heavy sheet iron. The smoke pipe, if the drum is attached, will pass from it—if not, it will come directly from the top of the furnace at (*v*).

The furnace being properly erected and incased in brick or sheet iron, and fire being made in it, the radiating plates and jacket become heated by the conducting property of the iron. By this contact, the plates and jacket become very hot, but never, (especially the upper section of the plates and

jacket) can reach the point of redness. Thus a large amount of radiating surface is heated at a very small expense, and is so heated as not to destroy the vitality of the air, when brought in contact with it. It is a well known fact that, when air is made to pass over iron heated to the degree of redness, the constituent properties of such air become changed, so as to render it unfit for respiration—hence the importance and novelty of this improvement by which the conducting property of the iron is arrested at a point below redness, by placing the radiating plates in contact with, and not cast on the fire pot.

I do not claim radiating or projecting surfaces which are cast with the fire pot or upper section of the furnace as used in James Miller's patent of Oct. 16, 1838—but

What I do claim and desire to secure by Letters Patent is—

1. The manner of increasing the radiating surface by the use of the movable plates, all in the manner and for the purpose as herein set forth.

2. The manner of constructing the ash box with its rim (*m*) to receive the fire pot, and projecting arms or supports (*o o o o*) substantially in the manner and for the purpose specified.

W. M. WRIGHT.

Witnesses:
E. P. MARTHENS,
WM. M. TABER.