D. T. WOODROW.

Furnace.

No. 29,840. Patented Aug. 28, 1860.

Fig. 2.

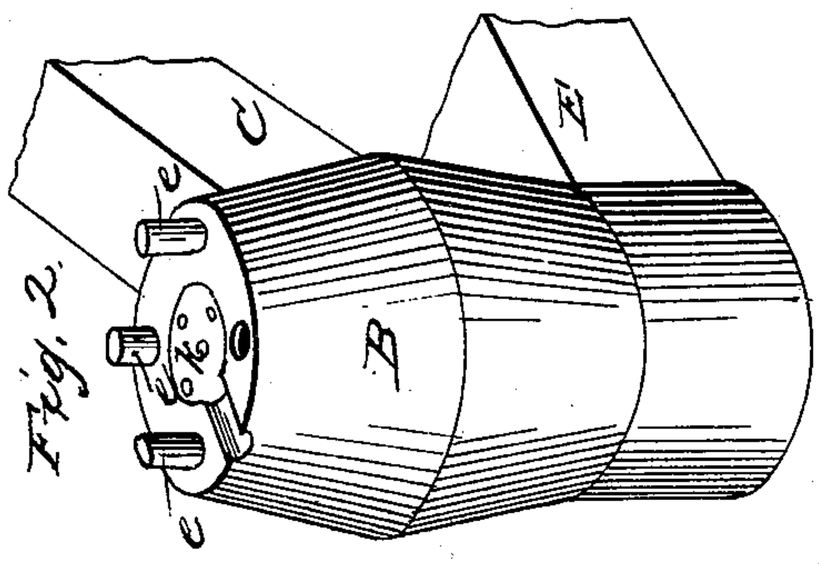


Fig. 3.

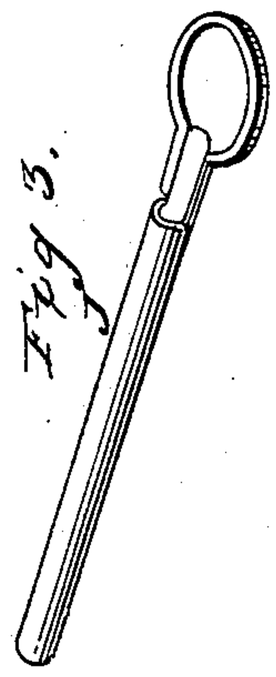
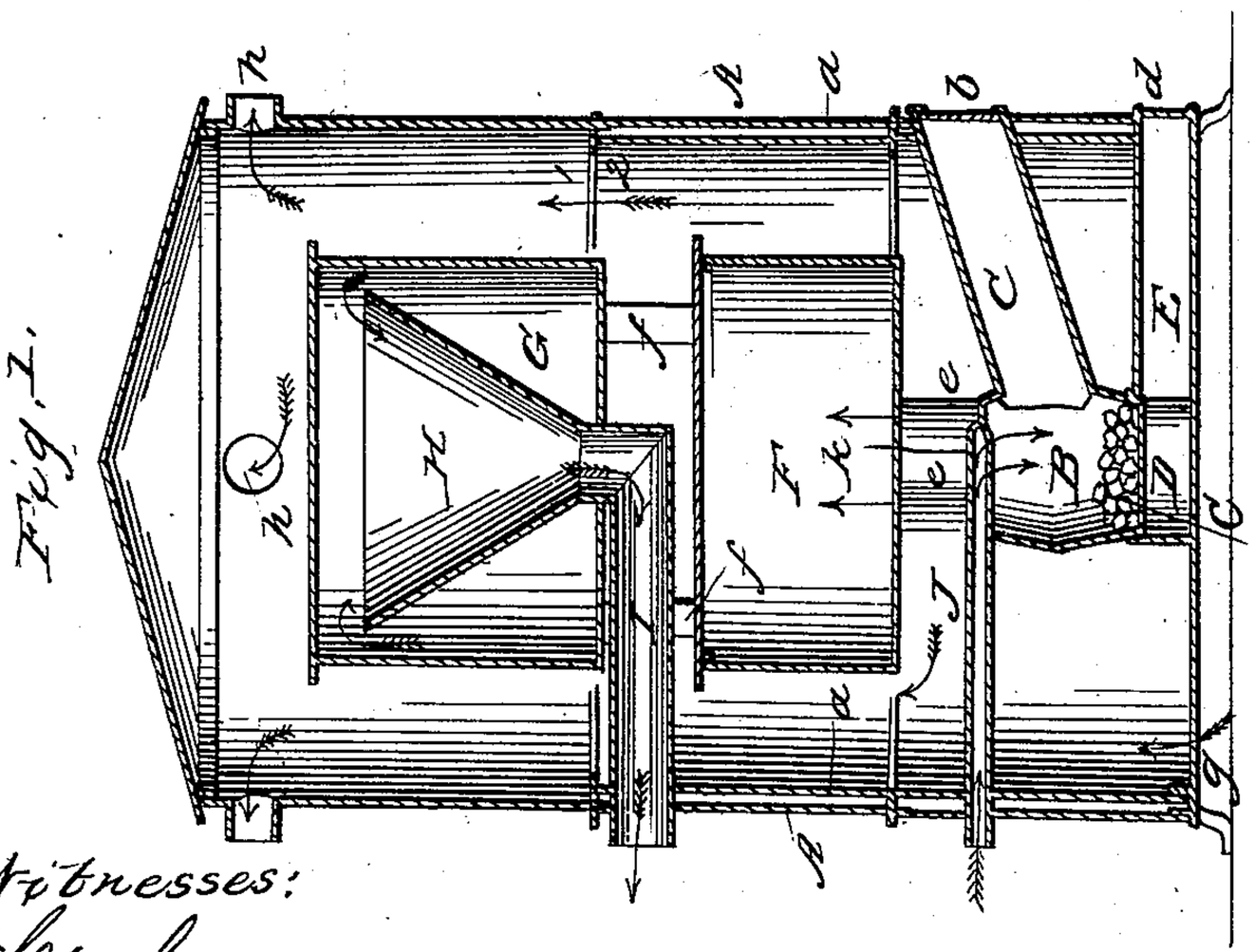


Fig. 1.



Witnesses:
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UNITED STATES PATENT OFFICE.

DAVID T. WOODROW, OF CINCINNATI, OHIO.

FURNACE.

Specification of Letters Patent No. 29,840, dated August 28, 1860.

To all whom it may concern:

Be it known that I, D. T. WOODROW, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming a part of this specification, in which—

Figure 1 represents a sectional elevation of the furnace. Fig. 2 represents a perspective view of the fire box and ashes chamber with the tubes or passages which extend from the outer casing to the parts respectively. Fig. 3 represents an air tube the position and office of which will be explained.

My invention consists in the construction and arrangement of the parts, hereafter described, constituting an improved air heating furnace.

A, is the outer casing, which is made of sheet metal, entirely inclosing the fire box and radiating chambers. This casing is double from the base of the furnace up to a point above the more intensely heated portions thereof, affording an annular space *a* between the two parts, and this space is open at the bottom for the ingress of cold air, and open at the top for the escape of heated air into the hot air space inclosed by the casings A. The outer casing is by this means prevented from becoming very hot and losing its heat by radiation.

B, is the fire box containing the coals which are fed into the stove through the tube or passage C, communicating with the outside and closed by the door *b*. The coals rest upon the grate *c*, and the ashes escape downwardly through the grate into the space D, from whence they are removed as often as required, through the passage E, which communicates with the outside casing and is closed by a door *d*. The fire box is made of heavy cast metal or it may be made of sheet metal and lined with a refractory substance such as soapstone or fire tile.

F, is a large drum mounted above the fire box and receiving the smoke and flame therefrom through the vertical connecting pipes *e*. This drum affords an area in which the unconsumed gases from the fire box are burned, after mingling with fresh air imparted to them, on their way into the drum as will be explained. The heated currents from the fire-box are moreover retained and are caused to be circulated for some time in the drum until a considerable portion of their caloric is taken up by the large surfaces and imparted to the air which is circulating between the drum and outer casing.

G, is a large drum supported above, F, by the vertical pipes *f*. Through the pipes *f*, the smoke and heated currents pass up into the drum G, where they are caused to circulate in contact with the larger surfaces of the drum until another portion of their caloric is absorbed and imparted to the outer air.

H, is a conical shaped deflector. As the heated currents pass up through the pipes *f*, they meet the inclined or flaring surface of H, and are caused to react against and circulate in contact with the inner periphery of G, constantly giving off their caloric until they reach the upper part of the drum, when they pass around the rim of the conical or funnel shaped part H, as indicated by the arrows, and downwardly to the ejection pipe I, and thence to the flue or chimney.

Surrounding the fire box and radiating chambers or drums which have been described, and within the outer casing A, is a commodious air space supplied with cold air through apertures *g*, in the bottom plate of A. As the air thus admitted within the casing becomes heated and rarefied it ascends and passes off through the hot air flues *h*, leading to the apartments which are to be heated, while the place of the hot air thus carried off is supplied by currents of cold air from the bottom.

J is an air flue which is carried through the outer casing A, and inwardly to the fire-box where it terminates in an air chamber K, in the upper part of the fire-box. This chamber is perforated with a great number of small holes into the fire-box, and the air from without being conducted in through the pipe J, into the chamber K, is thence discharged in a great number of small jets downwardly amid the gaseous and inflammable products of combustion rising from the burning coal.

The oxygen of combustion being thus appropriately supplied, the gases ignite and

pass upwardly in currents of flame through the pipes *f*, with the first drums or chambers F, which has been described.

The casing A, is made of two parts, 1 and 2. If the furnace requires to be cleaned or repaired part 1 may be removed, affording access to the interior arrangements, each part of which is readily separated from the others affording the means of repairing, renewing or cleaning any of the parts as they may require.

The construction and arrangement of my improved furnace are such as to promote in a high degree the perfect combustion of the fuel thus in a great measure preventing smoke. It affords an unusually large amount of radiating surface, thus permitting the caloric to be in a great measure utilized. It is extremely compact and simple, and it is believed to be cheaper than any effective air heating furnace in use.

My furnace is especially adapted to the wants of a large class of owners and occupants who desire to introduce furnaces into their dwellings, but who are not able to employ the larger and more expensive heating devices which are in use. The facility with which my furnace can be set up or taken down and removed renders it peculiarly convenient for persons occupying buildings temporarily as renters.

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

In combination with an outer casing A, the fire box B, air tube J, air chamber K, and cylindrical chambers or radiators F, G, the latter containing the deflector H, the whole being arranged in relation to each other and within the outer casing A, as herein set forth.

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Witnesses:
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