

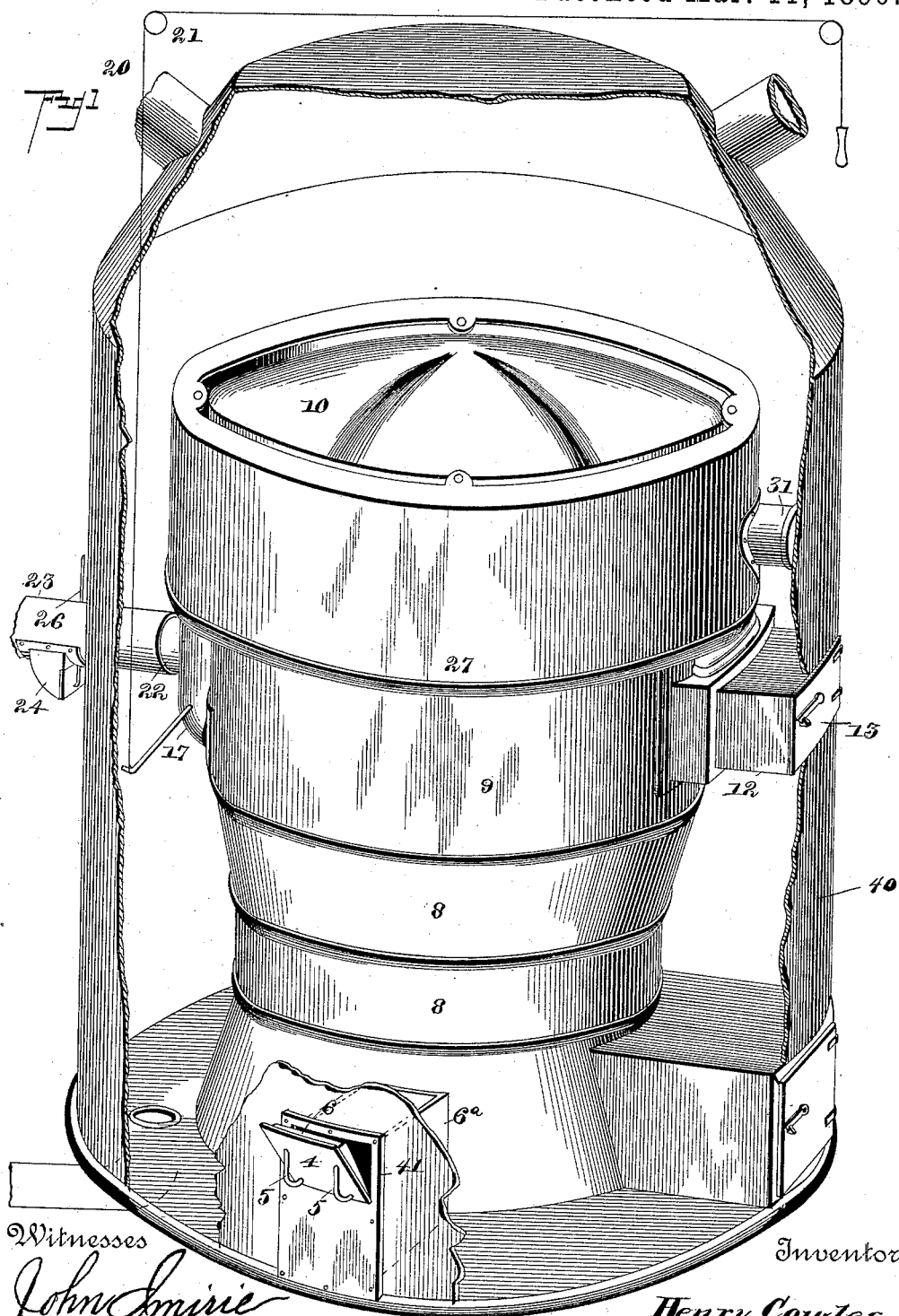
(No Model.)

2 Sheets—Sheet 1.

H. COWLES.
HOT AIR FURNACE.

No. 422,921.

Patented Mar. 11, 1890.



Witnesses

John Smiric
Wm. Bagger

Inventor

Henry Cowles

By his Attorneys

C. A. Snow & Co.

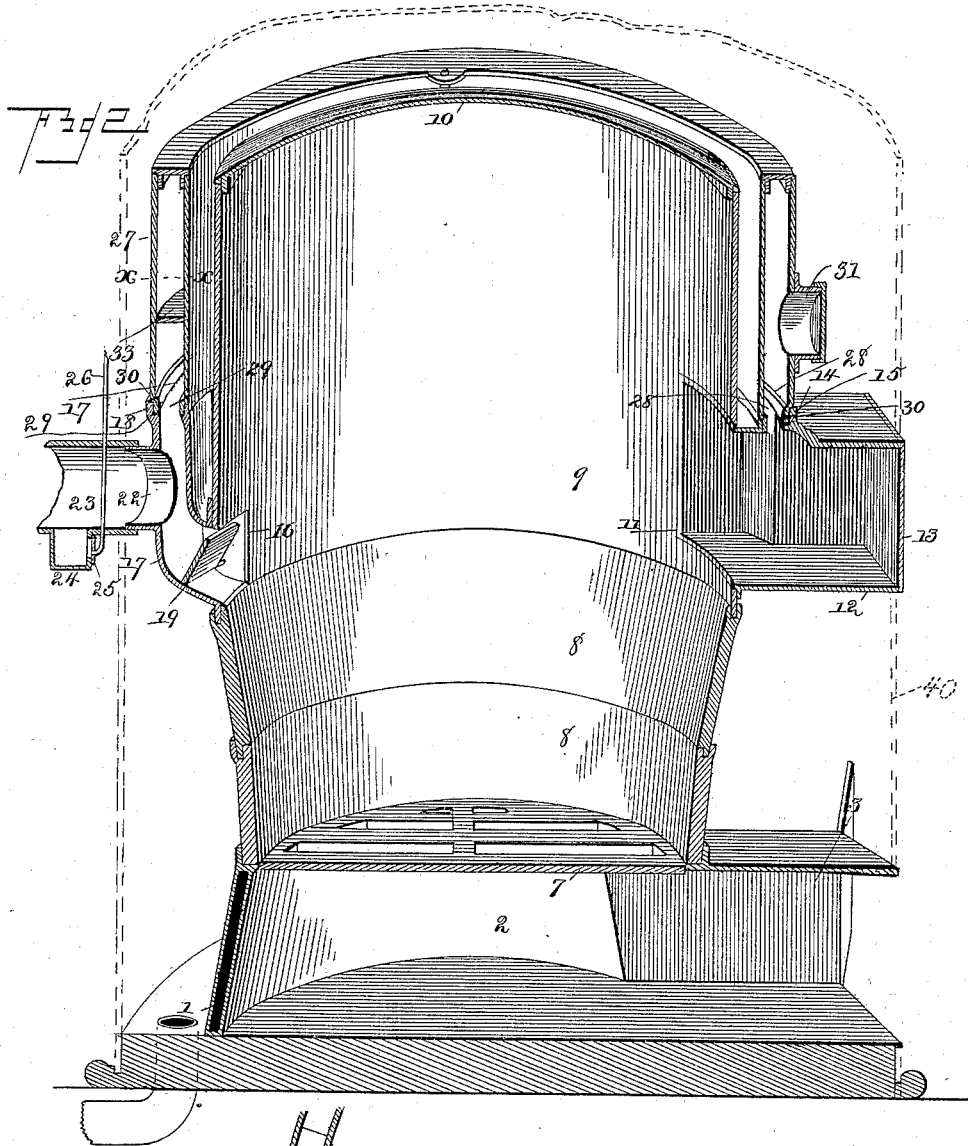
(No Model.)

2 Sheets—Sheet 2.

H. COWLES.
HOT AIR FURNACE.

No. 422,921.

Patented Mar. 11, 1890.



Witnesses
John Currie
Wm. Bagger

By his Attorneys,

C. A. Snow & Co.

Inventor

Henry Cowles

UNITED STATES PATENT OFFICE.

HENRY COWLES, OF UTICA, NEW YORK.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 422,921, dated March 11, 1890.

Application filed July 22, 1889. Serial No. 318,273. (No model.)

To all whom it may concern:

Be it known that I, HENRY COWLES, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented a new and useful Hot-Air Furnace, of which the following is a specification.

This invention relates to hot-air furnaces; and it has for its object to construct a furnace which shall be simple and efficient, and in which the heat shall be retained for a sufficient length of time to cause it to be imparted by radiation to the surrounding air, thus making the furnace economical in operation.

The invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a perspective view of a furnace embodying my improvements, with parts of the exterior or surrounding casing broken away to show the construction. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a horizontal sectional view taken on the line $x x$ in Fig. 2.

Like numerals of reference indicate like parts in all the figures.

1 designates the base of my improved furnace, which forms the ash-pit 2, access to which may be had through an opening 3 in the front side of said base, in which may be arranged a door having suitable draft-openings. Such a door, however, may be dispensed with.

The base 1 supports the grate 7, which may be of any desired construction; and the said base likewise supports the fire-pot, which may be composed of two or more annular sections 8 8, the meeting edges of which have joints of any suitable construction.

The upper section 8 of the fire-pot supports the dome of combustion-chamber 9, which is made preferably of sheet metal, such as rolled steel-plate, and is provided with a bulging top 10. The front side of the said dome or combustion-chamber is provided with a door-opening 11, to which is bolted a door frame 50 or casing 12, having a hinged door 13, of ordinary construction, through which fuel may be supplied. The upper side of the casing

12 has an opening 14, surrounded by an annular flange 15.

The rear side of the dome or combustion-chamber has an opening 16, at which is bolted an upwardly-extending elliptical or oval flue 17, the upper end of which has an annular flange 18. Suitably mounted in the lower part of the flue 17 is a damper 19, which may be operated by means of a chain 20, extending over suitably-arranged pulleys 21 to the front side of the furnace, where it may be conveniently reached and manipulated. The flue 17 is provided with a rearwardly-extending branch 22, upon which is mounted a pipe 23, to which the smoke-pipe is in turn connected. The pipe 23 is provided on its under side with a draft-regulator consisting of a valve-casing 24, the opening of which has a valve or damper 25, which may be operated by means of a rod 26, extending upwardly to any desired point.

27 designates a radiator, which consists of an annular chamber or drum constructed preferably of rolled steel-plate and provided at its lower edge with openings 28 29, surrounded by flanges 30, and adapted to be connected, respectively, to the flange 15 of the casing 12 and to the flange 18 of the flue 17, thus connecting the said radiator with the interior of the furnace. The front side of the radiator-casing is provided with a door-opening 31, arranged directly above the door-casing 12, and through which access may be had to the interior of the radiator for the purpose of cleaning the same and removing accumulations of soot and similar obstructions.

The furnace is inclosed in the usual manner by a casing 40. To said casing is bolted a frame 41, having a door 4, hinged by its lower edge and provided with handles 5 5, forming stops which, when the said door is thrown open, will support it in a partly-inclined position. The upper and side edges of said door are provided with flanges 6 to guide water into a box or receptacle 6^a, which extends from the frame 41 into the air-space between the furnace and its casing when the said receptacle is being filled. The object of this device is to moisten the air within the casing, which latter is to be connected in the usual manner with ducts for the admission of the cold and the exit of the heated air.

The operation of my invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. The furnace is charged 5 through the door 13, and when the fire is started a direct draft may be had by opening the damper 19 in the flue 17. After the fire has been well started the said damper 19 is closed and the products of combustion will 10 then pass through the opening 14 in the door-casing 12 up into the radiator, traverse the latter on opposite sides thereof and then pass downwardly through the opening 29 into the flue 17 and thence out through the smoke- 15 pipe. In the radiator 27, directly above the opening 29, is arranged a horizontal plate or deflector 33, which serves to cause the products of combustion which rise from the flue 20 to take a devious course before escaping through the radiator. The draft may be 20 regulated by means of the valve or damper 25, through which cold air in any desired quantity may be admitted into the smoke-pipe. Said draft-regulator being located on 25 the under side of the smoke-pipe, there will be no danger of smoke escaping into the room. When it is desired to clean the radiator, this may be done by means of an ordinary scraper which is inserted through the 30 opening 31. The soot and dirt may thus be scraped directly through the opening 14 into the door-casing 12, from whence it will drop into the fire-pot and thence into the ash-pit.

It will be seen by the construction of my 35 improved furnace the products of combustion will ascend into the upper portion of the dome or fire-pot and likewise into the upper portion of the radiator, where they will remain until the heat shall have been effectually given off 40 to the surrounding air, when they will be replaced by more intensely-heated particles. By this construction it will be found that the draft is in no wise impaired, while the furnace will be found exceedingly economical 45 in operation.

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

1. The combination, with the combustion- 50 chamber, of an annular radiator surrounding the same and connected at its lower end with flues extending from the front and rear side of said combustion-chamber, the smoke-pipe connected with the rearwardly-extending flue,

and a damper arranged in said rearwardly- 55 extending flue between the smoke-pipe and the combustion-chamber, substantially as set forth.

2. In a furnace, the combination of the dome or combustion-chamber, a door casing 60 or frame bolted to the front side of the same and having a hinged charging-door and provided with an opening in its upper side, an upwardly-extending flue bolted to the rear side of said combustion-chamber, an annular 65 radiator surrounding the upper portion of the combustion-chamber and connected with the opening in the upper side of the door-casing and with the upwardly-extending flue, a smoke-pipe extending from the latter and 70 having a damper or draft-regulator, and a damper arranged in the upwardly-extending flue between the smoke-pipe and the combustion-chamber, substantially as set forth.

3. In a furnace, the combination of the 75 combustion-chamber, the door-casing secured to the same and having an opening at its upper side, the flue secured to the rear side of the combustion-chamber, the annular radiator secured or connected to said flue and 80 to the opening of the door-casing, and an opening in said radiator arranged directly above the opening in the door-casing, substantially as and for the purpose set forth.

4. In a furnace, the combination of the 85 combustion-chamber, the door-casing secured to the front side of the same and having an opening in its upper side, the upwardly-extending flue secured to the rear side of said combustion-chamber, the smoke-pipe extend- 90 ing from said flue and having a damper or draft-regulator, a damper arranged in said flue between the smoke-pipe and the combustion-chamber, and the annular radiator surrounding the upper portion of the combustion- 95 chamber and connected to the upper end of the flue and to the opening in the upper side of the door-casing, said radiator being provided with a horizontal plate or deflector arranged directly above the said flue, substan- 100 tially as and for the purpose herein set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

HENRY COWLES.

Witnesses:

JOHN EDGAR,
JOHN J. BURKE.