Feb. 16, 1926. 1,573,406

E. D. LEWIS

COMBINED CHIMNEY, FURNACE, AND VENTILATOR

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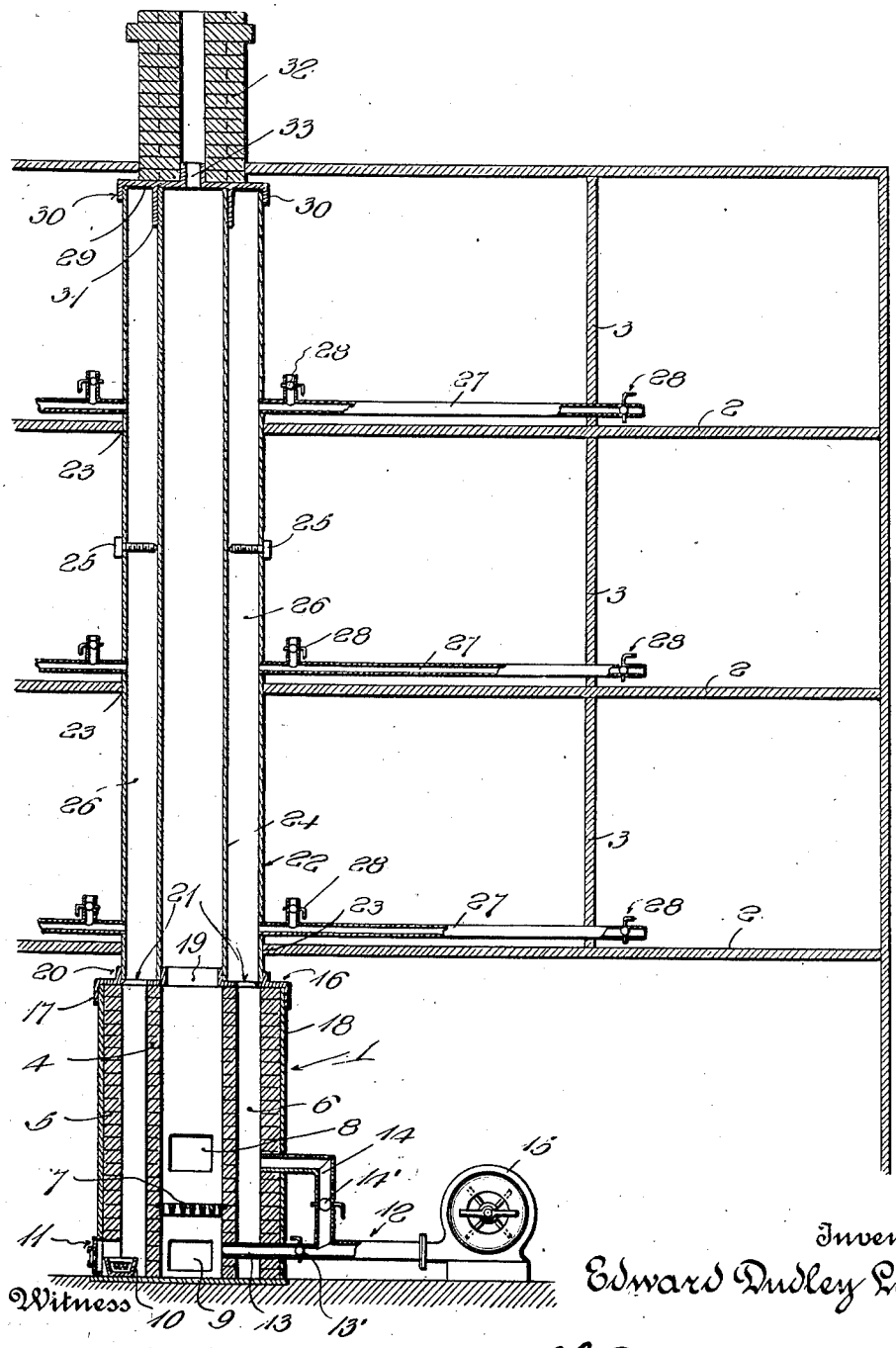

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EDWARD DUDLEY LEWIS, OF ELMIRA, NEW YORK.

COMBINED CHIMNEY, FURNACE, AND VENTILATOR.

Application filed February 12, 1925. Serial No. 8,763.

To all whom it may concern:

Be it known that I, EDWARD DUDLEY LEWIS, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in a Combined Chimney, Furnace, and Ventilator; and I do 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.

It is well known that a great deal of heat is exhausted and wasted through the ordinary chimneys and stacks from furnaces and other forms of heaters. It is the primary object of my invention however to provide a new and improved construction whereby there will be practically no waste heat, the hot gases discharged from the burning fuel, being utilized substantially throughout their travel, to heat air, such air being in turn used to heat the building in which the improved structure is used.

A further object is to provide for use of the heating system as a cooling and ventilating system in warm weather.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, the description being supplemented by the accompanying drawing, in which a vertical sectional view of the heating and ventilating system is shown, installed within a building.

In the drawing above briefly described, the numeral 1 designates a furnace in the basement of a building having a plurality of floors 2, and the numerals 3 designate partitions on said floors dividing the building into rooms.

The furnace 1 comprises an inner continuous wall 4 and an outer continuous wall 5, an air heating space 6 being provided between the two walls. Within the wall 4, a grate 7 has been shown for burning solid fuel, and a fuel door is indicated at 8, it being understood however that gas or oil could be consumed instead of solid fuel, if desired. In the construction shown, an ash pit is of course provided under the grate, and 9 designates a door for such pit. At 10, a moisture pan has been shown, having the usual functions, and 11 refers to a door for giving access to said pan.

I prefer to employ air-supply piping 12 having a branch 13 extending into the ash pit and another branch 14 extending into the air heating space 6, said branches having appropriate valves or dampers 13′ and 14′, respectively. Any desired means, such as the blower 15 may be used to direct air through the piping, and the travel of this air is of course controlled by the valves or dampers 13′ and 14′.

The inner and outer walls 4 and 5 are preferably of the same height, and their upper ends support a horizontal plate 16 having a flange 17 at its edge which surrounds the wall 5 and may assist in holding a jacket 18 around said wall if such jacket is desired. The plate 16 is provided with an inner relatively small upstanding collar 19 which communicates with the interior of the inner wall 4, and said plate is also provided with an outer relatively large upstanding collar 20, suitable heat escape openings 21 being formed through the plate, between the inner and outer collars. An outer comparatively large pipe 22 is engaged at its lower end with the collar 20 and extends upwardly from the plate 16 through openings 23 in the numerous floors of the building, and an inner smaller pipe 24 is engaged with the collar 19, said inner pipe being coextensive in length with the outer pipe 22. The two pipes are held in spaced relation by stay-bolts 25 positioned at desired intervals and the space 26 between said pipes constitutes an air heating space which makes use of all heat imparted to the pipe 24, by the discharge of smoke and hot gases therethrough. For conducting the hot air from the space 26, to the several rooms of the building, appropriate piping 27 may be employed, said piping having control valves or dampers 28. In addition to controlling the discharge of hot air, these valves or dampers may be used to similarly control cool air when the furnace is out of operation in warm weather and the blower 15 is utilized to direct a blast of air into the space 6, between the inner and outer walls 4 and 5 of the furnace. Thus, with a single system, heating may be effected to a high state of perfection in cold weather, and cooling and ventilating may be effected in warm weather.

Resting upon the upper ends of the pipes 22 and 24, is a cap plate 29 having depending flanges or collars 30 and 31 which engage said pipes 22 and 24, respectively, the collar 31 being preferably rather long to provide a slip joint, effectively taking care

of expansion and contraction of the inner pipe 24, in which connection, it may be stated that the drawing illustrates said pipe when expanded to the maximum, whereas cooling and contraction of said pipe will of course cause it to lower somewhat from the plate 29. In order that the stay-bolts will not interfere with unhampered expansion and contraction of the pipe 24 in a vertical direction, these bolts are preferably passed only through the outer pipe 22 and have their inner ends slidably engaged with said pipe 24.

The cap plate 29 supports a suitable chimney 32 which extends through the roof of the building and may well be formed of brick, although this is not essential, as any desired materials may be used. The pipe 24 is placed in rather restricted communication with the chimney by a discharge neck 33 at the center of the plate 29, said neck extending upwardly into the chimney so that there is no possibility of the latter shifting laterally with respect to the remainder of the system.

By providing the novel construction shown and described, or a substantial equivalent thereof, a system is provided which will utilize heat heretofore going to waste up the chimney or stack, and consequently great economy in fuel is effected, as well as obtaining more heating efficiency. Moreover, the invention is readily convertible for use as cooling and ventilating means in hot weather. Thus, with a single system two needs are effectively overcome.

As excellent results may be obtained from the general construction disclosed, it may well be followed. However, within the scope of the invention as claimed, modifications may of course be made.

I claim:

1. A heating system comprising a furnace having spaced inner and outer walls and an air inlet into the space between said walls, means within the inner wall permitting heating thereof to in turn heat the air between the two walls, an outer pipe rising from the outer wall and adapted for passage through an opening or openings in the floor or floors of the building in which the system is used, an inner pipe within said outer pipe in spaced relation with the latter and rising rigidly from the aforesaid inner wall to form an exhaust gas escape therefrom, a cap plate resting on at least the outermost of said pipes and connected with both of said pipes, and a chimney rising from and supported by said cap plate, said outer pipe having air escape openings.

2. A structure as specified in claim 1; said chimney being formed as a separate part from said cap plate and the latter being provided with an upstanding discharge neck received in said chimney to hold the latter in proper relation with the plate.

3. A heating system comprising spaced inner and outer walls and an air inlet for the space between them, means within the inner wall permitting heating thereof to in turn heat the air between the two walls, a horizontal plate resting on the upper ends of said walls and having heat discharge openings between them, collars rising from said plate adjacent said inner and outer walls, spaced inner and outer vertical pipes engaged with said inner and outer collars respectively and adapted for passage through an opening or openings in the floor or floors of a building, a cap plate resting on the outermost of said pipes and having a restricted central opening, depending collars engaging the inner and outer pipes respectively, the center of said cap plate having an upstanding discharge neck surrounding said restricted opening, and a chimney supported by said cap plate, said neck fitting within said chimney, the outermost of said pipes having hot air discharge openings.

4. A heating system comprising spaced inner and outer walls and an air inlet for the space between them, means within the inner wall permitting heating thereof to in turn heat the air between the two walls, a horizontal plate resting on the upper ends of said walls and having heat discharge openings between them, a downwardly extending flange on the outer edge of said plate and surrounding said outer wall, collars rising from said plate adjacent said inner and outer walls, spaced inner and outer vertical pipes engaged with said inner and outer collars respectively and adapted for passage through an opening or openings in the floor or floors of a building, a cap plate resting on the outermost of said pipes and having a restricted central opening, depending collars on said plate engaging the inner and outer pipes respectively, the collar engaging said inner pipe being elongated and forming a slip joint connection with said inner pipe to permit the expansion and contraction of said pipe, an upstanding neck surrounding the restricted central opening in said cap plate, a chimney supported by said cap plate, said neck fitting within said chimney, stay bolts passed through said outer pipe and having their inner ends slidably engaged with said inner pipe whereby the latter is centered, but permited to expand and contract, and valved air conducting pipes connected with the space between said outer and inner pipes.

In testimony whereof I have hereunto affixed my signature.

EDWARD DUDLEY LEWIS.