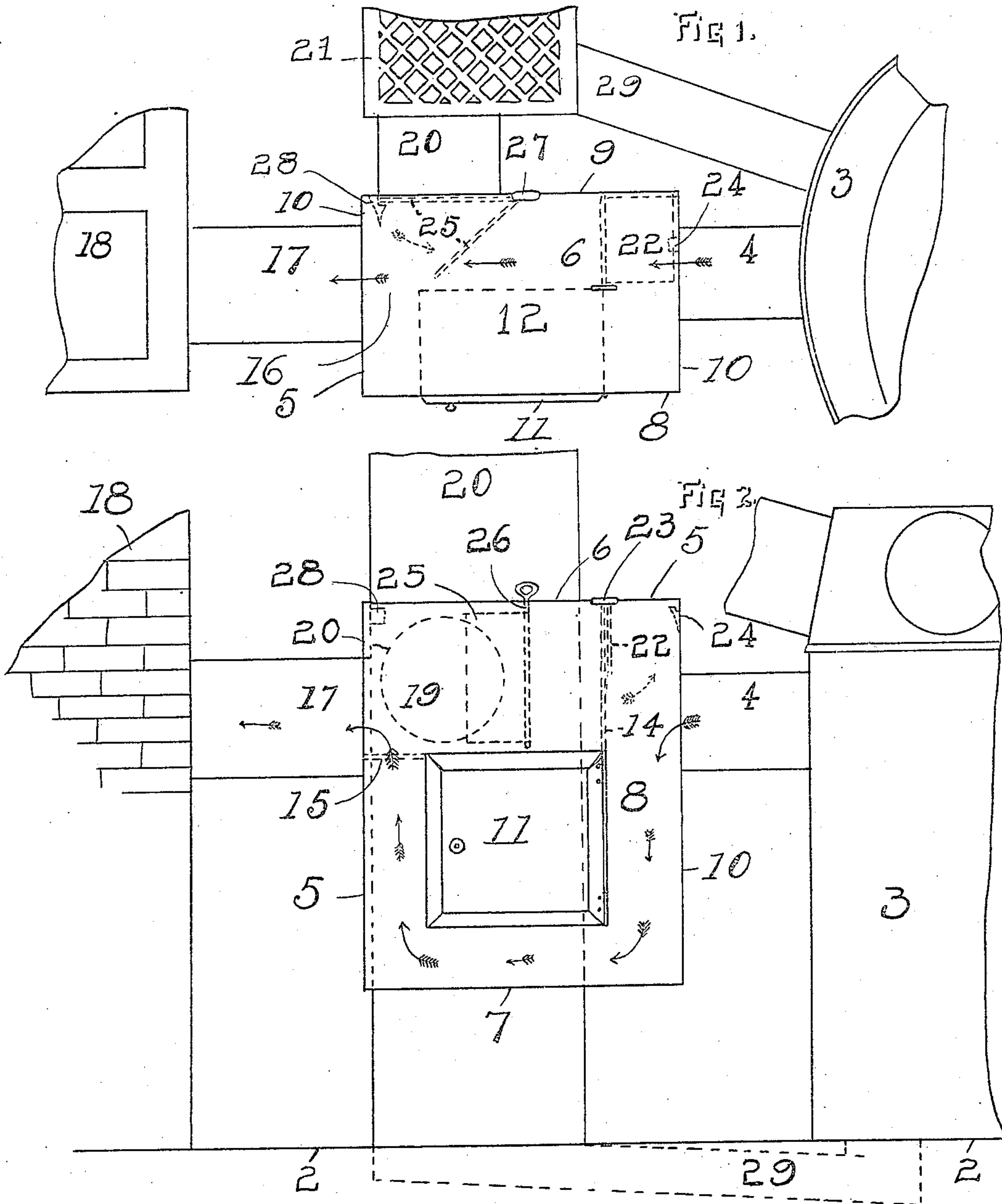


J. J. BERRY.
 COMBINED BUILDING VENTILATOR AND CHECK FOR FURNACES.
 APPLICATION FILED MAR. 11, 1909.

934,881.

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UNITED STATES PATENT OFFICE.

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COMBINED BUILDING-VENTILATOR AND CHECK FOR FURNACES.

934,881.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed March 11, 1909. Serial No. 482,837.

To all whom it may concern:

Be it known that I, JOHN J. BERRY, a citizen of the United States, and a resident of Galesburg, in the county of Knox and State of Illinois, have invented a new and useful Combined Building-Ventilator and Check for Furnaces, &c., of which the following is a specification.

The invention relates to means attachable to furnaces and the like for the purpose of securing superior ventilation and further for the purpose of providing a better and more regulable means for controlling the combustion than has heretofore been had.

One of the main objects of the invention is to provide means for readily, easily and effectively checking the fire to hold it back in the furnace instead of allowing it to pass out through the chimney.

A further object is to increase the circulation of air, which object I effect primarily by utilizing the draft of the chimney in connection with the cold-air register in the floor. In order to effect this object I provide communicating means whereby the natural draft of the chimney will draw the stagnant and impure air from the building, and introduce it into the chimney pipe or pipe leading to the flue, as will be hereinafter more fully described.

A still further object is to partly retard the smoke within the combustion chamber and there consume it instead of permitting it to pass directly from said chamber to the flue and out through the chimney.

A still further object is to lessen the danger of fires, and another object is to provide means for utilizing a portion of the otherwise waste heat for culinary purposes.

Subsidiary objects will be in part obvious and in part pointed out.

In the accompanying drawings my improvements are shown as embodied in the best way now known to me; obviously, however, the arrangement and disposition of most of the parts may be varied to suit the varying conditions, and some of the improvements may be used without the others. In fact numerous changes may be made in the details of construction without departing materially from the spirit of the invention.

In said drawings: Figure 1 is a top plan, and Fig. 2 is a front elevation.

The same numeral wherever herein used

refers to the same part in both figures of the drawings.

2 represents the floor line, and 3 an ordinary furnace resting thereon, from which furnace projects a smoke-pipe 4, the other end of which communicates with the casing 5, within which most of the parts of my improvements are located. This casing consists of a top 6, bottom 7, sides 8 and 9, and ends 10. An opening is provided in the front side 8 and is covered by the hinged door 11 of an oven 12, fixed within the casing 5, as hereinafter described.

Near that end of the casing with which the pipe 4 is connected is a vertical partition 14, suitably fixed to the top 6 and to a shelf formed by the upper portion of the oven, the latter being fixed at its other end to a horizontal shelf 15 provided with an oblong slot 16. The partition terminates some little distance above the bottom 7 of the casing. It will be evident that the partition 14 and the bottom of the oven form a reversed L-shaped passage through which the smoke and heated air may be directed as indicated by the series of arrows leading from the pipe 4 downwardly, thence horizontally, and thence upwardly to the chimney-pipe 17, which is secured at one end to said casing and at its other end projected into the flue of a chimney 18, with both of which it has manifest communication by means of openings as indicated. The partition 14 is provided with an opening (indicated by the right hand arrow at Fig. 1) by means of which direct communication is established from the pipe 4 to the pipe 17.

At the rear side 9 of the casing, about an opening 19 therein is a cold air pipe 20 leading horizontally therefrom and thence directed upwardly to communicate with a cold-air register 21, suitably located in the floor of the building.

A vertically actuable damper 22, is hinged at 23 to move in the direction indicated by the dot line arrow at Fig. 2, at which figure it is dropped to close the opening in the partition 14, whereby the direct draft is shut off and the smoke and heated air passing from the pipe 4 is directed as indicated by the series of arrows at said figure. Fig. 1 also shows this damper closed. A latch, 24, may be provided to secure it in open position.

A horizontally swinging damper, 25, is pivoted by a pintle, 26, having a handle, 27, to cover the opening into the cold-air pipe, 20. Its direction of movement is indicated by the dot line arrow at Fig. 1, at which figure it is shown both in closed and partly closed position, while at Fig. 2 it is shown in the latter position only. A latch, 28, is provided for securing it in closed position, as the draft of the chimney has a tendency to (and does) draw it open when no means are provided for closing it. It will therefore be clear that this damper becomes a self-opening or automatic one.

A cold-air induction pipe or box, 29, of any suitable construction is provided for introducing the cold air to the furnace.

The operation: Let the parts be presumed to be in the relative positions shown at Fig. 1 and the damper 25 in the closed (upper) position there shown. These are the positions suitable for starting a fire, the air current passing directly from the pipe 4 through the opening in the partition 14, thence over the oven, thence through the pipe 17 into the flue and chimney. After the fire has started, the damper, 25, may be moved to the other or partly closed position shown at said figure and at Fig. 2. When the fire is burning quite well the damper, 22, is dropped to the position shown at Fig. 2, whereby the smoke and escaping heated air will pass in the manner indicated by the series of arrows. The fire will then be entirely controlled by regulation or adjustment of the damper, 25, in an evident manner, the greater the amount of cold-air admitted thereby, the more the check upon the fire. This will be made more clear by the following explanation: By directing the air downwardly and indirectly to the chimney connection, (the chimney "drawing" in the usual manner to perform its ordinary function), and by providing the cold air pipe from the cold air register, the hot air coming from the furnace and through the opening in the shelf will come in contact with and be retarded by the current of cold air rushing downwardly through said cold air pipe to form a check. In actual use I have found that while the vertical space and that part of the chambers (lower and upper) which is below the lowermost portion of the cold air pipe are extremely hot, (the ventilator damper being open), that portion of the last recited chamber and the casing thereof which is above said pipe will be practically cold, thus demonstrating the fact that the cold air introduced from the cold air pipe retards or checks the heat passing from the furnace, and that said heat is saved or utilized in heating the building. I draw the cold air down through the register more rapidly than heretofore and carry a portion of it into and about the furnace and its cas-

ing. The supply of cold air passes so rapidly through the register that it more than offsets the amount which passes upwardly through the chimney.

An anemometer test in a building equipped with my improvements, with the damper, 25, closed, whereby the cold-air supply was cut off, and whereby the conditions were practically the same as though said improvements were not present, showed 35 cubic feet of air per minute passing downwardly through the register. A test made immediately afterward, said damper having been opened, (the fire and weather conditions being the same) showed 90 cubic feet of air per minute passing through the register and into the furnace by means of the pipe, 29.

Danger of fire "backing up" to the register is eliminated for the reasons that, first; when the damper, 25, is closed there is no communication between the chimney and cold air register, and second; when said ventilator is open it drives the heat in another direction.

My improvements may be employed in steam or hot water heating systems by placing a cold air register in the floor, thereby forming a check for the fire and a ventilator for the building.

Having thus set forth the construction and operation, the purposes and the advantages of my improvements, I claim as new and desire to secure by Letters Patent the following, to-wit:

1. An apparatus of the nature described comprising a casing, a furnace pipe communicating therewith, a chimney pipe directed toward and communicating lineally with said furnace pipe, a vertical part-partition within the casing, provided with an aperture whereby said direct communication is established, a damper adapted to close said aperture, an oven disposed between said partition and that end of the casing with which the chimney pipe has communication, there being a slot or similar means of communication between said end of the casing and the oven, a cold air supply pipe communicating with said casing, and means whereby the supply of air furnished thereby may be controlled.

2. In an apparatus of the nature described, a casing, a smoke pipe communicating therewith, a chimney pipe also communicating with the casing, a partition fixed within said casing and extending downwardly to near the bottom thereof, said partition provided with an aperture by which direct communication is established between said pipes, means for closing said opening, horizontal means extending from said partition to near that end of the casing with which the chimney pipe has communication, whereby a passage is provided therebetween, a cold-air supply pipe, a register with which it has

communication, and a damper for regulating the quantity of air furnished by said cold-air pipe to said casing.

3. In an apparatus of the nature described, 5 a casing, a smoke-pipe communicating therewith, a chimney-pipe also communicating with the casing, a partition fixed within said casing and extending downwardly to near the bottom thereof, said partition provided 10 with an aperture by which direct communication is established between said pipes, means for closing said opening, horizontal means extending from said partition to near that end of the casing with which the chimney pipe has communication, whereby a pas- 15 sage is provided therebetween, a cold-air supply-pipe, a register with which it communicates, its other end communicating with the casing, and a damper for regulating the quantity of air furnished by said cold-air 20 pipe to said casing.

4. In a device of the character described, a register, a furnace, a cold-air pipe leading from the former to the latter, a casing, a 25 pipe establishing communication between said furnace and casing, a damper for closing the last recited pipe, current-deflecting

means within said casing, a chimney-pipe communicating with said casing, a pipe leading from the casing to said register, and a 30 damper for regulating the flow of air between said last named elements.

5. In a device of the nature described, a casing, a furnace-pipe communicating with one end thereof, a chimney-pipe communi- 35 cating with the other end thereof, apertured means interposed between said pipes whereby direct communication is established, means for closing said aperture, means for diverting the products of combustion hori- 40 zontally and thence upwardly after they have been first diverted by said interposed means and closure, said last named means communicating with said chimney-pipe, and 45 means for inducing a current of cold air into said casing above that point at which the products of combustion are diverted into the chimney pipe.

In witness whereof I hereunto subscribe my name this sixth day of March, 1909.

JOHN J. BERRY.

In presence of—

H. M. RICHARDS,

WEBB A. HERLOCKER.