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HEATING APPARATUS.

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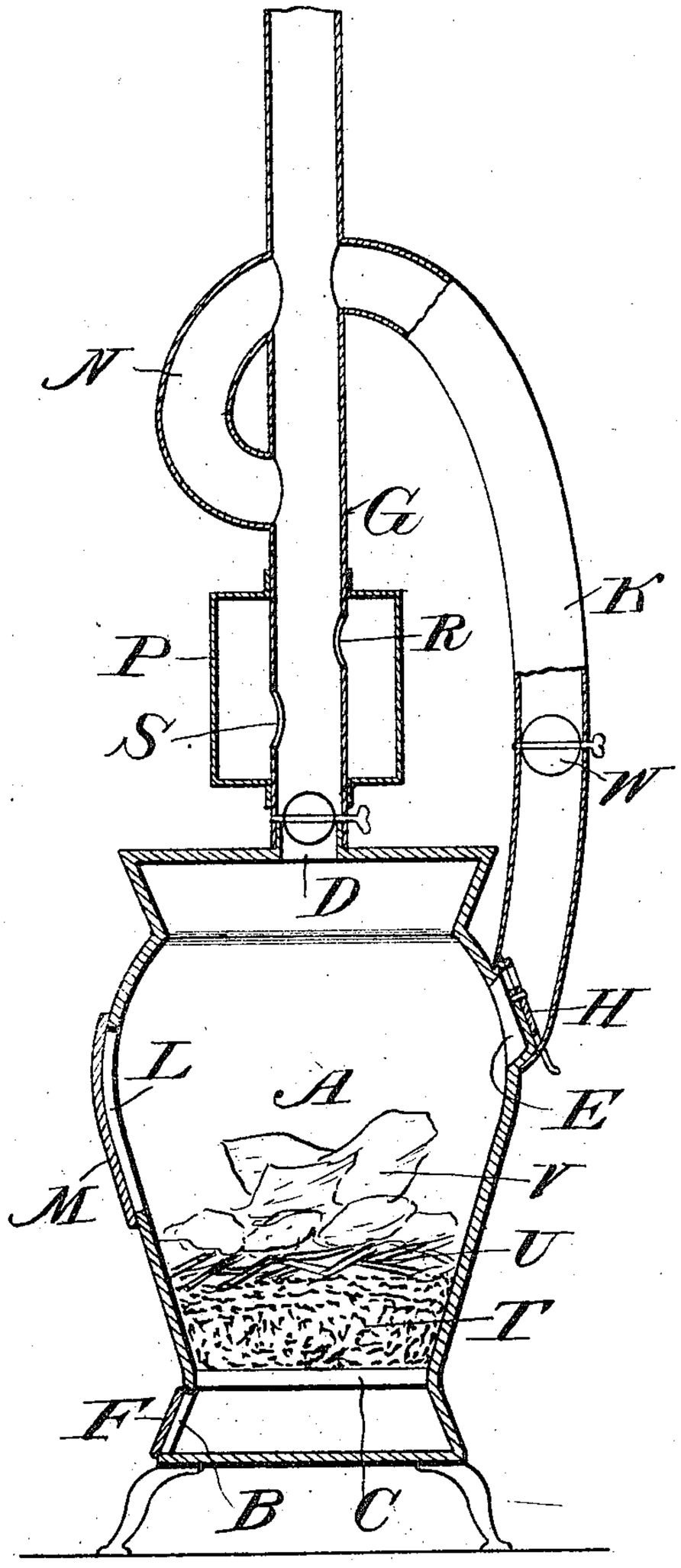
1,154,608. Patented Sept. 28, 1915.



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HEATING APPARATUS.

1,154,608. Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed December 13, 1913. Serial No. 806,490.

To all whom it may concern:

Be it known that we, MICHAEL H. BRENNAN and JOHN J. BRENNAN, citizens of the United States, residing at Devils Lake, in the county of Ramsey and State of North Dakota, and Girardville, in the county of Schuylkill, State of Pennsylvania, respectively, have invented certain new and useful Improvements in Heating Apparatus, of which the following is a full, clear, and exact specification.

This invention relates to heating apparatus, and has for its object to increase the radiation of heat in the room or apartment and to save the heat for radiation and power purposes and economize fuel at the same time.

Another object is to render the room or apartment more sanitary by shutting off the direct draft from the room or apartment into the fire, thereby stopping the counter current from the draft opening, from which when open, deleterious gases are discharged into the room or apartment. Also, by utilizing the down draft in the pipe or chimney pure air is brought into the stove for supporting combustion. This down draft is also utilized to retard the upward movement of the products of combustion so that practically all of the combustible gases and particles of carbon driven upward by the flames are consumed, practically only the non-combustible gases being allowed to escape, the same being carried off by the up draft in the pipe and chimney.

This invention applies to heating plants for heat and power, and the devices hereinafter described may be used in connection with same, the fundamental principle being the increase in radiation by better combustion and less loss of heat from draft, the device resulting in the taking in of sufficient oxygen for purposes of combustion, and no more. By this means, for the same amount of fuel, a much greater heat is produced and retained longer.

The invention will be first hereinafter described in connection with the accompanying drawings, which constitute a part of this specification, and then more specifically set forth in the claims at the end of the description.

A preferred form of heating apparatus embodying our invention is shown in the accompanying drawings wherein—

A designates a stove or fire chamber having a direct draft opening B below the grate C, a direct outlet opening D in the top, and another opening arranged above the fuel level and preferably in the side as at E. The direct draft opening is designed for causing a direct draft when the fire is first started, but is normally closed by a suitable valve F. In the direct outlet opening D there is fitted a pipe G leading to the chimney (not shown). The opening E is provied with a suitable valve H and communicates with a branch or forked pipe K which is connected to the pipe G some distance above the stove. There are no other openings in the stove except a fuel supply opening L which is normally closed by a door M constituting a substantially airtight closure. Another branch pipe N is bent into loop form and connected at both ends to the pipe G. Between this pipe N and the top of the stove, a drum P is placed around the pipe G. The outer walls of this drum are imperforate, but the pipe G has two openings R and S communicating with its interior. Said openings may be arranged on the same or on diametrically opposite sides of the pipe, or at some location between so as to obtain different grades of efficiency or regulation. One of those openings is preferably located on a higher level than the other.

When a fire is started in the stove, the coal or wood may be put in first to form the bottom layer T just above the grate. The kindling is then put in and forms the second layer U, while the paper constitutes the top layer V. In other words the fire (fuel material) is laid in just the reverse from the usual order. After the paper is lighted, the valve F in the direct draft opening B may be opened for a short time in order to start the kindling to burn freely. Or the fire may be started in the ordinary way. But the reverse order gives better results. The valve F is then closed, and the fire will burn downward, the kindling igniting the coal so that soon the coal is a glowing mass which will burn slowly and last a long time during which it will radiate intense heat. It has been found that very little heat escapes up the pipe G to the chimney, and that the pipes K and N and drum P remain cool, indicating that practically none of the combustible gases escape.

It will be understood that either of the pipes K and N, or the drum P may be used alone, that any combination of two of them may

be used together, or that all three may be used together, as illustrated in the figure. The theory on which each of said pipes works is that there is a down draft or current of fresh air in the chimney and pipe G which passes into said pipes N and K and is delivered into the pipe G at a lower point in the case of the pipe or loop N, or into the stove above the fire level in the case of the pipe K. In either case this current of fresh air striking the partially burned gases which are seeking an outlet through the top of the stove via the pipe G, has a retarding effect upon such gases and at the same time supplies them with additional oxygen so that substantially complete combustion takes place. This is further demonstrated by the fact that very little smoke is discharged from the chimney. The drum P acts in the same way, the fresh air entering it from the pipe G through the upper opening R and returning to said pipe through the lower opening S. It will be noted that in view of the fact that these openings are arranged on diametrically opposite sides of the pipe G, the current of fresh air must travel a spiral course downward before entering the pipe through the lower opening. This spiral and downward movement or current is contained in the pipe G causing if anything an even better mixture of the fresh air with the partly consumed gases, and consequently more effectually retarding the upward movement of said gases and accomplishing their more complete combustion, than when the pipes K and N are used alone. Whenever the pipe K is not to be used, the current of air therein may be cut off by closing the damper W. The valve H may be adjusted to suit conditions independently of the damper W, so as to give the proper action when the damper is opened and the pipe K is in use. When the pipes N and K are used together, a considerable portion of the products of combustion and gases not thoroughly consumed which pass up through the pipe K will enter the upper end of the pipe N, arranged on the opposite side of the pipe G and as shown, also located in horizontal alinement to the upper end of pipe K. Said gases will pass down said pipe N, and be delivered in a downward direction into the pipe G from the lower end of pipe N, thus further retarding the escape of unconsumed gases and aiding in securing more nearly complete combustion.

It will be obvious, of course, that the improvement herein described may be attached to any stove of ordinary construction and will not be necessary to construct a special form of stove to which the improvement may be attached as the same may be attached to the ordinary opening in the stove leading to the chimney and another opening in the stove.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. The combination with a fire chamber having two openings in its upper portion and adapted to be otherwise closed, of a main pipe fitted to one of said openings and leading to a chimney, a branch pipe fitted to the other opening and communicating with the main pipe, and a second branch pipe in the form of a loop communicating at both ends with the main pipe, the junction of the first branch pipe with the main pipe being opposite to and in horizontal alinement with the junction of one end of the second branch pipe with the main pipe.

2. The combination with a fire chamber having two openings in its upper portion, and adapted to be otherwise closed, of a main pipe fitted to one of said openings and leading to a chimney, a branch pipe fitted to the other opening and communicating with the main pipe, a second branch pipe in the form of a loop communicating at both ends with the main pipe, the junction of the first branch pipe with the main pipe being opposite to and in horizontal alinement with the junction of one end of the second branch pipe with the main pipe, and means for shutting off the first branch pipe and the main pipe when desired.

3. The combination with a fire chamber having two openings in its upper portion and adapted to be otherwise closed, of a main pipe fitted to one of said openings and leading to a chimney, a branch pipe fitted to the other opening and communicating with the main pipe, and a second branch pipe in the form of a loop communicating at both ends with the main pipe, said loop being arranged on the opposite side of the main pipe from the first branch pipe and coöperating therewith to regulate the current therethrough.

In testimony whereof we have signed our names to this specification in the presence of two attesting witnesses.

MICHAEL H. BRENNAN.
JOHN J. BRENNAN.

Witnesses as to Michael H. Brennan:
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