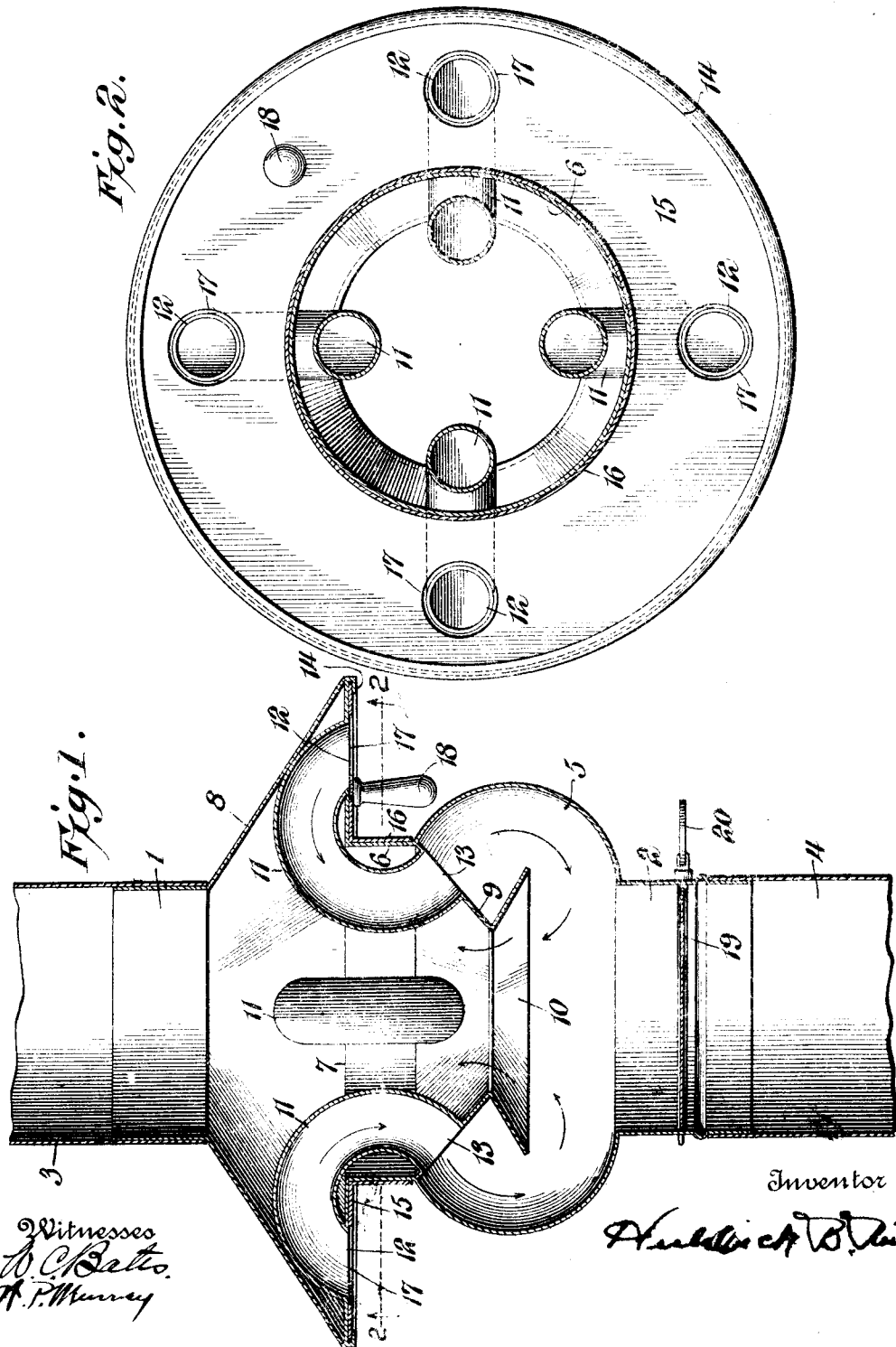


Patented July 4, 1916.



UNITED STATES PATENT OFFICE.

HULDRICK B. REID, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO GRACE L. PEINE, OF THE DISTRICT OF COLUMBIA.

SMOKE-PIPE AIR-CHECK.

1,189,623.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HULDRICK B. REID, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful improvements in Smoke-Pipe Air-Checks, of which the following is a specification.

This invention relates to improvements in smoke pipe air checks and the object is to provide a device of this character for regulating the draft in smoke pipes of furnaces, boilers and the like, whereby the variations of heat in the fire box may be kept at a minimum and the combustion so regulated as to result in considerable economy in the consumption of fuel.

Another object is to provide a draft-controlling device which is permanently fixed in the smoke pipe, adjacent to the furnace, and acts to automatically regulate the draft therethrough by admitting more or less air into the smoke pipe at this point to counteract any acceleration or diminution of the draft through the fire box, due to the variable effects of winds upon the chimney or smoke pipe, and thus to maintain a more even combustion in the fire box.

A further object is to secure these advantages in a structure that is of such a simple nature as to permit of its manufacture at a very small cost, which may be readily installed in any smoke pipe without the necessity of any alteration whatsoever therein and which requires no nicety of adjustment to cause the automatic regulation of draft therethrough.

A full and complete understanding of the invention may be obtained from a careful consideration of the following detailed description, taken in connection with the accompanying drawing, forming a part of this specification; it being understood that while the drawing shows a practical form of the invention, the latter is not confined to strict conformity therewith, but may be changed or modified, as long as such changes or modifications mark no material departure from the salient features of the invention, as specifically pointed out in the claims hereto appended.

In the drawing, in which like reference characters are employed to designate corresponding parts of the structure in each of the figures:—Figure I is a vertical, longitudinal, sectional view of the device applied

55 to a smoke pipe. Fig. II is a horizontal sectional view on the line 2—2 of Fig. I and looking in the direction indicated by the arrows.

As illustrated in the drawing, the invention comprises a cylindrical casing composed of sheet metal sufficiently strong to withstand the effects of the extreme heat to which the device may be subjected and is provided with an upper and a lower extended collar 1 and 2 of a diameter to snugly fit within the adjacent ends of two sections of standard smoke pipe as indicated at 3 and 4 respectively.

The collars 1 and 2 are of sufficient length to maintain the casing in rigid relation with the smoke pipe and in longitudinal alignment therewith; and while the device is shown in the drawing so applied to a vertical smoke pipe, it will be understood that the same is applicable to a pipe in any other position.

The section 4 of the smoke pipe may be assumed to connect, as by an ordinary elbow, (not shown) directly to a furnace or boiler while the section 4 of the smoke pipe is connected to a chimney which is also not illustrated.

The cylindrical casing is provided adjacent to the lower collar 2 with an enlarged circular air chamber 5 of a diameter considerably greater than the diameter of the said collar and having its walls curved from top to bottom to provide a continuous circumferential concave inner face for a purpose to be described. At the top of the enlarged circular chamber there is provided an intermediate collar 6, suitably secured to the chamber 5, having its axis in longitudinal alignment with the axes of the collars 1 and 2, and of a diameter considerably greater than the diameter of the said collars and terminating at its upper end in an outstanding horizontally disposed, annular wall or platform 7, disposed in overhanging relation to the air chamber 5, the outer periphery of the same being suitably secured to the lower, outer edge of a frustoconical hood 8, the upper portion of the circular inclined, converging walls of which terminate at the lower end of collar 1 and are fastened thereto.

Located within the chamber 5 and at the

upper portion thereof is an inclined annular partition plate 9 having its upper and outer edge suitably secured to the chamber 5 at its point of connection with the intermediate collar 6 and provided at its lower edge with an outstanding frustoconical deflector plate 10 the outer, lower edge of which is of a diameter slightly greater than the lower collar 2, and is supported in spaced relation thereto.

A plurality of the spaced tubular air ducts 11 are provided and connect, at their outer ends, with openings 12 formed in the horizontal annular platform 7 and at their inner ends with appropriate openings 13 formed in the inclined partition 9, said ducts being curved along their axes to form goose-necks to conduct air from the outside atmosphere to a point within the chamber 5 in a manner to strike the inner downwardly and inwardly curved face of the chamber and be deflected toward the center of the chamber, there to be caught by the up-draft through the device caused by the suction of the chimney, as indicated by the arrows.

The plate 10 serves to deflect the currents rising through the pipe 4 and collar 2 away from the concave walls of the chamber 5 and thus prevents the same from interfering with the inflow of the downwardly and inwardly directed currents of fresh air through the ducts 11, and it will be seen that, by reason of the inclination of the annular partition 9, no cinders or soot will collect thereon and thus a clear passage through the center of the device is always maintained.

The outer periphery of the hood 8 is formed into a downwardly and inwardly turned flange 14 slightly spaced away from the platform 7 to provide space for the outer periphery of an annular damper-plate 15, provided, at its inner edge, with a depending, cylindrical sleeve 16, surrounding the intermediate collar 6 and adapted to rotate thereon.

Appropriate apertures 17 are formed in the damper-plate 15, and are adapted to register with the outer open end of the ducts 11, or to partially open the same upon the rotation of the plate 15 in the proper direction, a handle 18 being provided on the same for this purpose.

An ordinary butter-fly damper 19 is interposed in the lower collar 2 and is provided with an external manipulating handle 20 so that the draft may be wholly or partially cut off between the furnace and the device, when the chimney may find its source of air supply wholly or in part through the ducts 11, or the damper 19, upon being in full open position, will permit of the maximum effect of the draft upon the fire at the same time a reduced volume of air is

passing in through the ducts 11 and caused to swirl in an inward direction to baffle the suction of the draft upon the fire.

It will be seen that when a low or moderate wind is blowing the supply for the chimney is drawn partially from the fire-box and partially through the ducts 11 and upon an increase in the suction a greater volume of air is drawn through the ducts in a downward direction to counteract any excessive draft upon the fire, thus maintaining a regularity of draft no matter what the conditions in the chimney may be.

From the foregoing it will be seen that a simple, durable and cheaply constructed smoke pipe air check has been devised, which will not easily become deranged and which requires no special adjustment or attention, the parts being suitably riveted, crimped, or otherwise secured together and that the same may be easily applied to any standard smoke pipe without requiring any expert knowledge therefor.

I claim:

1. A smoke pipe air check comprising a casing provided with terminal collars, an air chamber provided in the casing adjacent to one of the collars, a frustoconical hood arranged above and in overlying relation to the chamber and connected at its upper end to the other collar, a downwardly and inwardly inclined annular partition located within the upper portion of the chamber terminating at its lower edge in an outwardly directed annular deflector plate, ducts connecting the interior of the chamber near the walls thereof with the atmosphere and means for throttling the passage of air through the ducts.

2. A smoke pipe air check comprising a circular casing having terminal collars adapted to fit a furnace smoke pipe, an enlarged air chamber adjacent to one collar, an outstanding frustoconical shaped hood adjacent to the other collar of larger diameter than the chamber and having an inclined upper wall and a horizontal lower wall, an intermediate collar connecting the same with the upper edge of the chamber, an inwardly and downwardly inclined annular partition extending from the upper edge of the chamber and provided at its inner, lower edge with an outwardly and downwardly directed annular deflector plate, accurate air ducts communicating with the space between the partition and the walls of the chamber and with the outside atmosphere and means for simultaneously controlling the inflow of air through the ducts.

3. A smoke pipe air check comprising a circular casing having a collar at each end for connection with a smoke pipe, a damper located in one of the collars, an enlarged circular air chamber arranged adjacent to

the latter collar and having a continuous concavo-convex wall of greater diameter than the collars, a downwardly and inwardly inclined annular partition secured to the upper edge of the chamber and located in the upper portion thereof, an outwardly directed annular deflecting plate carried by the lower edge of the partition and in spaced relation to the walls of the chamber and the upper end of the last mentioned collar, a hollow hood arranged above the chamber having its outer periphery of greater diameter than the chamber and communicating at its top with the other collar and provided at its bottom with a horizontally disposed annular wall, an intermediate collar connecting the inner edge of the horizontal wall with the top edge of the air chamber, a plurality of openings formed in the aforesaid

inclined partition, a like number of radially alined openings formed in the horizontally disposed wall, curved tubular ducts connecting the several pairs of openings to establish communication between the interior of the chamber and the outside atmosphere, a depending annular flange arranged around the periphery of the hood, an annular damper-plate fitting in the flange and having a depending sleeve surrounding the intermediate collar and openings formed in the plate to register with or uncover the open outer ends of the ducts.

In testimony whereof I affix my signature in the presence of two witnesses.

HULDRICK B. REID.

Witnesses:

PHILIP F. LARNER,
W. C. BATES.