No. 828,702. PATENTED AUG. 14, 1906.

O. N. ANDERSON.

HEATER.

APPLICATION FILED MAY 28, 1904.

2 SHEETS—SHEET 1.

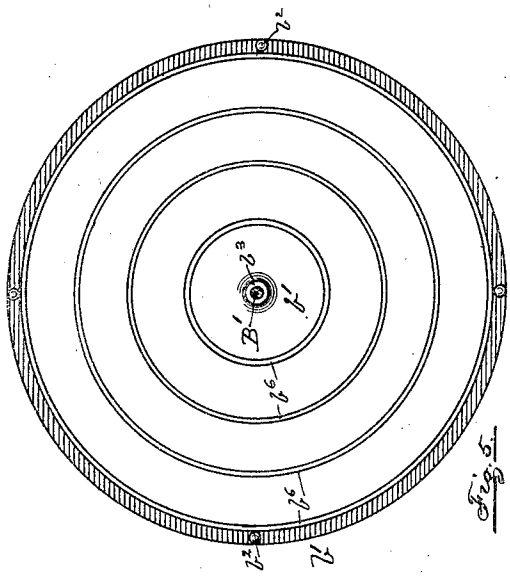


Fig. 5.

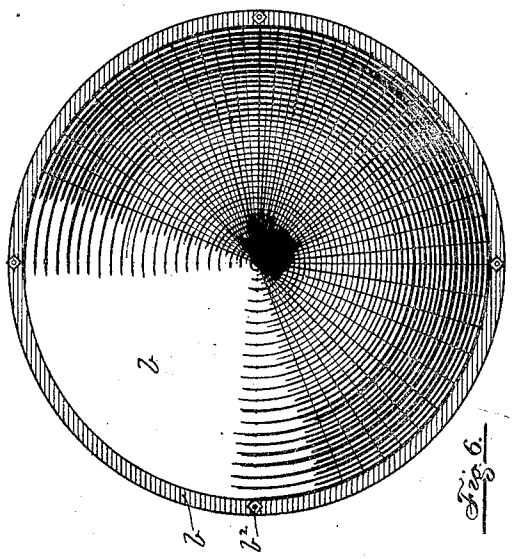


Fig. 6.

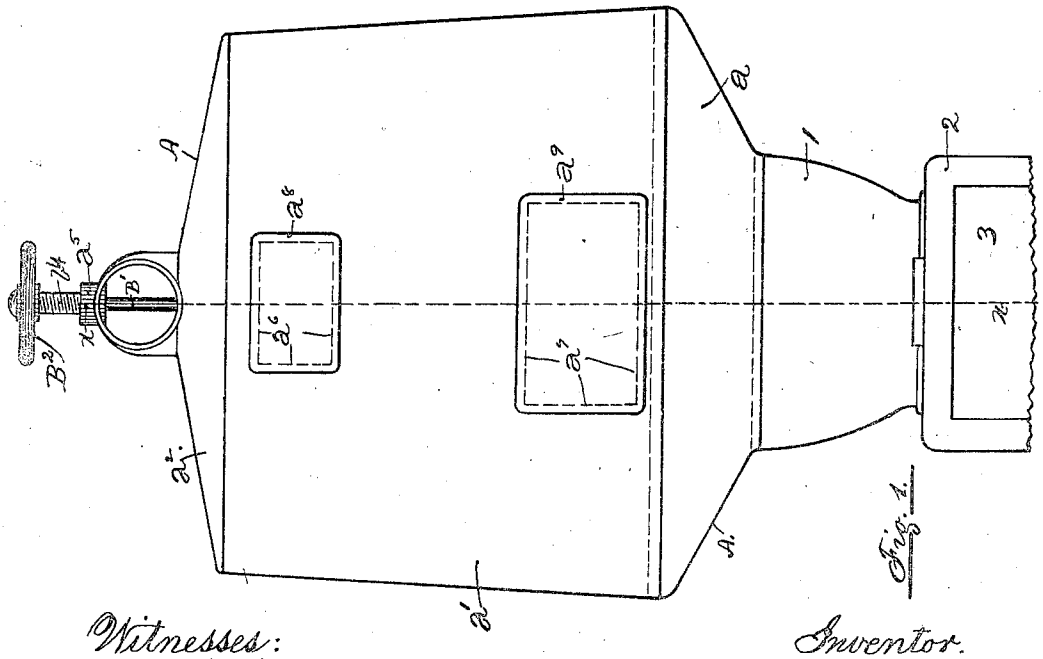


Fig. 4.

Witnesses:

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2 SHEETS—SHEET 2.

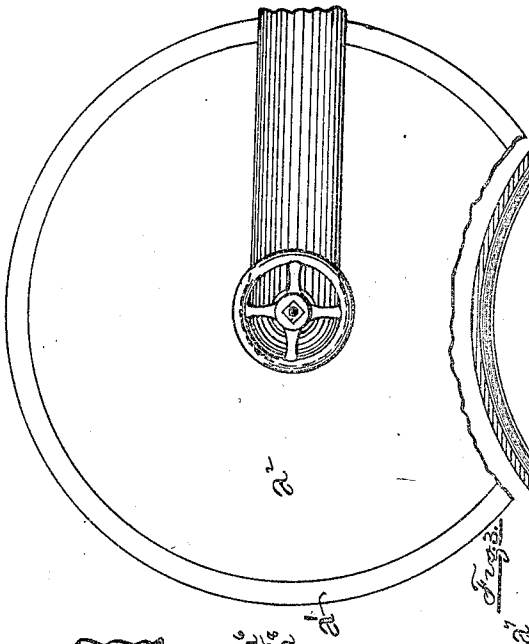


Fig. 3.

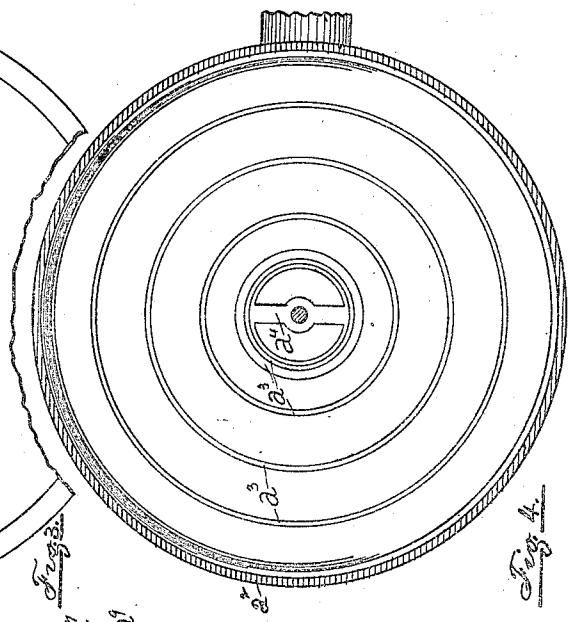


Fig. 4.

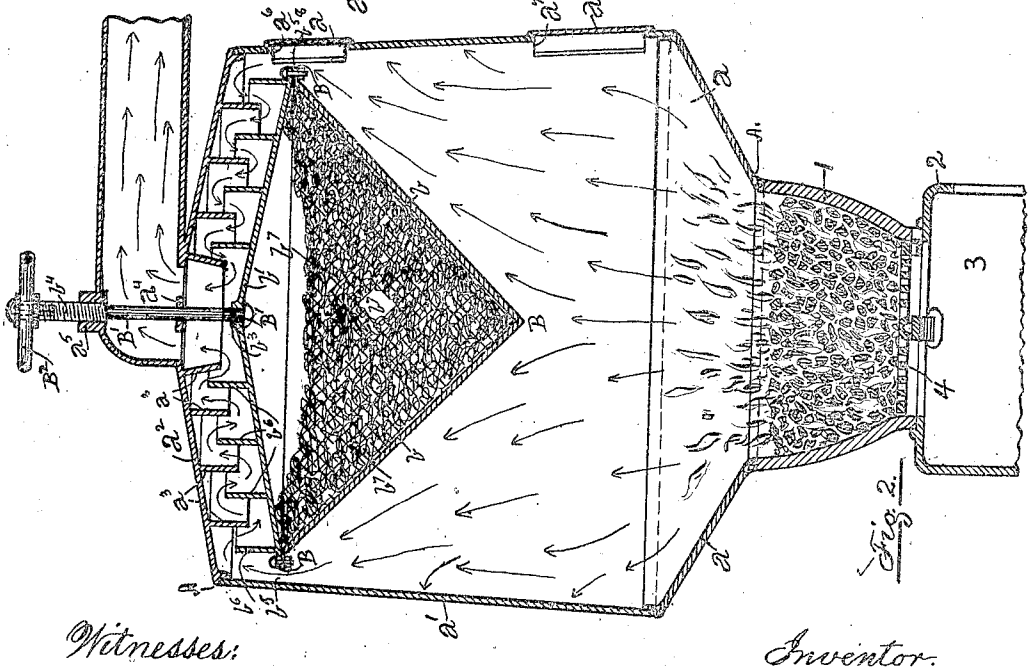


Fig. 2.

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UNITED STATES PATENT OFFICE.

OLIVER N. ANDERSON, OF LANCASTER, PENNSYLVANIA.

HEATER.

No. 828,702. Specification of Letters Patent. Patented Aug. 14, 1906.

Application filed May 28, 1904. Serial No. 210,297.

To all whom it may concern:

Be it known that I, OLIVER N. ANDERSON, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Heaters; and I do hereby 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.

This invention relates to improvements in a heater of that class in which an ordinary fire-pot is provided at its upper end with a specially-constructed drum containing a combustion-chamber and having at the center of its top a smoke-escaping aperture opening into a pipe or flue and having arranged within said drum a specially-constructed body adapted to be raised or lowered.

The object of the invention is the construction of a heater in which the products of combustion—smoke and gas—are allowed to escape by compressing them into and through a narrow surrounding ring in their passage to the smoke-outlet, forcing them against the inner surface of the wall of the drum, and thereby measurably increasing the radiating property thereof or enabling said wall to throw out a greater degree of heat.

The elements of the invention will severally and at large appear in the following description, and they will be separately or combinedly set forth or pointed out in the appended claim.

The purposes of the invention are attained by the devices and means illustrated in the accompanying drawings, with similar reference characters to designate similar or like parts throughout the several views, in which—

Figure 1 is a front elevation of a heater embodying the elements of the invention, but the lower portion of its base is broken away for want of room in the drawings; Fig. 2, a transverse vertical section of the same, taken on the line x x in Fig. 1 and viewed from the left; Fig. 3, a top view of Fig. 2 as it appears when completed and a portion of its lower side broken away; Fig. 4, an inverted view of the top as it appears when detached from Fig. 3 with the broken-away side restored; Fig. 5, a top view of the suspended body as it appears when detached from Fig. 2 and completed, and Fig. 6 an inverted view of Fig. 5.

In the drawings the numeral 1 designates a usual or well-known fire pot or box arranged on an ordinary base 2, with the lower portion thereof broken away. In the base is situated the usual ash-pit 3, while in the bottom of the fire-pot is arranged an ordinary rotatable grate 4, which supports the fire to furnish the required heat.

The specially-constructed drum A of the invention consists, preferably, of an upwardly and outwardly flaring base portion a of approved dimensions, open at both ends, with its smaller or lower end seated onto the upper end of the fire-pot 1 and its larger or upper end upwardly extending, onto which end is seated the lower end of an upwardly and inwardly sloping shell a', being slightly conical in its external contour and having its upper end closed by a slightly-depressed conical top a^2, provided at its apex with a smoke-exit aperture opening into a pipe or conduit leading to a smoke flue or stack, (not shown,) and the under surface of the top is provided with a series of concentric ring-walls a^3 about said smoke-exit aperture to aid in baffling the flow of the combustion product in its passage to said smoke-outlet, while through the center of the smoke-exit aperture said top is provided with a cross-strip a^4, having at its center a guide-orifice through which passes a suspending and adjusting rod, yet to be described, and axially above said orifice in the top wall of said smoke-conduit is arranged a boss a^5, having at its center an internally-screw-threaded orifice through which said suspending-rod is lowered or raised, as may be required to adjust the draft or heat controlling device suspended by said rod within the drum, both the device and its adjustment to be hereinafter described. The shell a' of the drum, in the upper portion thereof, is provided with a hand-hole a^6 for cleansing and at the desired point below with an opening a^7 for the admission of fuel to the fire-pot, both of which, said hand-hole and fuel-opening are adapted to be closed, as by doors a^8 and a^9, respectively; but their hinges are omitted in the drawings.

Within the body of the drum, in the upper portion thereof, is arranged a heat-controlling or draft-regulating body B, composed of an inverted cone b and a flattened or depressed but upright cone b', with their bases of less diameter than is that of the drum at this point, said bases being placed together and rigidly secured, as by headed bolts b^2

passed therethrough and by nuts screwed home on the threaded ends of the bolts, the slant surface of the cone b making angles of practically forty-five degrees opening with reference to its base, while the slant surface of the cone b' lies in lines practically parallel to that of the conical top a^2, before mentioned, the apex of the cone b being the required distance above the fire-pot and the apex of the cone b' surrounded by a boss b^3, through the center of which is secured the lower end of a rod B', having adjacent to its upper end an external screw-thread b^4, engaging the screw-thread of the boss a^5, also before mentioned, and to the upper extremity of the rod is rigidly secured the central hub of a hand-wheel B^2 to rotate said rod, lowering or raising the suspended body B, and thereby regulating or controlling the flow of smoke or gas through to the smoke-outlet, while around the joined bases of said cones there is formed an open ring or space b^5 for the passage of said smoke or gas. On top of the slant surface of said cone b' are erected a series of concentric ring-walls b^6, similar but oppositely disposed to the ring-walls a^3 before mentioned and with which they alternately intermesh, rendering completely tortuous under certain conditions the smoke-passage thereover and through to the smoke-outlet, said body B being filled with any suitable non-heat-conducting substance—such as mineral wool b^7, sheet asbestos, or ashes—preventing measurably the absorption of heat. Of course this result will only be obtained after the filling matter within the suspended body B shall have become thoroughly heated.

Now the several elements hereinbefore described and occupying the respective positions indicated in the drawings, with the tongues of flame from the fuel in the fire-pot producing the combustion product, gas, and smoke, sending said product or the gas and smoke upward throughout the area or space within the drum against the slant surface of the cone suspended therein, forcing it into the upwardly-narrowing angular space surrounding the cone to the narrow ring-space b^5 therethrough and into and through the tortuous passage-way to the smoke-exit aperture therethrough and into the smoke pipe or conduit, as indicated by arrows, the following observations will be noted: that the product of combustion in its upward flow by contacting with the slant surface of the inverted cone will be diverted outward against the inner surface of the shell a' of the drum, imparting heat thereto; that said product in its upward flow is gradually compressed as it progresses into the upwardly-narrowing angular space to said ring-space b^5, said compression becoming greatest when said ring-space is reached; that this gradual compression of said combustion product proportionately intensifies the heat contained therein, said intensification becoming greatest where said compression is greatest, being at said ring-space b^5; that during this upward flow of said product by reason of said intensified heat a measurable portion of the gas is consumed therefrom; that the narrow ring-space b^5, opening into the tortuous passage-way to the smoke-exit, checks the free passage of said flow therethrough, but it does not prevent the escape of unconsumed gas or smoke; that lowering the suspended body B by means of the hand-wheel B^2 and the rod B' widens said ring-space b^5 and reduces the tortuous passage-way, and that lowering said body B until the ring-walls a^3 and b^6 have their contiguous edges the required distance apart said tortuous passage-way entirely disappears, leaving a straight passage-way in place for the free passage of the combustion product therethrough to the smoke-outlet tube. Of course the area of the ring-space b^5 should not be less than the area of the smoke-outlet tube.

The invention having thus been ascertained and described and the manner in which its functions are performed fully shown and set forth, what is considered new, and desired to be secured by Letters Patent, is—

In a heater, in combination, a fire-pot mounted on a base; a practically cylindrical drum mounted on said fire-pot, said drum having a closed top with a smoke-exit aperture at the center thereof, a smoke-conduit extending from said aperture, and a plurality of concentric ring-walls arranged around said aperture and projecting downwardly from the under surface of said top; a non-heat-conducting body arranged within said drum in the upper portion thereof, said body having a conical under surface, and a closed top practically parallel to said first-mentioned top, with a plurality of concentric ring-walls projecting upwardly from its upper surface and spaced to alternately intermesh with said former ring-walls, and a ring-space surrounding the upper end of said body where its diameter is greatest, with a screw-threaded rotatable rod provided whereby the body is suspended, lowered, and raised, substantially as described and for the purpose hereinbefore set forth.

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

OLIVER N. ANDERSON.

Witnesses:

DANL. H. HERR,

CHAS. E. LONG