

No. 664,751.

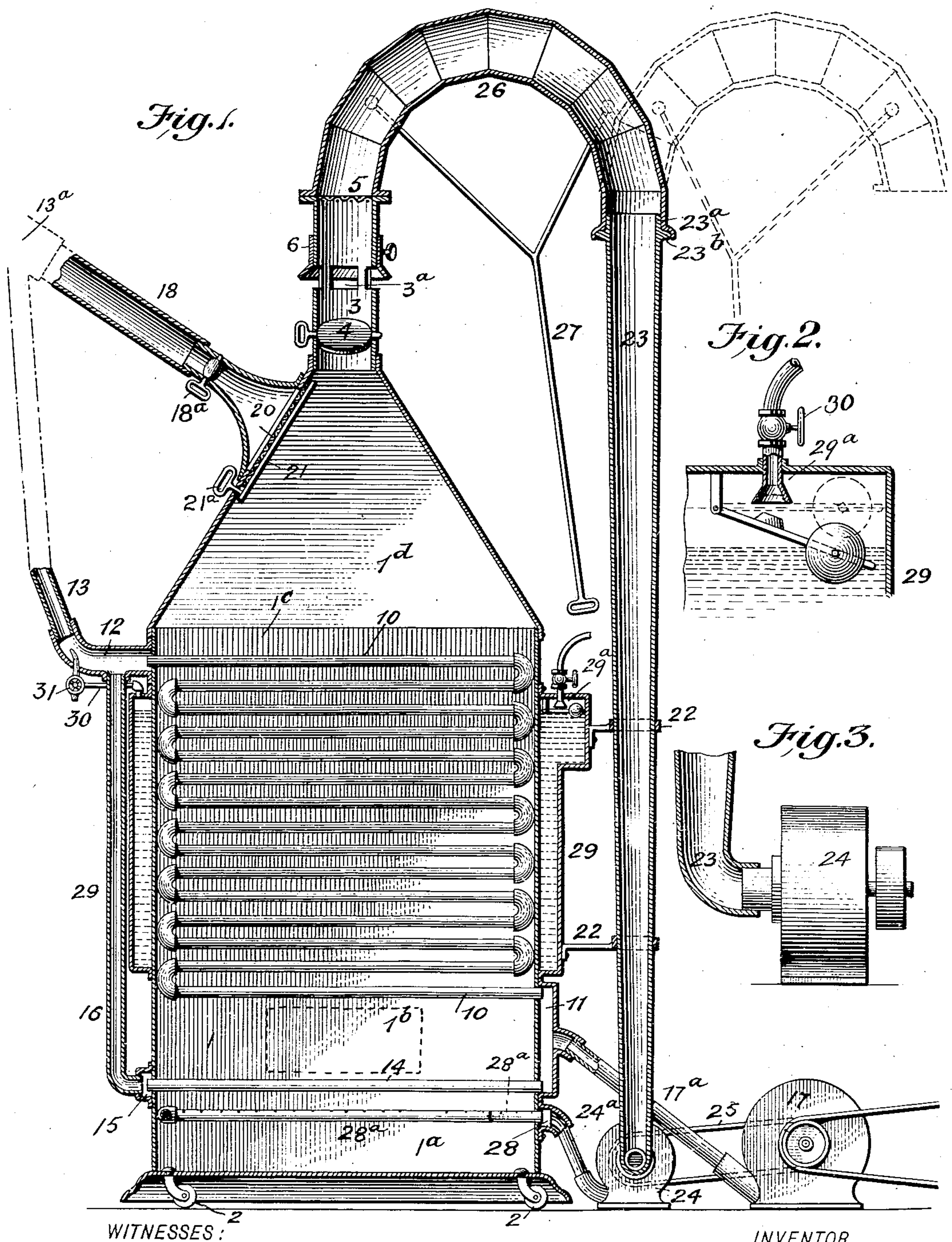
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J. L. HOLLINGSWORTH.

PORTABLE HEATER.

(Application filed Jan. 9, 1900.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## PORTABLE HEATER.

SPECIFICATION forming part of Letters Patent No. 664,751, dated December 25, 1900.

Application filed January 9, 1900. Serial No. 906. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES L. HOLLINGSWORTH, residing at Newbern, in the county of Dyer and State of Tennessee, have invented certain new and useful Improvements in Portable Heaters, of which the following is a specification.

This invention relates to improvements in portable heaters of that kind especially adapted for use in tobacco, lumber, grain, or fruit drying barns or kilns, and in its more generic nature comprehends a novel construction of parts embodying a suitable caster-mounted heater-body having means connected therewith for creating a forced or natural draft and having adjustable devices mounted thereon and movable therewith for producing a continuous-draft circulation, whereby a more complete and increased combustion is obtainable with a minimum consumption of fuel, said construction of parts also including a simple, novel, and peculiarly arranged means for creating a commingling of air with the products of combustion and adapted to operate in such a manner that the combined mass—i. e., the induced air and products of combustion—is mixed and discharged back in the fire-chamber and consumed.

The invention consists in the novel combinations and arrangement of parts above referred to and as will be hereinafter first described and then claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of my improved heater. Fig. 2 is a detail sectional view of the float-valve device hereinafter referred to. Fig. 3 is a detail view hereinafter referred to.

In its preferred construction my improved heater is made of sheet or cast metal and comprises a rectangular-shaped body 1, mounted upon casters 2 to facilitate the movement of the heater, especially when used for drying purposes.

The heater-body 1 has a lower or ash-pit compartment 1<sup>a</sup>, a fire-pot 1<sup>b</sup>, and a combustion-chamber 1<sup>c</sup>, which merges with the supplemental combustion-chamber 1<sup>d</sup>, which forms practically a continuation of the chamber 1<sup>c</sup>, said chamber 1<sup>d</sup> tapering conically toward the main offtake or draft pipe 3, which is provided with an offtake-valve 4 at its lower end and a spark-arrester diaphragm 5

at a suitable point above the valve 4. At a point between the valve 4 and the diaphragm 5 the pipe has one or more air-inlets 3<sup>a</sup>, arranged in the same horizontal plane, the area of which may be increased, or the said inlets cut off entirely by means of an adjustable hood 6, the purpose of which will presently be more fully explained.

The fire-pot in practice has the usual feed-opening and door, (indicated by dotted lines in Fig. 1.)

In its complete construction my improved heater is equipped with a series of continuously-coiled pipes 10, the coils of which are arranged in horizontal rows and extend the full width of the combustion-chamber, the lower legs of the series being disposed just over and forming, as it were, the crown of the fire-pot, while the upper ends of the said series of pipes terminate at the base of the upper or supplemental combustion-chamber, as clearly shown in Fig. 1. All of the lower ends of the pipes 10 project through the body 1 and communicate with the air-duct 11, while the upper ends of all of the said pipes discharge into air-collecting spaces 12, with which an air-conveyer flue 13 connects and which in practice is connected with the hot-air-circulating pipes disseminated within the drying house or kiln and which may be arranged in any suitable manner.

In my construction of heater the grate of the fire-pot is composed of a series of air-pipes 14, which project through the sides of the body 1 and have one end communicating with the air-space 11, while their opposite ends communicate with a duct 15, which in turn communicates through the pipe 16 with the air-duct 12, that discharges into the air-conveyer flue 13, as clearly shown in Fig. 1.

To maintain an air circulation through the pipes 10, 14, 16, and 13, a suitable blower 17 is provided, driven by any suitable means, the outlet-pipe 17<sup>a</sup> of which discharges into the air-collecting space 11.

18 indicates a smoke-flue which connects with the combustion-chamber 1<sup>d</sup> at a point below the valve 4 of the main offtake 3, and while I have not shown it in this application this flue 18 merges with the air-conveyer pipe 13, the two in practice being continued into a distributing-pipe section 13<sup>a</sup>, which through



the medium of any suitable coupling member is connected with the duct-flues of the barn or kiln before referred to.

The flue 18 has a cut-off valve 18<sup>a</sup>, and over its entrant end is placed a spark-arrester screen 20.

21 indicates a clearer-blade held to be operated from the outside by a handle 21<sup>a</sup>, the purpose of which is to clear the ashes from the screen 20. The said clearer may be of any suitable construction, as it forms no part of this invention.

29 indicates a closed jacket that surrounds the body 1, which forms a water-space, and which space has a feed-opening 29<sup>a</sup> in the top and an outlet with which a valve-pipe 30 connects and which has an injection-nozzle discharging into the air-offtake pipe 13.

By providing a water-jacket surrounding the heater-body 1 and connecting the said water-jacket with the air-offtake 13 I provide a humidizing means which can be utilized to either humidize the atmosphere of a room heated by direct radiation from the heater or for humidizing the hot air that passes from the said heater, it being understood that the valve 3, being a two-way valve when turned in one direction, will lead off the moistened air from the jacket into the room and when turned in the other direction will discharge it into the pipe 13.

This humidizing feature renders my invention particularly useful in the treatment of tobacco. It should be stated, however, that this feature of my invention, together with the manner of arranging the coiled air-pipes 10, the supplemental offtake 18, and the pipe 13, forms the subject-matter of my Patent No. 648,259, dated April 14, 1900.

In the use of heaters for lumber, tobacco, and fruit drying barns or kilns it is at times essential that the products of combustion be thoroughly controlled, so as to avoid danger of fire and also to increase the draft and capacity of the heater. For this purpose I equip my improved form of heater with a simple and novel arrangement of smoke-returning devices and means for creating a forced draft. For this purpose the heater-body at one side has projecting brackets 22, in which is fixedly held a downwardly-tapering pipe 23, the lower end of which is detachably fitted upon the discharge of a blower 24, as clearly shown in Fig. 3. In practice the said blower 24 may be belted to the blower 17 or may be separately driven by any suitable power, it being understood that when it is arranged to be driven by the shaft of the blower 17 it can be readily disconnected and held inert by slipping on the belt 25. The upper end of the pipe 23 is formed with a collar or seat 23<sup>a</sup>, having an annular rim 23<sup>b</sup>, and upon this seat-rim is pivotally supported an elbow 26, held upon the pipe 23, to swing in a horizontal plane, as indicated in dotted lines in Fig. 1, and to provide a simple means for adjusting the said elbow 26 a handle member 27 is pendently se-

cured to the elbow, by the manipulation of which the said elbow may be turned to or from connection with the pipe-section 3, it being understood that when turned in connection with the pipe-section 3 the coincident ends of the pipe 3 and the elbow may be secured from separating by any suitable clamp devices. (Not shown.) The blower 24 has an outlet-pipe 24<sup>a</sup>, which discharges into an air-space 28, with which one end of a series of perforated pipes 28<sup>a</sup> communicate. These pipes 28<sup>a</sup> are horizontally disposed below the grate-pipes and their perforations are arranged to discharge between the grate-pipes.

By providing the heater with means for creating a forced draft, such as described, the capacity thereof can be increased at will, this being particularly essential when the heater is to be used for drying purposes where the heat volume must be under easy control and capable of being quickly increased or diminished, as the character of the articles to be dried may make necessary, as well as the products of combustion controlled to prevent their passing out at points where their natural dissemination might prove dangerous. Furthermore, by providing an offtake-pipe 3 with air-inlets and an adjustable sleeve for controlling the size of the inlets it is obvious that when the elbow 26 is turned over, so as to provide for drawing the products of combustion back into the fire-pot, the said products of combustion can be commingled with atmospheric air, as may be desired, and the draft thereby not only increased, but the commingling of the air with the products of combustion causing a quicker and more perfect consumption thereof as they pass into the fire-pot. When it is intended to use it as a smoke-drier, the valve 4 is closed and the smoke caused to pass off into the pipe 18. When this is the case, it is obvious the hot air which passes out through the pipe 13 will act as a suction to draw the smoke from the fire-chamber into the pipe 18 and from it into the pipe 13<sup>a</sup> and through the disseminating-pipes within the kiln or barn.

By providing a swinging elbow member adapted to close over and form a continuation of the smoke-pipe 3 it is obvious that should it be desired to create a quick and powerful draft when the main flue-valve 4 is opened and the valve 18<sup>a</sup> in the pipe 18 is closed it is only necessary to swing the elbow member 26 over and bring its mouth in a line with the outlet of the offtake-pipe 3, and thereby not alone provide for a quick and powerful direct draft for the heater, but also for returning the products of combustion back under and into the fire-pot, such arrangement of my invention being particularly desirable when it is to be used as a hot-air generator for heating or drying purposes.

By providing a swinging elbow member it is obvious that should at any time it be desired to create a quick and powerful combustion the main flue-valve 4 can be opened and a



suction-draft secured, which also serves as a means for passing the products of combustion back in the fire-pot, this being particularly desirable when the device is used to generate hot air for heating and drying purposes.

When used for heating tobacco, after the tobacco has been smoked and hot-air dried the fire can be quickly banked or drawn and cold air moistened by reason of the escape of the vapor into the water-jacket 29 can be quickly charged into the barn and the tobacco fixed by proper humidization without atmospheric humidization, as is ordinarily done.

I am aware that it is not new to provide means for returning the products of combustion back into the fire-pot, and I make broadly no claim for such construction. My invention differentiates from what has heretofore been done in this line, so far as I know, in that I provide a portable heating apparatus by which the heat can be quickly generated for drying purposes or the smoke can be deflected and used for smoke-drying, the coöperative arrangement of the valved pipe 3, the swinging elbow 26, and the valved pipe 18 being such that the apparatus can be quickly set up for its different uses without changing the

parts thereof further than swinging the elbow 26 and adjusting the valves 18<sup>a</sup> and 4.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

An improved heating apparatus for the purposes specified, comprising in combination a heater having a hot-air outlet, the upper end of the heater having a valved offtake for the direct draft, and a supplemental valved smoke-outlet communicating with the hot-air outlet, the upper end of the direct outlet having a seat and suction-flue support upon the bed of the heater, a blast-fan communicating with the said flue, the upper end of the flue having a seat portion, and the elbow-section 26, forming a part of the flue mounted upon the upper end of the suction-flue portion supported upon the bed of the heater, the free end of the said elbow being shaped to engage with the seat of the main draft-pipe 3, said elbow-section having a pendent handle for turning it, all being arranged substantially as shown and described.

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Witnesses:

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