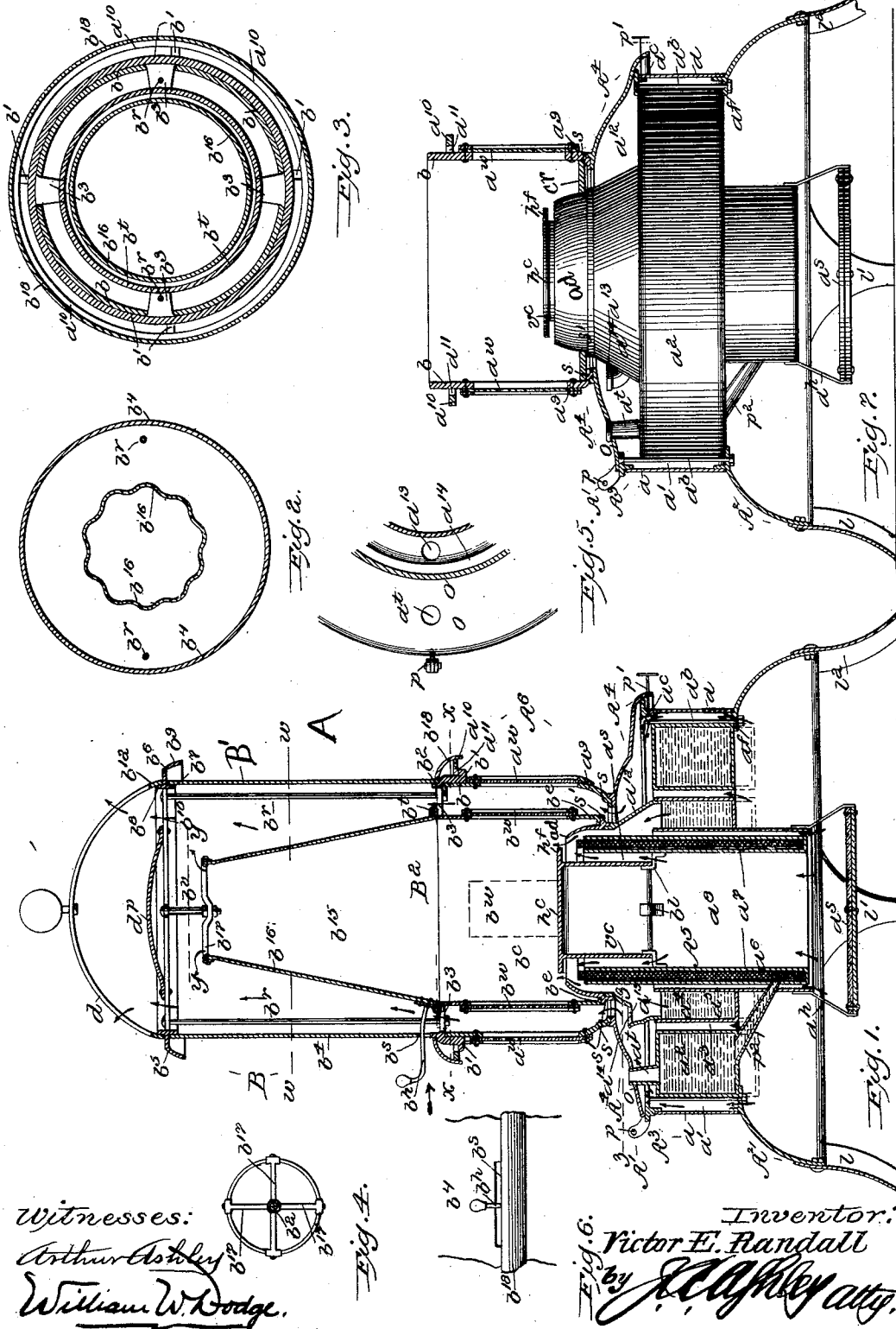


(No Model.)

V. E. RANDALL.
CULINARY AND HEATING OIL STOVE.

No. 481,511.

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UNITED STATES PATENT OFFICE.

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CULINARY AND HEATING OIL-STOVE.

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To all whom it may concern:

Be it known that I, VICTOR E. RANDALL, a citizen of the United States, and a resident of Burlington, in the county of Calhoun, in the State of Michigan, have invented a new and useful Culinary and Heating Oil-Stove, of which the following is a correct description.

The invention relates to that class of stoves in which hydrocarbon or other oils adapted to the purpose are employed as fuel, the same being supplied through a suitable reservoir or receptacle to any desired or convenient number of wicks.

The invention consists in certain novel parts or co-operating assemblages of parts in an oil-stove whereby the wick-chamber or wick-tube and its contents are prevented from becoming unduly heated, whereby the oil chamber or reservoir also is maintained at a low temperature, whereby currents of suitably-moistened air are supplied in proper volume to the flame-opening, whereby the chimney or combustion-chamber and the air or heating drum and mixing-chamber are made readily detachable from the body of the stove proper, whereby when the superstructure of the stove has been detached the base or substructure is readily convertible into a cooking-stove, and whereby the stove is readily rendered either illuminating or non-illuminating, as may be desired.

In the accompanying drawings, which constitute a part of this specification, Figure 1 represents a transverse vertical central section of the stove, the chimney or combustion-chamber and the outer casing or heating-drum, together with its surmounting discharging-dome, being in place. Fig. 2 represents a horizontal sectional plan view as in the plane at *ww* in Fig. 1. Fig. 3 represents a horizontal sectional plan view as in the plane at *xx* in Fig. 1. Fig. 4 is a detail top plan of the chimney as in the line *yy* in Fig. 1. Fig. 5 is a detail horizontal section in the line indicated at *z* in Fig. 1. Fig. 6 represents a detail side elevation as when looking in the direction indicated by the arrow seen at the left in Fig. 1. Fig. 7 represents the base or body of the stove as when the closing-ring or cut-off plate is applied and the stove is adapted for cooking purposes, the figure being in part a side elevation and in part a transverse ver-

tical central section of this portion of the apparatus.

The base *A'* of the stove *A* consists of an annular downwardly and outwardly flaring air-receiving section *A*², which is supported upon legs *l l' p*, &c., a reservoir-section *A*³, which is received upon the upper extremity of the air-receiving section, a cap or covering-section *A*⁴, which rests upon the upper extremity of the outer wall of the reservoir-section *A*³, and a central or intermediate wick-tube and flame-spreading section *A*⁵.

The reservoir-section *A*³ embraces the annular outer casing *a*, an outer or primary annular air-passage *a'*, the annular oil-reservoir or fuel-receptacle proper *a*², a secondary annular air-passage *a*³, an annular water-reservoir *a*⁴, a third annular air-passage *a*⁵, a wick-chamber or wick-tube *a*⁶, and a central air-tube or draft-passage *a*⁸, which is formed by the inner cylinder *a*⁷ of the wick-tube.

The annular oil-reservoir *a*² rests by its outer periphery upon the projecting inner flange or seat *a f* at the upper extremity of the annular air-receiving section *A*², and suitable securing-bolts *a b* connect this annular section and the parts immediately above it with a flanged annular collar *a c*, which is received upon the upper extremity of the outer casing *a* and which forms a suitable seat for the cap or covering-section *A*⁴.

The annular cap or covering-section *A*⁴ is in its lower portion flat and preferably nearly horizontal, as shown, and to it in its narrowest or deflecting portion is secured the lower extremity of the frame or body *a*⁹ of the outer illuminating or windowed section *A*⁶. This covering-section has at one side an orifice *o*, which is adapted to receive or be passed over the filling-tube *a t* of the oil-reservoir *a*², and it may at one side be pivotally secured by a hinge-pin *p* to projections upon the flanged ring or frame *a c* of the section *A*³, the opposite side being made fast by means of a pin *p'*, which engages the depending flange of the covering-section and the collar *a c* of the reservoir-section.

Upon the inner face of the frame *a*⁹ of the drum portion of the outer illuminating-section *A*⁶ is provided a continuous annular seat *s*, while upon the outer surface of the upper extremity of such frame or body are two op-

positely-placed lugs a^{10} , each of which is provided with a slot a^{11} .

The two concentric cylinders, which constitute the vertical walls of the wick-chamber or wick-tube and the inner of which constitutes the central draft-passage or air-tube a^8 , extend, as will be seen, both below the bottom and above the plane of the top of the reservoir-section proper. At a point near its base the wick-chamber is supplied with oil from the reservoir a^2 through a pipe p^3 , by which it is at one side connected to the lower portion of the reservoir.

Upon the inner surface of the central air-passage a^8 , preferably in plane with the upper extremity of the reservoir, are lugs or brackets b^1 in suitable number, the unattached upturned ends of which are engaged by the lower extremity of a vertical cylinder v^c , which extends upwardly to a point a short distance above the upper end of the wick-tube and its wick, at which point it is closed by an imperforate horizontal cap h^c , which is of somewhat greater diameter than the body of the cylinder, and thus overhangs the entire area of the central air-tube and slightly overhangs the wick-tube itself as well.

The outer wall of the water-reservoir has at its upper extremity a vertically-placed and upwardly-indrawn closing and deflecting ring a^{12} , the horizontal area of which corresponds with that of the body of the water-reservoir itself, and at its upper extremity it is suitably recessed to receive the lower extremity of an annular deflecting and supporting collar a^d , which upwardly is inwardly curved toward the projecting peripheral flange h^f of the deflecting and closing plate or horizontal cap h^c and in vertical plane with the third annular air-passage a^5 . Near its base the collar a^d has a continuous horizontal exterior seat s' , which, as will be seen in Figs. 1 and 7, is coincident with the seat s upon the lower inner portion of the frame a^9 of the outer illuminating-section A^6 .

The upwardly-indrawn deflecting-ring a^{12} has at one side an opening a^{13} , through which when the covering-section is tilted and when its cover a^{14} is removed water is supplied to the receptacle a^4 .

Suitable hangers a^h , which are secured to the lower and outer extremity of the third annular air-passage, receive a horizontal deflector or floor-screen a^s , which upon its upper surface is by preference covered with asbestos, felt, or other non-conducting and incombustible substance.

The upper section or superstructure B of the stove A consists of the cylindrical exterior drum or radiator B' and the cylindro-conical combustion-chamber and chimney B², the two being firmly connected together and detachable from the base-section of the stove, as shown and as will be described.

At the base of the drum or radiator B' is the ring b , which has exterior lugs b' , top recess b^2 , and interior horizontal inwardly-ex-

tending perforated arms b^3 . The top recess b^2 receives the sheet-metal cylinder b^4 , which at its upper extremity receives in turn the cap-ring b^5 , which has flat body b^6 , bottom flange b^7 , top flange b^8 , depending outer rim b^9 , and central centrally-perforated transverse bar b^{10} . The upper extremity of the cylindrical drum encircles the bottom flange b^7 , while the top flange b^8 receives the rim b^{12} of the surmounting air-discharging dome d .

Rods b^r received by their ends in perforations in the transverse bearing-bar b^{10} and in the inwardly-extending horizontal arms b^8 of the lower ring, serve to secure the described parts in position.

The combustion-chamber and chimney B² comprises the cylinder b^c , which by its lower and preferably flanged extremity b^e is received upon the seat s' and is provided with suitable windows b^w , which, as clearly seen in Fig. 1, are coincident with like windows a^w in the exterior casing of the stove, and the conical surmounting chimney b^{15} , the body of which has vertically-extending corrugations b^{16} and at its upper extremity is provided with a centrally-placed transverse bearing-bar b^{17} .

In assembling the parts the outwardly-extending lugs b' at the base of the ring b^4 of the radiator B' being passed through the slots a^{11} in the lugs a^{10} of the frame or body a^9 of the outer illuminating-section A⁶, the cylinder being then slightly turned in a horizontal plane, engage the body of such lugs, and thus lock the two cylinders together. By the same movement the interior arms b^3 are passed through coincident notches (not shown) in the rim b^t , formed by the junction of the cone with its cylindrical base, and engage the bottom surface of such rim. The lower extremity of the cylinder b^4 is received within a vertically-curved closing and covering ring b^{18} , the downwardly-extending portion of which conceals the main body of the base-ring and its slotted lugs from view and constitutes a suitable finish for this portion of the stove.

At one side the combustion and chimney section of the stove is provided with a handle or lever b^h , which extends outward through a horizontal slot b^s in the body of the cylinder b^4 and has movement to and fro therein.

A short vertical rod b^v is loosely received and secured at its upper extremity in a perforation at the mid-length of the transverse supporting-bar b^{10} of the upper ring b^5 of the radiator-section, and at its lower end such rod is suitably secured to the transverse central bar b^{17} at the top of the chimney, while coincident with this rod and concentric with it and with the chimney a circular deflecting-plate d^p is secured upon the upper transverse bar. In some cases it may be desirable to make the water-chamber a^4 of somewhat greater dimensions by extending its lower portion below the plane of the oil-reservoir, as indicated by dotted lines in Fig. 1.

Instead of the described compound or two-

part deflector extending upward from the upper extremity of the outer cylinder of the water-receptacle, a one-part annular deflector of like form and extent may be provided; also, the ring or collar $a c$ at the upper extremity of the base or oil-reservoir section of the stove may be made plain or unflanged upon its exterior face, and the closing-cap or covering-section may be sleeved over the same and secured thereto by a locking or bayonet joint after the manner of an ordinary two-part lantern; also, a capped opening coincident with the water-supply opening a^{13} in the inner section may be provided in such closing-cap or covering-section.

To persons skilled in the art to which the invention relates the operation of the stove will in the main be apparent from the foregoing description of its construction. The oil-reservoir and the water-reservoir having been duly filled and the wick having been lighted, air will be supplied to the flame interiorly through the central draft-passage and through the annular space $a s$ between the body of the cylinder a' and the inner wall of the wick-tube and exteriorly through the annular passage which directly encircles the wick-tube and which opens into the space above the annular water-chamber, the currents as they rise being suitably hydrated by moisture from the contents of the water-chamber. The air-currents which are received through the primary and secondary annular air-inlet passages a' and a'' are intermingled as they approach the indrawn portions of the inner and outer casings, and from this point to their point of discharge from the radiator into the dome which surmounts such radiator they are exposed to the influence of the highly-heated surface of the cylindro-conical combustion-chamber. The parts being under the adjustment represented in Fig. 1, the inner and outer windows are in coincidence, as shown, and the full illuminating power of the flame is made available. When it is desired to render the stove non-illuminating, the handle or lever $b h$ is moved to the opposite extremity of its slot, thereby moving an imperforate and non-illuminating section of the outer casing into coincidence with each of the windows in the inner section. Removal of the upper section or superstructure B from the lower section or base A' of the stove and the application of the closing or cut-off ring $c r$ to the seats s' and s adapts such base-section to use for culinary purposes, as represented in Fig. 7 of the drawings, either a baking-oven, a boiling-vessel, or a gridiron or other broiler being applicable upon the top of the section A'. The provision of the water-chamber between the wick-chamber and the oil-reservoir prevents the latter from becoming too highly heated, and the provision of the annular air-chamber between the wick-chamber and the water-chamber insures the continued low temperature of the water-chamber itself, while the entire separation of the outer air-cham-

ber from the flame-space and combustion-chamber insures avoidance of unsteadiness or flickering of the flame which in many of this class of devices is frequently produced by the sudden union of two air-currents of widely-different temperatures. The corrugation of the body of the chimney provides a largely-increased area of heated radiating-surface, thus effecting a more thorough utilization of the heat evolved from the fuel, and the provision of the deflector directly above and in suitable proximity to the upper extremity of such chimney affords at the point where the heat-currents from the combustion-chamber encounter the air-currents as they ascend through the radiating-drum a mixing-chamber in which the intermingling of oxygen with the heat-currents insures ignition of any previously-unconsumed gases contained therein.

The nature and the objects of the invention having been thus set forth and the apparatus in which it is embodied having been thus fully described, what is claimed is—

1. An oil-stove in which the wick-tube in its upper portion incloses an annular air-induction passage and which in its lower portion is itself directly encircled by an air-induction passage, which in turn is in its upper portion directly encircled by a water-containing vessel or compartment.

2. An oil-stove in which a central wick-tube in its upper portion incloses an annular air-induction passage, in which such central wick-tube is in its lower portion directly encircled by an air-induction passage around the wick-tube, in which the encircling air-induction passage is directly encircled by a water-chamber, and in which the encircling water-chamber is itself in turn directly encircled by an air-induction passage.

3. An oil-stove in which a central wick-tube incloses an air-induction passage, in which such central wick-tube is directly encircled by an air-induction passage, in which such encircling air-induction passage is directly encircled by a water-chamber, in which such encircling water-chamber is itself directly encircled by an air-induction passage, and in which the air-induction passage which encircles such encircling water-chamber is itself directly encircled by an oil-reservoir.

4. An oil-stove which has a central wick-tube which incloses an air-induction passage, and which in turn is encircled in succession by an air-induction passage, a water-chamber, an air-induction passage, an oil-reservoir, and an air-induction passage which exteriorly is inclosed by the annular outer shell of the reservoir-section of the base of such stove.

5. An oil-stove which has a central wick-tube which in its upper portion incloses a supporting-cylinder, and an annular air-induction space between such cylinder and the body of the wick-tube, an annular air-induction passage which directly incloses the wick-tube, an annular water-chamber which incloses the an-

nular air-induction passage which incloses the wick-tube, and a deflecting plate or ring which rises from the upper extremity of the outer periphery of the annular water-chamber and
 5 extends upwardly and inwardly along the upper portion of the wick-tube to a point in a plane above and near to the upper extremity of such wick-tube, the water-chamber being
 10 open at its top, whereby currents of air moistened by vapor are supplied to the outer portion or surface of the flame.

6. An oil-stove which is provided with a central wick-tube, with an annular water-chamber which encircles the wick-tube, with an
 15 annular air-induction passage between the wick-tube and the water-reservoir, which discharges into the flame-space and combustion-chamber of the stove, and with an annular air-induction passage which directly encircles the annular water-chamber and which discharges
 20 only into the air-warming chamber of the stove.

7. An oil-stove in which are combined a central wick-tube and an annular water-chamber which encircles the wick-tube and which
 25 is surmounted by an upwardly-indrawn deflecting and separating ring which overhangs the area between the outer extremity of the water-chamber and the outer periphery of the wick-tube.

8. An oil-stove in which are combined an annular oil-reservoir, an annular water-chamber, and an annular wick-tube, each of which directly encircles and each of which is directly encircled by an annular air-induction
 30 passage, the water-chamber and the oil-reservoir being in the same horizontal plane.

9. An oil-stove in which are combined a central annular wick-tube which is provided interiorly with a vertically-placed deflector-bearing cylinder which extends above the
 40 plane of the wick-tube, a water-chamber which encircles the wick-tube at a short distance therefrom, and an annular deflector which rises from the outer wall of the water-chamber and is upwardly indrawn from such wall toward and along the wick-tube to a point a short distance from the deflector which is borne upon the cylinder.

10. In an oil-stove, a central oil and wick chamber, an annular water-chamber which encircles the central oil and wick chamber at a short distance therefrom, an annular oil-reservoir outside the annular water-chamber, and a conduit which extends from the lower
 50 extremity of the annular oil-reservoir to a point near the lower extremity of the central oil and wick chamber, in combination.

11. In an oil-stove, a central annular wick-tube, an annular air-casing which encircles the central and lower portions of such wick-tube, and a horizontally-arranged floor-screen suitably suspended from the stove at a short distance below the lower extremity of the central wick-tube, in combination. 60

12. In an oil-stove, the exterior casing provided with the interior seat *s* and the interior deflector provided with the exterior seat *s'*, combined with the closing-ring *cr*, adapted to such seats, whereby when the combustion-chamber is removed the lower section of the stove is adapted to use for culinary purposes. 65

13. In an oil-stove, a central annular wick-tube in which in its upper portion is supported a capped and flanged cylinder which forms with the wick-tube an annular air-passage
 70 and a flame-deflector, an annular air-casing which encircles the central and lower portions of such wick-tube, and a horizontally-arranged floor-screen suitably suspended from the stove at a short distance below the lower extremity
 80 of the central wick-tube, in combination.

14. In an oil-stove, the exterior casing provided with the interior seat *s*, combined with the interior deflector provided with the exterior seat *s'*, substantially as set forth. 85

15. In an oil-stove, the exterior casing having vertical cylindrical drum, combined with the inclosed combustion-chamber having conical upper section provided with vertically-extending corrugations, for the purposes set forth. 90

16. In an oil-stove, the described exterior cylindrical radiating-casing, the inclosed upwardly-indrawn combustion-chamber, and the circular deflector suitably supported at a point above the combustion-chamber and in
 95 or near the horizontal plane of the upper extremity of the radiating-casing, in combination, substantially as and for the purpose specified.

17. In an oil-stove, the non-reciprocating exterior casing having a series of windows arranged in alternation with intermediate imperforate sections, combined with the interior reciprocating combustion-chamber which is provided with a series of windows which,
 100 like those in the outer casing, are arranged in alternation with intermediate imperforate sections, whereby the stove is made illuminating or non-illuminating, as may be desired. 105

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