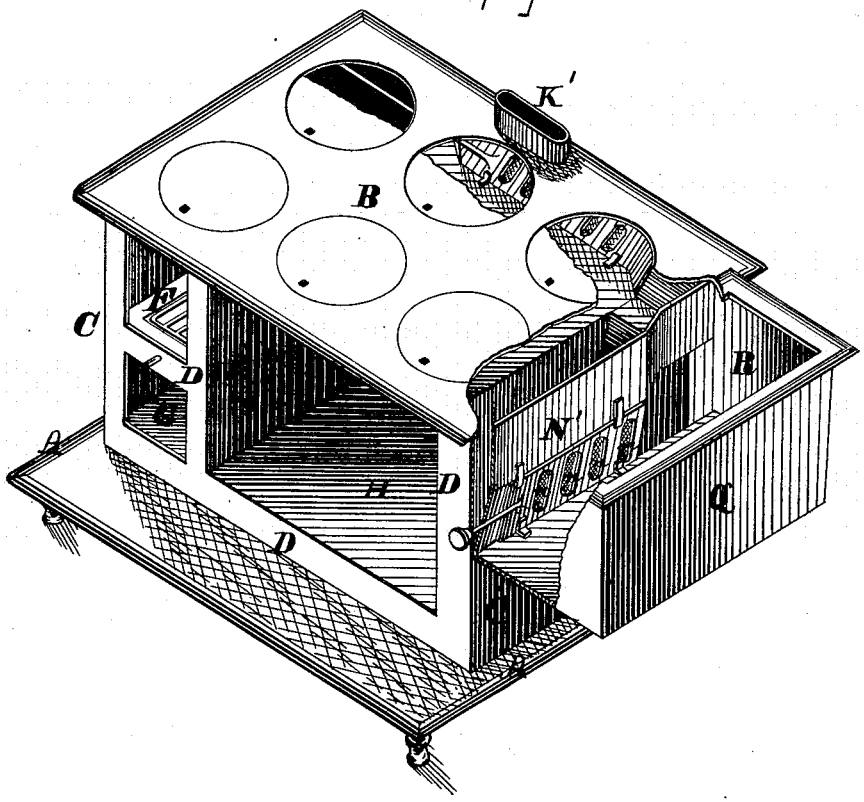
3 Sheets--Sheet 1.

# G. G. WOLFE.
## Portable-Range.

No. 164,630. Patented June 15, 1875.

Fig. 1.

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3 Sheets--Sheet 2.

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Fig. 2.

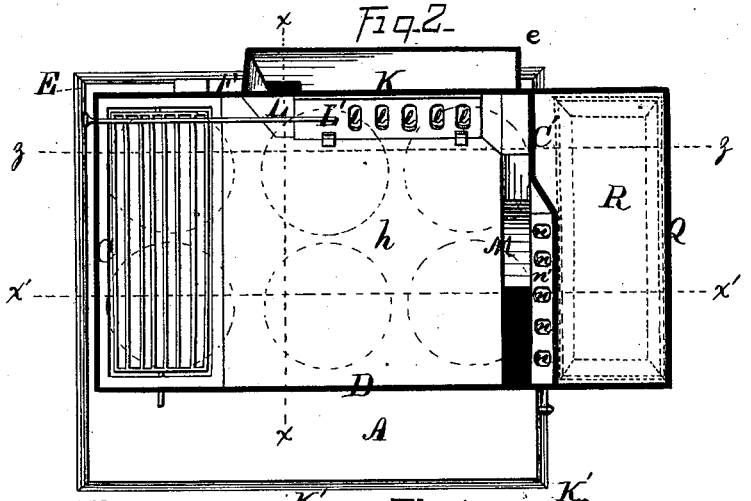



Fig. 3.

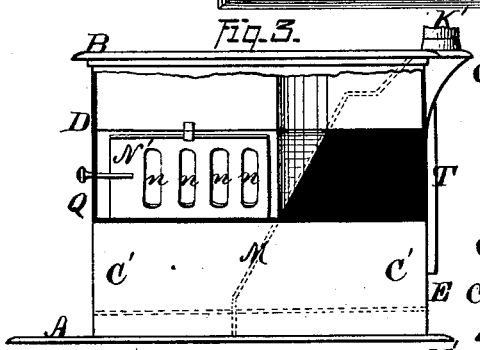



Fig. 4.

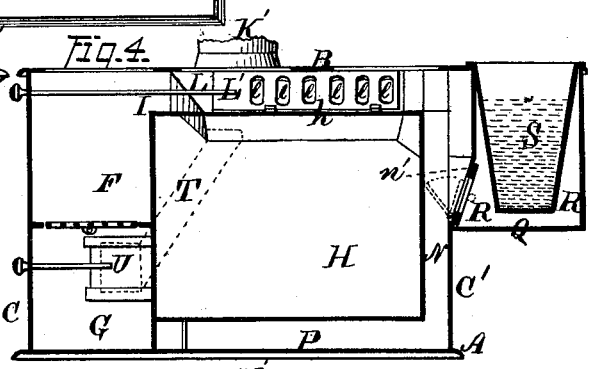



Fig. 5.

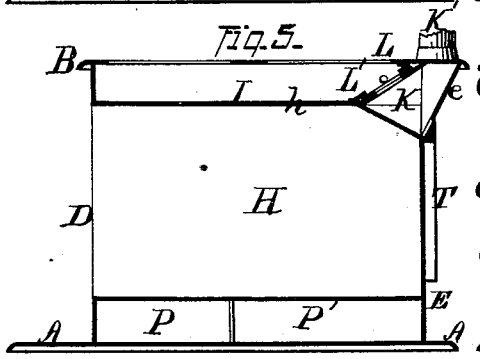
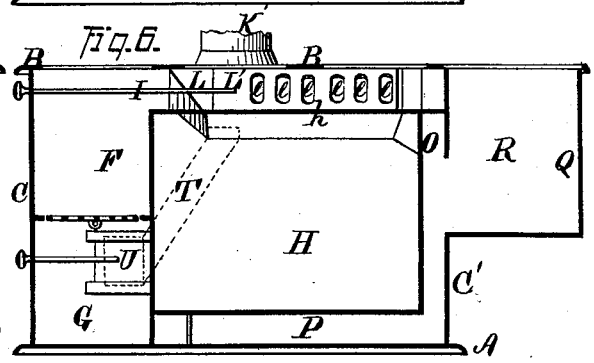



Fig. 6.

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3 Sheets--Sheet 3.

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Fig. 7.

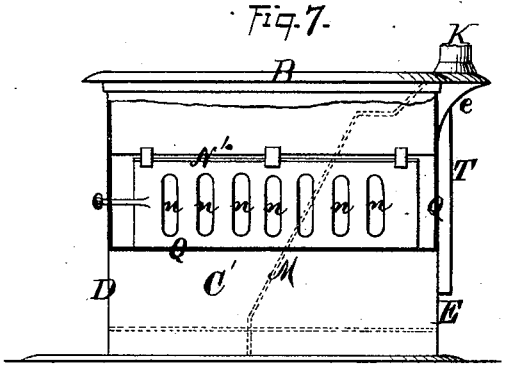
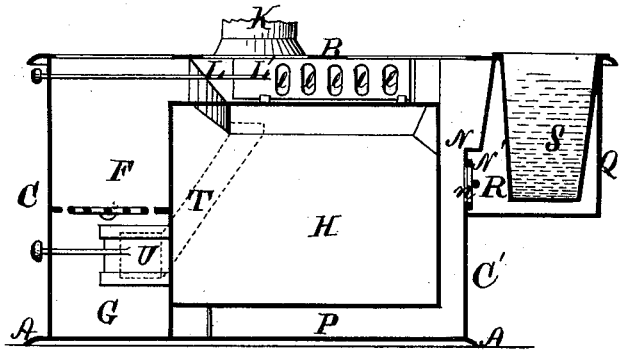



Fig. 8.

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# UNITED STATES PATENT OFFICE.

GURDON G. WOLFE, OF TROY, NEW YORK.

## IMPROVEMENT IN PORTABLE RANGES.

Specification forming part of Letters Patent No. **164,630**, dated June 15, 1875; application filed February 20, 1875.

*To all whom it may concern:*

Be it known that I, GURDON G. WOLFE, of Troy, in the county of Rensselaer and in the State of New York, have invented certain new and useful Improvements in Portable Ranges; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my improved range, a portion of the rear end being broken away, so as to show the arrangement of flues. Fig. 2 is a plan view of the upper side of my range, the top plate being removed, so as to show the arrangement of flues. Fig. 3 is an elevationof one end of the same, the reservoir-casing being broken away, so as to show the end flues. Fig. 4 is a vertical section of the same, upon line *x x* of Fig. 1. Fig. 5 is a like view of said range, upon line *x' x'* of same figure. Fig. 6 is a vertical section upon line *z z* of Fig. 1. Fig. 7 is similar to Fig. 2, and shows a modification in the construction of the vertical flues and their connection with the reservoir-chamber. Fig. 8 is a vertical central section upon a line parallel with the front of the range, showing a modification in the shape of the partition which separates the reservoir-chamber from the vertical flue or flues.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to render the operation of heating water within a reservoir attached to or upon one end of a portable range more within the control of the operator; and to this end it consists, principally, in a dampered opening within the plate which separates the descending flue from the reservoir-chamber, substantially as and for the purpose hereinafter shown. It consists, further, in the inclined dampered portion of the portion between the descending flue and reservoir-chamber, by means of which a passage is formed for the heated gases along the lower portion of the reservoir, substantially as and for the purpose hereinafter shown and described. It consists, further, in the dust-flue extending along the rear side of the range, connecting the ash-pit below the grate with the exit-flue, and provided with a damper, by means of which said communication may be opened or closed, substantially as and for the purpose hereinafter specified. It consists, finally, in a portable range having a fuel-chamber at one end, descending and ascending flues at its opposite end, and an exit-flue at the center of its rear side, the combination of flues by means of which the heated escaping products of combustion pass beneath each boiler-hole before entering said flues, when the reverse draft is employed, substantially as and for the purpose hereinafter set forth.

In the annexed drawings, A represents the bottom plate, B the top plate, C and C' the end plates, D the front plate, and E the back plate, of a portable range, which is provided with a fuel-chamber, F, ash-pit G, and oven H, all arranged in the usual manner. From the fuel-chamber F a sheet-flue, I, extends horizontally between the top oven-plate *h* and the top plate B, which flue has nearly the full horizontal dimensions of the space between the front and rear plates D and E, respectively, a flue, K, being formed at its rear side by a rearward-inclining plate, L, that extends between said top oven-plate *h* and top plate B, and a corresponding rearward extension, *e*, of said rear plate E. The plate L is provided with a number of apertures, *l l*, &c., which are inclosed, when desired, by a damper, L', and permit the heated escaping products of combustion from the fuel-chamber to pass directly into, or be excluded from, the flue K at such point. At the end of the stove farthest from the fuel-chamber the space between the oven and the end plate C' is divided by a flue-strip, M, (shown in Fig. 2,) into two flues, N and O, the first of which, N, communicates at its upper end with the flue I, and at its lower end with one of the usual bottom oven-flues, P, while the second flue, O, communicates at its lower end with the second of said bottom oven-flues, P', and at its upper end with the flue K, the upper end of said flue O being separated from said top oven-flue K by means of suitable flue-plates.

As thus arranged, by closing the damper L' the gaseous products of combustion will be forced from the top oven-flue I into and through

the descending flue N, through the bottom oven-flues P and P′ into the ascending flue O, through which latter said gases will pass to the flue K, and from thence will escape into the exit-flue K′, having, in their passage, imparted to the upper and lower sides and to the rear end of said oven a certain percentage of their heat. To the rear end C′ of the range is secured a casing, Q, which has the usual form, and incloses a chamber, R, for the reception of a water-reservoir, S.

In order that the liquid contents of the reservoir S may be properly heated, the end plate C′ is removed from the outer side of the ascending flue O, from the bottom of the casing Q to a point above its vertical center, by which means the heated gases passing through said flue are permitted to expand into said chamber. The outer wall of the flue N is extended outward against the reservoir S from the upper end of said flue to a point below the vertical center of the chamber R, and from thence said wall inclines downward and inward, and at the lower end of said chamber unites with the end plate C′. This construction of the flue N gives to its upper end much greater capacity than is possessed by its lower end, which disproportion between said ends is still further increased by the flue-strip M, that extends diagonally downward, as seen in Fig. 2, and gives to the upper end of said flue about two-thirds the space between the front and rear plates D and E, while at its lower end said flue occupies less than one-half of said space. This arrangement of said flue-strip M, while giving to said flue N decreasing dimensions from its upper to its lower end, gives to the flue O decreasing dimensions from its lower end upward.

The construction of the flues described enable a uniform velocity of the heated gases to be maintained at all points of their circuit between the fuel-chamber and exit-flue, said flues being largest when said gases are expanded most by heat, and diminishing in area in proportion to the shrinkage in bulk of said gases as they decrease in temperature. Within the inclined portion of the outer wall of the descending flue N are provided a number of openings, *n n*, &c., which are inclosed, when desired, by means of a damper, N′. When said openings are uninclosed, the heated escaping products of combustion will pass directly from said descending flue N into the chamber R, and from the latter into the ascending flue O without passing under the oven, thus enabling the contents of the reservoir S to be quickly heated without heating the oven. By partially uncovering the openings *n n*, &c., a corresponding portion of the current of heated gases may be permitted to pass directly into the chamber R, while the remainder of said gases will take their usual course beneath the oven. If desired, the sliding damper N′ may be omitted, and a rolling damper placed within the flue N, which damper, when turned to or toward a horizontal position, may inclose said flue below the openings *n n*, &c., and force the heated gases into the chamber R, and when turned upward to a vertical position may cover said openings, and leave said flue unobstructed, as shown by dotted lines in Fig. 4. Another arrangement may be secured by inclosing the entire rear side of the ascending flue O, providing apertures within said side which correspond to those *n n*, &c., between the chamber R and flue N, and extending the damper N′ over all of said openings, as shown in Fig. 6, in which event the course of the heated gases would be as before when said damper was open; but when the latter was closed, the chamber R would receive no heat except such as was radiated through the plates which separate the same from said flues.

It will be seen that by my arrangement of flues the boiler-holes all open into the top oven-flue, and each receives an equal proportion of heat, whether the direct or return draft is employed, while in ranges, as usually constructed, a portion of said boiler-holes open into the return-flue, and only receive their share of heat when the direct draft is employed.

In order that the dust which arises within the ash-pit G when the grate is being shaken may be prevented from passing outward into the room, a flue, T, is formed upon the rear side of the range, and at its lower end opens into the rear end of said ash-pit, while its upper end communicates with the exit-flue K′. A damper, U, is arranged to close the lower end of said flue when not in use; but when said end is uninclosed, it will be seen that the draft of said exit-flue will cause a strong current to pass through said flue T, which current will effectually dispose of dust within the ash-pit, and prevent the same from escaping into the room.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In combination with the reservoir-chamber R, the descending flue N and the ascending flue O, constructed as described, a dampered opening, *n*, formed in and through the wall which separates said parts, substantially as and for the purpose shown.

2. In combination with the chamber R, reservoir S, and flue N, the inclined dampered portion *n′* of the partition which separates said chamber and flue, substantially as and for the purpose shown and described.

3. In combination with the ash-pit G and exit-flue K′, the dust-flue T, extending between said parts, located outside of the back plate E, and provided with a damper, U, by means of which communication between said parts may be cut off when desired, substantially as and for the purpose specified.

4. In a portable range having a fuel-chamber at one end, descending and ascending flues at its opposite end, and an exit-flue at the center of its rear side, the combination of the

sheet-flue I, descending flue N, ascending flue O, and flue-strip M, by means of which the heated escaping products of combustion pass beneath each boiler-hole before entering said flues, when the reverse draft is employed, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of January, 1875.

GURDON G. WOLFE.

Witnesses:

GEO. S. PRINDLE,

W. L. BENNEM.