M. D. WELLMAN.

Stove Grate.

No. 60,602. Patented Dec. 18, 1866.

Fig. 2

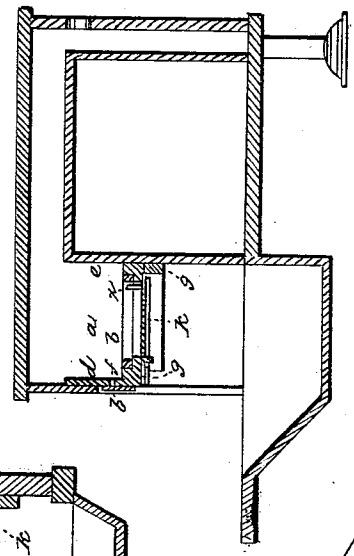


Fig. 5

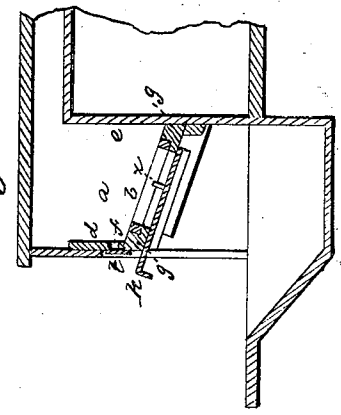


Fig. 3

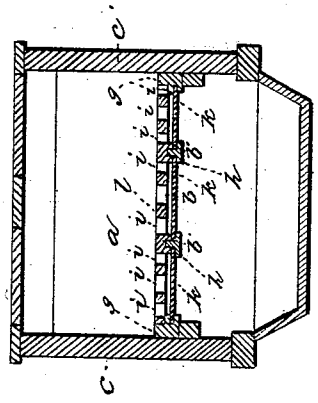


Fig. 1

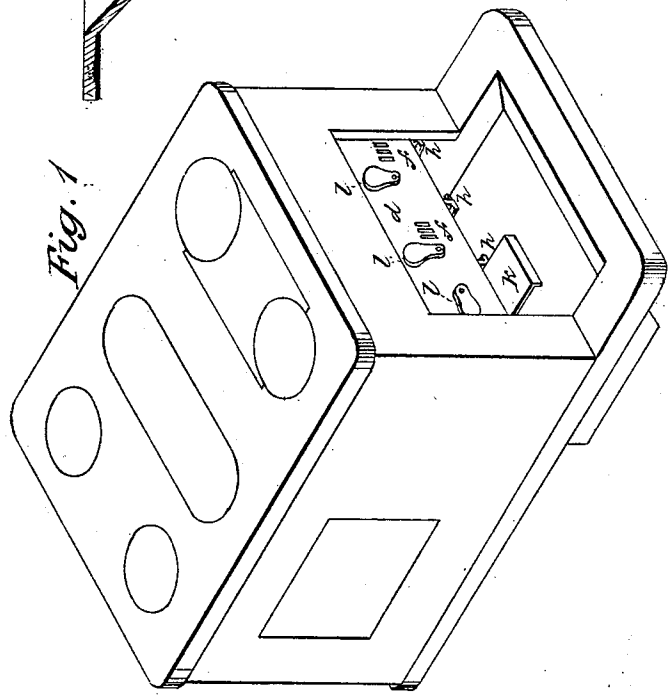
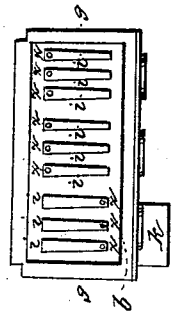


Fig. 4



Witnesses:

W. D. Lewis

Allan C. Bakewell

Inventor:

Marshall D. Wellman.

by his Attorneys.

Bakewell & Christy,

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United States Patent Office.

IMPROVEMENT IN COOKING-STOVES.

MARSHALL D. WELLMAN, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 60,602, *dated December* 18, 1866.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, MARSHALL D. WELLMAN, of Pittsburg, in the county of Alleghany, and State of Pennsylvania, have invented a new and useful Improvement in Cooking-Stoves; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a perspective representation of my improved cooking-stove.

Figure 2 is a longitudinal section.

Figure 3 is a transverse section through the fire-chamber.

Figure 4 is a plane or top view of the fire-grate.

Figure 5 is a longitudinal section showing fire-grate inclined, being a modification of the arrangement shown in fig. 2.

In the several figures like letters refer to similar parts.

The object of my invention is to increase the efficiency of cooking-stoves and ranges, and at the same time diminish the quantity of fuel used, by giving a more perfect control of the draught of air supplied to support combustion, so that the fire may be made to burn with greater or less rapidity, as may be desired, or to burn briskly in one portion of the fire-chamber while in other parts it is allowed to burn very slowly. These results I attain by enclosing the fire-chamber, on four sides, by blank walls without any air passage or openings, excepting small apertures or a shallow grating in front, near the level of the fire-grate or bed of the fire, which front openings or gratings may be closed tightly by slides or otherwise; and furnishing the grating forming the bottom or bed of the fire-chamber with slides or dampers, by which the air may be excluded from entering the fire-chamber through the fire-bed, or may be admitted through an opening susceptible of enlargement or diminution at pleasure, and commencing at the rear part of the fire-chamber. I also divide the space under the fire-bed, from which air is admitted into the fire through the grating, into sections, which may be opened and closed at pleasure so as to admit air directly into the fire at one or more portions of the fire-chamber, while the other portion or portions remain closed. The mere enlarging or diminishing of the opening through which air passes into the fire, or otherwise increasing or reducing the quantity of air supplied to the fuel, does not accomplish the desired result if the greater or less amount of air thus provided is allowed to pass under the entire area of the grate-bars or fire-bed, as it will affect the fire equally in all parts, whereas, if a small current of air is directed exclusively to a particular point in the fire-chamber, the fuel at that point will burn rapidly and with vivid combustion, while the fuel in other parts of the fire-chamber remains comparatively unaffected thereby.

To enable others skilled in the art to make practical use of my invention, I will proceed to describe the construction and use of my improvements as applied to cooking-stoves or ranges.

The cooking-stove represented in the accompanying drawing is of ordinary construction so far as relates to all parts excepting the fire-chamber in front; and my improvements are applicable without modification to the ordinary description of cooking-ranges.

In the cooking-stove shown in the drawing, the fire-chamber, *a*, (by which I mean the front portion of the stove which contains the fuel, above and including the fire-bed or grating, *b*,) consists of two side plates, *c c'*, a front plate, *d*, and back plate, *e*. These plates have no opening in them for the passage of air, excepting the front plate, *d*, which may be furnished with small openings or a shallow grating, *f*, just above the level of the fire-bed, *b*, although even this may be dispensed with. The fire-bed or grating, *b*, having spaces, *i*, between the bars for the passage of air is set in a frame, *g*, in the usual place, either horizontally, as in fig. 2, or inclining downwards from the lower edge of the front plate, *a*, to the back plate, *e*, as in fig. 4. Some of the bars, *b'*, of the grating are wider than the others, and are guttered on the under side, so as to straddle and cover the cross-bars, *h*, of the grating frame, *g*, so as to protect them from the action of the fire, and also to form the upper side of the ways in which the dampers *k* slide. The cross-bars, *h*, of the frame, *g*, are flanged on the lower side so as to form inverted T shaped ribs, which serve as supports or slides for the dampers. These cross-bars, *h*, also serve as partitions dividing the area of the grating or fire-bed into sections, each of which is covered on the under side by a sliding damper, *k*. The dampers, *k*, do not quite touch the under side of the grate-bars *b*, the purpose of which is to allow the ashes from the fire to fill the space when the dampers are closed, and protect

them from the fire, as well as to close all air passages around the edges of the dampers. By these means, the dampers may be made to fit loosely without imparing their utility, and thus they are prevented from getting fast in their slides. The dampers, *k k*, &c., are operated by drawing them forward to admit air to the fire and pushing them back to shut the air off. The pins, *x*, serve to prevent the dampers being pulled out too far, and and also to rake out the interstices between the grate bars so far as they are uncovered by the withdrawal of the dampers, and thus give the air a free passage to the ignited fuel in the fire-chamber. The gratings or apertures, *f*, in the front plate, *d*, of the fire-chamber, are furnished with slides or shutters, *l*, by which they may be opened or closed at pleasure. When a fire is to be kindled in the fire-chamber, *a*, of a cooking-stove or range, the dampers, *k*, are opened sufficiently or the shutters *l* are raised, as may be preferred. If it is desired to kindle a fire over the whole fire-bed, all the dampers are opened; but if only a small fire is required, one of the dampers is opened, and the fire kindled over that portion of the fire-bed thus uncovered. When the stove or range is not required for cooking, the dampers, *k*, may be all closed as well as the shutters *l*, when the air passages will soon become closed with ashes, and the fire being enclosed in a nearly air-tight chamber will soon deaden, and the rapid consumption of fuel will cease. If now it is desired to use the stove for boiling a kettle or cooking with a single pan or vessel, one only of the dampers *k* or shutters *l* may be opened, when the fire will burn up rapidly at that point without spreading throughout the fire-chamber. Thus, a perfect control is obtained of the fire, and the consumption of fuel may be reduced to the lowest point. It will be noticed that my object is attained by the admission of air through small openings or spaces directly into the fire-chamber at the point required, instead of by admitting the air into an air space, extending under the whole area of the fire-bed or into the fire-chamber on top or near the top of the fuel.

The improvement hereinbefore described as applicable to cooking-stoves and ranges may also be used to advantage in other descriptions of furnaces for sundry purposes, especially in all cases where various degrees of heat are required at different times, or where the furnace is not used constantly. I therefore do not desire to confine myself to the application of my improvements to use in cooking-stoves and ranges.

But what I claim as my invention, and desire to secure by Letters Patent, is—

The use, in cooking-stoves, ranges, and other furnace grates, of dampers, slides, or shutters, in combination with a close fire-chamber, so constructed and arranged, substantially as hereinbefore described, as that the air may be admitted below the surface of the fuel to a particular part or portion of the fire-chamber, while it is excluded from entering the fire-chamber at other points.

In testimony whereof I, the said MARSHALL D. WELLMAN, have hereunto set my hand in presence of—

MARSHALL D. WELLMAN.

Witnesses:

ALLAN C. BAKEWELL,

A. S. NICHOLSON.