G. H. HESS.
Cooking-Stove.

No. 212,379. Patented Feb. 18, 1879.

Fig. 1.

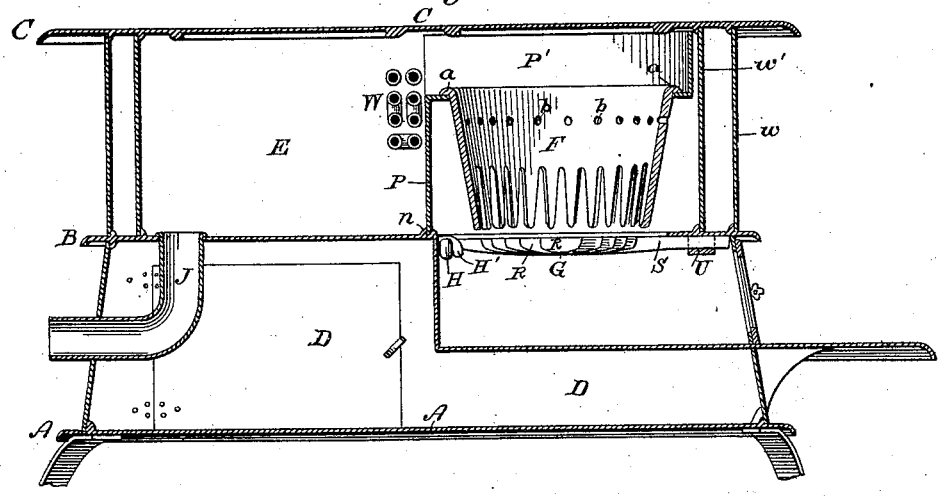


Fig. 2.

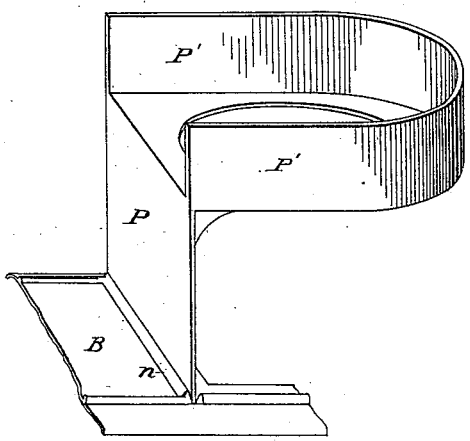


Fig. 3.

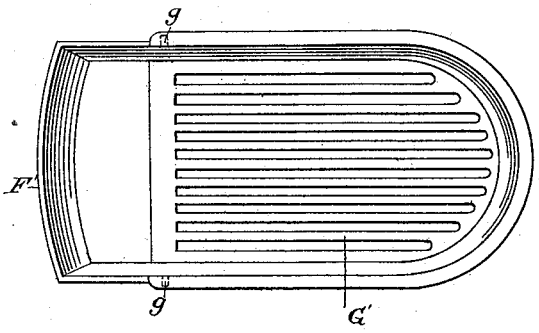
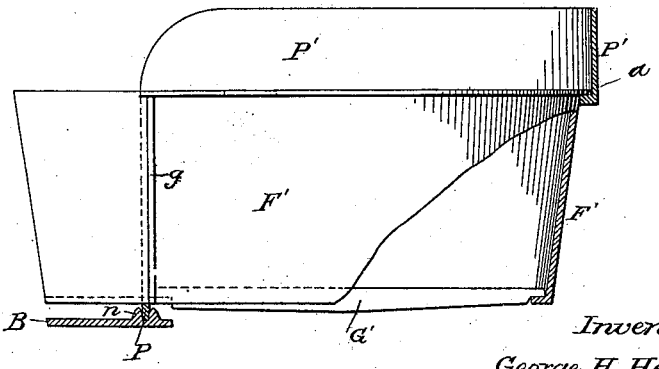


Fig. 4.



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GEORGE H. HESS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN COOKING-STOVES.

Specification forming part of Letters Patent No. **212,379**, dated February 18, 1879; application filed July 22, 1878.

To all whom it may concern:

Be it known that I, GEORGE H. HESS, of the city of Chicago and State of Illinois, have invented certain new and useful Improvements in Cooking-Stoves, of which the following, taken together with the accompanying drawings, is a full and accurate specification.

My invention mainly relates to stoves provided with a smoke-chamber in open connection with the fire-pot and the escape-flue, in which reservoir the heated gases and smoke from the fire have space and time to dispose themselves according to temperature, and in which the escape-flue is located below the top of the fire-pot, or in the lower part of the chamber, to draw off the cooler portion of the smoke and hot air therein contained, leaving the hotter portion to part with its heat in cooking or heating before passing into the flue. Some of the devices herein described and claimed are, however, applicable to other stoves.

The objects and nature of my several improvements will appear in the further description herein given.

In the drawings, Figure 1 is a vertical median longitudinal section of a cooking-stove having a smoke-chamber and other features as above briefly described, showing the general relation of its parts, and a water back-applied therein. Fig. 2 is a perspective view of a supporting-plate, by which the fire-pot is sustained and partly confined. Fig. 3 is a plan view of a fire-pot specially designed for burning wood in a stove of the description given; and Fig. 4 shows the wood-fire pot in its relation to the sustaining-plate, (separately shown in Fig. 3.)

A is the bottom plate, B the middle plate, and C the top plate, of a stove having a smoke-chamber, and, generally, of the character referred to above. In this stove, D is a warming-chamber, heated by several contiguous parts. E is the smoke-chamber, continuous with the space over the fire-pot F, and discharging through a flue, J, leading from its lower portion. P is a cast plate, with its foot resting upon the plate B, and held by the flange *n*. P has a vertical and a horizontal part, the latter extending forward to the chamber-wall and provided with and aperture, through which depends the fire-pot, sustained by the marginal flange *a* upon the latter. The plate P has also upon its horizontal portion a vertical marginal flange, P′, which rises to the top plate C, and preferably conforms to the shape of the chamber-walls, in this case rounded at the ends. This vertical flange serves to protect the inner wall, *w′*, from the heat from the fire-pot, and also to stiffen the part of the plate P that immediately supports said fire-pot. A considerable space surrounds the fire-pot beneath the plate P, in which the air is much heated. Perforations *b b* are made in the fire-pot near its top, for the admission of this air above the burning fuel, with the effect sometimes of promoting more perfect combustion.

The grate being suspended wholly below the fire-pot, it may be laterally vibrated to open a considerable space at either side thereof, and at the same time the whole is of such size that when centrally placed it may be tilted within the fire-pot.

W, Fig. 1, represents, in transverse section, a water-back, consisting of sinuous pipe located behind the plate P and across the smoke-chamber E. It may, however, be of any desired form and located elsewhere in the smoke-space below the level of the top of the fire-pot.

The effect of a water-back upon the interior temperature of any cook-stove to which it is applied is principally felt at the back lids wherever the water-back is placed. In an ordinary cook-stove having a shallow flue, and consequently a rapid draft beneath the back lids, the effect to lower the temperature is often very marked. On the other hand, when applied in a stove having the deep smoke-reservoir, in which the velocity of the smoke and air current is slight, the effect of a water-back upon the temperature at the lids above the reservoir is not appreciable, but is felt almost wholly at the bottom. The reason is obvious: The smoke and heated air that passes in contact with the water-pipes and is cooled by them immediately takes its place at the bottom of the chamber, and that not thus cooled at the top. The cool smoke in the reservoir is cooler, and, perhaps, its volume is greater, by reason of the water-back; but the smoke at the lids is not less hot because of it.

It will be desirable to so place the water-back in the stove that there need be no inter-

mingling or crossing of currents of hot and cooled smoke and air in their respective courses to the top and bottom of the reservoir.

In the cooking-stove illustrated all the external vertical walls are of sheet-iron. They are therefore very liable to be bruised and disfigured. To afford them proper protection the middle plate, B, projects slightly, and the top plate, C, projects considerably, (say three to five inches,) on all sides of the stove.

In a stove constructed on this principle the size of the stove proper, to accomplish a given result, is greatly less than in one of ordinary construction. The need for top space for cooking-vessels, &c., however, remains the same, wherefore the extended top plate, herein described as protecting the sheet-iron walls, is useful, and is required to accommodate the vessels that may be advantageously employed on the stove.

In Fig. 3 is shown a form of fire-pot adapted to hold wood instead of coal. It is oblong in shape, and extends backward through and beyond the vertical portion of plate P, as seen in Fig. 4. This fire-pot, like that for coal, is supported from a marginal flange, *a*. It also has vertical flanges *g* on its outside, connected, preferably, by a transverse flange across the bottom, which rest against the plate P in front, and prevent movement of the fire-pot backward.

Plates P, adapted, respectively, to wood and coal fire pots, are interchangeable in the same stove, being simply set in the foot-flanges *n*, and resting against the inner front wall of the stove.

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

1. In a stove provided with an air-reservoir, E, the plate P, having the vertical and horizontal portions, as set forth, and an aperture for a fire-pot, arranged to separate the chamber E from the lateral space about the fire-pot, substantially as described.

2. The vertical wall-protecting flange P′ on the margin of the horizontal portion of plate P, extending on three sides of the fire-pot, substantially as shown and described.

3. The combination, in the stove described, of the plate P and the flange *n* on the middle stove-plate, B, whereby the plate P, resting against the front wall, is supported in place, substantially as set forth.

4. In combination with the walls of a stove, the plate P, having a vertical and horizontal portion, to separate the fire-chamber from the smoke-chamber E, and the horizontal portion provided with an orifice to receive the rim of the fire-pot F, as set forth.

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