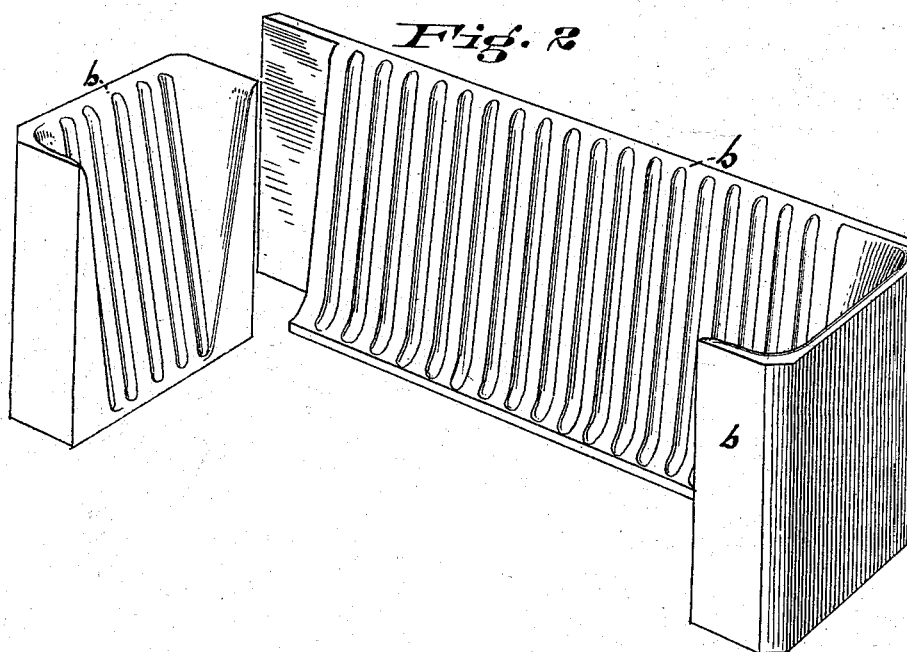
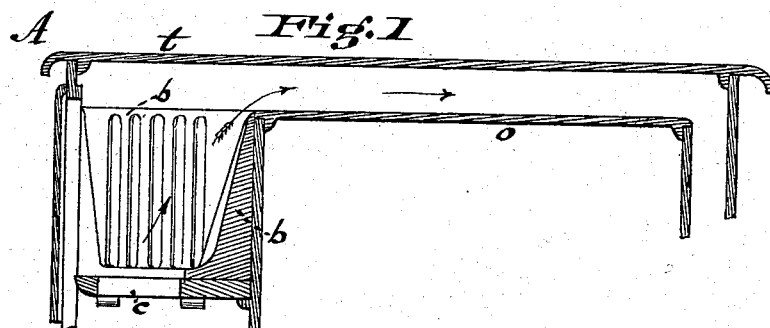


W. C. DAVIS.  
Fire-Pot for Stoves and Furnaces.  
No. 215,269. Patented May 13, 1879.



*Attest*  
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# UNITED STATES PATENT OFFICE:

WILLIAM C. DAVIS, OF CINCINNATI, OHIO.

## IMPROVEMENT IN FIRE-POTS FOR STOVES AND FURNACES.

Specification forming part of Letters Patent No. **215,269**, dated May 13, 1879; application filed November 29, 1878.

*To all whom it may concern:*

Be it known that I, WILLIAM C. DAVIS, of Cincinnati, county of Hamilton, and State of Ohio, have invented a new and useful Improvement in Heating and Cooking Stoves; and I do hereby declare the following to be a full, clear, and exact description of the same, which will enable others skilled in the art to which my invention relates to make and use it, reference being had to the accompanying drawing, forming part of this specification, in which is shown the fire-pot of an ordinary cooking-stove, as will be hereinafter more fully explained.

The object of my invention is to obviate those disadvantages inherent in the present construction of iron stoves used for heating and other purposes, arising from the tendency of those parts removed from the air and exposed to the action of the fire to warp, crack, and burn out; and to this end my invention consists in constructing such parts of steel, or in providing the same with a steel lining, which, while being more durable than iron in resisting the action of flame, by reason of its purer chemical constitution and more homogeneous texture, is free, also, from the objectionable non-conducting properties of fire-brick and other refractory material sometimes used as a substitute for iron therein.

It is well known that the life of an ordinary stove is comparatively limited unless great care be exercised in the management of the fire used in the same, or those parts exposed to the direct action of the fire be frequently renewed. This is especially true of cooking-stoves, where a large surface is necessarily exposed to the flame, in order to accomplish the objects of their construction.

Cast-iron, being the material commonly used in making them, is subject to the disadvantages above stated, arising partly from its chemical constitution and partly from its physical character, as influenced by the methods employed in reducing it to the desired forms. This substance, as shown by analysis, is a carburet of iron, containing about four or five per cent. of carbon, existing partly in chemical combination with the metal and partly in a free state, mechanically intermingled with its molecules, and containing,

also, certain proportions of sulphur and other deleterious elements, all readily attacked by heat, while steel, on the other hand, though also a carburet of iron, contains usually less than one per cent. of carbon, and proportionately less of the deleterious substances before mentioned.

In the process of casting iron fire-backs, oven-plates, and other fire surfaces of stoves, if the material be too rapidly cooled they are chilled and rendered brittle and liable to crack under the changes of temperature to which they are necessarily subjected, while, if cooled too slowly, the metal becomes too soft and porous, and less capable of withstanding exposure to heat. These disadvantages have led to many expedients to provide a remedy. Fire-backs, plates, and other contact-surfaces most exposed to the action of the fire have been cast in heavier masses, or have been provided with air-passages in rear, with a view to preserve them by preventing too high a temperature, and sometimes such exposed surfaces have been lined with refractory material in the nature of fire-brick; but such constructions, as may be readily understood, entail other disadvantages, such as loss of heat, besides increased expense. When constructed of iron in heavy masses, the injurious effect of fire, especially where coal or coke is used, has been still seriously felt in burning out and destroying the metal, while the more thoroughly this has been provided against in substituting a non-conducting material the more heat is dissipated and lost.

After numerous experiments I have found that steel possesses important advantages in these respects over the materials heretofore used for the fire-plates of stoves, and by reason of its peculiar chemical structure, as distinguished from iron, and its more compact and even texture, it not only resists for a much longer period the injurious effects of fire, but is also a better conductor of heat, and therefore correspondingly increases the durability as well as the efficiency of the stove in which it is used, as before indicated.

I therefore construct the side and back liners of the fire-pot either wholly of steel or provide them with a lining of steel for the exposed surfaces. If a lining is used it may be

formed in blocks, slips, or plates, and attached by bolts or rivets thereto, or secured in any other manner.

It is not necessary to the carrying out of my invention that any certain kind or quality of steel should be used, its value for the purpose indicated residing in the chemical constitution and close molecular structure of this form of the metal as distinguished from cast-iron.

In order to more fully illustrate my invention, I have selected for exhibition in the accompanying drawing an ordinary cooking-stove, A, exhibiting the fire-linings *b b*, which are cast of steel, and placed in such position as to prevent contact between the ordinary grates, which, being exposed to the air, are sufficiently protected thereby, and side and back liners, the body of fuel, and the cast-iron parts of the stove. The incandescent fuel is therefore held between contact-surfaces composed entirely of steel, which, in this case, are cast to the desired form, and, by reason of the better conducting properties of the metal employed than the ordinary refractory material used for a

similar purpose heretofore, more readily transmits heat to the outer radiating-surfaces. The top plate, *t*, may also be constructed wholly of steel, or lined therewith upon the inner surface exposed to the flame, as also the top oven-plate, *o*, and the lids or other coverings for the apertures.

Having fully described my invention, I claim—

1. In combination with the parts of a cooking or heating stove, a lining for the fire-pot made of steel, substantially as and for the purpose specified.

2. A movable steel lining for fire-surfaces of stoves as a substitute for fire-brick and similar refractory material, substantially as and for the purpose specified.

In witness whereof I have hereunto set my hand this 30th day of September, 1878.

WILLIAM C. DAVIS.

Witnesses:

L. M. HOSEA,

E. A. ELLSWORTH.