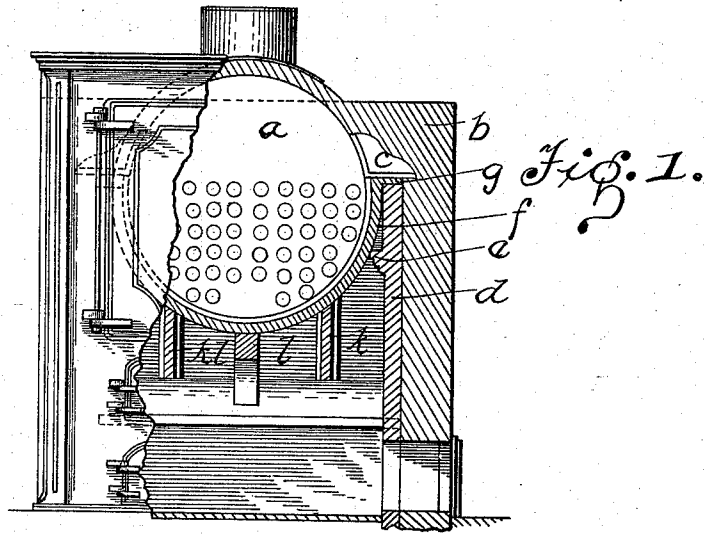


(No Model.)

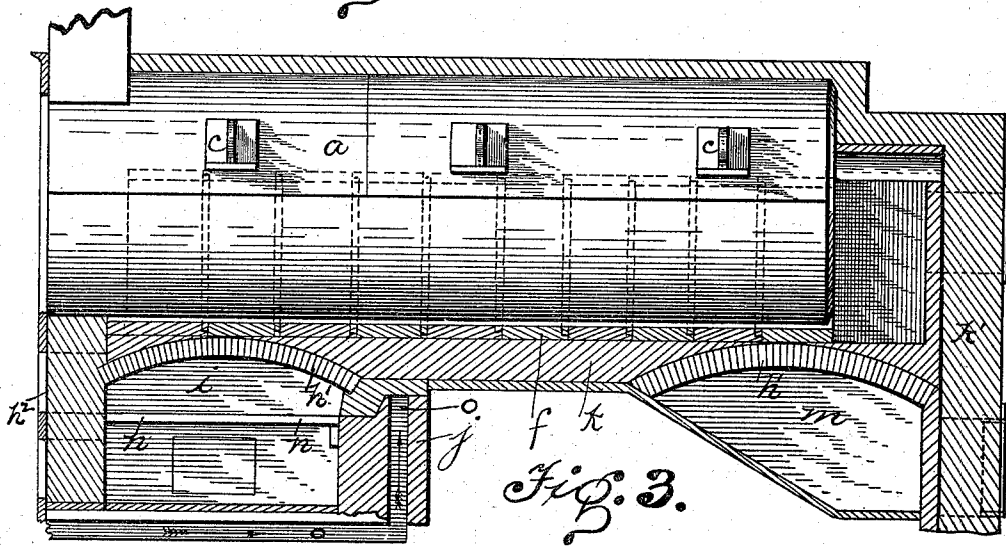
W. H. PECK & D. R. W. PATTERSON.  
FURNACE.

No. 573,235.

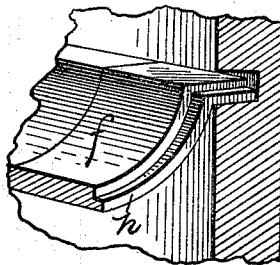
Patented Dec. 15, 1896.



*Fig. 2.*



Witnesses:  
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Inventors  
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# UNITED STATES PATENT OFFICE.

WILLIAM H. PECK AND DAVID R. W. PATTERSON, OF PITTSBURG,  
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## FURNACE.

SPECIFICATION forming part of Letters Patent No. 573,235, dated December 15, 1896.

Application filed May 27, 1896. Serial No. 593,225. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM H. PECK and DAVID R. W. PATTERSON, citizens of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in furnaces, and has for its object to construct a device whereby the smoke will be entirely consumed before it reaches the stack; furthermore, the utilization and development of all the units of heat and to prevent the fire coming in direct contact with the boiler.

A further object of the invention is to construct a furnace as above described wherein equally as good results may be obtained from coal, oil, or gas, the peculiar construction securing a higher degree of heat, and retaining the same, than is accomplished by the ordinary construction.

A still further object of the invention is to construct a furnace combining the above advantages which will be extremely simple in its construction, strong, durable, effectual in its operation, and comparatively inexpensive to manufacture; furthermore, a furnace whereby the grate-bars may be dispensed with, if so desired.

With the above and other objects in view the invention finally consists in the novel construction, combination, and arrangement of parts to be hereinafter more specifically described, and particularly pointed out in the claims.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like letters of reference indicate similar parts throughout the several views, in which—

Figure 1 is a front elevation of our improved furnace partly in section to show the throats and manner of securing the rings. Fig. 2 is a side elevation of a boiler, with the supporting-walls and casing in section. Fig. 3 is a

view of a portion of the supporting-wall and rings or casing.

In the drawings, *a* represents the boiler; *b*, the line or supporting wall, said boiler being provided with lugs *c c* to engage in the wall *b*, as in the ordinary construction, to support the boiler. At the inner side of the line or supporting wall *b* is a supporting wall or brace *d*, having an inwardly-projecting lug or flange *e*, abutting against the casing *f*, provided around the boiler. This casing *f* is preferably formed of fire-brick clay in a semicircular shape, is provided with a flange *g* at the top of each side, and rests on the braces or inner side wall *d*, said casing being formed in sections, each section being grooved or recessed, as shown at *h*, so as to permit the inner section to lap on the adjacent section, the joints being filled with cement or other suitable material to make the same fireproof. An arched wall *h'* is supported by the front wall *h<sup>2</sup>* and the bridge-wall *j*, covering the combustion-chamber *i*, and a similar wall *h'* is supported at the rear of the partitions *k k* and by the rear wall *k'*, these two walls serving to support the casing *f* at the front and rear of the partitions, the said partitions forming throats or passage-ways *l l* from the combustion-chamber to the retort *m*.

The grate-bars are designated by the reference-letters *n n* and may be constructed and supported in any of the well-known manners, and a series of air-ducts *o o* are arranged from the front of the furnace to the throats, admitting sufficient air to form a perfect combustion.

The operation of our improved furnace will be readily apparent from the views of the same that we have shown in the drawings, and a more concise description of the operation is deemed unnecessary; but we desire to point out some of the many advantages obtained by the use of the same, first among which is the fact that by our improved construction the fire is prevented from coming in direct contact with the boiler, the flame striking the casing *f*, heating the same, and producing a uniform and continuous heat between the casing and the boiler, and by rea-

son of the increased combustion converting the smoke by the time it reaches the retort to a gas, which passes in at the flues at the rear of the boiler and through the same to the smoke-stack.

5 The casing is adapted to be placed a short distance (say two inches) from the boiler. A much greater degree of heat is reached and maintained, and, further, the boiler is preserved by reason of the flame being prevented from coming in contact therewith, resulting in a prevention of any sudden expansion or contraction of the boiler, increasing the combustion, and reducing the smoke to a gas before it reaches the flues.

10 By reason of the high degree of heat entering into and retained by the casing constituting the covering of the boiler the heat is retained uniform and constant throughout on its action on the boiler, thereby obtaining the aforesaid results, and by the covering of the grate-bars with fire-brick or other suitable material will permit of coal, oil, or gas being used on the furnace with equal results.

20 Our construction of a furnace is particularly designed for the use of powdered coal fed to the furnace by a blast, by which an intense degree of heat is obtained, the boiler, by reason of the casing, being amply protected from the high degree of heat, but by our arrangement and construction the change to lump or slack coal or to oil and gas can be easily and quickly made, as provision has been made for the grate-bars.

30 It will be observed that various changes may be made in the details of construction

without departing from the general spirit of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a furnace, a semicircular casing formed in sections overlapping each other and supported by a lug or flange engaging in the side wall, said lug or flange extending in close proximity to the boiler-shell to hold the casing in position, substantially as shown and described.

2. In a furnace, the casing around the boiler, arched walls, partitions and side walls for supporting the same, said partitions forming throats or passage-ways, and a series of air-inlets to the said throats to complete the combustion, substantially as shown and described.

3. In a furnace, the boiler provided with a casing, supported by side walls, partitions arranged underneath said casing to form passage-ways from the combustion-chamber, a series of air flues or ducts leading to said passage-ways, and arched walls over the combustion-chamber and retort, reducing the smoke to a gas before the same reaches the flues, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM H. PECK.

DAVID R. W. PATTERSON.

Witnesses:

H. C. EVERT,

A. M. WILSON.