Franklin Till

Apparatus for Utilizing Products of Combustion

No. 121,973. Patented Dec. 19, 1871.

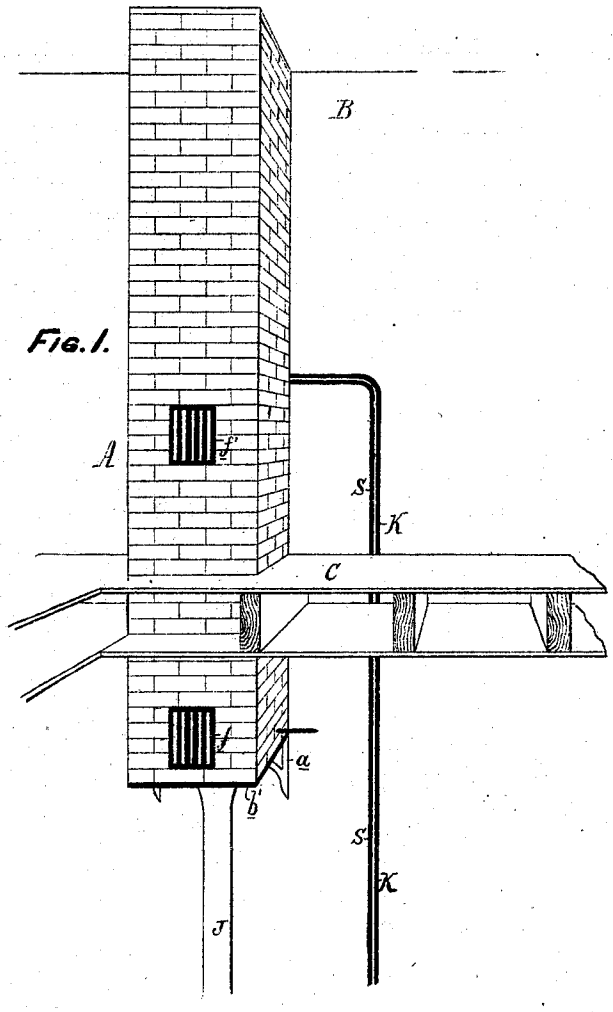

Fig. 1.

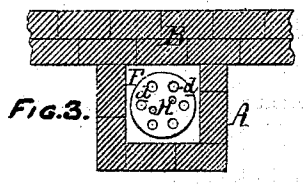

Fig. 3.

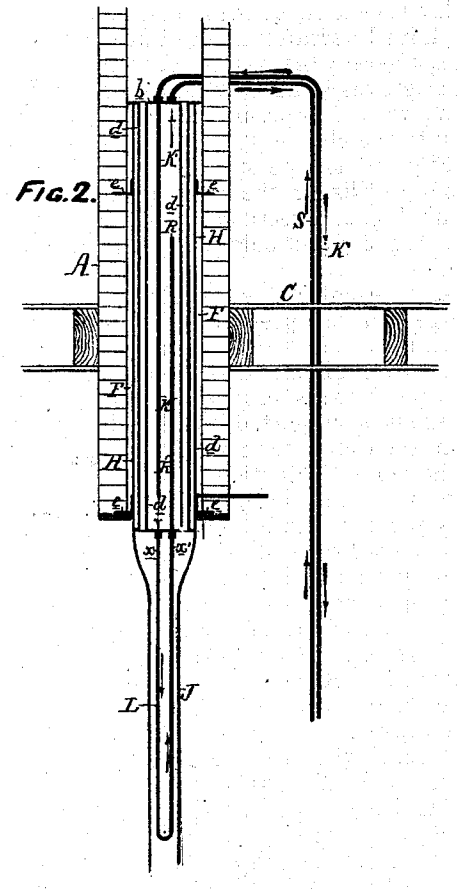

Fig. 2.

WITNESSES { Wm. A. Steel, John Parker

Franklin Till
by his Attys
Howson and Sons

UNITED STATES PATENT OFFICE.

FRANKLIN TILL, OF READING, PENNSYLVANIA.

IMPROVEMENT IN BOILERS FOR DOMESTIC PURPOSES.

Specification forming part of Letters Patent No. 121,973, dated December 19, 1871; antedated December 1, 1871.

To all whom it may concern:

Be it known that I, FRANKLIN TILL, of Reading, county of Berks, State of Pennsylvania, have invented Apparatus for Utilizing Products of Combustion, of which the following is a specification:

My invention consists of apparatus, too fully explained hereafter to need preliminary description, whereby the heated products of combustion from stoves, ranges, &c., are utilized instead of being wasted by permitting them to escape directly into the chimney.

Figure 1 is a perspective view of the apparatus for utilizing the waste products of combustion; Fig. 2, a sectional elevation of the same; and Fig. 3 a sectional plan view on the line 1 2, Fig. 2.

A represents a flue or casing of brick-work, arranged in the present instance against one of the walls, B, of a building and extending downward through one of the floors, C, of the latter to a point at a short distance beneath the same, where it is supported by a bracket, *a*, projecting from the wall B or in any other suitable manner. A horizontal partition, *b*, extends transversely across the interior of the flue A, and between this partition and a plate, *b'*, at the bottom of the flue is formed a chamber, F, within which is contained an upright tubular boiler, H, supported at proper intervals by lugs *e* projecting from the brick-work; and the said boiler is connected at its lower end to a stove-pipe, J, the heated products of combustion from which can pass freely through the tubes *d* of the boiler and thence into the upper portion of the flue A, the latter being connected with or serving as a chimney. A cold-water pipe, K, passes through one side of the flue and is connected at the top of the boiler to a pipe, K', the latter extending downward to within a short distance from the bottom of the boiler, to which is connected a long U-shaped heating-pipe, L, contained within the stove-pipe; one branch, *x*, of this pipe L communicating with the interior of the boiler at a point directly beneath the open end of the pipe K', while its opposite branch *x'* is connected to a pipe, R, which extends upward into the boiler to about the point shown in the drawing. A hot-water pipe, S, is also connected to the top of the boiler at a point above the open end of the pipe R and passes through one side of the flue A and thence to the points to which it is desired to conduct the hot water.

The several pipes and the boiler are maintained full of water, and the heated products of combustion from the stove-pipe pass upward, enveloping the U-shaped pipe L, through the tubes *d* of the boiler, thus heating the water in the latter as well as that within the said pipe L, which is, in fact, auxiliary to the tubes *d* in heating the water, and is intended as a substitute for the water-back commonly used in connection with stoves and ranges. It induces, moreover, a constant circulation of the water through the boiler and pipes in the direction of the arrows in Fig. 2, so that the whole of the water is brought in contact with the heated surfaces of the tubes and pipe L, and, finally, passes from the boiler through the pipe S in the desired heated condition.

It is not absolutely necessary that the pipe L should be perfectly straight or U-shaped, as in some instances it might be bent to conform to bends or elbows in the stove-pipes, while in other cases sufficient heating surface might be obtained within a short stove-pipe by making the said pipe L in the form of a worm or coil.

The flue A has an opening, *f*, at or near the bottom for the admission of cold air into the chamber F, within which the boiler is contained, and an opening or register, *f'*, at or near the top of the chamber for the outward passage of this air, which is heated by the radiation from the boiler. In this way, as will be understood without further description, the heated products of combustion from the stove-pipe are fully utilized.

It will be apparent that the stove-pipe may be of any desired height, in accordance with the distance between the boiler and the stove or range.

Without confining myself to a flue of brick-work, or to the arrangement of the boiler within a flue, I claim—

1. The combination, with a stove or range, of a tubular boiler provided with supply and discharge water-pipes and arranged within a flue so

as to be heated by the waste products of combustion from the stove or range, substantially as set forth.

2. The combination of the subject-matter of the preceding claim and a heating-pipe, L, extending from the boiler into the stove-pipe.

3. The said boiler in combination with a stove or range, as described, and arranged within a chamber or flue provided with registers *f* and *f'*, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

Witnesses: FRANKLIN TILL.

WM. A. STEEL,

F. B. RICHARDS. (154)