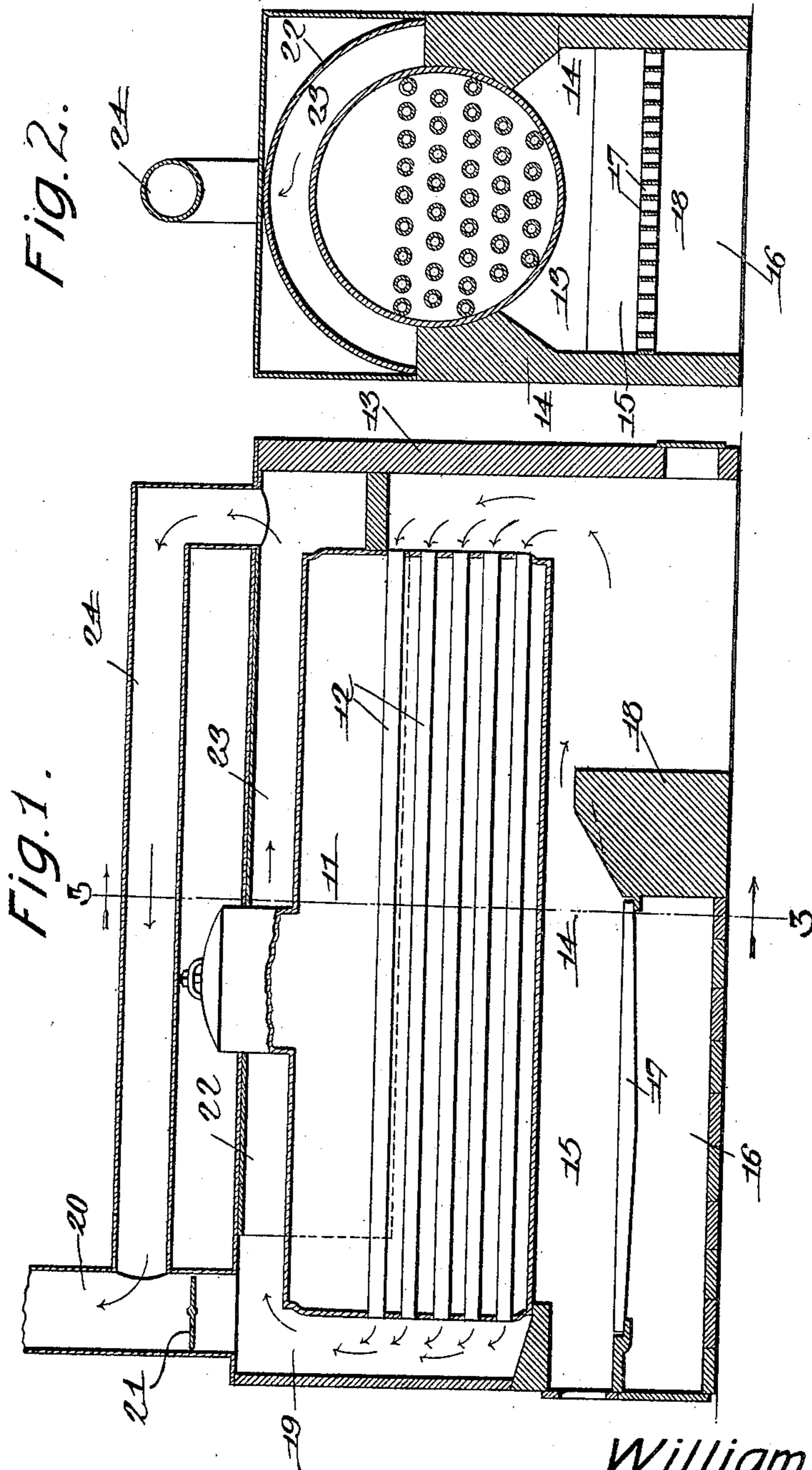


No. 821,961.

PATENTED MAY 29, 1906.

W. PETT.  
FURNACE, &c.  
APPLICATION FILED JUNE 5, 1905.



Witnesses

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# UNITED STATES PATENT OFFICE.

WILLIAM PETT, OF MUSKEGON, MICHIGAN.

## FURNACE, &c.

No. 821,961.

Specification of Letters Patent.

Patented May 29, 1906.

Application filed June 5, 1905. Serial No. 263,831.

*To all whom it may concern:*

Be it known that I, WILLIAM PETT, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented a new and useful Furnace, &c., of which the following is a specification.

This invention relates to furnaces and equivalent heating apparatus, and a principal object of the invention is to provide a circuitous passage for the products of combustion from the fire-box to the point of final exit, enabling the heat units contained in said products to be utilized by heating radiating-surfaces or otherwise.

A further object of the invention is to maintain a constant draft by arranging a by-pass for the products of combustion in connection with a damper in the main exit-pipe.

Further objects of the invention are to simplify and improve the construction and operation of the class of devices to which the invention belongs.

With these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention as applied to a boiler-furnace, and in said drawings, Figure 1 is a longitudinal sectional view of a steam-boiler furnace embodying the improvement. Fig. 2 is a transverse sectional view taken on the plane indicated by the line 3 3 in Fig. 1.

Corresponding parts in both figures are indicated throughout by similar characters of reference.

The drawings illustrate the application of the invention to an ordinary boiler-furnace, 11 designating an ordinary boiler having flues 12. 13 is the back wall, and 14 14 represent side walls supporting the boiler, 15 representing the furnace-chamber or fire-box, 16 the ash-pit, 17 the grate, and 18 the back or bridge wall. 19 is the smoke-arch at the front end of the boiler from which rises the stack 20, in which a damper 21 is located.

Supported above the boiler upon the walls of the furnace and concentric therewith is a hood or semicircular casing 22, between which and the top of the boiler is a space 23 communicating at its front end with the

smoke-arch 19 and at its rear end with a pipe 24, which in turn communicates with the stack 20 above the damper 21. The space 23 and the pipe 24 thus combine to form a by-pass through which products of combustion may pass from the fire-box to the point of final exit even when the damper 21 is closed, as in Fig. 1.

In operation the products of combustion will pass in the usual manner over the bridge-wall 18 to the rear end of the boiler, thence through the flues 12 to the smoke-arch and out through the stack, either direct or when the damper is closed through the by-pass 23 24. The upper portion of the boiler will by this construction be constantly enveloped by a space which is open to the passage of the products of combustion, thereby not only preventing the loss of heat from the boiler by radiation, but actually exposing the upper portion of the boiler to the heating influence of the flames and products of combustion in the space 23.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood by those skilled in the art to which it appertains.

The invention is extremely simple in its nature and general application, and it may be readily applied to furnaces and other heating apparatus of ordinary construction with a gain of heat at a decreased expenditure of fuel.

Having thus described the invention, what is claimed is—

The combination with a boiler, a furnace and a smoke-arch at the front end of the boiler, of a semicircular casing supported upon the furnace-walls above the boiler and spaced from the latter the intermediate space communicating at its front end with the smoke-arch, a stack rising from the latter, a smoke-conductor connecting the stack with the rear end of the space between the semicircular casing and the boiler, and a damper in the stack between the smoke-conductor and the smoke-arch.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM PETT.

Witnesses:

RAY H. TORRENT,  
CHARLOTTE MACDONALD.