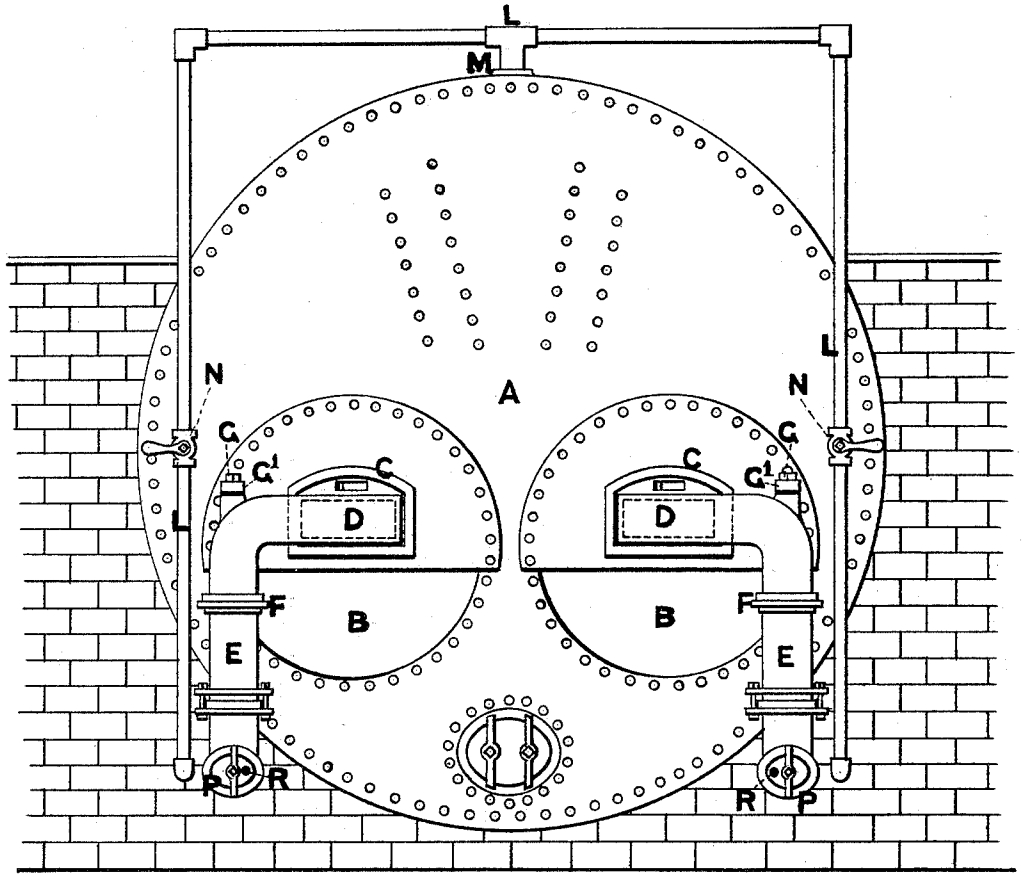
(No Model.) 3 Sheets—Sheet 1.

# W. & T. H. ACKROYD & J. WILLOUGHBY.

## SMOKE CONSUMING FURNACE.

No. 497,741. Patented May 16, 1893.

FIG. 1.

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(No Model.) 3 Sheets—Sheet 2.

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## SMOKE CONSUMING FURNACE.

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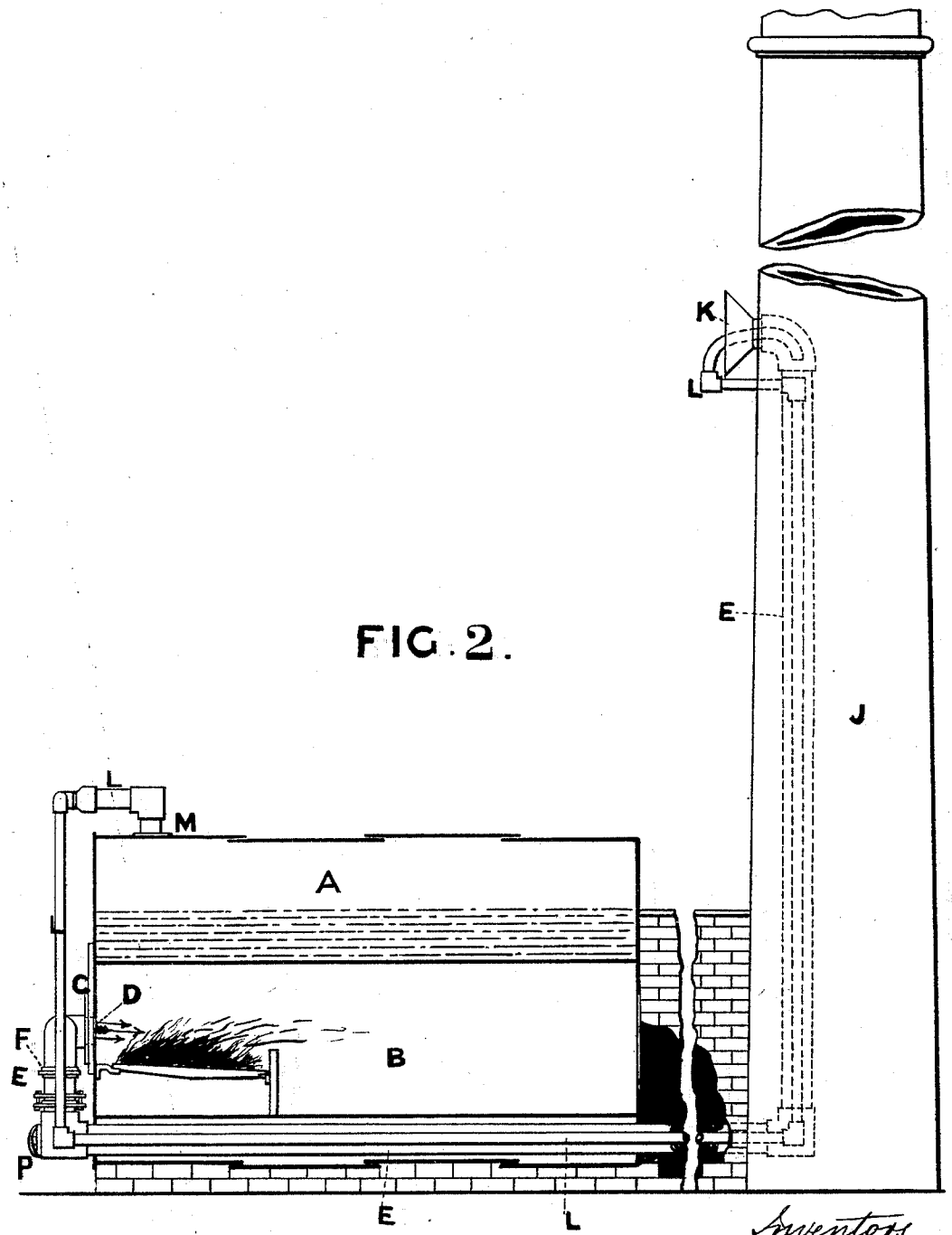


FIG. 2.

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(No Model.) 3 Sheets—Sheet 3.

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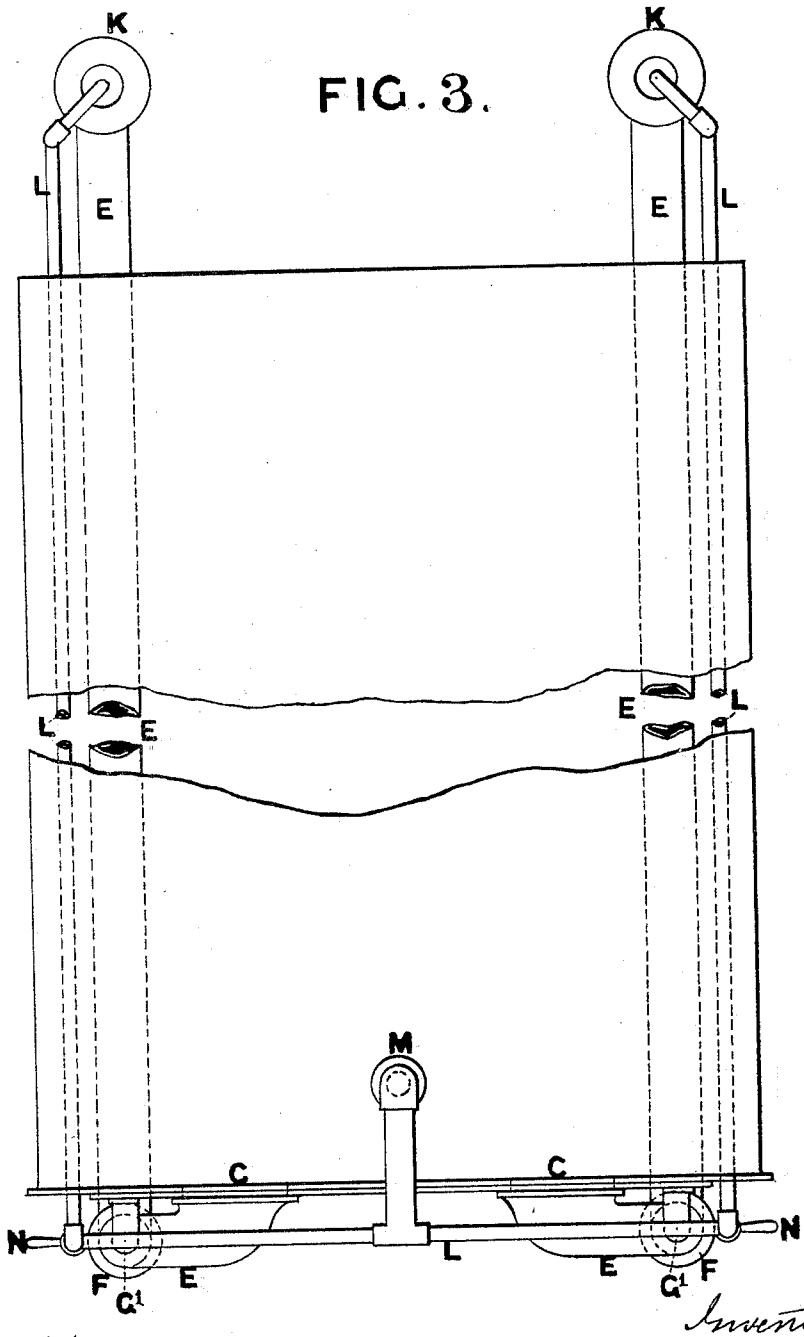
## SMOKE CONSUMING FURNACE.

No. 497,741. Patented May 16, 1893.

FIG. 3.

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# UNITED STATES PATENT OFFICE.

WILLIAM ACKROYD AND THOMAS HENRY ACKROYD, OF BIRKENSHAW, AND JOHN WILLOUGHBY, OF GOMERSAL, ENGLAND.

## SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 497,741, dated May 16, 1893.

Application filed April 22, 1891. Serial No. 389,984. (No model.) Patented in England July 10, 1888, No. 10,009, and April 10, 1890, No. 5,453; in Germany January 30, 1891, No. 60,270; in Austria-Hungary February 6, 1891, No. 7,084 and No. 22,304; in Switzerland February 7, 1891, No. 3,177; in France February 9, 1891, No. 211,272, and in Belgium February 9, 1891, No. 93,708.

*To all whom it may concern:*

Be it known that we, WILLIAM ACKROYD and THOMAS HENRY ACKROYD, residing at Birkenshaw, and JOHN WILLOUGHBY, residing at Gomersal, York county, England, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, (for which we have obtained Letters Patents in Great Britain, No. 10,009, dated July 10, 1888, and No. 5,453, dated April 10, 1890; in Germany, No. 60,270, dated January 30, 1891; in Austria-Hungary, No. 7,084 and No. 22,304, dated February 6, 1891; in France, No. 211,272, dated February 9, 1891; in Belgium, No. 93,708, dated February 9, 1891, and in Switzerland, No. 3,177, dated February 7, 1891,) of which the following is a full, clear, and exact specification.

This invention has for its object to provide a new and improved boiler furnace, and it consists in the features of construction and the combination or arrangement of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a front elevation of a stationary boiler having our invention applied thereto. Fig. 2 is a longitudinal sectional elevation of the same, and Fig. 3 is a broken plan view.

In order to enable those skilled in the art to make and use our invention we will now describe the same in detail, referring to the drawings wherein—

The letter A, indicates a boiler, B the flues, and C the furnace doors provided with openings D for receiving the air conducting tubes E.

The air conducting tubes E form one hinge or pivot of the furnace doors, as at F, while the screws G, and brackets G′ form the other hinge or pivot thereof.

The tubes E are passed along the bottom flue of the boiler to the rear thereof, as in Fig. 3, and rise in the chimney or shaft J, as in Fig. 2.

The tubes E, each terminate in a funnel or other shaped air receiving mouth K into which extends a steam nozzle or pipe L which follows the course of the tubes E and extends horizontally beneath the boiler to the front thereof from whence it rises vertically and connects with the steam space of the boiler at the point M, where the pipe L is charged with steam, which steam is highly superheated in its passage through the pipe L beneath the boiler and through the chimney or shaft J to the point where said pipe L enters the funnel or air receiving mouth K.

The tube E is provided with a cover P for cleaning purposes. It also has an opening such as R for the insertion of testing apparatus to show the heat of the steam and air before it passes to the fire of the furnace.

Each pipe L is provided with a valve N, which when turned on allows the steam to pass forward along the pipes to the mouth or opening K, of the tube E, which it enters in a dry state, and greatly increases the draft and heat in the tube E, and passes with the hot air to the door of the furnace where it is delivered upon the burning fuel and mixes with the gases or products of combustion, igniting and increasing such combustion, and consuming and rendering invisible the smoke passing to the chimney shaft.

Dampers or valves are provided in the tubes to regulate the amount of hot air admitted to the furnace as desired. The valves are preferably opened after each firing of their respective furnaces for a short time, and may be operated by hand or by automatic mechanism of any kind, operated by the opening and closing of the doors for stocking purposes.

Having thus described our invention, what we claim is—

The combination with a boiler furnace hav-

ing an up-take or chimney J, of horizontal air conducting tubes E rising in the up-take or chimney and having portions extending in front of the furnace and provided with door hinges F carrying doors C through which portions of said tubes extend to discharge hot air above the fire, and steam pipes L extending from the steam space of the boiler, thence horizontally below the latter and vertically through the up-take or chimney into the air conducting tubes, substantially as described.

In testimony whereof we have affixed our signatures in the presence of two witnesses.

WM. ACKROYD.
T. HENRY ACKROYD.
JOHN WILLOUGHBY.

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