

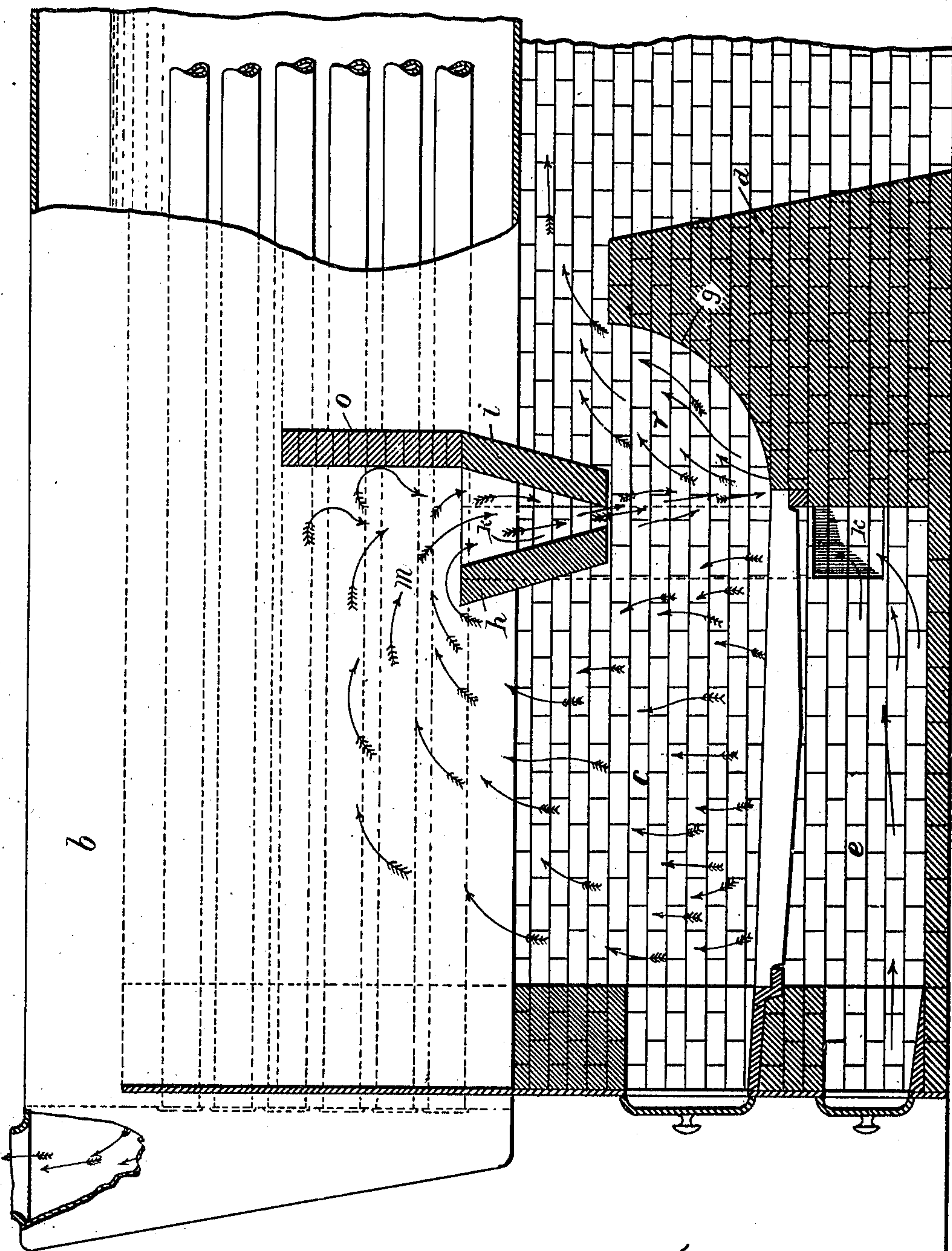
W. McARDLE.  
SMOKE CONSUMER.

APPLICATION FILED MAY 5, 1906.

978,467.

Patented Dec. 13, 1910.

2 SHEETS-SHEET 1.



Witnesses  
*Alberto B. ...*  
*W. J. ...*

FIG. 1.

*William McArdle*

Inventor

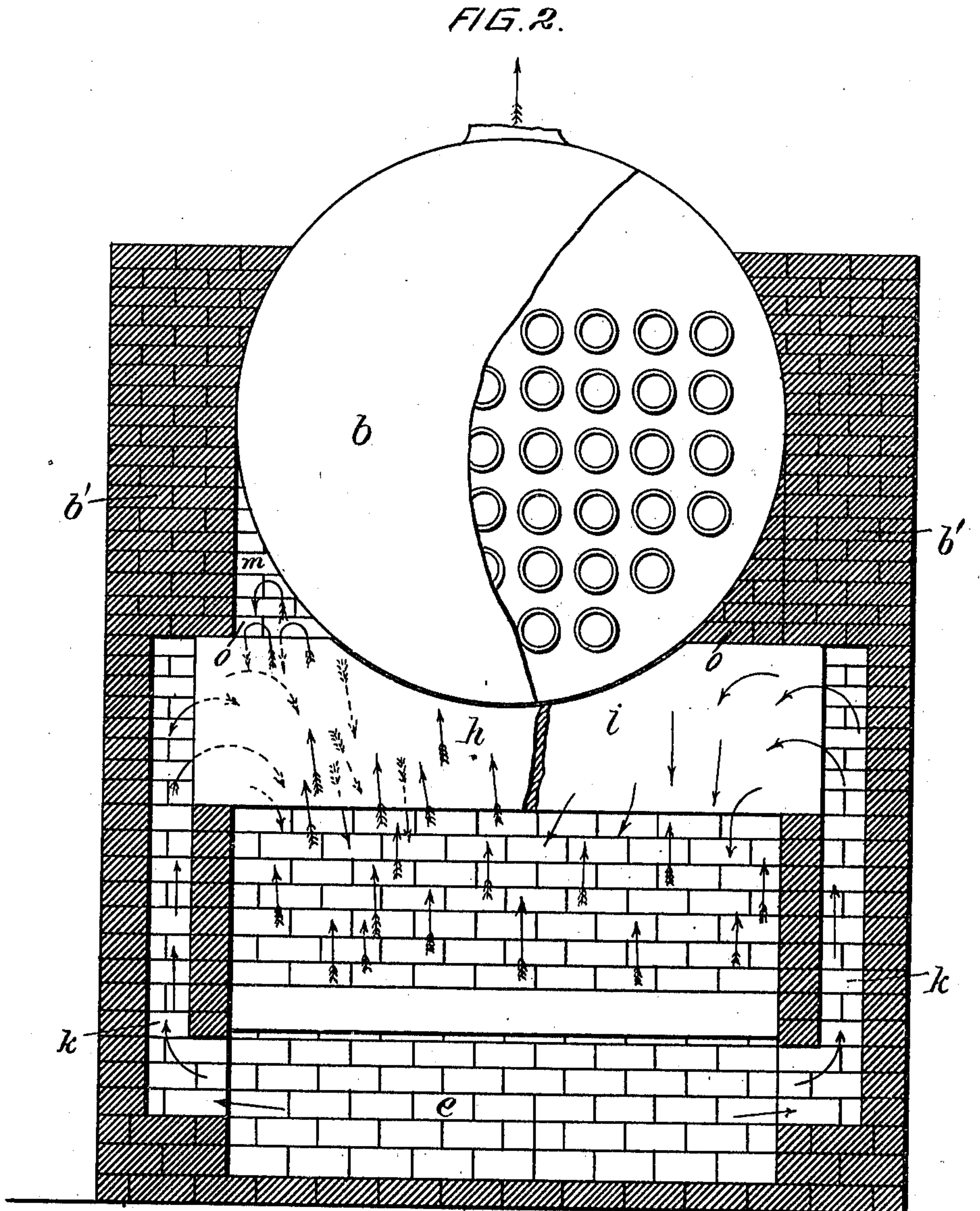
By Attorney  
*Wm. ...*

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2 SHEETS—SHEET 2.



Witnesses  
*Albert B. Peters*  
*Ed. J. Shaw*

*William McArde*  
Inventor

By Attorney  
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# UNITED STATES PATENT OFFICE.

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SIMPLEX COMBUSTION COMPANY, OF MONTREAL, CANADA.

SMOKE-CONSUMER.

978,467.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed May 5, 1906. Serial No. 315,426.

*To all whom it may concern:*

Be it known that I, WILLIAM McARDLE, of the city of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Smoke-Consumers; and I do hereby declare that the following is a full, clear, and exact description of the same.

The invention may be said briefly to consist of a chamber located above the fire grate adjacent to and preferably a short distance in advance of the bridge wall, an air supply being connected to such chamber which also has ports whereby the gases of combustion are drawn in, while the exit end of such chamber is preferably tapered and disposed to direct a blast of mingled air and gases of combustion transversely to the passage over the bridge wall.

For full comprehension, however, of my invention reference must be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate the same parts and wherein—

Figure 1 is a longitudinal sectional view of a tubular boiler and its furnace provided with my invention; and Fig. 2 is a transverse vertical sectional view thereof.

The tubular boiler *b*, fire chamber *c*, bridge wall *d* and ash pit *e* are in the main of usual construction the only difference in these parts being in the bridge wall the forward face whereof is transversely concaved as at *g*.

A pair of downwardly converging transverse plates *h* and *i* (preferably of fire brick), disposed with their lower side edges substantially on a level with the top of the bridge wall, and their ends built into the side walls of the fire chamber, and converging plates constituting a continuous transverse twyer and such side walls having internal vertical flues *k*, *k*, extending from the ash pit *e*, at points adjacent to the bridge wall, to the ends of the interior of such transverse twyer thereby introducing a draft of pure air thereto. The middle portions of the top of the twyer plates are made to conform to the underside of the perimeter of the boiler and the spaces *m*, *m*, between the top of the forward plate *h* and the point where the boiler *b* and its supporting walls *b'* meet, constitute entry ports for the admission of the gases of combustion to the

commingling chamber of the twyer, while the corresponding spaces above the plate *i* are bricked up (as at *o*, *o*,) to act as baffle-walls and insure such entry of the gases.

A draft is exerted from the ash pit *e* through flues *k*, the twyer, the curved passage way *r* (formed by the concavity *g* in the bridge wall and the rear side and bottom of the twyer) to the boiler tubes and chimney connection.

This draft circuit is intensified by the convergence of the twyer chamber and it is such that the gases of combustion emanating from the fire and drawn into the twyer are mixed with air and projected from the twyer with great velocity, and owing to the blast from the latter being directed against the lower portion of the concavity *g* the body of commingled air and gases are in a measure retarded in the zone of greatest heat where they meet the gases of the circuit from the ash pit through the grate and fire bed direct through the curved exit passage way *r* to the tubes and chimney, thus insuring practically perfect combustion. This advantageous result is due to the oxygen introduced at this point and even if the direct draft to the chimney were sufficiently strong to carry all the products of combustion that way and nothing but air issued from the twyer practically complete combustion would still be obtained.

What I claim is as follows:—

1. The combination with a fire chamber and a bridge wall therein, the chamber having an exit port between the bridge wall and the top of the chamber, of a pair of converging plates within such chamber between the front thereof and the bridge wall and adjacent to the said bridge wall and disposed to direct a blast against the portion of the bridge wall forming a portion of such exit port, means whereby air is supplied to the space between such plates and such plates being arranged to present ports whereby the gases of combustion flow into the said space.

2. In a tubular boiler furnace, the combination with a fire chamber and a bridge wall formed with its front side concaved transversely to the fire chamber, of a pair of downwardly converging plates extending transversely to the chamber and disposed to direct a blast against such concaved wall, means whereby air is supplied to the space

between the plates, such plates being arranged to present ports whereby the gases of combustion flow into the said space.

3. In a tubular boiler furnace, a bridge  
5 wall having its front side concaved transversely to the fire chamber, a twyer extending continuously from side to side of the fire chamber and disposed to direct a blast  
10 against the said concaved wall, means whereby air is supplied to the twyer, the said

twyer being provided with intake ports to allow the entry of the gases of combustion thereinto.

In testimony whereof, I have signed my name to this specification, in the presence of 15 two subscribing witnesses.

WILLIAM McARDLE.

Witnesses:

DAVID LANCASTER DWINNELL,  
JOHN FLEMING REDDY.