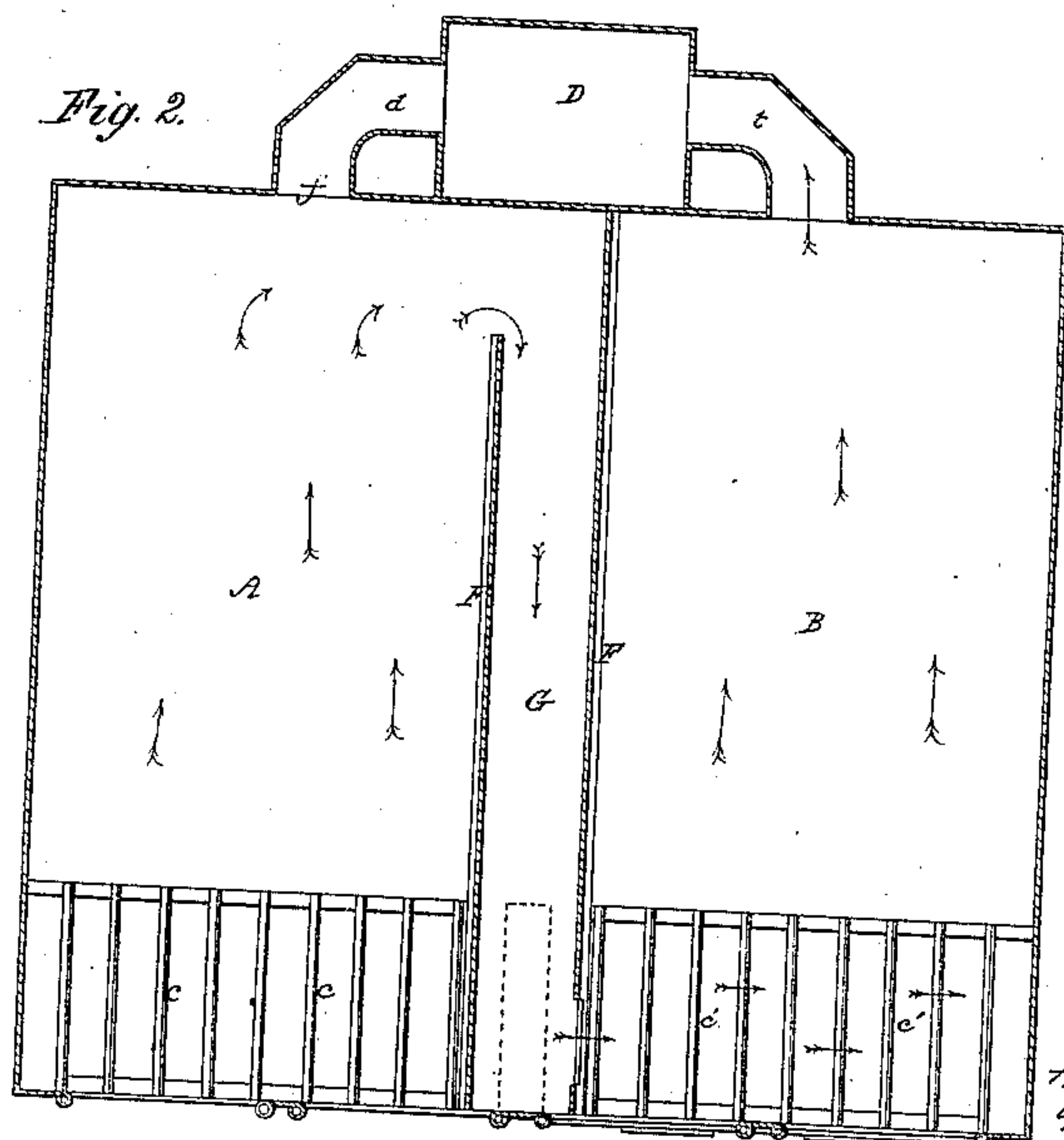
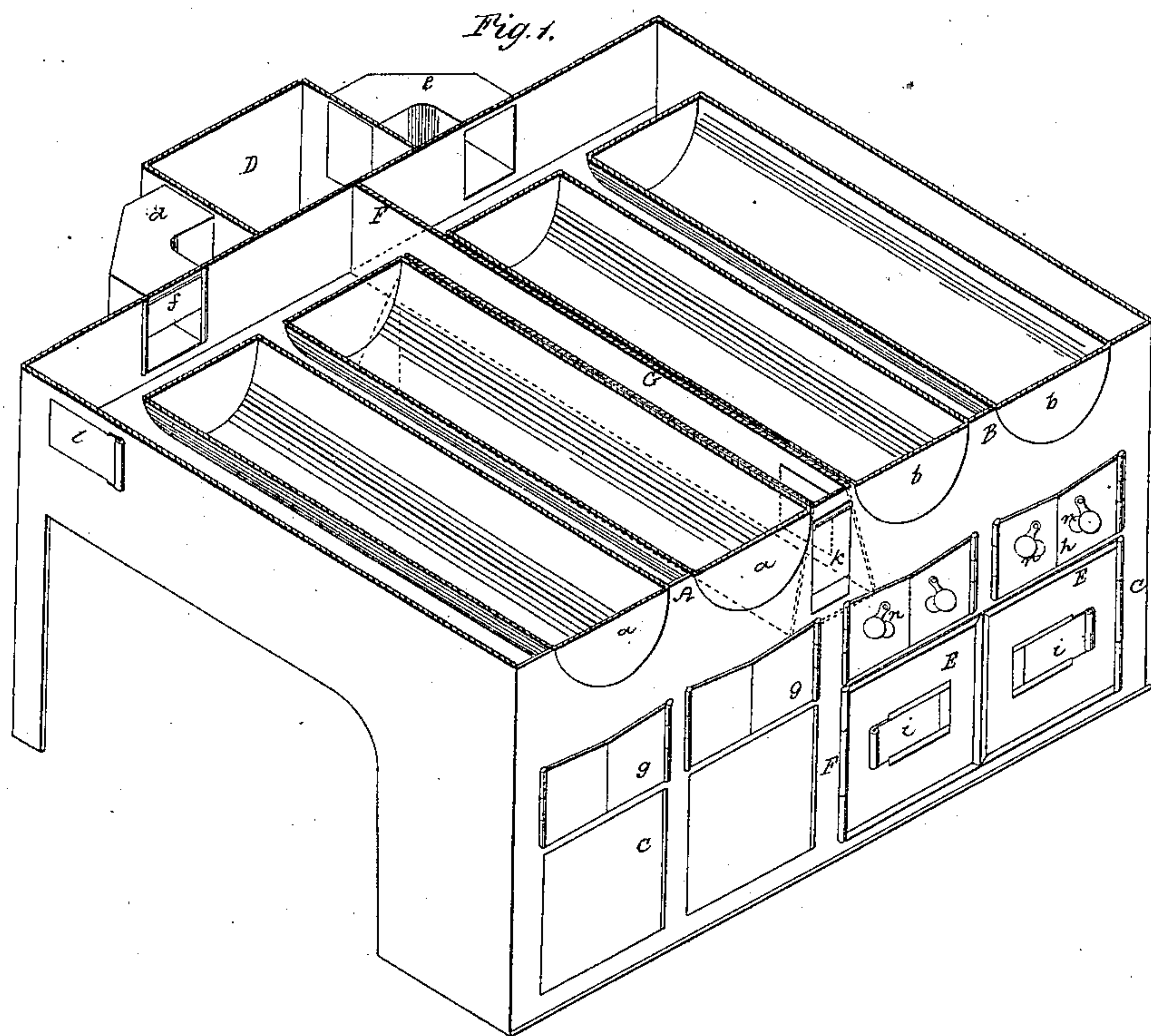


*H. Wilkins,*  
*Feeding Boiler Furnaces,*  
*N<sup>o</sup> 30,275, Patented Oct. 2, 1860.*



*Witnesses.*

*J. H. Shakespear*  
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*Inventor.*

*Henry Wilkins*  
*by his attorney*  
*J. G. Southeate Smith*



# UNITED STATES PATENT OFFICE.

HENRY WILKINS, OF BROWNSVILLE, PENNSYLVANIA.

## FURNACE FOR STEAM-BOILERS.

Specification of Letters Patent No. 30,275, dated October 2, 1860.

*To all whom it may concern:*

Be it known that I, HENRY WILKINS, of  
Brownsville, county of Fayette, State of  
Pennsylvania, have invented certain new  
5 and useful Improvements in Furnaces,  
More Especially Adapted to Boilers for the  
Generation of Steam as Motive Power or  
for other Purposes, of which the following  
is a full, clear, and exact description, refer-  
10 ence being had to the accompanying draw-  
ings, forming part of this specification, in  
which—

Figure 1 represents a perspective view of  
a furnace and boilers with my improve-  
15 ments. Fig. 2 represents a horizontal sec-  
tion through the furnace, below the boilers.

The principal object of my invention is to  
economize fuel, in the generation of steam,  
for a motive power or for other purposes,  
20 by burning most of the combustible matter  
that usually passes off with the smoke; and  
also to diminish the quantity of smoke, and  
thereby lessen its capacity for carrying off  
heat; and my improvements for effecting  
25 this object, consist in burning the fuel in  
separate furnaces connected by an interme-  
diate flue or flues for the conduction of the  
smoke and other products of combustion,  
from the fire of one furnace over the fire of  
30 the other furnace, by which the combustible  
portions of the smoke and other products of  
combustion, from the fires of the first fur-  
nace are ignited and consumed in passing  
over the fires of the second furnace and be-  
35 fore entering into the stack.

The manner in which I carry out my in-  
vention will be fully understood by refer-  
ence to the accompanying drawings in which  
are represented, two furnaces (A, B,) over  
40 each of which, are two boilers (*a* and *b*).  
The furnaces are constructed in the usual  
manner with grate bars (*c c'*) for the sup-  
port of the fuel, and an ash pit (C) below;  
with a fire front, which supports the outer  
45 end of the boiler, and flues (*d*) and (*e*) lead-  
ing from each furnace to a stack (D). The  
flue (*d*) is provided with a sliding damper  
(*f*) the closing of which, cuts off the direct  
communication between that furnace and  
50 the stack. A division wall (F) separates  
the two furnaces, and extends as low as the  
bottom of the ash pit. In this division wall  
is a flue (G) which connects with the fur-  
nace (A) at the back end, and with the fur-  
55 nace (B) at the front end, and at the side  
of the fire.

The furnace (A) is provided with doors  
(*g*) and in the present instance the front of  
the ash-pit is left open, but may also be pro-  
vided with doors if thought best.

The furnace (B) is closed by doors (*h*)  
60 and also the ash-pit by doors (E) and in the  
latter, are slides (*i*) to regulate the draft of  
the furnace. An opening is made through  
the fire front into the flue (G) for the pur-  
65 pose of cleaning it out, and is closed by a  
sliding door (*h*). There are also sliding  
doors (*l*) in the side of the smoke boxes of  
both furnaces for the same purpose; and a  
hinged door covering openings into the top  
70 of the smoke box of both furnaces.

In using this furnace, coal fires are built  
on the grate bars of both furnaces, the ash  
pit doors (L) of the furnace (B) being open,  
and also the damper (*f*) to the flue (*d*) of  
75 the furnace (A) communicating directly  
with the stack. After the coal in the fur-  
nace (B) is well ignited, the doors (E) of  
the ash-pit of that furnace, are closed to  
check the draft, which is then regulated by  
80 means of the slides (*i*) in the ash-pit doors  
or by draft holes (*n*) in the furnace doors.  
The damper (*f*) to the flue of the furnace  
(A) is then shut, which causes the smoke  
and products of combustion, from the fires  
85 in the furnace (A) after traversing the  
whole length of the furnace, to pass through  
the return flue (G) and over the fires in the  
furnace (B) and thence through flue (*e*) of  
that furnace (which is made one third larger  
90 than the flue (*d*) in order to increase the  
draft) into the smoke stack. The combusti-  
ble gases of the smoke from the furnace (A)  
and the combustible material mingled with  
it, such as cinders, &c., are entirely consumed  
95 in passing over the fires of the furnace (B)  
and a very hot fire produced under that fur-  
nace; while a comparatively small amount of  
smoke passes into the stack; consequently its  
capacity for carrying off heat, is greatly di-  
100 minished.

The draft to the fires in the furnace (B) is  
regulated to induce a slow combustion so  
that it is necessary to renew the coal only  
about once an hour, while the fires in the fur-  
105 nace (A) are replenished with coal as fre-  
quently as is usual in ordinary furnaces,  
about once in fifteen or twenty minutes.

I have found by actual experiments that  
the saving of fuel by this arrangement of  
110 furnaces is from 30 to 35 per cent.

Having thus described my improvement in

furnaces applicable to steam boilers, what I claim as new and desire to secure by Letters Patent is—

5 The combination of two furnaces or fires, separated by a division wall, with a return flue, arranged as described, so that the smoke and products of combustion from one fire, after traversing its furnace is caused to pass

over the other fire, previous to its escape into the chimney, for the purpose set forth. 10

In testimony whereof I have subscribed my name.

HENRY WILKINS.

Witnesses:

A. B. TODD,

R. M. SMITH.