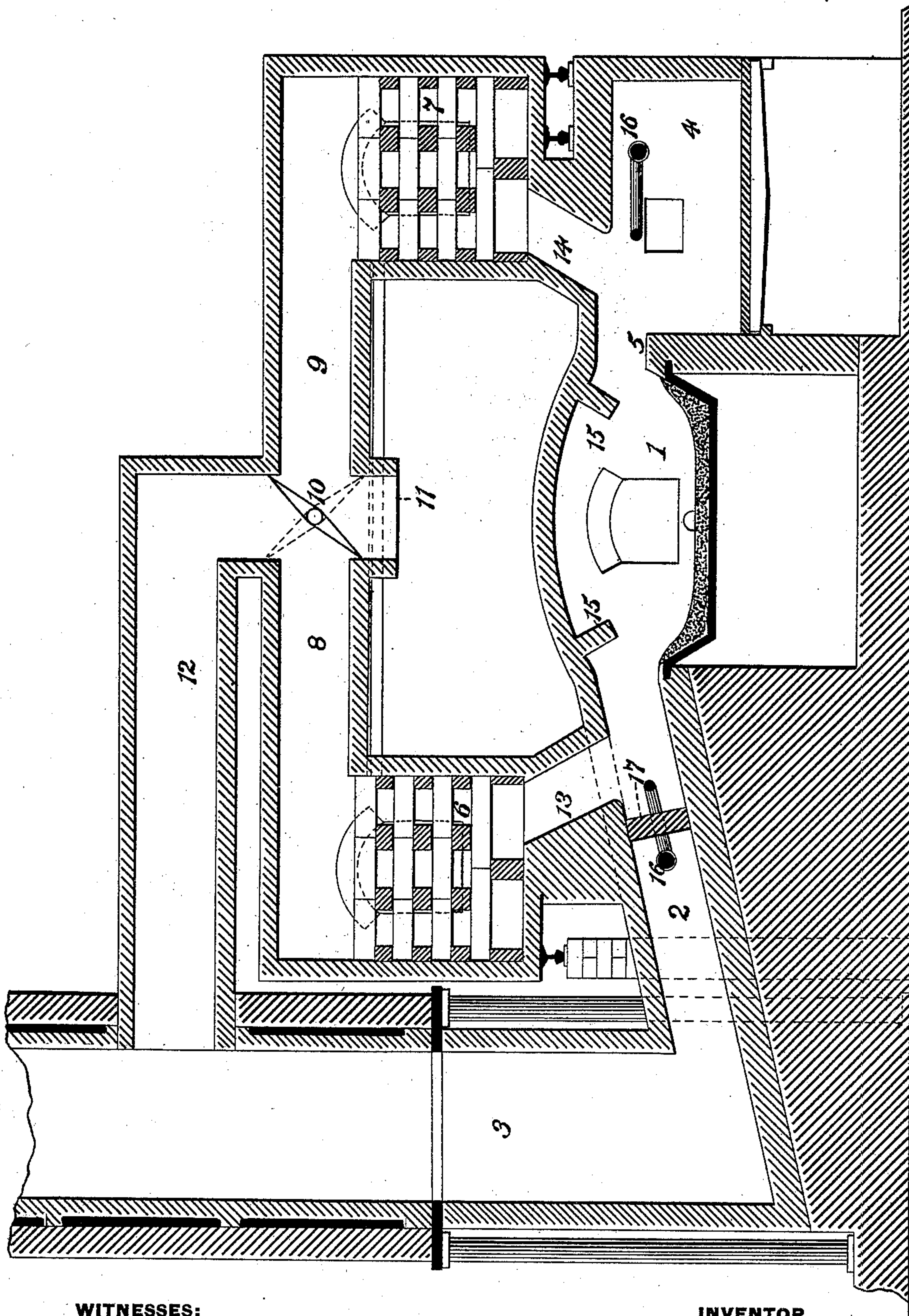


(No Model.)

T. McSWEENEY.  
METALLURGICAL FURNACE.

No. 391,980.

Patented Oct. 30, 1888.



WITNESSES:

*R. A. Whittlesey,*  
*F. E. Gaither.*

INVENTOR,

*Terence McSweeney,*  
*by Danvers S. Walcott,*  
Att'y.



# UNITED STATES PATENT OFFICE.

TERRENCE McSWEENEY, OF ALLEGHENY, PENNSYLVANIA.

## METALLURGICAL FURNACE.

SPECIFICATION forming part of Letters Patent No. 391,980, dated October 30, 1888.

Application filed March 14, 1888. Serial No. 267,157. (No model.)

*To all whom it may concern:*

Be it known that I, TERRENCE McSWEENEY, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Metallurgical Furnaces, of which improvement the following is a specification.

My invention more particularly relates to puddling and heating furnaces, although readily adaptable to other forms of metallurgical furnaces designed for the combustion of solid fuel; and its object is to effect the application of the regenerative principle of heating and the use of gaseous fuel in puddling and heating furnaces of the ordinary construction without material delay or expense and without involving such radical change in the present form of this class of furnaces as would prevent them from being readily adapted to the use of solid fuel if the same should at any time become necessary or desirable. The improvement claimed is hereinafter fully set forth.

The accompanying drawing is a vertical longitudinal central section through a puddling-furnace of the ordinary construction with my improvement applied thereto.

The furnace shown is of the usual form and construction of those heretofore used with solid fuel, having a hearth, 1, connected at one end by a downwardly-inclined exit-flue, 2, with a stack, 3, and communicating at the other end by a throat or passage located above a bridge-wall, 5, with a combustion or fire chamber, 4, which is provided with a proper grate and fire-door. In the application of my invention to such construction of furnace regenerative chambers 6 and 7 are built above the combustion-chamber and the neck of the furnace, respectively, said chambers being provided with the usual arrangement of checker-work, as shown. The chambers 6 and 7 are connected by flues 8 and 9, respectively, with the valve-chamber 10, which is provided with an air-inlet, 11, and is also connected with the stack 3 by a flue, 12, said flue entering the stack at a point above the exit-flue 2. The regenerative chambers are connected by short flues 13 and 14 with the combustion-chamber 4 and the exit-flue 2 at points near their entrance into the hearth 1, and in order to insure a proper impact of the flame and

products of combustion upon the metal on the hearth I provide depending walls or curtains 15, whereby the flame is deflected downward as it enters the hearth, and is, as it were, held down against the bottom of the hearth by the action of the draft through the opposite flue.

Gas is introduced into the furnace by pipes or burners 16, so arranged in the combustion-chamber 4 and exit-flue 2 that the gas escaping from said burners will commingle with the hot air from the regenerative chambers. The exit-flue 2 is closed at a point between the stack and the entrance of the flue 13, either by brick-work or a removable damper, 17, and the grate-bars are also covered in any suitable manner, thereby preventing any inflow of air to the hearth except through the regenerative chambers.

In order to restore a furnace provided with the accessories above described to condition for the use of solid fuel, it is only necessary to close the flues 13 and 14, which can be effected by means of brick-work or by a damper, and to remove the wall or damper 17 and the covering of the grate-bars. It will be seen that the addition of regenerative and gas-burning members to an ordinary furnace may, under my invention, be made without any material change in the furnace proper, and in such manner as to render the use of solid fuel again practicable, whenever desired, by an expeditious and comparatively inexpensive change of flue-openings and restoration of grate-openings.

I am aware that regenerative chambers located above the hearth of a furnace and communicating directly therewith have been heretofore proposed, and such construction, therefore, I disclaim. So far, however, as my knowledge and information extend, the furnaces have not been of the ordinary type, but have been specially constructed and combined with the regenerative chambers for the use of gaseous fuel, and a substantial reconstruction would be required to admit of the use of solid fuel.

I claim as my invention and desire to secure by Letters Patent—

The combination, with a regenerative furnace having a fire-chamber of the type adapted to the use of solid fuel, a hearth communicat-

ing therewith, an exit-flue leading from the  
opposite side of the hearth, and a stack, of a  
removable wall or partition located in the exit-  
flue and closing communication through the  
5 same between the hearth and the stack, a pair  
of regenerative chambers located above the  
fuel-chamber and the exit-flue, respectively,  
flues connecting said regenerative chambers  
with the fire-chamber and with the exit-flue  
10 on the inner side of its wall or partition, re-  
spectively, gas-supply pipes leading into the  
fire-chamber and exit-flue adjacent to said con-  
necting-flues, flues connecting the regenera-

tive chambers with a common valve-chamber,  
and a flue leading from said valve-chamber to 15  
the stack, these members being combined for  
joint operation to admit of the ready adapta-  
tion of the furnace to the employment of solid  
fuel, substantially as set forth.

In testimony whereof I have hereunto set my 20  
hand.

TERRENCE McSWEENEY.

Witnesses:

DARWIN S. WOLCOTT,  
R. H. WHITTLESEY.