

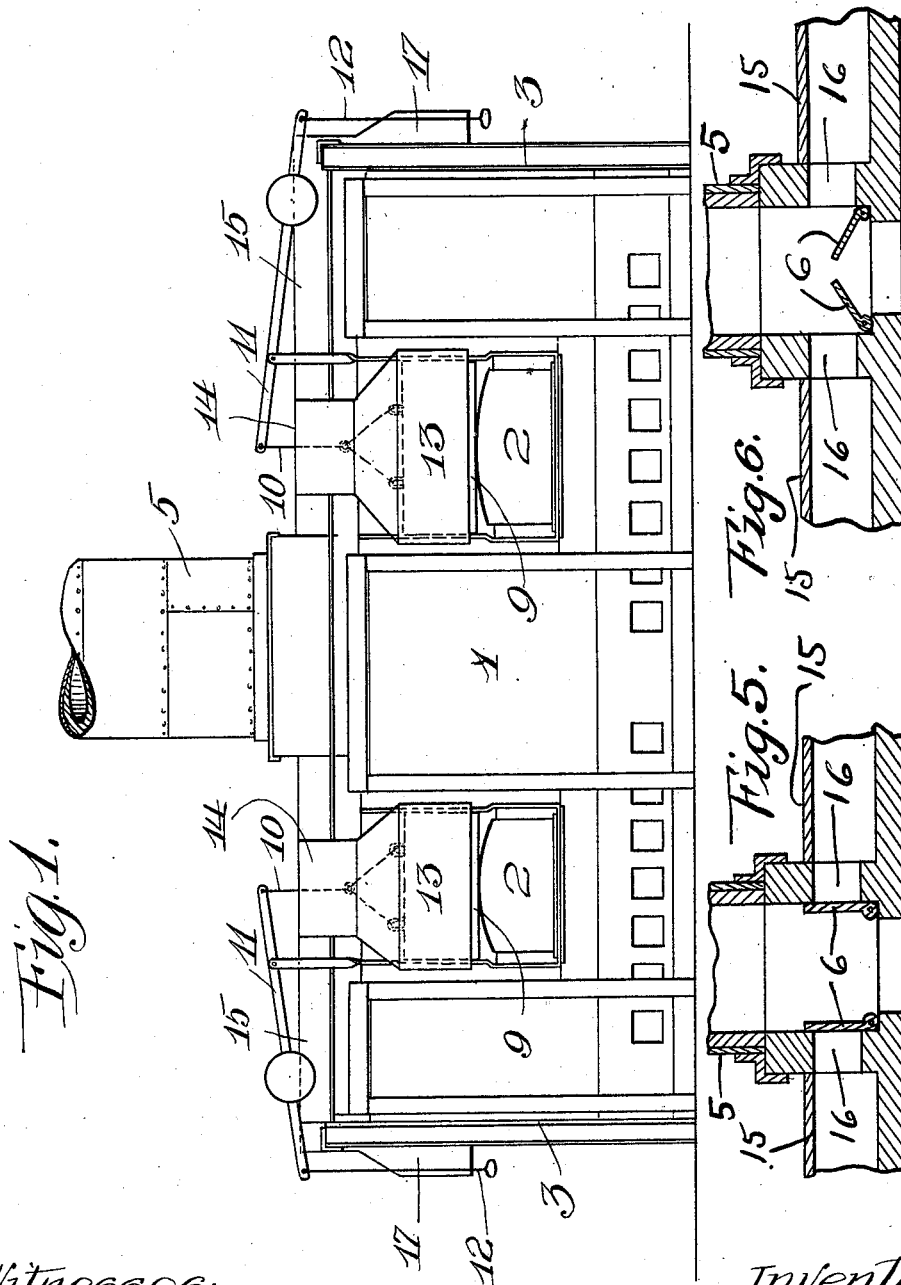
A. TOMKINS.
FURNACE.

APPLICATION FILED JULY 26, 1910.

1,008,876.

Patented Nov. 14, 1911.

3 SHEETS-SHEET 1.



Witnesses:-

Samuel Payne.
R. S. Butler

by

Inventor

Alfred Tomkins.

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3 SHEETS-SHEET 2.

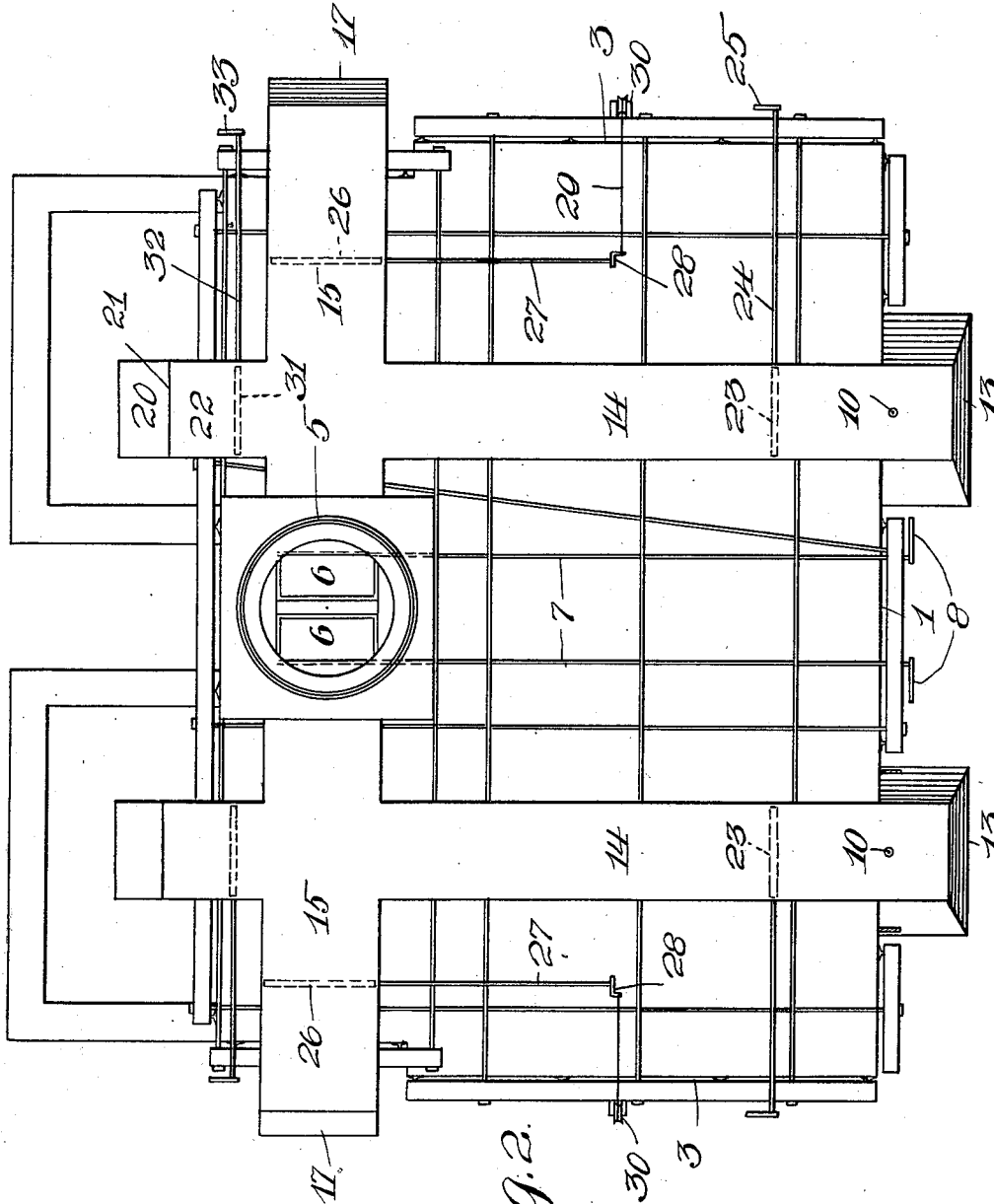


Fig. 2.

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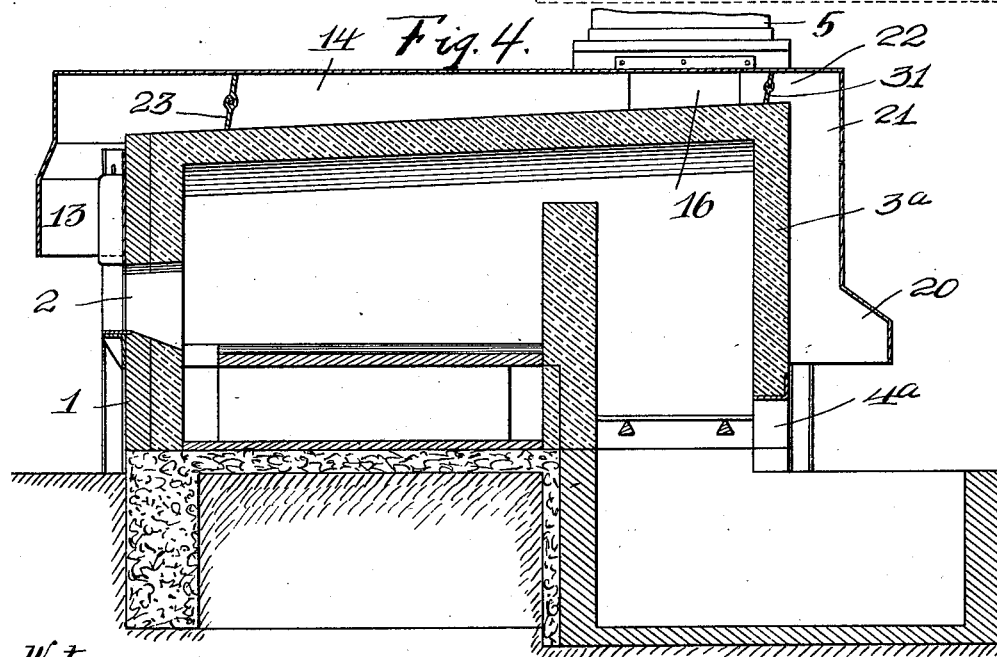
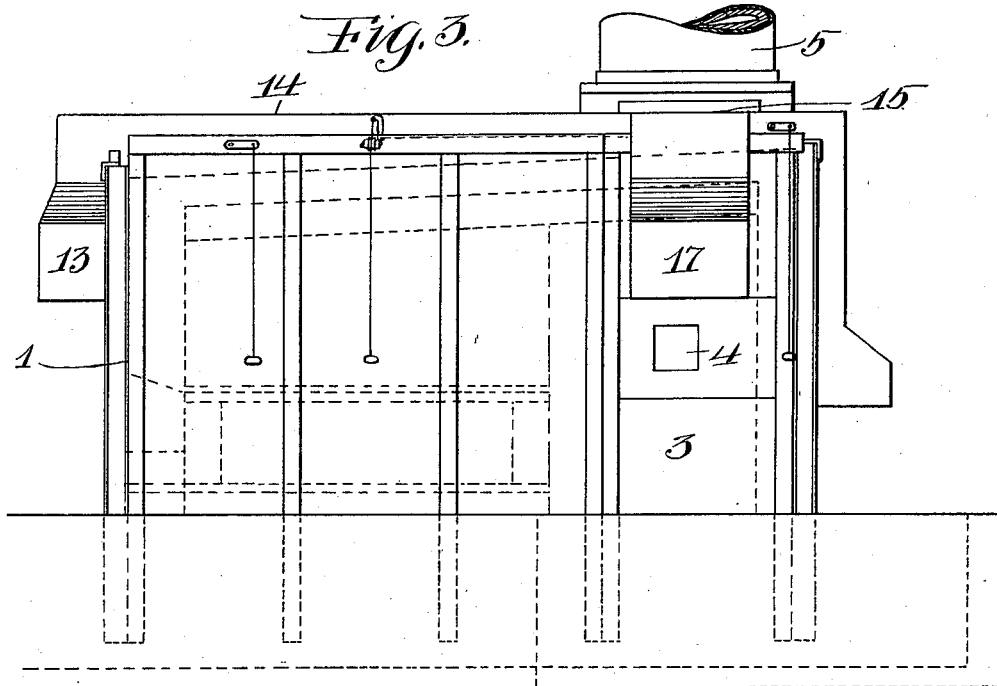
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3 SHEETS—SHEET 3.



Witnesses:
Samuel Payne
R. R. Rutler

Inventor
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UNITED STATES PATENT OFFICE.

ALFRED TOMKINS, OF PITTSBURGH, PENNSYLVANIA.

FURNACE.

1,008,876.

Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed July 26, 1910. Serial No. 573,903.

To all whom it may concern:

Be it known that I, ALFRED TOMKINS, a citizen of the United States of America, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawing:

10 This invention relates to furnaces and especially to that type of furnace used in connection with tin and sheet plate mills for heating sheets or plates of steel as disclosed in my Patent No. 944,299, granted December 28, 1909.

15 It is in connection with the above type of furnace that the furnace men or workmen encounter a high degree of heat, which in the summer time, causes heat prostration, short hours of labor, and inconveniences for workmen to the extent that the character of the work is often sacrificed, waste incurred and valuable time and labor lost.

20 It is to obviate the intense heat encountered by workmen that I have devised hoods for conveying the heat, ordinarily emitted from the furnace door, to the stack of the furnace, and to provide novel dampers that will control the passage of heated air into the 30 stack.

With this understanding of the principle of my invention, reference will now be had to the drawings, wherein there is illustrated one type of furnace in connection with which 35 the invention can be used, but it is to be understood that the invention is no wise limited to any specific structure or for the purposes for which it may be employed.

40 In the drawing:—Figure 1 is a front elevation of the furnace, with the stack thereof partly broken away and partly in section, Fig. 2 is a plan of the same, Fig. 3 is a side elevation of the furnace, Fig. 4 is a longitudinal sectional view of the same. Fig. 5 45 is a sectional detail illustrating the dampers closing the conduits, and Fig. 6 is a similar view illustrating the dampers moved to position within the stack when the furnace is working.

50 In the drawings there is illustrated a double furnace and this furnace has the front wall 1 thereof provided with two doorways 2, the side walls 3 provided with doorways 4, and the rear wall 3^a provided with doorways 4^a. The interior of the furnace communicates with a stack or chimney 5 and the

communication between said furnace and the stack or chimney is controlled by adjustable dampers 6 which are shifted through the medium of pivoted rods 7 extending forwardly over the furnace and having the forward ends thereof provided with operating handles or levers 8. The doorways 2 are closed by doors 9 raised and lowered through the medium of cables 10, fulcrumed weighted levers 11 and operating hand rods 12, all of these elements being of the ordinary and well-known type.

The front wall 1 above the doorways 2 is provided with hoods 13 and these hoods communicate with longitudinal flues 14 arranged upon the roof of the furnace, the rear end of said flues communicating with transverse flues 15 and these flues communicate with the stack or chimney 5 through the medium of openings 16 formed in the sides of the stack. The openings 16 are arranged whereby when the dampers 6 are moved to a vertical position they will close the openings 16. The opposite ends of the transverse flues 15 are in communication with hoods 17 arranged above the doorways 4 in the side walls 3 of the furnace. Arranged above the doorways 4^a are hoods 20 in communication with vertical flues 21 that extend over the roof of the furnace, as at 22 and communicate with the transverse flues 15.

In the flues 14, 15 and 21 are arranged dampers or shutters, the dampers or shutters 23 of the flues 14 being mounted upon rods 24 journaled in the flues 14 and extending outwardly to the sides of the furnace, where they are provided with operating cranks or handles 25. The dampers or shutters 26 of the flues 15 are mounted upon rods 27 journaled in the flues 15 and extending forwardly, these rods having the ends thereof provided with cranks 28 connected to cables 29 that extend over sheaves 30, carried by the sides of the furnace, whereby the cables 29 can be easily moved to open or close the dampers 26. The dampers or shutters 31 within the flues 21 are mounted upon rods 32 journaled in said flues, said rods extending to the sides of the furnace where they are provided with cranks or handles 33.

When the furnace is to be placed in operation, the dampers are raised to a vertical position as shown in Fig. 5 and when shifted to such position close the openings 16 of the conduits 15 and open the stack whereby the draft is through the furnace and up the

stack. After the fire has been started and the furnace is working in a satisfactory manner and is to be used by workmen, the workman lowers the dampers 6 to the inclined position as shown in Fig. 6, the stack is then partially closed but the draft in the furnace and up the stack is sufficient to insure combustion in the furnace and the proper heat of the same. It is necessary to maintain the dampers in a partially closed position as shown in Fig. 6, to prevent too strong a draft in the furnace and to cause a roll of the smoke within the furnace which is conducive to the proper production of tin and the combustion of all the coal placed within the furnace. On account of the draft being retarded in the stack, a considerable quantity of the heat from the furnace is thrown out of the doors, the stoker holes as well as the peep holes and it is this heat, particularly in hot weather, that prevents the workmen from giving the furnaces their proper attention. It is this heat that is thrown out of the doors and through the stoker holes and through the peep holes that is carried upward into the hoods and conduits and then conducted to the stack. When the dampers are in an inclined position, as shown in Fig. 6, the upward draft is produced by the stack in the conduits and the hot air from the openings of the furnace is immediately sucked up into the hoods, through the conduits and discharged into the stack.

It is through the medium of the hoods 13, 17 and 20 that the heated air is collected as it rises from the doorways, the air being conveyed to the stack from which it exhausts to the atmosphere, and when the hoods and flues are not being used, the dampers 6 close the openings 16 and prevent matter passing into the stack from the interior of the furnace from passing through the flues. The dampers 23, 26 and 31 are employed for shutting off a conduit, when the ashes are being withdrawn from beneath the grate at either of the openings of the furnace.

The hoods and flues are made of brick or sheet metal sufficiently reinforced to prevent distortion or buckling due to the intense heat of the furnace.

What I claim is:—

1. The combination with a furnace for tin and sheet plate mills having the walls thereof provided with doorways, and a stack in communication with the interior of said furnace, of hoods mounted above the doorways of said furnace, vertical flues communicating with said hoods, flues arranged upon the roof of said furnace and establishing communication between said vertical flues and said stack, and dampers movably mounted within said stack for controlling

the communication between said transverse flues, stack and furnace.

2. The combination with a furnace having the front wall thereof provided with doorways, the side walls thereof provided with doorways, and a stack in communication with the interior of said furnace, of hoods carried by the front wall of said furnace above the doorways thereof, hoods carried by the side walls of said furnace above the doorways thereof, transverse flues establishing communication between the hoods of the side walls and said stack, longitudinal flues establishing communication between the hoods of the front wall and said transverse flues, and dampers movably arranged in said stack for controlling the communication between said transverse flues and said stack.

3. The combination with a furnace for tin and sheet plate mills having the walls thereof provided with doorways, and a stack in communication with the interior of said furnace, of hoods mounted above the doorways of said furnace, vertical flues communicating with said hoods, flues arranged upon the roof of said furnace and establishing communication between said vertical flues and said stack, dampers arranged in said flues upon the roof of the furnace, and dampers movably mounted in said stack for controlling the communication between said roof flues and the stack.

4. In combination, a furnace having one of the walls thereof provided with a doorway, a stack in communication with the interior of the furnace, a hood secured to the outer face of said wall and arranged over the doorway in proximity thereto, a flue arranged upon the top of the furnace and opening into said stack and communicating with said hood, and a damper arranged in the stack for controlling communication between the flue and the stack.

5. In combination, a furnace having one of the walls thereof provided with a doorway, a stack in communication with the interior of the furnace, a hood secured to the outer face of said wall and arranged over the doorway in proximity thereto, a flue arranged upon the top of the furnace and opening into said stack and communicating with said hood, a damper arranged in the stack for controlling communication between the flue and the stack, and a damper within said flue.

In testimony whereof I affix my signature in the presence of two witnesses.

ALFRED TOMKINS.

Witnesses:

JOHN M. IRWIN,
W. T. VETTER.