

No. 682.843.

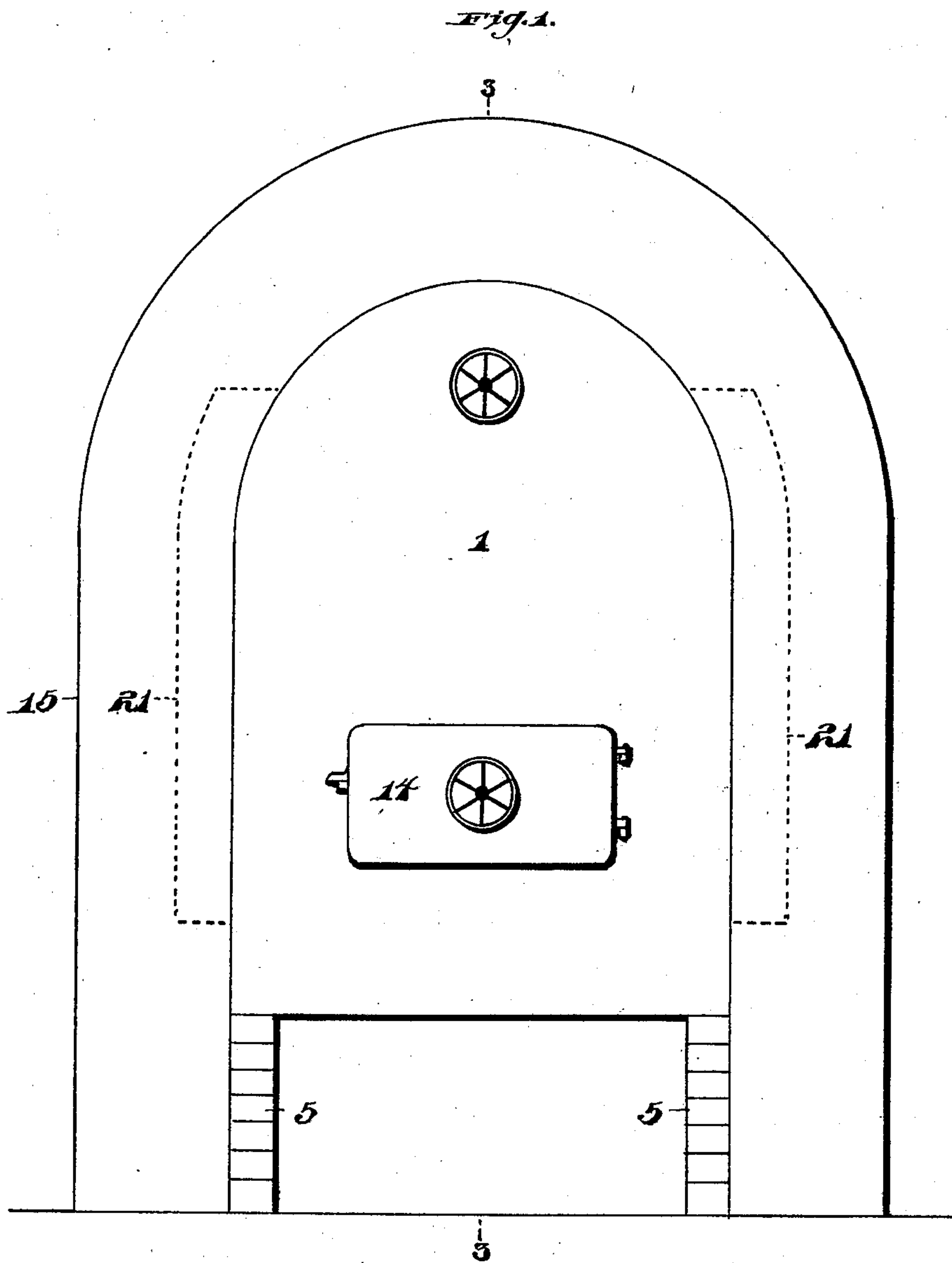
Patented Sept. 17, 1901.

J. DOWNING & H. G. WILLETTS.
FURNACE.

(Application filed Apr. 16, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses
J. Appleman
E. C. Potter

Inventors
J. Downing
H. G. Willetts
By
H. C. [Signature]
Attorneys

No. 682,843.

Patented Sept. 17, 1901.

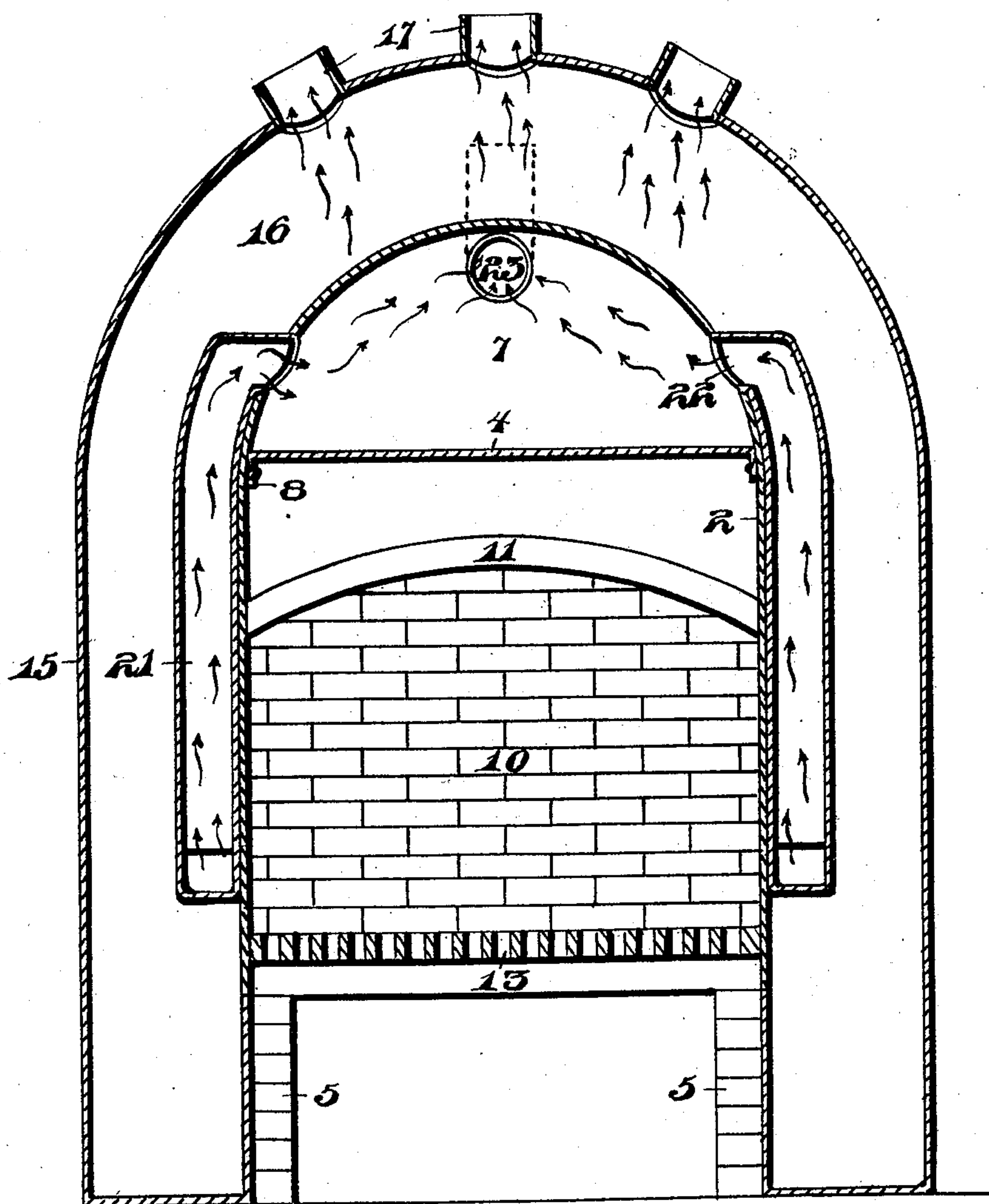
J. DOWNING & H. G. WILLETTS.
FURNACE.

(Application filed Apr. 16, 1901.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 2.



Witnesses

J. P. Appleman,
E. C. Potter

Inventors

J. Downing
H. G. Willetts

By

W. E. Court
Attorneys

No. 682,843.

Patented Sept. 17, 1901.

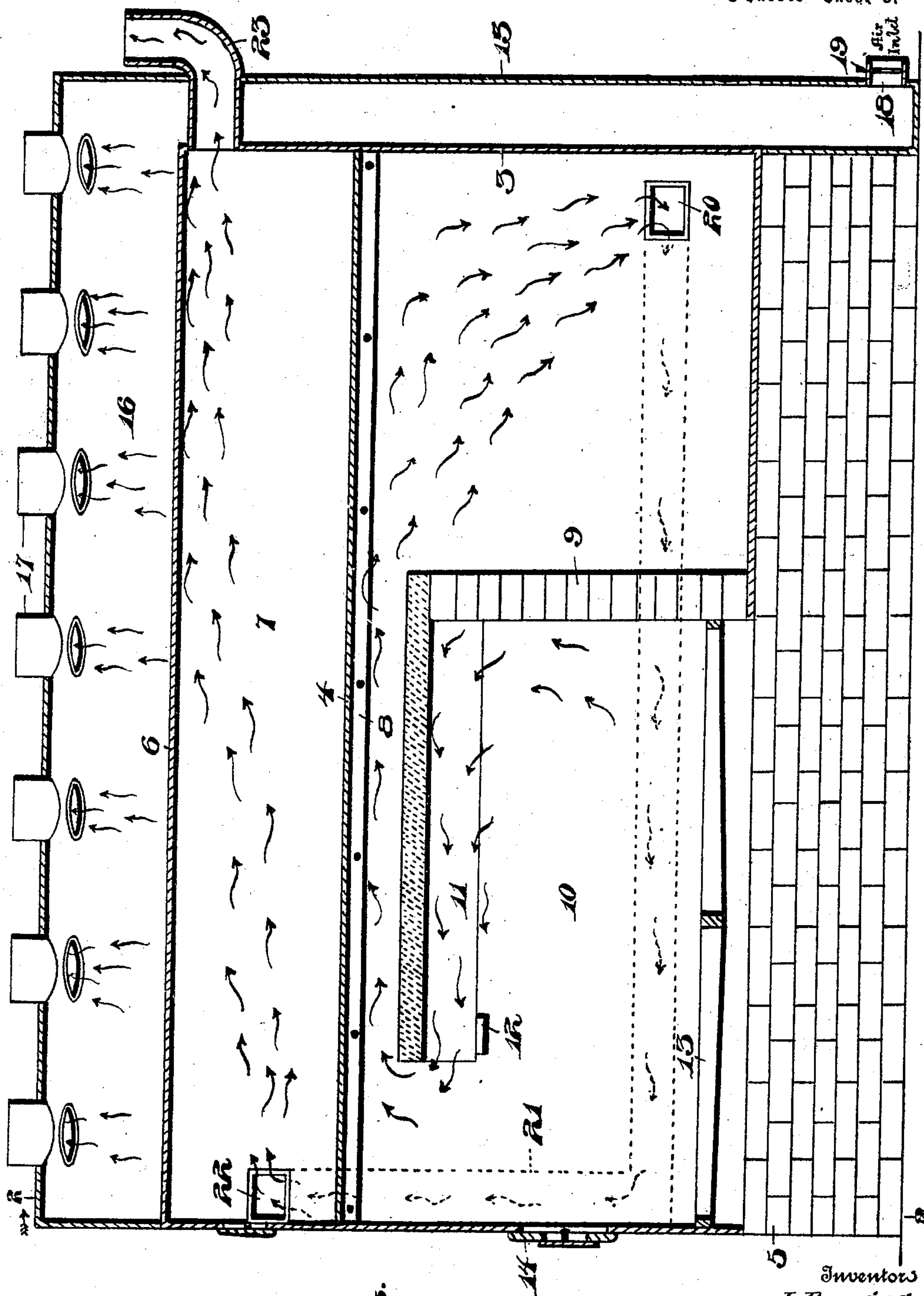
J. DOWNING & H. G. WILLETTS.

FURNACE.

(Application filed Apr. 16, 1901.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses
J. P. Appleman
E. E. Potter

Fig. 3.

Inventors
J. Downing
H. G. Willetts
By
H. C. Everett
Attorneys

UNITED STATES PATENT OFFICE.

JAMES DOWNING AND HARRY G. WILLETTS, OF PITTSBURG,
PENNSYLVANIA.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 682,843, dated September 17, 1901.

Application filed April 16, 1901. Serial No. 56,087. (No model.)

To all whom it may concern:

Be it known that we, JAMES DOWNING and HARRY G. WILLETTS, citizens of the United States of America, residing at Pittsburg, 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 drawings.

10 This invention relates to certain new and useful improvements in furnaces, and is particularly adapted for use in connection with heating purposes.

15 The invention aims to construct a furnace for heating air; and it consists of a body portion surrounded by a shell, the shell forming an air-chamber and provided with a suitable air inlet or inlets and in communication with a series of flues for carrying the hot air there-
20 from to various points when the same has been heated by the furnace and, furthermore, providing the furnace with a flue for carrying off the smoke and products of combustion, which assists in materially heating the air in
25 the air-chamber.

30 With the above and other objects in view the invention finally consists in the novel construction, combination, and arrangement of parts to be hereinafter more fully described, and specifically pointed out in the claims.

35 In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate corresponding parts throughout the several views, in which—

40 Figure 1 is a front elevation of our improved furnace. Fig. 2 is a vertical sectional view thereof, taken on the line 2 2 of Fig. 3. Fig. 3 is a longitudinal sectional view thereof.

45 Referring to the drawings by reference-numerals, 1 indicates the front, 2 the side, 3 the end, and 4 the top walls of the furnace, which are supported upon a suitable base 5. The front wall 1 and end wall 3 extend above the top 4 and are connected together by means of a dome-shaped cover 6, forming a smoke-chamber 7. The top wall 4 is provided with a downwardly-extending flange 8 to per-

mit of securing the same to the walls of the 50 furnace, as shown.

The furnace is provided with a bridge-wall 9 at the end of the fire-box 10, which does not extend the height of the furnace and is further connected to the smoke-deflector 11, 55 which consists of fire-brick and is supported by means of the transversely-extending support 12. The fire-box 10 is provided with a grate 13, which may be of any desirable construction, and the door 14. 60

Surrounding the furnace, with the exception of the front, is a shell 15, forming a hot-air chamber 16 and in communication with a series of flues 17 and provided with an air-inlet 18, having the damper 19. 65

Communicating with each side of the furnace, at the rear end thereof, is a smoke-flue 20, which extends in a longitudinal manner at each side of the furnace within the lower portion of the air-chamber 16 and at the upper part of the furnace extends in a vertical 70 manner, as at 21, the upper end thereof communicating with the smoke-chamber 7, as at 22. The rear of the smoke-chamber 7 is provided with an outlet-flue 23, which extends 75 through the air-chamber 16, as shown, and empties into the atmosphere. The passage of smoke and products of combustion is indicated by the arrows. For example, the smoke deflected by the deflector 11 will pass 80 over the top of the same and into the back of the furnace through the flue 20, emptying into the smoke-chamber 7, and thence to the atmosphere through the outlet-flue 23. The smoke and products of combustion assist in 85 materially heating the air in the chamber 16. The arrows in the air-chamber 16 indicate the passage of hot air through the flues. By this arrangement the temperature of the hot air is increased quicker than if the smoke-flue 90 were arranged in the manner shown.

It is thought the many advantages of our improved furnace adapted for use in heating air to be used for heating purposes can be readily understood from the foregoing de- 95 scription, taken in connection with the accompanying drawings, and it will be noted that various changes may be made in the de-

tails of construction without departing from the general spirit of our invention.

Having thus fully described our invention, what we claim as new, and desire to secure by

5 Letters Patent, is—

1. In a furnace, a smoke-deflector, a smoke-chamber arranged above said deflector, vertical flues arranged on each side of said smoke-chamber and communicating therewith, horizontal flues connected to said vertical flues
10 extending the length of the furnace and communicating with the interior thereof, an outlet-flue communicating with the smoke-chamber and the atmosphere, a hot-air chamber
15 arranged above the said smoke-chamber, a series of flues connected to said hot-air chamber, and an air-inlet arranged at the back of the furnace, substantially as described.

2. In a furnace, a horizontally-arranged
20 smoke-deflector, a smoke-chamber, vertical and horizontal flues communicating respectively with the said smoke-chamber and the rear interior of the furnace, a hot-air chamber surrounding said furnace, flues commu-

nicating therewith, and a vertical air-inlet 25 located at the rear of the furnace and communicating with the said hot-air chamber, substantially as described.

3. In a furnace, a smoke-deflector, a smoke-chamber, vertical flues arranged on each side 30 of said chamber and communicating therewith, horizontal flues extending the length of the furnace connected to the lower ends of said vertical flues and communicating with the rear interior of the furnace, a hot-air 35 chamber surrounding said furnace, a flue connected to the said smoke-chamber, and an air-inlet arranged at the rear of the furnace and communicating with the hot-air chamber, substantially as described. 40

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

JAMES DOWNING.

HARRY G. WILLETTS.

Witnesses:

JOHN NOLAND,

E. E. POTTER.