

No. 782,334.

PATENTED FEB. 14, 1905.

C. M. GUNN & W. D. MULLOY.

HOT AIR BLAST STOVE.

APPLICATION FILED SEPT. 8, 1903.

2 SHEETS—SHEET 1.

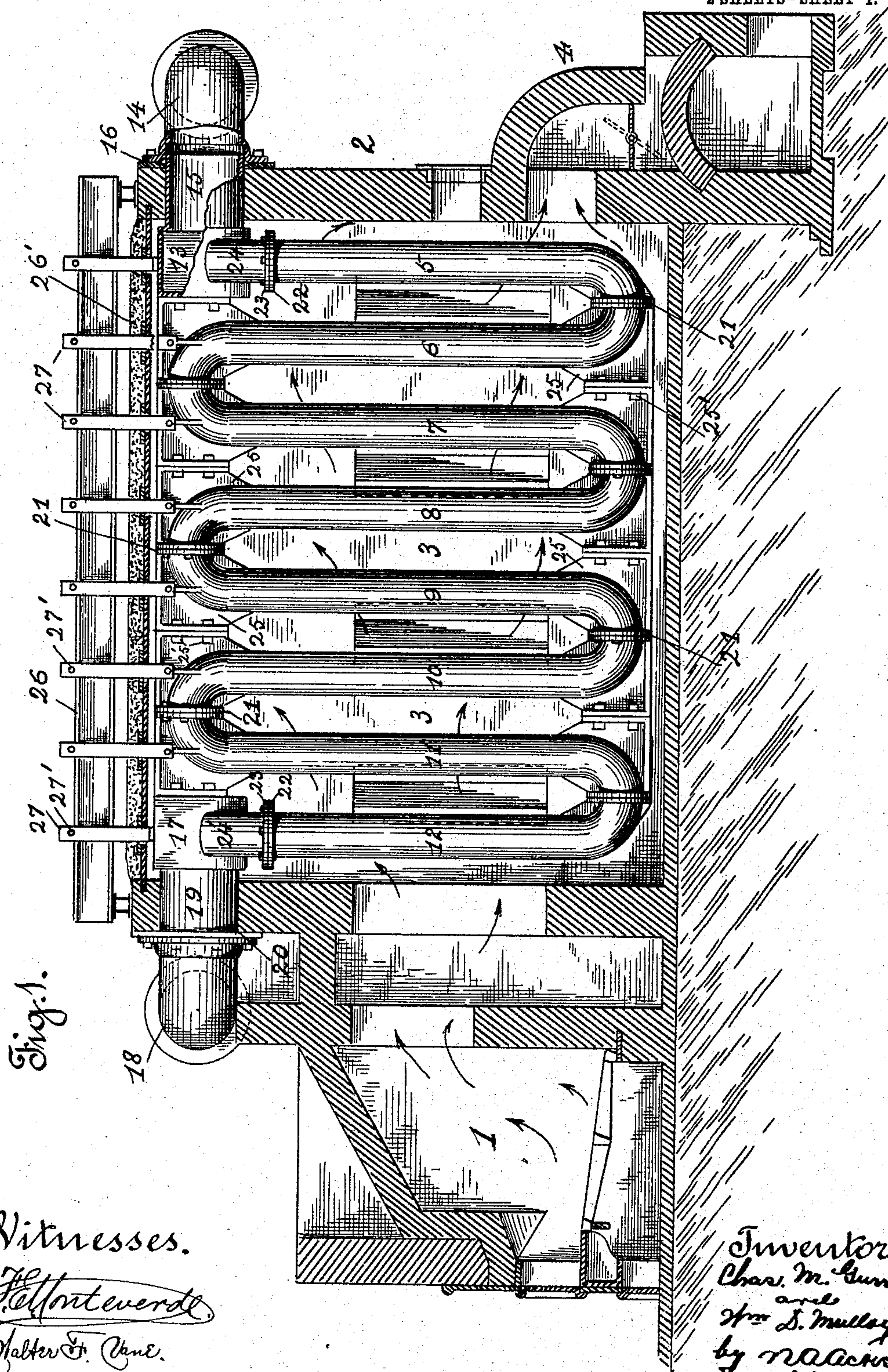


Fig. 1.

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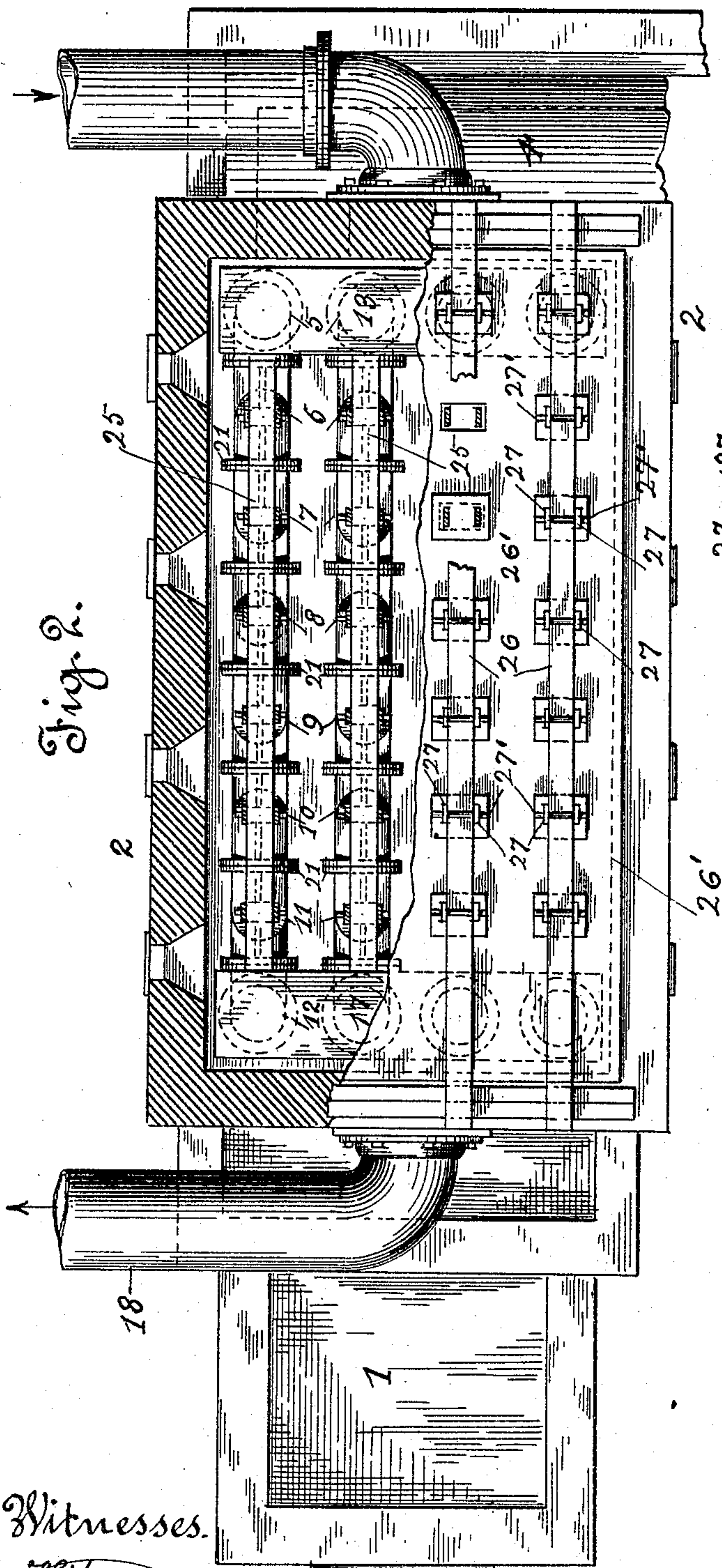


Fig. 2.

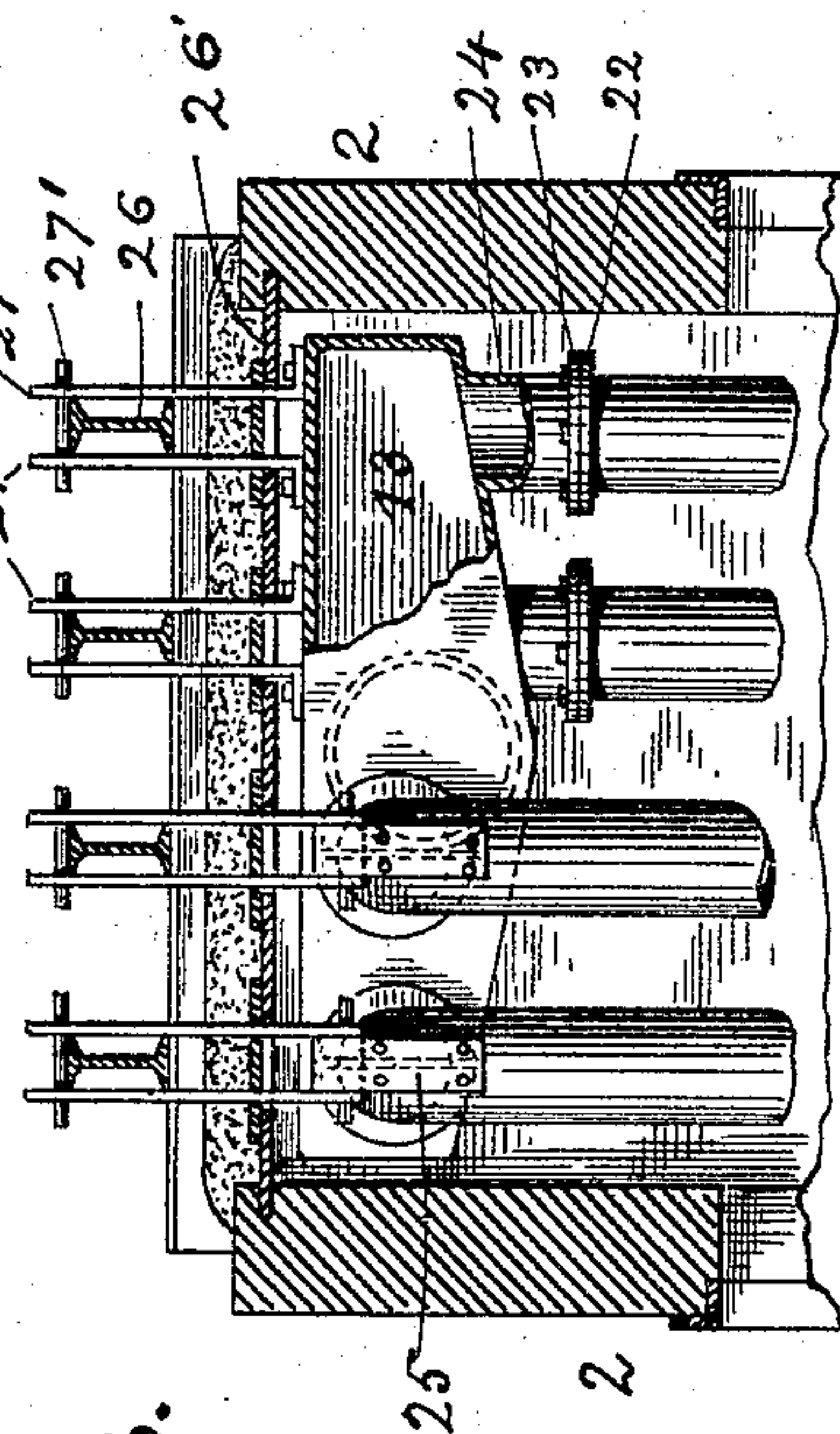


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES M. GUNN, OF SAUSALITO, AND WILLIAM D. MULLOY, OF CANYON, CALIFORNIA, ASSIGNORS TO UNION IRON WORKS, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION.

HOT-AIR BLAST-STOVE.

SPECIFICATION forming part of Letters Patent No. 782,334, dated February 14, 1905.

Application filed September 8, 1903. Serial No. 172,231.

To all whom it may concern:

Be it known that we, CHARLES M. GUNN, residing at Sausalito, Marion county, and WILLIAM D. MULLOY, residing at Canyon, Eldorado county, State of California, citizens of the United States, have invented certain new and useful Improvements in Hot-Air Blast-Stoves; and we do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates to certain improvements in connection with blast-stoves used for supplying heated air to smelting-furnaces, the same consisting in providing means whereby the air tubes or pipes are so connected as to distribute the strains of contraction and expansion uniformly throughout the series thereof, and in the connection of the end tubes of each series with end boxes or compartments for receiving the cool air and delivering same to the feed-tube of each series and the hot air from the discharge-tubes and delivering same to the supply-pipe for the heated air.

To comprehend the invention, reference should be had to the accompanying sheets of drawings, wherein—

Figure 1 is a longitudinal sectional view of the stove in side elevation, disclosing the manner of connecting or uniting the air-tubes to uniformly distribute the strains of expansion and contraction of the tubes, also the connection between the end tubes and the air-distributing boxes or compartments arranged at each end of the tubes. Fig. 2 is a top plan view of the stove, partly broken away, said view disclosing the arrangement of the tubes within the stove; and Fig. 3 is a cross-sectional end view in elevation, illustrating the manner of suspending the air-tubes from the longitudinal roof-beams of the stove.

The numeral 1 is used to indicate the fire-box of the stove 2, and 3 the heating-chamber communicating with the said fire-box. From the said chamber leads the outlet-flue 4 for the waste products of combustion, which flue communicates with the stack. (Not shown.) These

parts are of the usual construction, and hence require no specific description herein.

Within the combustion-chamber are arranged the air-tubes 5 6 7 8 9 10 11 12. Each stove unit, there being four disclosed by Figs. 2 and 3 of the drawings, consists of a corresponding series of said tubes, the first tube, or tube 5, of each series connecting with an air-distributing compartment 13, which is attached or united to the air-supply pipe 14, located outside of the rear wall of the stove by means of the connection 15, which extends through an opening 16, formed in the said rear wall of the stove, Fig. 1 of the drawings. The last tube of each series, or tube 12, connects with a receiving-compartment 17, which in turn is attached to the discharge-pipe 18 (which conveys the heated air to any desired point) by means of the connection 19. This connection extends through an opening 20, formed in the front wall of the heating-chamber. The compartments 13 and 17 are arranged inside of the heating-chamber 3 and at each end thereof, as shown in Figs. 1 and 2 of the drawings. The air-tubes at each end are formed with abutting collars or circular flanges 21, which are united in the usual manner. The upper end flanges 22 of the tubes 5 and 12 connect with flanges 23 of the extensions 24 24', depending, respectively, from the distributing-compartments 13 and 17. Each tube is formed with what shall hereinafter be termed "head-blocks" 25, which blocks are united to each other by means of bolts 25'. The upper head-blocks of the end tubes are united, respectively, to the compartments 13 and 17, Fig. 1 of the drawings. By preference the intermediate tubes are united at their upper and lower end by means of these head-blocks. As thus fastened a solid connection is made between the tubes throughout the length of each series. Hence the strains of expansion and contraction of any one tube is distributed uniformly throughout the entire series of tubes. This is due to the fact that a rigid connection is made between each of the said tubes of the series. Inasmuch as the

contraction and expansion takes place mainly at the top of the tubes, it is essential that a rigid or solid connection between the tubes be made at their upper ends, which connection
 5 at the lower end of the tubes, if so desired, may be omitted. Each series of tubes is suspended from a longitudinal beam 26, arranged above the stove-roof 26' by means of the straps 27. These straps are pivoted to
 10 the tubes and united at their upper end by means of the pin 27', which pin rests upon the upper edge of the beam 26. Being thus suspended, the entire series of rigidly-connected tubes may shift or swing longitudi-
 15 nally with the contraction and expansion of either tube, as the strain incident thereto is evenly distributed.

The air to be heated is delivered into the distributing-compartment or distributor 13
 20 from the supply-pipe 14 and discharged into the tubes 5, connected therewith. Inasmuch as the distributor or compartment 13 is located within the heating-chamber 3, the temperature of the air is raised the moment it
 25 enters the said compartment. As the air circulates throughout the length of the series of tubes it is highly heated and finally discharged into the receiver or receiving-compartment 17 for delivery into the discharge-pipe 18.

30 One series of tubes constitutes a single unit, the stove illustrated comprising four units. The number of units designates the capacity of the stove. These units are not connected other than by their end connections with the
 35 compartments 13 and 17.

The essential feature of the present invention resides in the introduction of means in each unit of tubes for compensating for the contraction and expansion of the tubes by
 40 distributing the same uniformly between all the tubes of the series, which means in the present instance resides in the forming of a

solid or rigid connection between the tubes throughout the length of each series.

Having thus described the invention, what 45 is claimed as new, and desired to be protected by Letters Patent, is—

1. In a hot-air blast-stove, the combination with the heating-chamber, of a series of air-circulating tubes suspended therein, compris- 50 ing vertically-arranged communicating coils, and solid connections between the tubes at the upper and lower ends, comprising heads extending over and connected to the communicating ends of the tubes, said heads hav- 55 ing inwardly-turned flanges between adjacent coils and bolts securing adjacent flanges.

2. In a hot-air blast-stove, the combination with the heating-chamber, of a series of air-circulating tubes suspended therein, compris- 60 ing vertically-arranged communicating coils, and solid connections between the tubes at their upper and lower ends, comprising heads extending over and connected to the communicating ends of the tubes, said heads hav- 65 ing connected inwardly-turned flanges between adjacent coils.

3. In a hot-air blast-stove, the combination with the heating-chamber, of a series of air-circulating tubes suspended therein, compris- 70 ing vertically-arranged communicating coils, and solid connections between the tubes at their upper and lower ends, comprising heads extending over and connected to the communicating ends of the tubes, said heads be- 75 ing connected between adjacent coils.

In witness whereof we have hereunto set our hands.

CHARLES M. GUNN.
 WILLIAM D. MULLOY.

Witnesses:

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