No. 829,717. PATENTED AUG. 28, 1906.

C. W. A. KOELKEBECK.

HOT BLAST STOVE.

APPLICATION FILED MAR. 14, 1903.

3 SHEETS—SHEET 1.

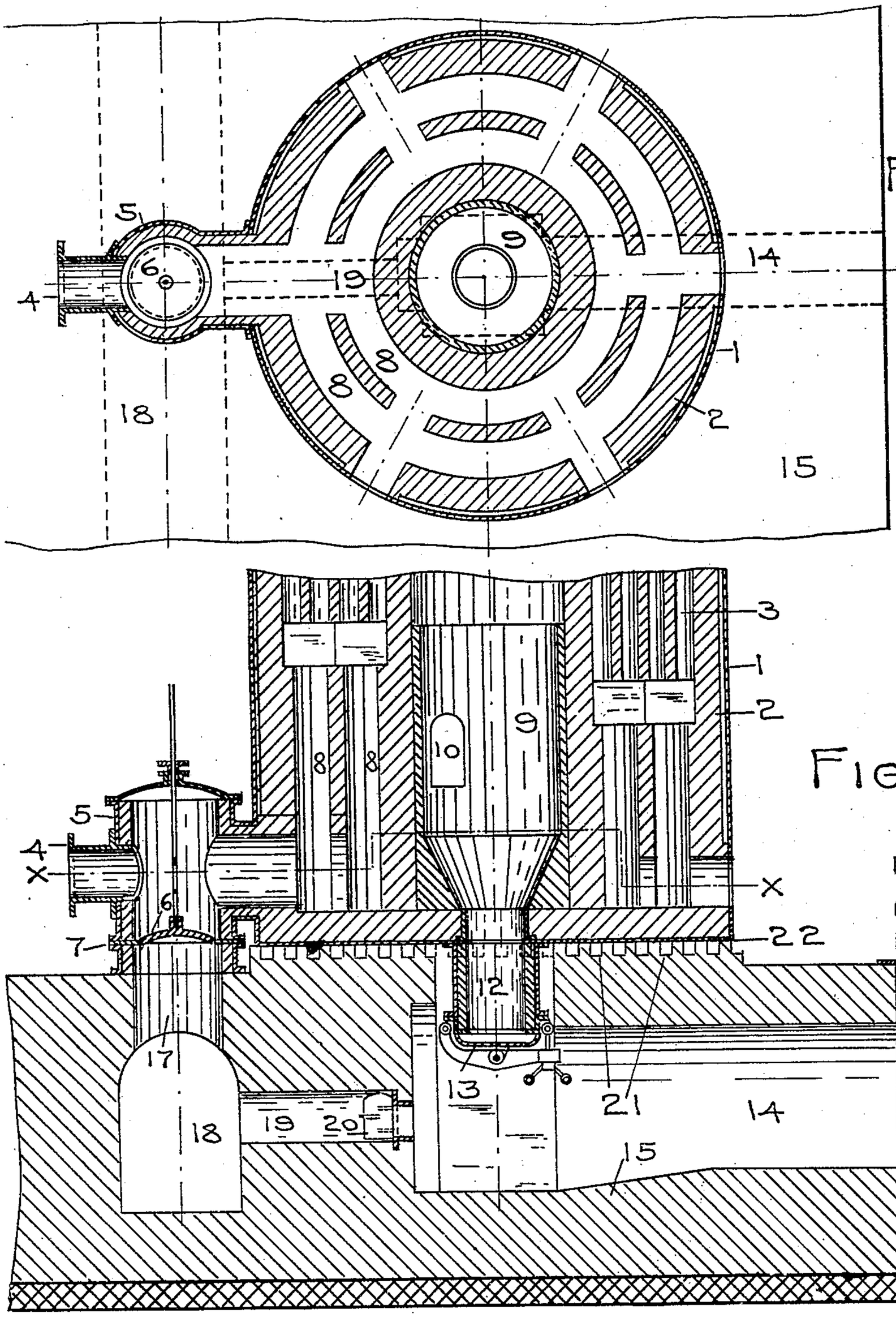

FIG 2

FIG 1

WITNESSES:

C. T. Thiemann

Edwin L. Allen

INVENTOR.

Carl W. A. Koelkebeck

BY

W. G. Doolittle

ATTORNEY.

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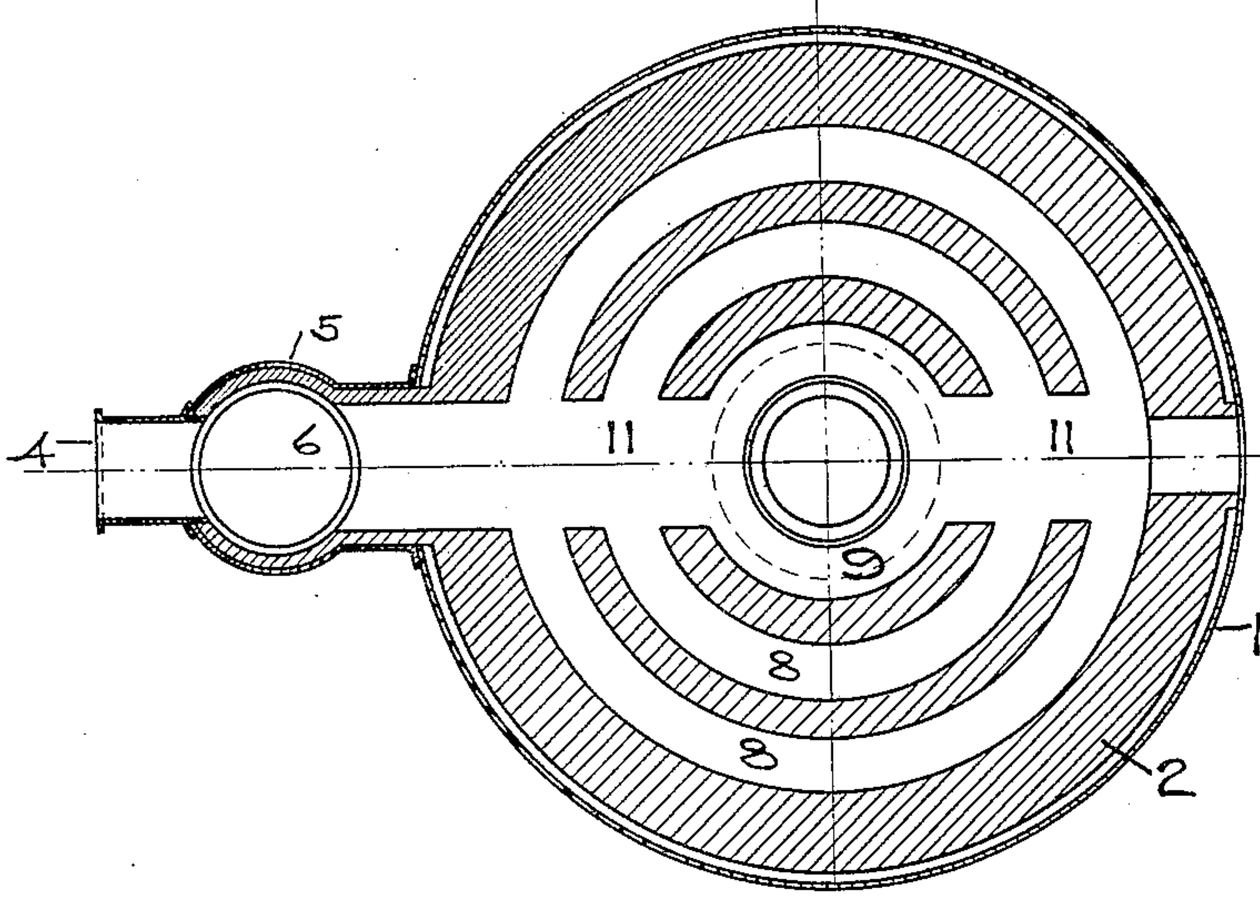

FIG 4

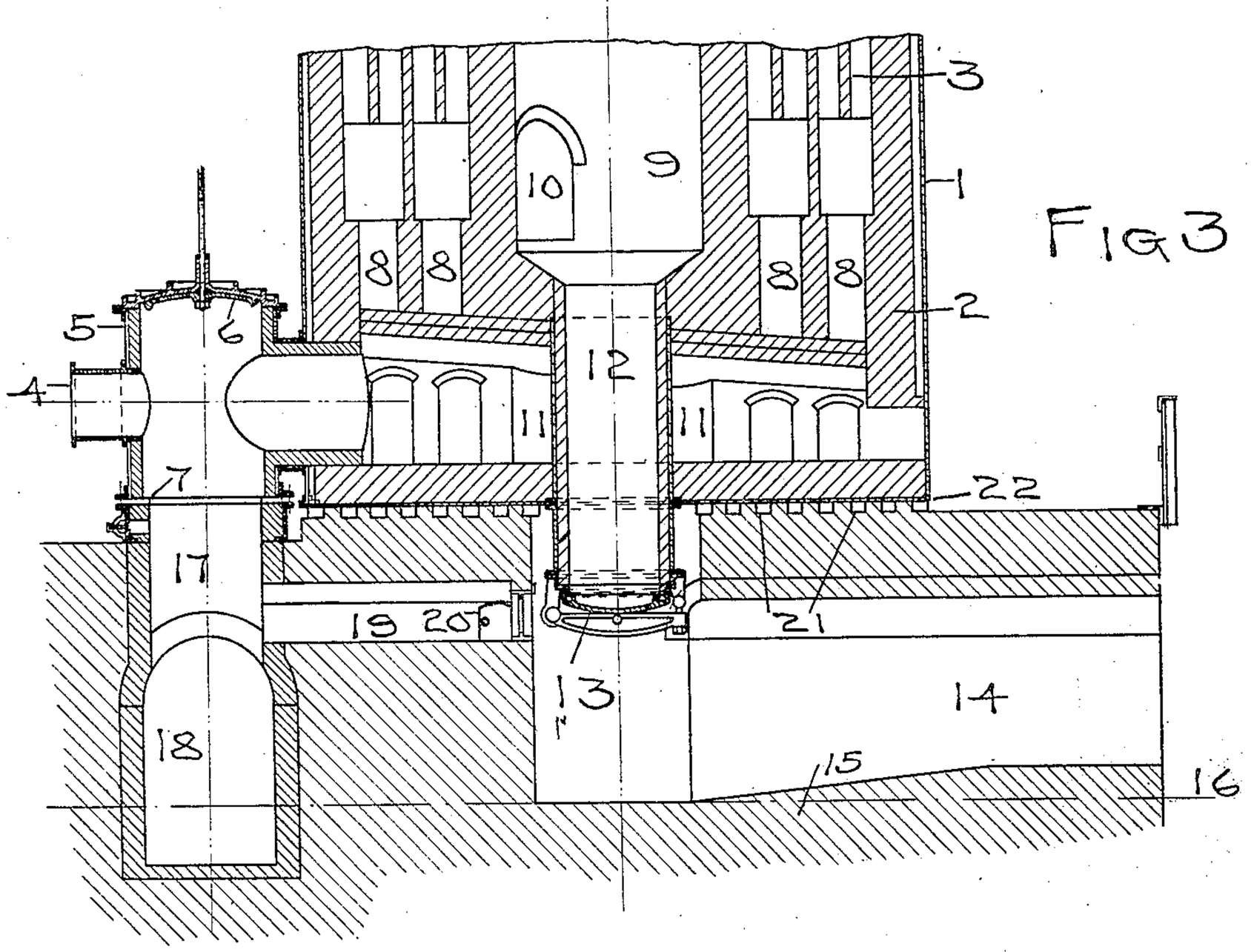

FIG 3

WITNESSES:

C. F. Rheinauer.

Edwin L Allen

INVENTOR.

Carl W. A. Koelkebeck

BY

W. G. Doolittle

ATTORNEY.

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3 SHEETS—SHEET 3.

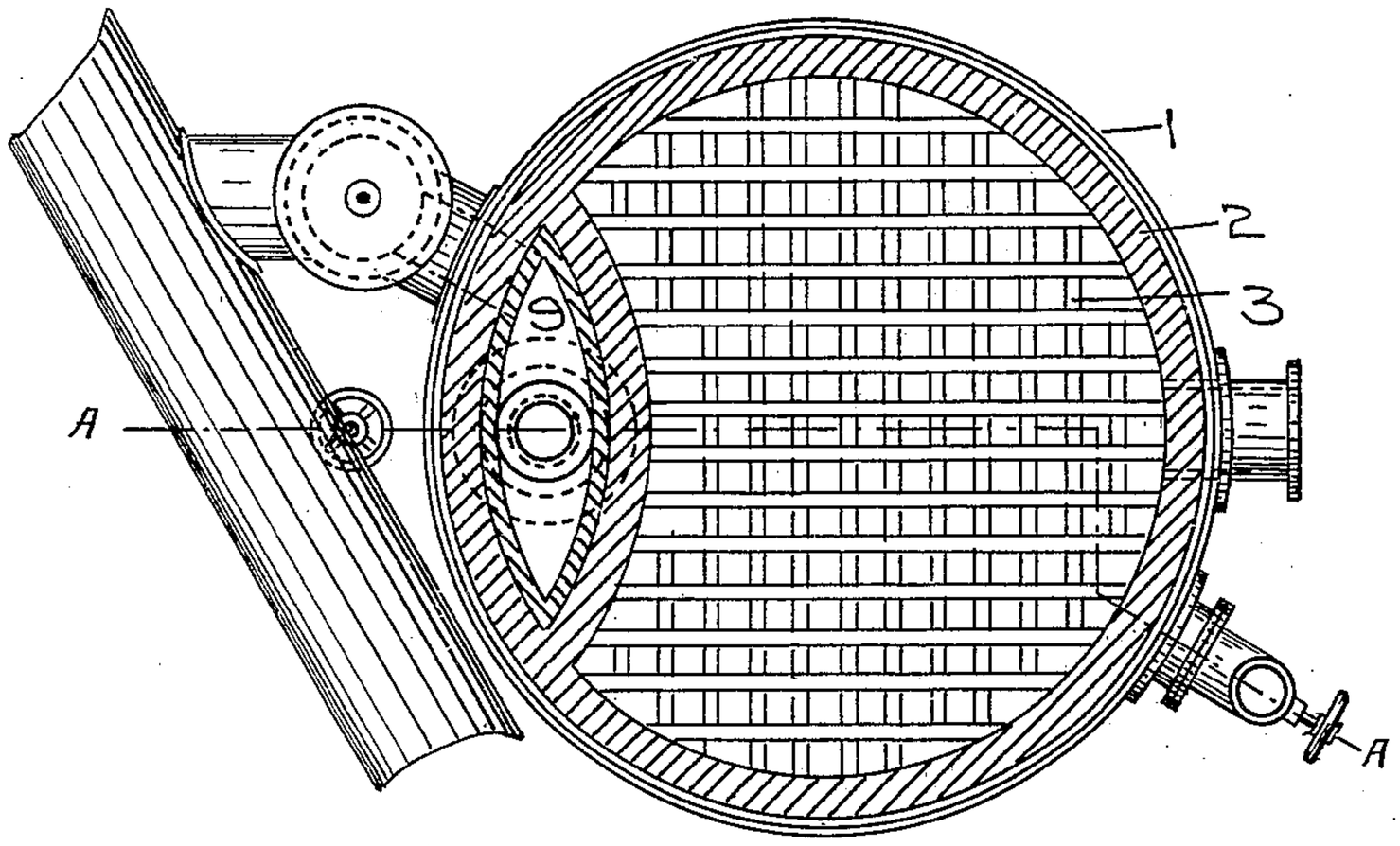

FIG. 6.

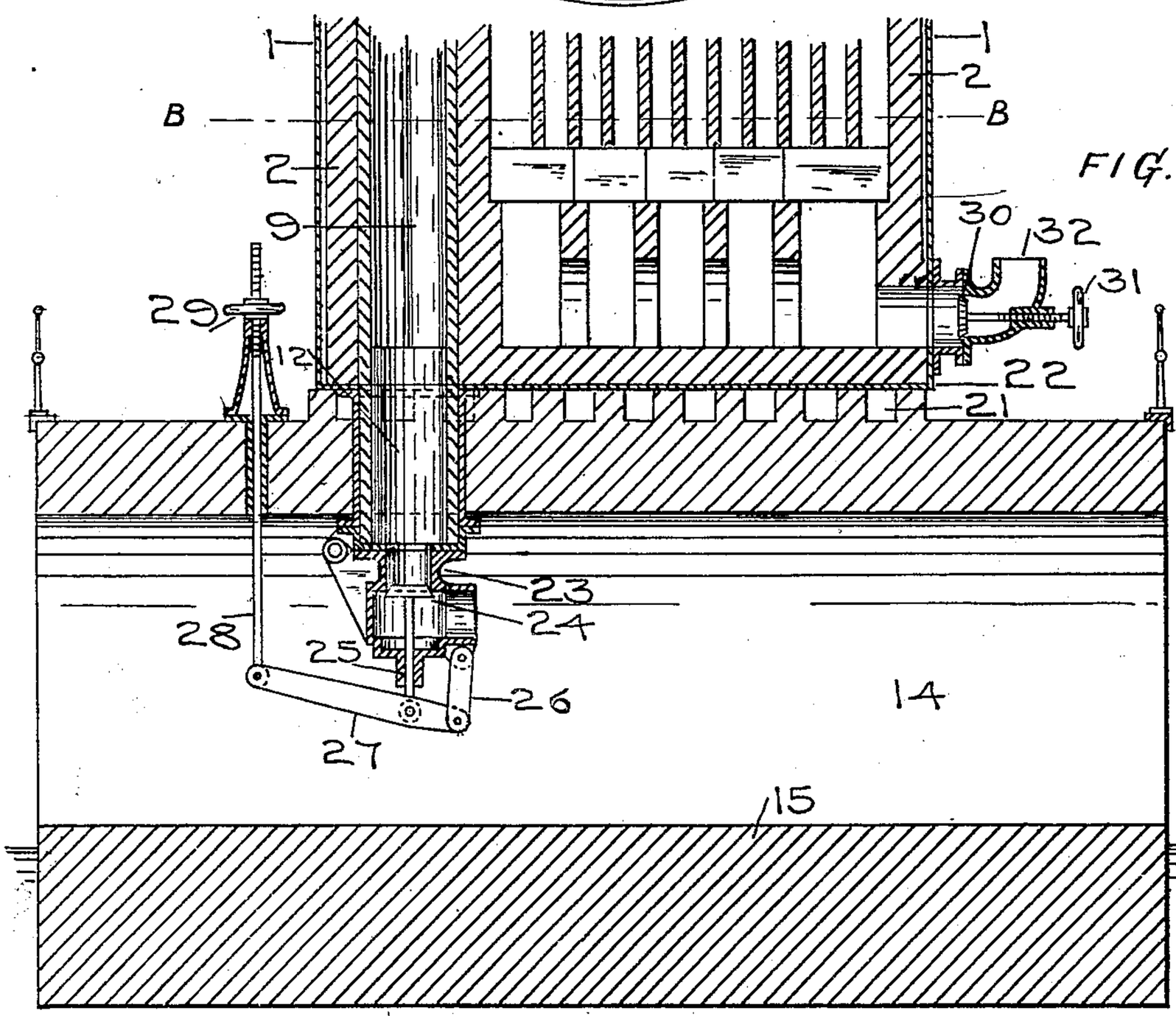

FIG. 5.

WITNESSES:

C. F. Pinkney.

Edwin L. Allen

INVENTOR

Carl W. A. Koelkebeck

by W. G. Doolittle

ATTORNEY

UNITED STATES PATENT OFFICE.

CARL W. A. KOELKEBECK, OF CLEVELAND, OHIO.

HOT-BLAST STOVE.

No. 829,717. Specification of Letters Patent. Patented Aug. 28, 1906.

Application filed March 14, 1903. Serial No. 147,835.

To all whom it may concern:

Be it known that I, CARL W. A. KOELKEBECK, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Hot-Blast Stoves, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in hot-blast stoves; and to this end the present invention consists of a new and improved hot-blast stove and in the construction and combination of parts, all as fully hereinafter described and claimed.

In the accompanying drawings, which illustrate applications of my invention, Figure 1 is a central vertical sectional view of a hot-blast stove and foundation constructed in accordance with my invention; Fig. 2, a horizontal sectional view taken on line *x x* of Fig. 1; Fig. 3, a central vertical sectional view of stove and foundation, showing modified form of flues within the stove; Fig. 4, a horizontal sectional view of the form of Fig. 3; Fig. 5, a central vertical sectional view showing combustion-chamber arranged at one side of the stove instead of being centrally located, the section being taken on line A A of Fig. 6; and Fig. 6, a part plan and a part horizontal sectional view of the form of Fig. 5, the section being taken on line B B of Fig. 5.

Referring to the drawings, the casing 1 is preferably of the usual construction, as well as the wall 2 and the regenerative checker-work 3. A cold-blast connection 4 communicates with chimney-valve housing 5, and 6 represents the chimney-valve, which latter has its seat 7 in the chimney-housing. The cold blast enters the stove through chimney-valve housing and passes to annular chambers 8, whence it rises into the flues of the checker-work 3, down combustion-chamber 9, and out through opening 10 to a hot-blast valve.

In the form of Fig. 3 the cold blast from the chimney-valve housing first passes into a transverse flue 11 and divides itself into eight currents, whence it passes to the annular chambers 8, checker-work, and combustion-chamber. This particular construction enables the cold blast to be more readily heated. Immediately below and in open communication with the combustion-chamber 9 is a downtake or passage 12, having a door 13 at the lower end thereof. This downtake communicates with a tunnel or passage 14, preferably built in a suitable foundation 15. 16 represents the yard-level.

In the construction shown by Fig. 5 the tunnel extends the entire width of the foundation. A downtake 17, in the forms of Figs. 1 and 3, connects the chimney-valve housing with chimney-flue 18, chimney-flue 18 being connected with tunnel 14 by draft-flue 19. Flue 19 is provided with a door 20, which controls the circulation of cooling air through the same. The purpose of the downtake in communication with the combustion-chamber and the tunnel or passage 14 is to permit ready access to the combustion-chamber for the purposes of cleaning the combustion-chamber. Heretofore ore and coke-dust which accumulates at the bottom of the stove and particularly at the lower part of the combustion-chamber has had to be raked out through openings in the stove in a very inconvenient and expensive manner, requiring the stove to be kept out of service for a considerable time, thereby chilling the stove and altogether causing much labor, time, and expense. In stoves in which Cuban ores are employed it has been found that the bottom of the combustion-chamber becomes filled up in a comparatively short time and also that these ores readily adhere to the brick walls of the combustion-chamber, necessitating a frequent removal of the same in order to operate the stove. The tunnel 14 in the forms of my invention as illustrated is of sufficient dimensions to permit a man to enter the same and travel to a position directly under the lower end of the combustion-chamber, from which position the accumulated mass may be easily removed. In the forms of Figs. 1 and 3 the door 20 of flue 19 should be opened while the combustion-chamber is being cleaned. Flues 21 for keeping the base 22 of the stove cool and dry are interposed between the foundation and the base. These flues preferably extend across the base and are open to the atmosphere.

In the form of Fig. 5 I have shown a relief-valve mechanism located at the lower end of the downtake 12. This mechanism comprises a frame or housing 23, arranged to be moved out of register with the downtake when required. A valve 24 has its stem 25 connected with valve-operating means 26, 27, 28, and 29 and is operated from the

working floor of the stove. Another air-relief valve 30 is shown, this valve being operated by hand-wheel 31 and controls the discharge through outlet 32. The function of air-relief valves in connection with hot-blast stoves is so well known by those skilled in the art I deem it unnecessary to particularly describe the same, except to state that by the employment of the relief-valves in the positions shown I am enabled to use the relief-valve located at the lower end of the downtake at one "reverse" of the stove and the other at the next. While I have shown these relief-valves only on the form of stove having its combustion-chamber located to the side of the stove, they may be employed on the forms shown by Figs. 1 and 3.

What I claim is—

1. In a hot-blast stove, the stove-body, a combustion-chamber located in the stove, a cold-blast inlet, a transverse flue in communication with the cold-blast inlet, a foundation for the stove having a tunnel or passage therein, a downtake leading from the combustion-chamber into the tunnel, and means on the lower end of the downtake for opening and closing the downtake-passage, substantially as set forth.

2. In a hot-blast stove, the stove-body, a combustion-chamber in the stove, a foundation for the stove having a tunnel or passage therein, a chimney-flue, a draft-flue connecting the tunnel and the chimney-flue, and a downtake leading from the combustion-chamber into the tunnel, substantially as set forth.

3. In a hot-blast stove, the stove-body, a combustion-chamber in the stove, a foundation for the stove having a tunnel or passage therein, a chimney-flue, a draft-flue connecting the tunnel and the chimney-flue, a door controlling the passage between the tunnel and chimney-flue, a downtake leading from the combustion-chamber into the tunnel and means on the lower end of the downtake for opening and closing the downtake-passage, substantially as set forth.

4. In a hot-blast stove, the stove-body, a combustion-chamber in the stove, a foundation for the stove having a tunnel or passage therein, air-flues located in the upper part of the foundation immediately under the base of the stove for the purpose of keeping the base dry and cool, a downtake leading from the combustion-chamber into the tunnel, and means at the lower end of the downtake for opening and closing the downtake-passage, substantially as set forth.

5. In a hot-blast stove, the stove-body, a combustion-chamber, a cold-blast inlet, a transverse flue in communication with the cold-blast inlet, and a downtake extending from the lower end of the combustion-chamber and crossing the transverse flue, substantially as set forth.

6. In a hot-blast stove, the stove-body, a combustion-chamber in the stove, a foundation for the stove having a tunnel or passage therein, a chimney-flue, a draft-flue connecting the tunnel and the chimney-flue, and a downtake leading from the combustion-chamber into the tunnel having means for opening and closing the downtake-passage, substantially as set forth.

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

CARL W. A. KOELKEBECK.

Witnesses:
MARGARET HUGHES,
EDWIN L. ALLEN.