J. I. LARIMER.

HOT BLAST STOVE.

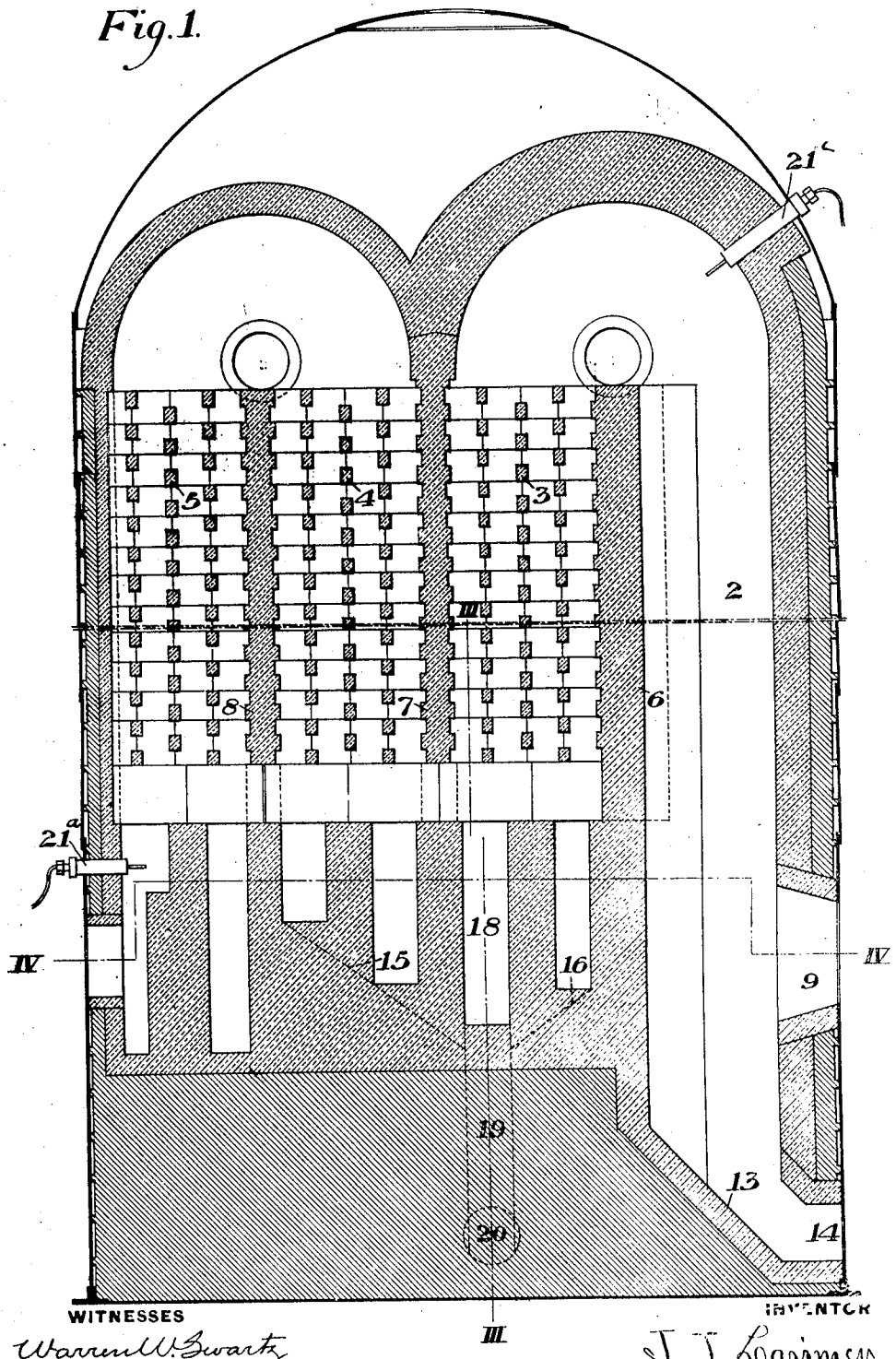
APPLICATION FILED MAY 22, 1906.

912,967.

Patented Feb. 16, 1909.

4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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4 SHEETS—SHEET 2.

Fig. 2.

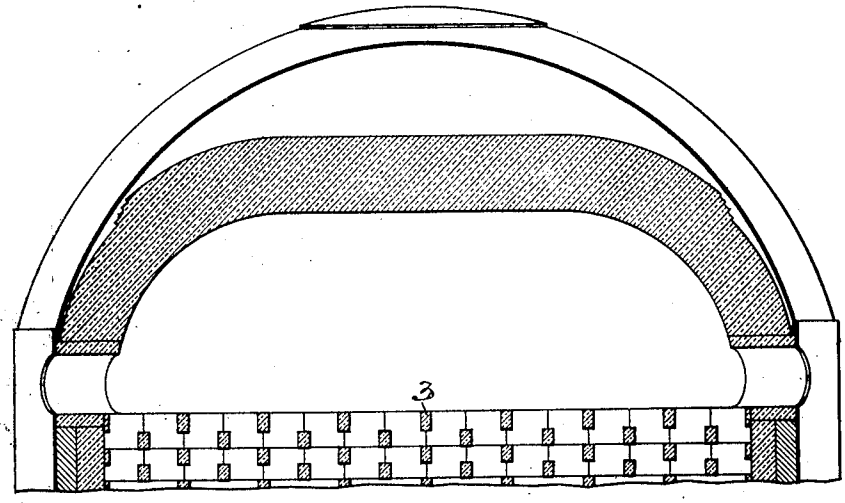
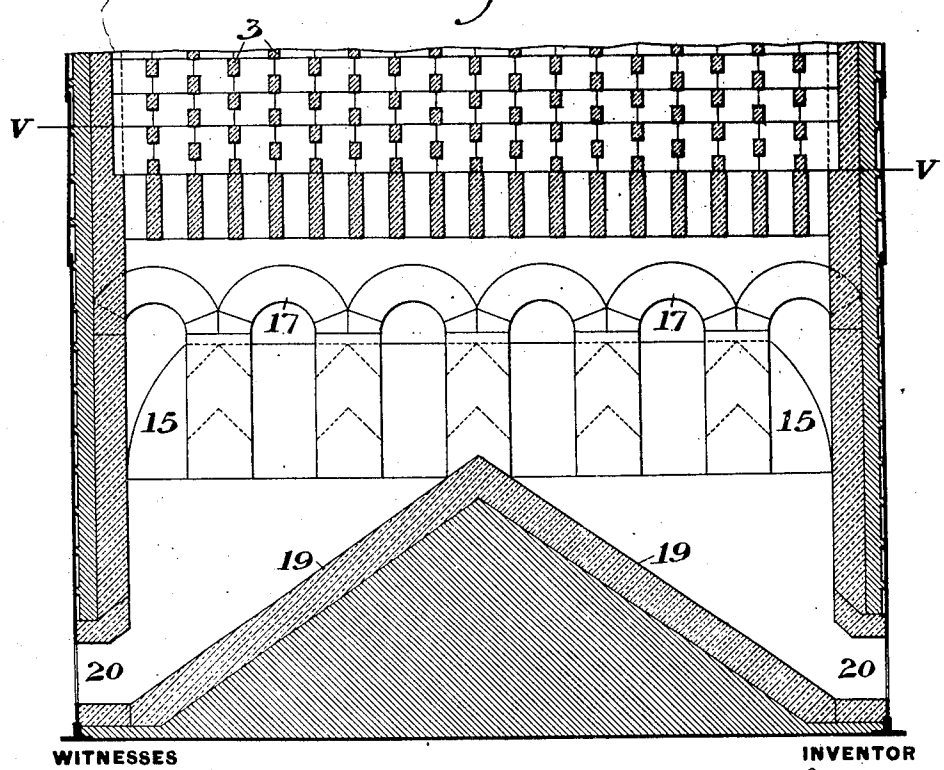


Fig. 3.



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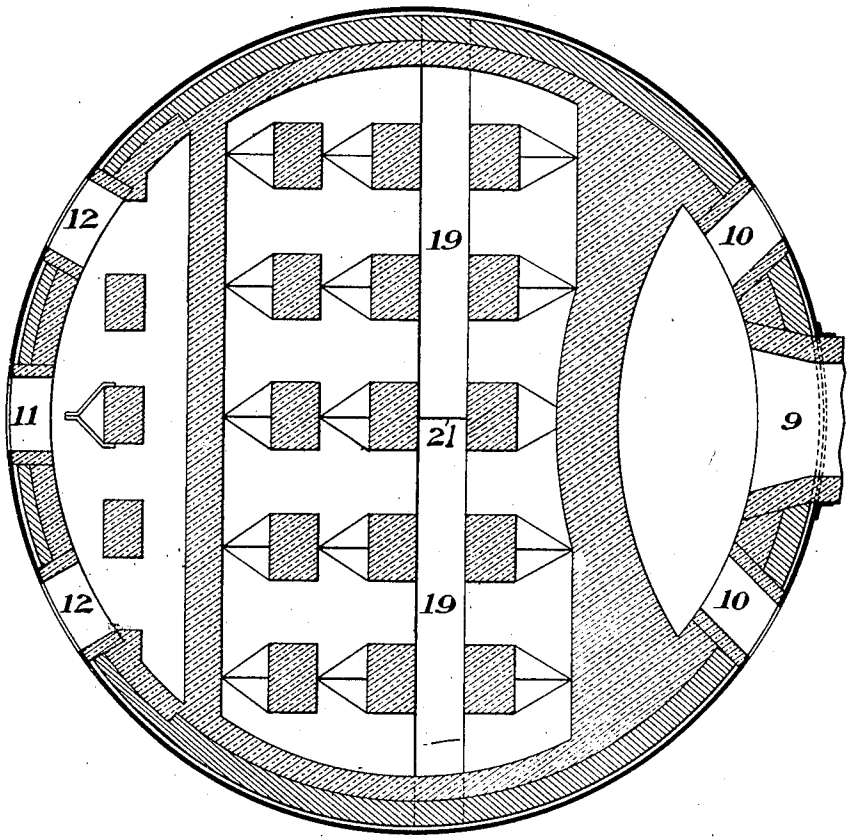
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4 SHEETS—SHEET 3.

Fig. 4.



WITNESSES

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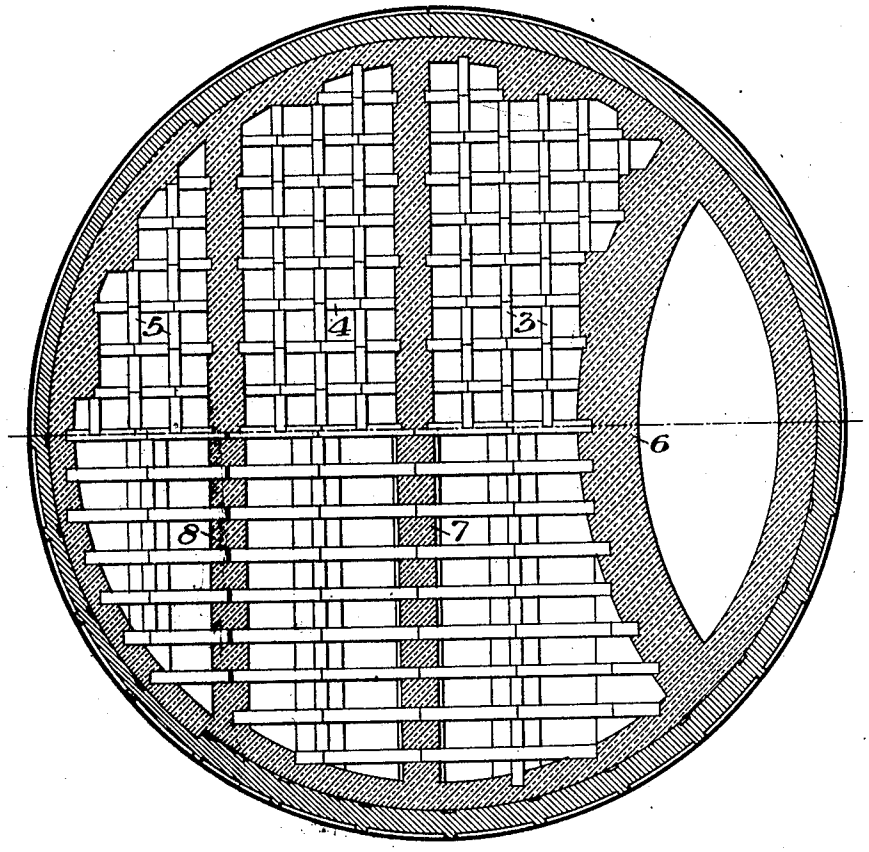
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4 SHEETS—SHEET 4.

Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES I. LARIMER, OF JOLIET, ILLINOIS.

HOT-BLAST STOVE.

No. 912,967. Specification of Letters Patent. Patented Feb. 16, 1909.

Application filed May 22, 1906. Serial No. 318,122.

To all whom it may concern:

Be it known that I, JAMES I. LARIMER, of Joliet, Will county, Illinois, have invented a new and useful Hot-Blast Stove, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a broken vertical section of a hot blast stove constructed in accordance with my invention; Fig. 2 is a vertical section of the top portion taken through one of the side ports; Fig. 3 is a vertical section of the lower portion of the stove on the line III—III of Fig. 1; Fig. 4 is a cross-section on the irregular line IV—IV of Fig. 1; and Fig. 5 is a cross-section on the irregular line V—V of Fig. 3.

My invention relates to the class of hot blast stoves, and is designed to increase the efficiency of the stove and give economy of operation.

To this end the invention consists in inclining or shaping the bottom of the stove in such a manner that the flue dust, etc. will be collected and may be easily taken out through suitable ports or openings. This arrangement of the bottom may be carried out either for the entire bottom of the stove, or for the part or parts thereof in which the main collection of dust occurs.

The invention further consists in the construction and arrangement of parts as hereinafter more fully described and claimed.

In the drawings in which I have shown my invention as applied to a four-pass stove, 2 represents the first pass or combustion chamber, 3 the checker-work in the second pass, 4 the checker-work in the third pass, and 5 the checker-work in the fourth pass. These passes are separated from each other by the usual partitions 6, 7 and 8.

9 represents the inlet for the waste gases from the blast furnace near the bottom of the combustion chamber, and 10 represents air inlets at the sides thereof. These ports may be controlled in any desirable manner. At the bottom of the fourth pass is the cold blast inlet 11 and the chimney ports 12, 12 which are controlled in any desirable manner.

The main collection of dust occurs in the first, second and third passes. In these passes, therefore, I provide my improved bottom arrangement for collecting and taking out the dust accumulation. In the combustion chamber the bottom 13 is inclined downwardly and outwardly, and the sides are also inclined inwardly, so that the dust will settle down by gravity on the inclined bottom, and may be taken out through the outlet port 14 which may be controlled by any suitable door or closure. This outlet as shown is directly below the gas inlet, though it may be arranged at one or both sides.

The bottom of the stove below the second and third passes is inclined downwardly and inwardly in opposite directions as shown by the dotted lines at 15 and 16, Fig. 1. These inclined bottom faces extend below the arches 17 supporting the checker-work, and feed the dust down into the space 18. The bottom of this space is of ridge form with oppositely inclined faces 19 which lead to outlet ports 20 at the sides of the stove. These outlet ports may be controlled by any suitable doors or closures, and through them the dust which settles down in the second and third passes may be taken out from time to time as desired. In Fig. 4, 21 represents the apex of this ridge.

In order to operate the stove with a proper regulation of temperature so that during the first stage of heating up the checker-work, it may be operated at the highest temperature consistent with minimum "slagging down," or melting of the walls of the combustion chamber and checker-work of the first or first and second passes, I provide one or more pyrometers or temperature measurements 21^a. These instruments may be inserted through the side walls of the stove in any desirable location or locations. I have shown one of them as inserted above the combustion chamber in the flue connecting it with the first down-pass; and the other in the lower part of the fourth pass just before the hot gases pass to the stack. These pyrometers are preferably connected with continuous registering instruments by which a continuous record of the temperature of the gases contacting with the pyrometer may be obtained. The operator can thus ascertain the temperatures of the gases at the desired points, and will thus be able to properly

regulate the air and gas, and heat the stove to the temperatures for giving the highest efficiency without melting down.

The advantages of my invention will be apparent to those skilled in the art. By inclining the bottom of the stove or a part thereof, I am enabled to collect the dust by gravity and provide for its easy removal. By opening the doors, the dust may be removed into suitable barrows or cars outside the stove, thus avoiding slagging down of the dust and consequently requiring less frequent periods for cleaning out and repairs, in addition to the time and labor saved in cleaning. By removing the dust at suitable intervals, the stove will retain its maximum efficiency much longer than with prior constructions. When it becomes necessary to shut down the stove for cleaning and repairs it must be cooled down to a temperature which will enable men to enter and work inside of it. This cooling and contraction of the brick-work decreases the life of the stove, and consequently my invention lengthens the life of the stove, as well as decreasing the cost of cleaning and repairs.

The invention may be applied to stoves having two, three or more passes, and of any desirable type; the inclined bottom arrangement may be applied to one or more of the passes; one or more of the pyrometers or temperature measuring instruments may be applied at any desirable place or places in the stove, and other changes may be made without departing from my invention.

I claim:—

1. A hot blast stove having an outlet opening in the lower portion of its side wall and provided with an inclined bottom which slopes downwardly and outwardly toward said opening to direct the dust thereto; substantially as described.

2. A hot blast stove having an oppositely inclined ridge beneath the checker work and leading to outlet ports in the side walls of the stove and arranged to discharge the dust outwardly beyond the sides; substantially as described.

3. A hot blast stove having a downwardly and outwardly inclined bottom portion beneath at least one pass, the side wall of the stove having an outlet opening in its lower portion, and a closure for said opening, the inclined bottom portion being arranged to direct the dust outwardly toward said opening; substantially as described.

In testimony whereof, I have hereunto set my hand.

JAMES I. LARIMER.

Witnesses:
LOUIS H. HILL,
S. MURRAY RUST.