

D. G. LITTLEFIELD.

Hot-Air Furnace.

No. 14,362.

Patented March 4, 1856.

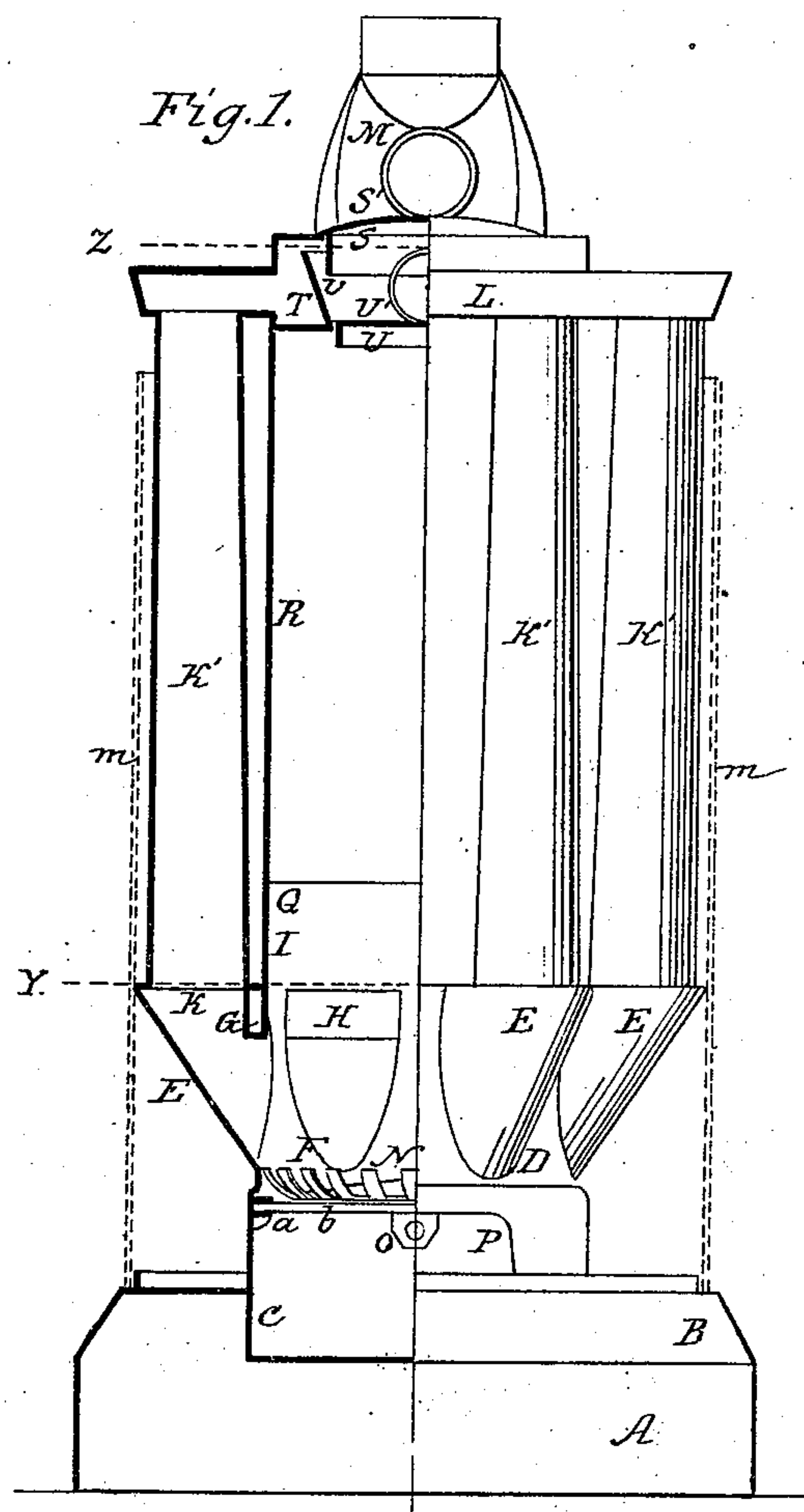
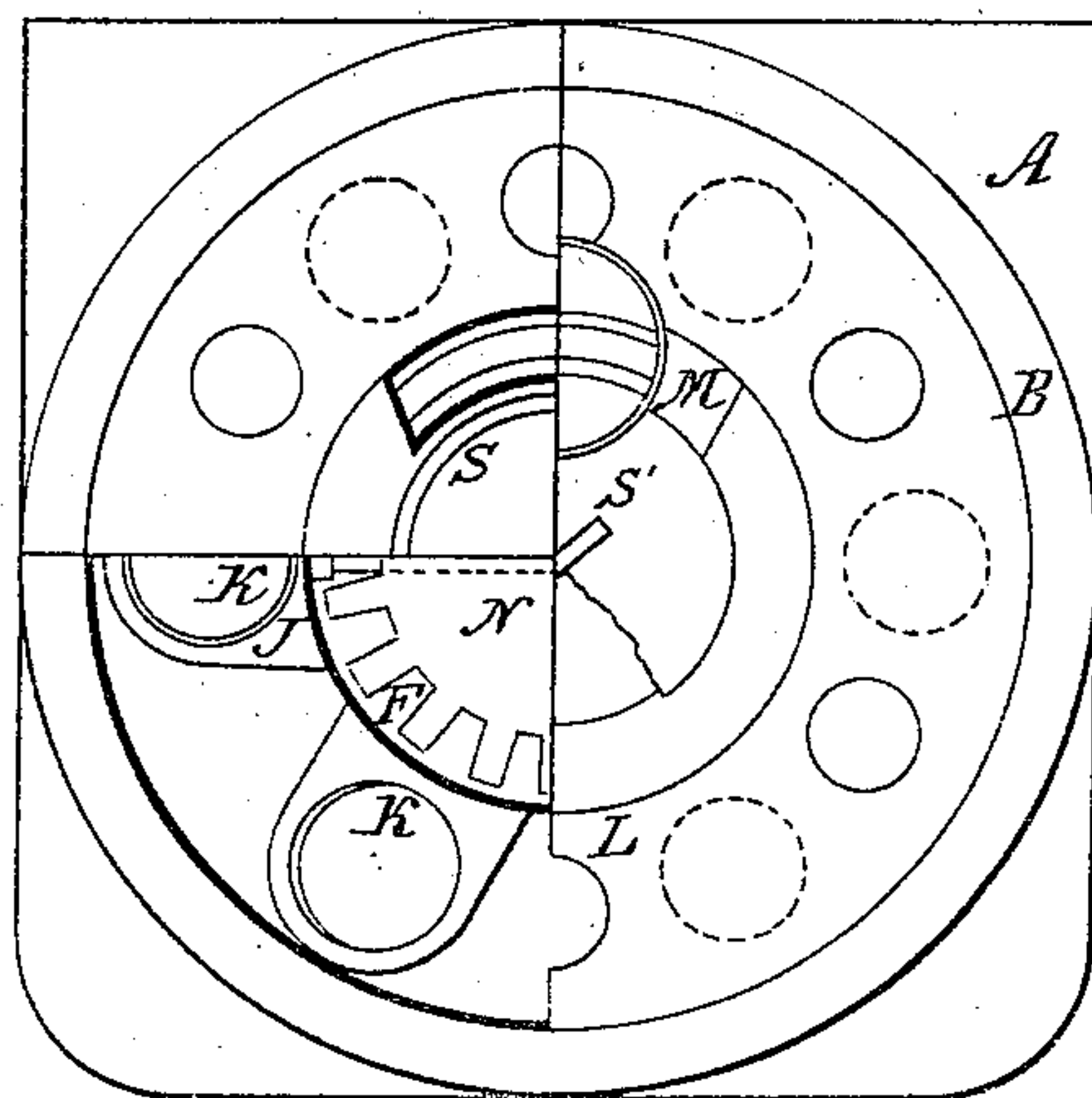


Fig. 2.



UNITED STATES PATENT OFFICE.

DENNIS G. LITTLEFIELD, OF ALBANY, NEW YORK.

STOVE AND FURNACE FOR RAILROAD-CARS AND OTHER PURPOSES.

Specification forming part of Letters Patent No. 14,362, dated March 4, 1856; Reissued March 3, 1863, No. 1,425.

To all whom it may concern:

Be it known that I, DENNIS G. LITTLEFIELD, of the city and county of Albany and State of New York, have invented certain
5 new and useful Improvements in Stoves and Furnaces for Burning Anthracite and other Coal, Coke, and other Fuel on Railway and other Carriages and for other Purposes; and I do hereby declare that the same
10 are described and represented in the following specifications and drawings.

To enable others skilled in the art to make and use my improvements I will proceed to describe their construction and use, referring to the drawings in which the same letters indicate like parts in each of the figures.

Figure 1, is an elevation of a stove with my improvements the left hand half being represented in section. Fig. 2, is a plan the
20 upper left hand quarter representing a section on the line *z*, Fig. 1. The lower left hand quarter is a section on the line *y*, Fig. 1.

The nature of my invention consists in providing a fire pot or furnace with a series
25 of enlargements or projections on its side or sides to contain the coal while it is being burned, which enlargements may be open at the top or provided with openings for the escape of the gaseous products of combustion. And in making a grate around a solid
30 center or disk for the purpose of burning the coal around the edge or in the enlargements of the furnace and not in the center over the disk. Also in the arrangement of
35 a supplying cylinder over the furnace and grate to supply fuel to the fire as required.

In the accompanying drawings A, is a rectangular base supporting the conical pedestal B, which surrounds and supports the
40 ash pan C, which supports the fire pot, or furnace D, as represented in the sectional portion Fig. 1. The furnace D, is made circular with perpendicular sides, provided with a series of enlargements or projections
45 E, E, which may be made semicircular as represented in the drawing, or in such other form as will answer the purpose; the bottoms of these enlargements inside being about even with the top of the grate F.

50 The furnace D with its projections may be cast whole, about three fourths of an inch thick, so as to set upon the top of the ash pan C, there should be a recess (either with, or without a flange around it,) at G on the
55 inside of the projections or enlargements

for the ends of some pieces of soapstone or fire brick; one of which is shown at H, to protect the cover or top I, of the furnace which may be cast whole and of the same diameter inside as the bottom of the furnace, 60 and about nine inches high; with projections J to cover the enlargements provided with a flange to surround them which projections are provided with circular openings K over the enlargements, with flanges around them 65 to receive the ends of the flues K', which conduct the smoke into the circular flue L, which may be made in the form represented with a projection M from the top to receive the pipe which is to conduct off the smoke. 70

There are two brackets on the inside of the ash pan C, one of which is represented at a, to support the bar b, which is fitted to turn in them whenever the grate F is emptied. This bar b, is made flat and broad in the 75 middle, and perforated so as to receive the pivot on the underside of the disk N, in the center of the grate which pivot is fitted to turn in the bar, so as to permit a lever to be put into the lug O, on the underside of the 80 disk N, so as to vibrate the disk and grate to shake down the products of combustion which remain on or above the grate and stir the fire when necessary. The top of the 85 disk N may answer if made flat but I prefer it made highest in the center by making it either conical or convex; so as to shed the coal toward the grate around it. This disk with its arms which form the grate may be cast altogether, and I prefer the arms should 90 curve upward from the disk to their ends as represented in Fig. 1.

There is an opening made in the ash pan C one half of which is shown in Fig. 1, at P, for the lever to vibrate in which operates 95 the grate, and for the removal of the ashes etc. this opening may be closed by a door provided with openings and a draft slide to regulate the supply of air to the fire so as to render any damper above the fire unnecessary. This stove may be used by placing a cover on the top I, at Q, which cover may be removed to supply coal and kindle the fire; but I prefer to put a cylinder R, of 105 cast or sheet iron onto the top I to extend up and join the circular flue L, which is made with an opening through it in the center which is closed by the cover S', as shown in Fig. 1.

The upper end of the cylinder R, is par- 110

tially closed by the horizontal rim or flange T, so as to make the opening U, smaller than the opening S, so that the cover U', may be taken out through the opening S, when the cylinder R, is to be filled with coal; the top of the diagonal flange V, being made larger than the opening S, so as to conduct the coal into the cylinder R, which will hold a supply of coal sufficient to last for a considerable time in proportion to the height of the cylinder.

There is a space between the top of the circular flue L and the upper edge of the diagonal flange V, so that if the draft is closed to put in coal while the fire is lighted, the smoke which rises through the coal in the cylinder R will be drawn into the pipe through the projection M. It is not intended that the coal shall burn at all in the cylinder R, which is only intended to keep a supply ready at any time to descend and supply the grate F, around the disk N, and it may be made to descend by shaking or vibrating the disk and grate, so as to spread the coal into the enlargements E, E, where it is intended that it should burn to produce the heat required. In burning anthracite coal it may descend so as to supply the fire if it is broken to a proper size, without vibrating the grate; and when it is intended for burning bituminous coal the supplying cylinder R, should be made tapering and smallest at the top so as to insure the coal to descend as it is required and to prevent it from choking under any circumstances. This stove may be surrounded with a metallic casing as represented by the broken lines W, W, which may be perforated to permit the air to circulate or the horizontal portion of the pedestal B, may be perforated so as to admit a supply of air. The circular flue L, is perforated at X X for the air to pass through it.

Prior to the date of my invention stoves designed for burning coal have failed entirely when placed in railroad cars and other carriages, as the motion of the car causes the coal to fuse and run together, so as to form a solid mass of clinker when the fire would go out. But I have discovered that by burning the coal in small projections from three to five inches wide and about four inches deep with my improvements above described, the difficulty heretofore existing has been perfectly overcome and remedied; for it is proved by the most ample experience, that with my improvements the

motion of the car rather promotes the combustion of the coal than otherwise, without the least tendency on the part of the coal to fuse, or form clinker, or any other product which either impedes or obstructs the free combustion of the coal even when the car is kept in motion for twelve or fifteen hours, at the end of which time the fire is in good condition and will keep through the night so as not to need kindling for the next trip.

Although I have described my invention as being adapted to burning coal in railway and other carriages, I believe it will be found more economical for general purposes than any stove heretofore introduced.

I contemplate that stoves with my improvements may be made elliptical, square or of such other form as may be desirable; and that my improvements may be so modified as to adapt them to locomotive engines, for the purpose of generating steam.

I am aware that Gardiner Chilson obtained a patent Sept. 25th, 1854 for an improved hot air furnace provided with enlargements above the fire to receive the pipes or flues; therefore I make no claim to such enlargements when constructed and used for the purposes to which Chilson applies them, but only when constructed and used substantially as claimed hereafter.

I believe I have described the construction, operation and use of my improvements so as to enable any person skilled in the art to make and use them, I will now specify what I desire to secure by Letters Patent to wit:

I claim—

1. A firepot or furnace provided with a series of enlargements or projections on its side or sides commencing at and extending upward from the grate to contain the fuel while it is being burned or during its consumption substantially as described, open or provided with openings at the top for the escape of the gaseous products of combustion.

2. I claim a grate made around a solid center or disk substantially as described for the purposes set forth.

3. I claim a supplying cylinder in combination with the above described firepot or furnace and grate or either of them.

DENNIS G. LITTLEFIELD.

Witnesses:

J. DENNIS, Jr.,

JOHN S. HOLLINGSHEAD.