O. Jenks,

Heating Stove,

No. 2,357. Patented Nov. 16, 1841.

Fig. 5.

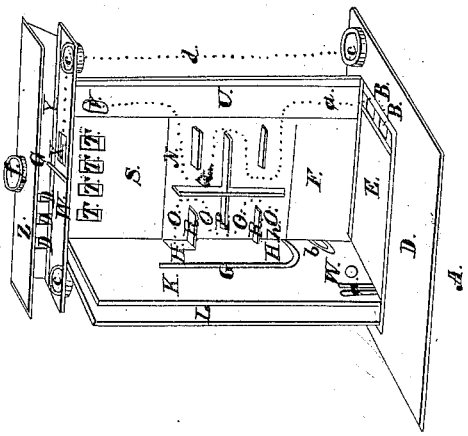


Fig. 7.

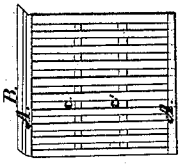


Fig. 8.

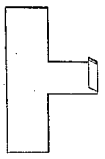


Fig. 4.

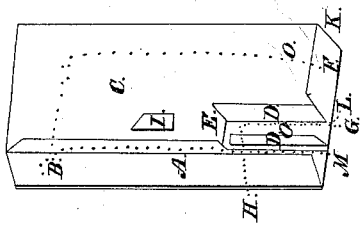


Fig. 6.

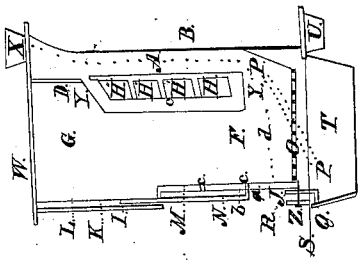


Fig. 1.

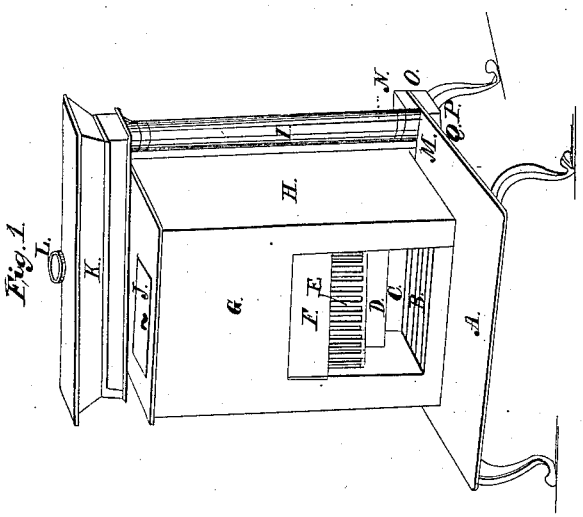


Fig. 2.

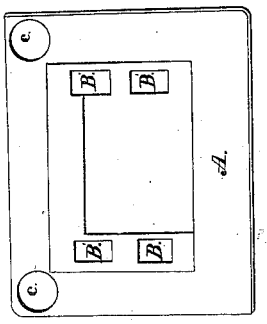
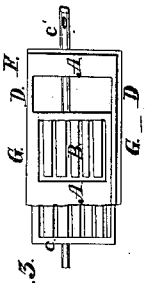


Fig. 3.



UNITED STATES PATENT OFFICE.

OTIS JENKS, OF ALBANY, NEW YORK.

CONSTRUCTION OF OPEN GRATES OR PARLOR-STOVES FOR BURNING ANTHRACITE AND OTHER COAL.

Specification of Letters Patent No. 2,357, dated November 16, 1841; Antedated November 2, 1841.

To all whom it may concern:

Be it known that I, OTIS JENKS, of Albany, in the county of Albany, in the State of New York, have invented a new and useful Open-Grate Anthracite Parlor-Stove, of which the following is a full and accurate description, reference being had to the accompanying drawings, making part of this specification.

My stove is placed on a broad flat bottom plate supported by four legs one at each corner of the plate, the front A of said plate Figures I and II, forming the hearth or apron of the stove. In the center of this plate there is a large square opening to which a horizontal grate to be described and which is shown detached at Fig. III, and in place at Fig. I is adapted, on this grate the fuel rests and below it on the under side of the plate an ash pan of the ordinary construction is fitted in the usual manner to receive the ashes, &c. The grate consists of two parts first of a rectangular frame of two long side pieces D and D, and of two short end pieces A and A, Fig. III, placed on the top of said side pieces, and secondly of a grate proper formed of longitudinal bars connected by cross pieces at the ends or united in the casting at their extremity so as to produce the same effect which grate is constructed not as long or wide as the frame and slides within said frame between the side pieces D and D and under the end pieces A and A which latter are placed on the top of said side pieces to allow of the sliding part being so arranged. The grate being supported in this position by projections C and C cast on the upper surface of the outermost bar in each side which when in its place extend over the surface of the side pieces D and D, of the frame supporting the grate and sliding in the top of said side pieces as the grate is moved backward and forward. The grate or sliding part has also a shaft at each end to turn on as seen at *c c'*, Fig. III, attached to the end pieces of the grate at a point without the center by which arrangement one side of the grate is made heavier than the other. The grate consisting of the sliding part and frame thus constructed and arranged is placed over the square or oblong opening already described in the bottom plate, the shaft at each end entering a hole in the side plates of the stove resting on this bottom plate by which the whole is supported, one shaft *c'* which is several times longer than the other extending some distance on the outside of the plate through which it passes, and having a mortise in its end to which a lever is adapted for shaking the grate as seen at P, Fig. I, the lower end of the lever passing through said mortise and entering a groove Q Fig. I in the bottom plate of the stove which forms its point d'appui making it a lever of the second order. From the construction described it will be seen that the grate has two movements, first of the sliding part alone which slides backward and forward between the side bars of the frame that is from side to side of the stove to admit of which vibration the shafts, *c c'* are proportionally lengthened the apertures in the side plates through which they pass being sufficiently large to admit of a free movement, and secondly of a rotary motion on its axis in which it carries with it the frame by means of the projections C, and C already described as one side of the grate is heavier than the other owing to the shaft being attached without the center it is necessary to support it when in use by a pin passing through the front plate as in many other stoves which when withdrawn allow the heavier side of the grate to fall and discharge the ashes, &c., into the pan below.

In the bottom plate Fig. II, a rectangular box or fire chamber is erected consisting of top front and back plant and double side plates as shown in Fig. I, the latter forming a hollow wall on each side or joints for heating air which is admitted through openings B B' in the bottom plate Fig. II to be described. The front plate is cast as shown in Fig. I, with a large square or oblong opening occupying nearly the whole of its lower half to which a vertical sliding grate forming when in use the front of the fire chamber and a plate of the size of the aperture sliding over this plate are adopted by being received between lips cast upon the inner side plates or walls of the furnace as shown in Fig. I where E is the sliding grate and F the sliding cover or damper arranged over it both being raised to exhibit the in-

terior of the stove. The sliding damper or blower is intended to regulate the draft of the stove and may be used with or without the sliding grate the latter being made to raise for the purpose of allowing an open fire to be used at pleasure and of the fire chamber being more readily cleared, &c. The two plates forming the hollow wall on each side are arranged at a distance of 1½ or 2 inches from each other leaving a space between them for heating air a small portion of this space is partitioned off so as to form a separate chamber by means of two perpendicular plates each of the same width as the space between the double plates and about one third its height connected at top by a cross plate as shown at Fig IV where D D′ are the perpendicular plates and E the cross plate referred to forming a separate chamber within the side wall of the stove on each side. The hollow side walls thus constructed rest on the bottom plate of the stove and on each side of the large opening E Fig. V in said plate to which the horizontal grate is adapted, and are supplied with air through apertures B B″ Figs. II and V, in the bottom plate the aperture B opening into the space between the plates forming said hollow walls and the aperture B′ behind it, opening into the chamber within said space already described.

The air admitted by the aperture B (Fig. II) is heated within the hollow side walls and passes again into the room by an opening B in that portion of the back plate of the stone which closes the hollow walls behind as shown at B (Fig. IV) or may be connected by a pipe attached to said opening to any other apartment while the air admitted through opening B, Fig. II, into the chamber referred to passes by means of an aperture H opening from the upper part of said chamber through the inner side wall C Fig. IV into a hollow back D, Fig. I, arranged between the side walls of the stove behind the fire through which it circulates. This back consists of two parts, viz, of one in front arches from below upward next the fire resembling in this particular hollow backs in other stoves which part I build of fire brick and call the brick plate and of a vertical metallic plate which closes the hollow arch behind forming as it were a chord to said arch. By the union of these two parts or plates the hollow back is formed which is divided again into two chambers one for each side of the stove by means of a partition Q, Fig. V, and into passages or flues for the draft which enters it on each side by means of ribs or partitions cast on the metallic plate. This hollow back is shown in section at Fig. VI, where C is the brick or arched slate, B the metallic plate and H H′ H″ H‴ the spaces formed by the partitions cast in said plate which more clearly designate the passages for the draft. The metallic plate with the partitions, above mentioned, are shown more clearly in Fig. V, where they are represented in perspective, N being the metallic plate and Q P R R′ the partitions, the front or brick plate C in Fig. V being removed to exhibit the interior of the chamber. The partitions referred to consist of a vertical one Q, Fig. V, extending from top to bottom of the plate N on which it is cast, dividing the hollow back into two chambers of equal size of a transverse partition P crossing the middle of the plate N on each side of the vertical partition Q extending from it to within a short distance of the edge of the plate N space being left between its termination and the edge of the plate to allow of the draft passing around it, and of two other transverse partitions R and R′, Fig. V, on each side of the vertical plate Q one above and one below the partition P commencing at the edge of the plate N and removing to within a short distance of the partition Q a space being left at their termination to allow of the draft passing around them so as to circulate from one division to the other. The brick or hollow back thus constructed and open at each side is arranged between the inner side plates of the stove as shown in Fig. VI being sustained on each side by a lip or projection as seen at C, Fig. V, cast on the inner side plate K, Fig. V, which lip surrounds the hollow back passing down in front under and up behind it so as to secure it firmly in its place. The hollow back being open at each side the inner side plates K, Fig. V, when it is in place close these openings and thus form as it were side plates both of the stove and hollow back plan describing the hollow walls of the stove a small trunk or chamber was mentioned as constructed within them and conducting air to the hollow back, the air entering this chamber through an opening B′ in the bottom plate, Fig. V, of the stove and passing from it into the hollow back through an aperture H, Figs. IV and VI, in the inner side plate at the upper part of said chambers. To allow of this aperture H opening into the hollow back the lips referred to above for sustaining said back is made to include this opening at its lower end so that when the hollow back is in place the aperture H opens into the space O, Fig. V, above it thence along the under side of partition R, Fig. V, and around its roots in space O, Fig. V, thence under and around plate R into space O‴ from whence it passes along the upper side of plate R through an aperture I, Figs. IV and V, in inner side plate K, Fig. V, into the hollow wall of the stone where it mingles with the air heated in said wall and passes

with it into the room by the opening B, Fig. IV, in the back plate of stove already referred to. One half of the hollow back is in the foregoing arrangement as represented to each side of the stove the vertical partition Q dividing it into two separate chambers of equal size having no communication whatever with each other.

A space is left below the hollow back between it and the horizontal grate as seen in Fig. I, where D is the hollow back and B the horizontal grate, there is a space also between the hollow back and the back plate of stove forming a flue A as shown in sectional, Fig. VI, which arrangement allows of the draft passing under and up behind the hollow back as represented by dotted line *d*.

Another plate S Fig. V extends from the top of hollow back to the top plate of the stove so as to close the opening between it and said top plate. A space is left between this plate S also and the back plate of stove continuous with that between the hollow back and said back plate and openings T T′ T″ T‴ Fig. V, are made in it governed by a register which when open allows the draft to pass over the brick or hollow back into the flue A A Figs. IV and VI, behind it and when closed turning it under said back into the same flue.

That portion W Fig. V, of the top plate of stove which covers flue A Fig. VI, has an aperture X Fig. V in it, and forms the flue or bottom of an oblong hollow entablature in indicator placed upon it into which the smoke passes through the aperture from the flue A Fig. V. This entablature is connected with a part of the bottom plate of stove in which a hollow base is formed to be connected by means of a hollow column on each side one of which is seen at I Fig. I. To direct the smoke through these columns there is a damper *e* Fig. V, which when a direct draft is required lies flat on top plate W permitting the smoke to pass through the aperture *x* into the cut oblature and thence directly into the smoke pipe *f* leading into the chimney from the top of said entablature but when inside dividing the entablature into two chambers one on each side of said damper as shown in Fig. V the aperture in the top plate W opening into one which the smoke pipe *f*, leads from the other, by which arrangement the direct communication with the pipe, *f*, is closed and the draft passing through opening X is forced down the hollow column on the side nearest the aperture *x* into the hollow base (that portion of the bottom plate behind the horizontal grate being constructed as a trunk or base with an opening on each side to which the columns are adapted) thence through said base and up the opposite column into the other division of the cut entablature from whence it escapes into the chimney, through the opening, *f*, Y back plate of entablature or radiator, D D′ D″. Holes in said back plate Y of entablature provided with a valve to close (then the valve not represented) which is a ventilator for the purpose of moderating the temperature of room by opening said valve forming a communication with the pipe thereby taking the air out of the apartment (when at too high a temperature) by allowing it to pass off through the communication with the pipe formed by opening the ventilator the course of the air passing from the apartment through the communication into pipe being represented by dotted line *e* as passing through holes D D′ D″ in back plate Y of entablature into entablature and along in entablature to pipe hole *f* and top plate or cap Z of entablature and discharged through pipe hole *f* into smoke pipe (when adapted to said pipe hole *f*) and thereby checking the draft of stove by supplying a draft of air for the pipe by the direct communication with the pipe through said ventilator and consequently in part arresting the draft through the coal or fire admitted through front or perpendicular grate and in this last respect coöperating with the use of the front or perpendicular grate the latter by shutting off the draft through the front grate above the lower edge of damper and thus graduating the fire by preventing the consumption of coal above the lower edge of damper N Fig. VI, the former by supplying the draft through the ventilator D D′ D″ in back plate Y of entablature and then by procuring the same result Z top plate or cap of entablature 24 inches in length and 7 in width, of pipe hole 5 inches in diameter situated at an equal distance from each end of plate Z.

Fig. VI is a vertical section from front to back. A, flue and the course of the draft represented by dotted line, *d* as passing from furnace F underneath brick back or air chamber C B between said chamber C B and horizontal grate O and up flue A posterior to air chamber C B, between said chamber C B, and back plate of stove F, Fig. V, thence through hole X in top plate W and down column, as shown by dotted line *d*, when damper *e* is closed as before described, and when damper *e* is open up through pipe hole, *f*, in top plate of entablature L, B iron plate to brick portion *c* of air chamber, *c* brick portion of said chamber. D an iron plate extending from the top of brick back or air chamber C B to the top plate of stove W Fig. V as seen at plate S with a valve T T′ T″ T‴ in its upper edge as described when on said plate F G furnace and chamber I J front plate K space in which front damper slides. L plate 8 inches in height 9 wide just closing the space between

the top of grate M and front plate I J, forming the front of the chamber C above the furnace F being placed ¼ inch back of front plate I J forming the space in which the front damper N slides, on the lower edge of plate L is a projection inward one-fourth inch upon which rests the front grate M.

Fig. VII, represents front or vertical grate which is formed of perpendicular bars connected at the top and bottom by transverse bars A A′ with two transverse bars C C′ between said transverse bars A A′ dividing it into three equal spaces the use of side bars *c c′* are for the projection *a* of front damper N to stop against closing the spaces between upright perpendicular bars and said grate placed (when in its place) 1 inch back of front plate I J as shown by M Fig. VI, being 9 inches square occupying the opening in front plate *c* Fig. I, when slid down in its place.

Upon the top edge of grate is a transverse projection B Fig. VII, one-quarter inch which rests upon a similar arm upon the lower edge of plate L Fig. VI, N front damper 8 inches in height and 9 wide the lower edge, *a*, of this damper projects back 1 inch to the anterior surface of front grate M the use of front damper N is to regulate the fire in combination in the front grate M, by taking damper N down placing its projection, *a*, either of transverse bars *c c′* Fig. VI, and there fastened by a slide *b*, passing through the lower edge of front damper N, and resting on the transverse bar *c′* of front grate M, thereby extending the air from the fire above the lower edge of front damper N extending back 1 inch coming in contact in the transverse bar *c′* in front grate M and consequently the whole air supplying the draft of stove being caused to pass through the front grate M under the lower edge, *a*, of front damper N, and thence under the back of furnace or air chamber C B as shown by dotted line *d* thus shutting off the air through the cut about the lower edge of damper N and thereby preventing the consumption of coal above the lower projecting portion, *a*, of said damper N; O, horizontal grate, its rotary motion represented by dotted lines P P′, R, a narrow plate 9 inches in length and 2 inches in width which is placed between the two inner side plates of stove seen used between ribs *a* on inner side plate K, Fig. V, (when in its place) and closing the space between the bottom edge of front grate M and the projection Q on the upper edge of the front plate of the drawer for sheathing and the air from horizontal grate O; S, hearth; T, sunk portion of hearth occupied by a drawer on the front plate of which is a projection Q of 1 inch on the top edge of said plate extending into the narrow plate R; U, through intermediate bottom plate forming a communication between columns at bottom for passage of smoke and gas; V, plate extending from back edge of horizontal grate O to back plate F of stove Fig. VI, W door 6 inches in length and 5 in width closing the hole in top plate of stove for feeding stove X entablature.

Apertures B B′ in bottom plate Figs. II and V for the admission of air into air chambers are provided with a damper shown at Fig. VIII, which by sliding underneath bottom plate excludes the admission of air from the chambers when shut, thus governing the apparatus for heating air.

What I claim as my invention and desire to secure by Letters Patent is—

1. The front damper N and its use in combination with the front or perpendicular grate M, Fig. VI, for the purpose of regulating or graduating the fire by damper N sliding up and in the space K between front plate I and plate L one-fourth inch back of said plate I in front of perpendicular grate M excluding the air from the coal or fire above said damper N which is done by the projection, *a*, on bottom edge of damper N coming in contact with either of the transverse bars *c c′* in said front grate M which bars *c c′* in said front grate M are for the purpose of preventing the air from passing up between the perpendicular bars of grate M, when, projection, *a*, of said damper N is applied to either of the transverse bars *c c′* in front grate M thereby preventing combustion above the bottom edge of said front damper N.

2. I claim the manner in which I have constructed the horizontal grate by combining with a frame constructed as set forth a sliding grate provided with a shaft at each end passing through the inner walls of the stove and so arranged as to allow both of a vibratory and rotary motion and by means of the projections on its surface described causing said frame to turn with it all as set forth.

3. I claim combining with the hollow walls or air chambers formed between the side plates of the stove a hollow back constructed with a central division plate and having flues for the passage of the draft by means of a seperated trunk or chamber constructed either in said hollow walls for conducting air to the hollow back aforesaid the whole being constructed and operating in the manner set forth.

4. The ventilation in the back plate of entablature, and its use in regulating the temperature of room by sliding the valve and opening the communication with the pipe, allowing the air in the room (when at too high a temperature) to pass off through this ventilation and at the same time supplying the draft through pipe by this air which is taken out of the room and

in the same ratio checking it through the front grate and fire coöperating with the use of the front damper, as heretofore described in specification in reference to drawing Fig. VI.

In testimony whereof, I the said Otis Jenks hereto subscribe my name in the presence of the witnesses whose names are hereto subscribed, on the 1st day of November A D 1841.

OTIS JENKS.

Witnesses:
D. Russell,
W. S. Osborn.