2 Sheets—Sheet 1.

H. H. BOWMAN, S. H. FRANKLIN & C. L. COLBY.

HEATING-STOVE.

No. 190,813. Patented May 15, 1877.

Fig. 1.

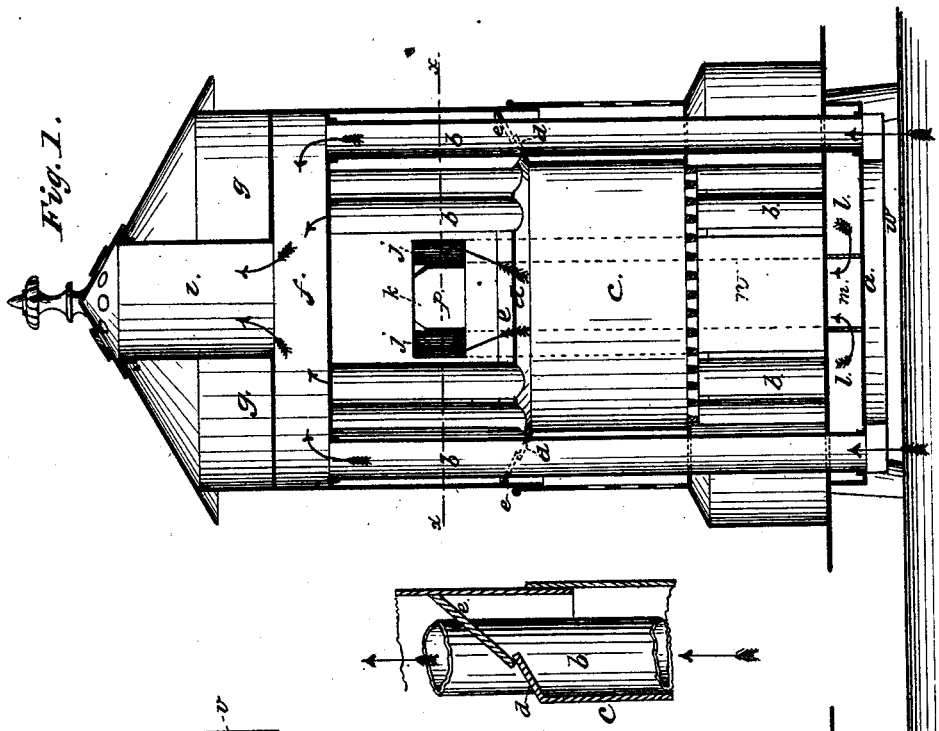


Fig. 2.

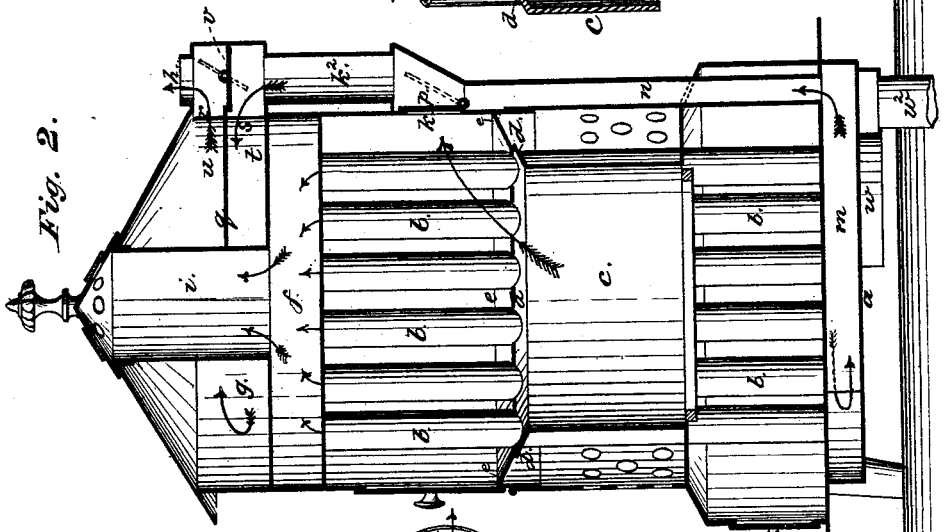
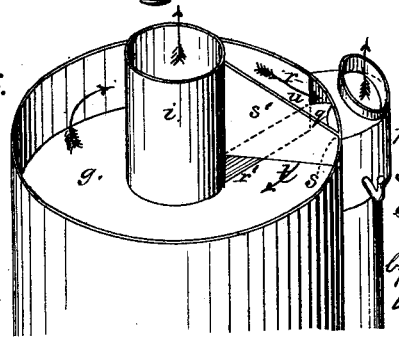


Fig. 6.



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2 Sheets—Sheet 2.

H. H. BOWMAN, S. H. FRANKLIN & C. L. COLBY.

HEATING-STOVE.

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Fig. 3.

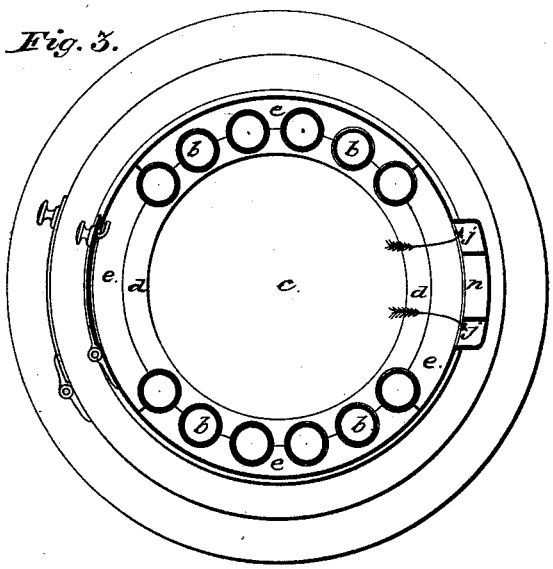


Fig. 4.

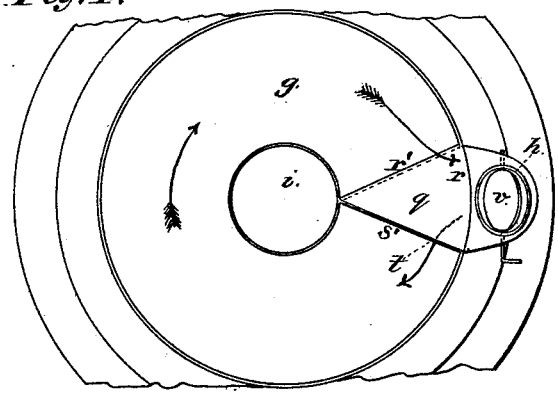
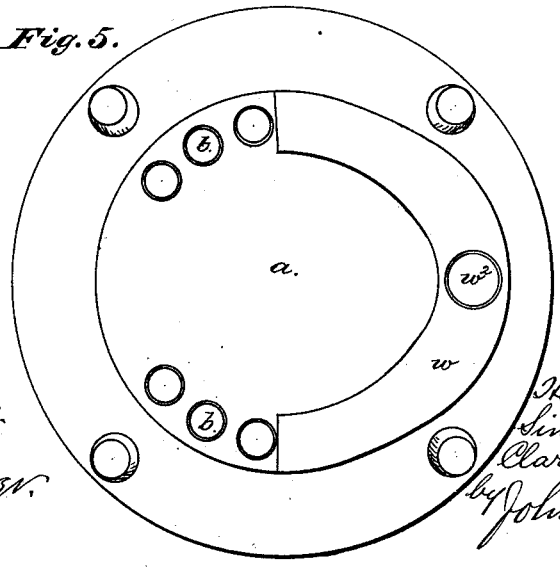


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY H. BOWMAN, SIMEON H. FRANKLIN, AND CLARENCE L. COLBY, OF OSAGE, IOWA.

IMPROVEMENT IN HEATING-STOVES.

Specification forming part of Letters Patent No. **190,813**, dated May 15, 1877; application filed March 31, 1877.

To all whom it may concern:

Be it known that we, HENRY H. BOWMAN, SIMEON H. FRANKLIN, and CLARENCE L. COLBY, of Osage, in the county of Mitchell, and State of Iowa, have invented certain new and useful Improvements in Heating-Stoves, which we denominate the "Boss Heater," which improvements are fully set forth in the following specification and accompanying drawings.

The stove is a surface-burner and base-heater, and is adapted for hard or soft coal, and it is especially designed for great heating capacity.

By a novel arrangement of direct and indirect flues and valves the heat is caused to pass around the base, and can be directed around a top chamber with the best effect and increased radiation.

For this purpose the top chamber has an inlet-junction with the smoke-pipe and an outlet therewith, one being immediately above the other, and both formed by a division-plate, which, while making two separate and distinct openings in the top chamber with the smoke-pipe, makes also a vertical division of said chamber, so that the product of combustion entering at one point makes a circuit and passes out at another.

The direct and indirect flues meet at or near the same point above the fire-pot, and there is a valve in the direct flue at this point which co-operates with the valve at the top chamber to throw the products of combustion all in the base-chamber, or all in the top chamber, as may be desired.

Air-conductors, open at the bottom, extend from the bottom plate, and, passing through the flanged top outside of the fire-pot, open into a hot-air chamber, from which the hot air passes through a large center pipe opening into the room at the top, or leading to other rooms. The flange of the fire-pot is formed with semicircular notches to fit closely between the air-conductors, to bring the fire-pot in contact with said conductors. A cast-iron sectional lining is also arranged to fit the air-conductors, and rest upon the flange of the fire-pot and against the inside of the casing, to close the opening at this point.

The air passing through the conductors is heated, and issues from the air-chamber in a highly-heated state, which is increased by the products of combustion passing round the top chamber and the air-outlet pipe.

The hot-air chamber is formed by the top of the fire-chamber, the bottom of the top-chamber, and the stove-casing, and is free from obstructions, so as to give a free and strong draft through the pipes, and from said chamber.

The open ends of all or a portion of the air-conductors are covered by an air-duct leading to the hall or outside the building, when it is desired to supply the hot-air from outside the room.

Referring to the drawings, Figure 1 represents a vertical section of a stove embracing our invention; Fig. 2, a similar section at right angles thereto; Fig. 3, a horizontal section taken at the junction of the direct and indirect flues at the line *x x* of Fig. 1; Fig. 4, a view with the top plate of the stove removed; Fig. 5, a bottom view of the base-chamber; and Fig. 6 a view showing the top-chamber plate and the inlet and outlet flues formed thereby.

The base of the stove, including that portion which rises to the top of the fire-pot, is of cast-iron, while the top portion is of Russia sheet-iron.

The stove has the usual ash-pan and shaking and dumping grate. A base-chamber, *a*, is formed below the bottom plate, and from this chamber a number of air-conductors, *b*, rise on each side of the stove and enter a hot-air chamber near the top of the stove.

These air-conductors fit against the fire-pot *c*, which has a flaring flange, *d*, made with notches to fit the semi-diameter of the air-conductors, and is combined with a sectional cast-iron lining, *e*, fitted back of the air-conductors, around them, and resting upon the said fire-pot flange and the casing, to close the space between the casing and the conductors. This sectional lining rises about eight inches above the flange of the fire-pot.

A hot-air chamber, *f*, is formed directly above the fire-chamber, and directly above this is formed a top chamber, *g*, which communicates with the smoke-pipe *h*, while the hot-air chamber has a large center pipe, *i*, which opens at the top of the stove.

This hot-air chamber has no tubes passing

through it, and the hot air from the conductors, which are open at the bottom plate, enters freely said chamber, and issues from the large center pipe *i* with considerable force.

The top of the stove, the top of the fire-chamber, and the casing, form the chambers *f* and *g*, so that the heat of both is made effective, and makes the upper portion of the stove like a drum.

A novel construction at the top and bottom of the stove, in combination with direct and indirect flues, gives a course to the products of combustion by which the base and top may be uniformly heated to the best advantage. The indirect flues *j j* open into the combustion-chamber just above the fire-pot, at which point there are no air-conductors, while between these openings is the opening *k* of the direct flue leading to the smoke-pipe. The flues *j j*, descending at the back of the stove outside of the casing, open into side flues *l l* in the base-chamber *a*, which communicate, by a center flue, *m*, with an ascending flue, *n*, which leads to and opens into the direct flue and the smoke-pipe, and the products of combustion take this course when the valve *p* at the inlet of the direct flue is closed, as shown in Fig. 2.

The valve *p* is arranged to open into the direct flue *k*, but does not go back far enough to close the ascending flue *n*, which forms a junction at this point with the direct flue k^2, which extends to the top of the stove, and communicates with the top chamber *g* by two openings, *r* and *s*, formed by an angular-formed division in said chamber. This division is formed by a horizontal triangular-shaped plate, *q*, extending from the smoke-pipe junction with said chamber to the center pipe *i*, and about midway between the top of the casing and the bottom of the top chamber, with two vertical extensions, *r'* and *s'*, the one, *r'*, joining the bottom plate of said chamber, and the other, *s'*, the top thereof, so as to form a lower passage, *t*, from the opening *s* beneath the triangular plate *q*, and an upper passage, *u*, from the opening *r* above said plate.

A valve, *v*, is arranged in the smoke-pipe at the junction thereof with the lower opening *s*, and is adapted to close the direct flue at the top by closing with the end of the horizontal plate *q* to divert the products of combustion from said flue into the top chamber through the lower passage *s t*, and passing through said chamber and around the center hot-air pipe *i*, escapes through the upper passage *u* into the smoke-pipe through the upper opening *r*. (See Fig. 2.) This construction causes all the products of combustion to pass either from the base-chamber *a* or (when the valve *p* is open) direct from the combustion-chamber into and around said top chamber. (See Figs. 2 and 4.) The opening of the valve *v* by turning it vertical causes the products of combustion to pass directly out of the smoke-pipe, either from the combustion-chamber, when the valve *p* is open, or from the base-chamber when such valve is closed. In this manner the two valves, in connection with the base and top chambers and the direct and indirect flues, give the best control over the draft and heating of the stove.

The heated air can be conveyed to any room or rooms by removing the urn or cap and connecting the hot-air conductors with the hot-air-chamber pipe. The urn or cap has a revolving register, by which the air may be regulated into the room.

The inlet ends of the air-conductors, all or a part of them, may be covered with a duct, *w*, Fig. 5, secured to the bottom of the base-chamber, as a means of connecting a pipe, w^2, which may lead to the hall or outside of the house to supply pure air to the room or rooms, if desired.

The stove is of cylindrical form, and the air-conductors are of cast or wrought iron. That portion of the base which surrounds the fire-pot may be of open or lattice work, to give out heat and make it ornamental.

The damper *p* of the direct flue *k* opens into the ascending flue *n*, but does not close it when the direct draft is open, as shown in Fig. 2, while the damper *v*, when closed, forms a junction with the horizontal branch *g* of the top-chamber division-plate, and the draft from the flue *n* is beneath said cross-plate around the central pipe *i*, and out above said cross-plate, so that whether the dampers *p* and *v* be open or closed the communication of the indirect flues with the exit-pipe *h* is perpetual, without interfering with the direct draft, thereby giving a partial indirect draft when the direct-draft damper is open.

The arrangement of the cold-air duct *w* beneath the base-chamber *a*, and at the junction thereof of the heat-conducting flues *l l m n*, gives the advantage of concentrating the heat from the fire-chamber directly upon said cold-air duct at the point to produce the best effect.

We claim—

1. The dampers *p* and *v*, arranged and combined with the flues *n*, k^2, and *h*, and the top-chamber openings *r s*, to give perpetual communication of the indirect flues *j j* with the exit-pipe *h*, whether the direct-flue damper *p* is opened or closed, as described.

2. The combination, in a surface-burner and base-heater, of the direct and indirect flues *k* k^2 and *j j* and the base-chamber *a* of a top chamber, *g*, the smoke-pipe *h*, and the dampers *v* and *p*, constructed and arranged substantially as and for the purpose herein set forth.

3. The top chamber *g*, its angular horizontal and vertical division-plate *s' q r'*, forming the upper and lower openings *r s*, the direct and indirect flues *k j j*, the dampers *v p*, and the exit-pipe *h*, constructed, combined, and adapted for use, as set forth.

4. The air-chamber *f*, its central outlet-flue *i*, and the air-inlet tubes *b*, arranged and com-

bined with the top chamber *g*, its inlet and outlet openings *s r*, the fire-chamber *c*, and the flues *n*, k^2, and *h*, all constructed and arranged as set forth.

5. The sectional lining *e*, in combination with the flanged fire-pot and the air-conductors, said lining and flange being constructed and adapted to fit said conductors, and close the space at the junction therewith and with the flange, as described.

6. The cold-air duct *w*, arranged beneath the base-chamber *a* and at the junction thereof with the descending and ascending flues *j j* *n*, and combined with said flues and the air-tubes *b*, whereby said cold-air duct is subjected to the direct heat of said flues, as set forth.

7. The direct and indirect draft openings *k* *j j*, arranged in an open space between the air-tubes *b*, and combined with the top chamber *g*, the bottom chamber *a*, and the exit-pipe *h*, as set forth.

8. The angular division-plate of vertical and horizontal sides *s' q r'* of the top chamber, arranged to divide said chamber vertically with its central pipe *i*, and horizontally with its inlet and outlets *s r*, forming upper and lower openings, and combined with the flues *n* k^2 *h*, as set forth.

In testimony whereof we have hereunto set our hands this 20th day of March, A. D. 1877.

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CLARENCE L. COLBY.

Witnesses:
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