2 Sheets--Sheet 1.

J. SPEAR.

Stoves.

No. 164,046. Patented June 1, 1875.

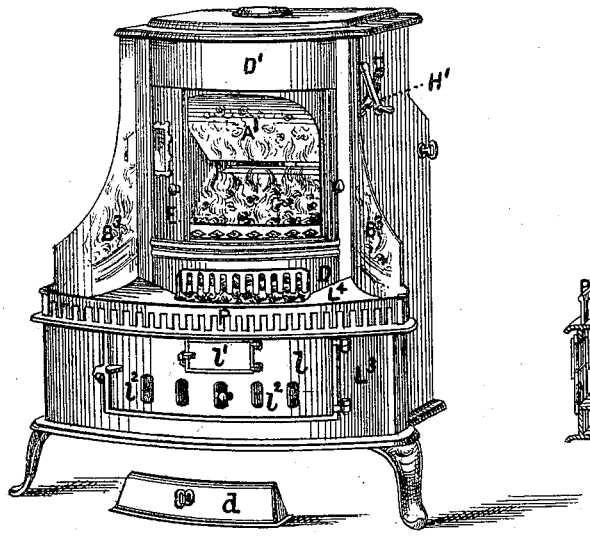
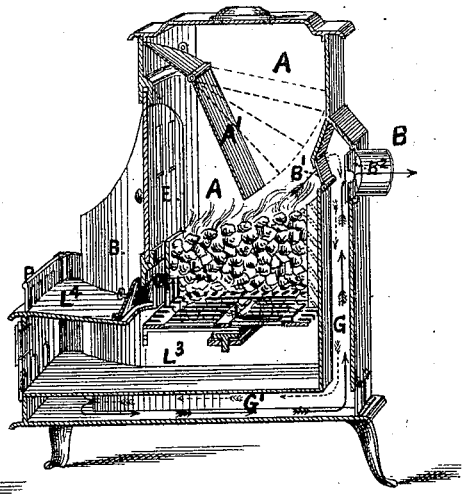


Fig. 1.



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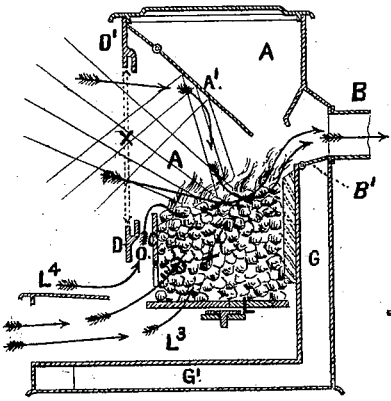

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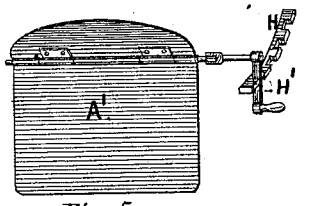
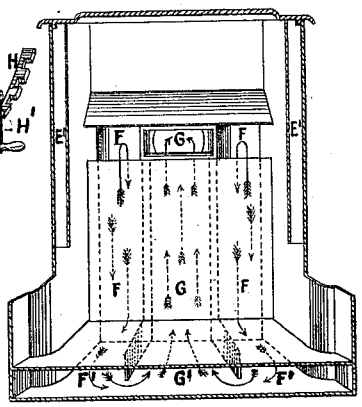


Fig. 5.

Fig. 6.

Fig. 7.



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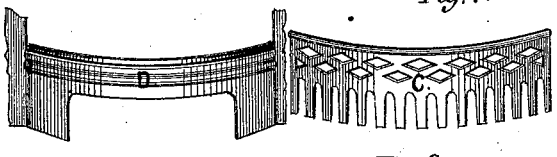
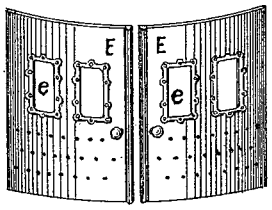


Fig. 8. Fig. 9.



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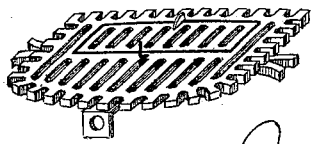
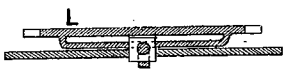


Fig. 11.



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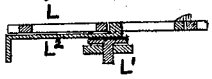

Fig. 13.

Witnesses;
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A. J. Beckmeyer

Inventor;
James Spear

2 Sheets--Sheet 2.

J. SPEAR.

Stoves.

No. 164,046. Patented June 1, 1875.

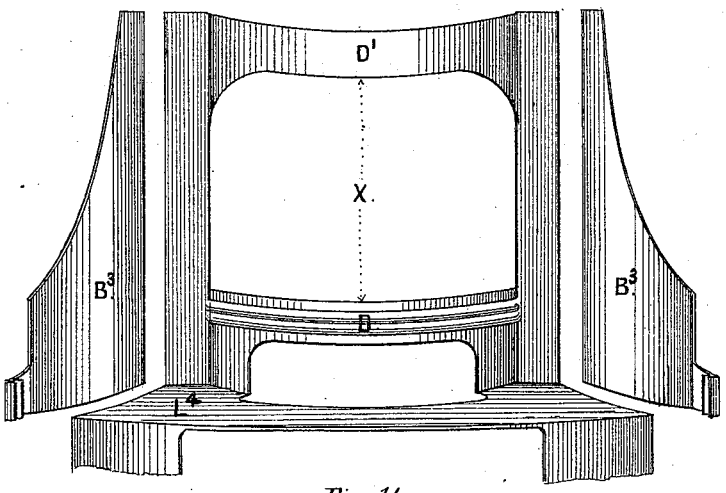

Fig. 14.

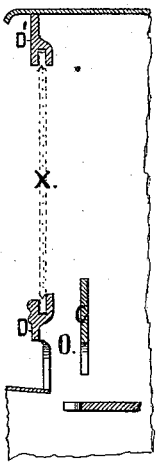

Fig. 15

Fig. 17.

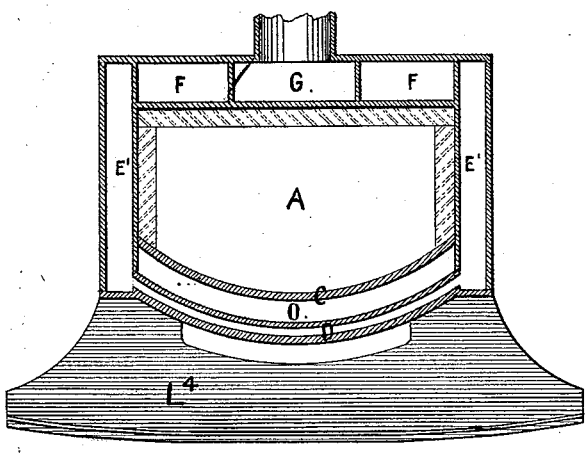

Fig. 16.

Witnesses;

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UNITED STATES PATENT OFFICE.

JAMES SPEAR, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN STOVES.

Specification forming part of Letters Patent No. **164,046**, dated June 1, 1875; application filed March 27, 1875.

To all whom it may concern:

Be it known that I, JAMES SPEAR, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Stoves, of which the following is a specification:

My improvements relate to that class of heating-stoves usually known as open-grate or Franklin stoves; and the object of my invention is to provide suitable and convenient means for preventing the escape of an undue amount of heated air up the chimney, maintaining a clear and bright fire upon the grate without a rapid consumption of fuel, increasing or diminishing the draft at pleasure, reflecting the light and heat of the fire into the room, and preventing the excessive heating and consequent warping of the doors.

The improvements claimed are hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a view in perspective of an open-grate parlor-stove embodying my improvements; Fig. 2, a perspective section of the same; Fig. 3, an elevation section of the same; Fig. 4, a similar section, taken at right angles to Fig. 3; Fig. 5, a view in perspective of the reflector and the devices used for changing and adjusting its position; Fig. 6, a similar view of the damper for turning the draft into the flues; Fig. 7, a similar view of the check-damper; Fig. 8, a similar view of the front plate, upon which the sliding doors move; Fig. 9, a similar view of the front grate; Fig. 10, a similar view of the sliding doors; Fig. 11, a similar view of the bottom grate; Figs. 12 and 13, sectional views of the same; Fig. 14, a view in perspective, and on an enlarged scale, of the front plate, hearth, and wings; Fig. 15, a vertical section, on an enlarged scale, of the front plate and grate; Fig. 16, a horizontal section, on an enlarged scale, of the stove; and Fig. 17, a view in elevation of the foot-rail.

My improved stove is constructed, preferably, of cast-iron lined with fire-clay, soapstone, or any other suitable material. The casing of the stove incloses a fire-chamber, A, the bounding surfaces of which are substantially rectangular, and the front of which is ordinarily open. The fuel rests upon a horizontal grate, L, which is, preferably, so constructed as to be shaken when required, and is supported in front by a vertical grate, C, the lower extremity of which is above the level of the horizontal grate, so as to leave an opening for the removal of clinkers without necessitating the dumping of the horizontal grate L. A stove-pipe, B, provided with a check-damper, B^2, leads from the upper portion of the fire-chamber to the chimney. A series of flues for revertible draft are formed in the casing of the stove, being governed by a damper, B^1. When the damper B^1 is turned into the position shown in Fig. 3 a direct draft to the stove-pipe B is established; but when turned into the position shown in Fig. 2, the gaseous products of combustion pass down the vertical flues F into the horizontal flues F′; thence along the horizontal flue G′ to the vertical flue G, up which they pass to and escape into the stove-pipe B. The front of the stove is partially closed by the upper and lower front plates D′ D, the space between which can be either left open or closed at pleasure by the doors E E, which are provided with suitable mica lights *e*, and slide upon a guide or way formed upon the lower front plate D, resting in recesses E′, formed in the sides of the casing, when the front of the stove is left open. The lower front plate D is set at such a distance from the vertical grate C of the fire-pot as to provide a space, O, between itself and the grate, into which space air enters freely through an opening, which can be closed when required by a damper, *d*. A polished or plated metal reflector, A, is pivoted to the casing near the upper part of the fire-chamber, its dimensions and location relative to the fuel-space thereof being such that it can be either turned down, so as to rest upon the surface of the fuel, or turned up clear of the same as far as the highest position shown in dotted lines in Fig. 2. The reflector should be always kept brightly polished, and dust or smoke can be readily removed from its surface with a cloth or wisp of paper, even when there is fire upon the grate. The position of the reflector can be adjusted as required by an arm, H′, upon its shaft, which engages in any of the notches of a segment, H, upon the outside of the stove. The light and heat of the fire are reflected into the

room from the polished surface of the reflector, as well as from the inclined or curved wings or jambs B^3, which are composed of polished or plated metal, and are attached vertically to the casing at each side of the front opening of the fire-chamber.

The ash-pit L^3 is extended outward beyond the front of the fire-chamber, and is provided with a door, *l*, having a smaller draft-door, l^1, and openings l^2. Mica lights may be placed around the ash-pit, if desired. The horizontal grate L can be vibrated at pleasure upon its bearing-bar L^1, and is provided with a supplementary sliding grate, L^2, which can be moved in a horizontal plane in guideways attached to and beneath the grate L, as well as vibrated with it. A detachable foot-rail, P, rests in grooves, or may be otherwise attached to the front of the hearth L^4 of the stove, the grooves which hold it being, in this instance, formed upon the reflecting wings or jambs B^3.

The operation of the stove is as follows: In starting the fire the check-damper B^2 is opened, and the damper B^1 turned into the position shown in Fig. 3, the reflector A being raised to its highest position, and the front sliding doors E being closed. Air to support combustion is admitted through the draft doors or openings of the ash-chamber. When the fire is well kindled the front sliding doors E are opened, and the reflector A turned down, so that its lower edge rests upon or near the surface of the fuel. The reflector then acts to prevent the escape of air and heat up the chimney, and presents an open cheerful fire, with all the advantages as to giving out heat of a close stove. The rays of heat striking the reflector are reflected into the room, and the air which passes in to the fire is thrown down upon the fuel, so that combustion takes place at the surface of the fire, while the draft at the base may be shut off, thus giving a clear and bright fire without an undue consumption of fuel. At the same time a sufficient amount of air passes up the chimney to maintain a healthy circulation in the room. When the room becomes sufficiently warm, and more ventilation is required, the reflector can be raised, and a greater amount of air be permitted to pass up the chimney, thus correspondingly checking the draft of the fire. It will be observed that by the use of the reflector the heat can be increased or decreased without the aid of any other device, so that, according to its position, it performs the function either of a blower or a damper. The large amount of reflecting-surface presented by the reflector and the wings or jambs enables the heat and light of the fire to be reflected, as far as practicable, into the room. When the stove is to be used as a close stove, I raise the reflector, close the sliding doors, and turn the damper B^1 into the position shown in Fig. 2, thereby establishing a downward or reverse draft around the base of the stove; and if, while the damper is in this position, the reflector is lowered and the sliding doors opened, an open fire can be maintained, with the advantages of a closed stove. The provision of an air-space in front of the vertical grate prevents the overheating and consequent warping of the front plate, on which the sliding doors move, and allows the doors to work freely at all times.

I am aware that a movable plate, for preventing or regulating the passage of air over the fire to the chimney, has been heretofore proposed, and do not, therefore, broadly claim the reflector, in so far as the same acts simply to fulfill such function.

I claim as my invention—

1. The combination, with an open-front stove, of a pivoted reflector, substantially as set forth.

2. The combination, in an open-front stove, of a fire-chamber, a pivoted reflector, and sliding doors, substantially as set forth.

3. The combination, in an open-front stove, of a fire-chamber, pivoted reflector, a reverse-draft damper, and revertible-draft flues, substantially as set forth.

4. The combination, in an open-front stove, of a fire-chamber and front doors sliding upon a front plate, which is separated by an air-space from the vertical front grate, substantially as set forth.

JAMES SPEAR.

Witnesses:
A. J. EICKMEYER,
JNO. P. LEY.