

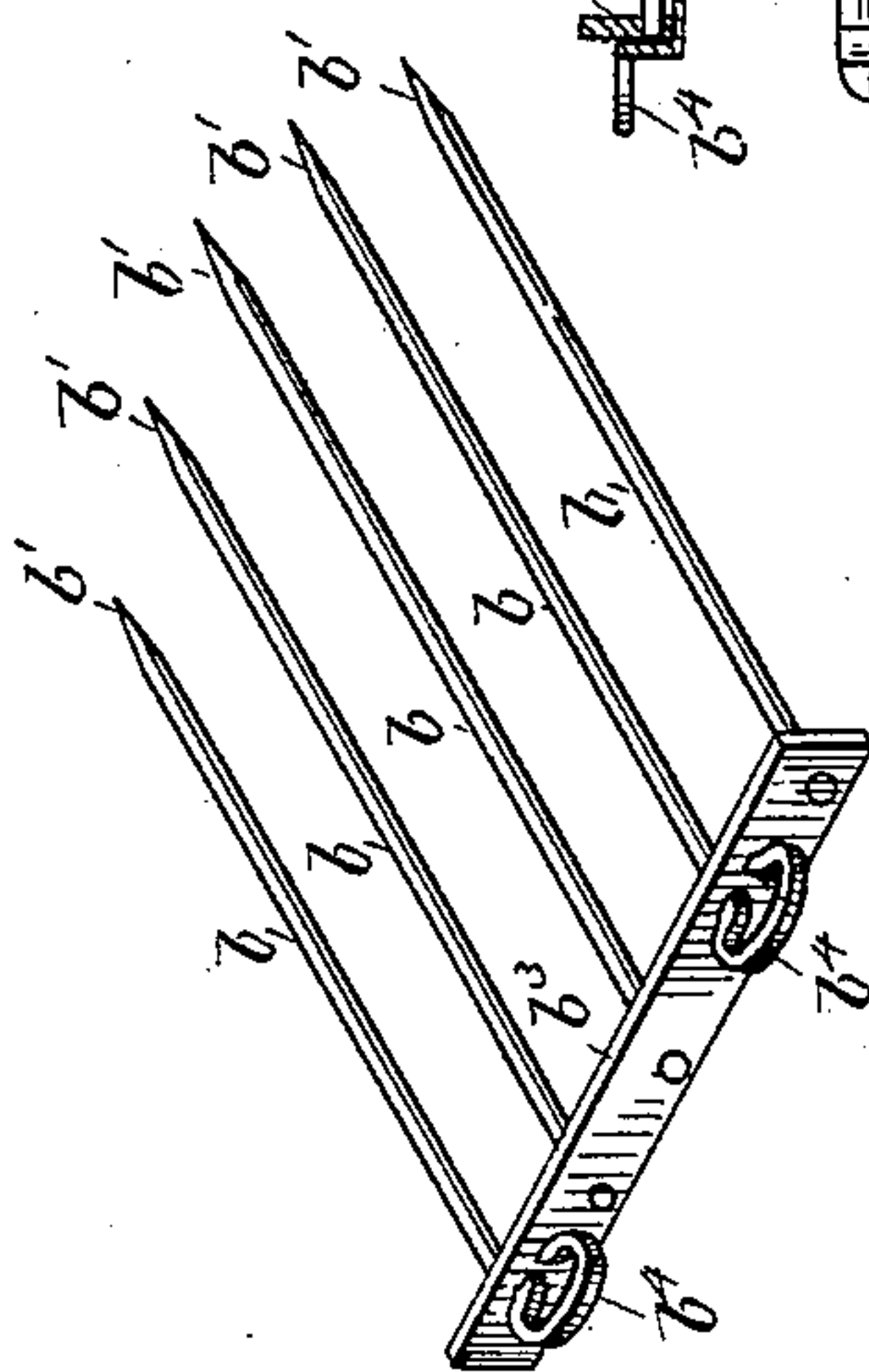
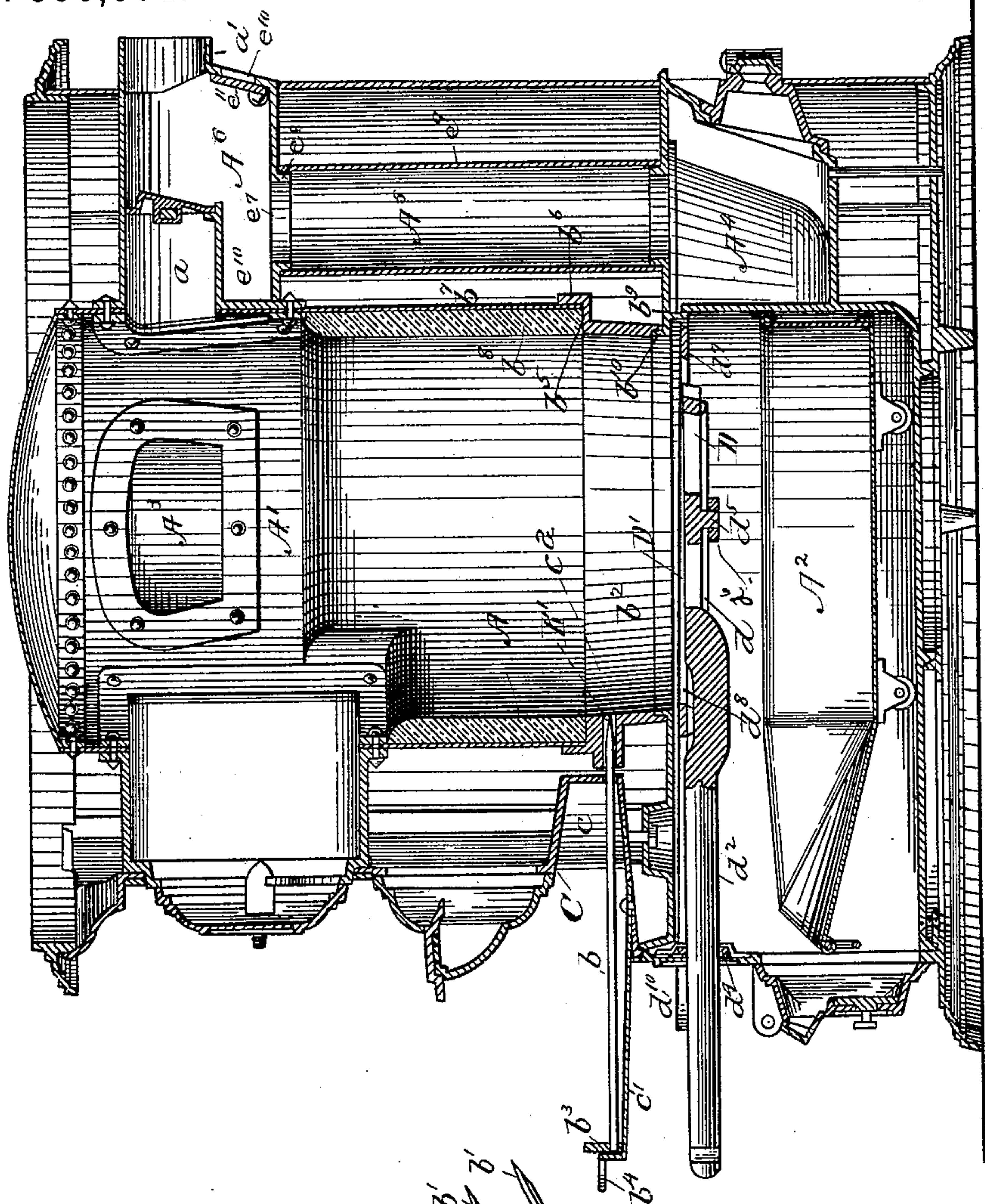
(No Model.)

6 Sheets—Sheet 1.

F. A. MAGEE.
STOVE OR FURNACE.

No. 390,684.

Patented Oct. 9, 1888.



WITNESSES.
Fred. B. Dolan.
J. H. Dolan.

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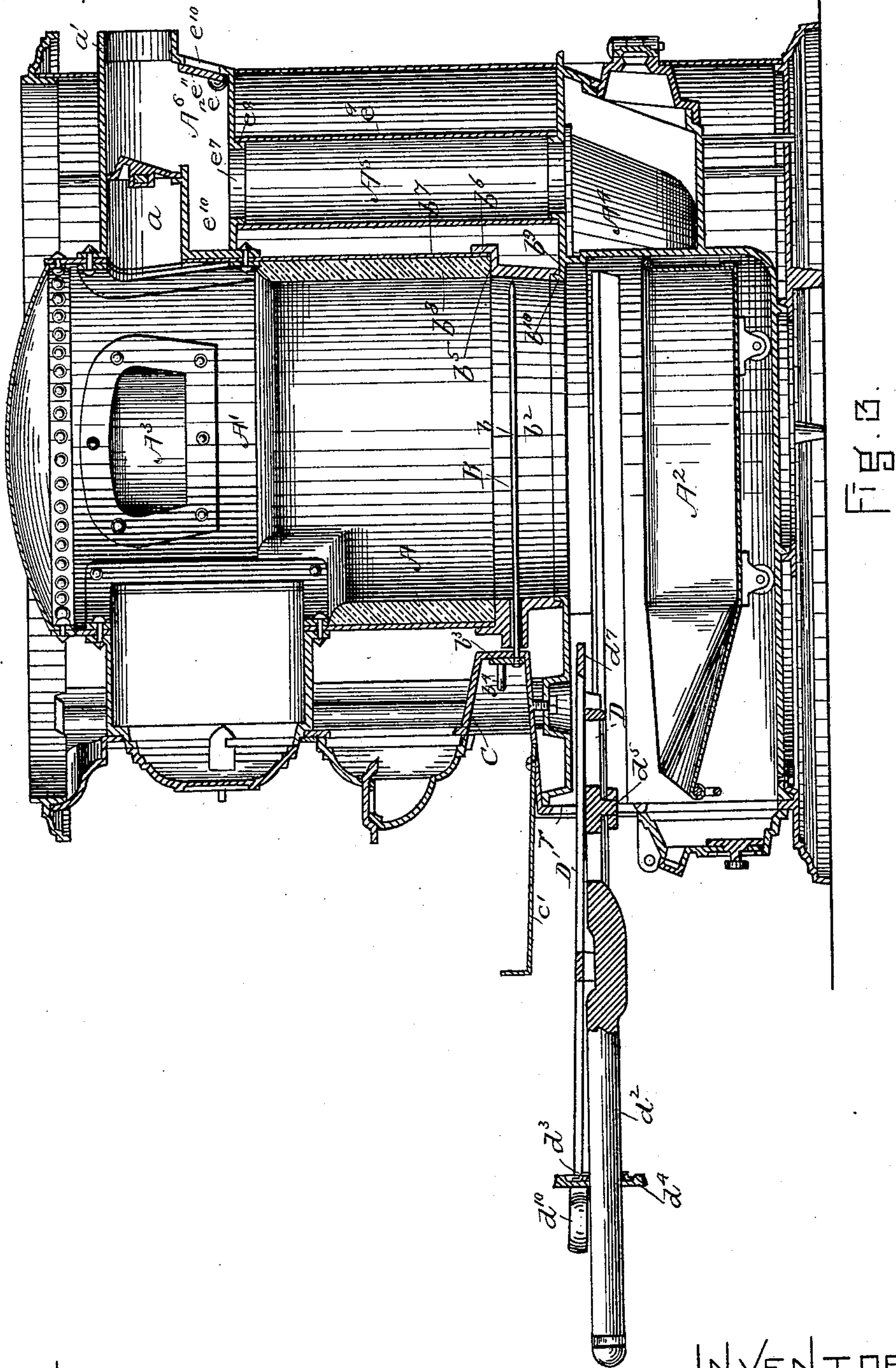
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(No Model.)

6 Sheets—Sheet 4.

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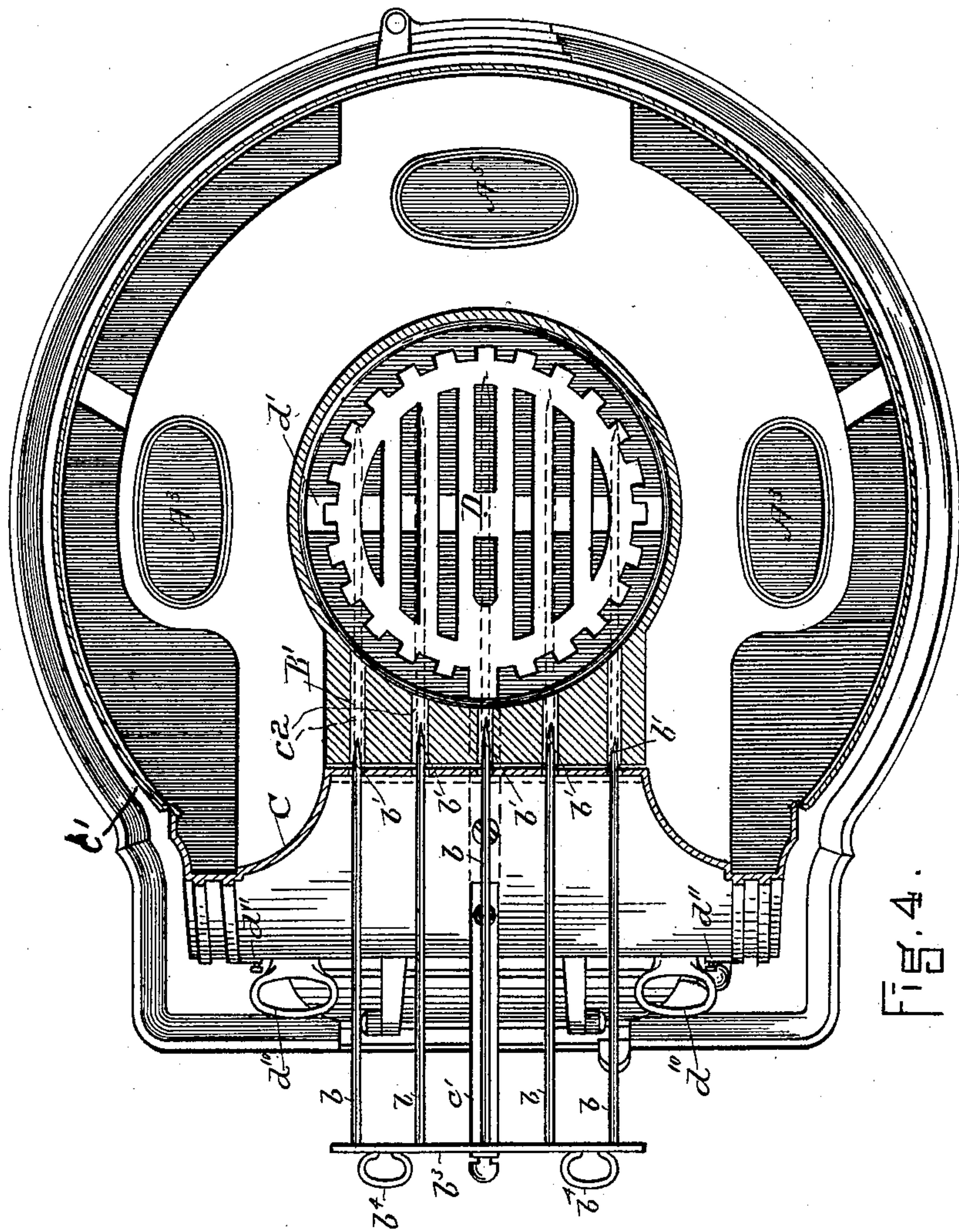


Fig. 4.

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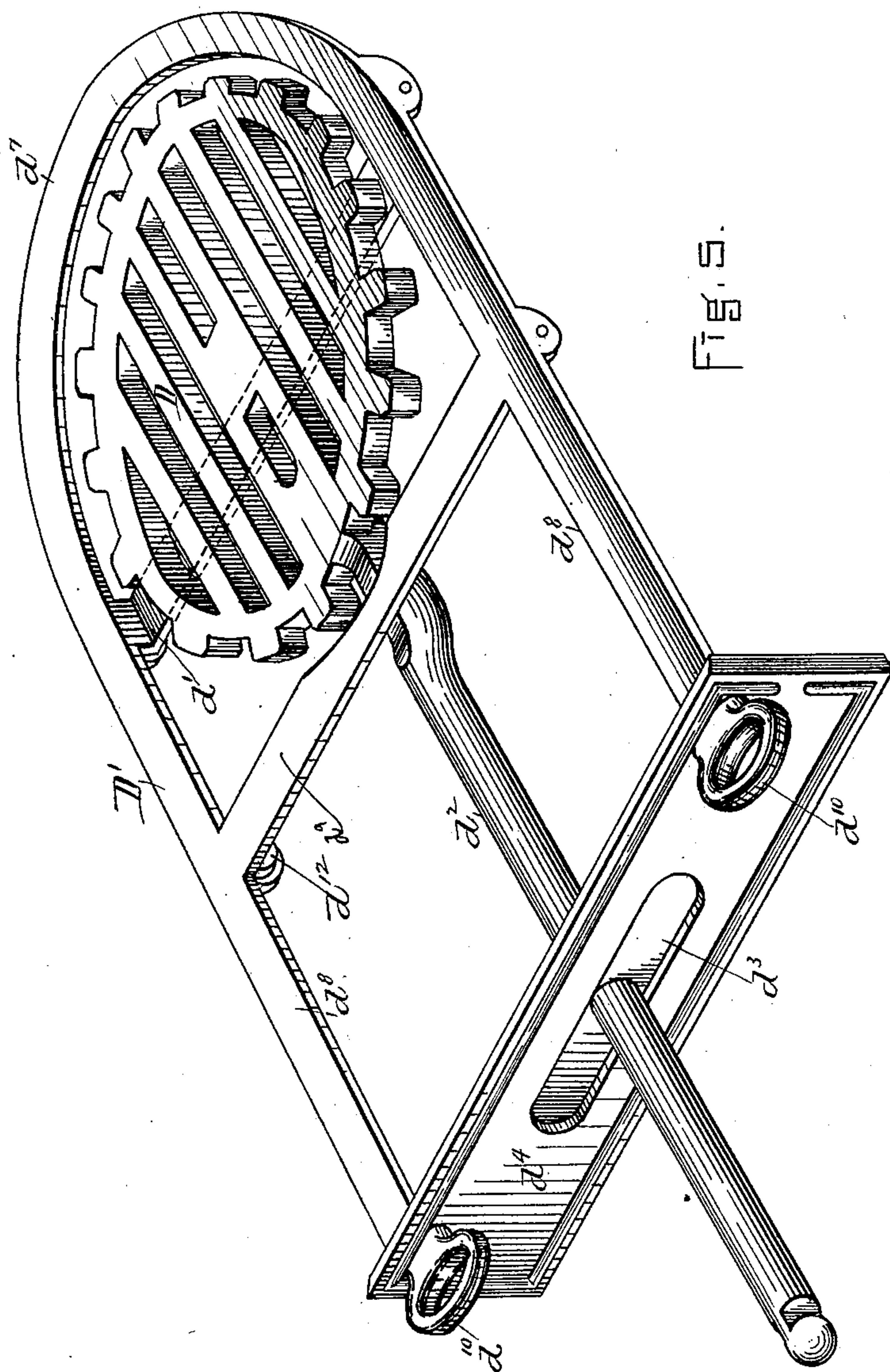
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F. A. MAGEE.
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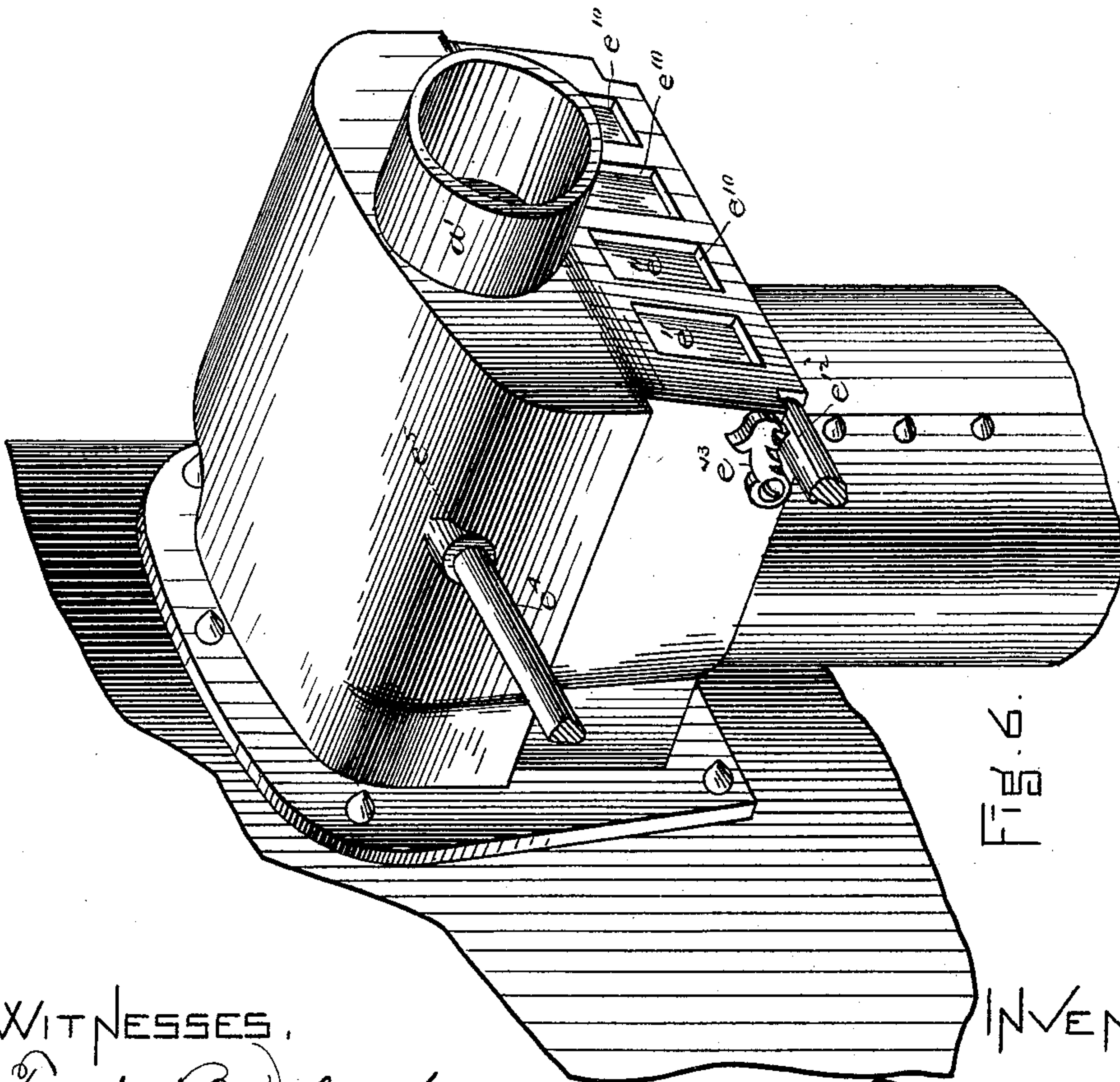
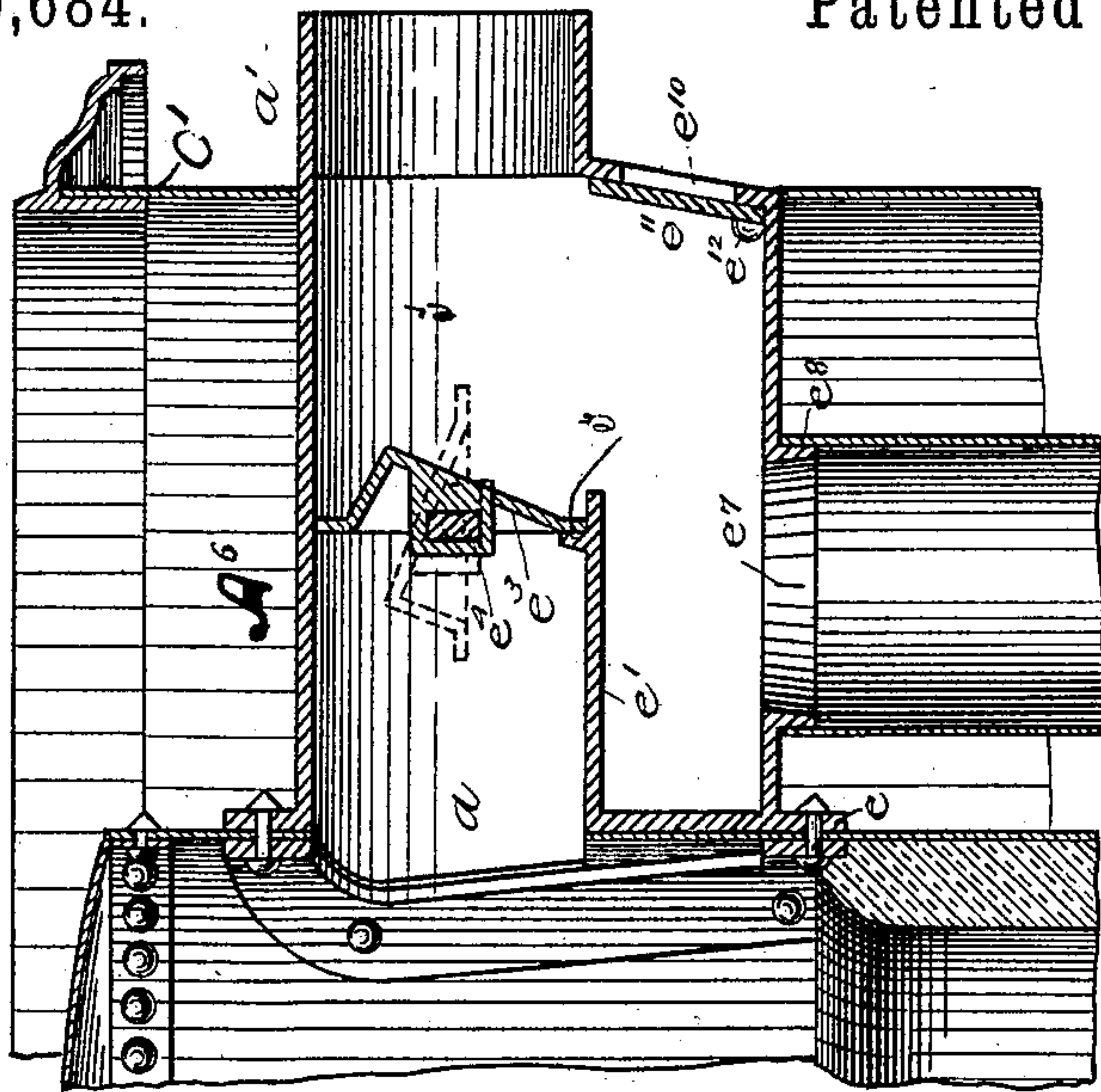
(No Model.)

6 Sheets—Sheet 6.

F. A. MAGEE.
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UNITED STATES PATENT OFFICE.

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STOVE OR FURNACE.

SPECIFICATION forming part of Letters Patent No. 390,684, dated October 9, 1888.

Application filed April 19, 1887. Serial No. 235,414. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. MAGEE, of Chelsea, in the county of Suffolk and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Stoves or Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention has relation to those air-heaters for domestic use which are provided with an exterior casing for containing the heated air.

The invention consists in a stove or furnace which has an air-casing which is provided with a front depression or recess which is open at its front, and which in its rear portion is provided with a series of perforations, through which access is had to the furnace within; in a fuel-chamber which is provided with a front projection or protuberance which has a series of horizontal passages; in the combination of the recessed and perforated air-casing with the fuel-chamber having passages in such manner that the recess and perforations of the former shall coincide with the projection and the passages of the latter; in the combination, with a recessed and perforated air-casing and with a fuel-chamber having a projection provided with passages, of a supplemental grate or fuel-supporter which has bearing both in the perforations in the recess of the air-casing and in the passages in the projection upon the fuel-chamber; in the combination of an air-casing which has an open or uncovered perforated recess and a projecting supporting-bar, a fuel-chamber or fire-pot which has a series of horizontal passages coincident with the perforations in the air-casing, and a fuel-supporter which is adapted to the passages, to the perforations, and to the supporting-bar; in a base-section having certain novel features of construction and a novel grate-carrying frame; in certain novel appliances for the regulation of the draft of the heater, and in various other novel parts or novel combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a vertical central section, taken from front to back, of a

furnace containing the features of my invention, showing the auxiliary or supplemental fire-support in its inoperative position. Fig. 2 shows the same section of the furnace represented in Fig. 1, with the supplemental or auxiliary fire-support moved into operative position. Fig. 3 is a view of the same section shown in Fig. 1, with the supplemental or auxiliary fire-support in operative position and the main grate removed to permit the escape of the contents of the fire-pot below the auxiliary or supplemental fire-support into the ash-pit. Fig. 4 is a view in horizontal section upon the line of the supplemental or auxiliary fire-support, showing in plan parts below said line. Fig. 5 is a perspective view of the grate-supporting frame and grate removed from the furnace. Fig. 6 is a view in perspective, enlarged, of the box containing the cold-air regulation and controlling valves. Fig. 7 is a vertical section through said box and adjacent parts. Fig. 8 is a view in perspective of the supplemental or auxiliary fire-support. Fig. 9 is a view in perspective of the ash-pan removed from the furnace.

Referring to the drawings, A is the fire-pot; A', the combustion-chamber; A², the ash-pan; A³, the downflues, which extend from the combustion-chamber to the base-flue A⁴.

A⁵ is the upflue; A⁶, the box into which the upflue A⁵ enters, and which also is connected by the passage a with the combustion-chamber. This box contains the regulating-dampers, and has a collar, a', for receiving the smoke-pipe.

B is the supplemental or auxiliary fire-support. It is represented as composed of the round rods b, having pointed ends b', (see Fig. 8,) and as arranged to extend across the fire-pot at any desired distance above the main grate. I have represented these rods as movable horizontally in order that they may be brought into place across the fire-pot when it is desired that they shall act to support the fire or section of fire above them and be removed from the fire-pot when the fire is supported by the main grate. To accomplish this, I have formed holes B' (see Fig. 1) in a front projection or protuberance, b^a, of the metal sleeve or ring b², which forms the lower part of the fire-pot, and have extended the rods

through these holes and have connected them together at their outer ends by a cross-bar, b^3 , provided with handles b^4 . These holes serve as guides in directing the movement of the rods. The fire-pot is composed of the metal cylindrical lower section or ring, b^2 , which is made thick at its front side, or the side in which the holes B' are formed, to provide a long bearing for the support of the rods b , and it also has a shoulder, b^5 , and an upward-extending flange, b^6 , which extends around the outer edge of the metal casing b^7 of the main part of the fire-pot. The shoulder also supports the fire-brick b^8 . The lower part of the metal sleeve b^2 rests upon the plate b^9 , and there is a flange, b^{10} , extending upward from said plate into a rabbet formed in the lower edge of the ring. This construction I find desirable for the purpose of carrying this feature of the invention into effect in a cheap, efficient, economical, and desirable manner. While this supplemental or auxiliary fire-support may be entirely detachable from the stove or furnace and brought into use only when it is desired to move the contents of the lower part of the fire-pot from the fire, I prefer that it be a permanent attachment—that is, that it shall always be in place for operation; and as I have represented it as operated from the front of the furnace or stove, in order that it may not project too far from the front when not in use, I have formed in the front plate, C , of the air-casing C' of the furnace or stove a deep recess, c , which has in its inner extremity the series of perforations c^2 , corresponding in number with the bars of the supplemental grate or fuel-supporter. The recess c is of a width to receive the rod-holding bar b^3 , so that shorter bars or rods may be used, as this permits the employment of rods or bars not very much longer than the diameter of the fire-pot. When not in use, the holding-bar b^3 rests upon the arm c' , with the ends of the rods in the holes in operative position in the holes B' . (See Fig. 1.)

As will be readily understood, owing to the frequent alternate expansion and contraction of the fuel-chamber and its projection, a narrow open space will necessarily exist between the rear extremity of the recess in the air-casing and the front extremity of the protuberance upon the fuel-chamber; and, since this space is in communication with and forms a portion of the air-chamber, deleterious gases might, by an imperfect draft or by an accidental closure of the exit-flue, be forced through the passages B' into such space, and thence into the several apartments which receive their heat-supply from such air-chamber. Under all ordinary circumstances, therefore, the supplemental grate or fuel-supporter will, when not projected into the cavity of the fuel-chamber, remain in the position indicated in Fig. 4, the bars b occupying the passages B' and effectually closing them against the escape of the gaseous products of combustion.

The main grate D is represented as of the

ordinary form, and is supported by a solid frame, D' , which slides horizontally in the ways d and is entirely removable from the casing of the furnace. The grate is supported upon the cross-bar d' (see Fig. 5) of the frame in a manner to be oscillated by the arm or rod d^2 , which extends from the front edge of the grate through the slot d^3 in the front plate, d^4 , of the frame, the grate having a pivot, d^5 , which extends into the hole d^6 in the cross bar or plate. (See Fig. 3.) The frame D' has the narrow plate d^7 , rounded at its inner end, and parallel sides d^8 from said rounded inner end to the front plate, d^4 , and it is stayed by the cross-bar d^9 , as well as by the grate-supporting bar d' . The front plate, d^4 , when in place, fits within a vertical opening, r , and thus forms a section of the front of the furnace or stove, and there is attached to it, to project from its outer surface, the handles d^{10} , for moving the frame and grate. The frame is locked in place by means of the buttons d^{11} , or in any other desired way.

The grate-frame A has the anti-friction rolls d^{12} secured to the under surface of the side bars, d^8 , which ride upon the ways d . This construction is quite essential in view of the weight of the grate frame and grate, and the ashes and fire supported thereby, in order to permit the frame and grate to be moved horizontally outward from the fire-pot to uncover or expose its opening to the ash-pit.

The damper-box A^6 (see Figs. 6 and 7) is a casting having a flange, e , by which it is bolted to the body of the furnace. It is divided horizontally by a partial partition-plate, e' , into two sections, which open into the chamber e^2 in the back part of the box. Over the end of this partition-plate is the main damper e^3 , which is fastened to or made a part of the turning-rod e^4 , which has bearings in the box at e^5 . The damper is balanced so as to remain open or closed, and when closed its lower edge shuts against the shoulder e^6 of the partition-plate e' . Below the partial partition-plate e' , and in the lower plate of the box, there is an opening, e^7 , surrounded by a collar, e^8 , which receives the upper end of the tube or pipe e^9 , forming the flue A^5 , so that the upflue opens into the chamber or flue e^2 in the box formed by the partial partition-plate, and thus has an unobstructed passage to the smoke-pipe. At the rear of the box and below the collar e^8 , which receives the smoke-pipe, are formed the holes e^{10} , which open into the back chamber of the box, and which form a cold-air inlet, and the holes are closed or controlled as to size by the damper e^{11} , which is attached to the turn-rod e^{12} , and which is pivoted along the inner lower edge of the said holes, and so that the damper is moved backwardly from the holes, the upper portion more than the lower. The damper is held in any position to which it is moved by a pivoted catch, e^{13} , which bears upon the turn-rod.

To those who are conversant with this class of devices it will be manifest from the forego-

ing description and from the drawings that the partition-plate e' affords a fixed bearing and stop for the damper when in its closed position; that at the same time it acts as a deflector to direct the products of combustion as they are discharged from the rising flue A^3 toward the exit-flue or collar a' , and that when the damper is open it has the effect to give direction to the products of combustion and to carry them well along toward the outlet-opening of the box.

The ash-tray A^2 (see Fig. 9) preferably is of sheet metal, and is capacious in size. It is preferably mounted upon the rollers f , and has the side handles, f' , and also the drawn-in sides f^4 . There is also a handle, f^5 , secured to the front or spout end of the pan.

Heretofore furnaces have not been, as a rule, provided with an ash-pan; but when they have been they have had but little capacity, have not been arranged to be moved easily, have been unprovided with handles of the character described, and have not been constructed so that the contents of the pan can be easily dumped or removed by tipping.

It will be observed that by supporting the main grate upon a slide-plate removable from the furnace two important results are obtained—namely, the ready and quick uncovering of the full opening of the fire-pot to the ash-pit, and also the entire removal of the grate and its support or frame from the stove, so that a broken grate or part connected therewith can be immediately taken from the stove or furnace and a new part or grate substituted therefor.

In operation, where the auxiliary or supplemental fire-support is movable, it is generally held in the position represented in Fig. 1, and when it becomes necessary to remove the dead clinker, ashes, and coal from the lower part of the fire-pot it is pushed into place, so as to occupy the position in relation to the main grate and the fire-pot represented in Fig. 2. The main grate is then removed and drawn out by moving the slide plate outward to the position shown in Fig. 3. This uncovering of the opening of the fire-pot to the ash-pit permits the entire contents of the ash-pit below the auxiliary fire-support to fall into the ash-pit. The main grate is then immediately moved back into place beneath the fire-pot to close the opening and the auxiliary fire-support moved from the fire-pot chamber to permit the fire to fall upon the main grate. This removes from the fire the principal matter which tends to check it and permits it to kindle as if it were an entirely fresh fire throughout.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. A stove or furnace which has an air-casing which is provided in its front or door-frame portion with a recess which is open at the front, and which has a vertical rear portion which is provided with a series of perforations, substantially as and for the purposes set forth.

2. The combination, in an air-heating stove or furnace, of an air-casing which is provided in its front or frame portion with a recess which is open at its front, and which has a vertical rear portion which is provided with a series of perforations, and a fuel-chamber which has an outwardly-projecting front portion which is coincident with the rear face of the recess in the air-casing, and which is provided with a series of horizontal passages which correspond with the series of perforations in such recess, substantially as and for the purposes specified.

3. In an air-heating furnace or stove, the combination of a fire-pot which has a front projection or protuberance in which is a series of horizontal passages, an air-casing which has a series of perforations which correspond with the passages in the protuberance upon the fire-pot, and a supplemental grate or fuel-supporter which is adapted to the passages and to the perforations, and which has bearing in such passages and in such perforations, whether it be in its fuel-supporting position or in its withdrawn position, substantially as described.

4. The combination, in an air-heating furnace or stove, of an air-casing which is provided with a recess which is open at the front, and which has in its rear wall a series of perforations, and which is provided, also, with a supporting-bar which projects outwardly from the front lower portion of such recess, a fuel-chamber or fire-pot which is provided with a series of horizontal passages which coincide with the perforations in the air-casing, and an auxiliary or supplemental fuel-supporter which is adapted, when in its withdrawn or non-supporting position, to extend transversely of the recess and to rest in the passages in the perforations and upon the supporting-bar, substantially as specified.

5. In a heating stove or furnace, the combination, with the base-section thereof, provided upon its ash-pit walls with bearings or ways, and having a front opening corresponding with such ways, of a grate-carrying frame which is provided with a vertical front plate which is adapted to enter and close the front opening in such base-section, the frame having movement in or out upon the ways, and being detachable, together with its grate, through the opening which is closable by its front plate.

6. In a stove or furnace, the slide grate-frame D' , comprising the plate d^4 , forming a section of the front of the casing of the stove or furnace, the side bars, d^8 , extending inward therefrom, and having the cross-support d^9 and cross-bar d' , for holding the grate, the grate D , pivoted upon said bar, and having the operating-rod d^2 extending through an opening in said front plate, as and for the purposes specified.

7. In a stove or furnace, the slide grate-

frame comprising the plate d^4 , forming a section of the front of the casing of the stove or furnace, the side bars, d^8 , extending inward therefrom, and having the cross-support d^9 and cross-bar d' , for holding the grate, the grate D, pivoted upon said bar, and having the oscillating rod extending through an opening in said front plate, the furnace-casing, and a locking device for locking said slide-frame in place, as and for the purposes specified.

8. In a stove or furnace, the combination, with the body thereof having an exit-opening, of a damper-box which is provided with a front receiving-opening which corresponds with the opening in the body of the furnace, with a horizontal division plate or diaphragm above the bottom of the box, which extends rearwardly from the lower extremity of the receiving-opening and divides the front portion of the box into two short horizontal flues, with a bottom receiving-opening for the indirect exit currents, with a rear discharging-opening which communicates with the uptake, and with a damper in the upper horizontal or direct exit-flue.

9. The combination, with the combustion-chamber having a direct exit-opening in its rear wall, of a damper-box which is secured to the rear wall of such combustion-chamber, which is provided with a horizontal diaphragm which divides the front portion of the box into an upper passage for direct exit and a lower passage for indirect exit, and which is provided with a damper-seat, with a front opening coincident with the direct exit-opening in the rear wall of the combustion-chamber, with a bottom receiving-opening, with a rear exit-opening in a plane with the upper passage for direct exit, with a damper in such upper pas-

sage, with check-draft openings—one or more—in the rear wall of the box below the rear exit-opening thereof, and with a damper pivoted at the base of the check-draft openings, movable in the arc of a circle toward or from the bottom plate of the box and operating to direct the incoming currents of air in a direction more or less oblique to the rear wall of the box.

10. In a heating stove or furnace, the combination, with the ash-pit chamber provided with the ways d , of the removable sliding grate-frame D' , having the front plate, d^4 , the side bars, d^8 , and the anti-friction rollers d^{12} , and the oscillating grate D, supported upon such grate-frame, substantially as described.

11. In a heating stove or furnace, a fire-pot or fuel-chamber which embraces a metallic annular section, b^2 , which is provided with a front projection or protuberance, as b^a , in which are formed the horizontal passages B' , in combination with the grate D, and with the adjustable supplemental fuel-supporter B, adapted, whether in its inner or outer adjustment, to rest in and be maintained in a horizontal position by the passages B' , substantially as specified.

12. In a heater, the base-section having top plate, b^9 , provided with upturned flange b^{10} , the annular metallic section b^2 , having rabbet in bottom edge, shoulder b^5 , and vertical flange b^6 , and the metallic casing b^7 and fire-brick lining b^8 , resting upon the shoulder b^5 and encircled by the vertical inclosing-flange b^6 , in combination, substantially as described.

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Witnesses:

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