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E. DETWILER.

GAS STOVE AND BURNER AND HEATING DRUM.

No. 268,083. Patented Nov. 28, 1882.

Fig. 1.

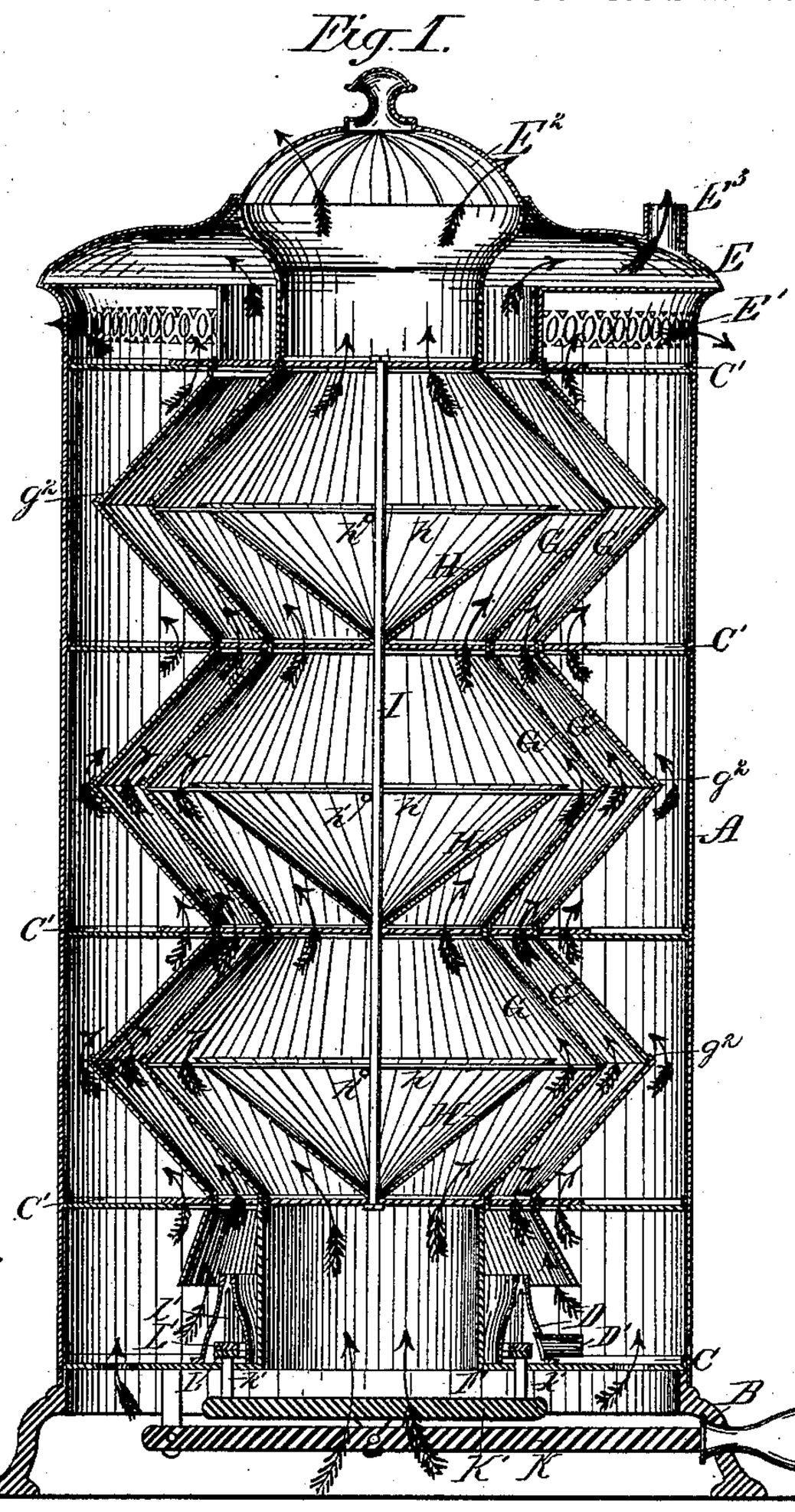

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Fig. 2.

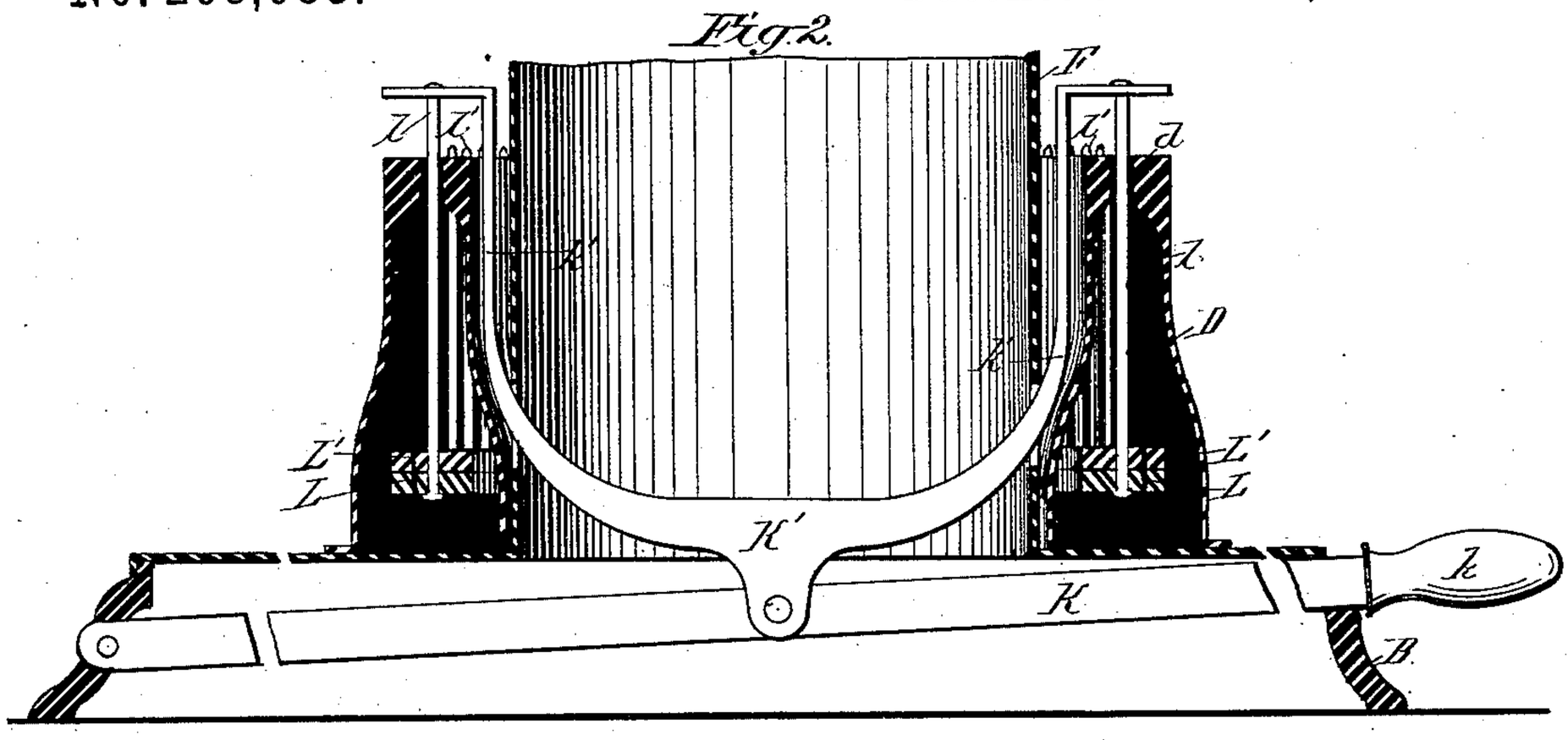


Fig. 3.

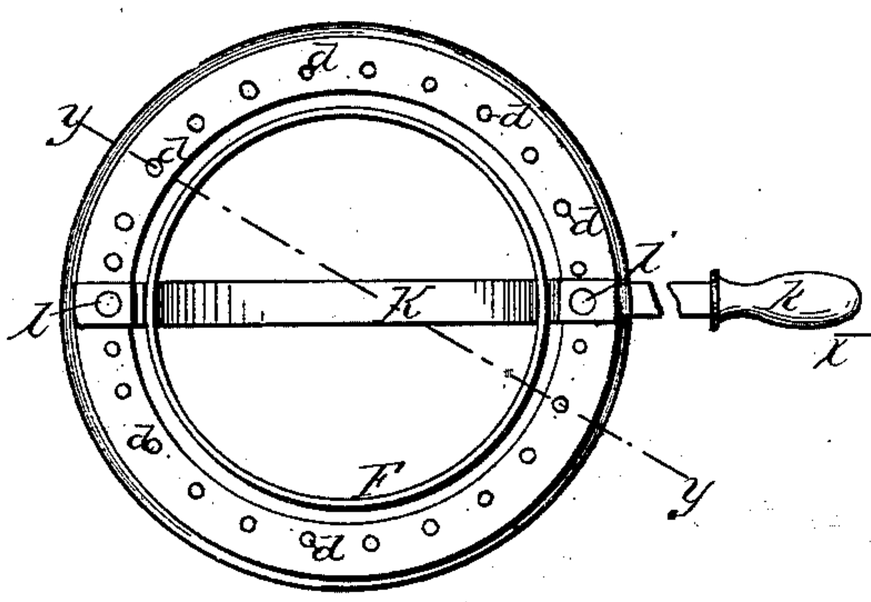


Fig. 4.

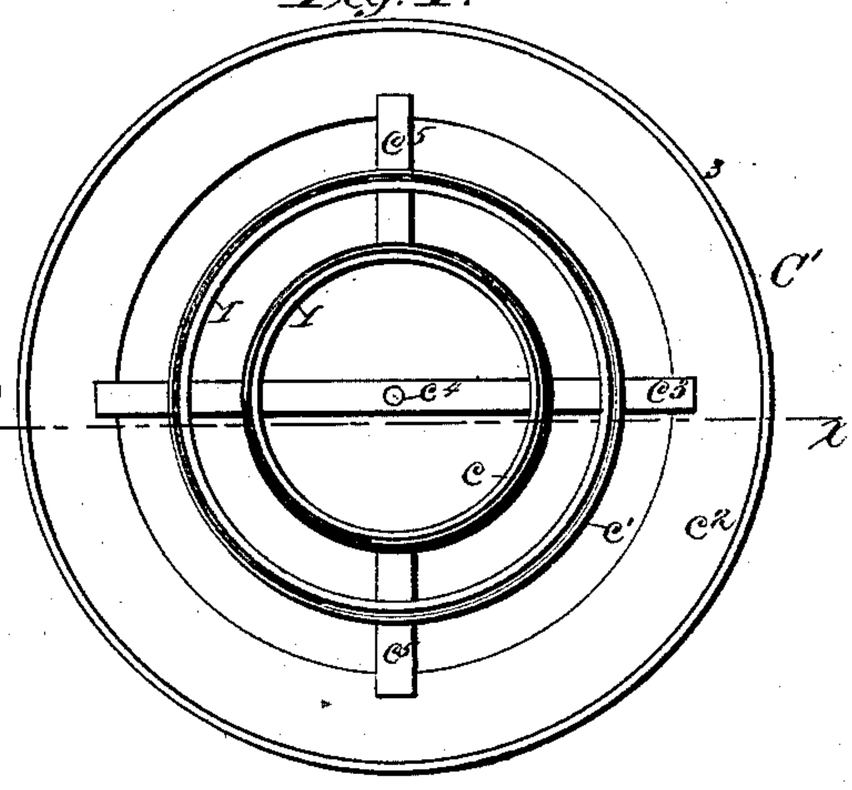
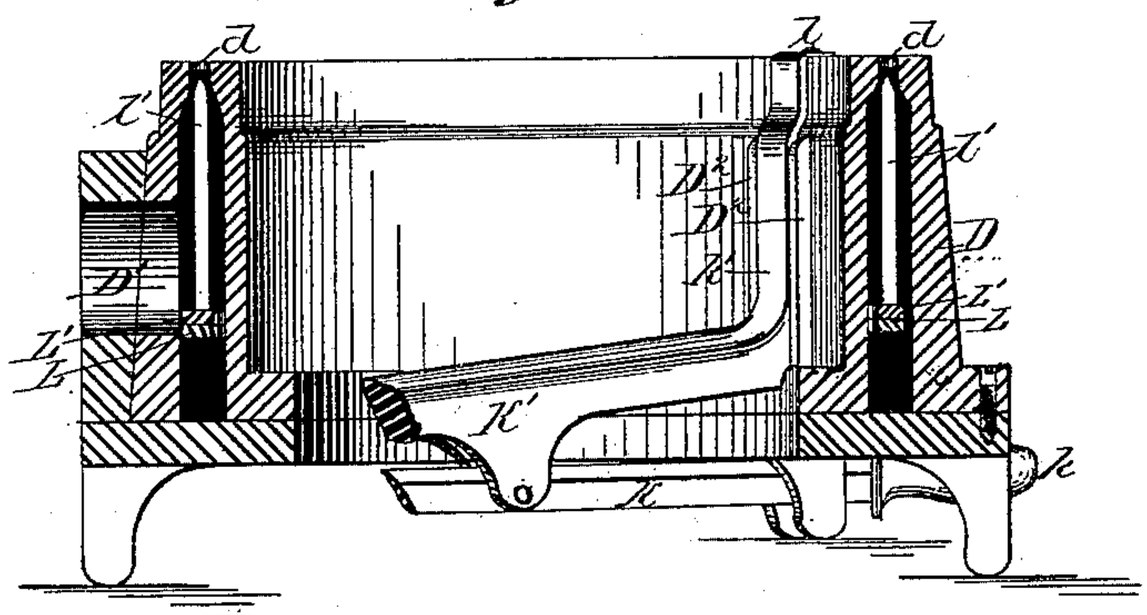


Fig. 5.



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GAS STOVE AND BURNER AND HEATING DRUM.

No. 268,083. Patented Nov. 28, 1882.

Fig. 6.

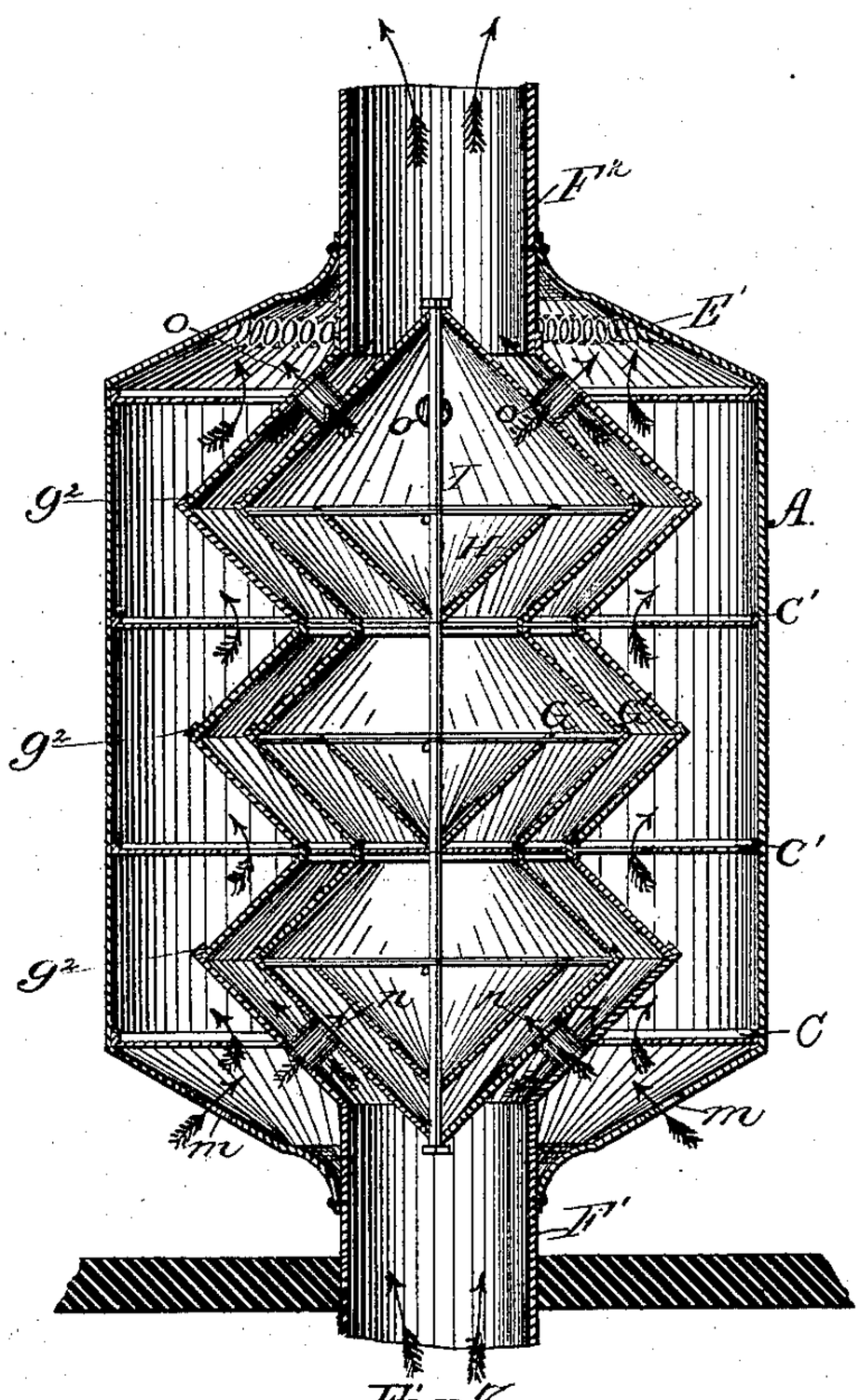
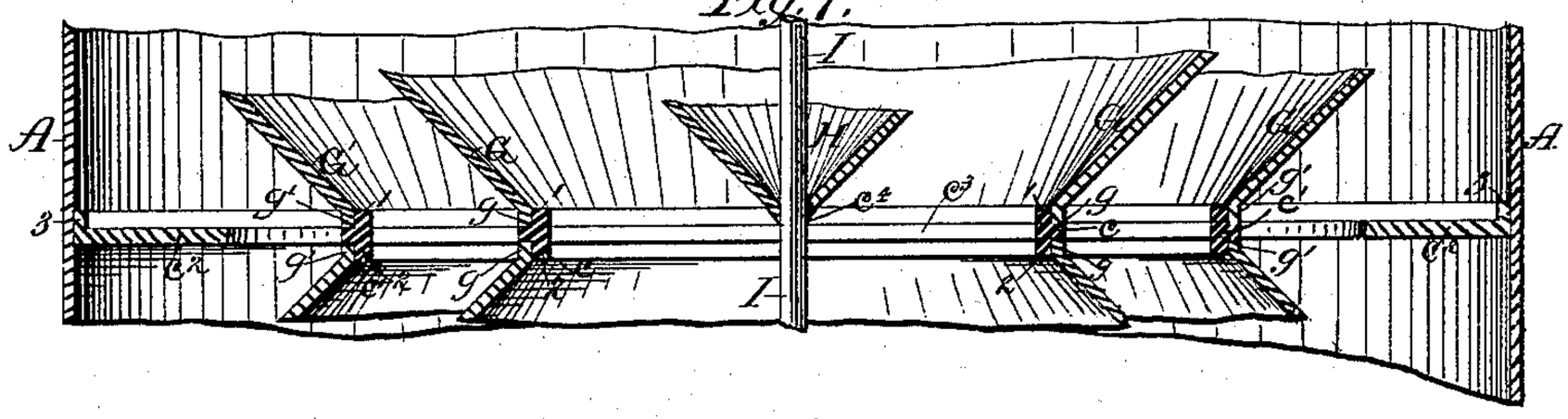


Fig. 7.



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UNITED STATES PATENT OFFICE.

EMANUEL DETWILER, OF MILWAUKEE, WISCONSIN.

GAS STOVE AND BURNER AND HEATING-DRUM.

SPECIFICATION forming part of Letters Patent No. 268,083, dated November 28, 1882.

Application filed September 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, EMANUEL DETWILER, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Gas Stoves and Burners and Heating-Drums; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to cylinder-heaters, used either as stoves or drums; and it consists in certain peculiarities of construction of the said heaters for securing an improved circulation of both the cold and heated air, and also of the burners used in connection with the device when gas is employed as fuel, and in a device for cleaning said burners and keeping them always in condition for use, all as will be more fully set forth hereinafter.

In the drawings, Figure 1 is a vertical section of a gas-stove embodying my invention. Fig. 2 is a similar section of the lower part of the stove, containing the burner, representing a modification of the cleaner, and showing its teeth pushed up through the burner to clean the burner-holes. Fig. 3 is a plan view of the device shown in Fig. 2, drawn to a reduced scale. Fig. 4 is a plan view of one of the plates or brackets which support and unite the hollow frustums of the hot-air passage and sustain them in position within the outer shell of the stove. Fig. 5 is a vertical section of the burner and cleaning device shown in Fig. 2, taken on the line *y y* of Fig. 3, detached from the stove and mounted on an independent base, and with the said cleaning device depressed out of the way. Fig. 6 is a vertical section of a heating-drum embodying my invention; and Fig. 7 is a vertical cross-section of the plate shown in Fig. 4, taken on the line *x x* of said figure, and also showing in section the portions of the outer shell and inner hollow frustums of the hot-air passage and central conical cold-air deflector adjacent to said plate.

A represents the outer shell or cylinder of my stove or drum, which part is preferably made of sheet-iron.

B is the base, which in the stove is preferably formed of cast-iron and provided with legs and a flange or plate, C, to support the burner D, &c. This plate C is substantially like the plates C′ shown in plan in Fig. 4, except that it is preferably cast solid with the base B.

E is the top of the stove, and is made of either cast or sheet iron, as preferred.

F, Fig. 1, is a pipe for the admission of cold air to the center of the device, and this pipe rests on the central ring or flange of the plate C.

G G′ represent respectively the inner and outer walls of the conical passages, between which the heated air and products of combustion from the burner circulate, and the frustums of which they are composed are placed together, as shown, with their narrowest diameters against the rings *c* and *c′*, respectively, of the plates C′, while each section of said hot-air passage between each two plates C′ is composed of two hollow frustums of cones, the bases of which are joined to the inverted bases of lower cone-frustums, the said frustums being thus united in the center of each section at their widest diameters, and the whole forming a continuous passage from bottom to top for hot air, smoke, &c., when the device is put together.

Each of the described plates C′ consists of a flat circular outer ring or flange, c^2, of a diameter just sufficient to fit snugly within the outer shell, A, and a cross-piece, c^3, extending transversely across the space within the inner periphery of this flange c^2, and provided with a perforation, c^4, at its center, for a purpose to be hereinafter described. Upon this cross-piece the rings *c′ c* are supported and further strengthened by short cross-bars c^5 c^5, which only extend from the outer flange or ring, c^2, (at right angles to the cross-piece c^3,) to the smallest or inner ring, *c*, all as shown in Fig. 4. The rings *c c′* have upward circular extensions 1 1 and downward circular extensions 2 2, while the ring c^2 has only an upward circular extension, 3, in line with the outer periphery of said ring, as most clearly shown in Fig. 7. The whole plate C′ thus constructed may be made of separate rings or castings bolted together; but I prefer to cast the whole solidly in one piece, as it is thus cheaper, stronger, and lighter than if made of separate pieces. In said Fig. 7 I have clearly illustrated the manner in which the hot-air frustums G and G′ are mounted upon the plates C′. The said frustums at their narrowest diameters are extended vertically a short distance, as shown at

g and *g'*, respectively, and these vertical extensions on the inverted frustum-sections are slipped from above down and around the circular extensions 1 1 on the upper surfaces of the rings *c* and *c'*, while the similar vertical extensions *g* and *g'* on the upright frustum-sections, below the plates C', are slipped from below up and around the circular extensions 2 2 on the lower surfaces of the rings *c* and *c'*, all exactly as sections of stove-pipe are united together, while the frustums and inverted frustums are united at their widest diameters by double-seaming or overlapping, as shown at g^2 in Figs. 1 and 6.

H H represent funnels or inverted cones of sheet metal, the inverted apices of which rest on the centers of the cross-strips c^3, already described, the entire series of said funnels (one in every section, or between each two plates C') being supported in vertical line and united together by the rod I, extending from the highest to the lowest of the plates C', passing through perforations in the apices of the said funnels and through the perforations c^4 in the cross-pieces c^3, and tightened at each end by bolts to secure the said frustum-sections, plates, and funnels all firmly together. The funnels H are, moreover, guarded against lateral displacement by means of the wires or rods *h h'*, which pass through the tops of said funnels, crossing each other at right angles close to the rod I, and extending as far as the inner walls, G, of the hot-air frustum-sections. The frustum-sections, plates, and funnels, being all thus put together and securely bolted to each other, are then placed upon the pipe F, (supported in turn upon the base B and bottom plate, C,) and the shell A placed over and around the whole, the upwardly-projecting rims 3 of the outer rings, c^2, of the said plates C' serving to brace and steady them against the said shell A. The top E is then placed upon the uppermost plate, C', (the outside periphery of said top coinciding with the shell A,) and the stove is complete. This top is provided with an open-work circumferential band, E', through the openings of which the air that enters through the openings in the bottom plate, C, and becomes heated between the shell A and the outer wall, G', of the hot-air passage, escapes into the room, while the air that enters through the air-pipe F and becomes heated in its upward passage between the outside of the funnels H and the inner wall, G, of the hot-air passage in the center of the stove, passes out into the room through openings in the top of the center piece, E^2, which forms part of the stove-top E, all as indicated by the several arrows, while the products of combustion escape through pipe E^3 at top (after having given off their heat to the walls G and G' in upward zigzag passage between said walls) and pass into the chimney of the room through a stove-pipe or otherwise.

The burners D consist of double-wall cylinders resting upon the base B, and either cast solidly therewith or made removable therefrom, as preferred. These double walls are united or closed at top and bottom, the top being provided with the burner-holes *d d d*, &c., the said holes extending quite a length downward through solid metal before communicating with the space between the double walls, so as to insure a long flame, which would not be the case if the said double walls extended at considerable distance apart to near the top of the burner, and there were united by a thin ring of metal having burner-holes therein, as in most of the burners known to me, and my improvement, consisting of making this ring of metal, which is perforated for the flames, very thick, or of extra length in vertical section, I regard as a very important adjunct to the successful operation of my device. The gas to be consumed is admitted to the burner through the pipe-coupling D', communicating in any convenient manner—as by rubber tube—with a gas-bracket in the room, or with any other suitable gas-supply.

Heretofore an objection has existed to the general use of gas-stoves on account of the tendency of the burner-holes to become clogged or filled with dust, (or, when the stoves were used for cooking purposes, to become filled up with the grease of cooking, &c.,) thus occasioning great annoyance and much impairing their general utility, requiring a constant outlay of time and labor in cleaning or picking out the said burner-holes. This I entirely obviate by my cleaning device, to be now described. This device is operated primarily by the lever K, suspended beneath the base, and one end of which is pivoted to a leg or other part of said base. In the several figures of my drawings I have illustrated various methods of attaching and operating said cleaner. In Fig. 1, for instance, I have shown the second lever, K', which is above and pivoted to the center of the first lever, as a straight horizontal bar, and have represented its uprights *k' k'* as straight vertical bars passing up through the bottom plate, C, and into the burner D, between its double walls, and there attached to the lower section, L, of a double ring, L L', while the upper section, L', of said double ring is provided with the cleaning-teeth *l'*—one directly under each burner-hole *d*. In order to clean the burner, it is only necessary to take hold of the handle *k* of the lower lever, K, and give it a quick upward pull, when the teeth *l'* will all simultaneously pass through their respective burner-holes *d* and instantly clear them of all dirt, grease, or other foreign substances.

In Fig. 2, instead of passing the upright arms *k'* of the second lever, K', up through the bottom of the burner D, I have shown the said arms *k'* brought first inside of the cold-air pipe F, and then passing through holes in opposite sides of said pipe up and out between the outer periphery of this pipe and the inner periphery of the burner D, then bent outwardly at right angles over the top of said burner and united to other uprights, *l*, which pass down into the burner, (through holes like the burner-holes

d, and which may be packed, if necessary,) and then, passing through the upper ring, L′, and the lower ring, L, are upset or otherwise secured to or against the under side of the lower ring, L, which ring may be otherwise united to the upper ring, L′, which bears the teeth *l′*, if deemed necessary; but in any case an upward pull of the handle *k* of the operating-lever K will instantly force all the teeth *l′* through the burner-holes *d* and clear the latter, no matter which form of cleaner attachment is used.

In Fig. 5 I have shown the same general form of burner and cleaner attachment as in Fig. 2; but in said Fig. 5 I have shown the burner without the stove and mounted on an independent base. This is to enable the burner to be used for cooking, instead of for heating a room, and in place of using the cold-air pipe F (not needed in cooking) as a guide for the uprights *k′ k′*, I have here shown the inner periphery of the burner D provided with ways or projections D^2 D^2, to serve as guides for the said uprights *k′ k′*; but it is to be understood that I may indifferently apply either or any form of attachment herein shown of my cleaning device to any style of stove or burner, as each form is the full equivalent of the others.

A great advantage possessed by my stove over those in common use consists in the great number of radiating-surfaces in my device, and the fact that both the cold and hot air is compelled to travel over the entire exposed surface in order to find an outlet, whereby the products of combustion must necessarily heat equally every portion of the frustums G and G′, while the cold air that enters through the pipe F and passes up through the center of my stove is deflected evenly and equally by the funnels H against the heated surfaces G, and, similarly, the cold air that passes up between the outer shell, A, and the outer surface of the frustums G′ finds its only outlet through the spaces between the rings *c′* and c^2 next the frustums G′, and through the narrow spaces between the widest peripheries of said frustums and the shell A, and hence the said air is compelled to follow and spread evenly and equally over said surfaces in order to escape, which it finally does after becoming thoroughly heated by said contact, out through the open-work band E′, already described, at the top of the stove.

In Fig. 6 I have shown substantially the same style of shell, frustums, funnels, and plates adapted to a heating-drum. Herein the same principle of circulation is maintained as in the stove, and the only differences of construction are such as are necessitated by the substitution of a drum for a stove. In this form of my device I am compelled, of course, to close the inner frustums, G G, at top and bottom, (preferably making cones of them, as shown,) because otherwise the products of combustion would flow straight through them without giving off all their heat, and hence it will be understood that the pipe F′ in Fig. 6 (corresponding in location to the cold-air pipe F in the other figures) is simply a section of ordinary stove-pipe communicating with a stove below, and the pipe F^2 above is the continuation of said stove-pipe, (in place of the top E^2 shown in Fig. 1,) and hence I have to perforate the bottom of the drum, as shown at *m m*, for cold air, and admit the same into the center of my device through tubes *n n*, extending from the lower frustum, G′, through the inner wall, G, and then, after this air has become heated in its zigzag upward circulation, (exactly as described in connection with the stove, Fig. 1,) allow it to escape into the upper part of the drum through other tubes, *o o o*, similar to the tubes *n n*, and thence to pass out into the room, together with the air which has been admitted to the drum through the opening in its bottom plate, C, into the space between the outer shell, A, and wall G′, flowing through the open-work band E′, precisely as hereinbefore described.

It should be understood that, if desired, I may apply a cast-iron base (similar to the base B, but without the burner) under my drum, to serve as a support thereto, (instead of riveting said drum to the stove-pipe,) when the stove from whence it derives its heat is situated in a room below the room containing the drum, in which event the lower part of the drum shown in Fig. 6, which contains the holes *m m*, could be dispensed with, thereby rendering the construction of this part of my device more nearly identical with that of the stove shown in Fig. 1; but these details of modifications are matters more particularly within the province of the skilled mechanic than that of the inventor, and do not affect the essence of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a stove or drum, of the outer cylinder or shell with an inner double wall or hot-air passage, consisting of the frustums of hollow cones united together as shown, and with a vertical central series of inverted cones supported on horizontal plates and connected by a central vertical rod bolted to the upper and lower plates, substantially as shown and described, and for the purpose set forth.

2. The combination, in a stove or drum, of the shell A and sheet-metal hollow frustums G G′, the said frustums being united at their widest diameters by lapping or double-seaming, and supported in place by means of the plates C′, composed each of a series of rings or circular flanges having upward and downward circular extensions, around which the smaller ends of the frustums are slipped to form continuous zigzag air-passages from bottom to top, all substantially as shown and described, and for the purpose set forth.

3. The combination, in a stove or drum, of the shell A, continuous hot-air passage composed of the hollow frustums G G′, united as

described, the plate C′, funnels or inverted cones H, rod I, and supporting-wires *h h′*, all substantially as shown and described, and for the purpose set forth.

4. In combination with the burner D, a cleaning device pivoted thereto, consisting of a double ring, the upper section bearing a series of teeth located under the holes of said burner, and the lower section secured to a U-shaped lever attached at its center to an operating-lever, and adapted to clean them by simply raising the operating-lever of the said device, substantially as set forth.

5. In combination with the burner D, the cleaning device described, consisting of levers K and K′, ring L, connected to the said levers, and ring L′, having teeth *l′*, one under each burner-hole, whereby all the burner-holes may be cleaned simultaneously and automatically by simply raising the lever K, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand on this 29th day of August, 1882, in the presence of two witnesses.

EMANUEL DETWILER.

Witnesses:
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HAROLD G. UNDERWOOD.