

(No Model.)

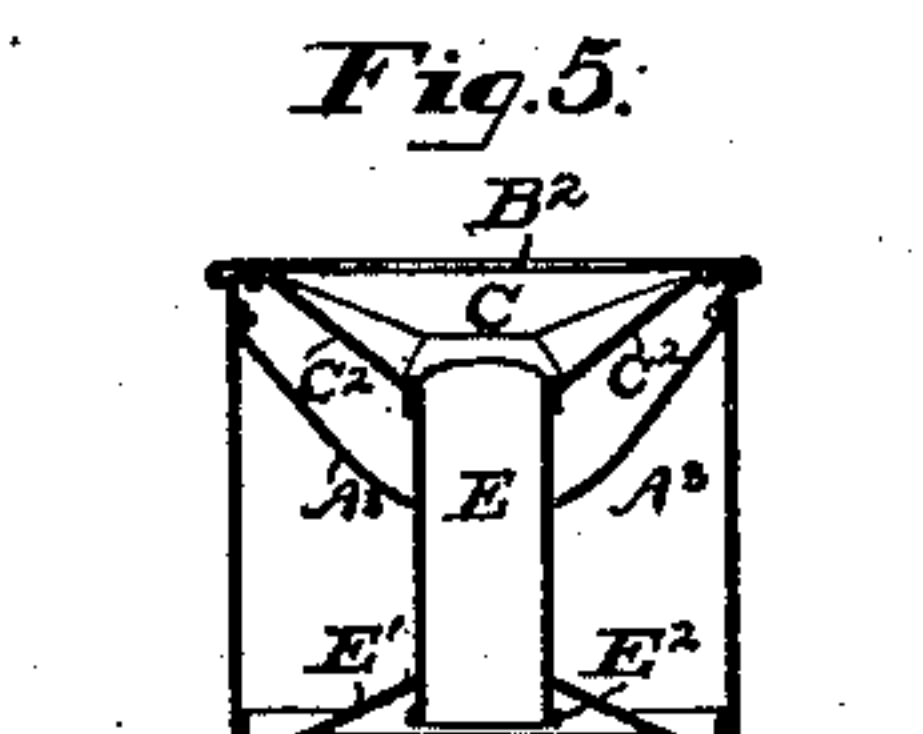
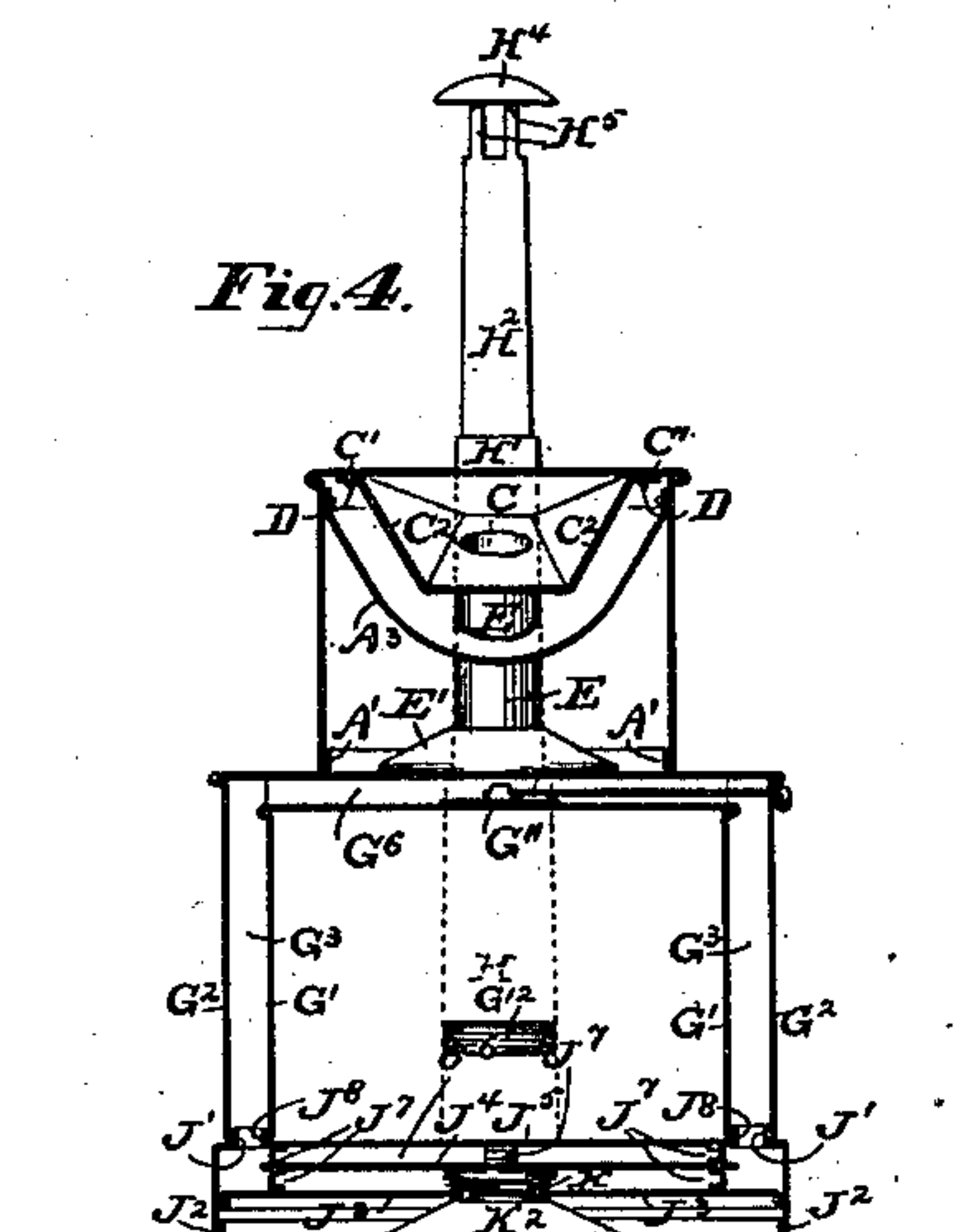
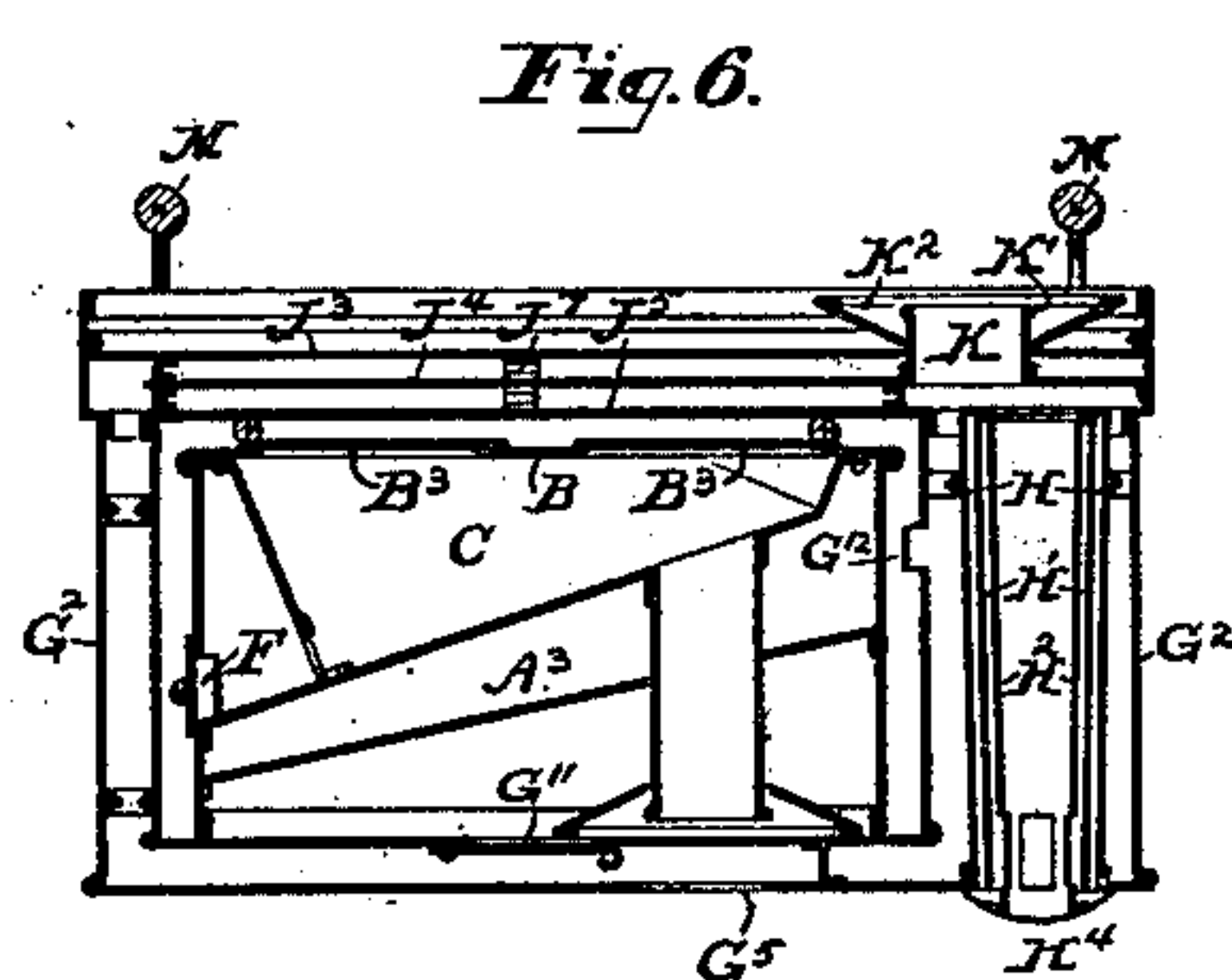
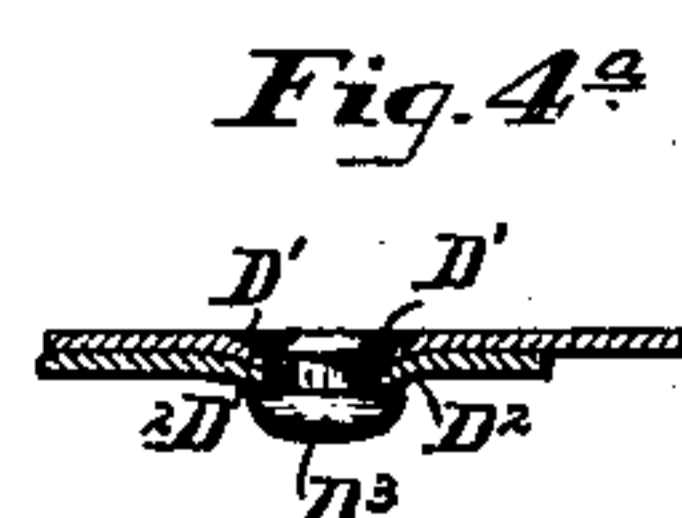
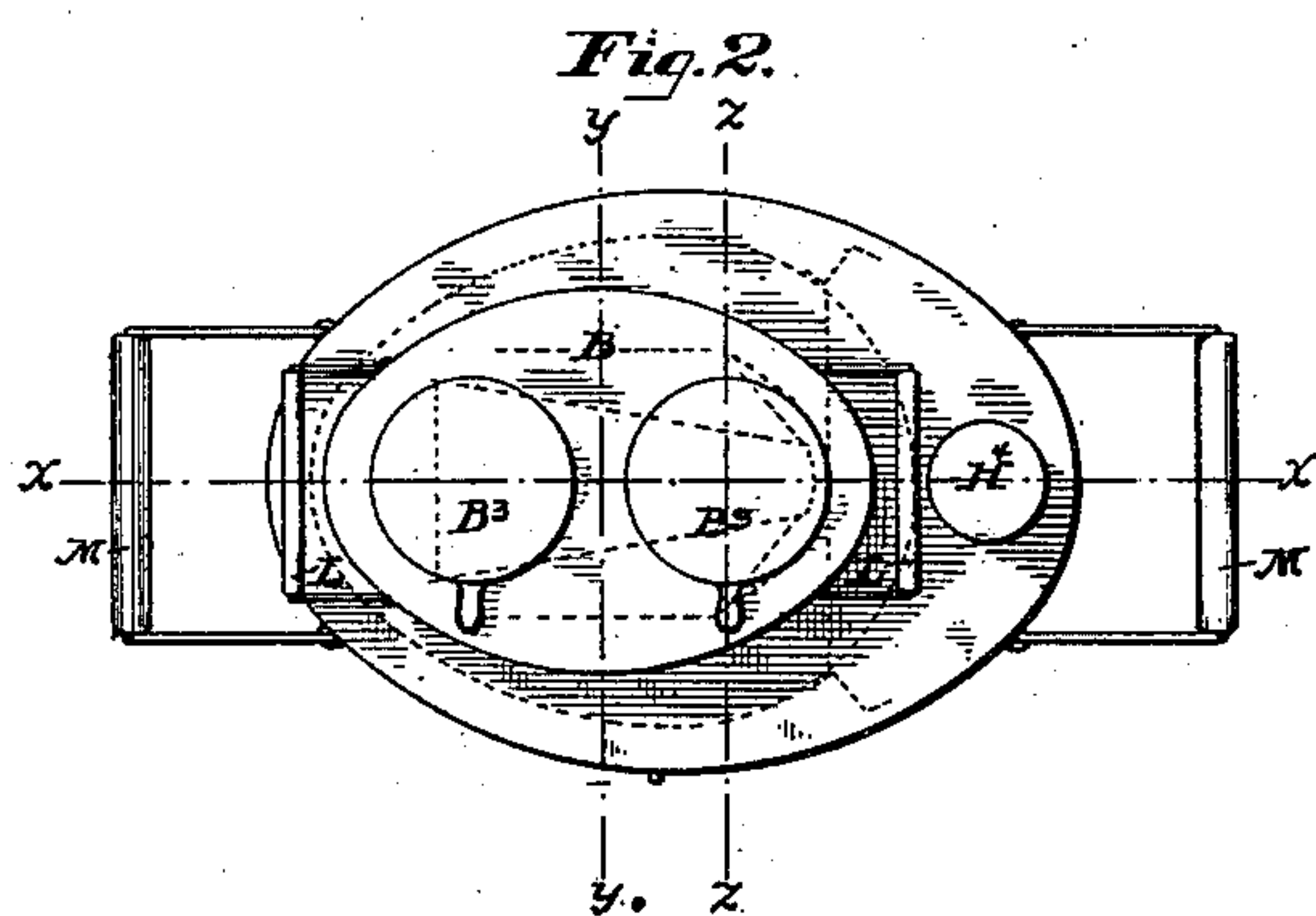
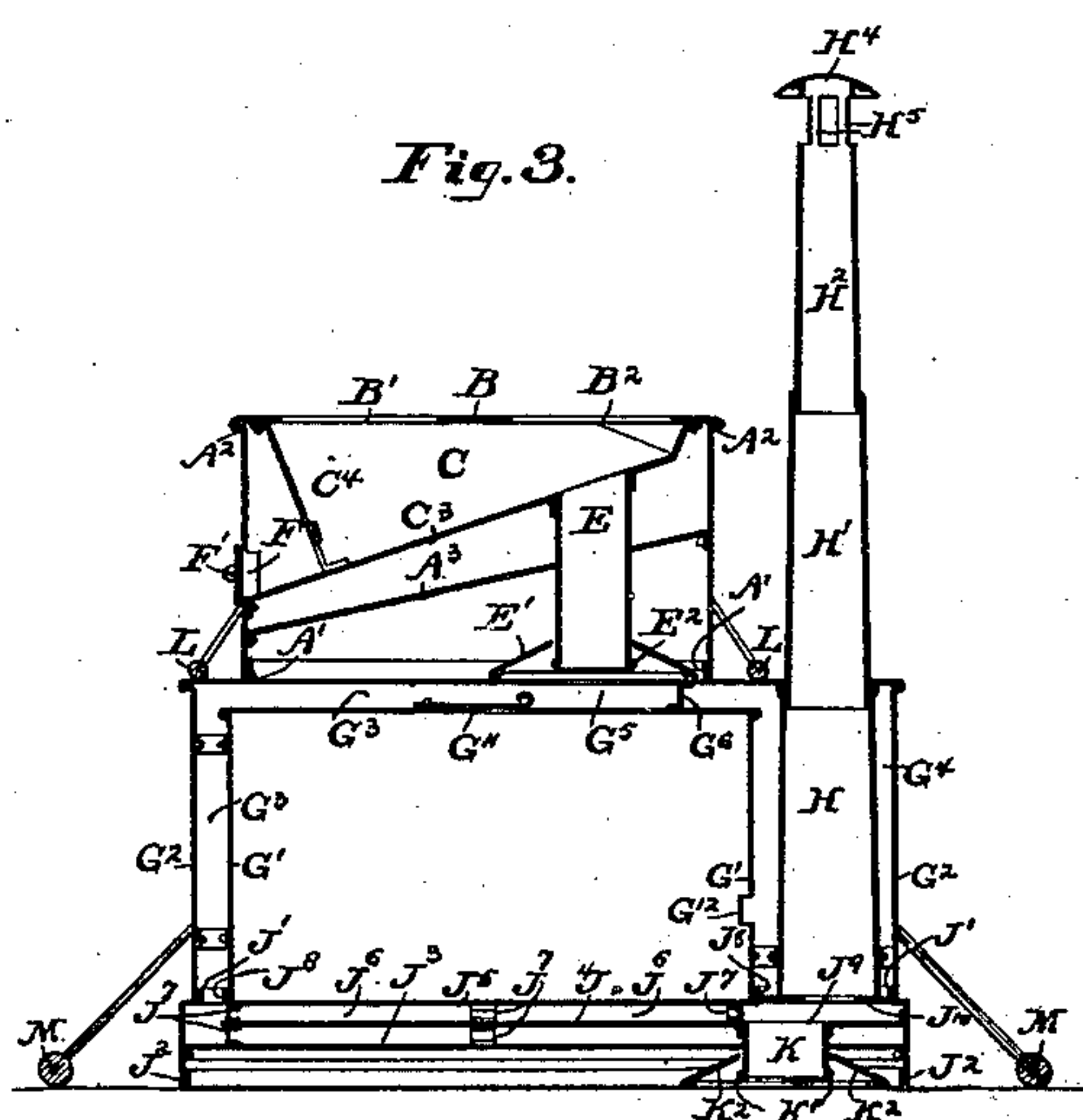
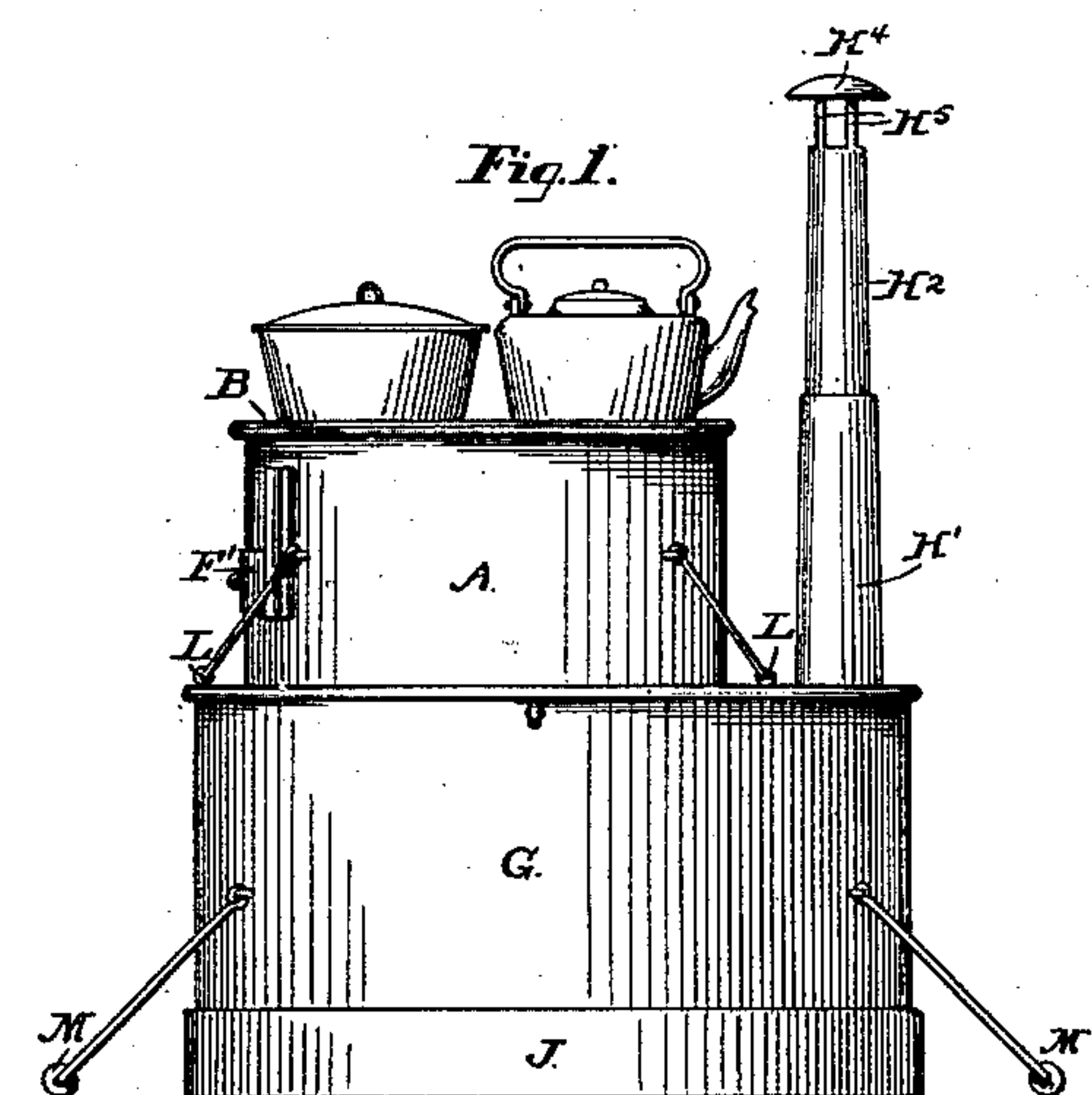
2 Sheets—Sheet 1.

S. L. WIEGAND.

PORTABLE FURNACE.

No. 334,400.

Patented Jan. 12, 1886.



WITNESSES:

A. E. Paige
Ann Wyck Buddel

INVENTOR

Shoy & Wegman

(No Model.)

2 Sheets—Sheet 2.

S. L. WIEGAND.

PORTABLE FURNACE.

No. 334,400.

Patented Jan. 12, 1886.

Fig. 7.

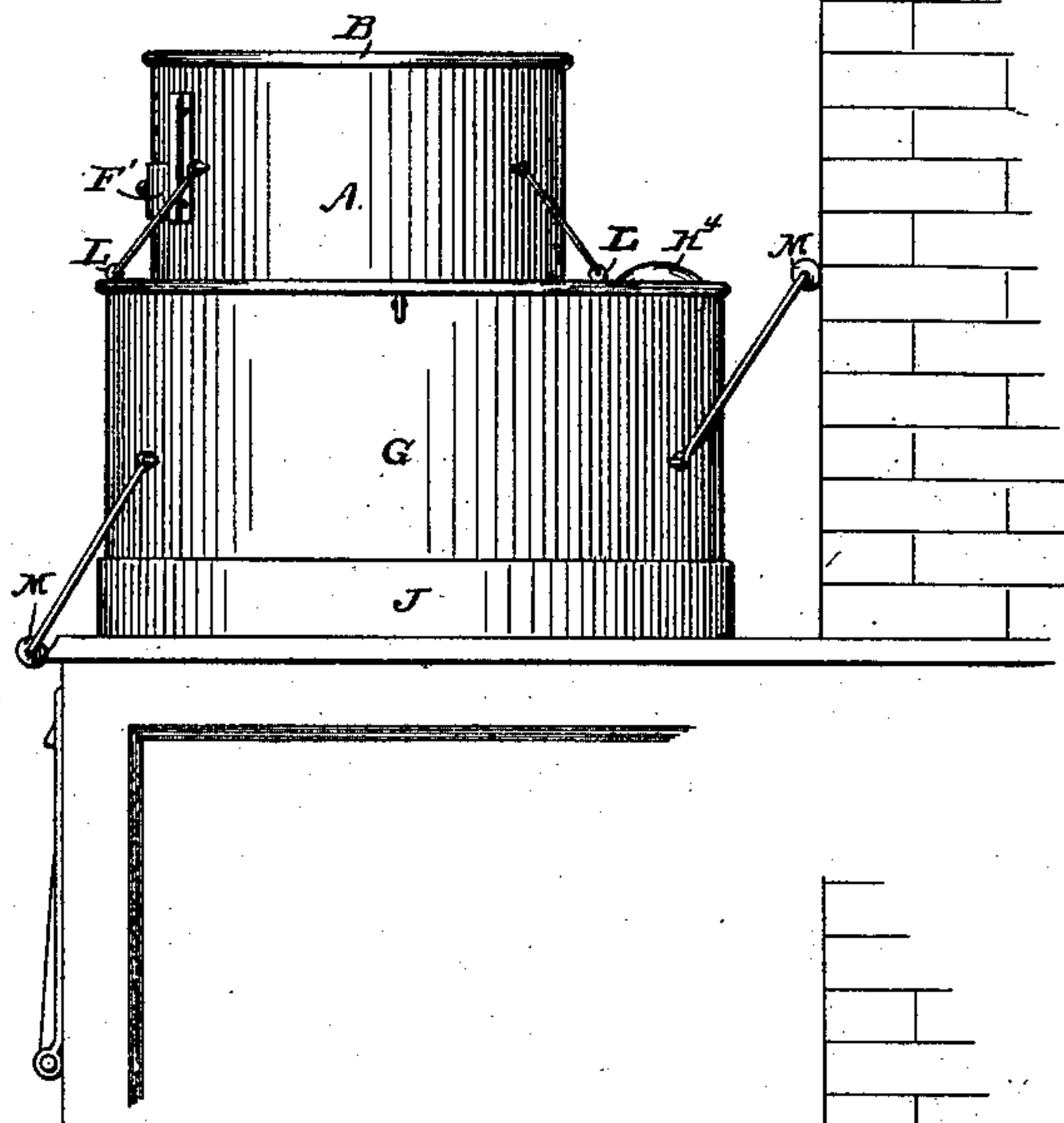
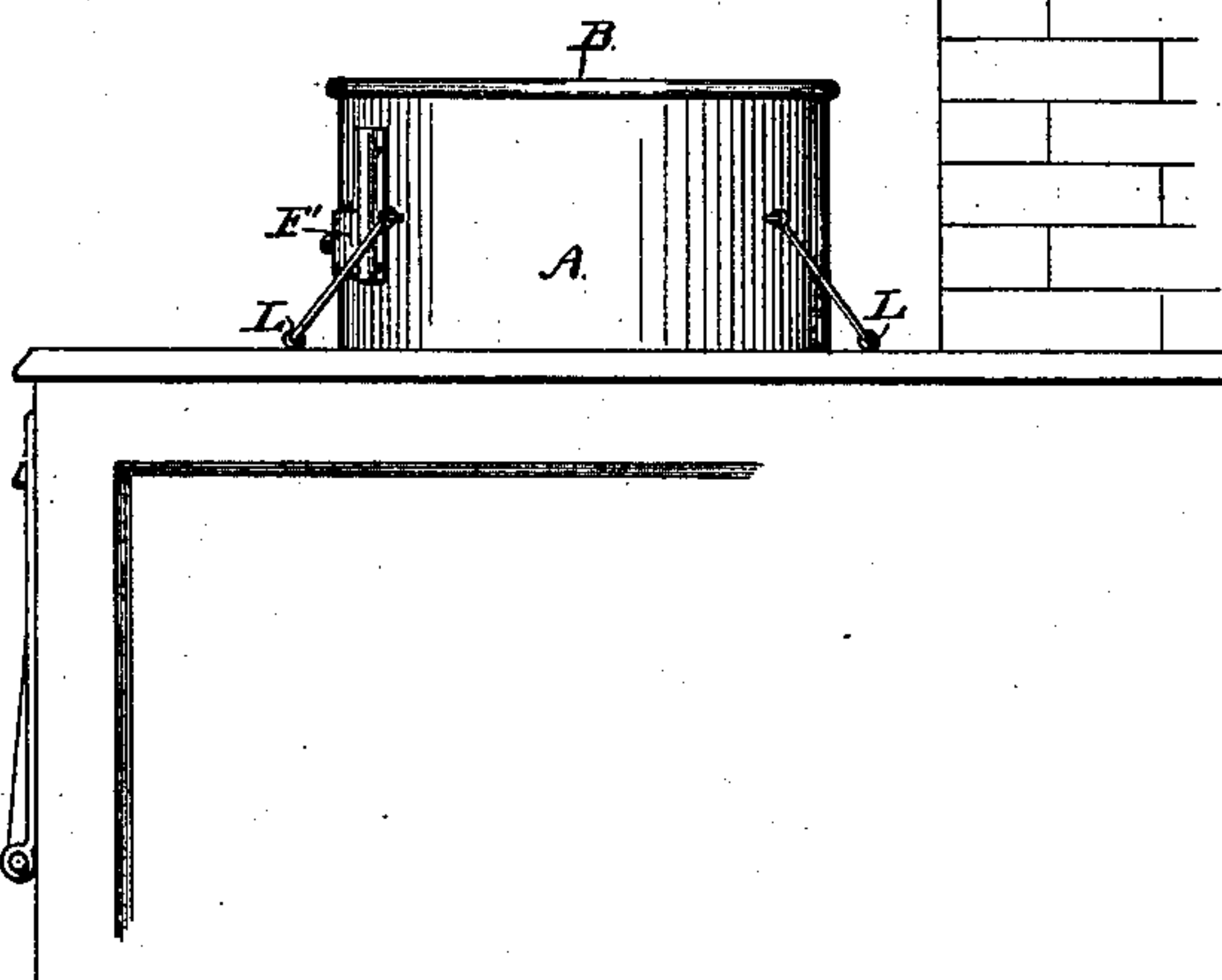


Fig. 8.



WITNESSES:

A. E. Paige.
Van Hook Budd

INVENTOR

S. L. Wiegand

UNITED STATES PATENT OFFICE.

S. LLOYD WIEGAND, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE ECONOMY KINDLING WOOD STOVE COMPANY.

PORTABLE FURNACE.

SPECIFICATION forming part of Letters Patent No. 334,400, dated January 12, 1886.

Application filed May 18, 1885. Serial No. 165,845. (No model.)

To all whom it may concern:

Be it known that I, S. LLOYD WIEGAND, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Culinary Stoves; and I do hereby declare the following to be a sufficiently full, clear, and exact description thereof to enable others skilled in the art to make and use the said invention.

This invention relates to stoves for temporary use, as for summer cooking and for cooking in camps or the open air, and has for its object the greater strength and durability of the stove, more effective cooking, economy of fuel, and convenience when in use, and lightness and compactness for purposes of storage and transportation.

To effect these desiderata, this invention may be said to consist in the combination, with a furnace formed of light material, of a surrounding casing, of cylindric or other convex form, which affords a support to top of the stove and cooking utensils resting thereon and prevents the discomfort from escaping heat, and utilizes much of the heat by reflecting it toward the furnace; also, in an improved mode of connecting the stove to the oven or other stove-fixtue to which the stove may be applied, combined therewith an oven of improved construction, in which baking by the hot products of combustion delivered from the stove is effected with but slight loss by radiation, and a chimney combined with such oven, whereby the stove may be used in the open air, or when used in houses having a permanent flat-topped range or stove connected with a chimney the draft of such chimney through the stove may be used. Incidentally the invention involves an arrangement of flues directing the draft, as fully hereinafter explained.

The following is a full and particular description of the construction and operation of this invention, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of the entire apparatus as erected for use in the open air as a camp-stove; Fig. 2, a plan view thereof; Fig. 3, a vertical section in the plane indicated by the dotted line *x x* in Fig. 2; Fig. 4, a transverse vertical section in the plane

indicated by the dotted line *y y* in Fig. 2; Fig. 4^a, a detail therein enlarged; Fig. 5, a section of the furnace in the plane indicated by the dotted line *z z* in Fig. 2. Fig. 6 shows a section of the apparatus as packed for transportation. Fig. 7 shows the invention as arranged for use on a cooking-range for baking and boiling simultaneously, and Fig. 8 shows the invention as arranged for boiling and broiling only.

The same letters of reference apply to the same parts in the several figures of the drawings.

A represents an outer shell, of circular or oval shape, formed of smooth bright plate metal, so as to have good reflecting-surfaces, and wired or doubled over or "hemmed" at the lower edge or rim, A', so as to stiffen it. The upper edge, A², is seamed or locked into the furnace-top B, of thin metal and of circular or oval form.

In the furnace-top B are two openings, B' and B², of circular form, adapted to fit culinary vessels, and provided with covers B³, or griddles, also formed of thin metal.

To the under side of the furnace-top B is fastened the furnace-chamber C, made of ductile metal in the shape of a trough, and having flanges C' upon the upper edges of its sides C², by which it is riveted to the furnace-top B, preferably by rivets having countersunk heads on the upper side, so as to be flush with the upper surface of the furnace-top B, and with the countersinks for receiving the head formed by making conical depressions in the plate B and the flange C' by stamping the metal into that form with a suitable punch or die, thus avoiding projections on the furnace-top and stiffening the flanges C' around the rivets. This peculiarity of riveting is shown in the section in Fig. 4, the rivet-head being indicated by the letter D, and is shown enlarged in Fig. 4^a, where the cone in the plate B is marked D', and in the flange C' is marked D², and the lower or button head of the rivet D³. The proportions of the furnace-chamber C are such that the bottom C³ is above the lower edge, A', of the shell A, and is narrower than the top of the chamber C, so that the sides C² converge toward the bottom. The furnace-chamber does not extend the entire length of the

shell A, but at the upper end, at a short distance from the shell A, is connected to the plate B, and near to the upper end has attached to it a cylindric flue-tube, E, projecting downwardly, and at the other in a partition, C⁴, forming the front of the fuel or furnace chamber, reaching from the plate B not quite to the bottom of the trough, leaving a space for the admission of air to the fuel. The trough of the furnace C is extended beyond the partition C⁴ to the shell A, to which it fits closely, and an aperture, F, is made in the shell A, through which air is admitted to the trough C, and the supply thereof is regulated by a door or gate, F', sliding thereon. The bottom C³ of the furnace-chamber C is inclined toward the partition C⁴, so that the fuel will tend to lie near the inflowing air current passing under the partition C⁴, and avoid obstruction of the flue-tube E, and reflect the flame and heat upwardly and backward upon the under side of the plate B, the converging sides C², as they approach the flue-tube E, also contributing to the same effect. The flue-tube E is of such a length as to be sufficiently above the lower edge, A', of the shell A not to come in contact with any of the projections usual from warping or defective molding of the top plates of stoves when the shell A is rested thereon.

Upon the tube E is fitted closely, but sufficiently loose to slide up and down freely, a blunt conical collar or inverted funnel, E', of sufficient external diameter to cover the ordinary griddle or pot hole opening of a stove or range top. A bead or collar, E², formed on the lower end of the tube E prevents the cone E' from becoming detached. When placed upon the top of a stove or range, or the oven G, hereinafter described, forming a part of this invention, the rim of the funnel E² adapts itself to deviations from level in the surface upon which it rests, and causes air drawn into the opening over which it is placed to flow through the furnace C and flue E.

Beneath the furnace C, and within the shell A, is placed a reflecting-plate, A³, the function of which is to diminish the waste of heat by radiation from the furnace C.

The oven G of this apparatus consists of two chambers or inverted boxes, G' and G², with flat tops, preferably cylindric or elliptic in form, the inner and smaller one, G', being of sufficient size to contain the furnace, and the larger chamber, G², such size as to fit over the smaller one, G', and leave a space sufficient to form a flue, G³, enveloping the smaller chamber in the heated products of combustion, and, in addition thereto, a space sufficient at the part G⁴ to contain a chimney, H.

In the top of the chamber G² is an opening, G⁵, through which the products of combustion from the furnace enter the oven, the furnace being placed on top of the oven G with the flue E over the opening G⁵, and the rim of the collar E' resting on the flat top of the oven. Upon the outer side of the chamber G' are

placed wings or projecting flanges G⁶, so as to center the chamber G' in the chamber G², and to so guide or direct the flow of the products of combustion in the flue G³ that they may evenly heat the oven. The base J of the oven is made similar in form to the top thereof, with a rim, J', projecting upwardly, of such size as to fit around the lower rim of the chamber G², and another rim, J², projecting downwardly, upon which it rests. The base J consists of three plates of metal having spaces between them, the lower one, J³, and middle one, J⁴, being of bright-surfaced reflecting metal, and the upper one, J⁵, being of metal having good heat conducting properties. The upper plate, J⁵, has a rim, J⁸, fitting closely but not tightly into the lower rim of the chamber G', leaving a flue, J⁶, between the plates J⁴ and J⁵, the plates J⁴ and J⁵ being secured to each other by pillars or braces J⁷, which serve to stiffen these plates as well as hold them together. From an opening, J⁹, in the plate J⁴ is a flue-tube, K, leading downwardly, and having a bead, K', upon its lower end, for retaining upon it a blunt conical collar, K². The relation of the collar K² and tube K and its proportions in reference to the rim J² is the same as the flue E and collar E' to the rim A' on the furnace, the function of the flue and collar being to afford a means of connecting the oven G to the draft through the griddle or pot hole openings of a stove or range, and when stood upon the ground to close the opening of the flue J. Through the top of the chamber G² is a chimney, H, extending down to and fitting upon a collar, J¹⁰, in the plate J⁵. This chimney H is preferably made slightly tapering, with the larger end downward. Into it slides a series of similarly-tapered extensions, H, H², and H³, which, when extended, make a chimney reaching considerably above the furnace and fit closely in each other, and when closed into each other are contained within the height of the oven G. A covering plate or cap, H⁴, supported by pillars H⁵, forms the upper termination of the inner section and acts as chimney-cap to promote draft when extended, and when closed down, fitting closely on the top of the oven G, closes the chimney. Handles L L, preferably with wood or other slow-conducting coverings, are attached to the furnace-shell A, by means of which the furnace can be lifted, and similar handles, M M, are attached to the oven G, for like purposes.

In the top of the chamber G' of the oven is a small opening, G¹¹, provided with a damper, by means of which any steam or fumes from the cooking can pass into the flue G³, and a small opening, G¹², is also made near the bottom of the oven, by means of which a portion of the products of combustion can be passed through the oven when in operation, producing an effect of "browning" not obtained by the heat as conducted through the material of the oven.

The operation of this invention is as follows: When packed, the chimney H is telescoped

into the oven, the furnace in its shell A is placed on the plate J⁵, and the oven G placed over it, producing a compact package resembling in form a small band-box. When required for use in baking in a dwelling where there is a flat-top range, the oven G is placed upon the top of the range, with a griddle thereof removed and the flue-tube over such opening, the rim of the collar K² resting with its edge upon the flat surface of the stove, the oven resting upon the base J, with the rim J² thereof supported by the stove, the chimney H is closed down so that the cap H⁴ is closed upon the top of the oven G. The furnace is placed upon the oven G, with its rim A' resting thereon, the flue E being over the opening G⁵, and the collar E' resting upon the top of the oven G. Lightkindling material—such as paper or shavings—being placed in the furnace-chamber C, and small pieces of wood or charcoal placed thereon through the opening B', the openings B' and B² are closed by the griddles B³, and the draft-slide F' being opened the kindlings are ignited by a lighted match or flame introduced through the opening F. The air flows in through the opening F to the fuel, and the products of combustion pass from the fuel in the converging space in the chamber C to the descending flue E, through which they are drawn down, and, passing through the opening G⁵ in the top of the oven G, enter the flue-space G³, and thus envelop the inner chamber, G', in hot products of combustion, which, passing thence from the lower part of the flue G³, enter the flue-space J⁶ in the base J of the oven between the plates J⁴ and J⁵, and from there are discharged downwardly through the flue K into the stove or range, the chimney-draft of which carries them away. In their transit through the flues surrounding the oven-chamber the products of combustion impart most of their heat to the oven and its contents. When used as a camp cooking apparatus, the flue K is closed by the collar or cone K² resting upon the ground or other flat surface, and the telescoping chimney H being extended the draft is produced by and the smoke and products of combustion are discharged through it. When the oven is sufficiently heated, the articles of food are placed upon proper supports on the base J, and the oven and furnace replaced and the cooking proceeds. When merely boiling or broiling are to be performed and the operation conducted where there is a stove or range having a good draft, the oven G is dispensed with and the furnace stood directly upon the stove with the flue E over the opening in the range-top and the collar E' resting upon the stove-top. Articles to be boiled are then placed over the openings B' and B², and the cooking speedily takes place, because, first, but very little heat is expended or wasted in heating the material forming the stove, and much of the heat radiated is retained by the reflecting properties of the body A, reflecting-plate A³, and the outer skin of the oven G² and reflect-

ing-surfaces J³ and J⁴, so that but little heat is wasted, and in warm weather the comfort of attendants is greatly promoted by confining and directing the heat that would otherwise be lost into the cooking utensils and their contents.

It is obvious that portions of this invention may be used separately—as, for instance, the stove without the reflecting-shell A, or with the reflecting-shell A and without replacing-plate A³. The operation of the remaining parts, although less perfect, is yet useful.

I am aware that portable stoves have been made of both cast and wrought metal, wherein the products of combustion were discharged into the flue or furnace of a stove having a chimney-draft; also, that portable stoves have been made wherein the oven was constructed to contain the furnace and other parts for purposes of transportation or storage. None of these do I claim.

By retaining the heat by a reflecting jacket and plates and suspending the furnace from its upper edge I am enabled to employ lighter metal than would be admissible were the furnace supported from below, and less heat being absorbed by the material of the furnace and less loss by radiation the heat from the fuel is more fully and immediately utilized, thus saving both time and fuel.

Having described the said invention and the mode of operating the same, what I claim is—

1. The furnace C, consisting of an inclined bottom, C³, connected at the rear to the plate B, sides C², partition C⁴, draft-opening F, and descending flue E, combined with the top plate, B, and reflecting and supporting casing A, constructed to operate as set forth.

2. The furnace C, consisting of the inclined bottom C³, partition C⁴, sides C², draft-opening F, and descending flue E, suspended from and in combination with the horizontal top plate, B, and reflecting-plate A³, constructed and arranged to operate substantially as set forth.

3. In a portable stove or furnace formed of light ductile metal for culinary use, the combination of the reflecting shell or jacket A with the furnace-top B, the furnace-chamber C, with converging sides and inclined bottom, the partition C⁴, draft-opening F, flue E, having a funnel, E', thereon, and the reflecting-plate A³, all constructed and arranged substantially as and for the purpose set forth.

4. In a portable furnace or summer cooking-stove, the combination of the flat top plate, B, supported by its outer edges, and having openings B' B² therein for the reception of cooking-vessels, with a furnace suspended from said plate B, having inclined sides C², rear and front walls provided with a draft-opening, and bottom C³ inclined upwardly from the draft-inlet to the outlet-flue, and outlet-flue E, substantially as set forth.

5. In a portable furnace or summer cooking-stove, the combination of an oven the

sides, top, and bottom of which are constructed with double plates and with flues between said plates, through which hot products of combustion may be circulated from a furnace, 5 with a descending flue, K, and a telescoping chimney, H, susceptible of two adjustments, whereby in one adjustment the products of combustion are discharged through the chimney, and in the other the chimney is closed 10 and the products of combustion escape through the flue K, substantially as set forth.

6. The combination of the furnace C, having a descending flue, E, and collar or cone E', with the oven G, having an opening, G⁵, a 15 surrounding flue, partitions G⁶, and openings G¹¹ and G¹², communicating from the interior

of the oven to the surrounding flue, constructed and arranged to operate substantially as and for the purpose set forth.

7. The combination of the furnace C, having a descending flue, E, and reflecting-jacket 20 A, with the oven G, having flue-spaces at the top and sides, and an opening, G², in the top thereof, and a base, J, having plates J³, J⁴, and J⁵, forming flue-spaces, and flue K and 25 chimney H, all constructed and arranged to operate substantially as set forth.

S. LLOYD WIEGAND.

Witnesses:

VAN WYCK BUDD,
J. DANIEL EBY.