

Sheet 1. 2 Sheets.

G. W. Swett.

Cooking Stove.

N^o 92,223.

Patented July 6, 1869.

Fig. 1

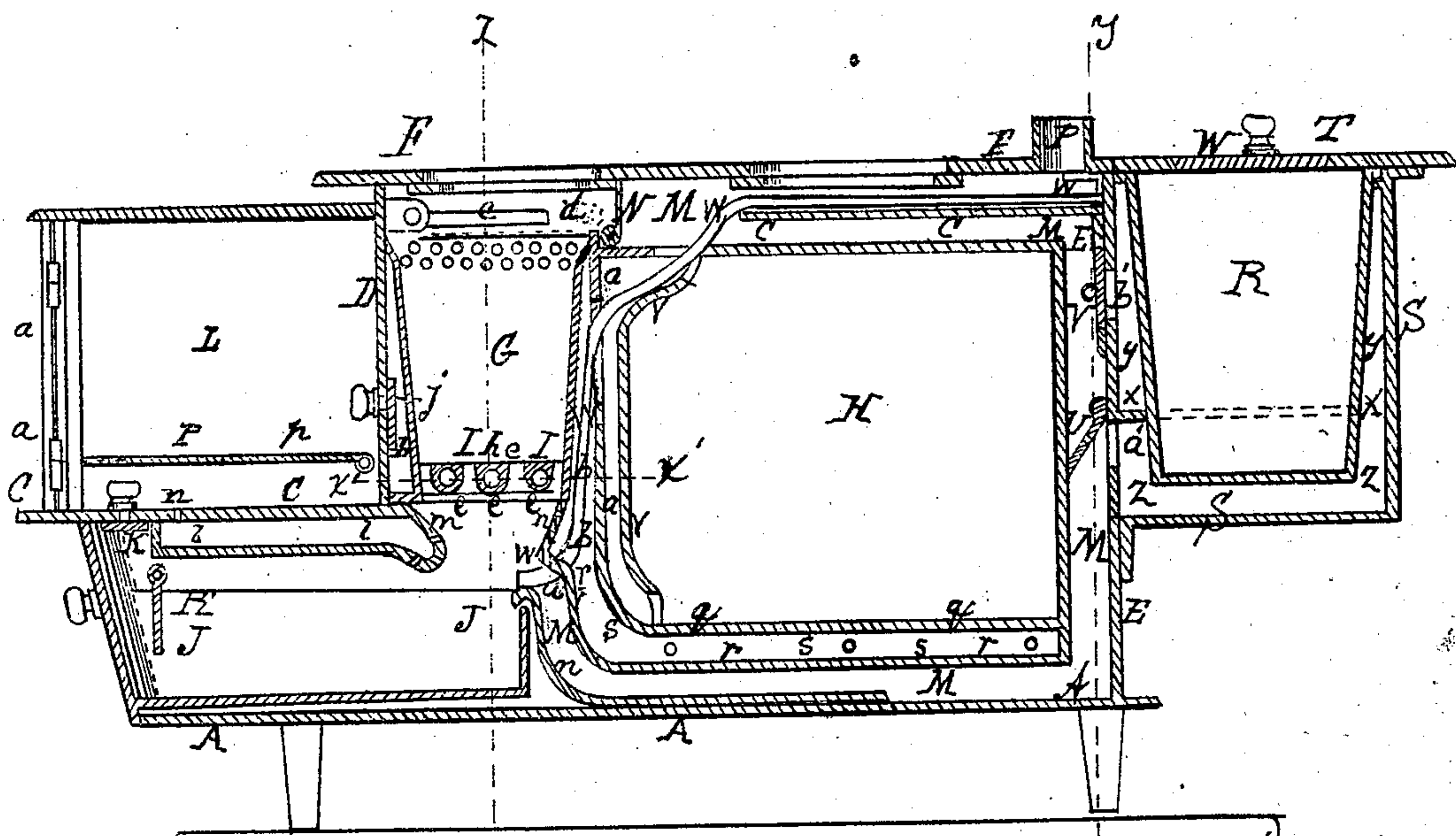
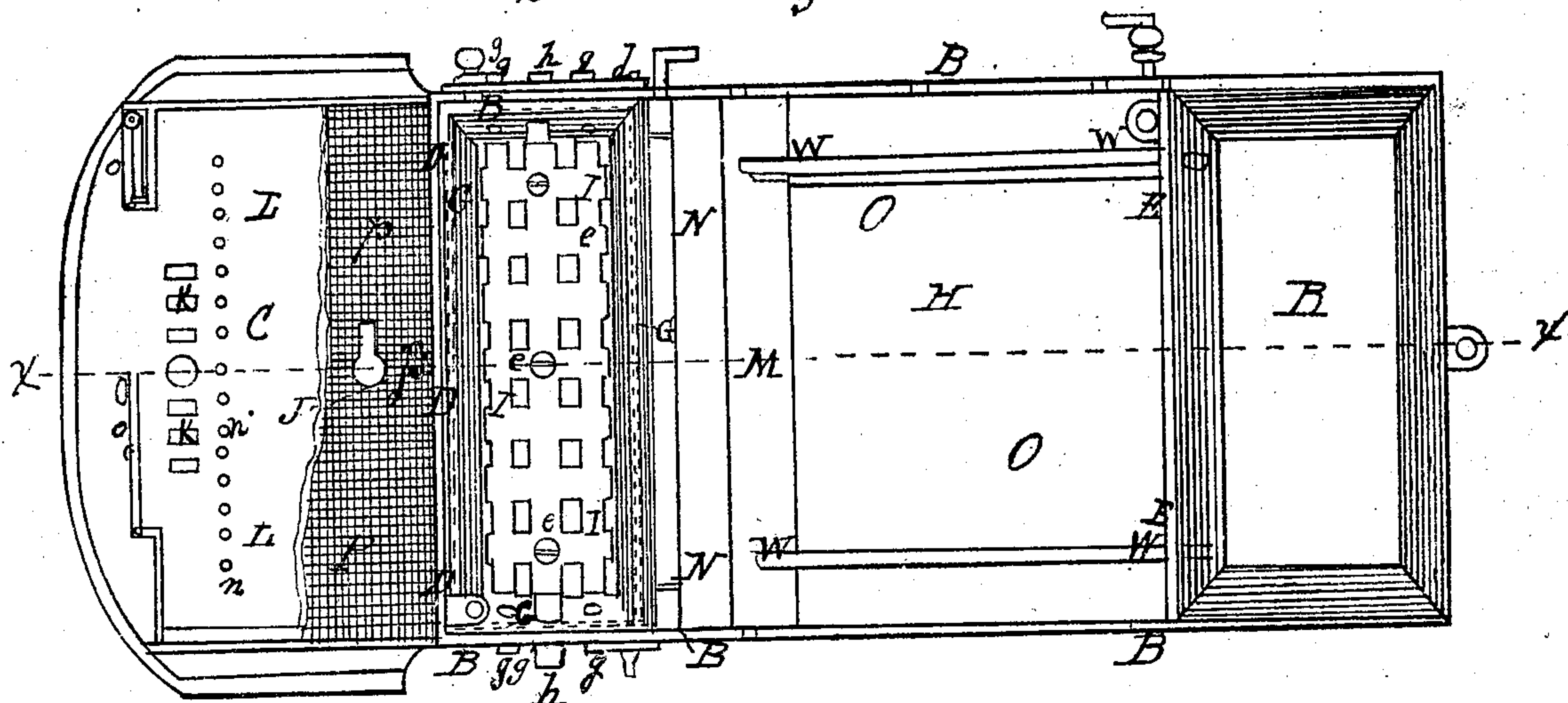


Fig. 2.



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Sheet 2. 2 Sheets.

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Fig. 3

Fig. 4

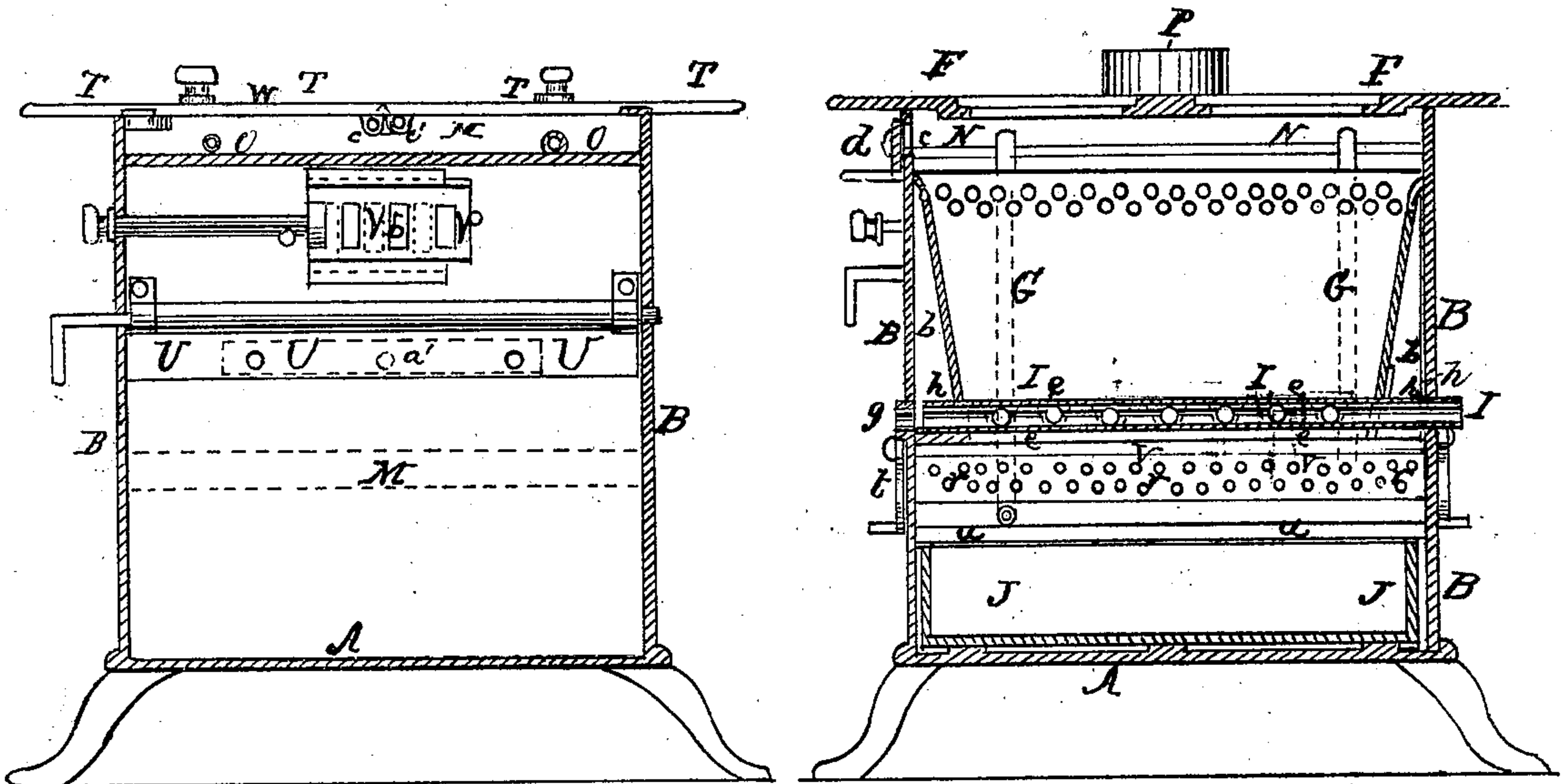


Fig. 5

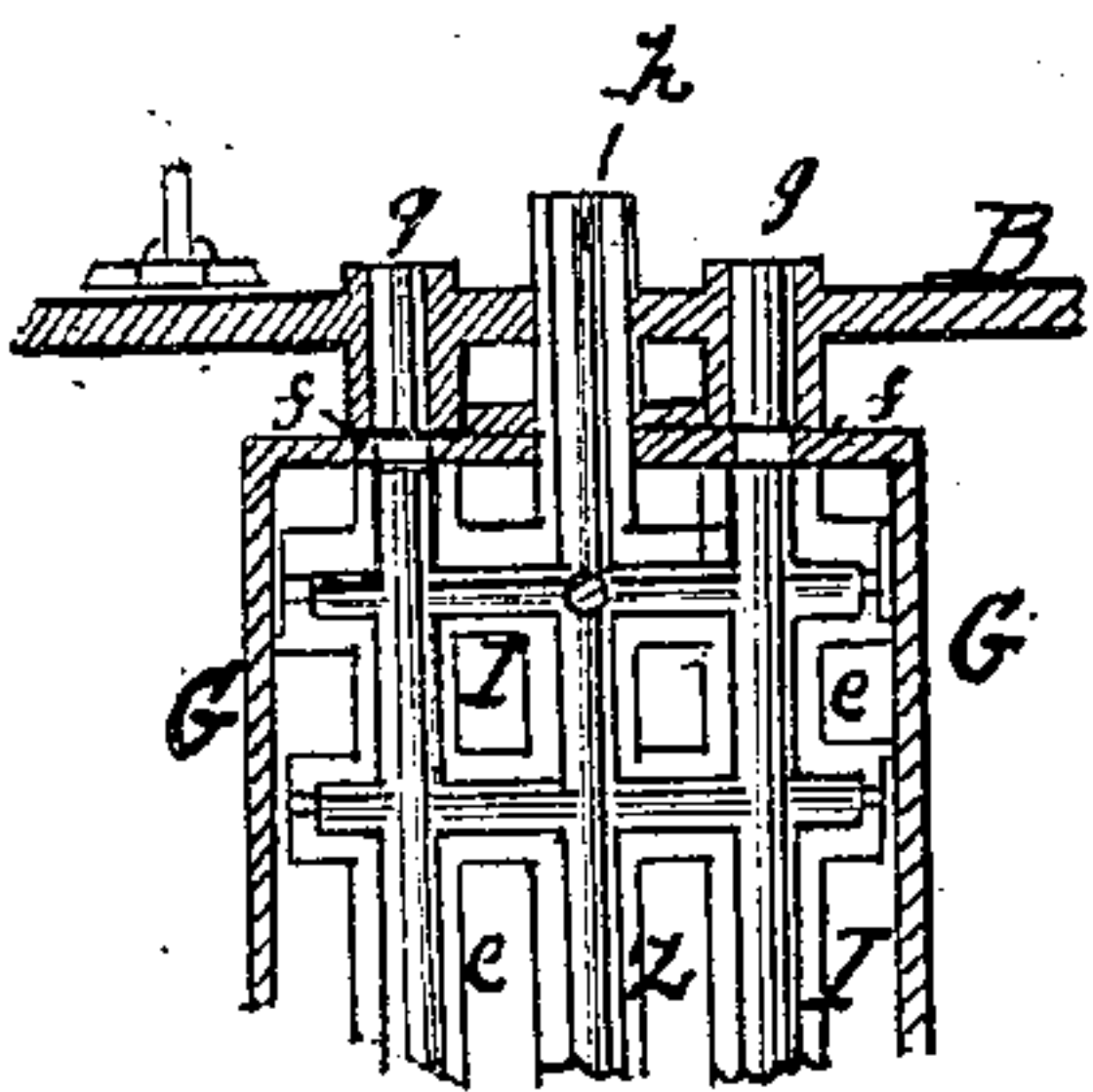


Fig. 6

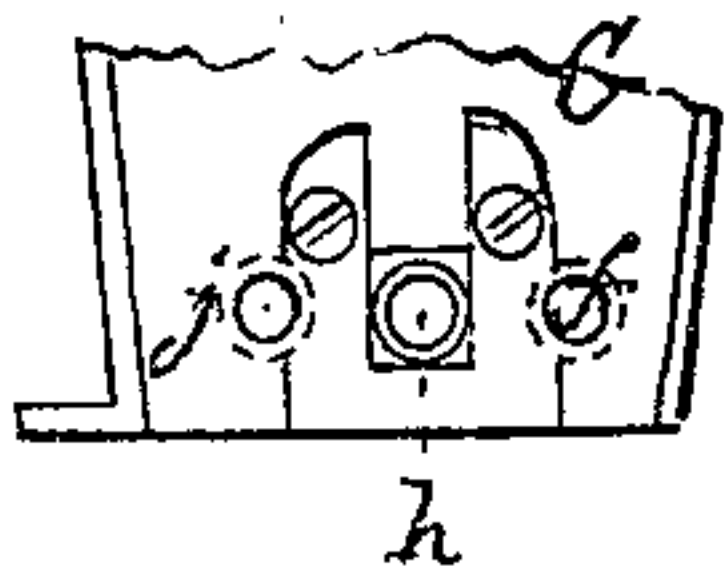


Fig. 8

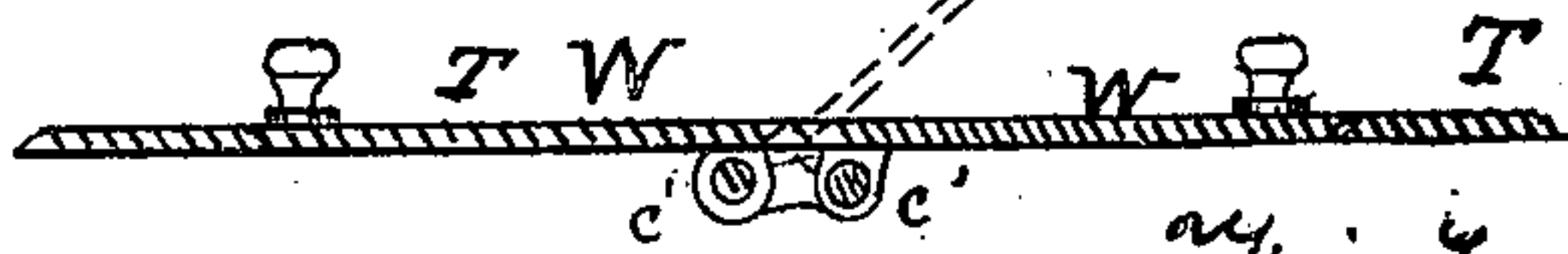
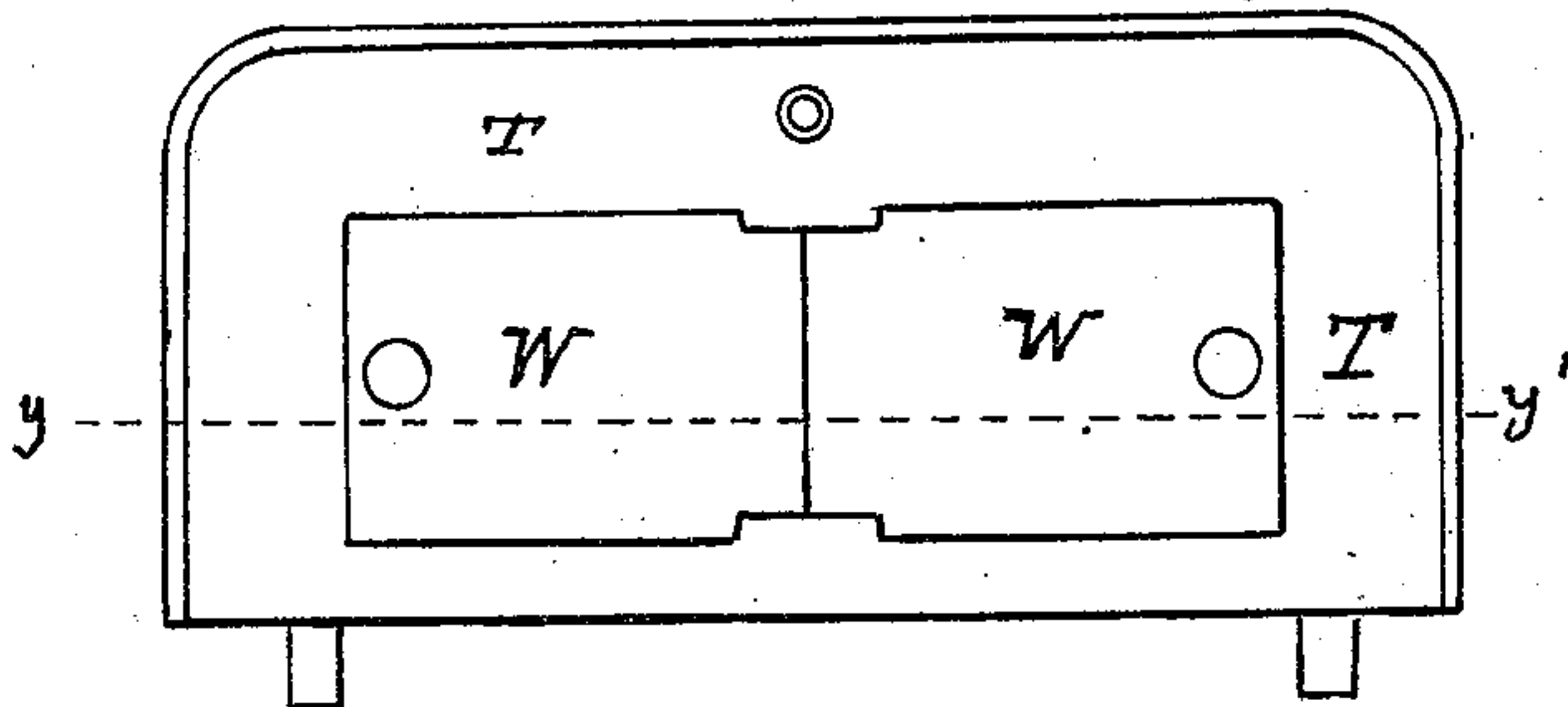


Fig. 7



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GEORGE W. SWETT, OF TROY, NEW YORK.

Letters Patent No. 92,223, dated July 6, 1869.

COOKING-STOVE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, GEORGE W. SWETT, of Troy, in the county of Reusselaer, and State of New York, have invented a new and improved Cooking-Stove; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1, Sheet I, represents a vertical longitudinal section of my improved cooking-stove, the plane of section being indicated by the line $x-x$, fig. 2.

Figure 2, Sheet I, is a plan or top view of the same, the top plate of the stove being removed.

Figure 3, Sheet II, is a vertical transverse section of the same, taken on the plane of the line $y-y$, fig. 1.

Figure 4, Sheet II, is a vertical transverse section of the same, taken on the plane of the line $z-z$, fig. 1.

Figure 5, Sheet II, is a detail horizontal section of the same, taken on the plane of the line $x-x'$, fig. 1.

Figure 6, Sheet II, is a detail end view of the fire-box.

Figure 7, Sheet II, is a detail plan or top view of the water-reservoir cover.

Figure 8, Sheet II, is a detail vertical section of the same, taken on the plane of the line $y'-y'$, fig. 7.

Similar letters of reference indicate corresponding parts.

This invention relates to a new cooking-stove, which is so arranged that the fuel, as well as the heat produced by the same, are utilized to the best advantage, and that, without any complicated mechanism and arrangement of parts, thorough heating, together with complete draught and good ventilation, will be obtained.

The invention consists, first, in making the grate of the stove of a series of longitudinal and transverse tubes, that are slotted at the sides, and that communicate with each other and with the outer air, so as to be kept cool by the air that passes through them, as well as to supply the fire with air, to facilitate combustion.

The invention consists, secondly, in extending the two ends of one tube thus formed in the grate, to form hollow trunnions, for pivoting the grate.

The invention consists, thirdly, in the application of apertures through the sides of the stove, above and below the fire-place of the same, and in providing dampers thereon, for the purpose of producing and regulating greater or less draught directly on the side of the fire-box.

The invention consists, fourthly, in arranging an oven in front of the fire-box, and above the ash-pan, for baking and warming-purposes, it receiving the surplus heat from the front plate of the fire-box, and serving to heat the air that passes through apertures in the back of said front oven into the fire-box.

The invention consists, fifthly, in providing a damper above the fire-place, in the transversely-undivided upper part of the stove. This damper arrests the smoke, and causes it to pass down through the flame and grate into a lower channel of the stove. Perfect combustion of gases is thereby obtained, as they all have to pass back through the flame.

The invention consists, sixthly, in providing, by means of a plate, a channel under the main oven, whereby, through side-openings of the stove, cold air is drawn in and carried to the back of the fire-place.

The invention consists, seventhly, in providing a draught-channel and chamber in front of the fire-place, under the hearth-plate.

The invention consists, eighthly, in carrying the aforesaid front and back channels so far under the grate that a narrow cold-air entrance, for carrying air to aid combustion, is provided.

The invention consists, ninthly, in conducting-pipes from the hot-water reservoir to the fire-place, for the purpose of supplying steam to the flame, whereby combustion is aided.

The invention consists, tenthly, in arranging in the main oven a shield, perforated at the upper and lower ends, whereby a circulation within the oven is obtained, to have the temperature therein even.

The invention consists, eleventhly, in providing a horizontal partition in the chamber that surrounds the hot-water reservoir, and in forming an entrance to said chamber in the lower part of the same, so that the smoke will first enter the lower part of the chamber, then rise through an aperture in the horizontal partition, and finally escape from the upper part of the chamber, through an aperture, into the regular smoke-channel of the stove. The reservoir will thus receive a complete circulation of hot products of combustion around it.

The invention consists, twelfthly, in so arranging the covers of the reservoir, that they have inwardly-bevelled edges, resting on correspondingly-bevelled edges of the top plate, so that all moisture dropping off the cover when open will fall back into the reservoir.

The invention consists, thirteenthly, in providing a horizontal partition in the upper return smoke-channel, or flue of the stove, for the purpose of forming an additional detention of smoke, and consequent greater absorption of its heat.

The invention consists, fourteenthly, in the application of a suspended draught-plate in the ash-pan, said plate serving to guide the front draught in a solid column directly to the flame, to prevent its being scattered.

The invention, finally, consists in providing within the aforesaid oven, which is in front of the fire-place, a perforated hinged plate, which will serve to support vessels or articles to be heated, and which can be

folded up out of the way, when it is desired to place the articles directly upon the bottom of the oven.

A, in the drawing, represents the main bottom plate of my improved stove;

B B are the side plates of the same;

C is the hearth-plate;

D, the front plate;

E, the back plate; and

F, the top plate of the same.

These seven parts are connected in suitable manner to form a stove of suitable form and size.

G is the fire-box, inserted between the front plate E of the stove and the front plate *a* of the oven H, in such manner that an air-space, *b*, is formed all around the fire-box, said air-space being closed on top by the inclined side and end plates of the fire-box, as shown in fig. 1.

The upper parts of the sides and ends of the fire-box are perforated, as shown, so that air can, from the channel or air-space *b*, enter the upper part of the fire-box.

Above the fire-box are apertures, *c c*, through the sides B of the stove, which apertures can be more or less closed by means of sliding or other dampers, *d*.

I represents the grate.

It is composed of a series of longitudinal and transverse tubes, all communicating with each other, and is made of two metal plates, *e e*, which form respectively the upper and lower halves of said tubes, as shown.

The longitudinal tubes are open at their ends, and are in line with apertures *f*, that are arranged through the end of the fire-box, and that communicate with open tubes, *g*, that are arranged through the sides B of the stove, as shown in fig. 5.

The tubular grate receives thus a full supply of air from the outside, through the tubes *g* and holes *f*, and this air escapes into the stove through crevices left between the two plates *e e*.

The central longitudinal tube *h*, of the grate, is prolonged beyond the ends of the grate, for the purpose of reaching through the ends of the fire-box and stove, to form the pivoted support of the grate.

The ends of the tube *h* are also open, to allow the circulation of air through the same.

The apertures *c*, besides serving as draught-holes, may also be used for inserting instruments for stirring or adjusting the fuel on the grate.

The front stove-plate D has a series of apertures, that may be closed or more or less opened, by means of a slide, *j*.

Between the hearth-plate C and the bottom plate A of the stove is arranged the ash-pan J, which receives air through apertures in the hearth-plate, that can be regulated by a slide, *k*.

From the hearth-plate C is suspended into the ash-pan a transverse plate, K, which reaches nearly to the bottom of the ash-pan, and from end to end of the same. It serves to cause the air entering through the apertures of the hearth-plate to be collected at the bottom of the ash-pan, and to pass under the lower edge of the plate K, so that it will, in a solid body, be conducted to the fire-place. When allowed to scatter in the ash-pan, the air is not as valuable to aid combustion as it is when thus confined to a proper channel. The plate K is pivoted so that it will swing aside when the ash-pan is put in or withdrawn from the stove, and readjust itself, by its own weight, as soon as the ash-pan is replaced.

Under the hearth-plate C is arranged an air-passage, *l*, by a horizontal partition *m*. This partition extends under the hearth-plate, about to the plate K, and in rear it reaches some distance under the grate, as shown in fig. 1. It is turned up under the grate, and is perforated on its back portion, as is clearly shown in fig. 1.

The channel *l* receives its air through apertures, *n*, of the hearth-plate.

In front of the plate D may be arranged, upon the hearth-plate C, an oven, L, with hinged or other front doors, *o*, so that the otherwise lost heat of the front plate may be utilized.

In this oven may be arranged a perforated supporting-plate, *p*, some distance above the hearth-plate, hinged to the plate D, so that it can be swung up out of the way when not to be used, while it may as well be let down when to be used, as in fig. 1.

Between the bottom plate *g* of the main oven H and the plate A of the stove is interposed a partition, *r*, which extends forward to the rear of the fire-box, its front portion being bulged out, and extended under the grate about as far as the plate *m* reaches below the same.

The side plates B are perforated, to let air into this channel, *s*, between *g* and *r*, which air is not only carried into the space *b*, but also, through apertures in the front bulged-out end of *r*, to the lower side of the fire-box. Those apertures, *t*, through the sides B, which are in line with the bulged-out parts of *r* may have dampers, to regulate the draught, as shown.

Around the top, bottom, and back of the oven H extends the smoke-passage M, which is not subdivided into narrow channels, but which extends from side to side of the stove.

In any suitable part of the passage M, above the oven, is arranged a transverse damper, N, which, when turned up, as in fig. 1, will prevent the smoke from passing upward. The smoke will thereby be thrown down through the flame and grate, and will have to reach the smoke-passage under the plate *r*, and thence pass up in the vertical back passage. To facilitate its entrance into the lower channel, I have provided an ogee-shaped plate, *u*, which is attached to the bottom of the stove, and laps over the back edge of the ash-pan, as shown.

In the upper horizontal passage M is arranged a horizontal shaft, O, which reaches from the back plate E any desired distance in front. It serves to carry the smoke that ascends in the rear passage forward again over the oven, and then back again to the smoke-pipe P.

In the oven H is arranged a vertical plate, V, some distance from the front plate *a*, and perforated at the upper and lower ends, as shown. It serves to produce a circulation of the air in the oven, to equalize the temperature therein.

R is the hot-water reservoir, secured in a case, S, that projects from and is attached to the back plate E of the stove.

A plate, J, serves as top or covering-plate for the reservoir and case.

From the water-reservoir extend forward to the fire-place one or more small pipes, *w w*, which serve to feed steam into the fire, to facilitate combustion, and which also ventilate the reservoir.

Around the reservoir is, within the case S, formed a space, which is, by a horizontal partition, *x*, divided into an upper chamber, *y*, and lower chamber, *z*. An opening, *a'*, in the plate E leads from the passage M to the chamber *z*, and another opening, *b'*, from *y* to M. A perforated damper, or valve, U, is pivoted opposite the opening *a'*, while a slide-valve, V, works opposite the aperture *b'*.

When the damper U is swung across the smoke-channel, as in fig. 1, the smoke will all have to pass through the aperture *a'* into the chamber *z*, around the reservoir, and will then, after having entirely enveloped the lower part of the reservoir, pass through an aperture in the back part of the partition *x*, into the upper chamber *y*, where it envelops the upper part of the reservoir. The smoke finally escapes through the opening *b'*.

The damper U is perforated, so as to still allow some smoke to pass directly up in the smoke-passage, that draught may not be too much impeded.

When the damper U is swung up, to close the hole a' , some, although but little, smoke will pass through its apertures into the lower chamber z , and escape through b' , so that some circulation of smoke around the reservoir is always kept up, unless the damper U is closed.

Through the plate T are arranged apertures, to receive the hinged covers W of the reservoir. These hinged covers have their edges bevelled inward on the under side, as shown in fig. 8, and fit upon correspondingly-bevelled edges of the plate T. By this arrangement, all the water dropping off a cover, W, when the same is opened, will flow back into the reservoir.

The pivots c' of the cover W, are set some distance from the inner ends of said covers, so that said inner end will be lowered into the reservoir when the upper part is swung up, as shown by red lines in fig. 8.

I am aware that dampers have been arranged within the upper horizontal flue of a cooking-stove, above the oven, and I am also aware that imperforate dampers have been placed in the back vertical flues, but these I do not claim broadly, as they are not of my invention; but

Having thus described my invention,

What I claim, as new, and desire to secure by Letters Patent, is—

1. The tubular grate I, consisting of two plates, e e , substantially as described, so that it will form longitudinal and transverse tubes, with open sides, substantially as and for the purpose herein shown and described.

2. Extending the central pipe h of the grate beyond the ends of the same, to form the hollow open-ended trunnions, upon which the grate can be reversed, as herein shown and described.

3. The openings f , in the fire-box, communicating with the open ends of the long tubes of the grate, in combination with the short tubes g in the sides of the stove, to operate as specified.

4. The openings c and t , in the side of the stove, arranged with relation to the top of the fire-box, and the air-passage b , between the front plate a of the oven, the back of the fire-box, and the perforated plate r , for the purpose of permitting a regulated supply of air to be brought to the fire-box from the sides of the stove, as herein shown and described.

5. The damper N, in combination with the fire-box G, arranged above said fire-box across the smoke-passage M, for the purpose of throwing the smoke down through the grate, as specified.

6. The plate r , perforated at its curved front end,

interposed between the bottom of the stove and the oven H, for the purpose of forming the smoke-passage M, and the air-passage s , in which air is, through openings in the sides of the stove, carried to the back and bottom of the fire-box, as specified.

7. The draught-chamber l , formed under the hearth-plate, and in front of the fire place, by means of the perforated plate m , substantially as herein shown and described.

8. The channels l and s , when carried so far under the grate as to produce a narrow air-entrance under the same, substantially as herein shown and described.

9. The pipes w w , extending from the hot-water reservoir to the fire-place of a stove, or near to the said fire-place, substantially as and for the purpose herein shown and described.

10. The perforated shield v , arranged in the oven H, to produce circulation, by causing the heated air to traverse behind the shield from the upper to the lower side of the oven, as herein shown and described, for the purpose specified.

11. The horizontal partition x , arranged in the case S, with relation to the reservoir and openings a' and b' in the back plate E of the stove, whereby the products of combustion are directed from the flue M, through the opening a' , into the lower chamber z , and around the back of the boiler to the upper chamber y , escaping into the flue M through the opening b' , as herein described, for the purpose specified.

12. The suspended draught-plate K, pivoted to the hearth-plate, and arranged in and across the ash-pan, substantially as herein shown and described.

13. The hinged perforated plate p , arranged within the front oven L, substantially as herein shown and described, so that it can be swung out of the way, as specified.

14. The perforated damper U, arranged in the back smoke-passage, opposite the opening a' to the chamber z , substantially as herein shown and described, to operate as specified.

15. The combination of the dampers U and V with the openings a' b' , chambers z and y , and horizontal partition x , all arranged and operating substantially as herein shown and described.

16. The plate u , arranged in rear of the ash-pan, for the purpose of conducting the downward-passing smoke to the channel M, as set forth.

GEORGE W. SWETT.

Witnesses:

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ALEX. F. ROBERTS.