

No. 630,807.

Patented Aug. 8, 1899.

J. H. GOODFELLOW.
FIRE GRATE FOR COOKING APPARATUS.

(Application filed Oct. 4, 1898.)

(No Model.)

Fig. 1.

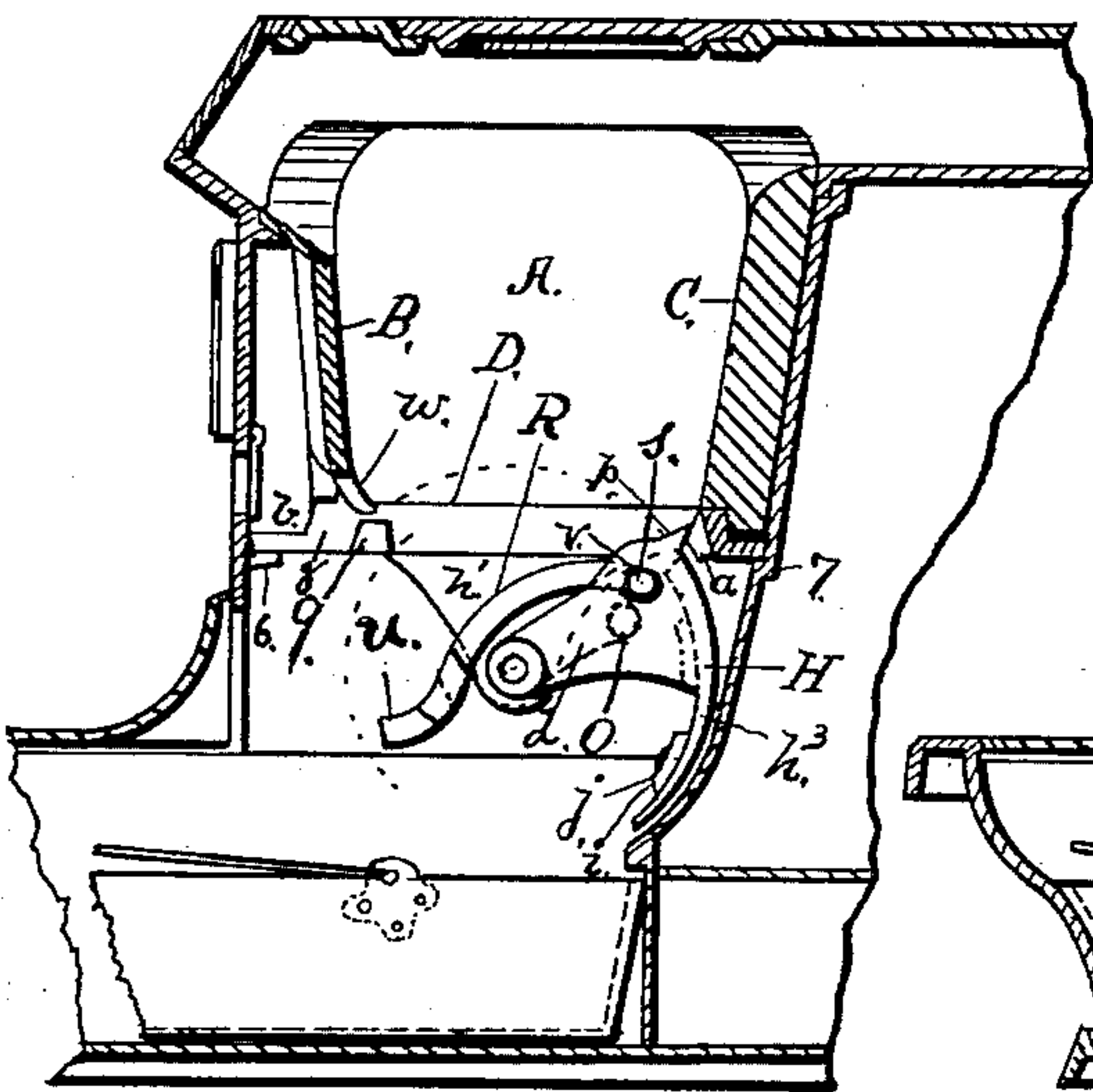


Fig. 2.

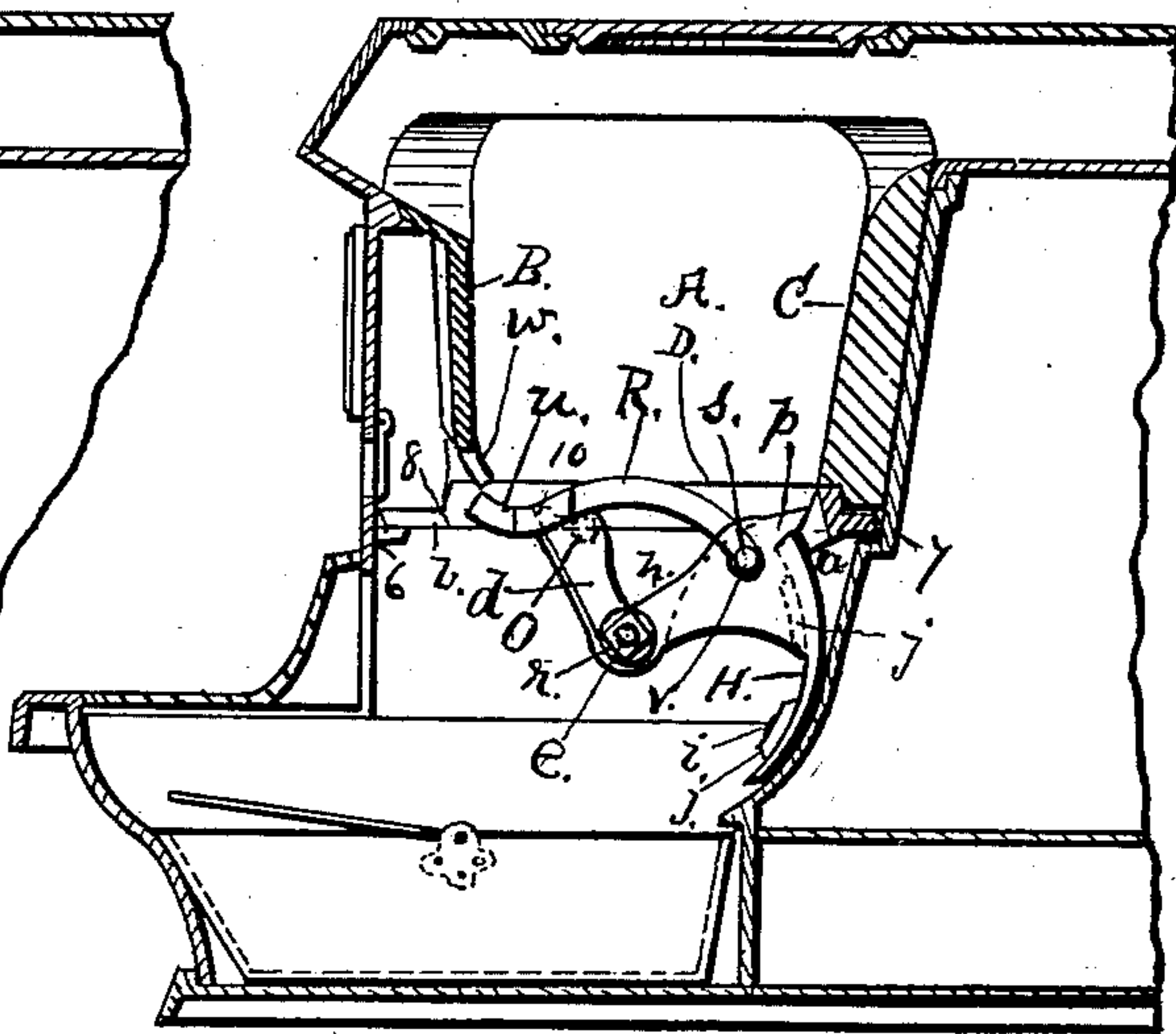
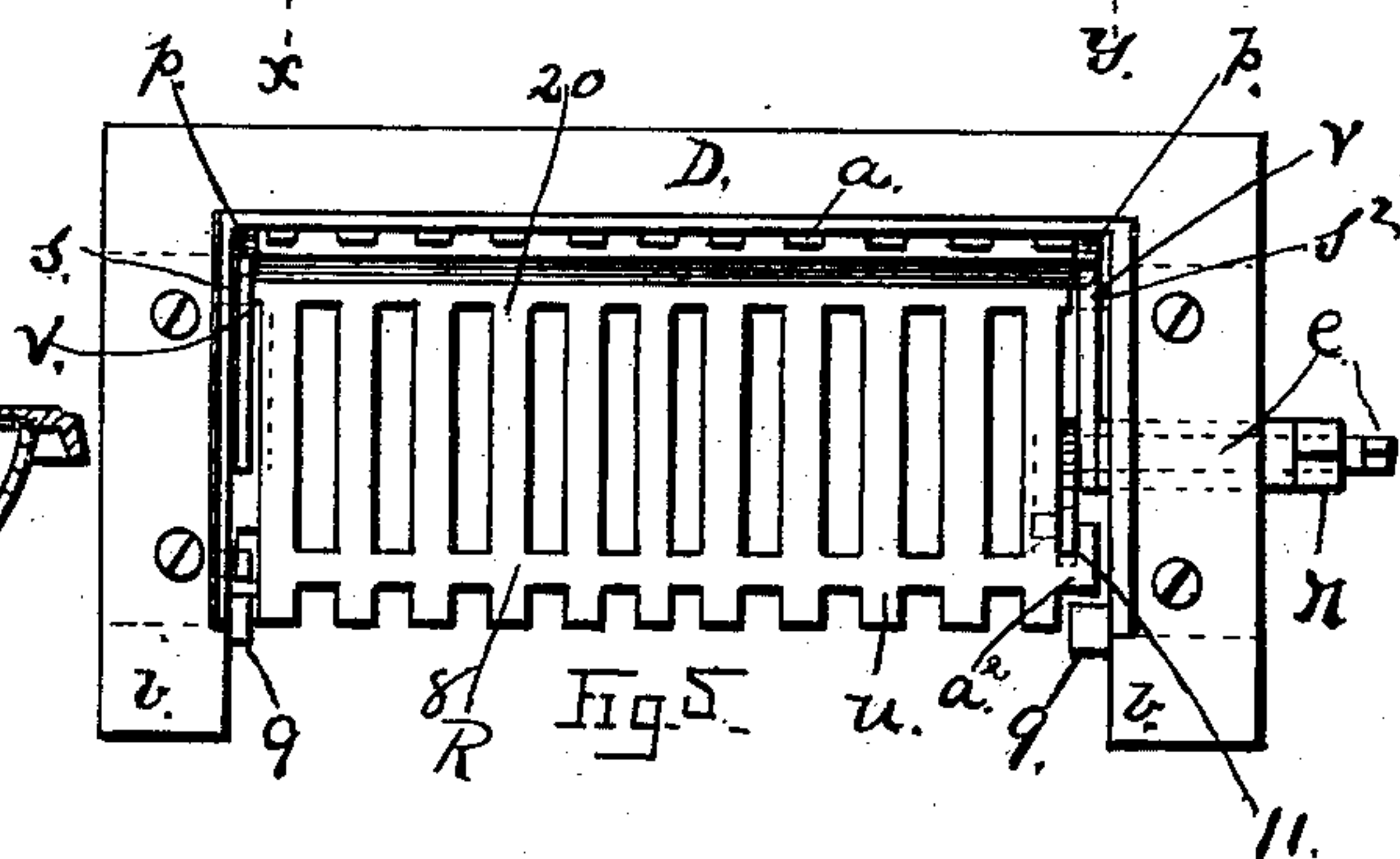
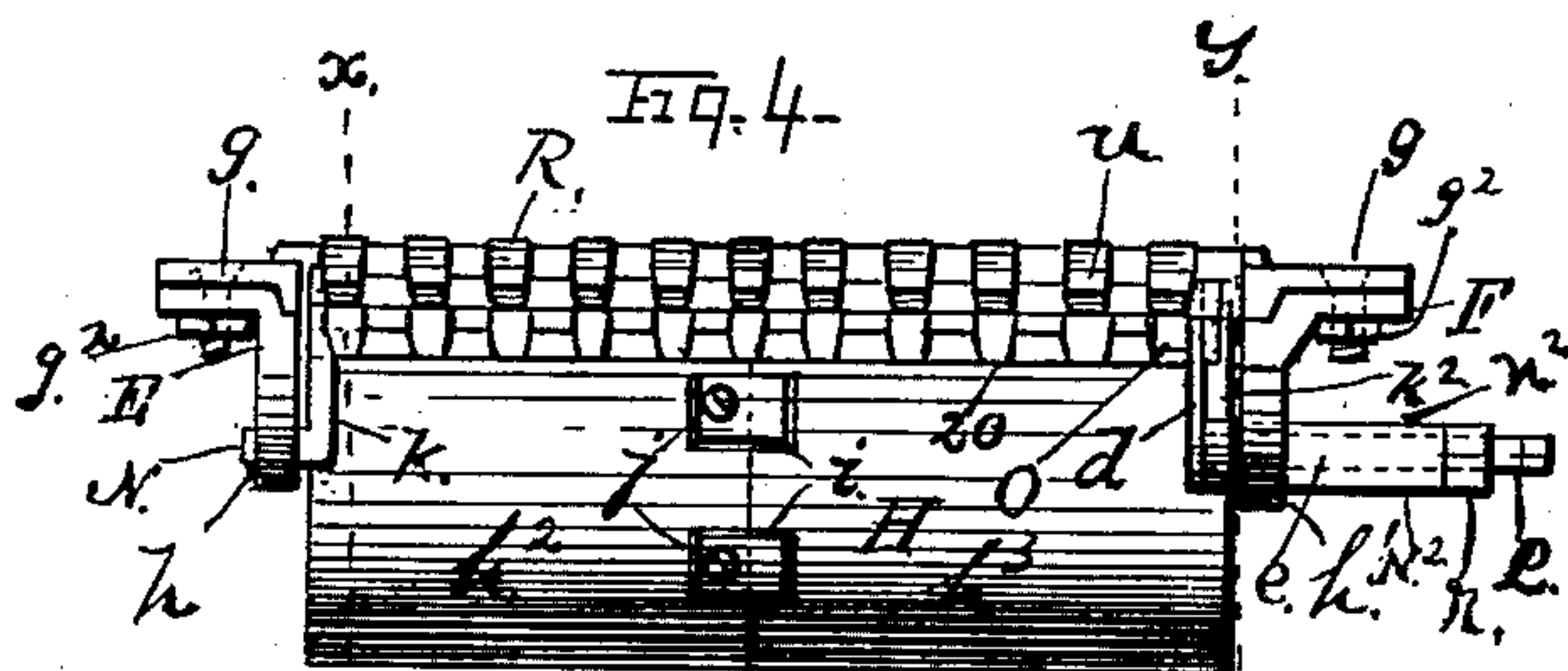
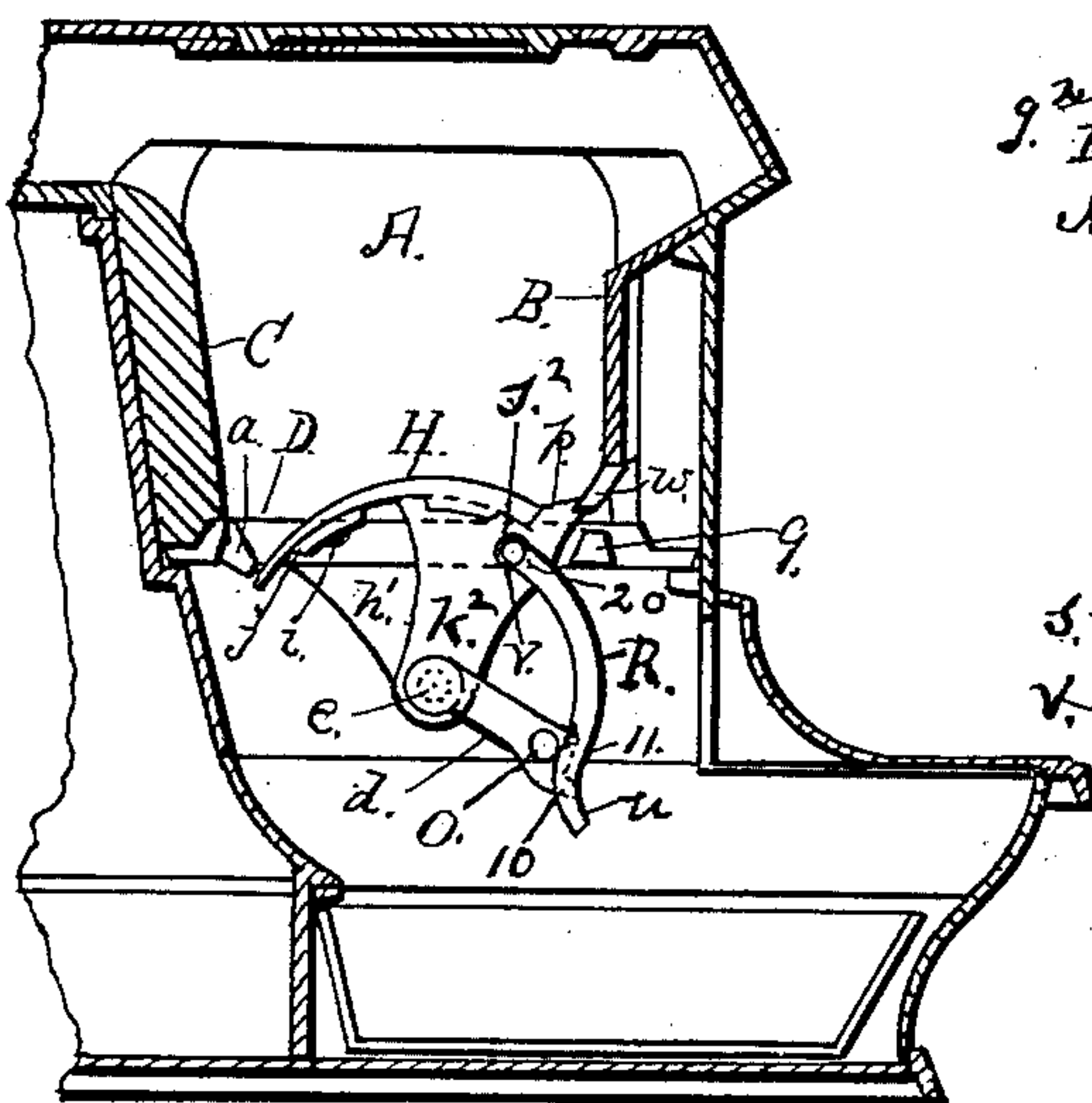


Fig. 3.



WITNESSES:

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JOHN H. GOODFELLOW, OF LOWELL, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO JOSEPH W. PIPER, OF SAME PLACE.

FIRE-GRATE FOR COOKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 630,807, dated August 8, 1899.

Application filed October 4, 1898. Serial No. 692,656. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. GOODFELLOW, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improved Slicing, Sifting, and Dumping Fire-Grate for Stoves and Ranges, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to cooking stove and range fire-grates, and has for its objects to provide effectual means for removing the slag and ashes from the fire-chamber; to provide a combined wood and coal grate capable of being operated as a slicing, sifting, and dumping grate; also, to provide means for creating oppositely-directed currents of air across the upper face of an imperforate fire-grate, thus increasing the intensity of the heat in the center of the fire and effecting a saving of fuel in kindling the same.

The invention consists in the new and novel construction, combination, and arrangement of parts, such as will be hereinafter more fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters and figures of reference designate corresponding parts, Figures 1 and 2 are vertical sectional views of my improved grate combined with the fire-chamber, taken at the line *y y*, Fig. 4, the latter illustrating the grates in their normal position to support the fire and the former illustrating the grate R in position to dump the contents of the fire-chamber, also the independent movement hereinafter described. Fig. 3 is a similar view taken at the line *x x*, Fig. 4, looking in the opposite direction, illustrating the wood or imperforate slicer in position to kindle the fire thereon, also illustrating the introduction of heated air from behind and cooler air from before the imperforate fuel-supports, also its position after slicing the fire. Fig. 4 illustrates a front elevation of the grate with its bed-plate removed from the fire-chamber, with all parts in their normal position, as seen in Fig. 2; and Fig. 5 is a top plan view of the same, illustrating distinctive features in my invention.

Referring to the drawings by letters and figures, A represents the fire-chamber of an ordinary range, having a front fire-plate B

and brick lining C, which rests upon a suitable bed-plate D, which consists of a rectangular frame, its free ends *b b* supported by the front jamb at 6 and its rear side by the oven-plate 7. The front fire-plate is shown with its top edge resting against the front jamb and its bottom extended across the opening 8 between the members *b b*, with its row of fingers *w* curved inward toward the chamber, and is supported at its outer edge by the said members.

a represents a series of downwardly-inclined fingers formed on the inside of said frame, the office of which is to provide sufficient openings for the admission of air, forming the inlet for the hot-air current of the oppositely-directed currents whenever the imperforate slicer is used as a fire-kindling grate. The meeting current passes in between the fingers *w* or bottom edge of the fire-plate and front edge of the slicer, thus causing them to meet in the center, and thereby concentrate the heat centrally beneath and through the fuel in the chamber. The fingers *a* referred to also perform the function of filling in the space between the said bed-plate and outer surface of the slicer, preventing the passage of cinders to jam or clog the same when being moved backward to its normal position. (See Fig. 2.)

E and F represent suitable hangers bolted to the bottom side of the ends *b b* of the bed-plate D by bolts *g* and nuts *g*². Each hanger is provided with journal-bearings *h* and *h'*, adapted to support the journals of the wood-grate and slicer, which may consist of a segment of a cylinder H, preferably cast in two parts *h*² *h*³, right and left, (see Fig. 4,) which are joined together by the overlapping ears *i i*, and suitable bolts or rivets *j j* secure them together. To their outer edges are cast or otherwise connected the arms *k k*², their free ends provided with the journals N N², the former adapted to rest in the bearing *h* and the latter adapted to pass through the bearing *h'* and of a sufficient length to be conveniently reached to operate the said slicer and grate.

p p represent stops arranged on the segment H in a position to engage the rear inside ends of the bed-plate D, (see Fig. 5,) thus supporting the said segment in its normal position in front of the oven-plate 7, with

the fingers a extending along its upper edge. (See Figs. 1 and 5.)

The numerals 9 9 represent stops cast on the inside edge of the members $b b$ of the bed-plate and in line to be struck by the stops $p p$ on the slicer, thus limiting its forward movement whenever turned on its journals $N N^2$. The latter may have its outer end provided with a suitable square r , adapting it to be engaged by a shaker or wrench.

$s s^2$ represent holes cast, drilled, or otherwise formed in the arms $k k^2$ at a desired distance, preferably inside of the radial diameter line of the segment, according to the desired quantity of slag and ashes to be removed or conveyed before the segment H as it is rotated or rocked upon its journals $N N^2$. Within these holes are mounted the journals $V V$ of the grate R , so as to freely swing between the arms, thus supporting the heel 20 of the said grate within the radial diameter of the slicer.

The bars of the grate R are preferably made circular and conform to a less radial circle than the slicer-segment and may continue in such a curve to the outer edge of the bottom of the fire-chamber or may be shaped by or to the reverse upward curve U , adapting said bars to meet the fingers w of the fire-plate, or the said grate may consist of a simple flat surface with the heel 20 dropped below the radial diameter line of the slicer and permanently fixed or cast therewith and attain to a measure the desired end, although the preferred shape of its grate-bars is that their upper face shall be arched or circular form, hence cannot bind or catch in its rocking movement as it is carried before the slicer by the arms $k k^2$ from its position seen in Fig. 2 to that seen in Fig. 3. Nevertheless I prefer to provide this grate with means for dumping the fire which consists, primarily, of pivotally supporting one side of the grate and detachably bracing or supporting the other and means for operating the supporting means independent of operating the said slicer. With this end in view I construct the journal N^2 with a suitable bore longitudinally through it. This may be done by any suitable means.

e represents a suitable shaft adapted to fit into the bore so as to freely turn therein and having its outer end squared, adapting it to a suitable wrench, knob, key, or turn-handle device, which, if desired, may be permanently left in position thereupon. To the opposite end of this shaft is cast at right angles thereto or otherwise secured the pawl-arm d . To the outer end, at one side, is arranged the finger 10. This extends upward to meet the top of the grate R . One of its sides engages the outside of the bar a^2 of said grate and prevents the shaft e from working out of its bore, and the finger also limits the vibratory movement of the pawl-arm between the notched member 11 on the grate, (see Fig. 5,) which is its outer supporting position, and the journals $V V$, (see Fig. 1,) which is its inner or dumping

position. An arm or stop o , cast to the side of this pawl-arm, extends therefrom at right angles thereto in such a position that it will ride beneath the bar a^2 to support the same. It is also so located that when the finger 10 is close to the journal V the said stop will have passed beyond or below the journal, (see Fig. 1,) allowing the grate to fall. If desired, these pawl arms and stops may be arranged at opposite ends of the grate and the shaft e extended to the journal N to support and operate a pawl-arm at that end of the grate.

As thus constructed and arranged, assuming it is desired to start a fire, the grate is turned by the journal N^2 to a position shown in Fig. 3, the wood and coal being supplied as in common, the draft to the fire passes in beneath the fire-plate B angular, is met by the angular draft between the fingers a , having passed beneath the segment H , is much rarefied as the fire progresses. The two currents meeting centrally beneath the coals, the wood embers are prevented from dropping by the imperforate slicer, (as would not be the case should the grate R be used,) thus effecting a saving of fuel. When fully ignited, the shaker may be applied to the journal at r and the slicer-grate rocked back in the position shown in Fig. 2, thus placing the live coals upon the grate. When it is desired to free the chamber from ashes and slag, it is but necessary to apply the shaker or wrench to the squared end r and move it from right to left as many times as desired, when it will be seen that the front edge of the segment H acts like a plane, conveying from the back toward the front each time it is moved forward. The quantity taken out from the bottom of the fire will be nearly equal to the space between the arcs of the grate and segment in which they move, while at the same time the entire outer surface of the imperforate slicer being smooth has no perceptible power to reverse the forward action on the slag, &c., which is forced forward and carried out upon the grate R . When it is desired to dump the contents of the fire-chamber A , the pawl-arm d may be turned by the shaft e to the right into the position shown in Fig. 1. This will carry the stop-brace back beneath the journal V , permitting the grate to swing down. Then to turn the slicer H into the position shown in Fig. 3 the pawl-arm L will naturally gravitate back into position to lock, leaving the parts in position to start a fresh fire.

Another advantage in this construction of fire-grates is that the deposit of ashes, &c., is toward the front of the ash-chamber, thereby preventing the banking of them against the front oven-plate, retarding its efficiency, and also often causing the destruction of the grate.

Having thus described my invention, what I claim is—

1. In a grate, the combination of a segmental section, a grated section permanently located between its center of motion and the periph-

ery of the segmental section, and means for supporting and moving said sections across the bottom of the fuel, the arrangement being such that the ashes, &c., are cut out and dumped when the grate is operated.

2. In a grate, the combination of a segmental section, a grated section pivoted thereto and adapted to be dumped, and means for supporting and moving said sections across the bottom of the fuel.

3. In a grate, the combination of a segmental section, a grated section pivoted to the segmental section between its center of motion and its periphery, and means for supporting and moving said sections.

4. In a grate, the combination of a segmental section, and a grated section constituting in effect a continuation of the segmental section, the bearing-surfaces of the two sections being at different distances from the center of motion, and means for supporting and moving said sections across the bottom of the fuel, the arrangement being such that the ashes, &c., are cut out and dumped when the grate is operated.

5. In a grate, the combination of a segmental section, a grated section pivoted at one side to the segmental section, a trip device for supporting the opposite side of the grated section, and means for supporting and moving said sections across the bottom of the fuel.

6. In a grate, the combination of an imperforate segmental section, supported to rock to and fro from a center of motion, a grated section pivoted at one side to the segmental section or its supporting means, a trip device for supporting the opposite side of the grated section, and means for supporting and moving said sections across the bottom of the fuel.

7. In a fire-grate, the combination of an imperforate segmental section supported to rock to and fro upon suitable arms from a center of motion, a grated section pivotally connected at or near its rear side ends between said arms, a device constructed and arranged to sustain the grate in position to support the fuel, and means adapted to operate the sustaining device to dump the same.

8. In a fire-grate, the combination of a segmental section provided with supporting-arms, a fire-grate frame constructed to support the same, devices arranged to support and limit the movement thereof, a grate pivoted between said arms, a trip device arranged to support the grate in its operative position, means for operating the same at the will of the operator, and means for moving the sections across the bottom of the fuel.

9. A slicing and dumping fire-grate, consisting of an imperforate segmental section adapted to be moved in an arc edgewise upon suitable arms from a center of motion, a supporting bed-plate adapted thereto, a grated section pivotally supported at a less distance from the center of motion than the imperforate segmental section and carried by said arms and extended therefrom to support the

fire, a trip device moving with the grate to support it, whereby the grate is adapted to convey and dump from the side as the ashes, &c., are sliced from beneath the fire.

10. In a fire-grate, the combination of a slicing segmental section, supported to rock to and fro upon suitable arms from a center of motion, a supporting bed-plate provided with bearings and stops adapted to support and limit the movement of the slicing segmental section, an open section consisting of connected convex bars pivotally supported to dump, one of its sides arranged between the periphery of the slicer and its center of motion, the opposite ends of the convex bars formed in a reverse curve, and means adapted to support and move the grate from and beneath the fire.

11. In a fire-grate, the combination with a fire-chamber, a grate-section suitably supported at one side, a segmental section provided with supporting-arm and hollow journals, a shaft adapted to pass through said journals and carrying a trip device adapted to support the grated section in its operative position.

12. In a fire-grate, the combination of the supporting-frame, D, hangers, E and F, segmental section, H, provided with journals, N and N², supported by said hangers, stops for limiting the movement of said section, grated section, R, pivotally supported and adapted to dump, pawl-arm, d, and shaft, e, combined to support and operate the latter, substantially as described.

13. In a grate, the combination of a fire-chamber, a grate-frame provided with air-spaces and a grate, the grate being composed of a segmental section and a grated section, the bearing-surfaces of said sections being at different distances from the center of motion, and means for supporting and moving said grate across the bottom of the fuel.

14. In a grate, the combination of a fire-chamber, a grate-frame and a grate, the grate consisting of an imperforate section, the bearing-surfaces of the two sections being at different distances from the center of motion, and means for supporting and moving the grate across the bottom of the fuel, the grate being arranged relative to the grate-frame so as to provide air-spaces therebetween.

15. In a fire-grate, the combination of a supporting grate-frame, a segmental section cast in two parts and provided with radial supporting-arms having journal-bearings, and a grate provided with journals adapted to enter said bearings when the parts of the segmental section are secured together.

I hereunto affix my name this 13th day of September, 1898, in the presence of two subscribing witnesses.

JOHN H. GOODFELLOW.

Witnesses:

PETER A. FAY,
JOSEPH A. PIPER.