No. 812,154. PATENTED FEB. 6, 1906.

R. E. SCOTT & L. O. STEINHOFF.

CONTINUOUS STEAM COOKER.

APPLICATION FILED APR. 1, 1905.

3 SHEETS—SHEET 1.

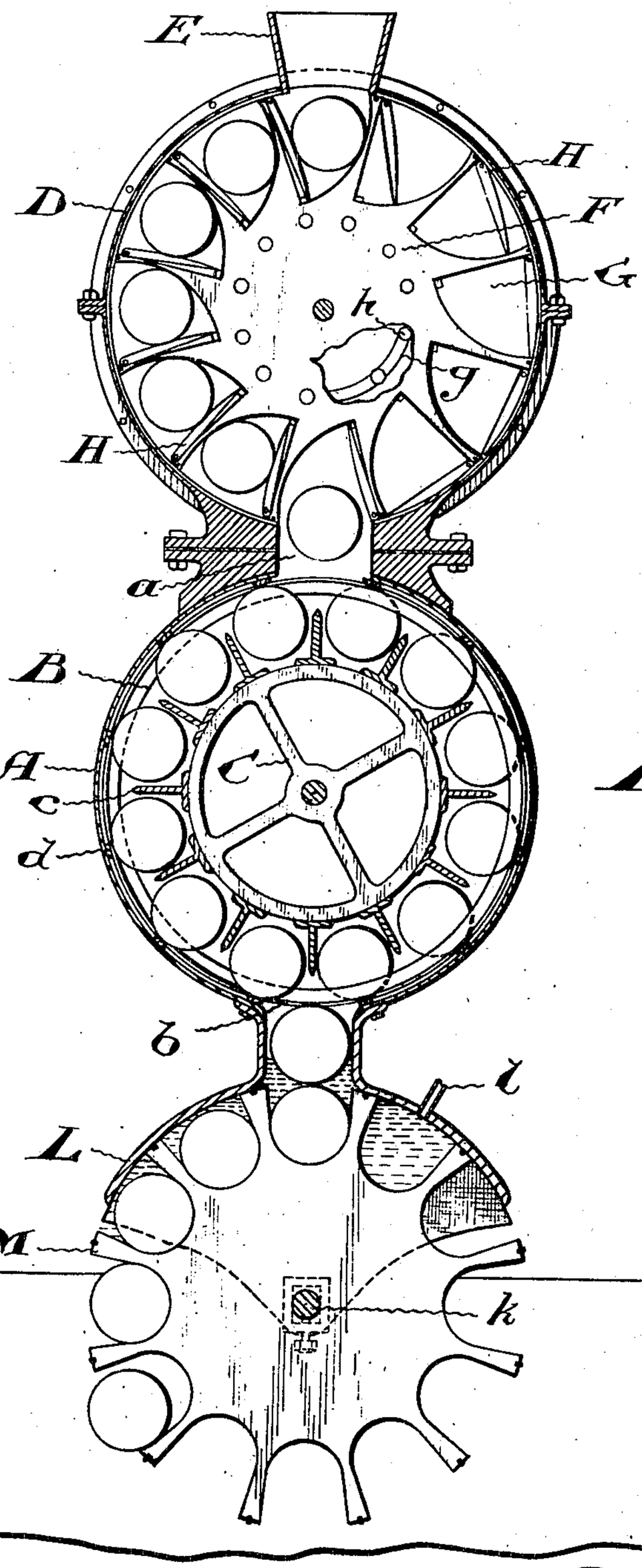


Fig. 1.

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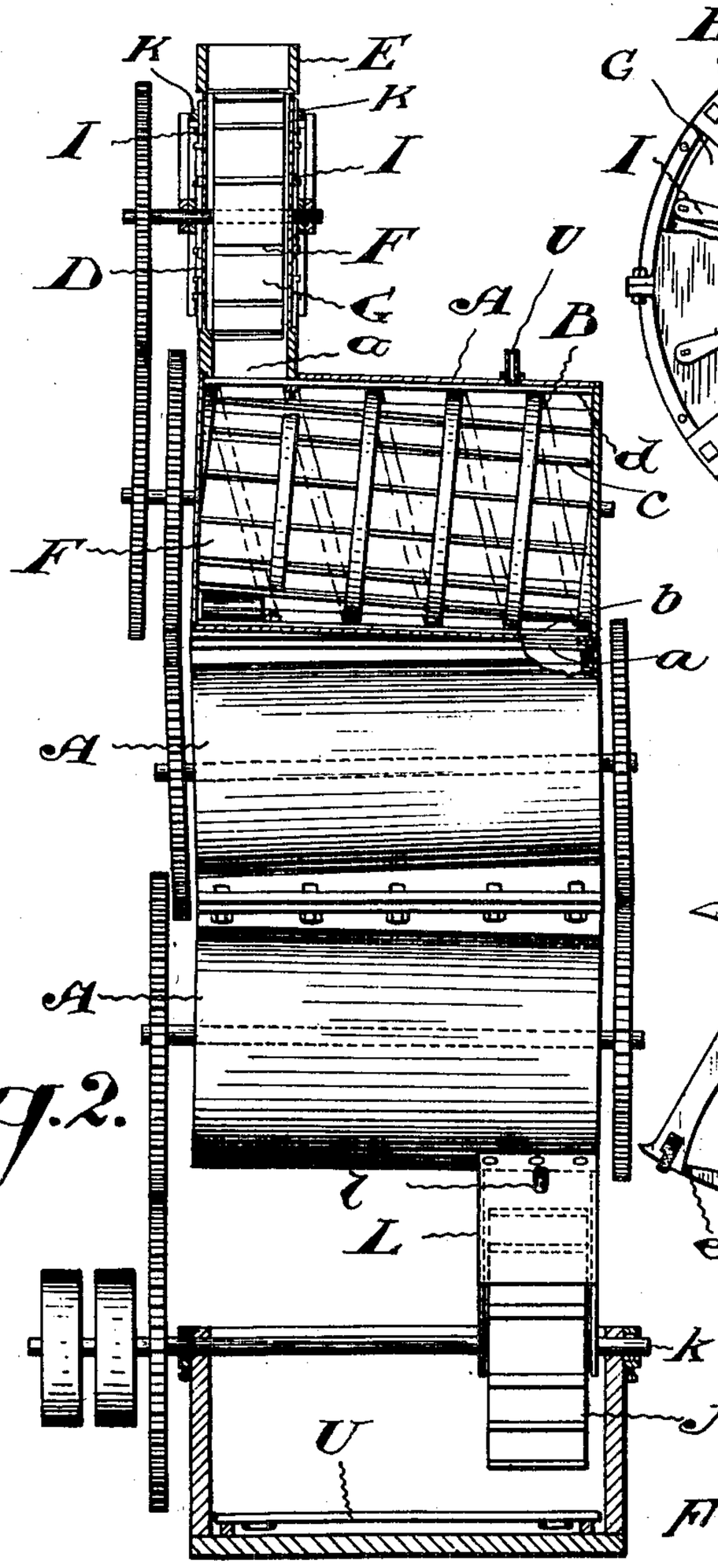



Fig. 2.

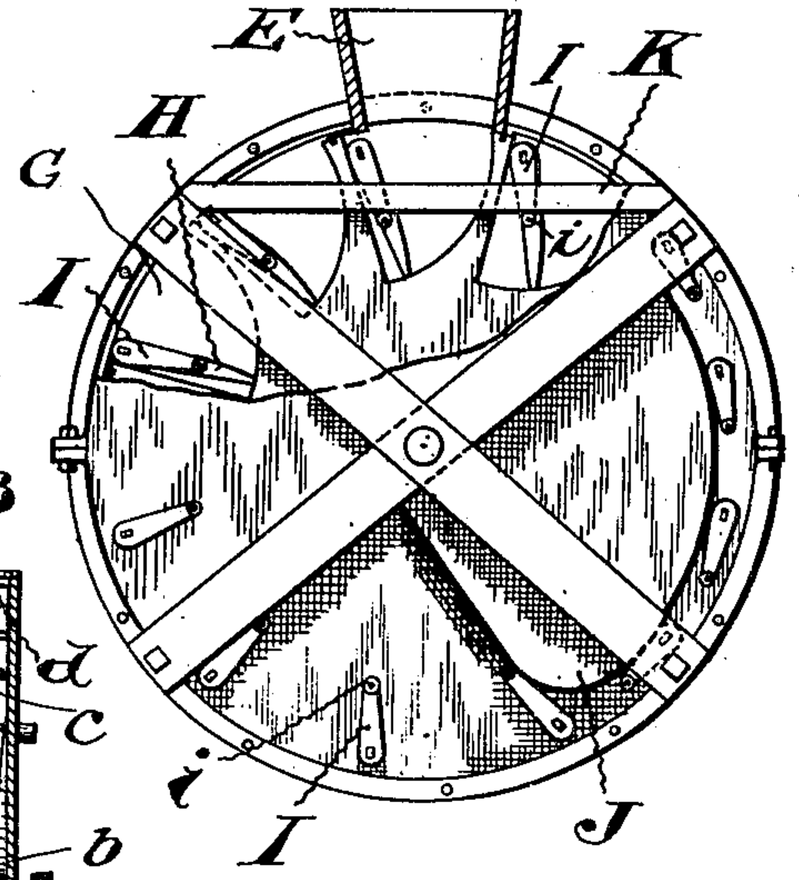



Fig. 3.

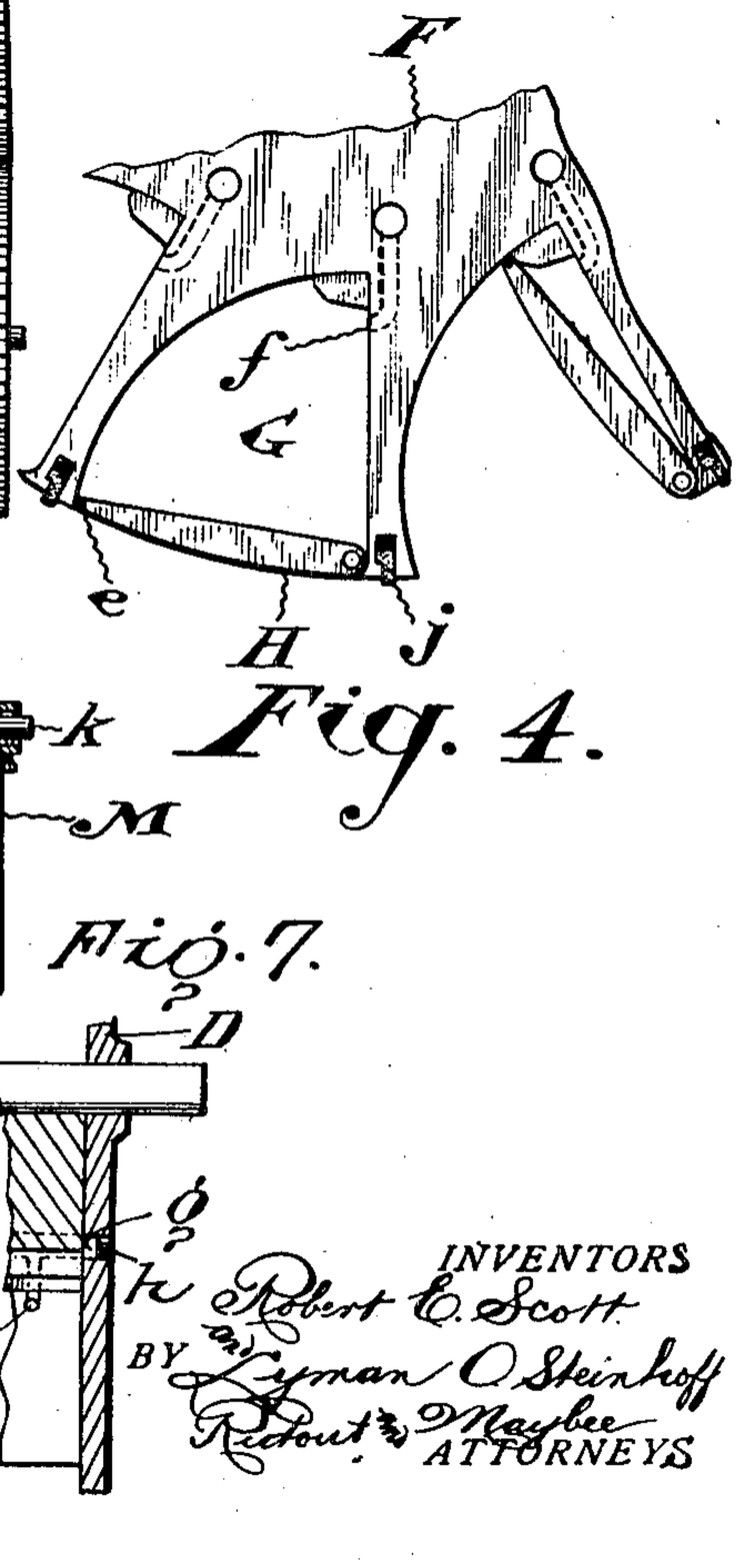
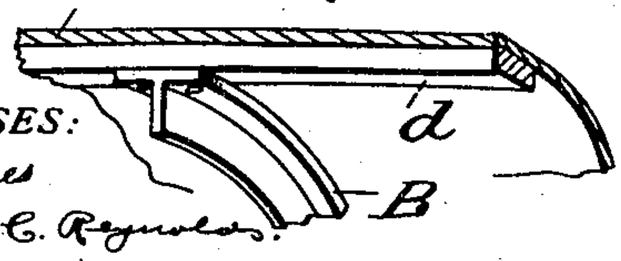



Fig. 4.

Fig. 7.




Fig. 8.

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3 SHEETS—SHEET 3.

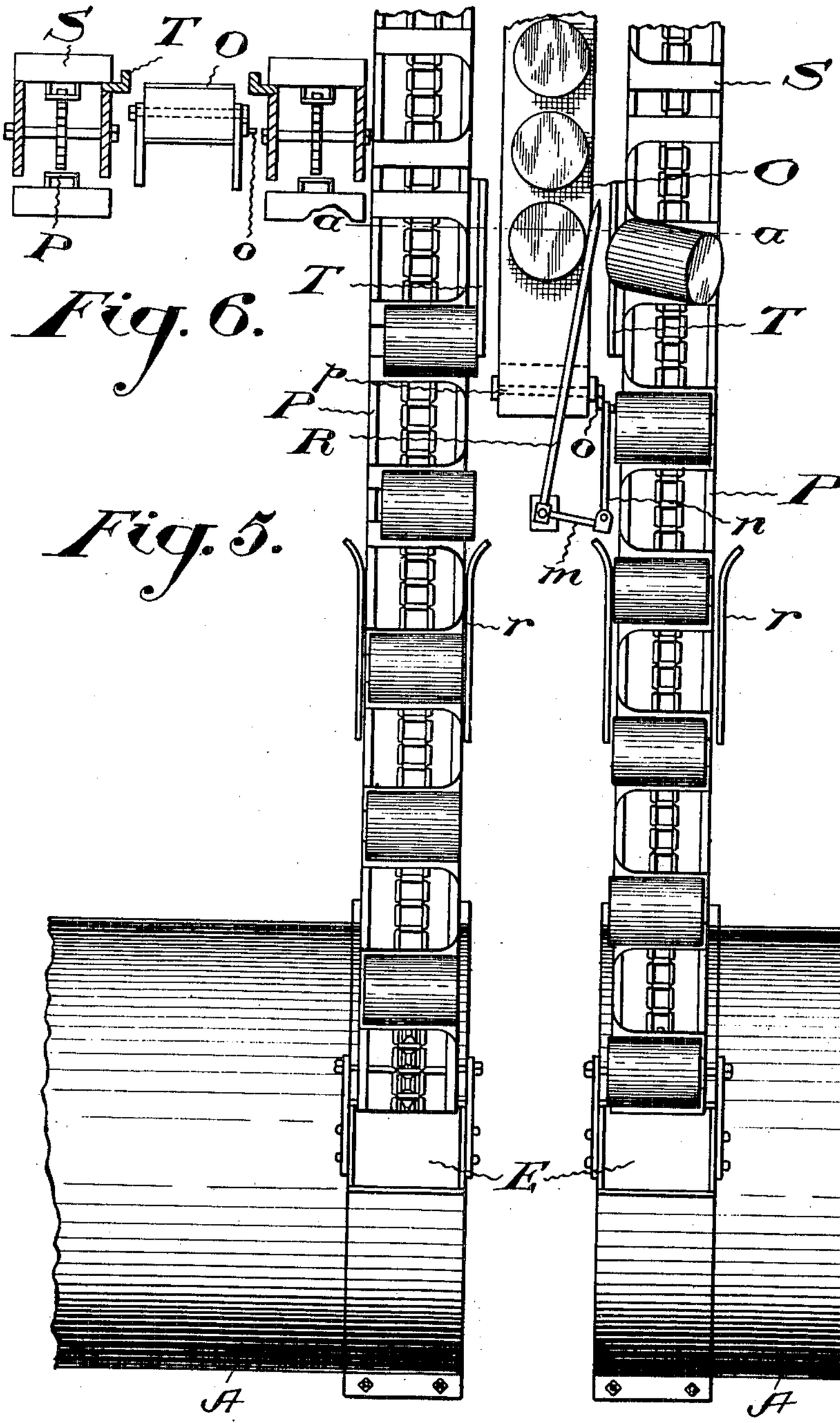


Fig. 6.

Fig. 5.

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# UNITED STATES PATENT OFFICE.

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SAID SCOTT ASSIGNOR TO ARTHUR C. LEA, OF SIMCOE, CANADA.

## CONTINUOUS STEAM-COOKER.

No. 812,154. Specification of Letters Patent. Patented Feb. 6, 1906.

Application filed April 1, 1905. Serial No. 253,333.

*To all whom it may concern:*

Be it known that we, ROBERT E. SCOTT and LYMAN OLEIN STEINHOFF, of the town of Simcoe, in the county of Norfolk, Province of Ontario, Canada, have invented certain new and useful Improvements in Continuous Steam - Cookers, of which the following is a specification.

The object of our invention is to devise means for continuously carrying on the cooking of canned goods in an economical and efficient manner; and it consists, essentially, of one or more cylindrical steam-retorts, each provided with an internal helical rib and of a longitudinally-ribbed cylindrical carrier journaled within the cylinder and adapted by its rotation to move cans along the helical guideway formed by the helical rib, means being provided for feeding and discharging cans, substantially as hereinafter more specifically described, and then definitely claimed.

Figure 1 is an end sectional elevation of the cooker, showing only one retort. Fig. 2 is a side sectional elevation on a small scale, showing three retorts arranged in series. Fig. 3 is a face view of the feeder partly broken away. Fig. 4 is an enlarged detail showing the spring-packing of the cylinder of the feeder and the valves. Fig. 5 is a plan view showing the means employed for feeding cans to the cookers. Fig. 6 is a sectional elevation on the line *a a* in Fig. 5. Fig. 7 is a sectional detail showing the air-vent of one of the pockets of the feeder. Fig. 8 is a perspective detail showing part of the helical rib and the bar to which it is connected.

In the drawings like letters of reference indicate corresponding parts in the different figures.

The fundamental feature of the cooker is the cylindrical retort A, suitably constructed of sheet metal. The interior surface of the retort is provided with a helical rib B, forming an internal helical guideway running from end to end of the retort. The retort is provided with an inlet-opening *a* and an exit-opening *b*, communicating with the aforesaid helical guideway. Within the retort is journaled a cylinder C, provided with longitudinal ribs *c*, extending into proximity to the helical rib B.

The helical rib may be formed in any desired manner. It is preferable, however, to form it of T iron or steel secured to bars *d*. Thus the rib may be inserted in the retort and easily removed at any time. The cylinder C and ribs *c* may also be formed in any suitable manner, a preferable construction being shown in Fig. 1.

From the construction described it follows that if a can be inserted through the inlet *a* into the space between two of the ribs *c* by the rotation of the cylinder C the can will be carried round and round the retort along the helical guideway formed by the helical rib B, and finally discharged through the exit *b*. To force the cans around the helical guideway with the least possibility of jamming, it is desirable that the ribs *c* should cross the rib B substantially at right-angles thereto, as indicated in Fig. 2. Steam of course will be admitted to the retorts through any suitable pipe, such as U.

In order to keep the cans for a sufficient length of time under the heating influence of the steam, while retaining the capacity for a large output, it is preferable to arrange two or more retorts in series one above the other, the outlet of one discharging into the inlet of the next retort in the series. (See Fig. 2.)

Suitable gearing must of course be provided to rotate the cylinders of the retorts in time with one another.

The retorts will be preferably inclined alternately from left to right, and vice versa, in order that the condensed steam may drain from one to the other and so to the final discharge.

The feeding apparatus comprises a cylindrical casing D, communicating with the inlet *a* of the upper retort and provided at its upper side with an inlet-hopper E. Within the casing is journaled a cylinder F, provided with peripheral pockets G, each adapted to receive a can on its side. Each pocket is provided with a swing-valve H, pivoted at one side of each pocket near the periphery of the cylinder. The opposite side of the pocket is formed on an arc constructed from the pivot of the swing-valve, and the end of the valve is preferably provided with any suitable packing *e*, whereby it may be given a steam-tight contact with the curved side of the pocket. (See Fig. 4.) The pivoted end of the pocket is of course also given a steam-tight joint. An air-inlet *f* is provided, leading into each pocket behind the valve. These air-inlets are given a suitable communication

with the external air. In Fig. 1 we have shown them as communicating with an annular space *g* in the end of the casing, which communicates, by means of a port *h*, with the outer air. Other means of course might be employed. As will be seen from Fig. 1, the purpose of these valves is to close the pockets G after the can has been discharged through the opening *a*, so as to force the steam out of the pocket, and thus prevent it being carried around and wasted through the inlet-hopper. To give the valves this motion and to open them again to receive the cans from the inlet-hopper, the mechanism shown in Fig. 3 is provided. It will be seen that the spindle of each swing-valve projects out through the end of the casing and has an arm I secured thereto. Of course each spindle must be suitably packed where it comes through the end of the casing in order to make a steam-tight joint. The end of each arm I is provided with a frictional roller *i*. A cam J is suitably supported on the casing in such a position as to engage each arm I as it is brought around by the revolution of the cylinder, and thus throw the swing-valves to the positions indicated at the lower right hand in Fig. 1. K is another cam secured to the upper part of the casing of the feeder and adapted to engage the arms I to cause the valves to resume the open position to receive the cans. As the back of each pocket is open to the atmosphere, as already described, when a swing-valve is moved to shut out the steam it merely has to overcome the steam-pressure and does not tend to form a vacuum behind itself, nor will it compress the air when moving in the contrary direction.

Any suitable mechanical means may be provided to form a steam-tight joint between the ends of the cylinder F and the casing D. The latter is also preferably made in halves secured together, as shown. Spring-packing *j* is also preferably provided in the cylinder F between the pockets G to give the cylinder a steam-tight bearing against the periphery of the casing D.

It is preferable to duplicate the valve-operating parts at each side of the feeder-casing. (See Fig. 2.)

The discharge is best seen in Fig. 1. It comprises a segmental cylindrical casing L, within which is journaled a steam-tight cylinder M, provided with peripheral pockets N. The spindle *k* of this cylinder M is preferably provided with adjustable bearings, as shown, in order to take up any wear between the cylinder and the periphery of the casing. A water-pipe *l* preferably communicates with the interior of the segmental casing adjacent to the communication between the casing and the discharge-aperture *b* of the retort above it. Ordinarily the water of condensation from the retorts will fill that portion of each pocket which is not filled by the can, and thus the escape of steam will be prevented; but through the pipe *l* water may be introduced into the pockets, if necessary, to supply any deficiency of water of condensation and bring its level above the cylinder M. The spindle *k* of the discharge-cylinder will be geared to the rotary cylinders of the retorts, as shown in Fig. 2. On the spindle *k*, or any of the other spindles of the apparatus, suitable driving-pulleys may be located.

From the construction described it follows that cans may be introduced into the apparatus without permitting the escape of steam and that the cans may be conveyed through the apparatus in sufficient quantities to give the machine a large output while giving them sufficient time to become thoroughly cooked, and ultimately discharged without permitting escape of steam or other loss than the water of condensation.

The arrangement of the gearing shown may be widely varied without departing from the spirit of the invention.

To enable the apparatus to cope with the output of the can-topping machine usually employed in canneries for sealing the cans, it is preferable to employ the conveying mechanism shown in Fig. 5. In this figure, O is the endless conveyer, supposed to be bringing cans on their ends from the topping-machine. This conveyer leads between two other endless conveyers P, each of which leads to the hopper E of a cooker. On a suitable support adjacent to the end of the conveyer O is pivoted an arm R. From this arm extends a short arm *m*, connected by the pitman *n* with a crank *o*, fastened on the end of the spindle *p* of the end drum or carrying-wheel of the endless conveyer O. From this construction it follows that the arm R is reciprocated synchronously with the movements of the conveyer O. Thus the cans as brought up by the conveyer are knocked by the arm alternately to the right and left. As the arm is arranged to strike near the top of the can, it tends to throw the can over onto its side into receptacles S, carried by the conveyers P. These receptacles, it will be seen, have somewhat flaring mouths, so that they easily receive a can and tend to straighten it out into a position exactly transverse to the conveyer. In order to insure a can falling over onto its side, a stop T is provided at each side of the conveyer O, which catches the bottom of the can, and thus holds it back while the arm is throwing over the top of the can. As the cans may not be exactly centered on the conveyers P, we provide guides *r* with flaring mouths, one for each conveyer. These catch the cans and center them exactly on the belt, so that each can is in exactly the proper position to be dropped into the hoppers E.

The discharge-cylinder M may be arranged above the endless conveyer O, either in or

leading to suitable cooling apparatus. Such a feature is indicated in cross-section in Fig. 2.

What we claim as our invention is—

1. Feeding means for a cannery-cooker comprising a cylindrical casing with inlet and discharge apertures therein, in combination with a steam-tight cylinder journaled therein and provided with peripheral pockets adapted to contain cans; a valve for each pocket pivoted on the cylinder and adapted to open and close the peripheral opening of said pocket; and means for opening each of said valves to receive a can and for closing it immediately after the discharge of a can, substantially as described.

2. Feeding means for a cannery-cooker comprising a cylindrical casing with inlet and discharge apertures therein, in combination with a steam-tight cylinder journaled therein and provided with peripheral pockets adapted to contain cans; valves adapted to open and close the peripheral openings of said pockets; means for opening each of said valves to receive a can and for closing it immediately after the discharge of a can; and means for forming a communication between the outer air and the pocket behind each valve, substantially as described.

3. Discharge means for a cannery-cooker comprising a cylindrical segment-casing with an inlet-aperture at the top, in combination with a steam-tight cylinder journaled therein and provided with peripheral pockets adapted to contain cans and a sufficiency of water to shut out the steam in the cooker; and means for supplying water to each pocket before it reaches the inlet-aperture, substantially as described.

4. Feeding means for a cannery-cooker comprising a cylindrical casing with inlet and discharge apertures therein, in combination with a steam-tight cylinder journaled therein and provided with peripheral pockets adapted to contain cans; a swing-valve pivoted at one side of each pocket near the periphery of the cylinder, the opposite side of the pocket being formed on the arc of a circle struck with the pivot of the valve as a center; and means for opening each of said valves to receive a can and for closing it immediately after the discharge of a can, substantially as described.

5. A cannery-cooker provided with a receiving-hopper; and an endless conveyer discharging into said hopper and provided with receptacles adapted to receive cans, in combination with a second conveyer parallel to and close beside the first and adapted to bring cans on end; and means timed with the second conveyer for knocking a can off the said conveyer onto its side in one of the receptacles of the first conveyer, substantially as described.

6. Two cannery-cookers, each provided with a receiving-hopper; endless conveyers discharging into the hoppers of the cookers and provided with receptacles adapted to receive cans, in combination with a second endless conveyer leading to a point between the first two; and an arm operated from the second conveyer and adapted to alternately sweep cans onto the two first conveyers, substantially as described.

7. Two cannery-cookers, each provided with a receiving-hopper; endless conveyers discharging into the hoppers of the cookers and provided with receptacles adapted to receive cans on their sides, in combination with a second endless conveyer leading to a point between the first two; an arm operated from the second conveyer and adapted to alternately sweep cans onto the first two conveyers; and bottom stops adapted to catch the bottom edges of the cans to insure their falling on their sides on the conveyers, substantially as described.

8. Two cannery-cookers, each provided with a receiving-hopper; endless conveyers discharging into the hoppers of the cookers and provided with receptacles adapted to receive cans on their sides, in combination with a second endless conveyer leading to a point between the first two; an arm operated from the second conveyer and adapted to alternately sweep cans onto the first two conveyers; bottom stops adapted to catch the bottom edges of the cans to insure their falling on their sides on the conveyers; and guides adjacent to each of the second conveyers adapted to center the cans on the conveyer, substantially as described.

Simcoe, Ontario, March 25, 1905.

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LYMAN OLEIN STEINHOFF.

In presence of—
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J. PORTER.