No. 796,833. PATENTED SEPT. 5, 1905.

W. J. RUFF.

INTERMITTENT MOVEMENT IN PASTEURIZERS.

APPLICATION FILED DEC. 5, 1904.

2 SHEETS—SHEET 1.

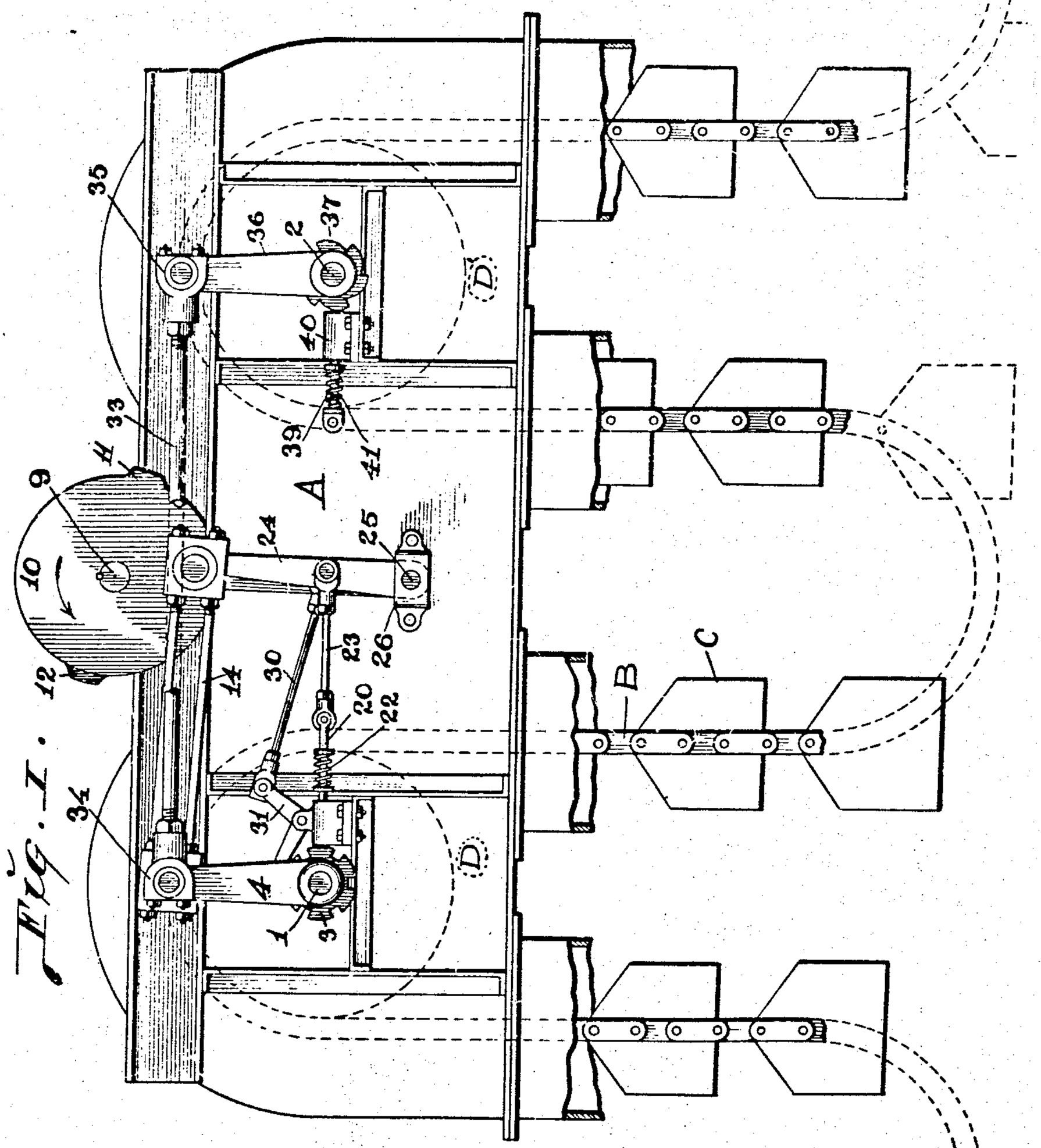

FIG. I.

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2 SHEETS—SHEET 2.

Fig. II.

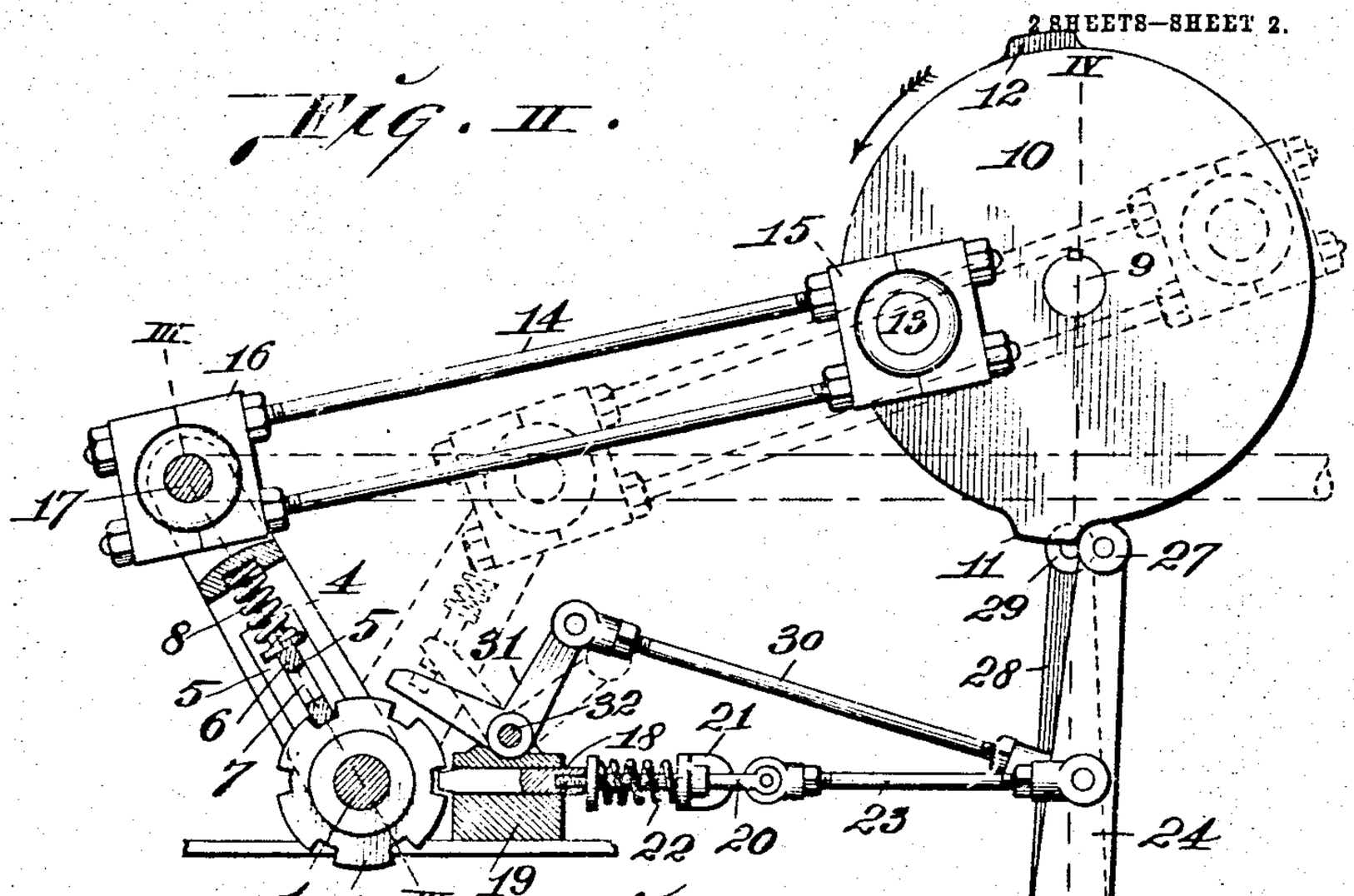


Fig. III.

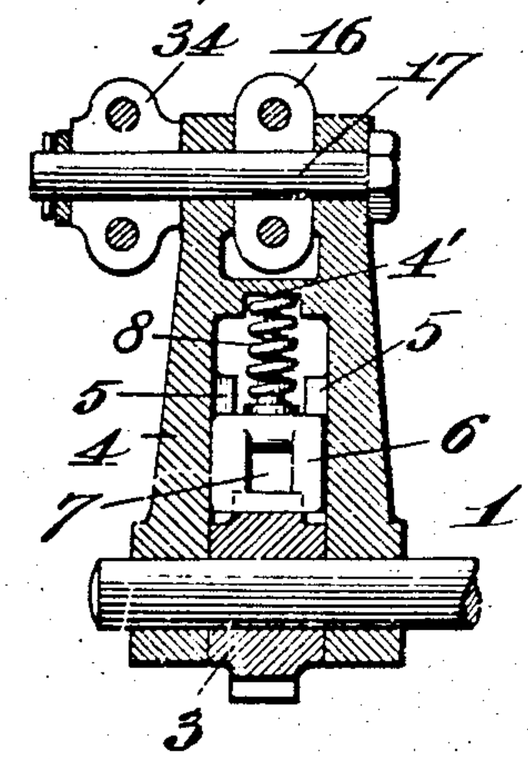


Fig. IV.

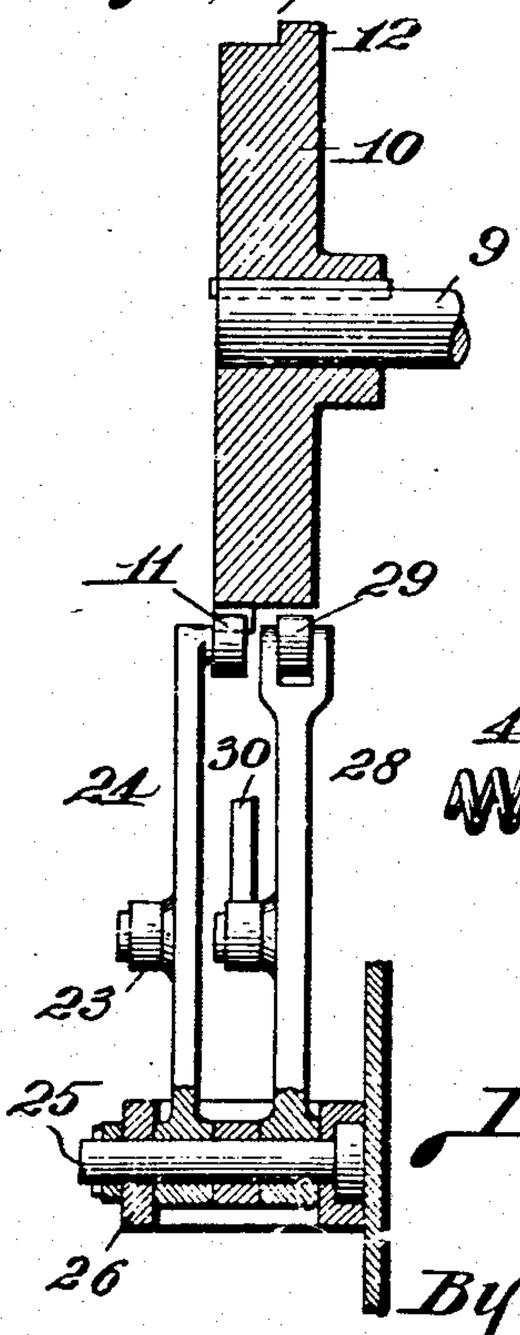
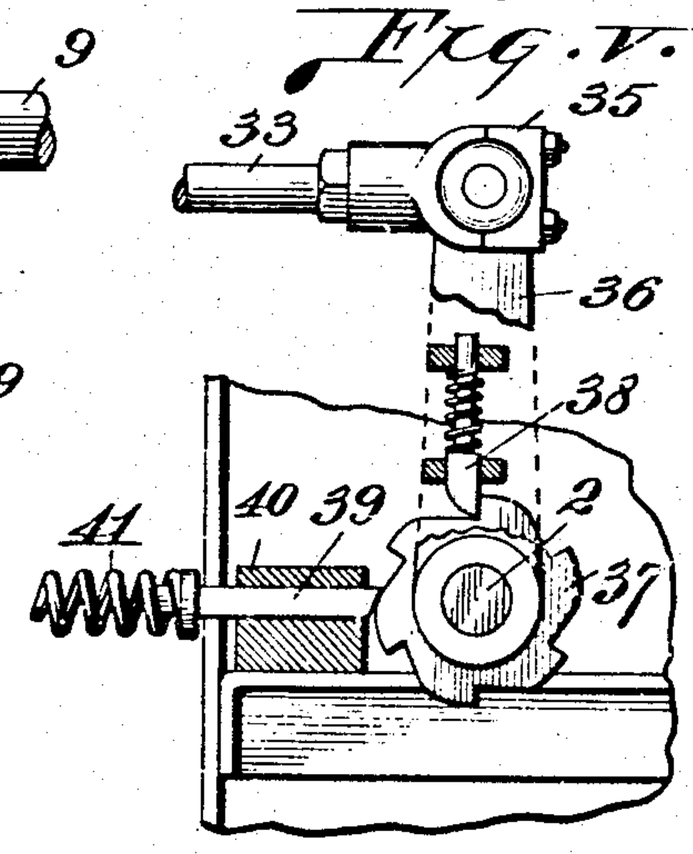


Fig. V.



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UNITED STATES PATENT OFFICE.

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INTERMITTENT MOVEMENT IN PASTEURIZERS.

No. 798,833. Specification of Letters Patent. Patented Sept. 5, 1905.

Application filed December 5, 1904. Serial No. 235,526.

To all whom it may concern:

Be it known that I, WILLIAM J. RUFF, a citizen of the United States, residing at Quincy, in the county of Adams and State of Illinois, have invented certain new and useful Improvements in Intermittent Movements for Pasteurizers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to an intermittent movement for imparting a step-by-step movement to the bottle-carrier of a pasteurizer in which the receptacles of the beer or other material to be pasteurized are made to pass successively through vertically-superposed strata of a heat-transferring medium for gradually raising and then gradually lowering the temperature of the goods contained in such receptacles. In other words, the material is made to ascend or descend through different strata of a medium adapted to transfer heat to the material to be pasteurized or transfer it from said material, according to the stage of the pasteurization through which the material is passing. By this intermittent movement the material is not only subjected during the periods of rest to the temperature of the medium in which the receptacles are found at the respective steps, but during the periods of rest the baskets or other receptacles of the carrier may be loaded and unloaded as they are successively presented at the proper points for receiving and discharging the material to be treated.

The improvement is well adapted for use in pasteurizers such as illustrated in United States Letters Patent issued to me, Nos. 701,622 and 767,962, dated, respectively, June 3, 1902, and August 16, 1904, and one issued to A. A. Busch *et al.*, No. 713,952, dated November 18, 1902.

The object of the present improvement is to provide for an intermittent movement of the conveyer in a pasteurizer as distinguished from a continuously-moving conveyer, this intermittent movement being deemed much more favorable for the pasteurization for reasons that I will specify further. The merits of the substitution lie in that I am enabled to make better use of the different strata in temperature in the pasteurizer, more especially in types of such apparatus in which there is means for causing a very thoroughly-defined line of demarcation of temperature as between two different strata of water, as in the patents enumerated. These different strata in temperature are made use of by the intermittent movement in that the cages containing the receptacles holding material to be pasteurized are transferred by a step-by-step movement from one stratum of temperature to a different temperature, after which they are allowed to rest for a stated period in order the better to create an exchange of temperature between the water and the contents of the receptacles. This results in a more even heating and cooling of the material and a more thorough transferring of the temperatures in both directions. In carrying on the pasteurization in a pasteurizer in which the conveyer moves continuously the water that enters the cages containing the receptacles is displaced very gradually and there is not an immediate complete exchange of temperature taking place within the conveyer-cages when the cages move from one temperature stratum to another, owing to lack of rapid circulation from the cages. By moving the conveyer intermittently the cages are suddenly moved forward step by step, as there is less circulation in the cages and between the receptacles therein than there is in the water surrounding the cages. The rapid movement of the conveyer through the stratified temperature zones causes the water to be expelled from the cages rapidly, so that it is displaced and immediately replaced by either hotter or colder water as soon as the cages reach the next stratum of temperature. In this way I am enabled to get the direct benefit of each separate stratified course of water and its temperature conditions. The cages stop in their respective positions in each stratified course of water a stated length of time in order to absorb and give off temperatures to and from the water surrounding the receptacles in the cages. This is much to be preferred over a continuous movement in that it insures a more complete and even pasteurization of the material over what can be obtained in a continuously-moving conveyer, as in that case currents are produced which follow a less defined course and as a consequence of which some of the receptacles containing material to be pasteurized are affected more than others.

Figure I is a side elevation of a portion of a pasteurizer with my intermittent movement

applied thereto. Fig. II is an enlarged side elevation of the main portion of my movement. Fig. III is a section taken on line III III, Fig. II. Fig. IV is a section taken on line IV IV, Fig. II. Fig. V is a view, partly in elevation and partly in vertical section.

A designates a portion of a pasteurizer (see Fig. I) that may be of the form illustrated in either of the patents hereinbefore alluded to or of any other desirable form.

B is an endless carrier (such as is shown in the patents referred to) that operates in the tank of the pasteurizer and the holders C of which may be in the form of baskets, as shown, or of any other suitable formation. The carrier B operates upon sheaves D and D'. (Indicated by dotted lines, Fig. I.)

1 designates a shaft to which the sheaves D are fixed, and 2 is a shaft to which the sheaves D' are fixed.

3 is a notched wheel carried by the shaft 1, and 4 is a bifurcated throw-lever that straddles the notched wheel 3 and the arms of which are loosely fitted to the shaft 1. Upon the inner faces of the arms of the throw-lever are guides 5.

6 is a pawl slidably positioned between the guides 5 to reciprocate within the throw-lever. This pawl is adapted for engagement with the notched wheel 3, as seen in Figs. II and III, and it is provided with an aperture 7. The pawl is held projected to the notched wheel by a spring 8, which bears at one end against the pawl and the other end of which rests against a seat 4', that is an integral part of the throw-lever.

9 designates a driving-shaft to which power is applied from any suitable source.

10 is a crank-disk fixed to the shaft 9 and bearing peripheral bosses 11 and 12, that are offset from each other, so that they travel in different paths.

13 is a wrist-pin projecting from one side of the disk 10 and forming a part of said disk.

14 is a pitman having at one end a box 15, that is loosely fitted to the wrist-pin 13. At the other end of said pitman is a box 16, that is pivoted to the outer end of the throw-lever 4 by a pin 17. The pitman 14 by its connection to the crank-disk and the throw-lever provides for the imparting of rocking movement to the throw-lever during the rotation of the crank-disk 10, and when the throw-lever is rocked and the spring-pressed pawl 6 is seated in one of the notches of the wheel 3 and the notched wheel is in freed condition rotation is imparted to said wheel and the shaft 1, to which it is fixed, so that the conveyer-supporting sheaves D will be moved to cause travel of the bottle-carrier to a degree corresponding to the movement imparted to said notched wheel.

18 designates a catch-bolt that is reciprocally positioned in a guide 19, located adjacent to the notched wheel 3 and the point of which is adapted to enter the notches of said wheel to prevent retrograde rotation of the wheel under a certain condition that will hereinafter be referred to. The catch-bolt has connected to it the shank 20, that operates through a suitably-supported bracket 21 and is surrounded by an expansion-spring 22, located between the head of the catch-bolt and said bracket and by which the bolt is normally pressed toward the notched wheel 3.

23 is a pull-rod having one of its ends connected to the catch-bolt shank.

24 is a pull-lever to which the other end of the pull-rod 23 is pivoted. The pull-lever 24 is rockingly supported at its lower end by a shaft 25, that is mounted in a bracket 26, suitably supported. At the upper or free end of the pull-lever 24 is a roller 27, that is positioned in the path of travel of the crank-disk boss 11, so that it is engaged by said boss when the boss travels thereto during the rotation of the crank-disk.

28 designates a second pull-lever mounted upon the shaft 25 independently of the pull-lever 24 and bearing at its upper or free end a roller 29, that is positioned in the path of travel of the crank-disk boss 12, so that said boss will strike thereagainst when it is rotated thereto.

30 is a connecting-rod, pivoted at one end to the pull-lever 28, and 31 is a bell-crank lever, to one arm of which the other end of said connecting-rod is pivoted. This bell-crank lever is mounted upon a rock-shaft 32, mounted upon the catch-bolt guide 19, and the second or free arm of said lever extends in a direction toward the spring-controlled pawl 6, carried by the throw-lever 4, so that it will enter the aperture in said pawl when the pawl is moved thereto by the rocking of the throw-lever.

The operation of my movement as thus far explained is as follows: The crank-disk 10 rotates in the direction indicated by the arrow, Fig. II, and while its crank-pin is traveling upon a dead-center with respect to the pivot-pin 17, that connects the pitman 14 to the throw-lever 4, the crank-disk boss 11 travels against the roller 27 of the pull-lever 24, thereby rocking said pull-lever and causing the catch-bolt 18 to be withdrawn from the notched wheel 3. As the crank-disk continues to rotate to carry the crank-pin 13 from the position seen in full lines to the position seen in dotted lines, Fig. II, the pitman 14 is drawn forwardly and the throw-lever 4 is rocked to rotate the notched wheel 3, shaft 1, and sheaves thereon a distance corresponding to the space between the notches in which the pawl 6 is seated and the notch next in advance of the one in which it is seated. When the sheaves are so rotated, the carrier B has a movement imparted to it corresponding to the spacing of the bottle-holders. The movement of the throw-lever, as stated, carries the pawl 6 to the free arm of the bell-crank lever

31, and said arm moves into the aperture in said pawl, as seen in dotted lines, Fig. II. At this time the crank-disk having made a half-revolution its boss 12 is brought to the roller 29 of the pull-lever 28, and said boss acts against said roller to throw said pull-lever rearwardly and through the medium of the connecting-rod 30 rocks the free arm of the bell-crank lever 31 upwardly for the purpose of withdrawing the pawl 6 from the notch in which it was previously seated. Previous, however, to the withdrawal of said pawl the catch-bolt 18 enters into a notch in the wheel 3, being projected thereinto by the spring 22 as soon as the throw-lever 4 is rocked to the limit of its movement. It will be understood that the point of the catch-bolt rides against the periphery of the notched wheel between notches thereof while the wheel is being rotated subsequent to the withdrawal of the catch-bolt, as previously explained. The notched wheel being now held by the catch-bolt, retrograde rotation thereof is prevented and the wheel held while the rotation of the crank-disk 10 is continued to bring the wrist-pin back to the starting-point and return the throw-lever to its former position and permit entry of the pawl 6 into the notch of the wheel 3 next adjacent to that it was seated in for the next operation, the pawl riding off of the bell-crank arm onto the notched wheel as the throw-arm is returned.

For the purpose of imparting rotation to the shaft 2, that carries the sheaves D', so that said sheaves may be driven supplementarily to the driving of the shaft 1, I utilize a reach-rod 33, that is connected at one end to the pivot-pin 17 in the pull-lever 4 by a box 34. The other end of said reach-rod is pivotally connected by a box 35 to a bifurcated supplemental throw-lever 36, the arms of which are loosely mounted upon the shaft 2. 37 is a ratchet-wheel fixed to the shaft 2, and 38 is a spring-pressed pawl mounted in the throw-lever 36 and engaging the ratchet-wheel 37. This construction provides for actuation of the shaft 2 similar to the actuation of the shaft 1 as each movement of the throw-lever 4 is communicated to the lever 36 through the medium of the reach-rod 33, and when the last-named lever is actuated in a forward direction it causes rotation of the shaft 2, due to the engagement of the pawl 38 with the ratchet-wheel 37.

39 is a catch-bolt mounted in a guide 40 and having its point presented to the ratchet-wheel 37. The catch-bolt is pressed forwardly by a spring 41, and it acts to prevent retrograde rotation of the ratchet-wheel 37 when the pawl 38 is being returned after it has carried said ratchet-wheel in a forward direction.

The supplementary mechanism for operating the second shaft 2 of my intermittent movement is of more particular utility in constantly taking up the slack in the carrier of the pasteurizer and imparting movement to the carrier to compensate for wear therein, so that the carrier may be conducted in a uniform manner.

It is to be understood that while I have shown only two shafts driven by the movement herein described any greater number may readily be driven by properly connecting the additional shafts to the movement by suitable means, such as reach-rods.

I am aware that a German patent has been issued to Anders Anderson Pindstofte, dated December 9, 1896, for sterilizers, and I do not claim herein anything shown and described in said patent. There is no provision in the apparatus described in this patent for causing a step-by-step movement of the conveyer, the apparatus embracing merely a tank to contain a solid shallow body of water and a conveyor operating through said body of water, which is stopped from time to time for unloading and loading purpose, but which has no contemplation of an intermittent movement, whereby the cages of the conveyer are constantly carried forward step-by-step for the purpose of subjecting the receptacles therein and their contents to different temperature strata of water in a pasteurizer.

I claim as my invention—

1. The combination with the carrier of a pasteurizer in which the receptacles ascend or descend through varying strata of heat-transferring medium, of means for imparting intermittent movement to said carrier, substantially as set forth.

2. The combination with the carrier of a pasteurizer in which the receptacles successively pass through vertically-superposed strata of varying temperatures, of means for imparting intermittent movement to said carrier, and means for holding said carrier at rest periodically after movement has been imparted thereto, substantially as set forth.

3. The combination with the carrier of a pasteurizer in which the material to be treated is passed vertically through varying strata of temperatures, a sheave on which said carrier operates, and a shaft carrying said sheave; of means for imparting intermittent movement to said shaft, substantially as set forth.

4. A pasteurizer having means for developing vertically-superposed strata of varying temperatures and means causing the material to be treated to ascend or to descend through said strata of temperatures, by intermittent movements.

5. A pasteurizer having means for developing vertically-superposed strata of varying temperatures and means causing the material to be treated to ascend or to descend through said strata of temperatures by intermittent movements; the periods of rest between said intermittent movements occurring while the material is subjected to the different temperatures.

6. An apparatus for pasteurizing compris-

ing means for developing vertically-superposed strata of heat-transferring medium of varying temperatures and means causing the material to be treated to ascend or to descend through said strata to be brought to rest in each of said strata successively for a suitable period to enable the temperature of each stratum to produce the desired effect on the material to be treated.

WILLIAM J. RUFF.

In presence of—
HENRY DAMHORST,
FRANK A. LUBBE.