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PATENTED FEB. 26, 1907.

F. J. MACNISH.
STARTER CAN.

APPLICATION FILED JULY 23, 1906.

3 SHEETS—SHEET 1.

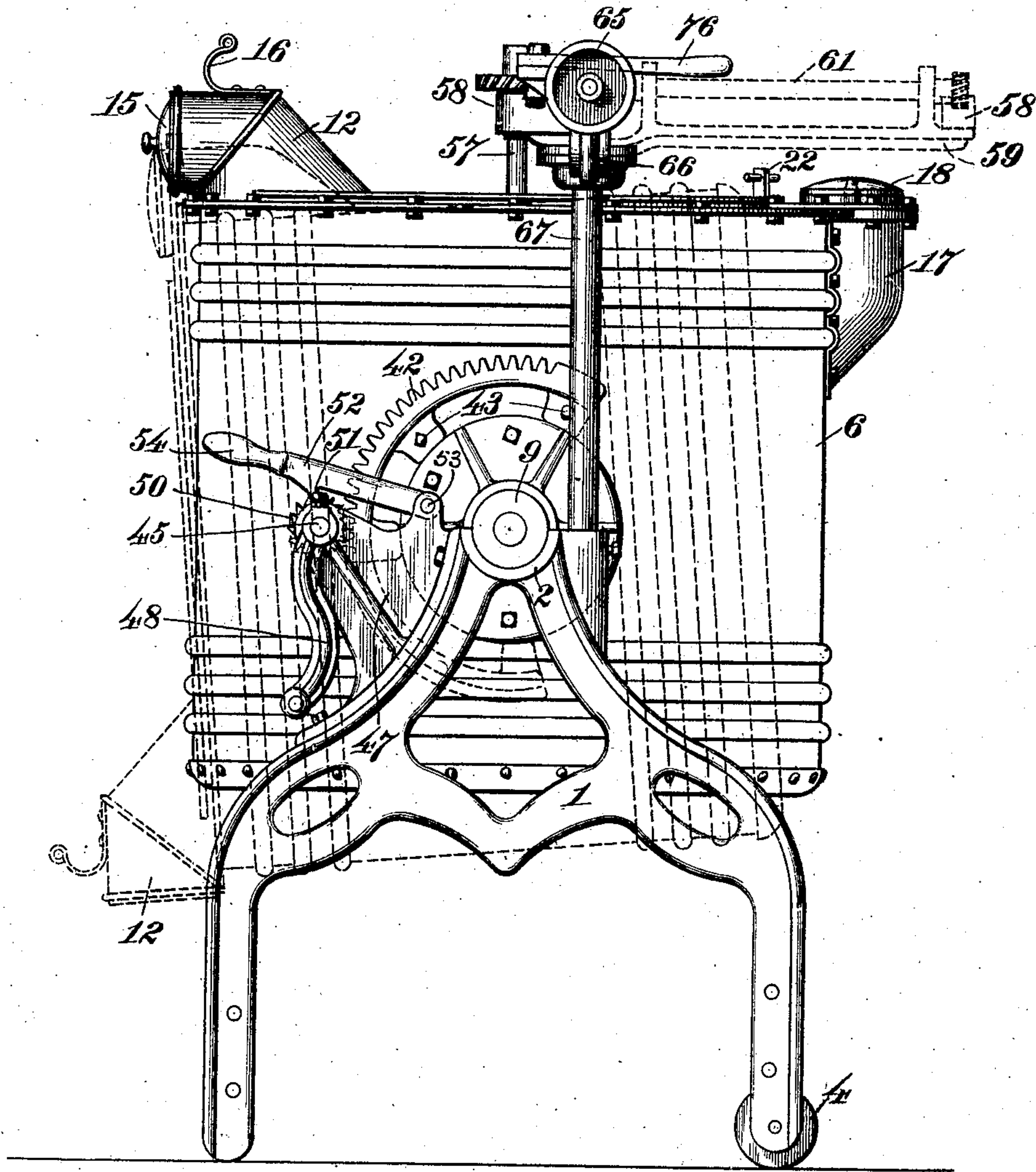


Fig. I.

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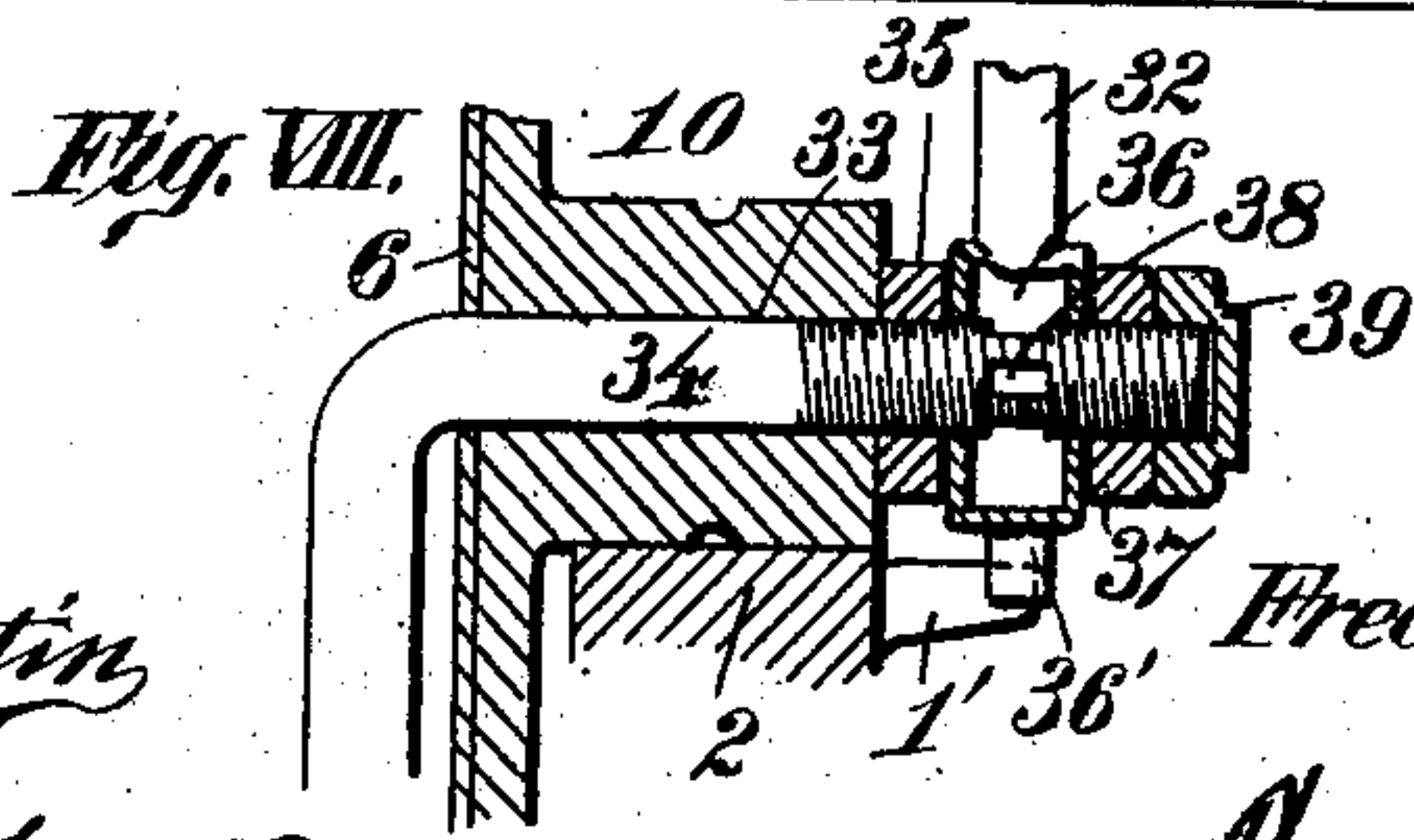
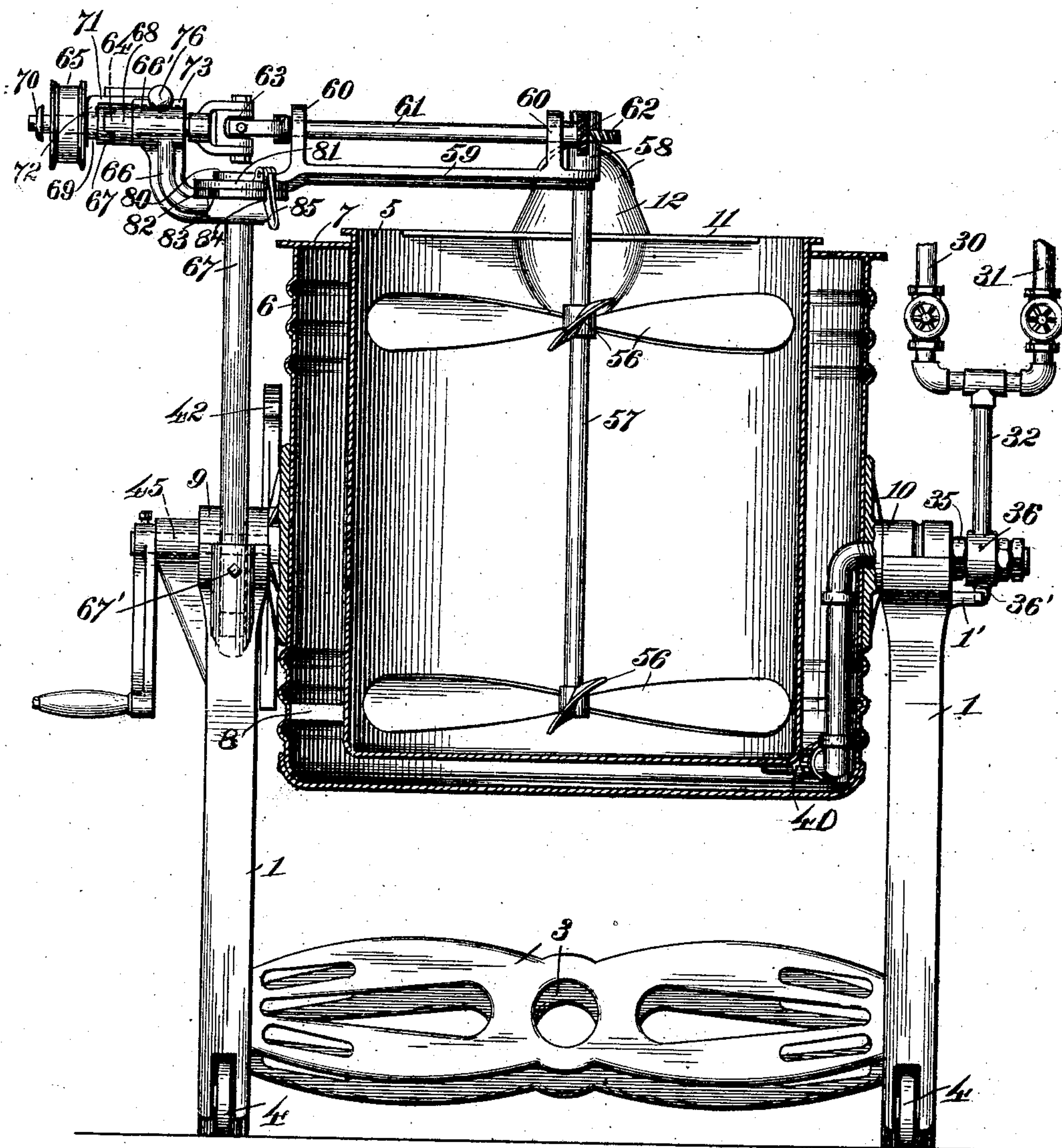
PATENTED FEB. 26, 1907.

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3 SHEETS—SHEET 2.

Fig. II.



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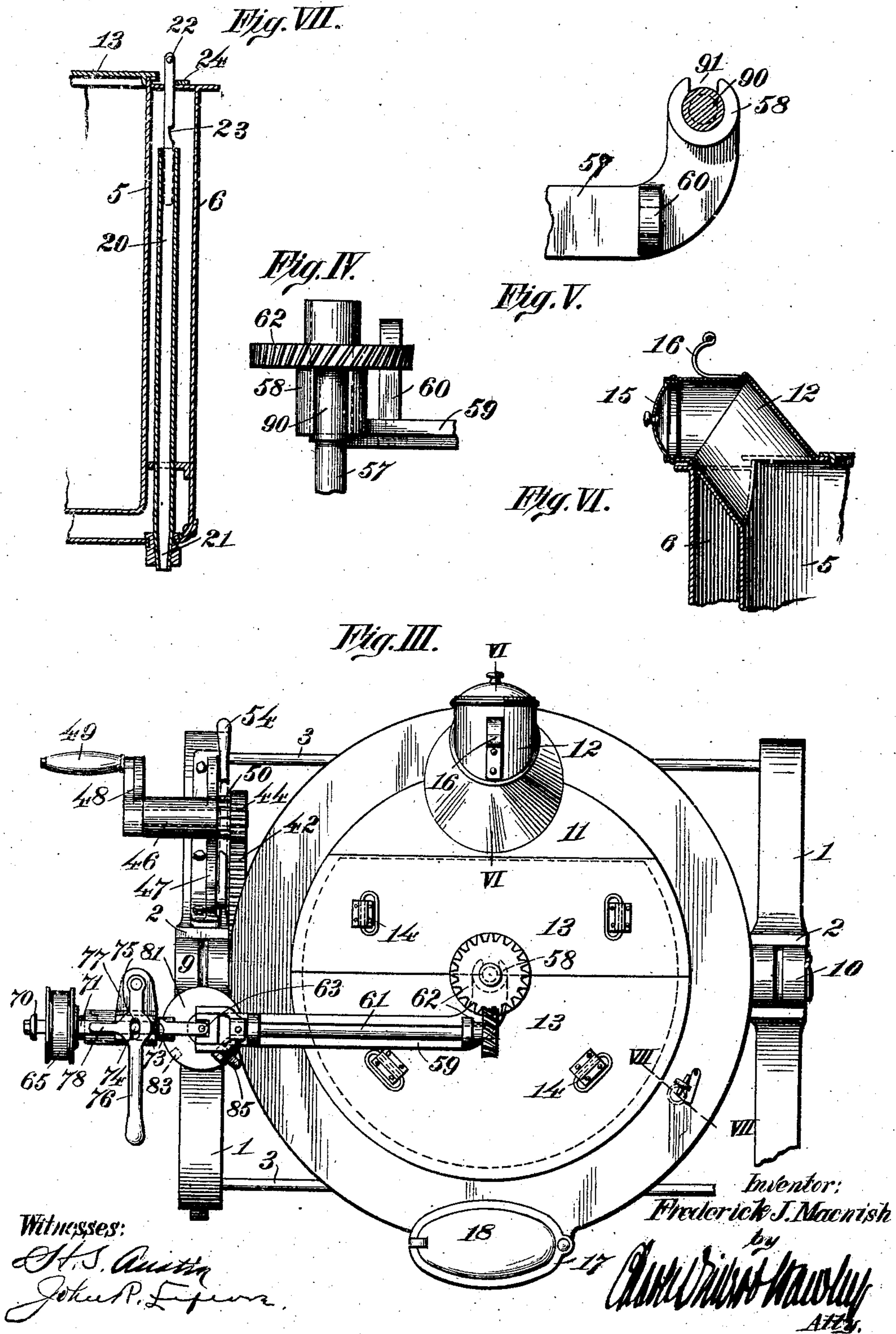
No. 845,469.

PATENTED FEB. 26, 1907.

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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE

FREDERICK J. MACNISH, OF OAK PARK, ILLINOIS, ASSIGNOR TO THE
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STARTER-CAN.

No. 845,469.

Specification of Letters Patent.

Patented Feb. 26, 1907.

Application filed July 28, 1906. Serial No. 328,262.

To all whom it may concern:

Be it known that I, FREDERICK J. MACNISH, a citizen of the United States, and a resident of Oak Park, Cook county, Illinois, have invented a certain new, useful, and Improved Starter-Can, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to starter-making apparatus. The so-called "starter" is the lactic ferment which is used in the ripening of cream preparatory to making butter therefrom. In large creameries great quantities of starter are used, and to make the required amount in the small cans or receptacles such as are in present use requires much labor, and, moreover, leads to non-uniformity in the starter and the butter product.

The purpose of my invention is to provide a starter-making apparatus in the form of a single can of sufficient capacity to supply starter of uniform quality adequate to present-day demands.

The particular object of the invention is to provide an improved starter-making can or vessel which shall be of such form that it may be easily cleaned and readily kept sterile, which shall be so constructed that its contents may be easily taken from it, and which shall be provided with all the necessary accessories for carrying out the process of making lactic ferment or starter.

With these objects in view my invention consists in a suitable frame, in combination with a large can or vessel trunnioned in said frame, means being preferably provided for tilting the can in the frame and for securing the can in either tilted or upright position.

The invention also consists in a starter-can provided with a suitable cover, in combination with an agitator and a support therefor above the can, said support and agitator being so constructed that both may be removed, leaving the cover in position.

Further, my invention consists in special constructions and in combination of parts, all as hereinafter described, and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this application, and in which—

Figure I is a side elevation of a can em-

bodying my invention, the same being shown tilted in dotted lines. Fig. II is a vertical section of the can, the frame and operating parts being shown in elevation. Fig. III is a plan view of the device. Fig. IV is a detail elevation of the end of the swinging bracket, showing the manner of supporting the agitator-shaft thereon. Fig. V is a plan view of the same, the agitator-shaft being shown in section. Fig. VI is a detail section of the discharge-spout on the line VI VI of Fig. III. Fig. VII is a detail section on the line VII VII of Fig. III, illustrating the drain and overflow device; and Fig. VIII is a detail section through one of the trunnions, illustrating the water and steam inlet to the water-jacket.

The principal element of my invention comprises a water-jacketed can composed of two tanks, one within the other and rigidly connected, making a simple structure. This can is trunnioned in a suitable frame, which carries the weight of the can and its contents, and it will be obvious that notwithstanding said weight the can may be easily tilted when it is desired to partially or wholly empty the same. An adjunct to this can is an agitator, which is normally within the can and supported by a suitable bracket, but which is so arranged that it may be easily detached therefrom before the can is tilted. As will be better described hereinafter, means are provided for filling the water-jacket with water and for heating the same to any desired temperature, incidental to which is the employment of a novel overflow and drain valve.

Referring now to the drawings for details of construction, 1 1 indicates the side members of the frame, provided at the top with trunnion-bearings 2, and 3 3 suitable cross members or braces which, together with the side members 1, form a strong and rigid frame. To facilitate moving the can from one point to another, the frame may be supplied with rollers or casters 4.

As previously stated, the can consists in two tanks, an inner one, in which the starter is prepared for use, and an outer one forming a jacket about the former.

5 indicates the inner tank, which is so constructed as to be readily cleaned and to present no openings or crevices for the lodgment of undesirable bacteria.

The outer tank is indicated at 6 and is of sufficient size to afford an ample jacket or space about the sides and bottom of the tank 5. A top to the water-jacket is closed by a permanent annular cover 7, as shown in Fig. II. This cover is secured to both the inner and outer tank and, together with suitable braces 8, interposed between the tanks near the bottom, secure the two tanks together in one rigid structure. The jacketed can thus formed is provided with trunnions 9 and 10, which rest in the trunnion-bearings 2. The inner can is partially closed by a segmental plate 11, which is rigidly secured thereto and to which is attached a discharge-spout 12. The remainder of the top is closed by a tightly-fitting two-part lid 13 13, provided with suitable handles 14. The discharge-spout 12, as stated, is attached to the stationary portion of the lid and opens therethrough into the can 5. It is normally closed by a cap 15 and is provided with a bail-hook 16, upon which a bucket or other receptacle may be hung to receive the starter when the can is tilted. An ice-spout 17 is attached to the can 6 and opens into the water-space. This spout is closed by a lid 18, and its use will be fully explained hereinafter. The space between the inner and outer cans forms a water or air jacket and is used for both during the operation of the device. I provide this jacket with a combined overflow and drain.

20 indicates an overflow-pipe, the same constituting a drain-valve. It is provided with a tapered lower end 21, which seats in a tapered valve-seat in the bottom of the outer can and extends upwardly nearly to the top of the jacket. It is evident that when water is turned into the jacket it can rise only to the top of the pipe 20. A handle 22, attached to the pipe 20 and extending through the cover 7 of the jacket, affords means for raising the pipe 20 to drain the jacket. A notch 23 in the stem of the handle and latch 24 on the cover 7 serve to hold the drain open. I will now proceed to describe the means for filling the water-jacket and the means for tempering the same after having been filled. Broadly speaking, I accomplish this by connecting suitably-valved water and steam pipes with said jacket through one of the trunnions. After the jacket is filled with water the valve in the water-pipe is turned off if it is desired to heat the contents of the can and the steam turned on. To cool the can, the cold water may either be left running, or if the water is not sufficiently cool for this purpose it is shut off after the jacket is full and crushed ice added through the ice-spout 17.

30 and 31 indicate the water and steam pipes, respectively, connected to the trunnion 10 by a common connection 32. The trunnion 10 is provided with a bore 33, in

which is secured a short pipe 34. A nut 35 locks the same against turning, except with the trunnion, and the connecting member 32 is provided with an enlarged end 36, which is pivotally connected to the pipe 34 and held in position thereon by a nut 37. Holes 38 in the pipe 34 afford ample passage-way for the water and steam, and suitable washers between the member 36 and the nuts 35 and 37 complete a tight joint. A nut 39 serves both to close the end of the pipe 34 and to lock the nut 37 in place. Interlocking lugs 36' and 1' on the member 36 and frame 1, respectively, hold the member 36 stationary when the can is turned on its trunnions. To more thoroughly heat the water, the steam is carried to the bottom of the jacket by a pipe 40, which is provided on the lower end with a suitable muffler.

To tilt the can when it is desired to withdraw the starter for use, I connect the can to the frame by suitable gearing and provide means for operating the same. It is obvious that the mechanism employed should be simple and easily operated and that it must be such as to put the can completely under the control of the operator. Accordingly I provide a segmental gear secured to the can and a pinion upon a shaft mounted on the frame and equip the latter with a crank for operating the same and further provide a suitable ratchet mechanism to place the device under better control.

42 indicates the segmental gear, attached to the can by suitable connecting means 43. The gear 42 may be made integral with the trunnion-casting 9 or may be made separate, as shown. A pinion 44 is in mesh with the gear 42. It is mounted on a shaft 45, having its bearings in a long sleeve 46, carried by a suitable bracket 47, attached to the frame. Upon the outer end of the shaft 45 is a crank-arm 48, having a handle 49. It will be seen that the can may be easily tilted by means of this device, especially as the trunnions are slightly below the center of the can, and, further, it may be tilted to just the extent desired by the operator. To retain the can in either its upright or tilted position, I provide the shaft 45 with a ratchet-wheel 50, engaged by a dog 51, formed upon a lever 52. The lever 52 is pivoted upon the bracket 47, as at 53, and is provided with a handle 54 for disengaging the dog from the ratchet when it is desired to right the can after having been tilted.

To properly incorporate the "mother-starter" with the milk, I provide the can with a suitably-driven agitator. This agitator comprises a plurality of blades mounted upon an agitator-shaft, the whole being journaled for rotation in a suitable support. The agitator and its support may be so arranged as to be movable with the can; but for obvious reasons it is preferable to support the

agitator upon the frame. This necessitates a peculiar and novel construction about to be described.

56 indicates a number of propeller-blades secured to a vertically-disposed shaft 57. This shaft is journaled in suitable bearings 58, provided for it in the outer end of a swinging bracket 59, which overhangs the can, as shown in Figs. II and III. The bracket 59 also carries a pair of bearings 60 for a horizontal shaft 61, which is suitably driven and constitutes the drive-shaft of the agitating device, the motion being communicated from the shaft 61 to the shaft 57 through screw-gearing 62. The shaft 61 is coupled by a universal joint 63 to a short pulley-shaft 64, normally in alinement with the shaft 61 and which carries a pulley 65. A stationary bracket 66, mounted upon a vertical arm or rod 67, rising from the frame 1, affords a bearing 66' for the shaft 64. The pulley 65 is loose on the shaft 64, but is operatively connected thereto by a suitable clutch.

67 68 indicate the clutch members, the former made integral with the pulley and the latter being rigidly secured to the shaft 64. The member 67 is provided with a groove 69 to be engaged by the clutch-operating device. It should be noted that it is the pulley and the clutch member thereon which is shifted on the shaft and not the member which is keyed to the shaft, as is the usual method. A stop 70 is provided on the shaft 64 to limit the movement of the pulley when being thrown out of operation. To operate the clutch, a bar 71, having a depending lug 72, engaging the groove 69, is slidably mounted upon the top of the bearings 66 between guides 73. A pin 74 extends upwardly from the slide-bar 71 and engages a slot 75 in a lever 76. The lever 76 is pivoted upon a lug 77, extending from the bearing 66', and is provided with a side extension or arm 78, which rests upon a slide-bar 71 to keep the lug 72 in engagement with the groove 69.

In order that the can may be tilted, it is necessary to move the bracket 59 out of the way. Accordingly it is pivoted at 80 upon the base of the bracket 66 and may be swung from over the can, as indicated in dotted lines in Fig. I. The universal joint connecting the shafts 61 and 64 is coaxial with the pivot 81. This permits the bracket 59 and shaft 61 to be swung from over the can, leaving the pulley and bracket 66 stationary, so that it is not necessary to ship the belt from the pulley.

81 82 indicate coöperating disks provided upon the brackets 59 and 66, respectively. The disk 82 has two notches 83 84 in its periphery, and the disk 81 carries a latch 85, adapted to engage either of said notches to lock the bracket in either its open or operative position.

Before the bracket 59 can be swung out of operative position it is necessary to detach the agitator-shaft 57. For this purpose the connection between the shaft 57 and bracket 59 is formed, as clearly illustrated in Figs. IV and V of the drawings. The top of the shaft is formed with an enlarged journal, and the bearing 58 is cut away or slotted, as at 91, for a distance slightly greater than the normal diameter of the shaft. Thus by raising the shaft 57 until its journal 90 is above the sleeve 58 the shaft is readily disengaged from the bracket. To regulate the height of the agitator in the can, the brackets 66 and 59, which carry the agitator and its operating mechanism, may be adjusted by raising or lowering the arm 67 in its socket on the frame 1. When properly adjusted, it is held in position by a set-screw 67'. It is evident that the brackets 59 and 66 may be made integral and the whole device pivoted upon the arm 67 or that the same may be located at a sufficient height above the can to avoid the necessity of swinging it at all. However, for obvious reasons I prefer to construct this portion of the device as herein shown and described.

The operation of the device is as follows: The desired quantity of skim-milk is placed in the inner can and the agitator put in place; also, the jacket is then filled with water and the steam turned on from the steam-pipe 31. The temperature is in this manner raised as quickly as possible to about 180° and kept at that temperature for about twenty minutes. During this time the lid is left off to permit the fumes to escape. The drain in the bottom is then opened and the hot water withdrawn, and the lid is then put on to tightly close the can. The valve in the bottom is then closed, and cold water is turned into the jacket to reduce the temperature of the milk to about 70°. The overflow will take care of the surplus water, so no attention is required until the milk is cooled. If the water is not cold enough to sufficiently reduce the temperature, a quantity of crushed ice may be placed in the jacket through the ice-chute 17. As soon as cooled to about 70° the mother-starter is added and the milk agitated until the starter is thoroughly incorporated therewith. The water is then withdrawn and all openings tightly closed. In this way the jacket forms an air-tight insulation about the can and holds the temperature much better than can be done otherwise. No further attention is required until the starter is ripe. It should then be cooled to about 50° and kept at that temperature until used. The lowering of the temperature is accomplished in the same manner as before explained. When starter is wanted for the cream-ripening vat, the shaft 57 is first disengaged from its bearings 58, then the latch 85 is raised, releasing it from the notch 84,

after which the bracket is readily turned out of the way of the can, as hereinbefore fully described. The dog 51 is disengaged from the ratchet, and the crank 48 is turned until the can is partly tilted. The cap 15 is removed from the discharge-spout and a bucket hung on the hook 16, after which the crank 48 is turned until the starter flows. The dog 51 holds the can tilted until enough starter is withdrawn. After raising the lever 52 to disengage the dog the can is easily righted and the cap 15 put in place to close the can.

It will be seen from the foregoing description that the device is one in which large quantities of starter may be made and yet one which is even more readily operated and handled than the small ones now in use. It will further be seen that the can may with proper attention be kept perfectly clean and sterile, there being no places where bacteria can lodge and remain, such as in the case with devices provided with pump, drain-gates, or the like.

As various modifications will readily suggest themselves to one skilled in the art, I do not limit myself to the exact construction and arrangement of parts as herein shown and described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a starter-making can, a suitable frame, in combination with a jacketed can trunnioned therein on an axis perpendicular to the axis of the can, a combined overflow and drain valve arranged in said jacket and means for supplying liquid to the jacket, substantially as described.

2. In a starter-making can, a suitable frame, in combination with a jacketed can trunnioned therein on an axis perpendicular to the axis of the can, a combined overflow and drain valve arranged in said jacket, means for supplying liquid to the jacket and means for tempering the contents of the jacket, substantially as described.

3. In a starter-making can a suitable frame, in combination with a can trunnioned therein, a bracket fixed above said can, a drive-shaft in said bracket, an agitator in said can, and detachably mounted upon said bracket and a flexible connection between said shaft and said agitator, substantially as described.

4. In a starter-making can, a suitable frame, in combination with a can trunnioned therein, a bearing fixed above said can, a driving-shaft in said bearing, an agitator provided in said can, a flexible driving connection between said shaft and said agitator and a swinging support for said agitator and flexible connection, substantially as described.

5. A starter-making can comprising an inner and outer tank, in combination with a

suitable frame wherein said can is trunnioned, a spout at the top communicating with the inner tank only, and means for tilting and righting said can in said frame; substantially as described.

6. A suitable frame, in combination with a jacketed can trunnioned therein, a spout at the top of said can and a hook on said spout, and means for tilting and righting said can on said frame, substantially as described.

7. A jacketed starter-can trunnioned in a suitable frame, in combination with a lid for said can, said lid comprising a stationary portion and a removable portion, and a spout arranged in said stationary portion, substantially as described.

8. A starter-can comprising an inner and outer tank, in combination with a suitable frame wherein said can is trunnioned, means for turning said can on its trunnions, a spout on the top of said can in communication with the inner tank only, and a closure for said spout; substantially as described.

9. A starter-can comprising an inner and outer tank, in combination with a suitable frame whereon said can is trunnioned, means for turning said can on said trunnions, a spout upon the top of said can, in communication with the inner tank and a device on said spout for attaching a receiving-receptacle, substantially as described.

10. In a starter-can, comprising inner and outer tanks and mounted for turning in a suitable frame, cold-water and steam pipes communicating with said outer tank through a common connection and means upon said frame to prevent the turning of said connecting member with said can, substantially as and for the purpose described.

11. A starter-can mounted for turning upon a suitable frame, a bracket pivoted upon said frame and normally overhanging said can, means for swinging said bracket from over said can, an agitator in the can and having bearings in said bracket, a rotatable shaft on said bracket and suitable connection between said agitator and said shaft operating said agitator, substantially as described.

12. A starter-can mounted for turning upon a suitable frame, a bracket mounted upon said frame and overhanging said can, an agitator in said can and having bearings in said bracket and means for swinging said bracket from over said can, substantially as and for the purpose described.

13. A starter-can mounted for turning upon a suitable frame, a bracket mounted upon said frame and normally overhanging said can, and adapted to be swung from over said can, means for locking said bracket in both operative and open position, an agitator in the can and having bearings in said bracket and means for rotating said agitator, substantially as described.

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14. In a device of the class described, a can provided with trunnions, a suitable frame therefor, means for tilting the can on said trunnions, in combination with a bracket 5 attached to said frame, said bracket comprising a stationary portion and a swinging portion pivoted on said stationary portion, an agitator in said can and journaled in the end of said swinging portion, a flexible drive- 10 shaft journaled in said bracket and suitable connections between said drive-shaft and said agitator, substantially as described.

15. In a device of the class described, a can provided with trunnions, a suitable frame 15 therefor, and means for tilting the can on said trunnions, in combination with, a bracket attached to said frame, said bracket comprising a stationary portion and a swinging portion pivoted on said stationary por- 20 tion, a shaft in each said portions, a flexible joint connecting said shafts above the pivotal point of the bracket, an agitator in said can and journaled upon the outer end of said swinging portion and a suitable connection 25 between said agitator and the shaft carried by said swinging portion of the bracket, substantially as described.

16. In a device of the class described, a can 30 mounted upon a suitable frame and provided with an agitator, said agitator comprising a vertical shaft having a plurality of blades extending therefrom, and an upper end extending above the top of the can and of greater diameter than the rest of the shaft, 35 and constituting a journal for said agitator, in combination with a bracket carrying a drive-shaft, a bearing upon said bracket for the journal of said agitator and a slit in said bearing of greater width than the diameter

of said agitator-shaft, substantially as and 40 for the purpose described.

17. In a device of the class mentioned, a suitable frame in combination with a can trunnioned therein, means for swinging said 45 can on its trunnions, a detachable agitator suspended in said can and adapted for use only when the can is in a vertical position, suitable drive mechanism for said agitator, and a support for said agitator and its drive 50 mechanism; substantially as described.

18. In a device of the class mentioned, a suitable frame in combination with a can trunnioned therein, means for swinging said 55 can on its trunnions, a detachable agitator suspended in said can and adapted for use only when the can is in vertical position, suitable drive mechanism for said agitator, and a swinging support for said agitator and its drive mechanism; substantially as de- 60 scribed.

19. In a starter-making can, a suitable frame, in combination with a can trunnioned therein, means for swinging said can on its trunnions, a detachable agitator suspended 65 in said can and adapted for use only when the can is in vertical position, suitable drive mechanism for said agitator, a support for said agitator and its drive mechanism, and means for swinging said support and drive 70 mechanism from over said can; substantially as described.

In testimony whereof I have hereunto set my hand, this 23d day of July, 1906, in the presence of two subscribing witnesses.

FREDERICK J. MACNISH.

Witnesses:

A. McCOMB,

E. J. WELLINGHOFF.