June 20, 1944. C. H. ABBOTT 2,351,731

CAN DUMPING MECHANISM

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FIG. 1

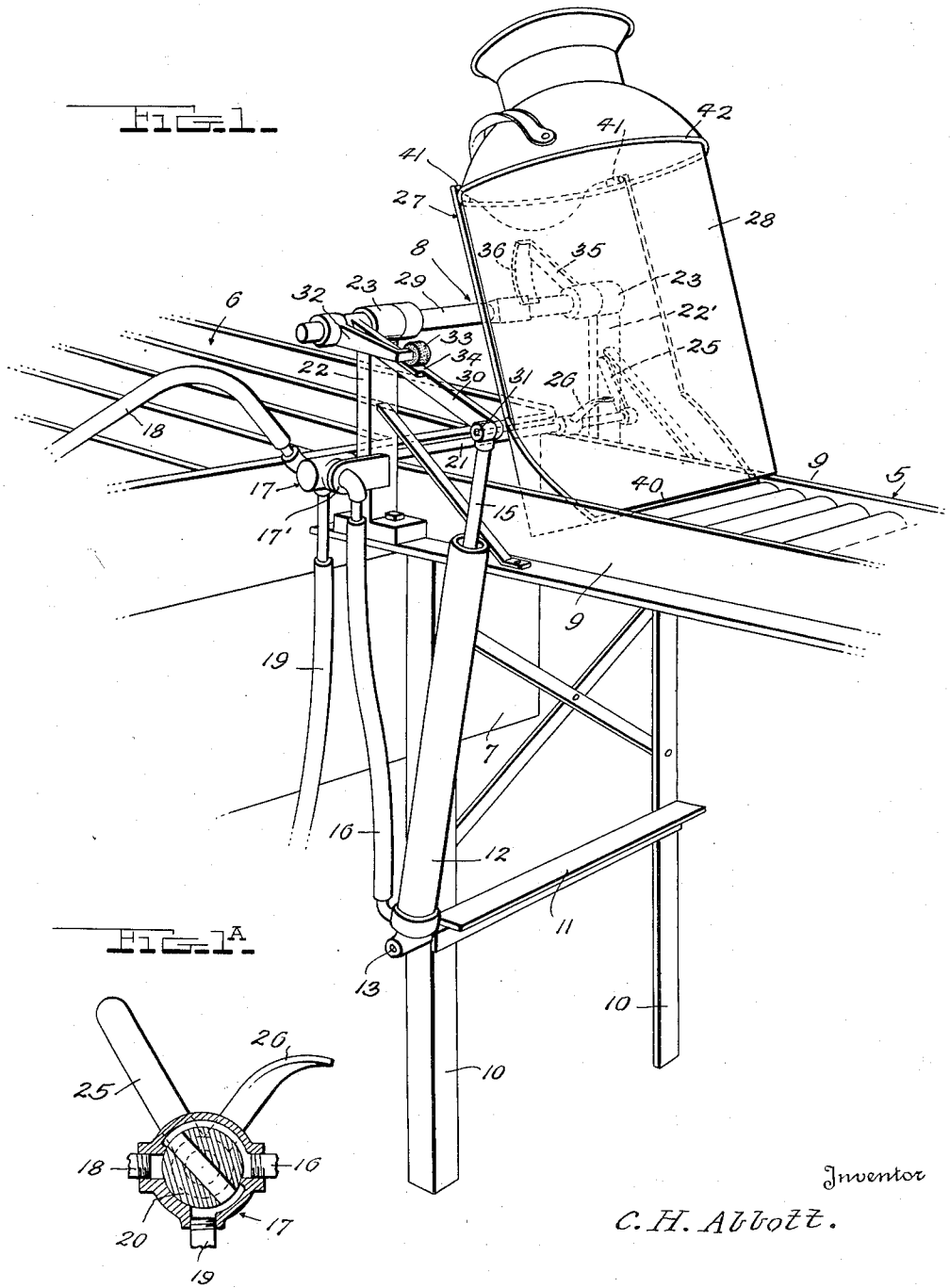


FIG. 1A

Inventor

C. H. Abbott.

By

H. B. Wilson & Co. Attorney

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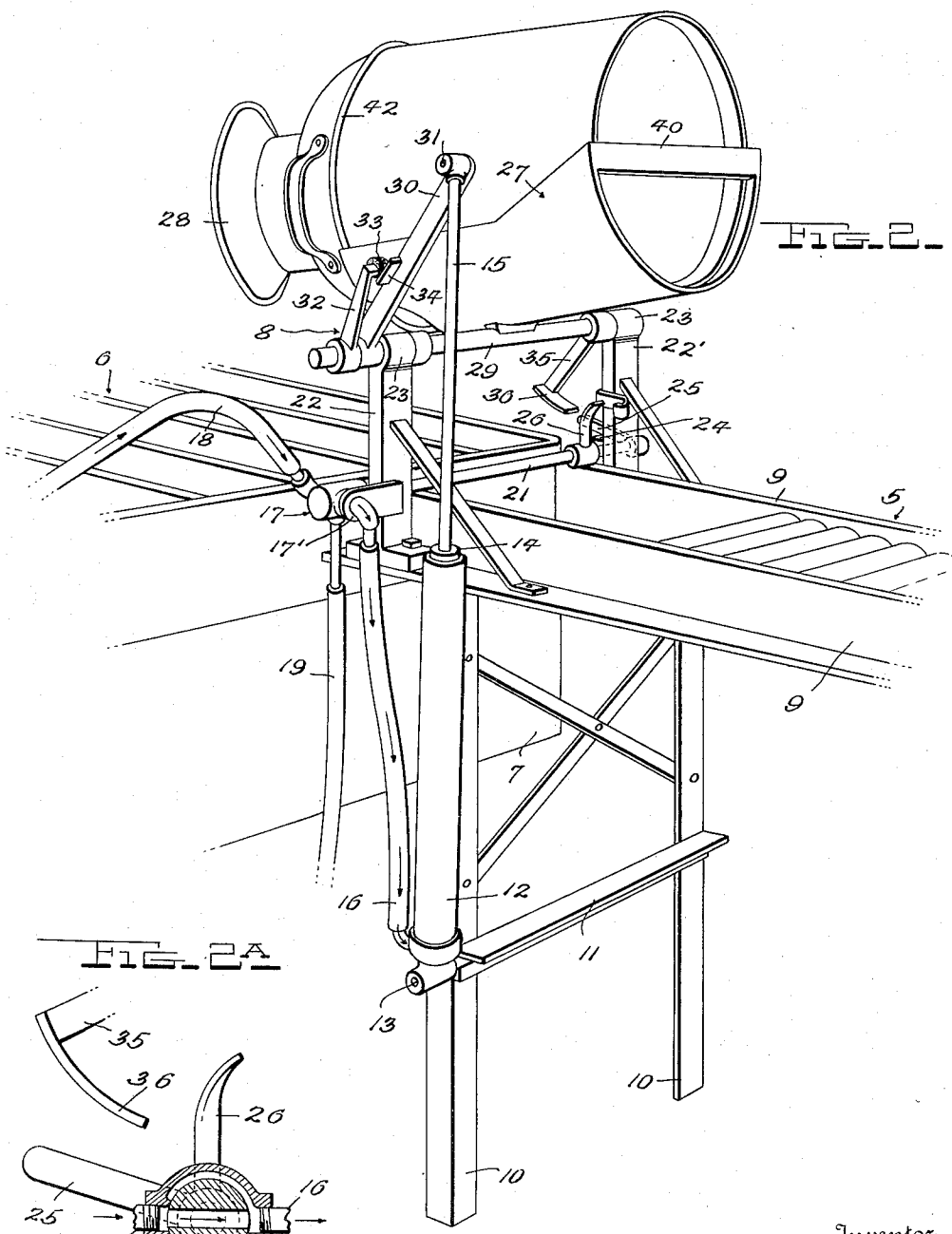


FIG. 2

FIG. 2A

Inventor

C. H. Abbott.

By

H. B. Wilson & Co.

Attorney

June 20, 1944. C. H. ABBOTT 2,351,731

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FIG. 3.

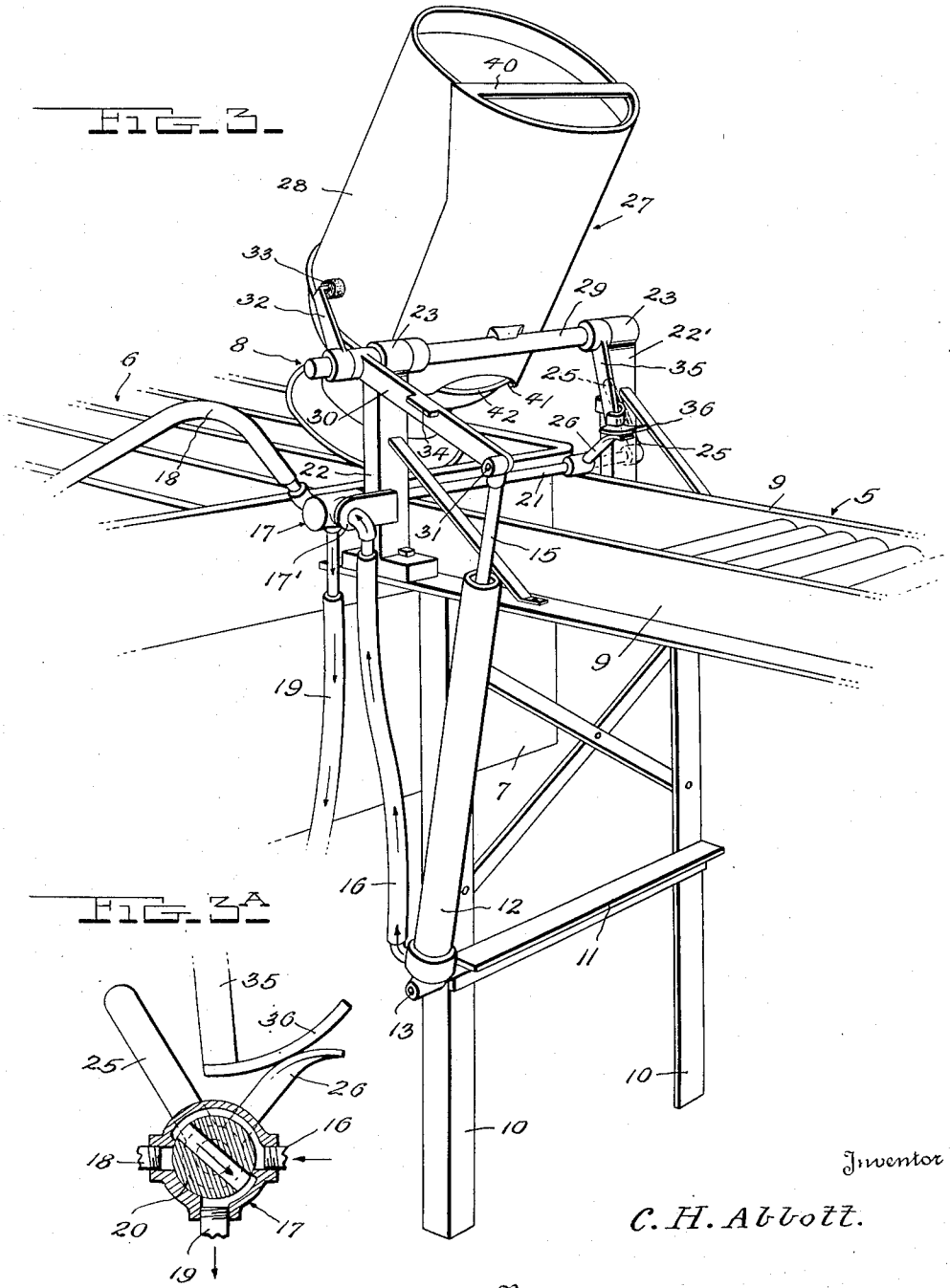


FIG. 3A.

Inventor

C. H. Abbott.

By

H. B. Wilson & Co. Attorneys

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UNITED STATES PATENT OFFICE

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CAN-DUMPING MECHANISM

Claude H. Abbott, Astoria, Oreg.

Application June 29, 1943, Serial No. 492,767

6 Claims. (Cl. 214—1.1)

The invention aims to provide a novel and advantageous mechanism for use in dairies for emptying cans of milk as they are received.

A further object is to provide a novel can dumping mechanism which may be operated by the usual water pressure which is always available in any dairy.

A still further object is to provide a novel can dumping mechanism in which a control valve for the water pressure which actuates said mechanism, is operated by hand to tilt the can to dumping position and is actuated automatically to exhaust the water when its task has been performed.

Yet another aim is to provide a novel can dumping mechanism in which the water-actuated means returns to normal in readiness for the next operation, during final emptying of the can.

A still further object is to provide a structure which is simple and inexpensive, yet efficient, reliable and durable.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawings.

Figure 1 is a perspective view showing the invention associated with a roller conveyor and a receptacle which receives the milk.

Fig. 1ª is a detail vertical section showing the position of the control valve in Fig. 1.

Fig. 2 is a perspective similar to Fig. 1 but showing the mechanism in the act of dumping a can.

Fig. 2ª is a view similar to Fig. 1ª but showing the position of the control valve in Fig. 2.

Fig. 3 is a perspective view showing the parts in the positions which they assume during final can dumping.

Fig. 3ª is a detail vertical section showing the position of the control valve in Fig. 3.

The construction illustrated in the drawings above briefly described, may be considered as preferred, with the understanding, however, that variations may be made within the scope of the invention as claimed.

A roller conveyor 5 is shown extending to a grating 6 over a receptacle 7, and the present can dumping means is indicated in a general way by the number 8, said mechanism being positioned to receive the incoming cans from the conveyor 5, one at a time, and to dump them through the grating 6 into the receptacle 7, each emptied can being removed from the dumping means and moved on to the usual can washing mechanism. As the conveyor 5, grating 6 and receptacle 7 are conventional, no attempt has been made to disclose them in detail.

The supporting frame structure for the conveyor rollers, in the present disclosure, includes parallel side bars 9 supported by legs 10, suitably braced and tied together near their lower ends by a bar 11. A vertical cylinder 12 has its lower end pivoted to one end of this bar 11 as shown at 13, said cylinder containing a piston 14 (Fig. 2) having a rod 15. A water line 16 leads to the lower end of the cylinder 12 from a control valve 17, to which valve a water line 18 extends from a conventional source of water pressure. An exhaust line 19 also extends from the valve 17. This valve is of such construction as to place the lines 18 and 16 in communication with each other (Fig. 2ª) when water is to be admitted to the cylinder 12 to operate the can dumping mechanism, the construction of said valve being also such that it will place the lines 16 and 19 in communication with each other, when the water is to be exhausted from the cylinder 12 to permit the piston 14 and its rod 15 to return to normal position (Fig. 3ª). A conventional form of valve for accomplishing these results is shown, with the understanding that any other appropriate valve may be employed. The illustrated valve includes a rotatable plug 20 to which an operating shaft 21 is secured at one of its ends, said shaft extending across the supporting frame structure of the roller conveyor 5, near the grating 6. One end of the shaft 21 is of course supported directly by the valve 17, the casing of which is suitably mounted on a bracket 17'. This bracket is secured to a standard 22 secured to and projecting upwardly from one of the side bars 9 of the roller conveyor 5 and there is a similar standard 22' secured to the other of said side bars, these two standards being provided with bearings 23 at their upper ends. The standard 22' also carries another bearing 24 for the end of the shaft 21 remote from the valve 17, said end of shaft 21 having an operating handle 25 and an arm 26 for a purpose to appear.

A cradle 27 is provided to receive any milk can 28 to be dumped, said cradle having a rock shaft 29 mounted in the bearings 23. A vertically swingable arm 30 is freely pivoted at one of its ends upon the shaft 29, the other end of said arm being pivoted at 31 to the upper end of the piston rod 15. A second arm 32 is secured to the shaft 29 and normally lies upon the arm 30 as seen in Fig. 1, the free end of said arm 32 preferably having a cushion 33 contacting

with the arm 30, and the latter being preferably widened at 34 for engagement with said cushion. There is also a third arm 35 secured to the shaft 29, said arm 35 having a curved terminal 36 for coaction with the arm 26 of the valve-operating shaft 21 as seen in Figs. 3 and 3a, to so operate the valve 17 as to exhaust water from the cylinder 12 when this cylinder and its piston have tilted the cradle 27 and can 28 somewhat beyond the position shown in Fig. 2. Before the can reaches this position, it is held by an attendant and its complete emptying is effected, after which it is passed on to the washing mechanism. Just as soon as arm 35—36 moves arm 26 to operate valve 17 to exhaust water from the cylinder 12, the piston 14, rod 15 and arm 30 return by gravity to their normal positions (Fig. 3) in readiness for the next operation. When the can has been completely emptied and taken from the cradle 27, this cradle tilts back to the normal position shown in Fig. 1, again placing the arm 32 on the arm 30 and again moving the arm 35—36 out of engagement with the valve-operating arm 26, as also seen in Fig. 1. When 36 clears 26, the latter remains in the position to which it was moved by 36 (see Fig. 3a) and thus the supply of water to the cylinder 12 remains cut off until again required. When water is to be admitted to cylinder 12 to again operate the dumping means, the handle 25 is actuated to operate the valve 17 (see Figs. 2 and 2a).

While the operation will probably be clear from the foregoing, it may be briefly restated as follows:

The cradle 27 normally occupies the substantially upright position shown in Fig. 1 in readiness to receive a can 28 from the roller conveyor 5. When the can is properly positioned in the cradle, the handle 25 is actuated from the positions of Figs. 1 and 1a to that shown in Figs. 2 and 2a, thus operating the valve 17 to admit water from the supply line 18, through the valve and through the line 16 to the cylinder 12. The water pressure elevates the piston 14 and its rod 15 with the result that the arm 30 is upwardly swung, causing this arm to thrust against the arm 32 to tilt the cradle 27 and the can as shown in Fig. 2. When the cradle tilts somewhat past the position shown in Fig. 2, the terminal 36 of the arm 35 strikes the arm 26 on the valve-operating shaft 21 (Figs. 3 and 3a) thus operating the valve 17 to exhaust water from the cylinder 12 through the line 16, said valve 17, and the exhaust line 19. The piston 14, rod 15 and arm 30 then return by gravity to their normal positions, said arm 30 simply separating from or receding from the arm 32 which is secured to the shaft 29 of the cradle 27. Before the parts really reach the position shown in Fig. 2, an attendant is holding the can 28 and when the cradle is freed from the action of the piston 14 (by the exhaust of water from the cylinder 12), said attendant tilts the can and cradle on to final dumping position, removes the emptied can from the cradle and moves said can on to the washing means. The cradle 27 and its arms 32 and 35 then return to the normal positions shown in Fig. 1 and said arm 35 leaves the arm 26 in the position to which it was moved by the terminal 36 of said arm 35 (see Figs. 1 and 1a). With the valve 17 thus left in the position shown in Figs. 1 and 1a, no more water may be admitted to the cylinder 12 until handle 25 is again operated to reposition the valve as seen in Figs. 2 and 2a.

The cradle 27 is preferably somewhat less than semi-cylindrical, is provided at what is normally its lower end with a supporting bar 40 for the can 28, and is provided at its other end with two internal ribs 41 to engage the usual external bead 42 of the can, thus holding the can against slippage on the cradle, said can being, however, held during the final dumping movement, by the attendant who is thus in readiness to remove the emptied can from the cradle.

From the foregoing taken in connection with the accompanying drawings, it will be seen that novel and advantageous provision has been made for carrying out the objects of the invention, and while preferences have been disclosed, attention is again invited to the possibility of making variations within the scope of the invention as claimed.

I claim:

1. A can dumping mechanism comprising a supporting structure, a cradle tiltably mounted on said supporting structure and normally occupying a can-receiving position, fluid-actuated means mounted on said supporting structure, a control valve for admitting fluid to said fluid-actuated means and exhausting it therefrom, and connecting means from said fluid-actuated means to said cradle for tilting the latter toward can-dumping position, said connecting means including separable thrust portions operatively connected with said cradle and said fluid-actuated means respectively, said thrust portions being cooperable to transmit can-dumping motion from said fluid-actuated means to said cradle and being separable from each other to free said cradle from the influence of said fluid-actuated means, whereby said fluid-actuated means may be returned to normal position during final can-dumping, and said cradle may be returned to its normal position after removal of the emptied can.

2. A can dumping mechanism comprising a supporting structure, a cradle pivotally mounted on said supporting structure and normally occupying a can-receiving position, fluid-actuated means mounted on said supporting structure, a control valve for admitting fluid to said fluid-actuated means and exhausting it therefrom, a normally lowered arm connected at one of its ends to said fluid-actuated means and pivoted at its other end to said supporting structure, a thrust member secured to said cradle and normally lying against said arm, said arm and thrust member being cooperable to transmit can dumping motion from said fluid-actuated means to said cradle, said arm and thrust member being separable from each other to free said cradle from the influence of said fluid-actuated means when said control valve is operated to exhaust fluid from said fluid-actuated means, whereby said arm and said fluid-actuated means may return to their normal positions during final can-dumping and said cradle may be returned to its normal position after removal of the emptied can.

3. A can dumping mechanism comprising a supporting structure, a tiltable cradle having a supporting shaft rockably mounted on said supporting structure, one normally lowered arm freely pivoted at one of its ends on said shaft, a second arm secured to said shaft and normally abutting said one arm to transmit can-dumping motion from this arm to said cradle, fluid-actuated means connected with said one arm for first raising it to a can-dumping position and then effecting return of said one arm, and a con-

trol valve for said fluid-actuated means, said one arm being movable away from said second arm during its return movement, whereby said one arm and said fluid-actuated means may return to their normal positions during final can-dumping and said cradle may be returned to its normal position after removal of the emptied can.

4. A structure as specified in claim 1; together with actuating means for said valve including a handle for operating said valve to actuate said fluid-actuated means, and means actuated by said cradle for operating said valve to exhaust the fluid from said fluid-actuated means.

5. A structure as specified in claim 2; together with actuating means for said valve including a handle for operating said valve to actuate said fluid-actuated means, and means actuated by said cradle for operating said valve to exhaust the fluid from said fluid-actuated means.

6. A structure as specified in claim 3; together with an actuating shaft connected with said valve and mounted in parallel relation with said rock shaft, a handle on said actuating shaft for turning the same to admit fluid to said fluid-actuated means, and coacting means on said rock shaft and actuating shaft for turning the latter to exhaust fluid from said fluid-actuated means.

CLAUDE H. ABBOTT.