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HAM PUMP.

APPLICATION FILED JULY 17, 1909.

982,601.

Patented Jan. 24, 1911.

2 SHEETS—SHEET 1.

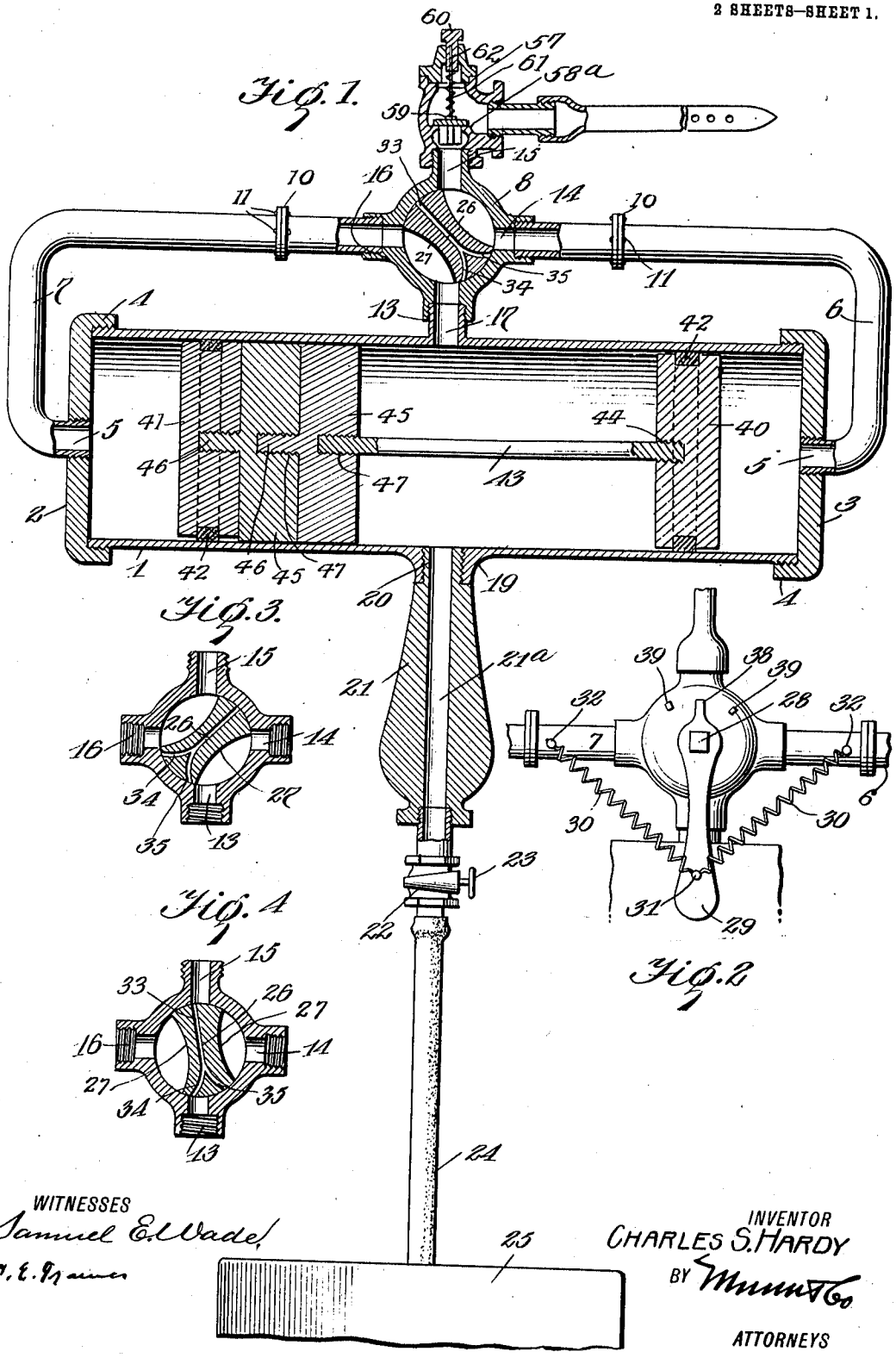

Fig. 1.

Fig. 3.

Fig. 4.

Fig. 2.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 5.

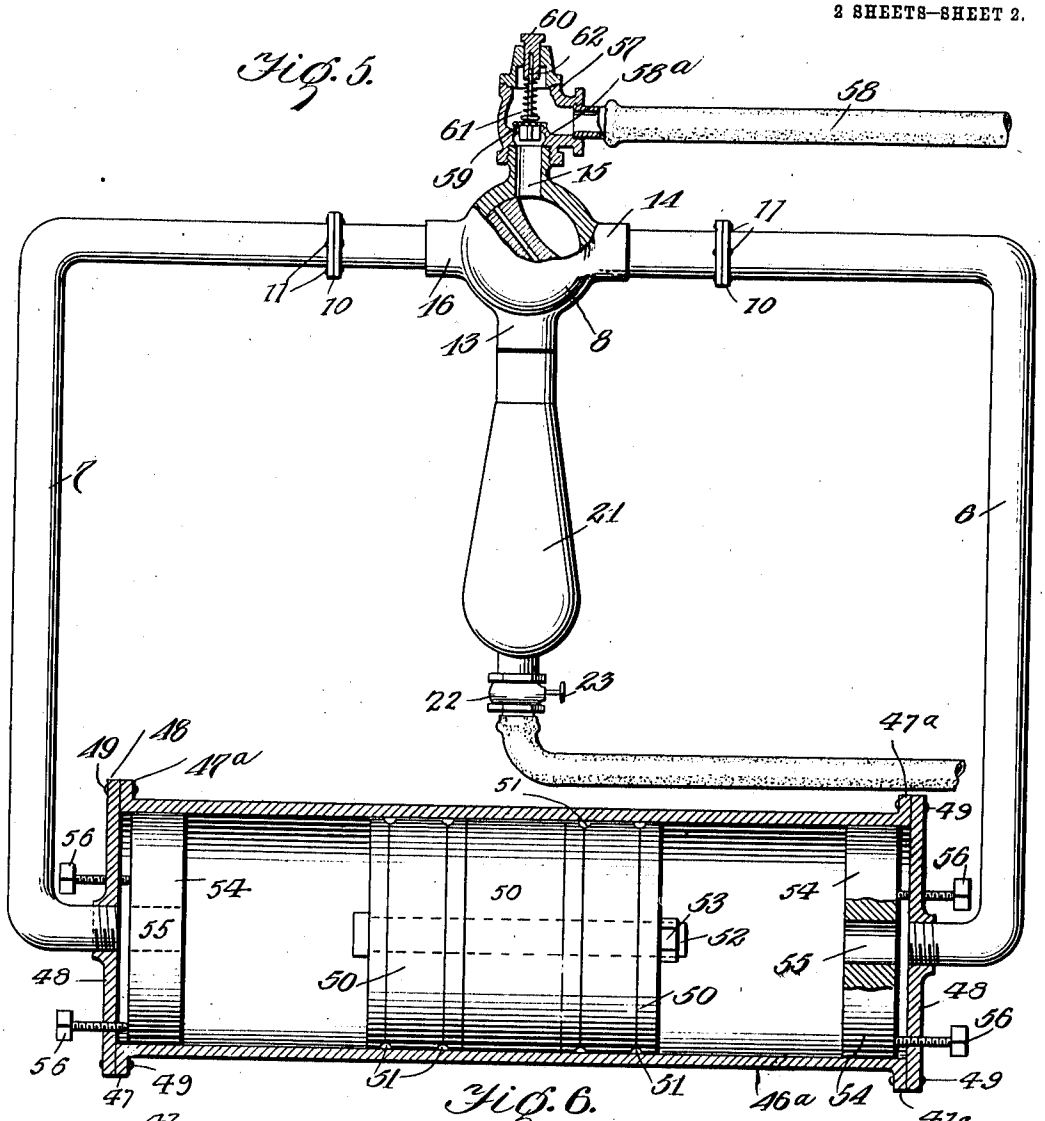
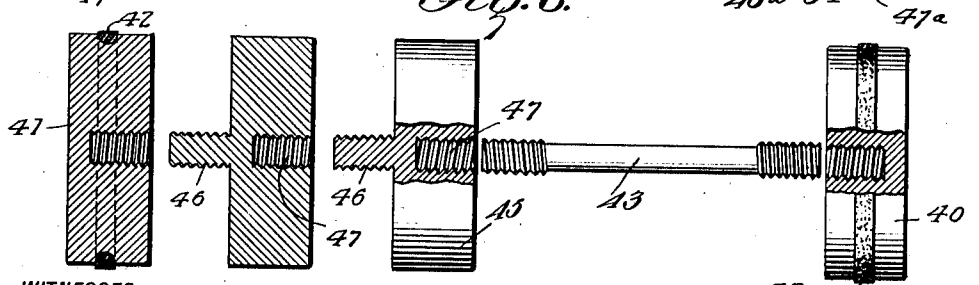


Fig. 6.



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HAM-PUMP.

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To all whom it may concern:

Be it known that I, CHARLES S. HARDY, a citizen of the United States, and a resident of San Diego, in the county of San Diego, State of California, have invented certain new and useful Improvements in Ham-Pumps, of which the following is a specification.

My invention is an improvement in ham pumps, and consists in certain novel constructions and combinations of parts hereinafter described and claimed.

The object of the invention is to provide a device of the class described, especially adapted for introducing pickle into hams, but also capable of use as a measuring device, which is operated by the pressure of the liquid to be pumped, and wherein the quantity of liquid ejected at each stroke of the pump may be varied.

Referring to the drawings forming a part hereof: Figure 1 is a longitudinal section of the pump; Fig. 2 is a side view of the valve; Fig. 3 is a section of the same showing the valve in one position; Fig. 4 is a similar view showing the valve in another position. Fig. 5 is a longitudinal section of another embodiment of the invention; and Fig. 6 is a side view partly in section of a sectional piston.

The embodiment of the invention shown in Figs. 1 to 4 of the drawings consists of a barrel 1, whose ends are threaded and closed by caps or heads 2, 3 provided with internally threaded flanges 4 engaging the threaded ends of the barrel. Each head is provided with a threaded central opening 5, into which is threaded a pipe 6 and 7, the said pipes being curved around parallel with the barrel and connected with a valve casing 8. Each of the pipes 6 and 7 is provided with a joint, the ends of the pipe at the joints being flanged, as at 10, and connected by screws or rivets 11. The casing 8 before mentioned is provided with four ports and forms a part of a four way valve to be described in detail.

The valve casing is provided with four nipples 13, 14, 15, 16, through which the ports open, and the nipples 14 and 16 are internally threaded to receive the pipes 6 and 7, the ports thus communicating with the ends of the barrel. The nipple 13 is also internally threaded and receives a nipple 17 extending from the center of the barrel, and the nipple 15 is externally threaded and is engaged by a needle 18 to be presently described.

On the opposite side from the valve the barrel is provided with an internally threaded nipple 19, into which is threaded the reduced end 20 of a handle 21 having a longitudinal passage 21^a opening into the barrel at the center, and a throttle valve casing 22 is threaded into the outer end of the handle. The throttle valve casing is provided with a valve plug 23 and communicates by means of a flexible pipe 24 with the reservoir 25 for the liquid.

The valve 26 of the four way valve extends across the casing and its ends are rounded to fit tightly the inner wall of the casing, and its sides are concave, as at 27, to permit the adjacent ports to communicate as shown in Fig. 3 or to close the communication between all of the ports as shown in Fig. 4.

The valve is provided with a square stem 28 and a handle 29 is fitted onto the stem for convenience in manipulating the valve. A spring 30 is arranged on each side of the handle, one end of each spring being connected with a pin 31 on the handle and the other with a pin 32 on the pipes 6 and 7. The springs act to normally retain the valve in the position shown in Fig. 2, that, is, with all the ports closed. The valve is also provided with a longitudinal passage 33, which at the end adjacent to the barrel branches, forming two branches 34 and 35. The needle before mentioned is provided with a point 36 and with a plurality of openings 37 behind the point. The handle 29 of the valve is also provided with a lug 38 which engages stops 39 on the valve casing to limit the movement thereof.

A plunger consisting of a plurality of pistons 40 and 41 is arranged within the barrel, and each piston is provided with a packing ring 42 for engaging the inner wall of the barrel. The pistons are connected by a stem 43, whose ends are threaded into the pistons,

as at 44, and the size of the pistons may be varied by the mechanism shown more particularly in Fig. 6. The said mechanism comprises a plurality of filling disks 45, each of which is provided at its center on one face with a threaded lug 46, and on the other with a threaded opening 47 for receiving the stem, or the lug 46 of another filling disk. By inserting or removing disks the pistons may be made of any desired thickness.

In the embodiment shown in Fig. 5 the handle 21 is arranged between the valve casing 8 and the barrel, the pipes 6 and 7 being extended to permit such arrangement. The barrel 46ª has its ends annularly flanged, as at 47ª, and a cap 48 has its edges secured to the flange by rivets or screws 49.

The piston in the above embodiment consists of a plurality of disks 50, three in the present instance, and the outer disks are peripherally grooved, as at 51. The disks are arranged with their faces abutting and are traversed by a bolt 52, whose threaded end is engaged by a nut 53 to secure the disks in place.

A disk 54 is arranged in the barrel at each end thereof, each of the disks having a central opening 55 and set-screws 56 are threaded through the caps and engage the outer faces of the disks to space them from the inner face of the cap. The position of the disks, and consequently the stroke of the piston, may be varied by moving the disks toward or from the adjacent cap.

A check valve is interposed between the needle, which in Fig. 5 is not shown, being replaced by a flexible pipe 58, and the valve casing 8, the said valve comprising a casing 57, having a perforated diaphragm 58ª, the perforation forming a seat upon which rests a valve 59, the stem 62 of the valve extending into a nut 60 threaded into the casing, and the stem is encircled by a spring 61 for normally retaining it on its seat.

The check valve may be of any desired construction and is designed to prevent regurgitation of the fluid into the barrel. The size of the piston in the above form may also be varied by inserting or removing disks.

In operation the throttle valve 23 is opened to admit the fluid under pressure to the barrel, the four way valve being in the position shown in Fig. 3, in which position it is normally retained by the springs 30. The valve 26 is now turned into the position shown in Fig. 4, and the air in the barrel, valve and needle is forced out by the fluid passing through the passages 35 and 37. The needle is now inserted and the valve is turned into the position shown in Fig. 1. The fluid now passes through the barrel, the valve casing of the pipe 7 to the adjacent end of the barrel and the pistons are forced to the right of Fig. 1, the fluid in the end of the barrel adjacent to the pipe 6 passing out through such pipe, and the ports 14 and 15 of the valve casing to the needle. At the end of its stroke in this direction, the valve is turned in the opposite direction until the lug 38 engages the other stop 39. The valve now connects the ports 13 and 14 and 16 and 15, so that the fluid passes into the end of the barrel adjacent to the pipe 6 and the movement of the pistons is reversed.

By inserting or removing filling disks the size of the chambers of the barrel may be varied, so that the pump will eject a specified and predetermined quantity of liquid at each stroke, the amount ejected being equal to the quantity contained between the end of the piston and the end of the barrel.

The operation of the embodiment shown in Fig. 5 is the same, but the course of the liquid is somewhat different. In this form the liquid enters through the handle, and, as the valve is positioned in Fig. 5, passes into the end of the barrel adjacent to the pipe 7 and forces the piston to the right, the liquid passing out from the barrel through the pipe 6 and the ports 14 and 16 to the needle or pipe 58. When the position of the valve is reversed the ports 15 and 16 are connected, the liquid passing from the left end of the barrel.

The amount of liquid ejected at each stroke of the pump depends upon the length of the stroke, and the measure of the said amount is the space between that end of the barrel connected with the needle, and the adjacent end of the plunger. When the length of the plunger is increased, the stroke is lessened, and consequently the amount of liquid ejected at each stroke is also lessened.

I claim:

1. A ham pump, comprising a barrel, a plunger comprising spaced rigidly connected pistons therein, said barrel having oppositely arranged ports at approximately the center of its side wall, and a port at each end, a reservoir of fluid under pressure, a four way valve casing communicating with one of the side ports and with the end ports and having a discharge opening, a valve in the casing for alternately connecting the space between the pistons with the alternate ends of the barrel, and with the discharge opening, a communication between the reservoir and the other side port of the barrel, a needle connected with the discharge opening, and a check valve between the needle and the valve casing.

2. A ham pump, comprising a barrel, a plunger comprising spaced rigidly connected pistons therein, said barrel having oppositely arranged ports at approximately the center of its side wall, and a port at each end, a reservoir of fluid under pressure, a four way valve casing communicating with

one of the side ports and with the end ports and having a discharge opening, a valve in the casing for alternately connecting the space between the pistons with the alternate ends of the barrel, and with the discharge opening, a communication between the reservoir and the other side port of the barrel, and a needle connected with the discharge opening.

3. A ham pump, comprising a barrel, a plunger comprising spaced rigidly connected pistons slidable in the barrel, a reservoir for fluid under pressure communicating with the barrel between the pistons, a four way valve casing communicating with said space and with the ends of the barrel, said casing having a discharge opening, a needle connected with the discharge opening, a check valve between the needle and the valve casing, a valve in the casing for alternately connecting the alternate ends of the barrel with the space between the pistons and with the needle, and means for varying the capacity of barrel, said means comprising filling disks, and means for detachably connecting the disks with the pistons.

4. A ham pump, comprising a barrel, a plunger comprising spaced rigidly connected pistons slidable in the barrel, a reservoir for fluid under pressure communicating with the barrel between the pistons, a four way valve casing communicating with said space and with the ends of the barrel, said casing having a discharge opening, a needle connected with the discharge opening, a check valve between the needle and the valve casing, a valve in the casing for alternately connecting the alternate ends of the barrel with the space between the pistons and with the needle, and means for varying the capacity of the barrel.

5. A ham pump, comprising a barrel, a plunger comprising spaced rigidly connected pistons slidable in the barrel, a reservoir for fluid under pressure communicating with the barrel between the pistons, a four way valve casing communicating with said space and with the ends of the barrel, said casing having a discharge opening, and a valve in the casing for alternately connecting the ends of the barrel with the space between the pistons and with the discharge opening.

6. A ham pump, comprising a barrel, a plunger comprising spaced rigidly connected pistons slidable in the barrel, a reservoir for fluid under pressure communicating with the barrel between the pistons, a four way valve casing communicating with said space and with the ends of the barrel, said casing having a discharge opening, and means for alternately connecting the ends of the barrel with the space between the pistons and the discharge opening.

7. A ham pump, comprising a barrel, a plunger comprising spaced rigidly connected pistons slidable in the barrel, a reservoir for fluid under pressure communicating with the barrel between the pistons, a four way valve casing communicating with said space and with the ends of the barrel, said casing having a discharge opening, and means for alternately connecting the ends of the barrel with the space between the pistons and the discharge opening, and a check valve at the discharge opening.

8. A ham pump, comprising a barrel, a plunger comprising spaced rigidly connected pistons slidable in the barrel, a reservoir for fluid under pressure communicating with the barrel between the pistons, a four way valve casing communicating with said space and with the ends of the barrel, said casing having a discharge opening, and means for alternately connecting the ends of the barrel with the space between the pistons and the discharge opening, and means for varying the capacity of the barrel.

9. A ham pump, comprising a barrel, a plunger comprising spaced rigidly connected pistons slidable in the barrel, a reservoir for fluid under pressure communicating with the barrel between the pistons, a four way valve casing communicating with said space and with the ends of the barrel, said casing having a discharge opening, and means for alternately connecting the ends of the barrel with the space between the pistons and the discharge opening, and means for varying the stroke of the pistons.

10. A pump comprising a barrel, a plunger therein, a reservoir for fluid under pressure, a four way valve casing communicating with the reservoir and with the ends of the barrel, and having a discharge opening, a valve in the casing for alternately connecting the alternate ends of the barrel with the reservoir and with the discharge opening, and means for varying the capacity of the barrel.

11. A pump comprising a barrel, a plunger therein, a reservoir for fluid under pressure, a four way valve casing communicating with the reservoir and with the ends of the barrel, and having a discharge opening, a valve in the casing for alternately connecting the alternate ends of the barrel with the reservoir and with the discharge opening, and a check valve at the discharge opening.

12. A pump comprising a barrel, a plunger therein, a reservoir for fluid under pressure, a four way valve casing communicating with the reservoir and with the ends of the barrel, and having a discharge opening, a valve in the casing for alternately connecting the alternate ends of the barrel with the reservoir and with the discharge opening, and means for varying the stroke of the plunger.

13. In a device of the character specified, a plunger comprising a plurality of disks, each of said disks having a central opening, a stem extending through the openings and connecting the disks, and a plurality of filling disks, each having on one face a central threaded depression, and on the other a central threaded lug, one of the first named disks having a threaded lug for engaging the adjacent filling disk.

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Witnesses:

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