Feb. 10, 1942. W. B. THREM 2,272,445

FLUID CHARGING HEAD

Filed March 27, 1939 2 Sheets-Sheet 1

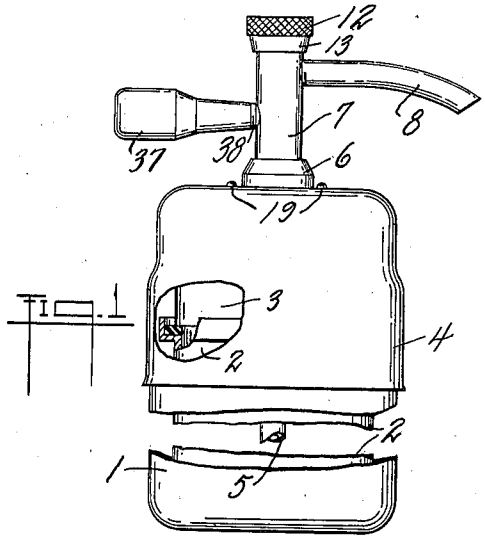


FIG. 1

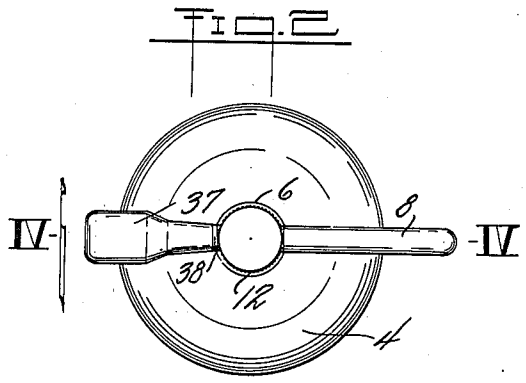


FIG. 2

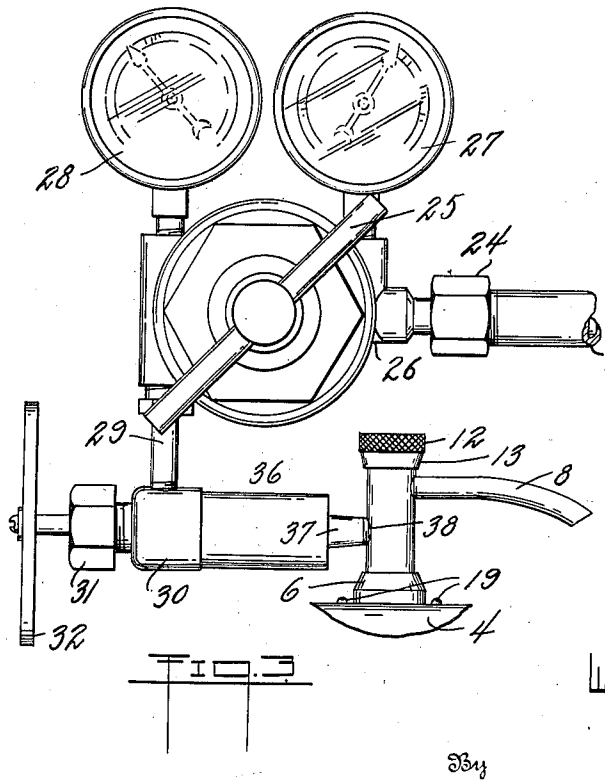
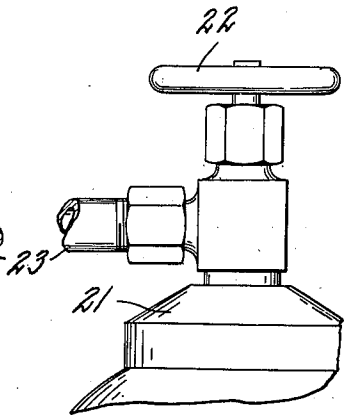


FIG. 3



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FLUID CHARGING HEAD

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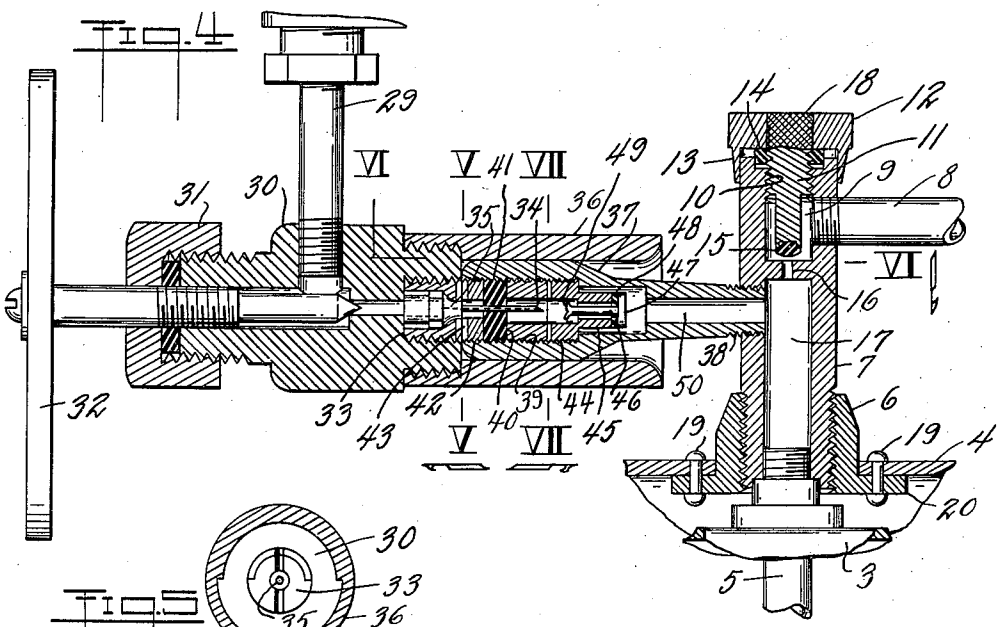


FIG. 4

FIG. 5

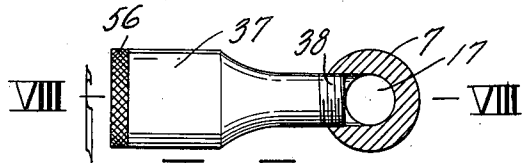


FIG. 6

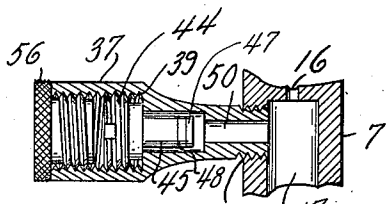
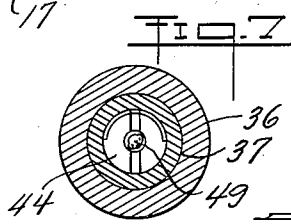


FIG. 8

38

FIG. 7



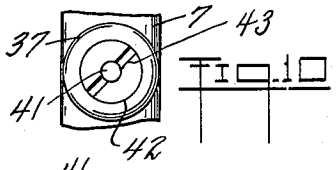


FIG. 10

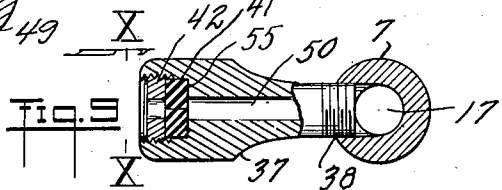


FIG. 9

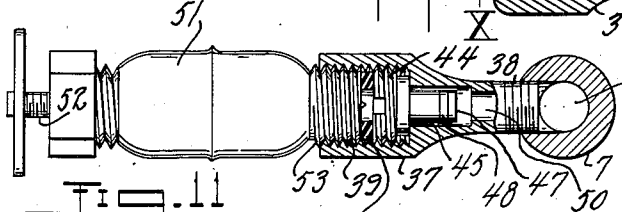


FIG. 11

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UNITED STATES PATENT OFFICE

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FLUID CHARGING HEAD

William B. Threm, Toledo, Ohio

Application March 27, 1939, Serial No. 264,394

1 Claim. (Cl. 221—74)

This invention relates to pressure charging and release of gases.

This invention has utility when incorporated in control heads or valve devices for pressure gas servicing.

Referring to the drawings:

Fig. 1 is a side elevation, with parts broken away, of an embodiment of the head in assembled position with a dispensing or service container, say for whipped cream;

Fig. 2 is a plan view of the head of Fig. 1;

Fig. 3 is a side elevation of a pressure charged assembly and controls for the head, parts being broken away;

Fig. 4 is a section on the line IV—IV, Fig. 2, showing valve details of the charging branch for the head;

Fig. 5 is a section on the line V—V, Fig. 4, showing the seating means for the check valve features at the perforable diaphragm check valve therefor;

Fig. 6 is a view on the line VI—VI, Fig. 4, showing the charging branch in elevation with the plug closure therefor in position and with the pressure cylinder fitting removed;

Fig. 7 is a view on the line VII—VII, Fig. 4, looking at the plunger check valve as in position;

Fig. 8 is a view on the line VIII—VIII, Fig. 6, showing the plunger check valve as the unit for the charging branch;

Fig. 9 is a view similar to Fig. 8, showing the branch as having the perforable diaphragm check valve only therewith;

Fig. 10 is a view on the line X—X, Fig. 9, looking toward the diaphragm or disk to be perforated; and

Fig. 11 is a view of a pressure fluid charger or cartridge for the container of Fig. 1 in lieu of the pressure fluid charging tank as shown in Fig. 3.

A container is shown having external wall 1 (Fig. 1), and internal cup 2 as a double-walled structure having internal cap 3, outer protecting shell cap 4, provided with central tube 5 from intake fitting 6 mounting head 7, herein shown as provided with spout 8. The tube or duct 5 extends downwardly in the chamber or cup 2 to a lower terminal port. This spout 8 (Fig. 4) is in communication with chamber 9 and has internal threading 10 to carry plunger 11 provided with knurled head 12 having depending skirt 13 about the head 7 and therein a compressible gasket 14. This plunger 11 has compressible seat 15 to be shifted off of port 16 and thereby allow spill of pressure fluid from chamber 17 in the head 7, thence by the port 16 into the chamber 9 for discharge by the port 8 in a controlled quantity as determined by rotation of the knurled head 12. The tube 5 provides a chamber connection from the chamber 17 to the cup or charge receiving major chamber 2. This knurled head 12 has pressure fit assembly with the plunger 11 at roughened sections 18. The anchorage of this head 7 with service container cap portion 4 is desirably through screw machine fitting 6 having rivet assembly 19 with flange 20. There is an efficient set-up to withstand the range of pressures up to several atmospheres in the instance that the charge be say nitrous oxid from pressure cylinder 21 (Fig. 3) having valve 22 with communication through duct 23 past fitting 24 to valve 25 in fitting 26 on which is mounted gage 27 showing supply pressure from the cylinder 21. Also in communication with this valve fitting 26, at the delivery or discharge side therefrom, is gage 28. This gage 28 shows the delivery pressure for the gas as passing by duct 29 to fitting 30 having gland 31 and operating or hand wheel 32. This fitting 30 may be provided with port providing attaching means 33 (Fig. 4) mounting point or terminus 34 of tubular member 35 of hypodermic needle type. This needle device for cooperating with the port means 33 is protected by sleeve portion 36 effective to telescope over branch 37 having thread connection 38 with the head 7.

This branch 37 is tubular and is provided with internally threaded portion 39 in which may be located against shoulder or seat 40 for yieldable partition or perforable diaphragm 41, as of rubber, back of removable externally threaded disk 42 having transverse slot 43 (Fig. 10). A screw driver may thus be effective to place or remove this holding washer or nut 42 and thereby, upon removal, permit replacement of the perforable or rubber diaphragm 41. This diaphragm 41 is desirably of such elastic or compressible material as to be readily perforated by the needle 34 but upon removal of such needle is self-closed and is thus an automatic check valve independent of moving parts. Experience in practice has been that in this operation the diaphragm may be efficient for an extended number of even fifty or more perforations before tendency to leak.

However, occasion may be adopted to place in this branch 37 nut 44 having tubular extension 45 therefrom in which is loosely located stem 46 having head 47 carrying valve seat 48. The extension 45 therefore provides a guide for the plunger having the head 47, which guide is effec-

tive to direct and control the stem 46. This stem 46 may have, after insertion, its terminal portions 49 spread or flared to hold the stem of this plunger check valve assembled with the nut or fitting 44. Accordingly, as pressure builds up in central passage 50 of this branch 37 it will seat this plunger check valve automatically and thereby protect the charge in the container against leakage and likewise protect the perforable check valve section at the diaphragm 41.

With the heavy charging pressure from a charging cylinder 21 the hypodermic needle 34, 35, is an efficient device for quick functioning hereunder to build up a charge in the service container to a desired pressure as disclosed by the gage 28. Upon withdrawal of the needle there is self-sealing at the perforable diaphragm 41. In the event there is a supplemental plunger type of check valve, it is an additional safeguard against seepage. These are factors of importance in the event the charge of the container be a food substance, say of liquid or semi-liquid as cream, the service being of whipped cream portions. This charging gas may be nitrous oxid, carbon dioxid or air under pressure and there might be use of the gas without mixing with fluid. However it is desired, such has a range for serving beverages and foodstuffs as at soda fountains.

In some instances, instead of having the containers brought to assembly with a large charging cylinder 21, the pressure supply means may be service cartridges 51 for a pressure charge of the desired fluid or gas. Stem 52 therein may be manually operated as the threaded portion 53 of this cartridge 51 is assembled with the internally threaded portion 39 of the branch 37. In this position for the externally threaded portion 53, desirably it is sealed by gasket portion 54 (Fig. 11) and as the plunger 52 is withdrawn, pressure fluid may enter to act to unseat the plunger check valve head 47 at seat 43, thus permitting charging flow to a desired extent into the chamber 17 of the head 7.

In other instances, instead of the dual check valve of the perforable diaphragm and plunger type, and in lieu of the plunger type, there may be perforable diaphragm alone. Such perforable diaphragm 41 may be assembled against shoulder 55 (Fig. 9). In carrying out the invention herein, there is simplicity in a compact control head readily operable say by thumb or finger action to permit the discharge by way of the spout 8. In such periods of none-use it may be appropriate to place knurled plug 56 (Figs. 6, 8) in closure position on the branch 37. The control of this knurled head 12 is for desired service portions as of whipped cream. There is accordingly requirement to replenish this pressure charge in the container. To such end, the plug 56 may be removed. If the servicing be at the place of business in which the container is used, this servicing may be from cartridge 51, allowed to expend charge entirely in the container or to be left in assembly therewith until the cartridge be exhausted. The cartridge flow is controlled through the plunger or valve 52. It is, of course, to be understood that this small dimension cartridge may not be effective to build up the charge in the service container to an extent which may be effective from pressure cylinder 21. Accordingly, in lieu of these small, high pressure service charges by cartridges the entire service container may be subjected to the charge and, for rapidity in functioning with efficiency in closing, the hypodermic needle type of device is an efficient assembly therefor.

What is claimed and it is desired to secure by United States Letters Patent is:

A fluid charger control head for a service container having a delivery spout, a control valve therefor, a chamber connection from said head, a charging branch adapted to respond to supplied pressure charge, said branch being connected to the head between the control valve and chamber connection, check valve means in said branch mountable as a unit and comprising a plunger, a guide for the plunger providing a seat and a disk carried by the plunger cooperating with said seat, a charging cartridge, a packing for sealing the cartridge with the branch, and a control for releasing pressure in the cartridge to operate said plunger and check valve means.

WM. B. THREM