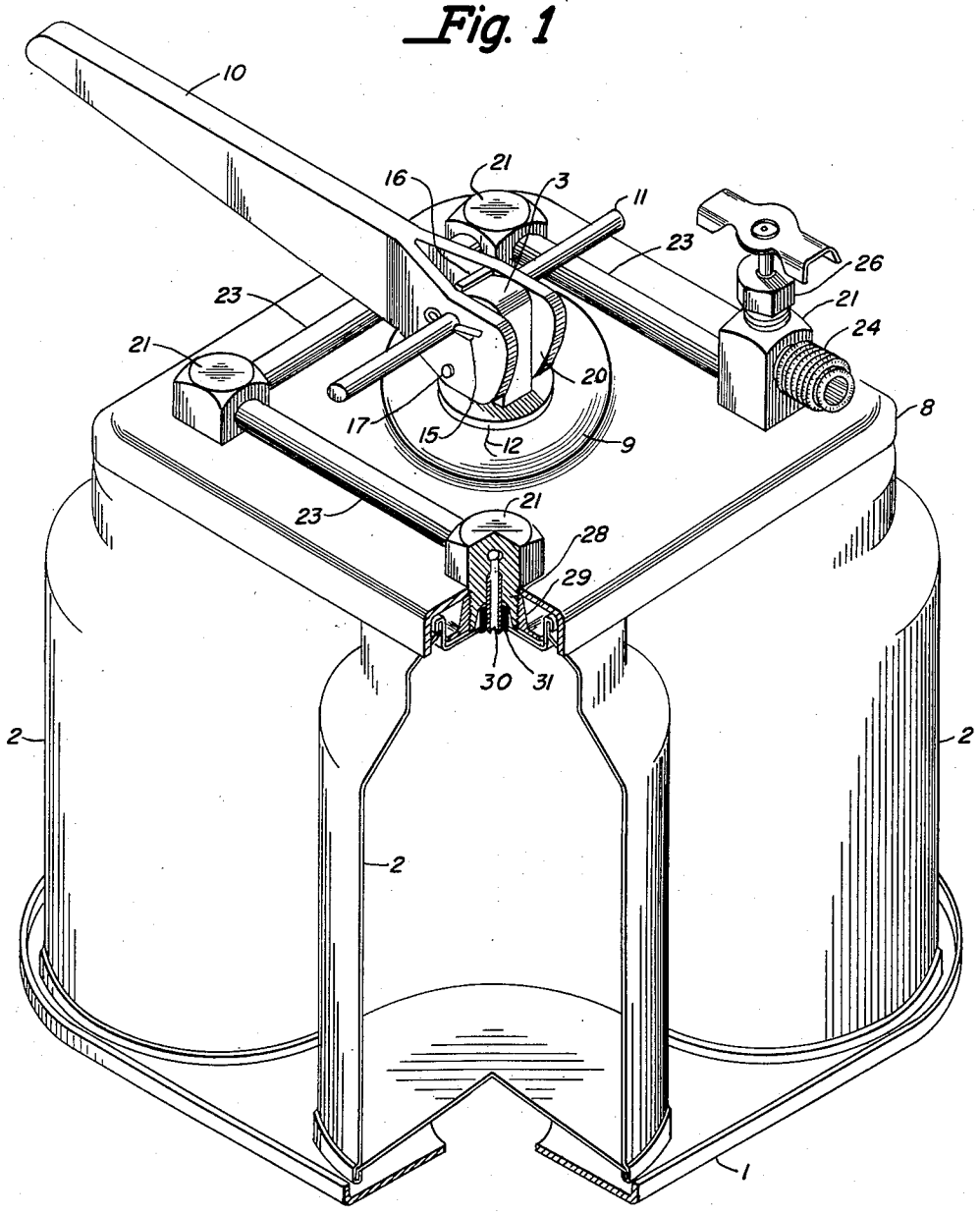
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APPARATUS FOR SIMULTANEOUSLY PUNCTURING GAS CHARGED CONTAINERS

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Fig. 1



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Fig. 2

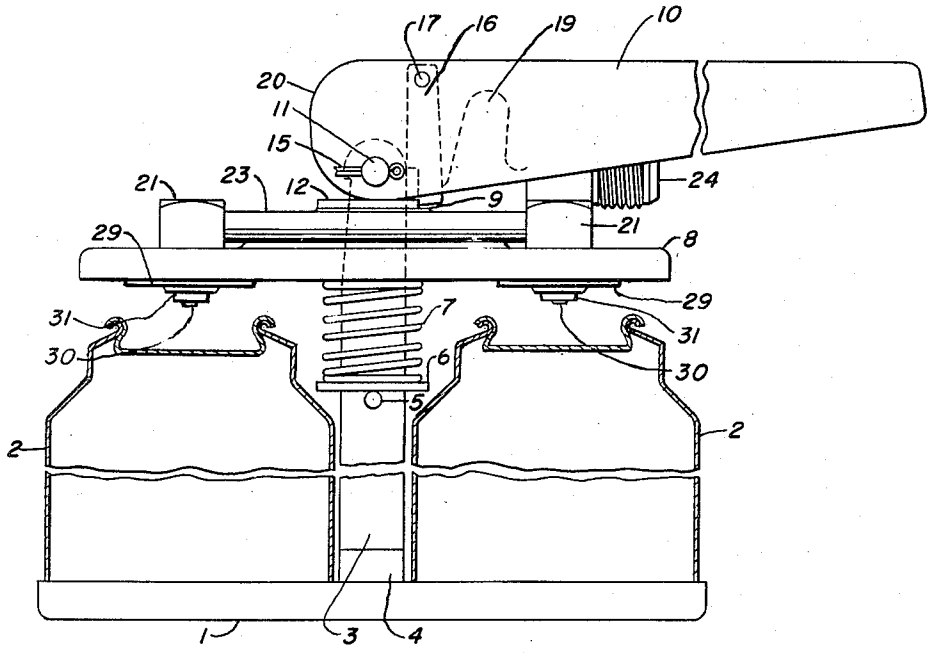
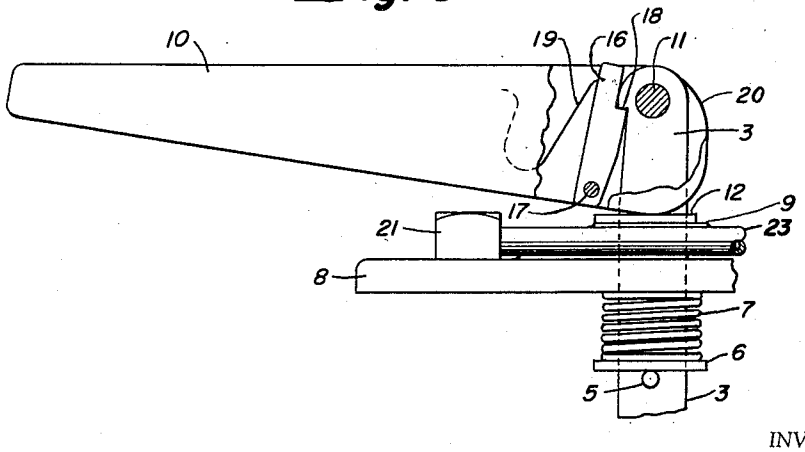


Fig. 3



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Fig. 4

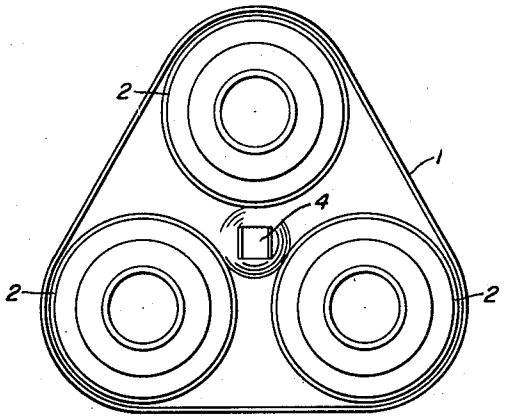
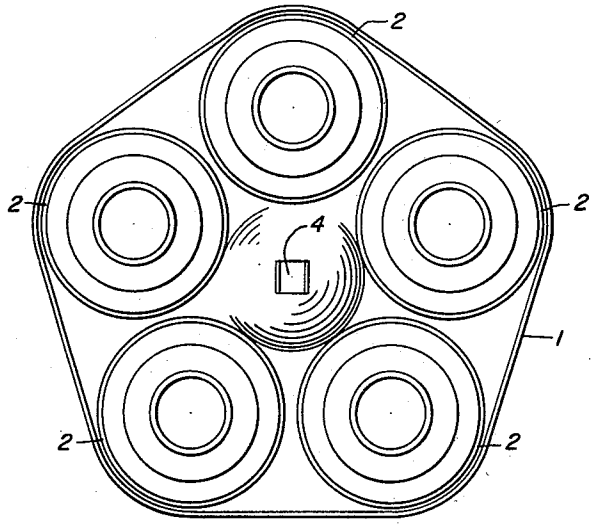


Fig. 5



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APPARATUS FOR SIMULTANEOUSLY PUNCTURING GAS CHARGED CONTAINERS

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4 Claims. (Cl. 222—5)

The present invention relates to devices for handling pressurized gases and more particularly to a dispenser unit adapted to permit the controlled release of pressurized gases from a plurality of individual containers thereof in a single operation.

The use of pressurized gases has become widespread over the past few years. Fumigants, aerosol insecticides, inert propellants and refrigerants of many types are now commercially available in containers of both large and small volume. Large containers are hard to handle in the field because of their bulk, and accurate control of the amount of gas released therefrom is difficult. Furthermore, the possibility of gas loss occasioned by repeated connections to the large containers is considerable. In addition, the cost of large containers for pressurized gases is inordinately high since rigid I. C. C. specifications require heavy walled units, special valve closures and safety caps capable of withstanding extreme pressure loads.

Manifestly, the use of can type containers of small volume presents numerous advantages arising from their light weight, ease of manipulation, low cost, etc. Yet, the handling of these small containers creates additional problems which have necessitated some restriction on their general adoption. For example, the small capacity of the can type containers requires the emptying of several to obtain a desired loading. In opening the charging line repeatedly for connection to fresh containers of gas, the chance of contaminants entering the system, loss of gas therefrom, or moisture condensate occurring is magnified.

Briefly stated, the present invention contemplates the formation of a dispenser wherein a plurality of can type containers of pressurized gases are opened simultaneously through individual headers feeding into a common conduit and the discharge of the can contents is maintained under complete control.

A primary object of the present invention is to provide a dispenser unit whereby a multiple number of can type containers of pressurized gas may be handled together in a single operation.

A second object of my invention is to provide a dispenser unit wherein a multiple number of can type containers of pressurized gas can be opened and emptied under complete and individual control of dispersal rates.

Another object of the invention is to provide a dispenser unit adapted to deliver a unit or fixed weight of refrigerant into a refrigerating machine or other component of the refrigerating cycle.

A further object of the invention is the provision of a dispenser unit wherein the handling of multiple numbers of can type containers of pressurized gas is simplified and freed of the inherent dangers normally constituting an incident of risk in such operations.

Other objects and advantages of my invention will be readily apparent from the following detailed description of a preferred embodiment thereof when taken in conjunction with the accompanying drawings wherein:

Fig. 1 is a perspective view, partially broken away, of a dispenser unit embodying the principles of the invention;

Fig. 2 is a side elevational view, partially in section, of the unit prior to the opening of the cans therein;

Fig. 3 is an enlarged detail view of the actuating means for the dispenser; and

Figs. 4 and 5 are plan views of the bed plate of the dispenser, showing contemplated modifications of container arrangement thereon.

Turning now to the drawings, the multiple dispenser as contemplated by my invention includes a rimmed bed plate **1** of stamped metal or material of comparable strength in triangular, square or polygonal form, adapted to receive and hold a plurality of cylindrical, capped cans **2** containing pressurized gas, the cans **2** being in symmetrical arrangement about a centrally disposed, vertically projecting shaft **3**. The shaft **3** may be permanently attached to the bed plate **1** or it may be releasably secured within a socket **4** provided in the bed plate **1** if a demountable arrangement is preferred.

A pin **5** extending through the shaft **3** at a point intermediate its length serves to support a washer **6** upon which is seated a compression spring **7**. The spring element carries a cap plate **8** which has a configuration conforming to that of the bed plate **1** and which is maintained in spaced, substantially parallel relation to said bed plate **1** at a sufficient distance therefrom to permit placement of the cans **2** between the plates without difficulty.

The central portion of the plate **8** is elevated to provide an anvil **9** against which a bifurcated handle **10**, pivotally and eccentrically secured by a pin **11** to the upper extremity of the shaft **3**, can operate to force downwardly the cap plate **8** against the spring **7**. A chafing washer **12** is interposed between the handle **10** and the anvil **9** to reduce frictional wear thereon. The handle **10** is retained on the pin **11** through suitable detents, as for example, cotter keys **15**. A safety latch **16** pivotally mounted, as at **17**, within the handle **10** engages a notch **18** on the shaft **3** when the plate **8** is in its lowered position (Fig. 3), a convolute leaf spring **19** suitably positioned between the latch **16** and the handle urging such engagement, to prevent accidental release of the handle **10**, and upward movement of the plate **8**. The handle **10** is provided on its inner, bifurcated end with cam segments **20** for engagement against the anvil **9**.

The cap plate **8** carries a plurality of connector heads **21** in symmetrical arrangement thereon for alinement with the vertical axes of the cans **2** disposed within the dispenser. The heads **21** communicate with each other through tubes **23** and one of the heads is provided with a threaded boss **24** to which a suitable delivery tube (not shown) may be connected. The terminal head **21** is preferably provided with a control valve **26** for regulation of material passage therethrough. The other heads on the plate **8** may be similarly equipped with control valves, if desired, for individual regulation thereof.

Each of the connector heads **21** has a downwardly extending body section **28** which projects below the plate **8**. An outwardly flared sleeve **29** is secured to the body section **28** fastening the head **21** to the plate **8** and also serving as an indexing guide for proper alinement of the head **21** with the can **2** positioned thereunder.

Each of the connector heads **21** contains piercing means including a hardened steel tubular cutter **30** which is centrally disposed of and projects beyond the body section **28** thereof. A composition gasket **31** of a suitable material, such as a plasticized resin or synthetic rubber, surrounds the punch **30** and is seated in the body section **28** of the head **21**.

The dispenser illustrated in Fig. 1 of the drawing is

designed to handle four cans of gas simultaneously, the base plate **1** and cap plate **8** being substantially square for proper reception thereof. With the handle **10** in open position, and the plate **8** raised (as in Fig. 2) four cans of pressurized gas are placed on the bed plate **1** in symmetrical arrangement, the formation of the plate insuring proper position thereof. The plate **8** is lowered against pressure of the spring **7** until the indexing sleeves **29** contact the tops of the cans **2**. Additional pressure is exerted against the cap plate **8** by movement of the handle **10** through an arc of 180°, its eccentric mounting and cam sections serving adequately such purpose. As the plate **8** advances the gaskets **31** are first forced against the cap seals of the cans **2** and then compressed as the tube cutters **30** continue to move against and finally to pierce the can sealing elements. The gaskets **31** prevent escape of the gases around the cutters **30**. At the end of the opening operation, the safety latch **16** automatically operates to lock the handle **10** against reverse movement and secures the unit for subsequent dispensing operations. The contents of the cans **2** are thus released through the tube cutters **30** into the heads **21** and the connecting tubes **23** for ultimate discharge through a delivery tube connected to the boss **24**.

It will be readily apparent that one or more valve assemblies **26** in the heads **21** enables an accurate control of the rate of discharge of the pressurized gases from the cans **2**. The dispensing operation can also be halted before the cans are emptied by closing the terminal valve **26**.

After the several containers being handled in a unit operation have been emptied, movement of the latch **16** away from the shaft **2** against pressure of the spring **19** frees the handle **10** for rotation in the opposite direction, such action releasing the pressure against the cap plate **8** permitting it to be urged upwardly by the spring **7**. The empty containers **2** can be then removed from the cutters **30** and indexing heads **29** against which they have been forced. The unit is then ready for reloading.

It is not necessary that all of the containers being handled in a unit operation be charged alike. It is possible to combine containers of different gases in the dispenser for releasing a mixed product or where each header is valved different gases may be released in succession for specialized application. Individual valving will also permit regulation of composition of the mixed product and in this connection flow meters may be included in the apparatus, if desired.

It will be obvious that any multiple number of cans may be handled in my dispenser unit and it is not limited to the four as hereinbefore described. As shown in Figures 4 and 5, three and five cans may be handled together, the shape of the plates **1** and **8** being altered to permit symmetrical arrangement of the cans of pressurized gas in the dispenser in various geometric patterns to satisfy the necessary stress design. Closed geometric pattern is

defined herein to include triangular or rectangular plane as where a horizontal line may be drawn through the center axes of a plurality of containers retained between the plates. The number of heads **21** and openers carried by the cap plate **8** will also be correlated to the number of cans being handled.

Other modifications in the form of the component elements of my apparatus, their composition and arrangement are possible without departing from the spirit of the invention or the scope of the appended claims.

What I claim is:

1. A dispenser unit for handling a multiple number of can type containers of pressurized gas, which dispenser comprises a pair of spaced, parallel plates arranged one above the other and adapted to receive and retain therebetween a plurality of said containers in definite geometric arrangement, head connectors disposed upon the upper plate in vertical alinement with said containers, can piercing tubular cutters dependent from said head connectors, and means for lowering the upper plate toward the bottom plate to secure the containers in position, to penetrate simultaneously said containers and to establish communication thereof with a common discharge manifold.

2. A dispenser unit for handling a multiple number of can type containers of pressurized gas as defined in claim 1, in which a sealing gasket surrounds each of the can piercing tubular cutters to prevent gas leakage around the openings created thereby.

3. A dispenser unit for handling a multiple number of can type containers of pressurized gas, which dispenser unit comprises a pair of spaced, parallel plates arranged one above the other and adapted to receive and retain therebetween a plurality of said containers in definite geometric arrangement, head connectors disposed upon the upper plate in vertical alinement with said containers, means establishing communication among said head connectors, can piercing tubular cutters dependent from said head connectors, sealing gaskets surrounding each of said tubular cutters, and cam means for forcing the upper plate toward the bottom plate to secure the containers in position, to penetrate simultaneously said containers, to provide a peripheral seal around the openings created by the cutters, and to establish communication between said containers and a common discharge manifold including selective valved regulatory means.

4. A dispensing unit according to claim 3 in which the parallel plates are adapted to retain the containers in closed geometric pattern.

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