Aug. 17, 1943. P. A. ANDERSON 2,327,235

GAS INSTALLATION EQUIPMENT

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Fig. 1.

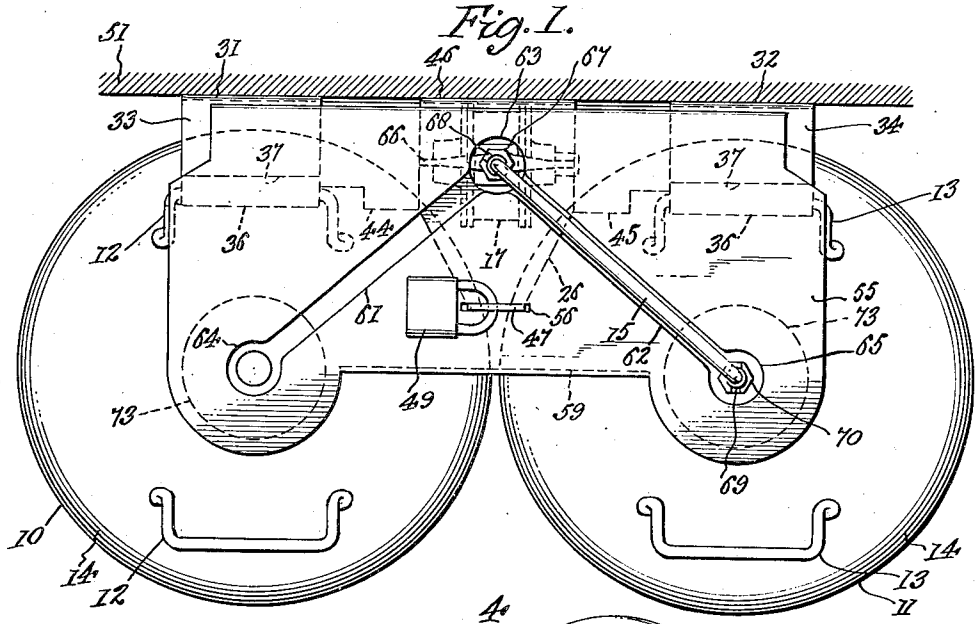
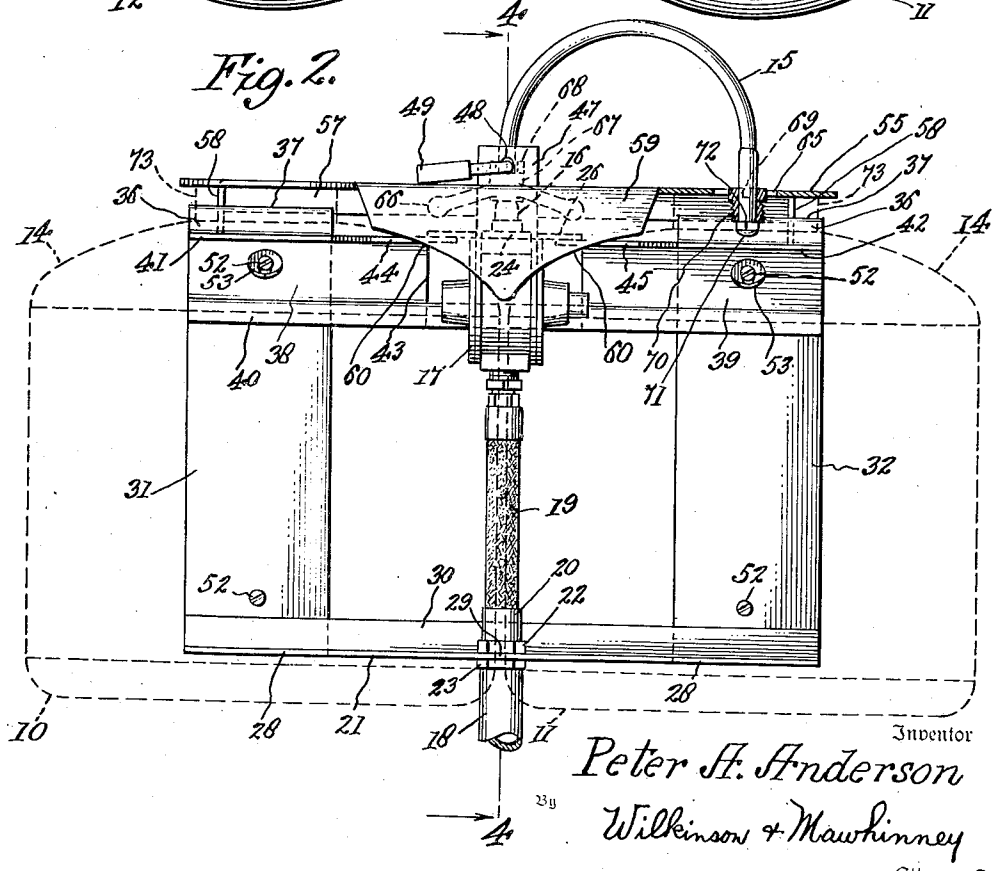


Fig. 2.



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GAS INSTALLATION EQUIPMENT

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Fig. 3.

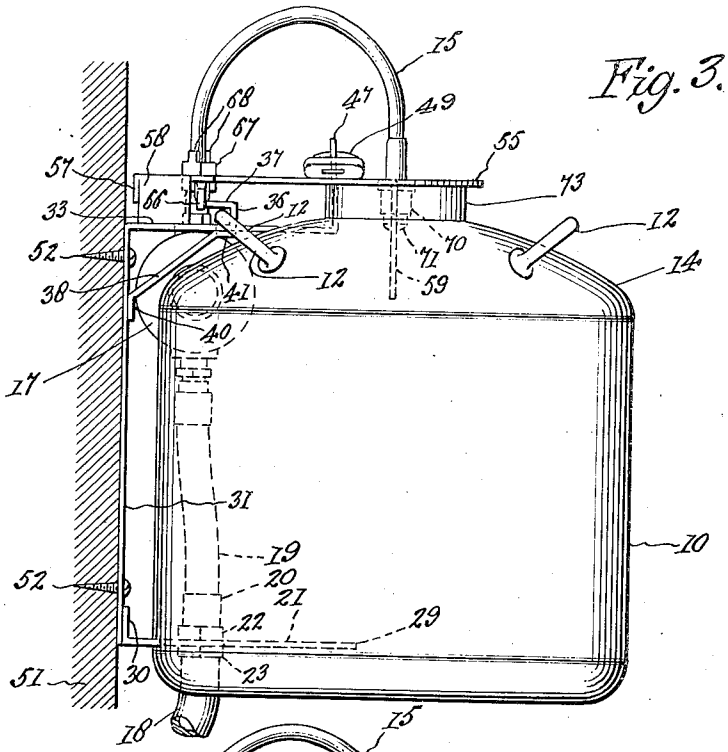
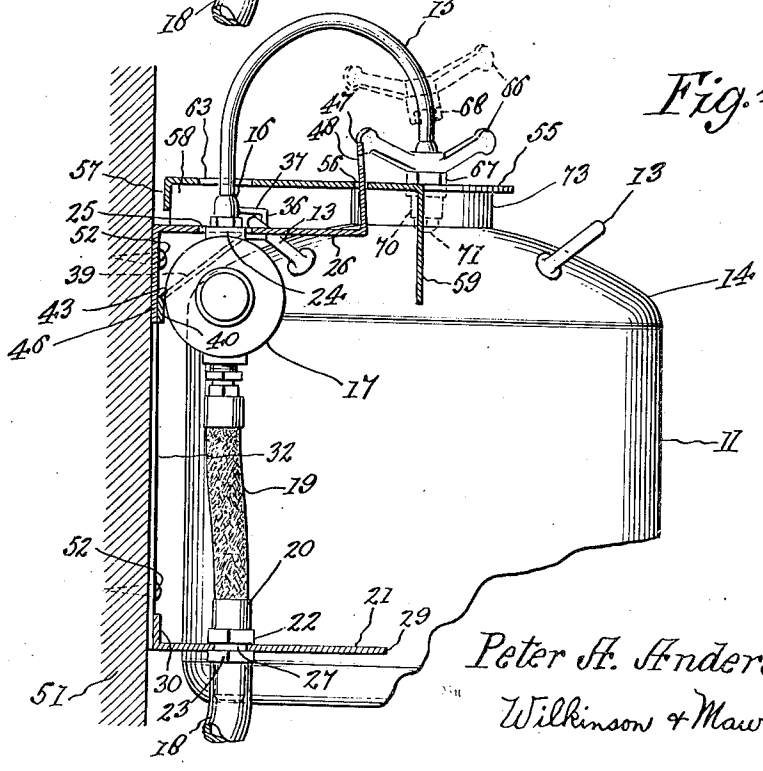


Fig. 4.



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GAS INSTALLATION EQUIPMENT

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Fig. 5.

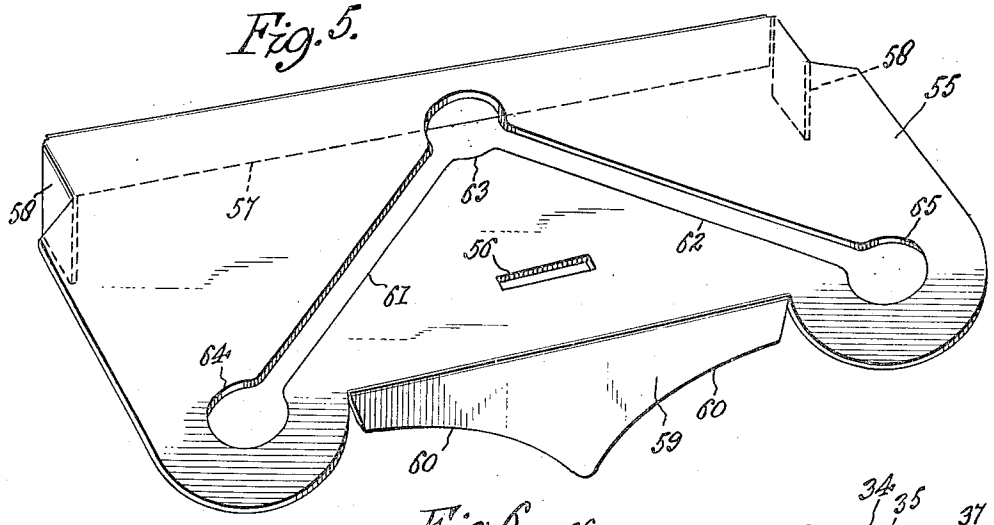
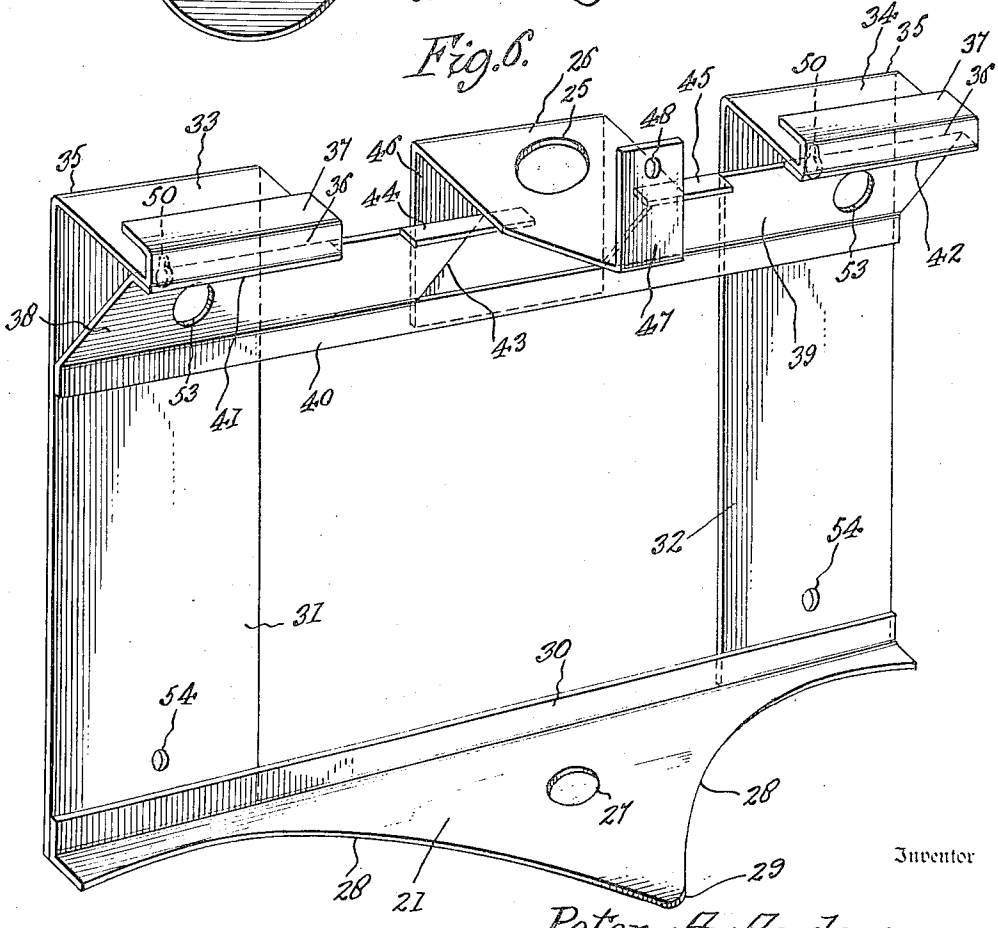


Fig. 6.



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GAS INSTALLATION EQUIPMENT

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Fig. 7.

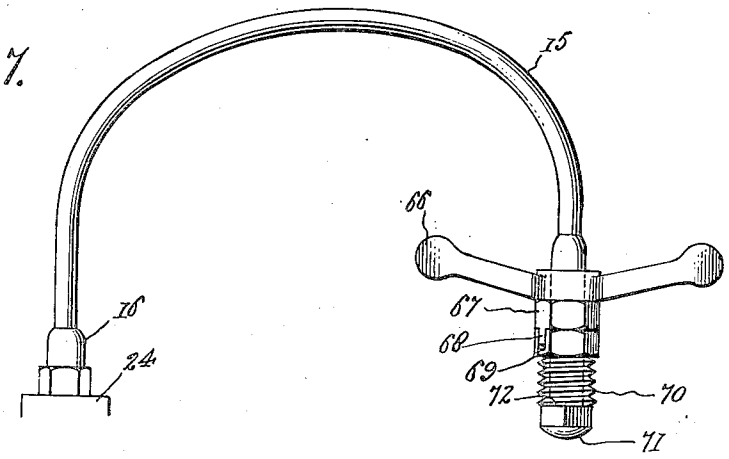


Fig. 8.

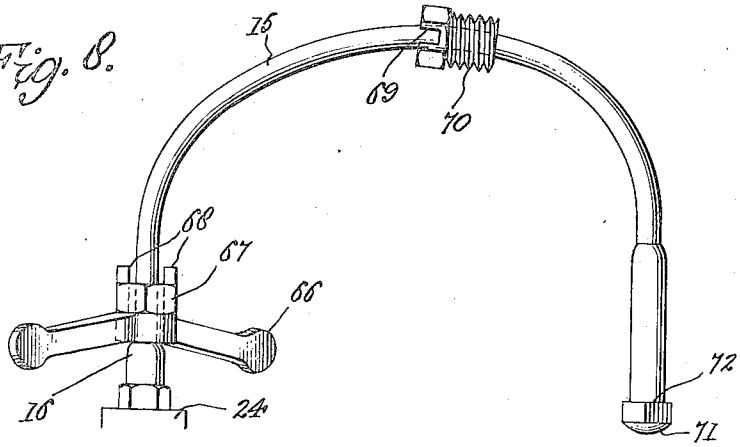


Fig. 9.

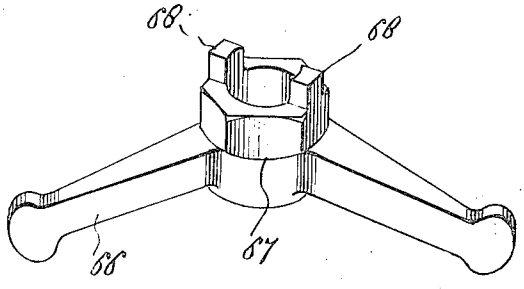
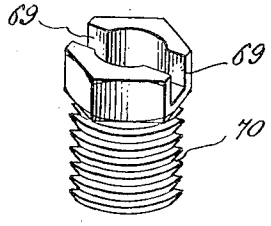


Fig. 10.



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UNITED STATES PATENT OFFICE

2,327,235

GAS INSTALLATION EQUIPMENT

Peter A. Anderson, Portland, Maine

Application June 30, 1941, Serial No. 400,529

17 Claims. (Cl. 221—73.5)

The present invention relates to improvements in gas installation equipment, and more particularly refers to equipment for residence houses or industrial plants where gas through mains from a central plant is not available, such equipment consisting generally in an installation in which containers of the gas are mounted and installed in a position relatively to a regulator whereby the gas may be fed under regulation to the house or plant as consumer needs require, and at the exhaustion of each bottle or cylinder of gas, the same may be replaced by a replacement bottle filled with the particular gas being used.

In equipments of this nature double bottles or containers have been employed with a so-called pigtail for swinging from the exhausted bottle to the replacement bottle to the end of improving the service in a matter of doubling the capacity of the source of gas.

Lately so-called cash and carry systems have been evolved in which the customer himself services his equipment, purchasing the bottles or containers of the gas from an appropriate source, carrying such bottles and gas to destination and himself mounting and removing the bottles and connecting and disconnecting same to and from the equipment.

Certain objections have been met with in this type of service in that installations so far developed, in attempting to give accessibility and ease in operation to the customer, do not interpose sufficient difficulties against unauthorized tampering. It is an object of the present invention to correct this stated objection and to provide equipment which may be not only easily customer-serviced but will be substantially sealed against tampering by others or against removal of the bottles or containers, or against tampering with the regulator.

It is another object of the present invention to so construct and arrange the parts of the equipment relatively to each other as to enable the simultaneous locking of both cylinders or containers and with a single lock, in locking the reserve cylinder as well as the cylinder in service, in providing all external parts of metal including the pigtail, to provide improved support for the bottles, to provide improved equipment for the connection of the pigtail to the bottles, and in general to improve this type of equipment from a customer standpoint.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a top plan view of an improved gas installation equipment constructed in accordance with the present invention and with the two bottles in place and the device in locked condition.

Figure 2 is a front elevation with parts broken away and parts shown in section and with the bottles indicated in dotted lines.

Figure 3 is an end elevation with the wall or support shown in section and as seen from the left in Figure 2.

Figure 4 is a vertical section taken transversely through the equipment on the line 4—4 in Figure 2.

Figure 5 is a perspective view of the top plate.

Figure 6 is a similar view of the installation frame.

Figure 7 is a fragmentary side elevation of the pigtail showing the method of assembly to the bottle outlet and in position to effect connection.

Figure 8 is a similar view with the wrench slid to inverted position at the proximal end of the pigtail and with the attaching screw slid to an intermediate position.

Figure 9 is a perspective view shown from the bottom of the improved form of captive wrench, and

Figure 10 is a similar view of the attaching screw sleeve.

Referring more particularly to the drawings, 10 and 11 designate two cylinders or bottles or other containers of compressed or other gas suitable for producing heat and light or for any other purpose, one of which bottles is in service and the other in reserve. The bottles according to the present practice are each equipped with two handles 12 and 13 at the upper dome shaped portions 14 thereof and at opposite sides of the center, the handles being inclined as indicated. The bottle 11 is shown in service as being connected to the pigtail 15, which in this instance is made of appropriate metal as it is an exposed part. The pigtail may swing from one bottle to the other about its point of connection 16 with the regulator 17. To permit the regulator 17 to partake of this rotary motion such regulator is connected to the metallic service pipe or main 18 by a flexible hose connection 19. This flexible hose 19 possesses sufficient rigidity to substantially support the regulator 17, although in service the regulator will also be in part supported by the pigtail 15, but the hose 19 possesses sufficient

flexibility to permit of its rotation along with the regulator 17 when the pigtail 15 is shifted from one to the other bottle. A hose coupling 20 connects the lower end of the flexible pipe 19 with a metallic service pipe 18 and extends through the floor or bottom plate 21 of the installation, to which it is affixed by nuts 22 and 23 extending respectively above and below said bottom plate 21. The upper square inlet boss 24 of the regulator is accommodated in the opening 25 made in the central bracket 26 of the main installation frame, which bracket overlies the central portion of the floor or bottom plate 21, as best seen in Figure 6, with the opening 25 extending substantially vertically above the perforation 27 in the floor or bottom plate 21 through which the hose coupling 20 passes.

The bottom plate 21 is of substantially the form shown in Figure 6 having incurved edges 28 complemental to the curvature of the side cylinder walls of the bottles 10 and 11 which fit thereagainst, as indicated in Figure 3, in the supported positions of such bottles. The incurved edges 28 of the bottom plate 21 at their proximal edges unite in an apex 29 which produces a substantially triangular forwardly projecting bottom plate structure for entering between the mutual cylinder surfaces of the side walls of the two bottles 10 and 11 when suspended in juxtaposition as shown in Figure 1. Thus the bottom wall 21 blocks off the entire space between the rear portions of the bottles from underneath, preventing access from beneath in an upward direction to the regulator 17.

The bottom plate 21 is reinforced and strengthened by an upturned rear flange 30 which also has the function to support the bottom plate 21 from other parts of the frame; and incidentally this flange 30 forms the lower tie-bar between spaced vertical risers 31 and 32, preferably in the form of wide sheet metal plates, out of which material it is preferred to make the frame although this is not critical. However, sheet metal of a heavy gauge lends itself readily to welding and the necessary strength and stiffness can be secured by welding of the flange 30 to the plates 31 and 32 along the lower portions thereof.

At the upper portions of the plates 31 and 32 are side brackets 33 and 34 containing hooks or supports for the engagement of the handles 12 and 13 of the bottles 10 and 11 by which to support such bottles. The brackets and hooks in the instance shown are all made integrally with the back plates by first bending the material forwardly on the line 35 to produce the horizontal bracket portions 33 and 34 extending forwardly from the back plates 31 and 32 a suitable distance, whereupon the material is bent upwardly to produce the vertical yoke portions 36 from which are bent rearwardly the bill portions 37. The bills 37 of the hooks may lie in substantial parallelism with the bracket portions 33 although the hook might be otherwise formed.

Inasmuch as considerable weight of the bottles devolves upon the hooks, it is desirable to appropriately brace these hooks from beneath and to this end diagonal brace members 38 and 39 are positioned at this point extending horizontally across the frame at its upper portion and respectively beneath the side bracket members 33 and 34. The brace members 38 and 39 may conveniently be both carried by an upper tie-bar 40 which overlaps the risers 31 and 32 and may be welded thereto. The diagonal brace members 38 and 39 also preferably have upper flanges 41 and 42 which lie beneath and in supporting contact with the forward free portions of the side brackets 33 and 34 to which they are preferably welded or secured in some other appropriate manner.

The diagonal brace members 38 and 39 are separated by a central gap 43 which accommodates the regulator 17. Disposed above this gap is the central bracket 26 which is partially supported by underlying tongues 44 and 45 forming parts of the diagonal brace members 38 and 39. These tongues may be welded to the central bracket 26. Such central bracket 26 is also supported at its rear edge by a vertical wall 46 which extends down to a position overlapping the rear of the tie bar 40 to which it may be welded. The vertical wall 46 and the horizontal bracket 26 with its connections to the tongues 44 and 45 forms a bridge about the removed central gap portion 43 of the diagonal braces 38 and 39, thus reinforcing and strengthening the structure at this point.

The central bracket 26 performs the further function of carrying the upstanding lug 47 at its outer end, which lug 47 is provided with the perforation 48 to receive the shackle of the padlock 49 shown in Figures 1 and 2.

The risers 31 and 32 have in their upper portions keyhole slots 50 for receiving therethrough the heads of screws or other fastenings previously partially driven into the wall or other support 51; the arrangement being that the entire frame is fitted to the wall with the larger lower portions of the keyhole slots registering with the heads of the screws 52, the frame being thereupon pushed backwardly over the heads of the screws and then allowed to descend with the narrow portions of the keyhole slots 50 fitting over the shanks of the screws, the heads of the screws then becoming locking members for holding the frame to the wall. After this operation access may be had to the heads of the screws by a screw driver or other implement through openings 53 made horizontally opposite such screws in the diagonal brace members 38 and 39. Also in the lower portions of the plates perforations 54 may be made through which screws or other fastenings may be passed to further secure the frame to the supporting wall 51.

The top plate is shown more particularly in Figure 5 and is represented generally at 55, the same having a slot 56 to receive therethrough the upstanding lug 47, as shown in Figures 1 and 2.

At its rear portion the top plate 55, also preferably of heavy gauge sheet metal, may be bent downwardly to form a stiffening and reinforcing flange 57. Adjacent the ends of such flange 57 are downturned lugs 58 for resting upon the side brackets 33 and 34 rearwardly of the hooks 37.

The top plate at its forward edge is formed with a downturned flap or apron 59 of a central triangular downwardly projecting construction and with incurved edges 60 to conform generally to the curvature of the dome or breast portions 14 of the two bottles for the purpose, as shown in Figure 2, of obstructing the widening gap made between the upper portions of the two adjacent bottles and which would ordinarily permit access through this gap to the regulator 17.

The top is also provided with a V-shaped slot the two members of which are indicated at 61 and 62. Such slots meet rearwardly in the enlarged opening 63. At their outer ends the member slots 61 and 62 terminate respectively in enlarged openings 64 and 65. The opening 64 is arranged above the outlet of the bottle 10, while the opening 65 is disposed above the outlet of the com-

panion bottle 11. The opening 63 is above the regulator and receives therethrough the pigtail 15 adjacent its point of connection 16 with the regulator 17.

Slidably mounted on the pigtail is a wrench member having diametrically opposed wrench handles 66 and a tubular portion 67 slidable on the pigtail pipe 15. Depending from the tubular portion 67 are projections 68 adapted to enter notches 69 in the nut 70. This nut is also slidable on the pigtail and is threaded into the socket of the bottle for causing the end of the pigtail to be fitted to the outlet of the bottle with a gas tight leak-proof fit.

In operation, the customer or proprietor purchases the bottles, preferably in pairs 10 and 11, from the source or from a retail establishment paying generally cash therefor, transports such bottles to destination, and hangs them by their handles upon the hooks of the installation frame. To accomplish this the top plate 55 is removed, which leaves the frame in substantially the open position shown in Figure 6; in which event it is an easy matter for any novice to insert the handles 12 or 13 over the hooks 37 and to permit the bottles to descend, rotating about the center formed by the engagement of the hook with the handle until the lower portion of the bottle strikes the incurved edge 28 of the bottom plate 21. The relative arrangement of hooks 37 and incurved edges 28 is such as to preferably support the bottle in a substantially upright position as seen in Figures 3 and 4. The act of thus hanging the bottles upon the hooks causes the bottom plate 21 to substantially close the interior space lying above the bottom plate 21 and in rear of the two bottles whose cylindrical walls are contiguous along the diametric line seen in Figure 1 which run parallel to the back or supporting wall 51.

When the two bottles 10 and 11 have been thus assembled to the frame, the pigtail connection is made to a selected bottle by running the cylindrical screw 70 outwardly to the distal end 71 of the pigtail 15, at which distal end there is a rounded or conical surface for mating with a similar surface on the outlet part of the bottle to make a tight connection. There is also a shoulder 72 to engage the cylindrical screw 70 to prevent the screw from becoming disengaged from the pigtail 15, as for instance while the pigtail is being swung from one to the other bottle. The wrench, being engaged with the cylindrical screw 70 as shown in Figure 7, the cylindrical screw is turned home into the threaded socket of the bottle and a gas tight connection is thus formed allowing the compressed gas in the bottle to pass through the pigtail 15, under the action of the regulator 17 to the service pipe 18. The wrench 66 is thereupon returned over the pigtail 15 from the distal to the proximal end taking up the position substantially as shown in Figure 8.

The top plate 55 is thereupon put in place by allowing it to descend vertically with one of the slot members 61 or 62 receiving therethrough the metallic pigtail 15. This pigtail remains permanently in place as respects its connection 16 with the regulator 17. This point of connection 16 is the proximal end of the pigtail 15 articulating through the regulator 17 and the flexible hose 19 and its twisting action with the service pipe 18.

The top plate 55 is lowered until the lugs 58 encounter the side brackets 33 and 34. These lugs 58 therefore delimit the downward motion of the top plate 55, assuring that the top plate is brought to a correct position where the apron 59 will be arrested in its final proper relationship with the two bottles. The movement of the top plate is also arrested by the necks 73 of the bottles as indicated in Figures 3 and 4. Also these stops or limiting devices cause the top plate 55 to move down sufficiently over the perforated lug 47 to expose the perforation 48 thereabove for the padlock 49, to the end that such padlock will lock the top plate 55 in position on the frame. The top plate excludes accessibility to the hooks 37 and prevents the bottles being lifted sufficiently to disengage the handles thereof from the hooks. Also the side lugs 58 of the top plate 55 in connection with the rear edges of the hooks 37 tend to destroy the clearance back of the bills 37 of the hooks which would admit of the release of the handles.

Also the top plate 55 envelopes and covers the wide spread handles 66 of the inverted wrench at the proximal end of the pigtail, as shown in Figure 2, thus closing off accessibility to the wrench and preventing its being moved out on the pigtail 15.

When one bottle has become exhausted, and the customer wishes to connect the other bottle, he first removes the entire top-plate, disconnects the empty bottle, swings the pigtail to the full bottle and connects it, removes the empty bottle, and replaces and locks the top plate. He then exchanges the empty bottle for a full one, again removes top plate, hangs the new bottle where the previous empty one was located, relocates top plate and locks it.

The openings 63, 64 and 65 accommodate a slight variation of the location of valve on the cylinders. The slots 61 and 62 accommodate the pigtail when lifting the top plate off and lowering it back into position.

The bottles themselevs will prevent access to the fastening means 52 and therefore the device cannot be removed from the wall 51 as a unit.

It will be appreciated from the foregoing that the frame with its bottom plate 21 and top plate 55 forms a complete unitary enclosure locking both cylinders so that tampering with the cylinder valves by an unauthorized person is impracticable. Furthermore one lock secures this result. The flap or apron 59 prevents unauthorized persons from reaching in between the cylinders and tampering with the regulator in any respect.

When one cylinder is exhausted the customer may remove completely the top plate 55 in changing the connection of the pigtail 15 to the reserve cylinder if he so desires. The slots in the top plate permit the removal and replacement of this top plate without disturbing the pigtail, thus making the equipment accessible to the customer.

In the present instance the rubber hose 19 is completely enclosed. Animals have been known to gnaw off such rubber connections where exposed externally with damage to the equipment and necessary suspension of service. The present device obviates not only this difficulty but lengthens the life of the hose because it is not exposed to the sun and weather. The pigtail 15 may be made of copper which is bendable for use in accommodating the same to the bottles and to the top plate. This copper pigtail is exposed and has none of the disadvantages of rubber.

In changing connections of the pigtail from

one bottle to another, it is unnecessary to move the entire regulator from one bottle to the other. In the present equipment the rubber hose on the inside of the installation allows the regulator to turns the amount necessary to shift the pigtail from one to the other bottle. The top plate covers the valve of the reserve bottle and prevents tampering therewith.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:

1. In gas installation equipment for a pair of substantially cylindrical containers having dome shaped tops with valves therein and handles thereon, a frame, means for securing the frame to a support, hooks on the frame for releasably engaging the handles of the containers and positioned relatively to one another to support the containers in substantially contiguous relation, a substantially triangular bottom plate on the frame for closing the included space between and at the rear portions of said containers and having incurved edges for encountering the containers to cooperate with said hooks in holding the containers substantially upright, a top plate assemblable on the frame and said containers and so constructed and arranged as to close the hooks and shut off access to the valves of the containers, a substantially triangular apron depending from said top plate for closing the included space between and above the dome top portions of the containers, a pigtail swingable above said top plate for movement from one container to the other, said top plate having slots for receiving said pigtail, a service pipe, a regulator connected to the pigtail, a twistable connection between said regulator and service pipe, said connection and regulator being located in the enclosed space between and in rear of said containers, and means for releasably locking said top plate in operative position on said frame, pigtail and containers.

2. In gas installation equipment for substantially cylindrical gas containers having dome shaped top portions and handles, a frame, supports on the frame detachably engageable by handles of the containers for sustaining the containers in substantially contiguous position, a bottom plate on the frame of substantially triangular form for closing the space included between and in the rear of said containers and having incurved edges to receive the walls of the containers to cooperate with said supports to hold the container substantially upright, a pigtail swingable from one to the other container, and a top plate releasably and interlockingly connected with said frame having an apron so constructed and arranged as to substantially fit into the included space between the dome portions of the contiguous containers, said top plate also having means for locking said pigtail in place.

3. In gas installation equipment for substantially cylindrical containers having valves in their upper portions, supporting means for supporting a pair of containers in substantially contiguous relation, a bottom plate on said supporting means of substantially triangular form for fitting in the included space between and in rear of the cylindrical containers, a top plate releasably supported on said supporting means of such a nature that it shuts off access to the valves of the containers, a pigtail swingingly mounted to move from one container to the other, and a service pipe for taking off the gas from said pigtail, said top plate when in operative position adopted to lock said pigtail in place.

4. In gas installation equipment for a pair of substantially cylindrical containers, supporting means for supporting the containers in substantially contiguous relation, a bottom plate so constructed and arranged as to close the included gap between the supporting means and the sides and rear portions of said containers, a service pipe extending through said bottom plate, a rotary connection to said service pipe in said included space, a pigtail connected to said service pipe and swingable from one to the other container, and a top plate for closing said included space at the upper portion thereof and locking said pigtail in place.

5. In gas installation equipment for containers of substantially cylindrical form, supporting means for supporting a pair of such containers in substantially contiguous relation, a bottom plate so constructed and arranged that it cooperates with the containers in the relation stated to close from beneath the included space at the mutual side portions of the cylindrical containers back of the contiguous line, a top plate for releasably enclosing the upper portion of such included space, and equipment carried by said supporting means in said included space rendered inaccessible by said bottom and top plates and by the presence of the containers on the supporting means for taking off under control the contents of said containers.

6. In gas installation equipment, supporting means for a pair of substantially cylindrical containers in substantially contiguous relation, means for closing off to access from beneath the included space rearwardly of the contiguous line between the containers, means for closing off such included space from above, a metallic swivelly-mounted pigtail extending above said last named means and movable selectively from one container to the other, said last named means adapted to lock the pigtail in a selected position, and equipment carried by said supporting means in such included space rendered inaccessible by said means for taking off under control the contents of the containers by way of said pigtail.

7. In gas installation equipment including a gas bottle having a handle, a frame having a hook to detachably receive the handle of a gas bottle, and a top plate movable against said hook to close the same, said plate extending over a portion of the top of the bottle in engagement therewith.

8. In gas installation equipment including a valved bottle having a handle, a frame having a hook to detachably receive the handle of the gas bottle, a plate removably closing said hook and having a portion spanning the valve of the bottle, and means to lock said plate in place on the hook and bottle.

9. In gas installation equipment including a gas bottle having a handle, supporting means having a hook to detachably receive the handle of a gas bottle, and a top plate for detachably closing said hook and having a portion extending across the open bill of the hook to form a keeper for such hook, said plate extending across a portion of the bottle in engagement therewith.

10. In gas installation equipment including a

gas bottle having a valve, supporting means for detachably supporting a gas bottle, locking means for closing said supporting means against removal of the bottle and having a part to extend over and mask the valve of the bottle, said locking means having an opening to expose the outlet of the bottle, and a member carried by said supporting means and detachably connected with said outlet for taking off the contents of said bottle, said member adapted to be locked in place on said supporting means.

11. In a gas installation equipment including a gas bottle having a handle and a valve, a bracket having a hook with an open bill at its upper forward portion for detachably receiving the handle of the gas bottle, and a locking plate for extending over and closing said hook and having a part extending downwardly therefrom rearwardly of the hook for acting as a stop to engage the bracket and prevent the rocking movement of the locking plate and also acting as a keeper for the open mouth of said hook, said plate also having a portion extending forwardly of the hook for engaging over and masking the valve of the bottle, said locking plate having an opening over the outlet of the bottle, and means flexibly carried by said supporting bracket and detachably connecting through said opening with the outlet for taking off the contents of the bottle, said means adapted to be locked in place by said locking plate.

12. In gas installation equipment, a back plate, brackets carried adjacent the top and the sides thereof and having hooks for detachably engaging the handles of a pair of gas bottles to hold same in contiguous relation, said hooks being open and accessible from above the hooks, a top plate extending in common over said hooks and closing the same and having downturned lugs at the rear portions thereof to engage said brackets across the mouths of the hooks, and means for locking said top plate in place.

13. In gas installation equipment, a frame, side and central brackets carried by said frame, hooks on the side brackets adjacent the tops thereof for detachable engagement by the handles of a pair of gas bottles supported by said hooks in substantially contiguous relation, said hooks having their open portions disposed on their upper portions and accessible from above the hooks, a top plate extending over and closing said hooks and having delimiting means positioned and adapted to encounter said brackets and to extend as keepers across the open mouths of said hooks, said top plate having an opening therein, and a padlock receiving member on the central bracket extending up through said top plate opening to lock the plate in its operative position.

14. In gas installation equipment, supporting means for holding a pair of gas bottles in substantially contiguous relation, a metallic pigtail swivelly mounted on the supporting means for moving from one to the other of the bottles, and a sealing plate having a substantially V-shaped slot to accommodate said pigtail in either position without interfering with the opening and closing movements of said sealing plate, and means to secure said sealing plate in the sealing position to lock the lock pigtail in either position.

15. In gas installation equipment, supporting means for holding a gas bottle, a sealing plate for said supporting means having a slot therein, an external durable gas connection carried by the supporting means and detachably connected to the bottle and received through said slot, and means for locking the sealing plate to said supporting means and lock the gas connection in place.

16. In gas installation equipment, supporting means for a gas bottle, and a sealing plate for the supporting means having a slot therein, an external durable connection adapted to extend through said slot and having proximal and distal ends with the distal end engageable with the threaded outlet socket in the bottle, the proximal end of the durable connection being carried by the bottle supporting means beneath the sealing plate, a cylindrical screw loosely and slidably mounted on said connection for detachable connection with the threaded socket of the bottle, and a wrench also slidably mounted on said connection separable from said screw, said screw and wrench having mutual means for mating to cause rotation of the screw from said wrench, said wrench adapted to be slid to the proximal end of the connection and beneath said sealing plate to be rendered inaccessible by said plate.

17. In gas installation equipment, supporting means for holding a pair of gas bottles, a pigtail flexibly mounted on said supporting means for connecting one or the other bottles with a house service pipe, a sealing plate for said bottles and supporting means having a substantially V-shaped slot with enlarged openings over the outlet sockets of the bottles and over the proximal end of the pigtail, a wrench having a cylindrical body portion loosely and slidably mounted on said pigtail and having substantially diametrically opposite arms wider than the opening about the proximal end of the pigtail, and a hollow screw also slidable on the pigtail and adapted to enter the outlet sockets of the bottles in sequence, said screw and wrench having detachable mating parts, and means to lock the sealing plate on said supporting means to lock the pigtail in place.

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