June 11, 1963 H. H. LOGAN ETAL 3,093,002

FLUSH MOUNTED, DUSTPROOF GAS SERVICE CABINET

Filed Dec. 19, 1960

Fig. 1

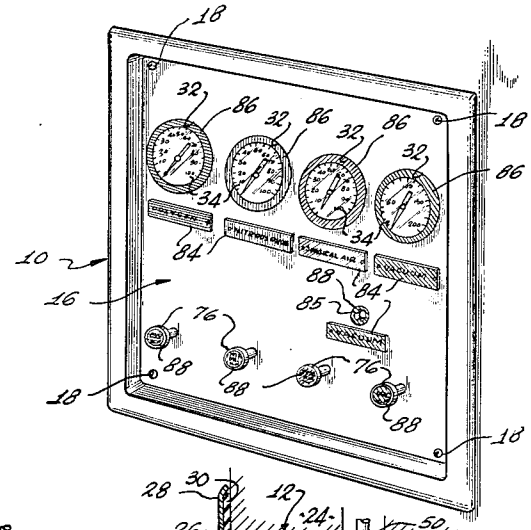
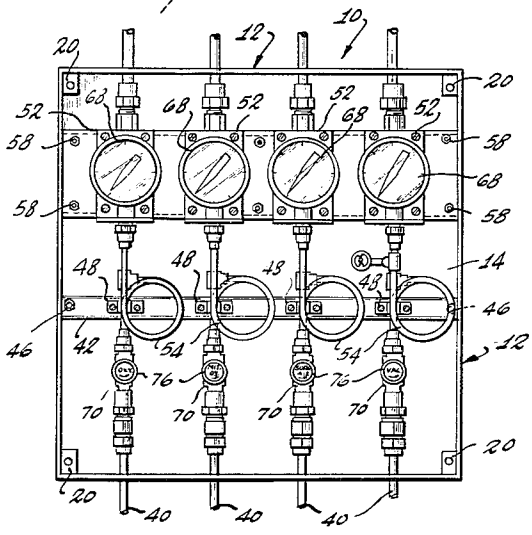


Fig. 2



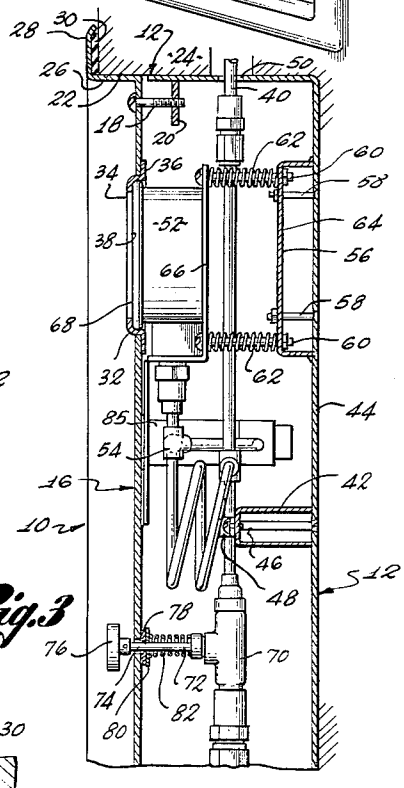
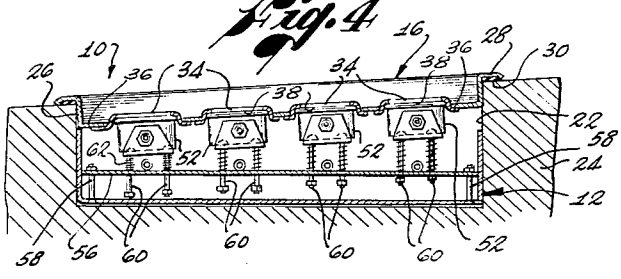


Fig. 3

Fig. 4



INVENTORS

HUGH H. LOGAN

BY GEORGE I. DOTY

JAMES F. NELSON

Lilly & Nyhagen

Attorneys

United States Patent Office 3,093,002 Patented June 11, 1963

3,093,002

FLUSH MOUNTED, DUSTPROOF GAS SERVICE CABINET

Hugh H. Logan, Pasadena, George I. Doty, La Canada, and James F. Nelson, Woodland Hills, Calif., assignors to Logan Hospital Equipment Co., Glendale, Calif., a corporation of California

Filed Dec. 19, 1960, Ser. No. 76,958
4 Claims. (Cl. 73—431)

This invention relates generally to control equipment for gas supply systems and, more particularly, to a so-called gas service cabinet.

The gas service cabinet of the invention is especially designed for installation in rooms which must be maintained free of contaminants to a high degree. For example, the illustrative embodiment of the invention is a surgical gas service cabinet for installation in the wall of a hospital surgery room and has certain unique features of construction that uniquely adapt it to this use. It will become clear as the description proceeds, however, that these same features may be beneficially utilized in gas service cabinets for other applications as well.

With this preliminary discussion in mind, a general object of the invention may be stated as being the provision of a new and improved gas service cabinet of the character described.

A more specific object of the invention is to provide a gas service cabinet of the character described which is adapted for installation in an opening in the wall of a room flush with the wall surface and effectively seals the wall opening against the passage of contaminants through the opening into the room so as to be uniquely adapted for use in hospital surgery rooms.

Another object of the invention is to provide a gas service cabinet of the character described which is equipped with one or more gas gauges contained within the cabinet and readable through openings in a removable front panel of the cabinet, and wherein these gauges are mounted in a unique way which permits them to be easily read even though it is necessary to incline the front panel slightly with respect to the rear housing of the cabinet in order that the panel may seat flat against the wall in which the cabinet is installed.

Yet another object of the invention is to provide a gas service cabinet of the character described in which the gas gauges and valve handles associated therewith are color coded to facilitate proper adjustment of the cabinet.

A further object of the invention is to provide a gas service cabinet of the character described which is simple in construction, inexpensive to manufacture, pleasing in appearance, compact, and otherwise ideally suited to its intended uses.

Other objects, advantages, and features of the invention will become evident as the description proceeds.

Briefly, these objects are attained by providing a gas service cabinet equipped with a rear housing having an open front side and a front panel which overlies this open side and is releasably secured to the housing. This panel has a circumferential lip behind which is a gasket for seating against the wall in which the cabinet is installed.

The gas lines serving the cabinet extend through the housing and are connected to gas gauges in the housing. These gas gauges are spring mounted in the housing in a unique way which assures that the gauges will be urged flat against the front panel of the cabinet. This renders the gauges easily readable through panel openings, sealed by transparent windows, even though it is necessary to incline the panel with respect to the housing of the cabinet in order to permit the panel gasket to seat properly against the wall surface and thereby effectively seal the wall opening in which the cabinet is installed.

The cabinet is also equipped with control valves and outlet fittings, the latter and the valve handles being accessible at the front panel. This panel is recessed so that when the cabinet is installed in a wall, the front of the cabinet is substantially flush with the wall surface.

A better understanding of the invention may be had from the following detailed description of a present illustrative embodiment of the invention and the attached drawing illustrating the same, wherein:

FIG. 1 is a perspective view of the present service cabinet installed in a wall opening;

FIG. 2 is a front view of the cabinet with the front panel removed;

FIG. 3 is an enlarged, partial vertical section through the cabinet; and

FIG. 4 is a horizontal section through the cabinet illustrating how the yieldable gauge supports function to maintain the gauge faces flat against the front panel of the cabinet even though the panel is inclined.

The service cabinet **10** illustrated in this drawing, which is actually an instrument enclosure, comprises a rear rectangular housing **12** having an open front side **14** and a front panel **16** which overlies this open side. The panel is secured to the housing by screws **18** which pass through the four corners of the panel and are threaded in pieces **20** fixed on the four corners of the housing.

Service cabinet **10** is installed in an opening **22** in a wall **24**, as shown best in FIG. 3. The front cover panel **16** has a forwardly extending, right angle flange **26** about its edge and an outwardly extending lip **28** along the forward edge of the flange. Behind this lip is a gasket **30** which is adapted to seat against the outer surface of the wall **24** in which the service cabinet is installed, as shown.

The front cover panel **16** has a horizontal row of circular apertures or holes **32**, each of which is closed by a transparent window **34**. As shown best in FIG. 3, each window **34** is generally dish shaped and has its center portion projecting through its respective panel opening **32**. At the rear of the front panel, each window has a peripheral flanges **36** which seats against and is adhesively sealed to the rear surface of the panel. Because of its dish shape, each window defines a rearwardly facing circular recess or cup **38**. While each window **34** projects slightly forwardly of the central wall portion of the panel having the openings **32**, these windows are located behind the plane of the panel lips **28** so as to be somewhat protected against being marred or scratched when the panel is placed face down on a surface.

Extending vertically through the service cabinet housing **12** are four gas lines **40**. The lower ends of these gas lines extend through and beyond the lower wall of the housing **12** and the upper ends of the gas lines extend through and above the upper wall of the housing. Extending horizontally across the inside of the housing, behind the gas lines **40**, is a channel member **42** which is secured to the rear wall **44** of the housing by means of bolts **46**. The gas lines are connected, somewhat loosely, to this channel member by means of clips **48** which straddle the gas lines, as shown, and are bolted to the channel member. The holes **50** in the upper and lower housing walls through which the gas lines extend are appreciably larger than the lines, as may be best observed in FIG. 3. The loose fit of the gas lines in the housing holes **50** and the somewhat loose attachment of the gas lines to the channel member **42** permit the gas lines to move, to a limited degree, with respect to the housing for facility of attachment of the gas lines to external fittings.

Located directly behind each panel window **34** is a gas gauge **52**. Each gas gauge is operatively connected to one of the gas lines **40** through a flexible tube **54**. These flexible tube connections provide the gas gauges

with a degree of freedom of movement in the housing, for reasons to be presently seen.

Extending horizontally across the inside of the service cabinet housing **12**, behind the row of gauges **52**, is another channel member **56**. This channel member is secured to the rear wall **44** of the housing by means of bolts **58**. Each gas gauge **52** is loosely and resiliently supported on the channel member **56** by means of four rectangularly arranged posts or bolts **60** and compression springs **62** on these bolts. Thus, the four supporting bolts for each gauge extend loosely through aligned holes in the forward, vertical web **64** of the channel member **56** and a rectangular bracket plate **66** fixed to each gauge. Each gauge is thereby capable of limited fore and aft movement as well as limited rocking movement. The springs **62** urge each gauge toward and against the rear side of the respective panel window **34**, the face **68** of each gauge being circular and proportioned to fit closely in the rear cup **38** of the respective panel window. Moreover, since the bolts or posts **60** have a loose fit in the channel **56** and in the respective gauge bracket plate **66**, the bolts have limited freedom of lateral movement or deflection. Thus, the bolts **60** and their springs **62** form resilient, laterally deflectable spring supports for the gauges, whereby the latter can shift laterally in any direction to align themselves with their respective panel windows and thereby compensate for inaccuracies of manufacture and eccentric mounting of the front panel **16**. The inner annular surface of each window recess **38** which extends about the forward end of the respective gauge **52** serves as a locating surface for the gauge which laterally locates the gauge face in coaxial alignment with the respective panel opening.

Connected in each gas line **40** is a valve **70**. Each valve has a rotatable valve stem **72** which extends loosely through an opening **74** in the front panel **16** and mounts a knob or handle **76** at its forward end, forwardly of the panel. The valve handles **76** are, therefore, accessible from the front side of the service cabinet for opening or closing of the valves **70**. Positioned on each valve stem **72**, behind the front panel, is a seal ring **78** of felt or other suitable sealing material. Each seal ring is backed by a washer **80** and a compression spring **82** which urges the ring against the rear side of the front panel about the adjacent valve stem hole **74** in the panel to seal the hole against the passage of dust and other contaminating material from the inside of the service cabinet into the room in which the service cabinet is installed.

The service cabinet illustrated in the drawing is especially intended for use in a hospital surgery room. In this application, the lower ends of the gas lines **40** are connected, for example, to sources (not shown) of pressurized oxygen, nitrous oxide, and surgical air and to a vacuum source, as indicated by labels **84** on the front panel **16** below the gas gauges **34**, respectively. The upper ends of the gas lines connect to suitable outlets in the operating room. When any one of the three valves **70** on the left-hand side in FIG. 2 is opened, therefore, the corresponding gas is delivered to the respective outlet in the operating room. Opening the valve on the right-hand side connects the respective room fitting to the vacuum source.

The gas gauges **34** obviously indicate the pressure in their respective gas lines at the downstream side of their respective valves **70**. Thus, the left-hand gauge **34** in FIG. 1 indicates the pressure of the oxygen flowing through the left-hand gas line **40** in FIG. 2. The second to the left-hand gauge **34** in FIG. 1 illustrates the pressure of the nitrous oxide flowing through the second to the left-hand gas line **40** in FIG. 2. The third from the left-hand gas gauge **34** in FIG. 1 indicates the pressure of the surgical air flowing through the third from the left gas line **40** in FIG. 2. Finally, the right-hand gauge **34** in FIG. 1 indicates the vacuum in the right-hand gas line **40** in FIG. 2.

A self-closing room outlet **85** is connected to the right-hand vacuum line **40**. This outlet is mounted on and accessible from the front side of the front panel **16** for connection to a hose or the like.

In order to facilitate correct use of the service cabinet and minimize the danger of operating the wrong valve **70**, the service cabinet is color coded. That is to say, each transparent window has a colored ring **86** and each valve handle **76** and the outlet **85** has a background color **88** matching the color of the ring **86** on its respective gauge. The face of each valve handle is provided with an appropriate identifying legend and the outlet **85** is provided with a label **84**, as shown. The labels **84** are colored to match the color of the rings **86** on their respective gauges.

When installing the gas service cabinet, the cabinet housing **12** is set into the wall opening **22** and secured in position in any suitable way. Front cover panel **16** is then placed over the opening and the panel attaching screws **18** are tightened to draw the panel toward the housing **12**. The panel gasket **30** is thereby forced tightly against the outer surface of the wall to effectively seal the panel to the wall surface about the entire circumference of the panel. As noted earlier, the peripheral lips **36** on the panel windows **34** are adhesively sealed to the rear surface of the panel **16** and the valve stem openings **74** in the panel are effectively sealed by the seal rings **78**. The wall opening **22** and front panel **16** of the service cabinet are effectively sealed against the passage of dust and other contaminants from the interior of the cabinet into the operating room.

In order to accomplish this complete seal, it is essential that the panel gasket **30** seat against the surface of the wall **24**, which surface may slope, as illustrated in exaggerated fashion in FIG. 4. Such a sloping wall surface causes the front panel **16** of the service cabinet to slope correspondingly with respect to the housing **12** of the cabinet. The resilient supports for the gas gauges **52**, furnished by the gauge mounting bolts **60** and springs **62**, permit the gauges to orient themselves parallel to the sloping front panel and their faces **68** to rest flat against the rear surfaces of the panel windows **34** so that the gauges may be clearly read even though the panel slopes. The mounting bolts **60** may be adjusted to initially properly position the gauges in the service cabinet. It will be seen that the outlet **85**, valve handles **76**, and gauge windows **34** are all within the recess of the front panel. When the service cabinet is installed in the wall **24**, therefore, the front of the cabinet is substantially flush with the wall surface. In this way, the cabinet presents no obstruction in the room and, more important, the valve handles are shielded against accidental turning.

Clearly, therefore, the gas service cabinet herein described and illustrated is fully capable of attaining the several objects and advantages preliminarily set forth.

While the present preferred embodiment of the invention has been disclosed for illustrative purposes, numerous modifications in the design, arrangement of parts, and instrumentalities of the invention are possible within the spirit and scope of the following claims.

What is claimed is:

1. In an instrument enclosure, a rear housing open at its front side, a front panel overlying said open side, releasable means securing the panel to the housing, said panel having an opening, a dished transparent window closing said opening including a peripheral flange seating against the rear surface of said panel about said opening and a central portion protruding through said opening and beyond the front surface of said panel, said central portion of said window having its rear surface located forwardly of said rear panel surface to define a rearwardly opening recess in said central portion, a gauge within said housing behind said window having a face closely fitting in said recess, a spring support resiliently

mounting said gauge on said housing and urging said gauge face into said recess, and said spring support accommodating tilting of said gauge, whereby to permit the gauge face to align itself flat against said rear surface of said central window portion.

2. In a gas service cabinet, a rear housing having an open front side, a front panel overlying said open side, releasable means securing the panel to the housing, said panel having a plurality of circular openings arranged in a row, a transparent window closing each opening, each window having a rear circular recess coaxial with its respective panel opening, a plurality of gas lines extending through the housing, a gas gauge behind each window having a circular face closely fitting in the recess of its adjacent window, a flexible tube connecting each gauge to a gas line so that each gauge responds to the pressure in its respective line, a channel member secured to the rear wall of the housing behind and parallel to the row of gauges, four rectangularly arranged bolts loosely connecting each gauge to the channel member so that each gauge is capable of limited rocking and fore and aft movement in the housing, and compression springs on said bolts for urging the faces of the gauges into flat contact with their respective windows.

3. In an instrument enclosure, a rear housing having an open front side, a front panel overlying said open side of said housing, means releasably securing said panel to said housing, said panel having an opening, a gauge within said housing having a forward end removably projecting through said panel opening and a gauge face at said forward end, said panel having a locating surface aligned with said panel opening which encircles and engages said forward end of said gauge to laterally locate said gauge face in alignment with said panel opening, a forwardly acting, laterally deflectable spring support mounting said gauge on said housing and yieldably urging said gauge forwardly through said panel opening, whereby said gauge has limited freedom of lateral movement in any direction to align itself with said panel opening, and cooperating means on said panel and gauge for limiting forward movement of the latter through said panel opening under the action of said spring support.

4. In an instrument enclosure, a rear housing having an open front side, a front panel overlying said open side of said housing, means releasably securing said panel to said housing, said panel having an opening, a gauge within said housing having a forward end removably projecting through said panel opening and a gauge face at said forward end, said panel having a locating surface aligned with said panel opening which encircles and engages said forward end of said gauge to laterally locate said gauge face in alignment with said panel opening, a forwardly acting, laterally deflectable spring support mounting said gauge on said housing and yieldably urging said gauge forwardly through said panel opening, whereby said gauge has limited freedom of lateral movement in any direction to align itself with said panel opening, and cooperating means on said panel and gauge for limiting forward movement of the latter through said panel opening under the action of said spring support to a position in which said gauge face is located substantially flush with the front surface of said panel.

References Cited in the file of this patent

UNITED STATES PATENTS

1,112,280	Fitch	Sept. 29, 1914
2,423,597	Hurn	July 8, 1947
2,538,489	Walton	Jan. 16, 1951
2,574,203	Wills	Nov. 6, 1951
2,758,257	Wills	Aug. 7, 1956
2,906,863	Ritter	Sept. 29, 1959