Nov. 6, 1951

W. P. WILLS

2,574,203

INSTRUMENT CASING FOR MEASURING AND CONTROLLING APPARATUS

Filed May 31, 1947

2 SHEETS—SHEET 1

FIG. 1

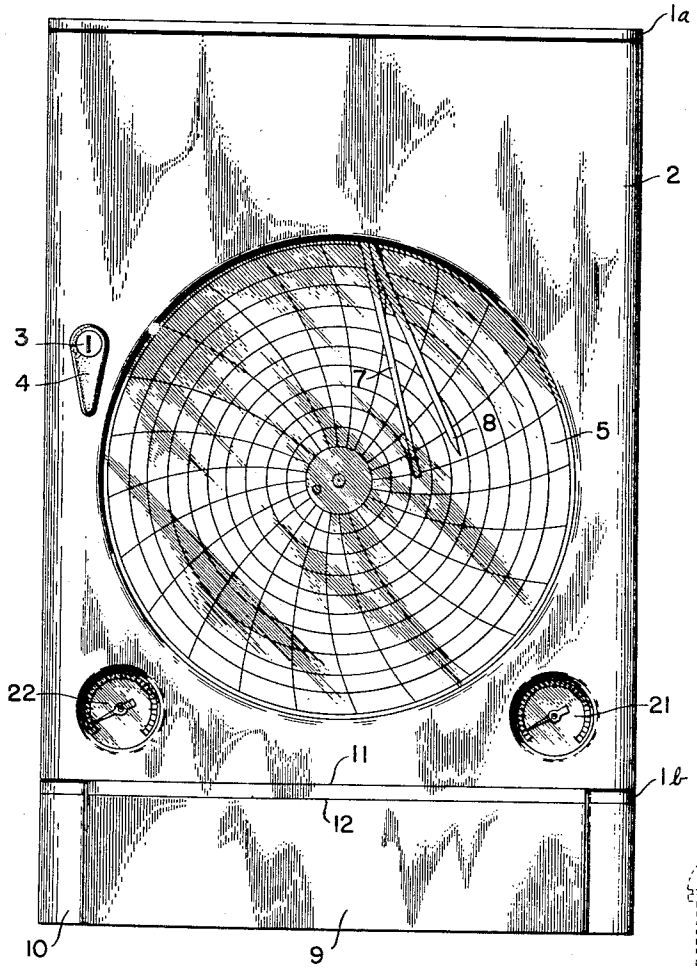


FIG. 2

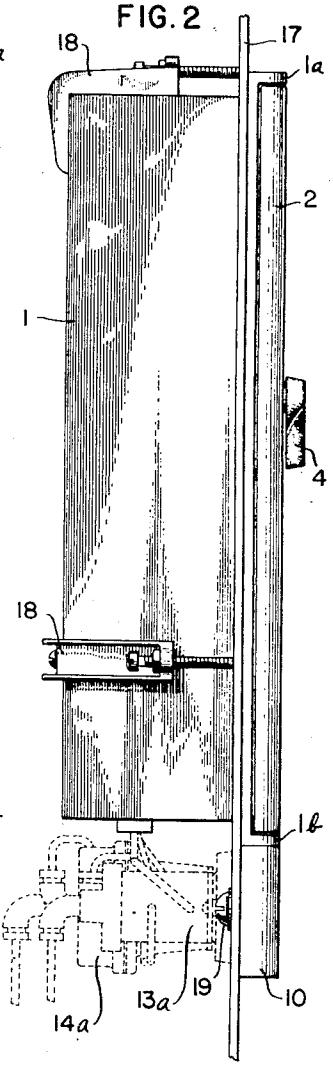
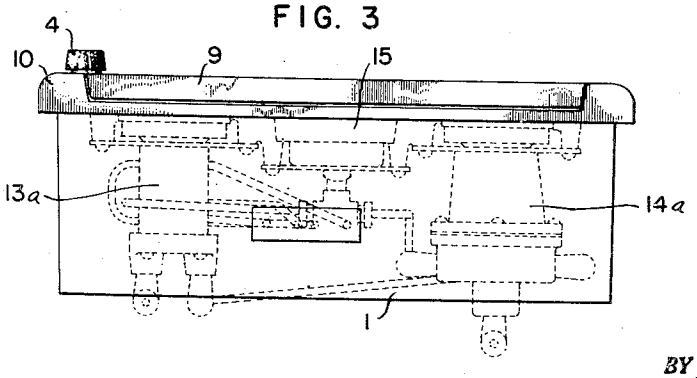


FIG. 3



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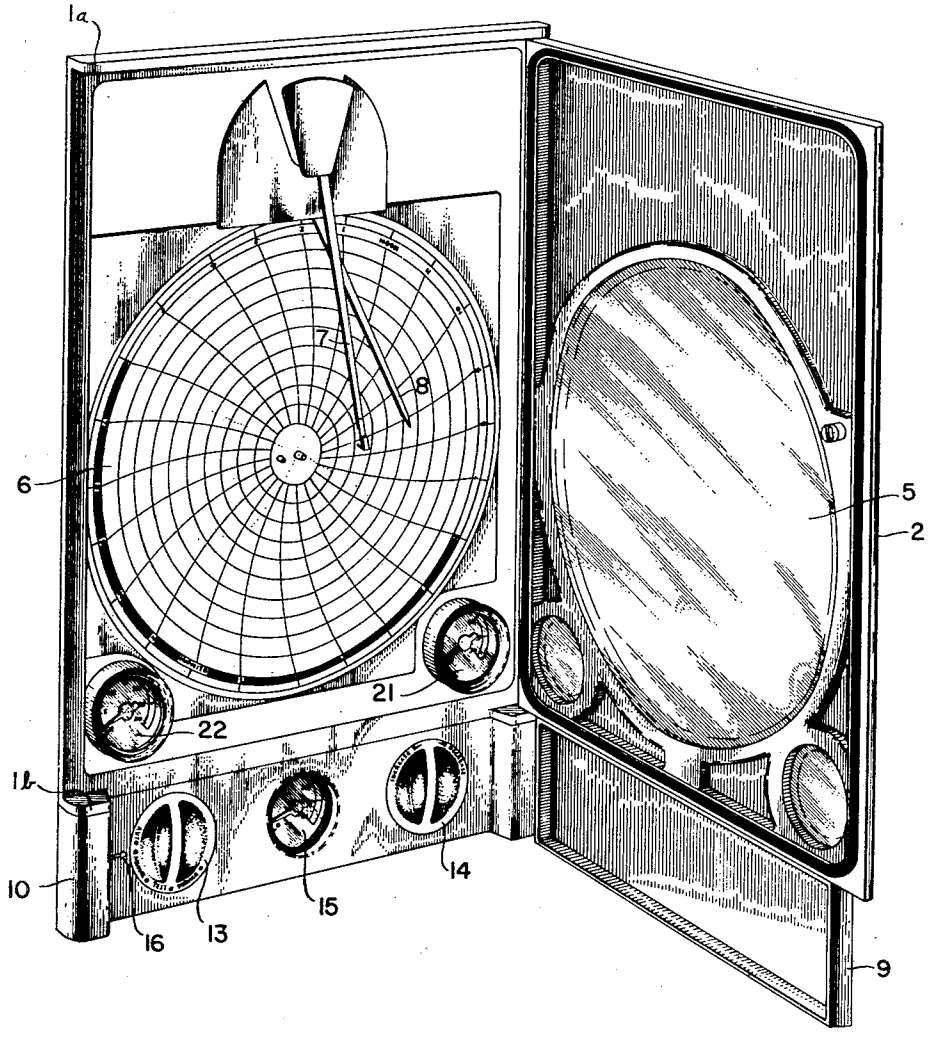
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2 SHEETS—SHEET 2

FIG. 4



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Patented Nov. 6, 1951

2,574,203

UNITED STATES PATENT OFFICE

2,574,203

INSTRUMENT CASING FOR MEASURING AND CONTROLLING APPARATUS

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Application May 31, 1947, Serial No. 751,522

2 Claims. (Cl. 73—431)

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The present invention relates to measuring and controlling instruments which are selectively adjustable by authorized persons only for either manual or automatic regulation of the application of a controlling medium to a variable condition.

A general object of the invention is to provide measuring and controlling instruments of the above mentioned type in which the manually and automatically operable mechanisms while separable, are so arranged in association with each other that only authorized persons have access to said mechanisms for selectively effecting automatic or manual operation and/or for removing the automatically operable mechanism for repair or other purposes without interfering with the operation of the manually operable mechanism in effecting its condition regulating function.

In automatically operable control systems it is desirable and in some cases necessary to make some provision for effecting manual control of the condition. The manual control mechanism may be used when the condition or system under control is first placed into operation and while the variables being regulated are brought to a normally desired value. It is also desirable to use the manual control mechanism when an upset occurs in the system or condition or any one or more of several related variables are being changed. Accordingly, it is desirable to provide mechanism by means of which manual as well as automatic control may be effected.

In accordance with the present invention, the mechanism for effecting automatic regulation of the flow of a controlling medium to the variable condition is contained within an instrument case which is provided with a normally locked door. The mechanism for effecting manual regulation of the flow of the controlling medium to the variable condition is arranged for mounting immediately below the instrument case and is recessed so as to receive a downwardly extending portion of the door of the instrument case. The adjustment devices provided on the manual control mechanism are arranged substantially flush with the recessed surface of the manual control mechanism so as not to interfere with the closing of the door of the instrument case. By virtue of this arrangement, the adjustment devices of the manual control mechanism are unavailable for unauthorized or accidental adjustments when the door of the instrument case is locked. Furthermore, the shielding of the adjustment devices of the manual control mechanism by the downwardly extending portion of instrument door serves to substantially improve the appearance of the measuring and controlling instrument mechanism as a whole by covering up the adjustment devices of the manually operable mechanism.

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Thus the invention in its preferred form is of especial utility in connection with instrumentalities enclosed in a casing provided with a normally locked door which must be unlocked from time to time by an authorized person to permit access to the casing interior for record chart replacements or other purposes. Upon opening of the door, the adjustment devices of the manually operable mechanism are exposed for adjustment. It is a feature of the invention that since the manually operable mechanism is separate from the instrument casing containing the automatically operable mechanism that the latter may be removed for repair or other purposes, the manually operable mechanism then being utilized to effect the necessary regulation of the flow of controlling medium to the variable condition under control.

The various features of novelty which characterize this invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, its advantages and specific objects obtained with its use, reference should be had to the accompanying drawings and descriptive matter in which is illustrated and described a preferred embodiment of the invention.

Of the drawing:

Fig. 1 is a front elevation of the measuring and controlling arrangement of my invention, showing the door of the instrument casing closed;

Fig. 2 is a side elevation of the measuring and controlling instrument arrangement of Fig. 1 and shows the instrument arrangement mounted on panel;

Fig. 3 is a bottom view of the measuring and controlling instrument arrangement of Fig. 1; and

Fig. 4 is a view showing the measuring and controlling arrangement of Fig. 1 with the door open.

Referring now to the drawing, the numeral 1 represents the body of an instrument casing which is rectangular in outline and is provided with a doorway normally closed by a rectangular front door 2. The latter is connected at the right side, as seen in Figs. 1 and 4, to the casing body by hinges (not shown) and is provided at

its left side with a lock which is adapted to be released by a key inserted in a keyhole 3 which as shown is formed in the doorknob 4. The casing body 1 is provided with upper and lower ledges 1*a* and 1*b* which are of the proper depth to present a flush surface with the door 2 when the latter is closed. The door 2 includes a glass panel 5 through which may be seen a circular record chart 6, a recording pen 7 and a control index 8.

The front door 2 includes a downwardly extending part 9 which is somewhat narrower than the door 2 and is symmetrically arranged with respect thereto. The downwardly extending dimension of the door part 9 is substantially the same as the width of a manual control mechanism or so-called "by-pass panel" which is represented by the numeral 10. As shown, the by-pass panel 10 is mounted directly beneath the instrument casing body 1, with the upper edge thereof in physical engagement with the lower side of the ledge 1*b* of the instrument casing body 1. The front surface of the by-pass panel 10 is recessed so as to accommodate the downwardly extending door part 9 whereby the door 2 with its downwardly extending part 9 and the front surface of the manual by-pass panel 10 on either side of the recessed portion thereof present a continuous flush or smooth surface of extremely pleasing appearance.

It is noted that the meeting of the upper edge of the door part 9 and the lower edge of the door 2 completes a straight line, represented by the numeral 11, which extends across the width of the instrument casing arrangement. For the purpose of adding to the aesthetic beauty of the instrument casing arrangement, a second line as shown at 12 and parallel to the line 11 may be engraved or otherwise cut into the surface of the downwardly extending door part 9. This line 12 together with the lines formed on both sides of the door part 9 by the meeting of the upper edge of the by-pass panel 10 and the lower edge of the ledge 1*b* also extends completely across the width of the instrument casing arrangement.

Referring to Fig. 4 it will be seen that the manual by-pass panel 10 is provided with manually rotatable knobs 13 and 14 and also with an instrument 15 which may comprise a pressure gauge. In accordance with the preferred embodiment of the invention, the instrument mechanism arrangement is arranged for either manual or automatic regulation of a control pressure to a control device such as a pneumatic operated valve (not shown) although it will be evident to those skilled in the art that the present invention is not limited in its application for use with pneumatic control systems but may be utilized with equal facility with electric or hydraulic control systems, if desired.

The knobs 13 and 14 and the instrument 15 are all so arranged as to be substantially flush with the surface of the recessed portion of the by-pass panel 10. The knob 13 is arranged in association with an arrow 16 which is engraved or otherwise formed on the recessed portion of the by-pass panel 10 and is adjustable into four different positions which are designated on the knob as "Auto," "Manual," "Test" and "Service." Thus, by adjustment of knob 13 the instrument mechanism arrangement may be adjusted for automatic operation or may be adjusted for manual operation. Manipulation of the knob 13 also permits adjustment of the instrument mechanism arrangement into test or service conditions,

the need for which conditions are known to those skilled in the art and need not be further elaborated on herein. The knob 13 is mechanically connected to and, when rotated, adjusts a transfer valve mechanism shown in dotted lines in Figs. 2 and 3 and represented by the reference numeral 13*a*. The details of the transfer valve mechanism 13*a*, and the connections thereof to an air supply source and to the mechanism contained in the instrument body 1 form no part of the present invention and therefore further description thereof is not believed necessary.

The knob 14 is provided for adjusting the application of a control air pressure to a control device such as an air operated valve and when rotated in clockwise direction serves to increase that control pressure while rotation thereof in a counterclockwise direction serves to decrease that control pressure. To this end the knob 14 is mechanically connected to and, when rotated, adjusts a suitable pressure regulator which is shown in dotted lines of Figs. 2 and 3 and is represented by the reference numeral 14*a*. The instrument 15 is arranged to indicate the pressure established by the pressure regulator 14*a* for the purpose of facilitating the adjustment of the air operated valve pressure to a desired value. Further description of the pressure regulator 14*a* and the instrument 15 is believed unnecessary since the details thereof form no part of the present invention.

As is shown in Fig. 2, the instrument casing body 1 is adapted for mounting on a panel 17 by suitable fastening means indicated diagrammatically at 18. The manual by-pass panel 10 is adapted for separate mounting by suitable mounting means on the panel 17 immediately below the instrument body 1 with the upper edge of the manual by-pass panel in engagement with the lower edge of the lower ledge 1*b* of the instrument casing body 1. The mounting means for the manual by-pass panel are shown in Fig. 2 as comprising a screw 19 extending through the panel 17 and received by a suitable tap provided in the panel 10.

By virtue of the separate mounting provisions for the instrument casing body 1 and the manual by-pass panel 10, the instrument casing body 1 may be removed from the panel 17 for repair or other purposes, if desired, without disturbing the position of the manual by-pass panel 10 or its effectiveness in accomplishing its manual regulating function. This feature of my invention is of considerable practical importance since it permits removal of the instrument casing body and the automatically operable exhibiting and regulating mechanism contained therein to a work bench or other more convenient location for effecting such repairs as may be necessary. It permits also easy replacement of the instrument casing body 1 and the mechanism therein contained by another similar instrument mechanism.

From the foregoing explanation, it is evident that the present invention is adapted for use with any instrument mechanism arrangement comprising a manually adjustable device employed in association with an automatically operating mechanism, which manually adjustable mechanism is made accessible for adjustment upon opening of the door of the automatically operable mechanism and where it is desirable to prevent unauthorized or accidental adjustment of the manually adjustable device. Merely by way of example, it is noted that the particular in-

strument illustrated in the drawing comprises a self-balancing potentiometer mechanism including a pen 7 which is automatically adjusted across the circular chart 6 in accordance with the varying values of the thermocouple voltage or other quantity measured and that the adjustments of the pen 7 relative to the control index 8 give corresponding adjustments to the flapper valve of an air actuated control mechanism located in the instrument casing 1. In the particular instrument referred to, the self-balancing potentiometric measuring mechanism is of the commercial type manufactured and sold by my assignee, The Brown Instrument Company, and which is disclosed and claimed in my copending application, now U. S. Patent 2,423,540, filed December 1, 1941, and bearing Serial No. 421,173. The air actuated control mechanism is of the commercial type also manufactured and sold by my assignee and disclosed in the Moore Patent 2,125,081. That air actuated control mechanism includes pressure gauges 21 and 22 which respectively indicate the pressure from the air supply source and the air pressure applied to the air operated control valve.

The said air actuated control mechanism includes a pipe connection to the transfer valve 13*a* so that upon adjustment of the knob 13 to its automatic position the said air actuated mechanism is made effective for regulating the application of a control air pressure to an air operated valve utilized to control the flow of a condition regulating medium. Upon adjustment of the knob 13 to its manual position, the air actuated control mechanism contained within the instrument casing is deprived of its automatic regulating function and the control of the air pressure to the air operated valve may then be accomplished by manipulation of the knob 14.

While in accordance with the provisions of the statutes, I have illustrated and described the best forms of the invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of the invention as set forth in the appended claims, and that in some cases certain features of the invention may sometimes be used to advantage without a corresponding use of other features.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In combination, a casing formed with a doorway, a door normally closing said doorway but movable to open the latter, said door having a part extending beyond one side of said casing, and a panel arranged exterior of said casing but positioned adjacent said one side thereof, said panel having a recessed portion on which manually actuable adjustment devices may be arranged, said recessed portion having substantially the dimensions of said part of the door extending beyond one side of the casing, said panel being so positioned with respect to said casing that the door part extending beyond the casing is received in said recessed portion when the door is closed so that the devices which may be mounted on the panel are covered and made inaccessible.

2. In combination, a casing formed with a doorway, a door normally closing said doorway but movable to open the latter, said door having a part narrower than the other parts of said door and extending symmetrically beyond one side of said casing, and a panel wider than said door part and of substantially the same height as said door part and arranged exterior of said casing but positioned adjacent said one side thereof, said panel having a recessed portion on which manually actuable adjustment devices may be arranged, said recessed portion having substantially the dimensions of said part of the door extending beyond one side of the casing, said panel being so positioned with respect to said casing that the door part extending beyond the casing is received in said recessed portion when the door is closed so that the devices which may be mounted on the panel are covered and made inaccessible.

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