

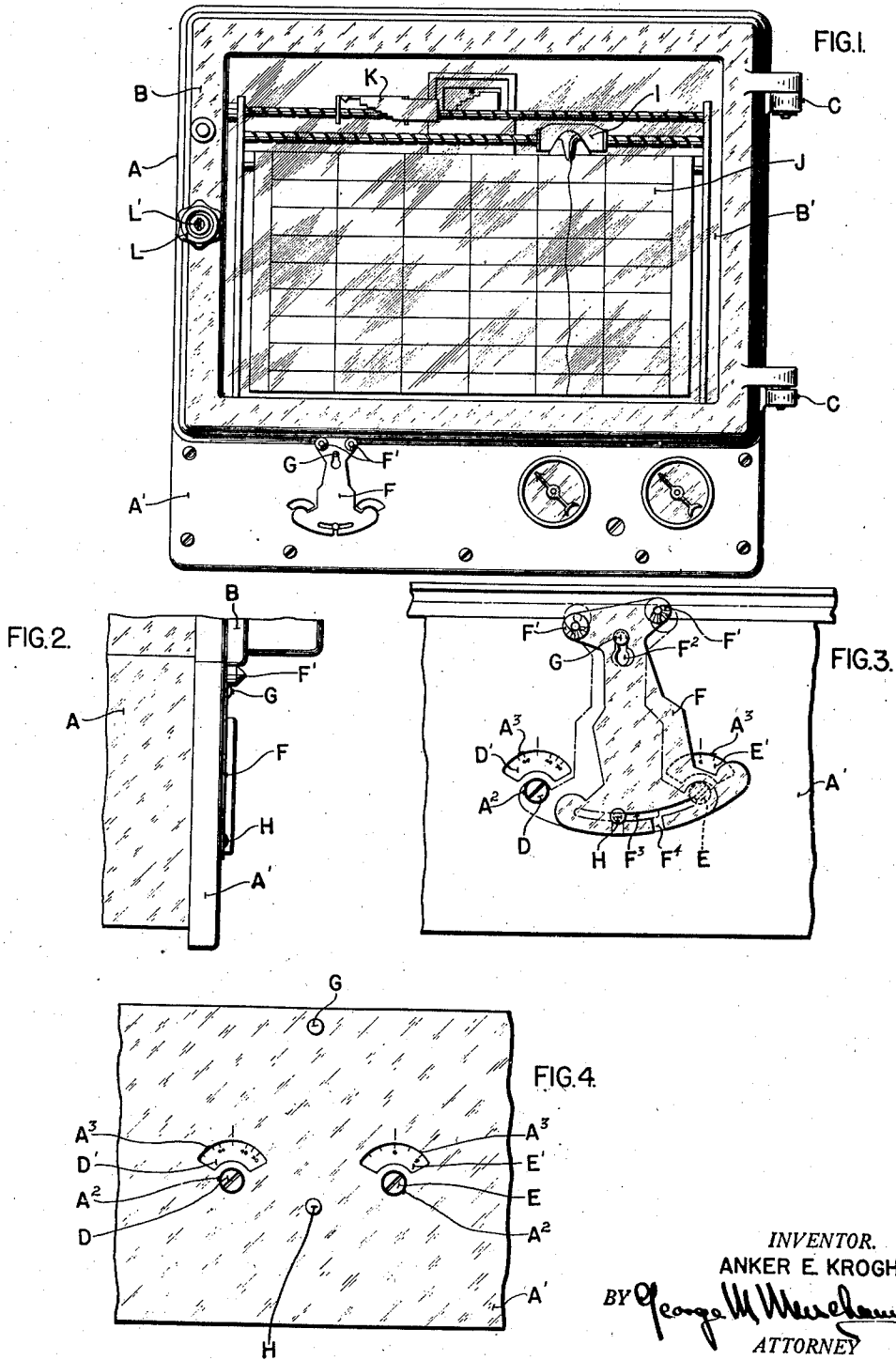
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INSTRUMENT CLOSURE PLATE

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## UNITED STATES PATENT OFFICE

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## INSTRUMENT CLOSURE PLATE

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The present invention relates to measuring and control instruments of the type in which the instrument housing or casing encloses instrument mechanism including one or more manually actuated adjustment devices.

The general object of the present invention is to provide an instrument of the above mentioned type, with an instrument enclosing casing, formed with an aperture or apertures suitably located for the actuation through each such aperture, of a manually actuated instrument adjustment device within the casing, and to provide the latter with means normally secured in position to cover each such aperture or to otherwise prevent actuation through the aperture of the corresponding adjusting device, but which may be readily released for actuation of the adjusting devices through the apertures, by releasing means not readily available to unauthorized persons, so as to avoid unauthorized or accidental adjustments of said devices.

The present invention is adapted for advantageous use with instruments of many different forms and used for widely different purposes. The invention in its preferred form, is of especial utility, however, in the case of an instrument enclosed in a casing provided with a normally locked door which must be unlocked from time to time by some authorized person to permit access to the casing interior for record chart or strip replacements, or other purposes necessarily effected from time to time. In such case, the means for preventing unauthorized adjustment of the adjustment devices is preferably in the form of a shield or cover plate, which is movably mounted on the casing, and which is automatically secured in its aperture closing position by the casing door, when the latter is closed, and which is readily movable, when the casing door is open, as required to expose each adjustment device aperture, so that the corresponding adjustment device may then be adjusted through said aperture.

The various features of novelty which characterize the present 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, and its advantages, reference should be had to the accompanying drawing and descriptive matter in which I have illustrated and described a preferred embodiment of the invention.

Of the drawing:

Fig. 1 is a front elevation of an instrument;

Fig. 2 is a partial elevation taken at right angles to Fig. 1;

Fig. 3 is a front elevation taken similarly to Fig. 1, of a portion of the instrument casing, shown in larger scale than in Fig. 1, and with the shield or cover member adjusted to a different position; and

Fig. 4 is an elevation of the portion of the instrument casing shown in Fig. 3, but with the cover member removed.

In the drawing, A 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 B. The latter is connected at one side to the casing body by hinges C, and is provided at its opposite side with a lock adapted to be released by a key inserted in a key-hole L', which, as shown, is formed in the door knob L. As shown, though this is not essential, the door B includes a glass panel B' in the form of an open ended box, the closed end of which is at the front of the instrument, and is displaced forwardly from the frame of the door, to increase the volume of the casing space, which is rendered accessible when the door is opened. As shown, the casing body includes a front wall part A', below the level of the bottom of the door B, and formed with two apertures A<sup>2</sup> through each of which a corresponding instrument adjustment device within the casing may be manually actuated. As shown, one of said devices comprises a rotatable operating shaft or stem D extending into one of the apertures A<sup>2</sup> and formed at its exposed end with a kerf for engagement by a screw driver or like implement by which the stem D may be rotated. As shown, the stem or shaft D carries a dial D' at the inner side of the wall part A', the angular position of which, and thereby the angular adjustment of the stem D, may be visually observed through an opening A<sup>3</sup> in the wall A'. The second instrument adjusting device includes a stem or shaft E, similar to the stem D, and similarly extending into the second opening A<sup>2</sup>. The stem E carries a dial E' observable through a second opening A<sup>3</sup>.

In accordance with the present invention, a shield or cover plate member F is mounted on the casing wall for movement into and out of a normal position in which it covers both of the apertures A<sup>2</sup>, but the member F is so mounted, shaped, and disposed that it can be moved out of said position only when the casing door B is open. To this end, in the preferred construction illustrated, the member F is pivotally connected to the casing part A' for turning movement out of its normal position in which it covers the apertures A<sup>2</sup>, and comprises portions F' which are

adapted to engage the lower edge of the door B, when the latter is closed, and thereby prevent turning movement of the member F out of its normal position. As shown, the pivotal connection for the member F is formed by a headed pivot pin G, carried by the casing part A' and extending through an opening F<sup>2</sup> in the member F. The portions F' of the member F are located at opposite sides of said pivotal connection and extend beneath, and engage, or are in close proximity to, the lower edge of the door B, when the latter is in its closed position. When the door is open, the member F may be turned about the pin G in one direction to expose the aperture A<sup>2</sup> receiving the adjustment shaft D, as shown in Fig. 3, and may be turned in the opposite direction to expose the aperture A<sup>3</sup> receiving the adjustment shaft E.

Advantageously, and as shown, the portions F' are in the form of pins transverse to the body of the member F and bevelled or tapered at their outer ends, so that when the door B is closed, it will engage one or the other of the projections F', and cam the member F back into its normal position, if not already in that position. As shown, the lower portion of the cover member F is shaped so that when the member is in its normal position, in which it covers both apertures A<sup>2</sup>, both apertures A<sup>3</sup> are uncovered so that both dials D' and E' are visible.

To permit of the ready detachment of the cover member F from the instrument casing, when desirable, the cover member F opening F<sup>2</sup> is of keyhole shape and has its narrow slot portion extending upward toward the casing doorway and receiving the body of the pin G, in the normal condition of the member. The head of the pin G is too large to pass through the narrow slot portion of the keyhole opening F<sup>2</sup>, but is small enough to pass through the larger lower round portion of that opening. In consequence, when the member F is moved relative to casing part A' to bring the round portion of the opening F<sup>2</sup> into register with the pin G, the latter does not prevent movement of the member F bodily away from the casing body.

The risk of accidental separation of the cover plate F from the instrument casing, is minimized, and the member F is guided in its normal turning movement, and has those movements suitably limited, by a headed pin H carried by the casing part A', and having its body portion normally received in an arc shaped slot F<sup>3</sup> formed in the member F at some distance from the opening F<sup>2</sup>. The slot F<sup>3</sup> is concentric with the upper end of the keyhole opening F<sup>2</sup>. Movement of the member F relative to the casing part A', in the direction to bring the round portion of the keyhole opening F<sup>2</sup> into register with the pin G, is prevented by the engagement of the pin H with the concave wall of the slot F<sup>3</sup>, except when the angular position of the member F is such as to bring its slot F<sup>4</sup> in line with the pin H. The slot F<sup>4</sup> extends from the concave wall of the slot F<sup>3</sup> to the lower edge of the member F. The opening F<sup>2</sup>, slot F<sup>4</sup>, and pins G and H are so relatively disposed that when the angular position of the member F is such that slot F<sup>4</sup> is in line with the pin H and the casing door B is open, the member F may be moved relatively to the casing in the direction of the length of the narrow slot portion of the keyhole opening F<sup>2</sup>. On such movement, pin H passes through the slot F<sup>4</sup> and out of engagement with the member F, and the pin G is brought into register with the larger round por-

tion of the keyhole opening F<sup>2</sup>, and the cover member may then be moved bodily away from the wall portion A'.

As shown, the slot F<sup>4</sup> is in line with the narrow slot portion of the keyhole opening F<sup>2</sup> and the pin H is in line with the slot F<sup>4</sup> only when the member F is in its normal position in which it covers both apertures A<sup>2</sup>, and the initial separation movement of the member F relative to the casing is directly toward the casing doorway, and is permitted by the door B only when the latter is in its normal open position. The member F may be remounted on the casing by passing the pin G through the round portion of the keyhole opening, and then moving the member F relative to the casing as required for movement of the pin H through the slot F<sup>4</sup> into the slot F<sup>3</sup>.

As has already been indicated, and as will be apparent to those skilled in the art, the invention is adapted for use with any instrument comprising an adjustment device within an instrument casing, which is desirably made accessible for adjustment through an aperture in the casing wall, and where it is desirable to prevent unauthorized or accidental adjustment of the adjustment device. Merely by way of example, it is noted that the particular instrument illustrated in the drawing, comprises a self-balancing potentiometer measuring mechanism including a pen carriage I automatically adjusted, transversely of a record strip J, in accordance with the varying values of a thermocouple voltage or other quantity measured, and that the adjustments of the carriage I relative to a stationary control table K give corresponding adjustments to the flapper valve of an air actuated control mechanism located in the instrument casing, back of the wall part A'. In the particular instrument referred to, the self-balancing potentiometer measuring mechanism is of the commercial type employed in the well known and extensively used "Brown potentiometer", made and sold by my assignee, The Brown Instrument Company, and the air actuated control mechanism is of the commercial type employed in the "Air-O-Line controller", made and sold by my assignee. One form of the last mentioned mechanism and its operative connection to a potentiometer mechanism of the above mentioned commercial type, is illustrated and described in my prior application Ser. No. 75,704, filed April 22, 1936.

The said commercial air actuated control mechanism includes an adjustment device, of which the shaft D is the actuating member, which is employed to vary the magnitude of a reverse, or "follow-up", adjustment of the control pressure, following each initial adjustment of that pressure resulting from a movement of the pen carriage I, and includes an adjusting device, of which the member E is the actuating member, which is employed to vary the rapidity with which a "compensating" adjustment, subsequent and opposite in direction to the follow-up adjustment of the control pressure, is effected. Further reference to the said follow-up and compensating adjustments, and to the above mentioned potentiometer and air actuated control mechanisms, is plainly unnecessary herein, not only because said adjustments and mechanisms are well known to those skilled in the art, but also because those adjustments and mechanisms constitute no part of the present invention, which may be used with instruments not including those particular mech-

anisms, and in which the adjusting parts D and E serve very different adjustment purposes.

While in accordance with the provisions of the statutes, I have illustrated and described the best form of embodiment of my 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 my invention as set forth in the appended claims and that in some cases certain features of my invention may 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. An instrument casing formed with a doorway, and with an aperture through which a manually actuatable instrument adjustment device within the casing may be actuated, and a member mounted on said casing for movement into and out of a normal position in which it prevents actuation of said adjustment device through said aperture, and a door normally closing said doorway but movable to open the latter, and which when in its doorway closing position prevents movement of said member out of the said normal position of the latter.

2. An instrument casing formed at one side with a doorway, and with an aperture through which a manually actuated instrument adjustment device within the casing may be actuated, a door normally closing said doorway but movable to open the latter, and a member mounted on said casing for turning movement into and out of a position in which it prevents actuation of said adjustment device through said aperture, and a door, said door and member having portions cooperating to hold said member against said turning movement when said door is in position to close said doorway.

3. An instrument comprising a casing formed with a doorway and with an aperture adjacent

said doorway, through which a rotatable adjustment device extending into said aperture is thereby made accessible for adjustment, a member mounted on said casing for movement into and out of a normal position in which it covers said aperture and a door normally closing said doorway but movable to open the latter, and adapted when in its doorway closing position to prevent movement of said member out of its said normal position.

4. An instrument casing formed with a doorway and an aperture through which a manually actuatable instrument adjustment device within the casing may be actuated, headed pins projecting from the outer side of said casing adjacent said aperture, and a cover member normally in the position in which it covers said aperture and formed with slots which normally receive said pins and are shaped and arranged to permit movement of said member out of said position without separation of said member from said casing, and permitting other movements of said member whereby the latter may be separated from said casing, and a door normally closing said doorway but movable to open the latter and adapted when in its doorway closing position to prevent said movements of said member.

5. An instrument casing formed at one side with a doorway and an aperture adjacent said doorway and through which a manually actuatable instrument adjustment device within the casing may be actuated, a member pivotally connected to said casing for turning movement about an axis into and out of a normal position in which it covers said aperture, and having engaging parts at opposite sides of said axis, and a door normally closing said doorway but movable to open the latter, and adapted when in its closed position, to be engaged by said engaging parts and thereby prevent movement of said member out of said normal position.

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