Aug. 19, 1947. S. KAHN 2,425,941

MANUALLY ADJUSTABLE INDICATOR FOR DIAL INSTRUMENTS

Filed Nov. 9, 1944 2 Sheets-Sheet 1

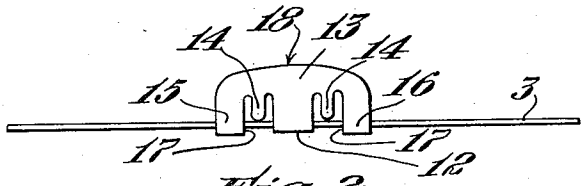


Fig. 2

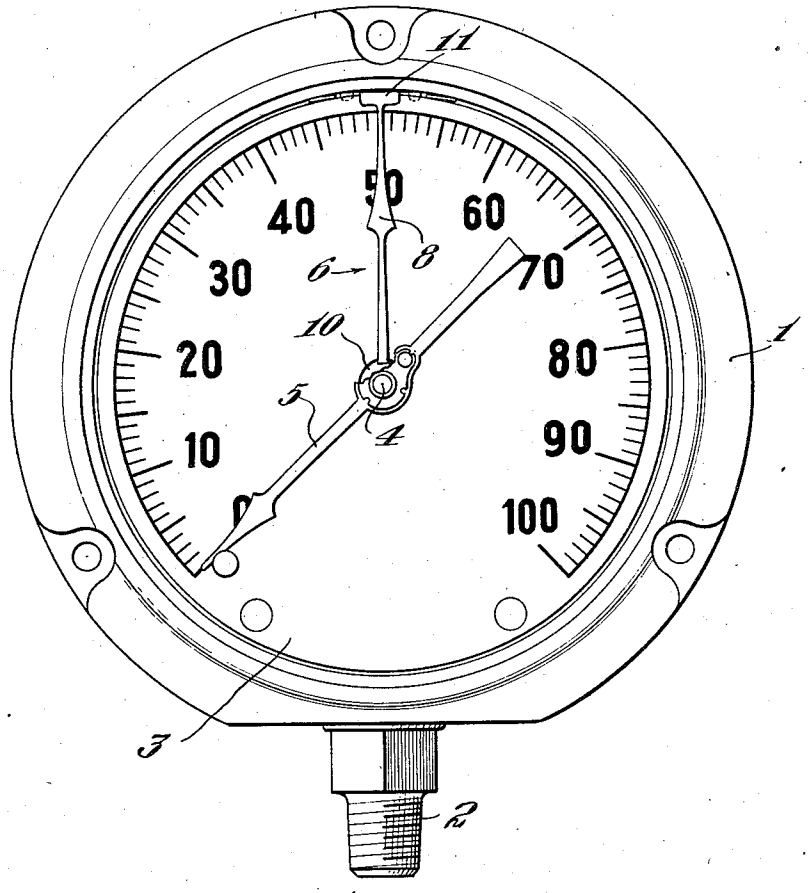


Fig. 1

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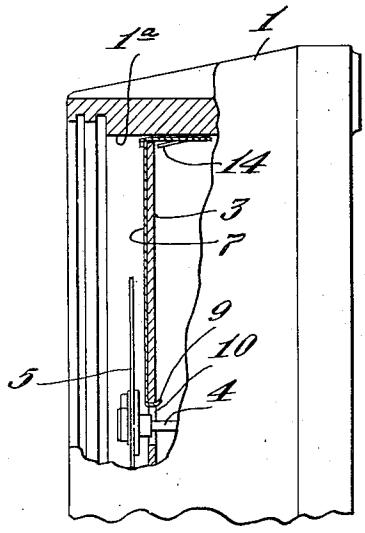


Fig. 6

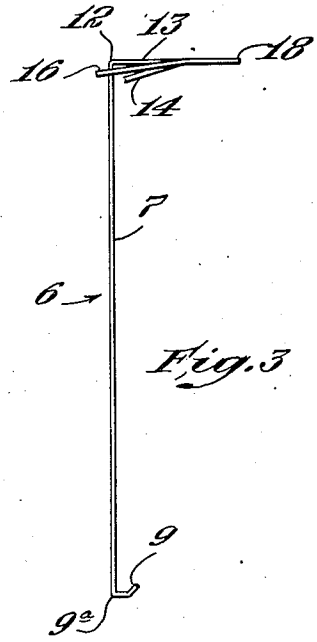


Fig. 3

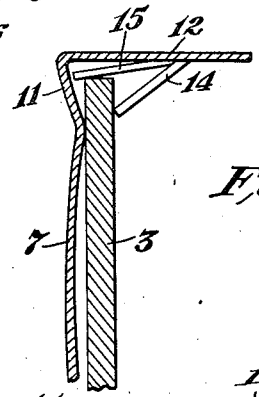


Fig. 7

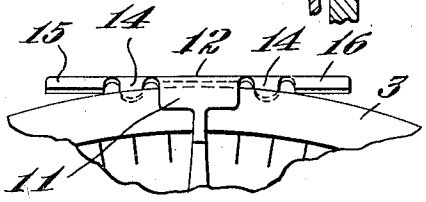


Fig. 4

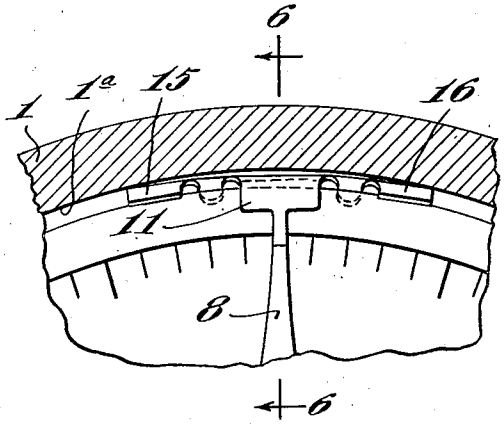


Fig. 5

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UNITED STATES PATENT OFFICE

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MANUALLY ADJUSTABLE INDICATOR FOR DIAL INSTRUMENTS

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Application November 9, 1944, Serial No. 562,714

11 Claims. (Cl. 116—129)

1

This invention pertains to dial instruments, for example pressure gauges, dial thermometers, etc., and relates more especially to a manually adjustable indicator or set hand, normally stationary but movable at will to any desired portion of the dial and cooperable with the movable index to designate some particular condition of the working medium. For instance, when the instrument is a steam pressure gauge, the set hand may be arranged to show maximum working pressure, or when the instrument is a thermometer, it may be set to indicate a maximum safe temperature.

Customarily, the set hand is quite similar in shape and construction to the movable index, but has a hollow grommet or short sleeve member at its inner end which passes through the usual hole at the center of the dial and is expanded or peened over at the back side of the dial to retain it in assembled relation with the dial, the grommet or sleeve being of such diameter, relatively to the hole in the dial, as frictionally to retain the set hand in any position to which it may be turned. While the set hand, as thus arranged, may be moved manually to any desired position and stays, where set, fairly well after adjustment, at least so long as the parts are not worn, the set hand, when thus constructed, must be assembled with the dial before the latter is associated with the movement mechanism and before calibration of the instrument. Thus it may readily happen that the manufacturer, having a complete instrument properly calibrated in stock, but unprovided with such a set hand, will receive a customer's order for such an instrument having a set hand, and will then be obliged to disassemble the instrument, apply the set hand to the dial, reassemble the parts and recalibrate before he can fill the order.

The principal object of the present invention is to provide a movable indicator or set hand which can readily be applied to the dial of an instrument, which is otherwise complete and which has been calibrated, without necessitating any disassembly of the dial or recalibration. A further object is to provide a set hand which is cheap and easy to construct and to apply and which will remain, when manually adjusted, in desired position without danger that it will be displaced by vibration or shock. Other and further objects

2

and advantages of the invention will be pointed out in the following more detailed description and by reference to the accompanying drawings wherein

Fig. 1 is a front elevation of a dial instrument, for example a pressure gauge, embodying the present invention;

Fig. 2 is a top plan view of the dial of the instrument, removed from the case and having the improved set hand of the present invention applied thereto;

Fig. 3 is an edge elevation of the improved set hand as it appears before application to the dial;

Fig. 4 is a fragmentary front elevation of the dial with the set hand applied thereto, as it would appear were it applied to the dial before the latter was placed within the instrument case;

Fig. 5 is a view similar to Fig. 4, but showing the dial within the instrument case and indicating the position which the set hand assumes when within the instrument case;

Fig. 6 is a fragmentary side elevation of the instrument, omitting the front transparent panel and with parts broken away and in vertical section, showing the improved set hand in operative position; and

Fig. 7 is a fragmentary radial section through the dial, to very large scale, showing the upper portion of the set hand associated therewith.

Referring to the drawings (Fig. 6) the numeral 1 designates the case of an instrument, for instance a pressure gauge, having the attaching nipple 2, the dial 3, the index or pointer staff 4 and the index 5 which cooperates with graduations on the dial. The mechanism for moving the index 5 forms no part of the present invention.

The manually adjustable indicator or set hand of the present invention is indicated at 6. This device is preferably made from a single piece of sheet metal by a stamping or equivalent operation and comprises the elongate portion 7 (Fig. 3) which is preferably shaped to provide the pointer portion 8 (Fig. 1). At its lower or inner end the part 7 is bent at 9^a to provide an open hook 9 which, when the indicator is assembled with the dial, is passed through the usual center hole 10 in the dial so as to engage the edge of the hole, the hole 10 being of a diameter greater than that of the staff 4 as shown in Fig. 6. Beyond the pointer

portion 8 the part 7 is preferably widened to provide a head portion 11 comprising a part designed to engage the front face of the dial. The head portion is bent transversely at the point 12 so that a part 13 (Fig. 2) of the head lies in a plane perpendicular to the part 11 and to the plane of the dial. The distance between the bend 12 and the bend 9a approximates the radial distance between the edge of the hole 10 in the dial and the outer edge of the dial. The portion 13 of the head of the indicator is slotted to provide two resilient tongues 14 which are bent downwardly as shown in Fig. 3 so that when the device is in use the free ends of these tongues are disposed at the rear of the dial thus preventing the indicator from moving forwardly.

The head portion 13 of the indicator is also comprised of two resilient tongues 15 and 16 which normally incline downwardly below the plane of the main portion of the head 13 so that the forward parts at least of their inner edges 17 are normally at a distance from the bend 9a less than the radial width of the dial between the edge of the opening 10 and its periphery. Normally, before application of this indicator to the dial, the parts 15 and 16 lie in substantially the same plane, the mid portion of the head 13 being substantially tangent to the edge of the dial. The indicator, as thus provided, may be applied to the dial before the latter is assembled with the other gauge parts, but may as readily be applied after the dial has been assembled and after the gauge has been calibrated. In the latter case, the operator inserts the hook 9 into the opening 10 in the dial and then pushes the rear edge 18 of the head 13 of the indicator rearwardly between the outer edge of the dial and the inner wall 1a (Fig. 6) of the instrument case until the tongues 14 snap down back of the dial. In thus pushing the head 13 rearwardly into the space between the edge of the dial and the wall of the case, the head 13 may bend transversely as shown in Fig. 5 to a curvature more or less approximating the edge of the dial and since this head portion 13 is resilient, its right and left outer edges are thus caused to bear frictionally against the inner surface of the case, thus adding to the frictional resistance to movement which results from the engagement of the inner edges 17 of the tongues 15 and 16 with the edge of the dial. It may be noted that when the head portion is thus curved, these edges 17 have a tendency to bite into the material of the dial so as, in effect, to form detents which offer substantial resistance to movement of the indicator or set hand and this, in addition to the friction exerted against the inner surface of the case, provides a very firm retention of the set hand such as to prevent its displacement if the gauge is subjected to vibration or shock. On the other hand this frictional retention is such as to permit movement of the set hand to desired position by manual adjustment whenever such adjustment is desired.

As noted, the set hand may be applied to the dial before the latter is mounted in the gauge and this procedure may often be followed when the manufacturer is making a line of gauges in which a set hand is a conventional part of the construction. On the other hand if the set hand is not applied to the gauge before assembly and calibration, it may just as readily be applied after the dial has been assembled with the other parts and the instrument has been calibrated. The set hand thus provided is very advantageous as compared with the usual construction and although

having these advantages it is nevertheless cheap and easy to make and may readily be applied without any particular skill.

While one desirable embodiment of the invention has been illustrated by way of example it is to be understood that the invention is inclusive of any and all modifications falling within the scope of the appended claims.

I claim:

1. A manually adjustable set hand for use in a dial instrument having a case which houses a graduated dial with which cooperates a pointer carried by a rotary staff, the dial being provided with a central opening through which the rotary staff extends, said opening being of a diameter greater than that of the pointer staff, the dial being of a diameter less than the inner diameter of the case, said hand being applicable to the dial of an instrument which is otherwise complete and which has been calibrated and without necessitating any dis-assembly of the parts or recalibration, the hand comprising portions designed respectively to engage the material of the dial which defines the edge of the central opening in the dial, and the outer edge of the dial, the latter portion of the hand being constructed and arranged to exert pressure against the edge of the dial.

2. A manually adjustable set hand for use in a dial instrument having a case which houses a graduated dial with which cooperates a pointer carried by a rotary staff, the dial being provided with a central opening through which the rotary staff extends, said opening being of a diameter greater than that of the pointer staff, the dial being of a diameter less than the inner diameter of the case, said hand being applicable to the dial from the front without removing the dial from the case, said hand comprising portions designed respectively to engage that part of the dial which borders the central opening and the outer edge portion of the dial, the latter part of the hand being constructed and arranged to exert frictional pressure against the inner surface of the instrument case.

3. A set hand for use in a dial instrument having a case which houses a graduated dial with which cooperates a pointer carried by a rotary staff, the dial being provided with a central opening through which the rotary staff extends, said opening being of a diameter greater than that of the pointer staff, the dial being of a diameter less than the inner diameter of the case, said hand consisting of a single piece of material and comprising an open hook portion designed to be inserted from the front through the central opening in the dial and to engage that portion of the dial which borders the central opening and a part designed to be inserted from the front between the outer edge of the dial and the case and which bears frictionally against the outer edge of the dial, said latter part including detent edges which oppose movement of the hand either clockwise or anti-clockwise relatively to the dial.

4. A set hand for use in a dial instrument having a case which houses a graduated dial with which cooperates a pointer carried by a rotary staff, the dial being provided with a central opening through which the rotary staff extends, said opening being of a diameter greater than that of the pointer staff, the dial being of a diameter less than the inner diameter of the case, said hand consisting of a single piece of material and being applicable to the dial of an instrument which is

otherwise complete and which has been calibrated and without necessitating removal of the dial or recalibration, the hand comprising an elongate pointer portion designed to be located in front of the dial, an open hook portion designed to hook over the material of the dial which forms the edge of its central opening, and a part which is substantially perpendicular to the plane of the dial and which overlaps the edge of the dial, said latter part being provided with a retainer element arranged to engage the rear surface of the dial and to prevent removal of said hand from the dial.

5. A set hand for use in a dial instrument having a case which houses a graduated dial with which cooperates a pointed carried by a rotary staff, the dial being provided with a central opening through which the rotary staff extends, said opening being of a diameter greater than that of the pointer staff, the dial being of a diameter less than the inner diameter of the case, said hand being applicable to the dial of an instrument which is otherwise complete and without removal of the dial, said hand comprising a pointer portion designed to lie in front of the dial, an open hook portion designed to engage the edge of the dial which defines the central opening, and a part which overlaps the outer edge of the dial, said latter part comprising a resilient retainer tongue arranged to snap down behind the dial when the said hand is assembled with the latter.

6. A set hand for use in a dial instrument having a case which houses a graduated dial with which cooperates a pointer carried by a rotary staff, the dial being provided with a central opening through which the rotary staff extends, said opening being of a diameter greater than that of the pointer staff, the dial being of a diameter less than the inner diameter of the case, said hand being applicable to the dial of an instrument which is otherwise complete and without necessitating dis-assembly of the instrument parts, the hand comprising a pointer portion, an open hook portion designed to engage the material of the dial which forms the edge of its central opening, and a part which overlaps the outer edge of the dial, said latter part comprising a forwardly directed resilient portion arranged to bear frictionally against the outer edge of the dial and a part designed to engage the rear surface of the dial inwardly from said edge.

7. A set hand for use in a dial instrument having a case which houses a graduated dial with which cooperates a pointer carried by a rotary staff, the dial being provided with a central opening through which the rotary staff extends, said opening being of a diameter greater than that of the pointer staff, the dial being of a diameter less than the inner diameter of the case, said hand being applicable from the front to the dial of an instrument which is otherwise complete and without necessitating any dis-assembly of the instrument parts, the hand comprising a pointer portion, a part designed to hook over the edge portion of the dial at the central opening, and a part which overlaps the outer edge of the dial, said latter part comprising transversely spaced resilient portions, each constructed and arranged frictionally to engage the inner surface of the instrument case when the said hand is assembled with the dial, and retainer means engageable with the rear surface of the dial to prevent removal of the said hand.

8. In combination with a dial instrument having a case which houses a graduated dial with which cooperates a pointer carried by a rotary staff, the dial being provided with a central opening through which the rotary staff extends, said opening being of a diameter greater than that of the pointer staff, the dial being of a diameter less than the internal diameter of the case, a set hand applicable to the dial without removing the latter from the case or disturbing the calibration of the instrument, said hand having a part at its inner end which bears against the material of the dial which defines the edge of the central opening, the hand also having a part at its outer end which bears against the rear surface of the dial bordering the outer edge of the latter, the hand also including a pointer portion which overlies the front face of the dial.

9. A set hand for use in a dial instrument having a case and a graduated dial housed within the case and provided with a central opening through which passes a rotary staff of smaller diameter than the opening and which carries a pointer cooperable with the graduated dial, the dial being of an external diameter less than the internal diameter of the case, the set hand being applicable from the front to the dial of an instrument which is otherwise complete and without necessitating any dis-assembly of the instrument parts or re-calibration, the hand consisting of a unitary piece of sheet material and comprising a pointer portion designed to lie in front of the dial, the hand having an element at its inner end which engages the material of the dial at the edge of the central opening, the hand also having a resilient part at its outer end which, when the set hand is assembled with the dial, is interposed between the outer edge of the dial and the inner surface of the case, said resilient part being so constructed and arranged as, when assembled with the dial, to bear frictionally against the outer edge of the latter.

10. A set hand for use in a dial instrument having a case and a graduated dial housed within the case and provided with a central opening through which passes a rotary staff of smaller diameter than the opening and which carries a pointer cooperable with the graduated dial, the dial being of an external diameter less than the internal diameter of the case, the set hand consisting of a unitary piece of sheet material and comprising a pointer portion designed to lie in front of the dial, a hook element at its inner end which engages the material of the dial forming the edge of the central opening, and a part at its outer end which overlaps the outer edge of the dial, said latter part having transversely spaced resilient elements engageable with the rear surface of the dial and forwardly directed resilient parts constructed and arranged to bear frictionally against the edge of the dial, each of said latter parts having an angular edge which tends to bite into the substance of the dial.

11. A set hand for use in a dial instrument having a case which houses a graduated dial provided with a central opening through which passes a rotary staff of smaller diameter than the opening and which carries a pointer cooperable with the graduated dial, the dial being of a diameter less than the inner diameter of the case, said hand being applicable to the dial of an instrument which is otherwise complete and which has been calibrated and without necessitating any dis-assembly of the instrument parts or re-calibration, the hand comprising an element which may be inserted from the front through the central opening of the dial, and a part which may be inserted from the front between the

outer edge of the dial and the case, the latter part comprising retaining elements engageable with the dial and operative to prevent removal of the hand from the dial.

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