(No Model.)

T. M. GORDON.

SIGNALING APPARATUS FOR PRESSURE GAGES.

No. 559,131. Patented Apr. 28, 1896.

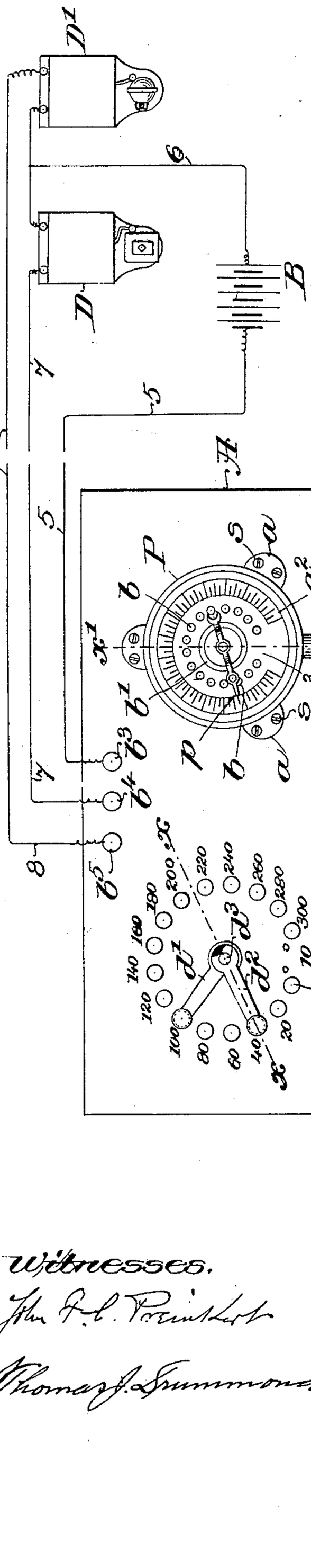

Fig. 1.

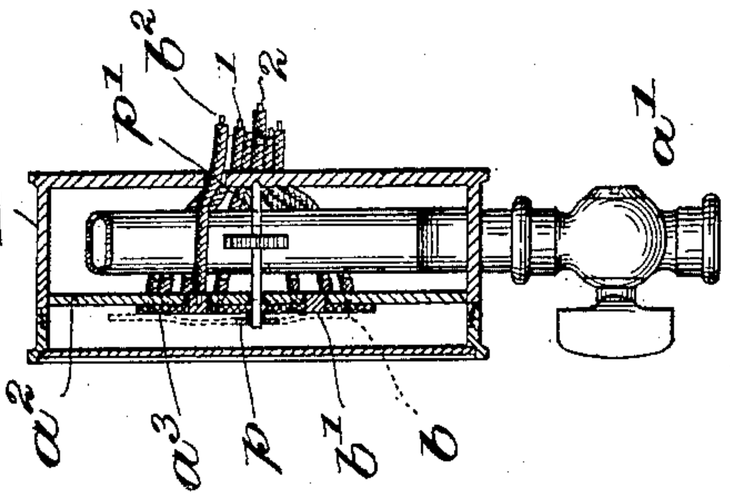

Fig. 4.

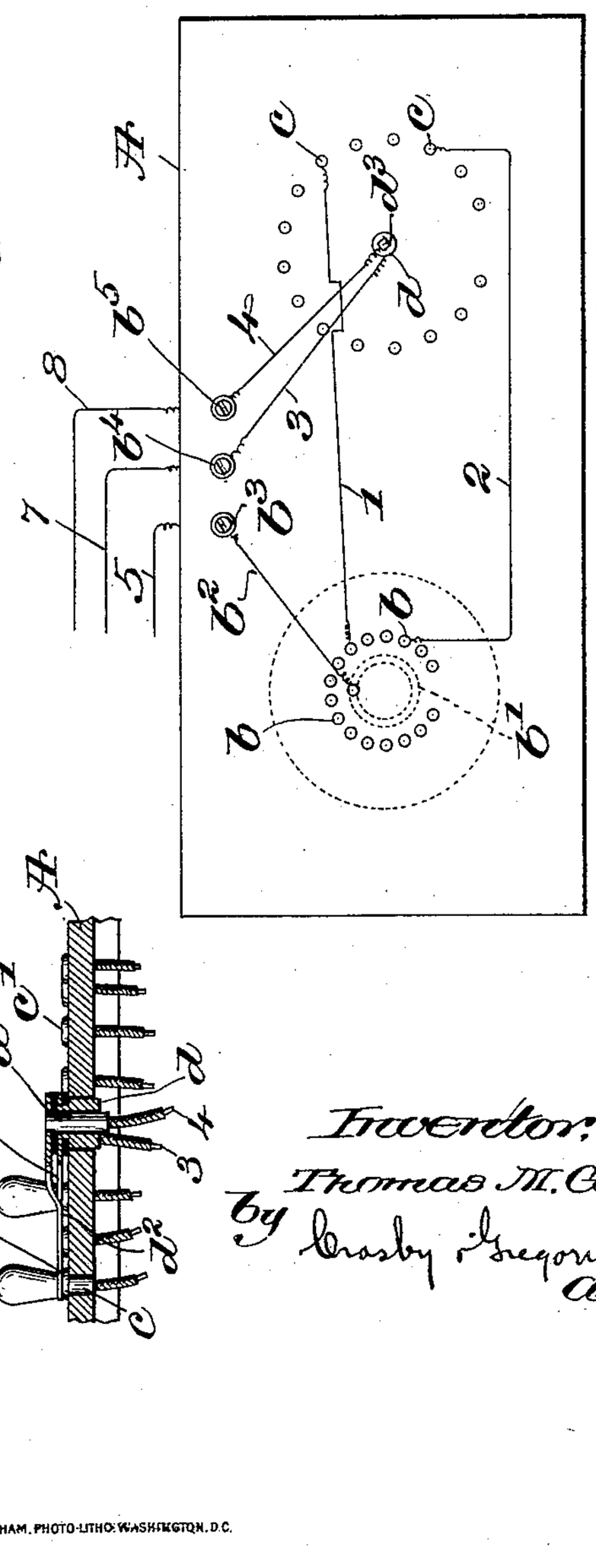

Fig. 2.

Fig. 3.

Witnesses.
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UNITED STATES PATENT OFFICE.

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SIGNALING APPARATUS FOR PRESSURE-GAGES.

SPECIFICATION forming part of Letters Patent No. 559,131, dated April 28, 1896.

Application filed July 10, 1895. Serial No. 555,486. (No model.)

To all whom it may concern:

Be it known that I, THOMAS M. GORDON, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Signaling Apparatus for Pressure-Gages, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

This invention has for its object the production of means for giving a signal when the pressure of a fluid reaches a certain predetermined point, the maximum or minimum, or both, whereby the attendant is instantly informed of any undue variation in the pressure and can at once take the necessary steps to correct it.

In plants employing steam or compressed air it is very desirable that any increase or decrease of pressure toward an improper point shall be instantly indicated without depending on the attendant to closely watch the gage; and my invention provides means for attaining that object in a simple and effective manner.

Figure 1, in front elevation and partly diagrammatically, shows a pressure-gage with my invention applied thereto. Fig. 2 is a rear view of the gage-support and circuit-controlling devices with two of the circuit connections shown in place. Fig. 3 is an enlarged sectional detail of the circuit-controlling devices, taken on the line x x, Fig. 1; and Fig. 4 is a sectional view, also enlarged, taken through the pressure-gage on the line x' x', Fig. 1.

The pressure-gage P, of the well-known Bourdon or other similar type, is preferably mounted on a suitable support A by means of screws s, extended through ears a of the gage-case, the gage being connected to the source of pressure by the usual tube a'. The dial a^2 of the gage (best shown in Fig. 4) has secured thereto a circular plate a^3 of insulating material, through which are extended a series of metallic plugs b, extended through the dial a^2 and insulated therefrom, the outer ends of the contact-plugs being preferably flush with the outer face of the insulating-plate a^3, and a concentric ring b' of metal is set into the plate and by a wire b^2 communicates with a binding-post b^3 on the support A, the wire passing through the gage-case and support.

A hand or pointer p is secured to and insulated from the spindle p' of the gage, said pointer being bent to contact at all times with the annulus b', and also to move over the plate a^3 and to contact with one or the other of the contact-plugs b as it sweeps thereover. Each of these plugs is connected to an insulated wire extended through the gage-case and support, only two wires, 1 and 2, being shown in Fig. 2 for the sake of clearness, the wires being led along the back of the support and up through it to a series of contact-plugs c, extended through the support and corresponding in number to the contacts b, the contacts being arranged in a circle and preferably having enlarged flattened heads c'. At the center of the circle a metal bushing d is let into and insulated from the support A and having rotatably mounted upon it a switch d', adapted to be moved into contact with any one of the plugs c except one of the extreme end ones, a second switch d^2, mounted on a spindle d^3, rotatable in the bushing d and insulated therefrom, as clearly shown in Fig. 3, being adapted to contact with any of the plugs c but the other end one.

The bushing d, and consequently the switch d', is connected by a wire 3 to a binding-post b^4, (see Fig. 2,) and the switch d^2 by a wire 4 to a binding-post b^5.

One pole of a suitable battery B is connected by a wire 5 to the post b^3, its other pole being connected by a branch wire 6 to the signaling devices, (herein shown as bells D and D',) the circuit of one of the bells, as D, being continued by a wire 7 to the post b^4 and that of the bell D' by wire 8 to post b^5.

The contacts c have indicated adjacent thereto by suitable numerals different degrees of pressure (shown in Fig. 1 as from zero to three hundred) corresponding to the number of pounds pressure indicated by the gage P, two of the contacts c—denoting, for instance, forty and one hundred pounds pressure—being connected by the wires 1 and 2, respectively, with the corresponding plugs or contacts b of the gage.

Supposing now that it is desired to cause an alarm to be given, should the pressure fall to forty or rise to one hundred pounds

the switches d^2 and d' will be moved to contact with the proper contact-plugs c at the left of the support A, as shown in Fig. 1, the pointer p of the gage being shown as between the forty and sixty pound graduations and contacts b. If the pressure falls to forty pounds, the signaling-circuit will be completed, as follows: from battery B, wires 5 and b^2 to the ring b', pointer p, corresponding contact b, wire 2 to contact c, switch d^2, wires 4 and 8 to bell D' and back to battery by wire 6, the bell ringing and giving the alarm, the bell D' thus giving the minimum-pressure signal. Should the pressure increase to one hundred pounds, the signaling-circuit would be closed for the bell D, as follows: from battery B, wires 5 and b^2 to ring b' and pointer p, contact b opposite the one-hundred-pounds-pressure point on the dial, wire 1 to corresponding contact c, switch d', wires 3 and 7 to bell D, and thence by wire 6 to battery again, sounding the maximum-pressure alarm.

Any two contacts c can thus be selected for the maximum and minimum pressure points by moving the switches d' and d^2 into contact therewith, and a sufficient variation of pressure will give the proper signal through its own signaling-circuit entirely independently of any attention on the part of the attendant or engineer.

While I have shown the switches as arranged adjacent to the gage, it will be obvious that they may, with their coöperating contacts c, be located any distance therefrom, and the signaling-circuits may be carried to any desired points. The high and low points could be determined by the properly-authorized person and the whole apparatus put under lock and key.

A couple of stop-pins 10 limit the movements of the switches d' and d^2 to prevent their interference with each other.

By leaving one of the switches between two adjacent contacts c the signaling-circuit coöperating therewith will be inoperative so long as such position of the switch is maintained, and it will be obvious that the "controlling-contacts," as the series c may be called, can be increased or diminished in number, as desired.

Instead of providing the signaling-circuits with bells any other suitable alarm or signal device, either visual or audible, may be employed.

My invention is well adapted for use in making tests of boilers, vacuum apparatus of various kinds, and any form of apparatus to be tested by fluid-pressure without any danger to the person making the test, as the controlling-contacts, with the coöperating switches, may be located a sufficient distance from the apparatus to be tested to obviate any liability to accident in case the apparatus should give way during the test.

A further practical use of my invention is to enable the chief engineer, for instance, of a steamship to ascertain the boiler-pressure at any time when off duty, the controller being located for this purpose at some convenient place remote from the gages—as, for instance, in his state-room—when by turning of one of the pressure-handles d' d^2 a signal will be sounded as the contact is reached that corresponds to the boiler-pressure of the gage.

I claim—

1. A pressure-gage, its pointer, a series of contacts with which it is adapted to coöperate at different pressures, a second series of controlling-contacts connected electrically with the gage-contacts, a plurality of normally inoperative signaling-circuits, a high-pressure signal and a low-pressure signal in said circuits, and means to include one of the controlling-contacts in each circuit, said means comprising two contact-levers, one for the high-pressure signal-circuit, and the other for the low-pressure signal-circuit, and arranged to reciprocate over said controlling-contacts independently of each other, but so as not to pass each other, the gage-pointer being in continuous electrical communication with said circuits, whereby variation of pressure will operate one or the other of the signaling-circuits, substantially as described.

2. A pressure-gage, its pointer, a series of contacts with which it is adapted to coöperate successively, a second corresponding series of controlling-contacts separate from said gage, electrical connections between said two series comprising a plurality of normally inoperative signaling-circuits, two signals, one for high pressure and one for low pressure, a contact-lever adapted to include the high-pressure signal and one of said controlling-contacts in a corresponding signal-circuit, a second contact-lever adapted to include the low-pressure signal and one of said controlling-contacts in a corresponding signal-circuit, stops to limit the movement of said levers away from each other and the levers being so arranged as to prevent their movement past each other, all combined substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS M. GORDON.

Witnesses:
JOHN C. EDWARDS,
AUGUSTA E. DEAN.