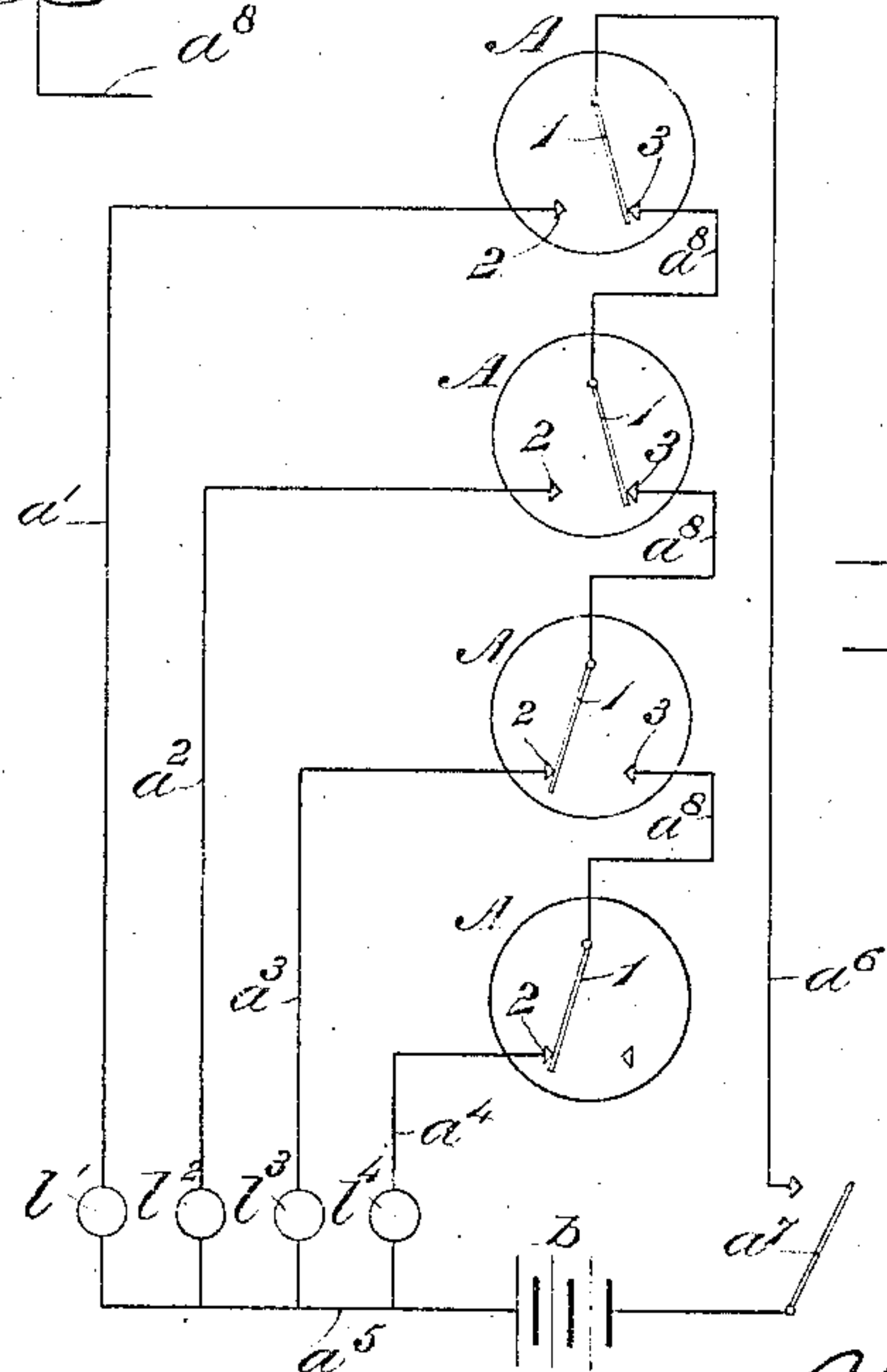
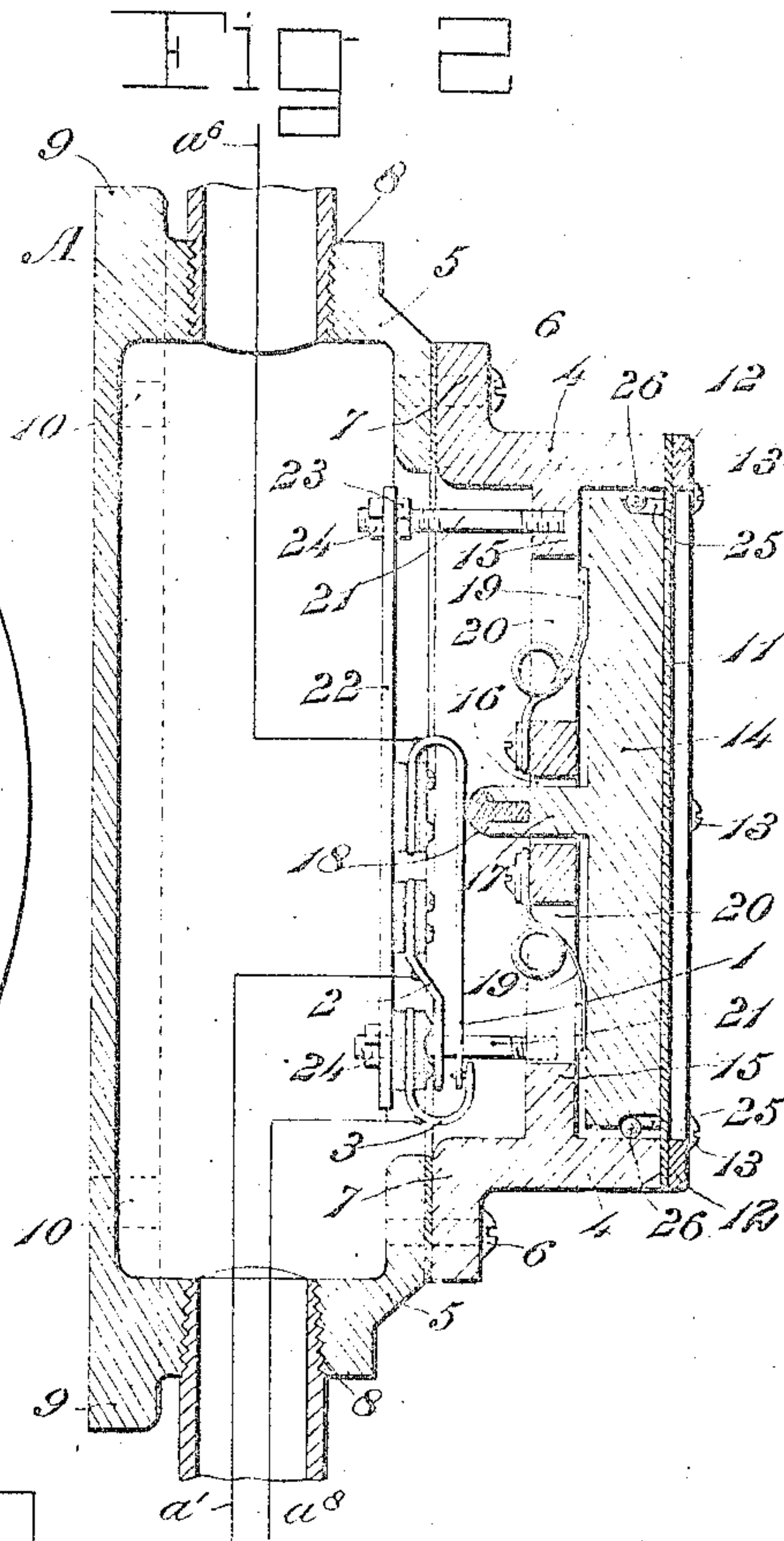
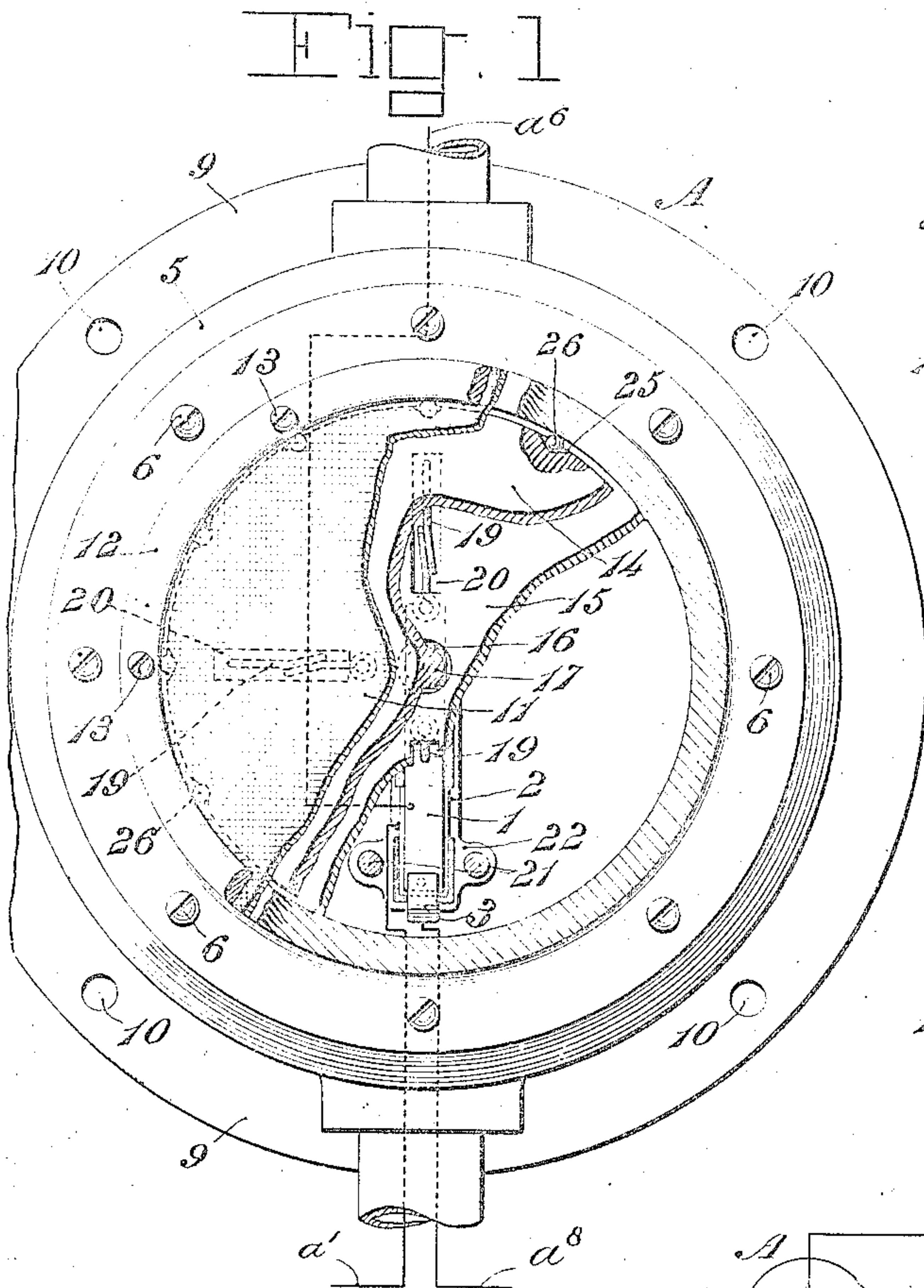


F. J. FRASIER.  
PRESSURE OPERATED CIRCUIT CONTROLLER.  
APPLICATION FILED APR. 19, 1910.

993,977.

Patented May 30, 1911.



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# UNITED STATES PATENT OFFICE.

FRED J. FRASIER, OF MINNEAPOLIS, MINNESOTA.

PRESSURE-OPERATED CIRCUIT-CONTROLLER.

993,977.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed April 19, 1910. Serial No. 556,317.

*To all whom it may concern:*

Be it known that I, FRED J. FRASIER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented new and useful Improvements in Pressure-Operated Circuit-Controllers, of which the following is a specification.

This invention relates to a circuit closer adapted for use in indicating systems in connection with grain or other bins, whereby the exact or approximate contents can be determined.

The invention has for one of its objects to provide a novel circuit controlling device responsive to the pressure of the material in the bin to electrically connect with a signal device when the material is at the same height or greater height than the circuit closer, and to be electrically disconnected when the material is below the circuit closer.

With these objects in view, and others as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention; Figure 1 is a front view of the circuit controlling device, partly broken away. Fig. 2 is a central vertical section thereof. Fig. 3 is a diagrammatic view showing several circuit controlling devices connected in circuit with the indicating system.

Similar reference characters are employed to designate corresponding parts throughout the several views.

In actual practice, a plurality of circuit closer or controlling devices A will be arranged in the bin, with which the indicating system is to be used, the devices being arranged one above another so that only that device will be operative that is nearest the level of the material in the bin. In the diagram shown in Fig. 3, four devices A are illustrated, and these are connected by wires  $a^1$ ,  $a^2$ ,  $a^3$ , and  $a^4$  with an annunciator consisting of lamps  $1^1$ ,  $1^2$ ,  $1^3$ ,  $1^4$ , or equivalent means, the said lamps being in turn connected by a wire  $a^5$  with one side of a battery  $b$ , the opposite side of the battery being connected by a wire  $a^6$ , with the uppermost device A, and in this wire  $a^6$  is a push button, or equivalent device  $a^7$  which, like the an-

nunciator, will be located in the office so that upon pushing the buttons  $a^7$ , the contents in the bin can be readily ascertained by that lamp which is lighted. Each device A includes a spring contact 1, which is movable between fixed contacts 2 and 3. The contacts 2 are connected with the wires leading to the annunciator, and the contact 3 of each device is connected by a wire  $a^5$  with the spring contact 1 of the next lower device. As long as material in the bin is pressing on the devices A, the spring contacts will engage the fixed contacts 2 so that when the push button  $a^7$  is pressed, the current will flow through the wire  $a^6$ , the top device A, wire  $a^1$ , lamp  $1^1$ , and wire  $a^5$ , the annunciator thus indicating that the bin is filled. As the material lowers, the device A will successively cut out the lamps of the annunciator, and as shown in the diagram, the first two lamps are cut out of circuit as the level of the material in the bin is disposed between the second and third devices A. As the material settles below a device A, the spring contact 1 automatically engages the contact 3 so that the wire  $a^5$  will be included in circuit. As shown in the diagram, the current flows through the wires  $a^5$  between the first and second and second and third devices A and thus these wires form shunts around the lamps  $1^1$  and  $1^2$ . In other words, when the push button  $a^7$  is closed, the current flows through the wire  $a^6$ , contacts 1 and 3 of the top device A, wire  $a^5$  connected therewith, contacts 1 and 3 of the second device, wire  $a^5$  connected therewith, contacts 1 and 2 of the third device A, wire  $a^3$ , lamp  $1^3$  and wire  $a^5$ . When the material settles to a point below the third device A, the lamp  $1^4$  will be lighted when the push button  $a^7$  is pressed, the lamp  $1^3$  having been automatically disconnected by the spring contact 1 of the third device A moving out of engagement with fixed contact 2 and engaging the contact 3. Of course, any number of devices may be employed according to the accuracy of the indications desired.

Having described the use of the devices A, the details of construction of one of the devices will now be explained by reference to Figs. 1 and 2. Referring to the drawing, 4 designates an annular casing that constitutes a housing for the part of the circuit controlling device and this casing is secured to a base 5, by means of screws 6, passing



through an annular base flange 7 on the casing and screwing into the base 5. The base 5 may be of any approved construction and serves as a box into which the wires enter for connection with the contacts 1, 2 and 3, the base being hollow or chambered and having threaded openings 8 for receiving conduit pipes for the conductors. The base has an annular flange 9 which is provided with apertures 10 for receiving screws or equivalent means, for fastening the device to the bin. The casing 4 is open at the side opposite from the base 5 and extending across the said open side is a diaphragm 11 of rubber, canvas, metal, or other suitable material which is secured in place by a clamping ring 12, bearing against the outer face of the diaphragm at the periphery thereof and fastened by screws 13, which are threaded in the ring or casing 4. This diaphragm forms a tight joint so that dust or water cannot enter the device and as the material in the bin to which the device is applied presses laterally on this diaphragm it yields and moves the spring contact 1.

Within the casing 4 is a disk-shaped follower 14 that forms a backing for the diaphragm and behind the follower is a shoulder formed by a partition 15 on the casing and by this means the inward movement of the follower is limited. This partition has a central opening 16 through which extends a central stem 17 on the follower, the stem carrying the tip 18 of insulation which engages the spring contact 1. The follower is held outwardly, when the diaphragm is not subjected to pressure, by springs 19 that are fastened to the partition 15 and bear against the inner face of the follower, the said springs passing through openings 20 in the partition. On the partition are threaded rods 21 that carry a support 22 on which the contacts 1, 2, and 3 are secured and insulated therefrom. The support is in the form of a plate having openings through which the rods 21 extend and by means of nuts 23 and 24 on the rods, the support can be adjusted laterally to change the set of the spring 1 with respect to the insulation tipped follower. The follower 14 has notches or pockets 25 spaced around its periphery and within these pockets are arranged balls 26, which serve to hold the follower centrally and at the same time materially reduce the friction between the follower and casing. When the follower is pressed inwardly, the spring 1 is

held against the contact 2 and as soon as the pressure is removed from the follower, the spring automatically moves into engagement with the contact 3. It will thus be seen that an effective circuit controlling device is provided in which the parts are completely housed and protected from dirt, moisture, or injury.

From the foregoing description taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention relates, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative and that such changes may be made when desired as are within the scope of the claims.

What I claim as new and desire to secure by Letters Patent is:—

1. A device of the class described, comprising a chambered base, an annular casing secured to the base and communicating with the chamber thereof, a diaphragm secured to the casing, a follower located behind the diaphragm, means for pressing the follower against the diaphragm, a spring contact against the tension of which the follower acts, fixed contacts with which the spring contact alternately engages, and conductors leading into the said chambered base and connected with the contacts.

2. A device of the class described, comprising a casing having a partition, a diaphragm secured to the casing, a follower behind the diaphragm and provided with a stem passing through the partition, springs secured to the partition and extending through the same and engaging the follower for holding the same against the diaphragm, a spring contact with which the stem engages, a fixed contact with which the spring contact is adapted to engage, a support for the contacts, and members secured to the partition and on which the said support is adjustable to vary the position of the spring contact with respect to the said stem.

In testimony whereof I affix my signature in presence of two witnesses.

FRED J. FRASIER.

Witnesses:

ADA BURCH,

W. E. HARRINGTON.