

No. 860,132.

PATENTED JULY 16, 1907.

H. J. HEENEY.

SIGNAL DROP.

APPLICATION FILED SEPT. 17, 1906.

Fig. 1.

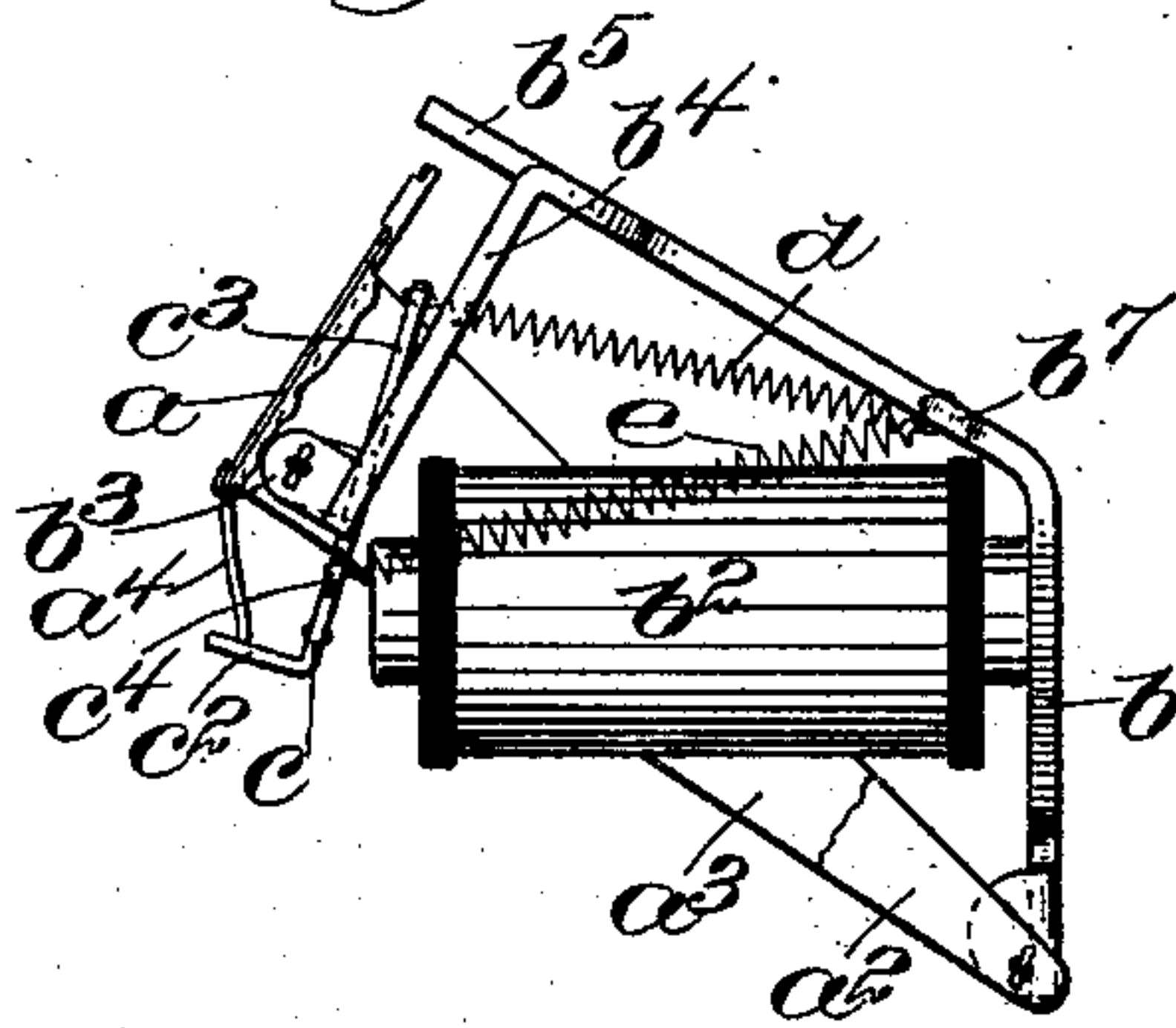


Fig. 2.

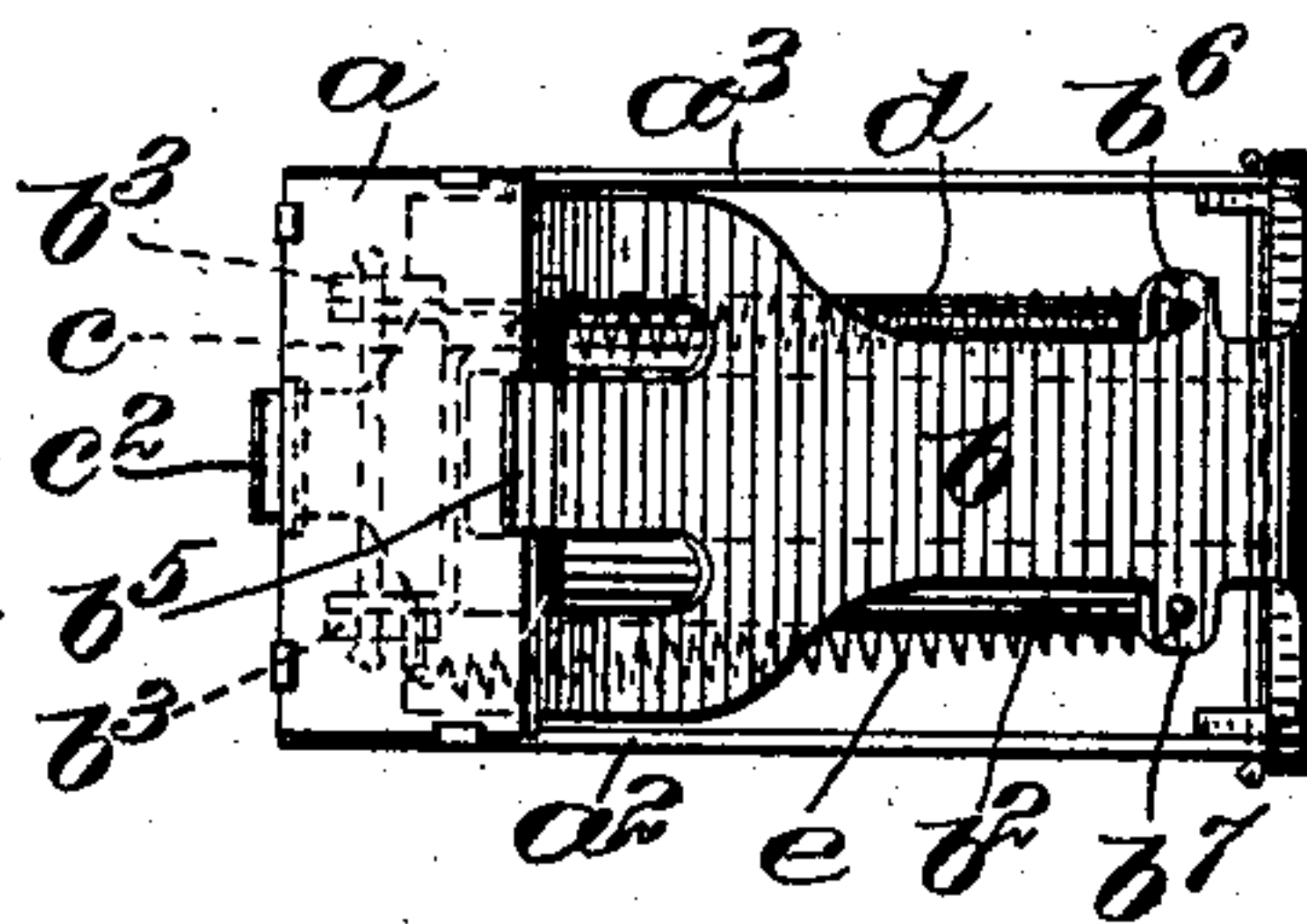
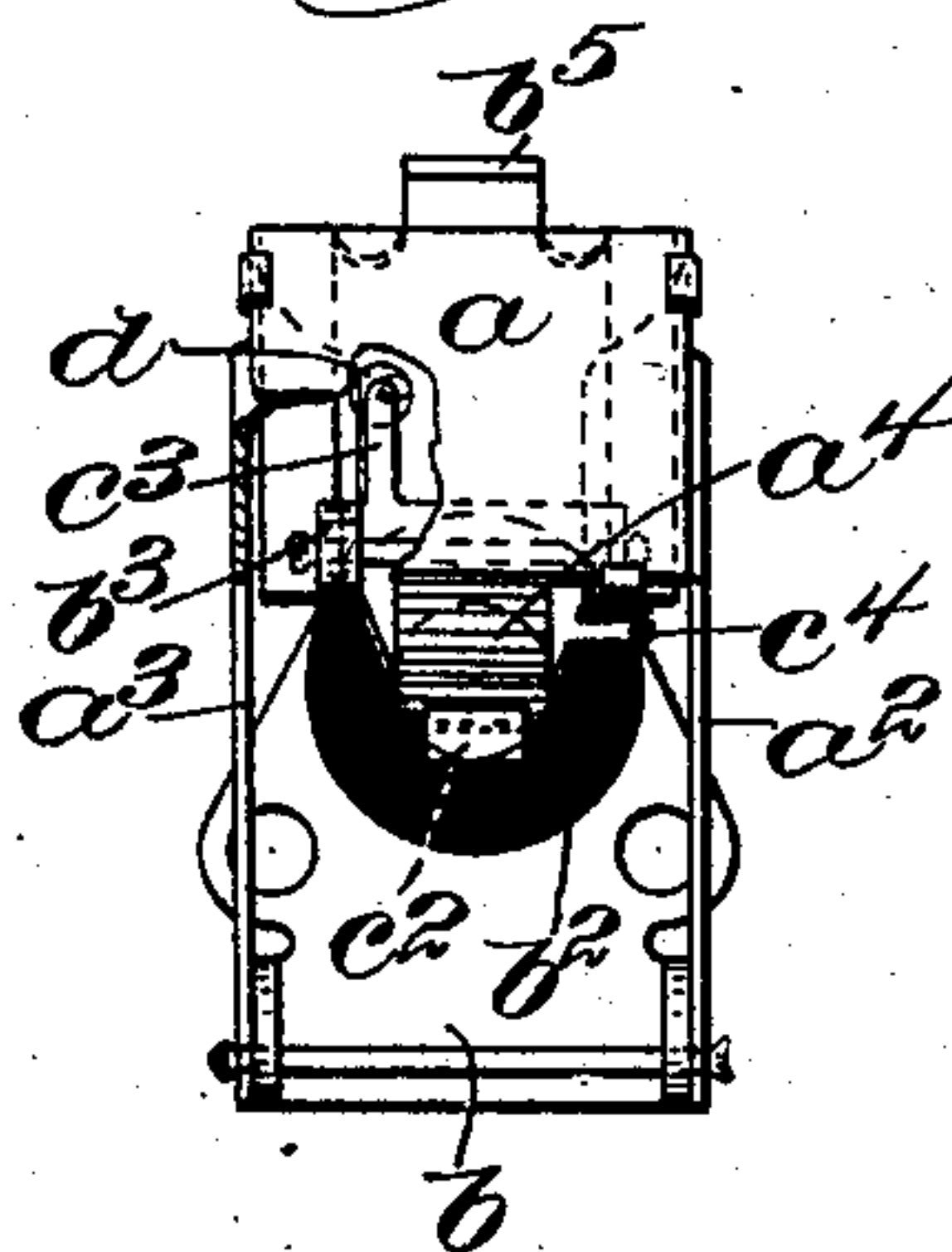


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY J. HEENEY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HOLTZER CABOT ELECTRIC COMPANY, A CORPORATION OF MASSACHUSETTS.

SIGNAL-DROP.

No. 860,132.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed September 17, 1906. Serial No. 334,858.

To all whom it may concern:

Be it known that I, HENRY J. HEENEY, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented an
5 Improvement in Signal-Drops, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a signal drop of the
10 kind commonly used in connection with telephone switch boards and similar signaling apparatus, the purpose of the invention being to arrange a drop which cannot be accidentally operated by shocks or vibrations.

15 The device embodying the invention is especially adapted for use on board ship, or in other places where the drops are continually subjected to vibration.

The drop embodying the invention is held in place
20 by means of a retaining armature under the influence of an electro-magnet, the said armature being held in position to retain the drop by means of a spring in the ordinary way. It is necessary, however, that the movement of the armature under the stress of the spring should be limited, and, if a rigid stop is utilized for
25 this purpose, any jar or vibration tends to throw the armature away from the stop, such movement frequently being sufficient to cause the drop to fall when no signal has been sent. In order to obviate this tendency, the retaining device, in accordance with the in-
30 vention, is acted upon by a second spring, the stress of which is not sufficient to overcome the stress of the main spring unless assisted by the magnetism when the electro magnet is energized. The two springs acting together hold the retaining device in its operative
35 position, one acting to remove the retaining device to the position in which it sustains the drop, and the other acting as a cushioned limiting device. Any jar or vibration, therefore, which tends to move the retaining device from its position is taken up by the
40 springs and will not tend to dislodge the drop as would be the case if the retaining device were positively held by the spring in contact with the drop, or with a fixed limiting stop.

Figure 1 is a side elevation of a drop embodying the
45 invention, with part broken away; Fig. 2 is a top plan view of the drop; and Fig. 3 is a front elevation with a portion of the drop itself broken out to show the retaining device behind.

The drop a is connected with arms a^2 and a^3 at oppo-
50 site sides, the said arms extending to the rear, and being pivoted at the opposite sides of a magnet frame or support b , to which is connected the electro-magnet b^2 . The drop is supported in the normal position

shown in the drawings by means of a retaining member c , which is herein shown as a pivotally supported catch 55 mounted in lugs b^3 formed in downward extensions b^4 from the magnet frame b . The upper portion of said magnet frame is shown as extended in the form of a tongue b^5 to provide a limiting stop in the upward or restoring movement of the drop.

The member c is in the magnetic field of the electro-magnet b^2 , the lower portion of said member constituting an armature, so that when the electro magnet is energized, the retaining portion c^2 of the member c is withdrawn from an extension a^4 on the drop, which 65 rests thereon. The member c is held in the position shown by means of main and supplemental springs d and e , the spring d being capable of overcoming the stress of the spring e to a sufficient extent, to hold the retaining device in operative position, the spring e , 70 however, serving to limit the movement of the retaining device away from the pole piece of the electro magnet. In the construction shown, the point of connection between the spring e and the retaining device is nearer the pivotal support than that between the spring 75 d and the retaining device, so that the leverage is in favor of the spring d .

The springs d and e , which, as explained, are opposed to each other in their action on the retaining device, are herein shown as connected at one end to lugs c^3 and 80 c^4 , respectively, on the retaining device c at opposite sides of the pivotal support therefor. The said springs extend along opposite sides of the electro-magnet b^2 , and are connected at the other end, respectively to lugs b^6 and b^7 on the frame b . 85

Claims.

1. The combination with a drop; of a pivoted retaining member therefor; an electro-magnet to operate said retaining member; a spring connected with said retaining member at one side of the pivotal support therefor to hold 90 said member in position to sustain the drop when the magnet is de-energized; and a second spring connected with said retaining member constituting a cushioned limiting device for the retaining member when in position to hold the drop. 95

2. The combination with a frame; of an electro-magnet mounted thereon; a drop; a retaining device for said drop pivotally connected with said frame; said retaining device at one side of its pivotal support being in the field of said magnet; a spring connected with the frame and with said retaining device at one side of the pivotal support therefor to hold said retaining device in position to sustain the drop when the magnet is de-energized; and a second spring connected with the frame and with said retaining device at the opposite side of the pivotal support therefor to 100 substantially balance the other spring when the retaining device is in position to sustain the drop. 105

3. The combination with a frame; of an electro-magnet supported thereby; a drop pivotally connected with said frame at a point below the electro magnet, and projecting 110

forward of said magnet; a forward projection from said frame above said magnet; a retaining device for said drop pivotally connected with said frame above the polar extremity of said magnet, said retaining device constituting
5 an armature; a spring connected with the frame and with said retaining device at a point above the pivotal support therefor to hold said retaining device in position to sustain the drop; and a second spring connected with the retaining device below the pivotal support to balance the other spring and constitute a cushioned limiting device 10 when the retaining device is in position to sustain the drop.

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

HENRY J. HEENEY.

Witnesses:

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H. J. LIVERMORE.