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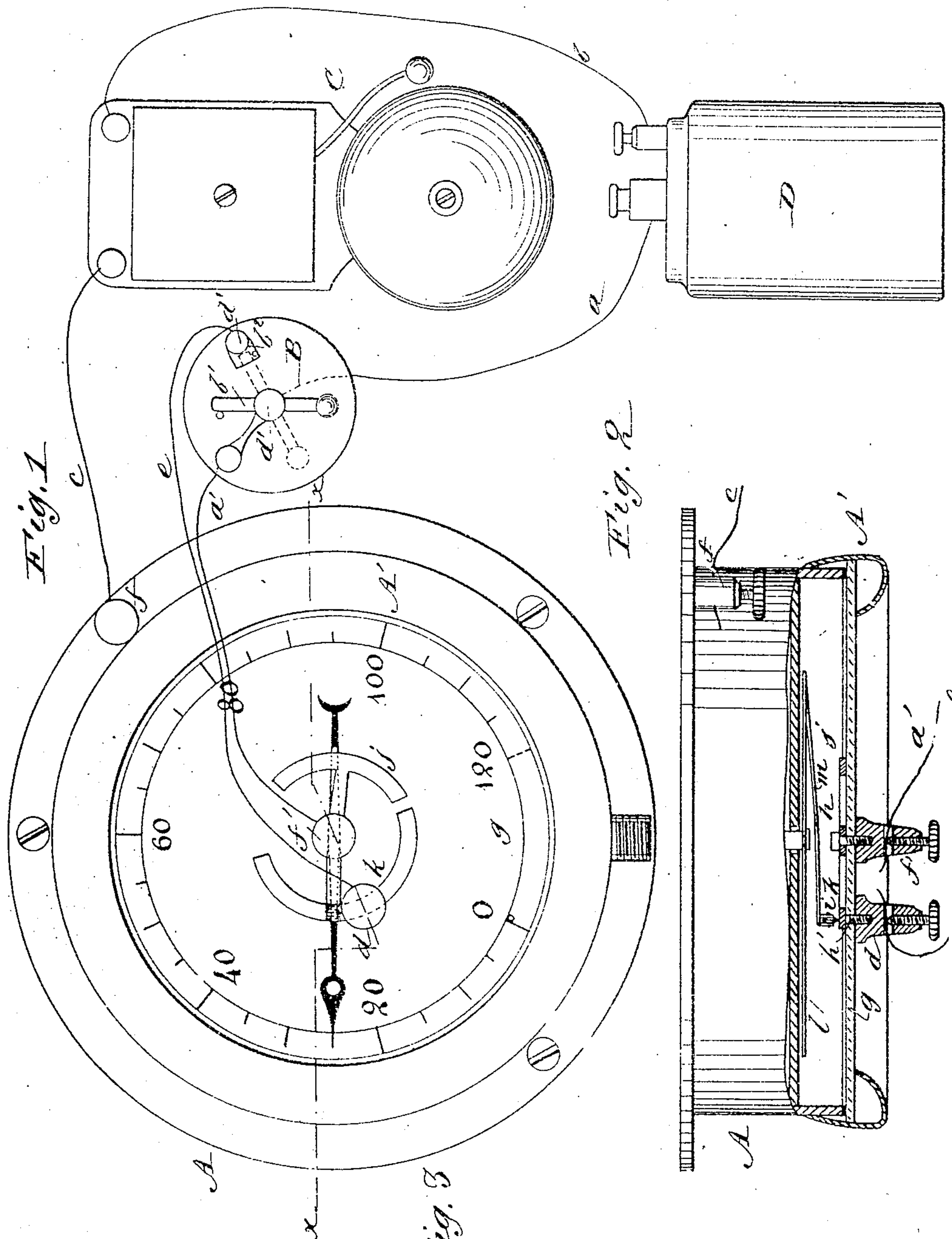
(No Model.)

H. CARLEY & T. McKENNA.

ELECTRIC ALARM FOR STEAM GAGES.

No. 294,195.

Patented Feb. 26, 1884.



WITNESSES:

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## UNITED STATES PATENT OFFICE.

HARVEY CARLEY AND THOMAS MCKENNA, OF LONG BRANCH, NEW JERSEY;  
SAID CARLEY ASSIGNOR TO SAID MCKENNA.

## ELECTRIC ALARM FOR STEAM-GAGES.

SPECIFICATION forming part of Letters Patent No. 294,195, dated February 26, 1884.

Application filed May 11, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, HARVEY CARLEY and THOMAS MCKENNA, of Long Branch, in the county of Monmouth and State of New Jersey, have invented a new and Improved Electric Alarm for Steam-Gages, of which the following is a full, clear, and exact description.

Our invention relates to the combination, with a steam-gage, of an electric alarm, whereby any increase or decrease of steam-pressure in the boiler beyond certain fixed limits may be signaled at a distant place or office.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of a pressure steam-gage having our invention applied thereto. Fig. 2 is a sectional plan view of the gage and alarm attachment taken on the line *x x*, Fig. 1; and Fig. 3 is a plan view of the pointer, showing the circuit-closing spring.

A represents a steam-gage, which may be of the ordinary or of any approved construction. B represents an electric switch; C, an ordinary electric-alarm bell; and D represents an ordinary galvanic battery, all of which are put in electric connection with each other and with the gage A by the wires *a*, *b*, *c*, *a'*, and *e*, the wire *c* leading to the binding-post *f*, attached to the metallic casing of the gage at any desired point, the wire *a'*, which is but a continuation of the wire *a*, leading through the switch B to the binding-post *f'*, attached to the glass face *g* of the gage A, and the wire *e* leading from the binding-post *d*, also attached to the glass-face *g*, to the binding-post *d'* of the switch B. The binding-post *f'* is held in place upon the glass face *g* by the screw *h*, that passes through an orifice in the glass, and this screw *h* also holds in place against the inside of the glass face *g* the circuit-plate *j*. The binding-post *d* is held in place by the screw *h'*, passing through or formed upon the circuit-plate *k*, which screw serves the double purpose of attaching both the binding-post and the circuit-plate to the glass face *g*. These circuit-plates *j* and *k* are respectively the high and low pressure circuit-plates of the gage, and have, by preference, a

curved form, and are both struck from the same center; but the curved portion of the plate *j* is less than a half-circle, so that a space may be left between its ends and the ends of the plate *k*, as shown clearly in Fig. 1, in which the pointer *l* of the gage may fluctuate without closing the circuit and causing the alarm. Upon the pointer *l* is secured the flat spring *m*, the free end of which travels when the pointer turns in the same circle formed by the circular plates *j k*, and immediately back of them, so that when in line with either of the said plates it will close the electric circuit and cause the bell C to ring.

To prevent unnecessary friction of the spring *m* in passing from the neutral or no-alarm limit between the ends of the plates *j k* upon the plates closing the circuit, the free end of the spring is provided with the small anti-friction roller *i*, as shown clearly in Fig. 2.

In use the switch B and bell C will be located at the place or in the office where it is desired to have the signal given. The plates *j k* will be adjusted, the former by being turned on the screw *h* as a center, the latter by loosening the cover A' and turning it axially on the case of the gage, so that the upper adjacent ends of the plates will coincide with the graduation-marks on the dial of the gage, indicating the minimum and maximum pressure of steam desired to have maintained in the boiler when running. Steam now being raised in the boiler to the minimum pressure, the pointer *l* may fluctuate between the upper ends of the plates *j k* without closing the circuit; but if the pressure of steam goes above the maximum or below the minimum limit, the circuit will be closed by the contact of the spring *m* with one or other of the circuit-plates, provided the switch-arm *b'* of the switch B is turned upon the button *b''* of the switch, thus giving the alarm, and the alarm will be given as soon as the pointer passes the neutral limit in either direction, and will continue as long as the pointer remains outside the neutral limit. But if the arm *b'* is moved to the position shown in full lines in the drawings off from the button *b''*, the alarm will not be given by the contact of the spring *m* with the plate *k* until the circuit



is closed by the arm *b'*, which may be done at any time by the superior officer or any person in charge at the office. The circuit will always be closed by the contact of the spring *m* with the plate *j*, so that this plate stands as a constant danger-signal to give the alarm if the steam goes above the maximum limit of pressure.

To increase or diminish the neutral limit within which the pointer *l* may fluctuate when steam is up without closing the circuit, it is only necessary to loosen the binding-post *f'* on screw *h* and turn the plate *j* accordingly; and to change the position of the attachment upon the dial for a limit of higher or lower pressure, the cover *A'* will, as above mentioned, be loosened, and the glass *g* turned to the right or left on the edge of the case *A* of the gage, to properly situate the plates *k* and *j*, to coincide with any desired graduation-marks upon the dial.

In most instances the gage will be inclosed in an outer case having a glass door, which may be locked, so as to prevent access to the gage, except by the proper person having the key.

It will be understood that the binding-post *f'*, being attached to the glass face *g*, is thus properly insulated; and it will also be under-

stood that where a metallic circuit is used, as shown in the drawings, the gage *A* will be suitably insulated from the steam-boiler, and also that, instead of using a metallic circuit, a ground-connection might be employed where the distance from the boiler to the alarm is considerable.

Constructed in this manner, the appliance is very cheap, and it is practical and reliable as a danger-alarm, and for signaling neglect of duty on the part of the fireman or person in immediate charge of the boiler; and it may be easily applied to any steam or other gage employing a pointer.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

The combination, with the steam-gage *A*, having the metallic binding-posts *d f f'*, the electric switch *B*, having binding-post *d'*, the electric-alarm bell *C*, and the galvanic battery *D*, of the circuit-plates *j k*, struck from the same center, the screws *h h'*, the pointer *l*, and the flat spring *m*, as shown and described.

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Witnesses:

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