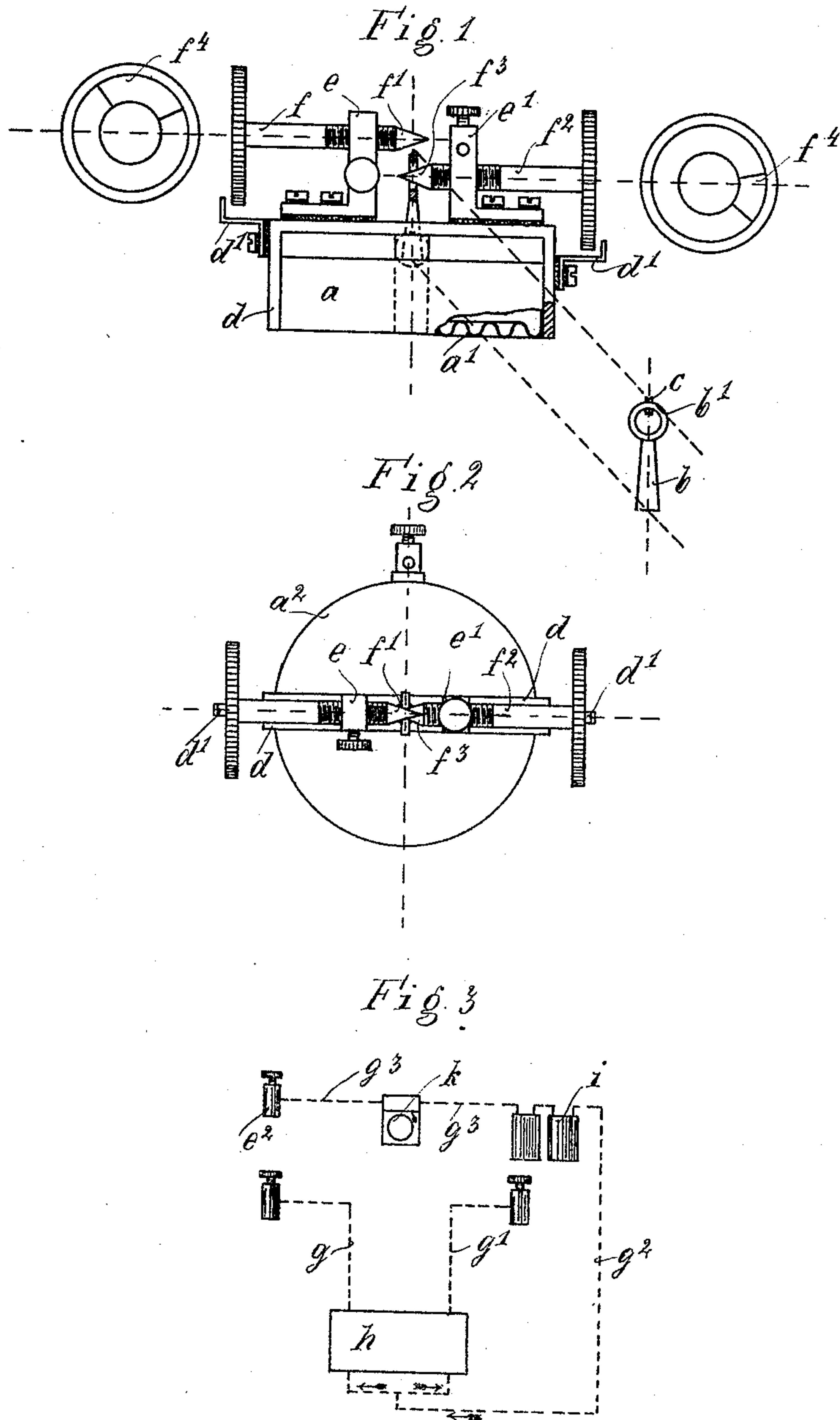


(No Model.)

E. KLOSS.  
ELECTRICAL TEMPERATURE ANNUNCIATOR.  
No. 519,634. Patented May 8, 1894.



Witnesses:  
Arthur Walther  
Emil Kayser.

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# UNITED STATES PATENT OFFICE.

ERNST KLOSS, OF STETTIN, GERMANY.

## ELECTRICAL TEMPERATURE-ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 519,634, dated May 8, 1894.

Application filed December 22, 1893. Serial No. 494,478. (No model.)

*To all whom it may concern:*

Be it known that I, ERNST KLOSS, a subject of the King of Prussia, German Emperor, and a resident of Stettin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Electrical Temperature-Annunciators, of which the following is an exact specification.

My invention refers to electrical temperature-annunciators, in which air or another gas inclosed within a metallic casing is expanded by the influence of the temperature of the outer air on said casing, and in which a diaphragm forming one side or bottom of the casing, is lifted by said expansion, so that by this movement an electric contact or circuit respectively may be closed; and my improvements in such electrical temperature-annunciators relate to the combination of said closed gas-container, and of a contact-piece fixed to the center of the diaphragm of the same, with two contact-screws, the ends of which are of conical shape, and which may be moved against or from the said contact-piece in planes parallel to that of the diaphragm, so that, on account of the conicalness of the ends of the two screws, the distance between them and the fixed contact-piece may be altered or may be adjusted to announce a maximum-temperature as well as a minimum one.

In order to make my invention more clear, I refer to the accompanying drawings, in which similar letters denote similar parts throughout the different views, and in which—

Figure 1 shows a side-view of the improved annunciator, the casing being partly opened. Fig. 2 shows the upper-view of the same, and Fig. 3 shows how the binding-screws of the annunciator are connected with an alarm-bell, a battery and an indicator.

The mode of construction shown in the above-named figure is as follows:

The casing containing the air or gas is formed by the ring  $a$ , the corrugated or undulated bottom  $a'$ , and by the diaphragm  $a^2$ . The latter has fixed to its center-part the column  $b$ , which at its end carries the ring  $b'$  with the piece  $c$  of platina-wire. A double-angular strip  $d$  fixed to ring  $a$  carries two isolated angular supports  $e$   $e'$  for the two contact-screws  $f$   $f^2$ , the vertical parts of said

supports forming at the same time binding-clamps for the connection with the wires  $g$   $g'$ , Fig. 3, which latter conduct the current to the indicator  $h$ . The shanks of said screws  $f$   $f^2$  extend in opposite directions, and they are arranged in different horizontal planes, but in one vertical plane, so that their conical ends  $f'$   $f^3$  are one over the other. The position of the fixed contact-piece  $b$  with its ring  $b'$  and the platina-wire  $c$  is such, that the latter is directly between the conical ends of the screws  $f$   $f^2$ , and the distance between the platina and each of the conical heads  $f'$   $f^3$  may be altered by a corresponding movement, of one or the other screw or of both of them, so that the contact occurs sooner or later just as predetermined.

The maximum or minimum-temperature, at which the one or the other circuit shall be closed, may be predetermined by scales  $f^4$  on the surfaces of the screw-heads, and by hands  $d'$  fixed to strip  $d$ , but isolated from the same. Suppose now, the apparatus shall announce a maximum-temperature of  $50^\circ$  and a minimum-temperature of  $20^\circ$ , the heads of the screws  $f$   $f^2$  will be turned then so that the hand belonging to the screw  $f$  is over the number 50, and the other hand over the number 20 of the respective scales. As long as the temperature does not reach either of those limits, the platina-contact  $c$  will not touch either of the conical points  $f'$  or  $f^3$ . If, however, the temperature has risen to the maximum or fallen to the minimum respectively, the column  $b$   $b'$   $c$  will come in contact either with point  $f'$  of screw  $f$ , or with point  $f^3$  of screw  $f^2$ . The electric current is generated by a battery  $i$ , Fig. 3, one pole of which is connected by wire  $g^2$  with the electric indicator  $h$ , the other pole being connected by wire  $g^3$  with a binding-clamp  $e^2$  attached to the casing. An electric bell  $k$  is inserted into wire  $g^3$  for the purpose of calling attention to the indicator  $h$  if one or the other of the apparatus of the same has been operated by a closure of one or the other circuit.

Having thus described the nature of this invention, what I desire to secure by Letters Patent of the United States is—

1. In an electric temperature-annunciator with a casing closed by a diaphragm, and containing gas, the combination with a pro-



jection fixed to said diaphragm, and adapted to close an electric circuit, of an adjustable screw arranged parallel or nearly parallel to the diaphragm, said screw forming a cone at its end, adapted to limit the movements of said projection, for the purpose as described.

2. In an electric temperature-annunciator with a casing closed by a diaphragm, and containing gas, the combination with a projection fixed to the diaphragm in a normal position, and adapted to close an electric circuit when being moved in one direction and another electric circuit when being moved in the other direction of two adjustable screws forming cones at their ends, and being arranged parallel or nearly parallel to the diaphragm, one cone being adapted to limit the movements of said projection in one direction, the other cone being adapted to limit said movements in the other direction, for the purpose as described.

3. In an electric temperature-annunciator

with a casing *a* closed by a diaphragm, and containing gas, the combination with a projection *b* fixed to the center of the diaphragm *a*<sup>2</sup>, and having a head-ring *b'*, of two adjustable contact-screws *f f*<sup>2</sup> forming cones *f' f*<sup>3</sup> at their ends, and being arranged parallel to the diaphragm in different planes, cone *f*<sup>3</sup> catching into ring *b'*, and being adapted to limit the downward movement of the same, cone *f'* extending over ring *b'*, and being adapted to limit the upward movement of the same, the screws *f f*<sup>2</sup> being held by binding clamps *e e'* secured to, and insulated from, a strap *d* fixed to the casing, substantially as described.

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

ERNST KLOSS.

Witnesses:

E. MAY,

F. W. KICKBUSCH, Jr.