No. 794,012. PATENTED JULY 4, 1905.

C. P. HEPLER.

ELECTRIC TEMPERATURE ALARM.

APPLICATION FILED FEB. 6, 1905.

2 SHEETS—SHEET 1.

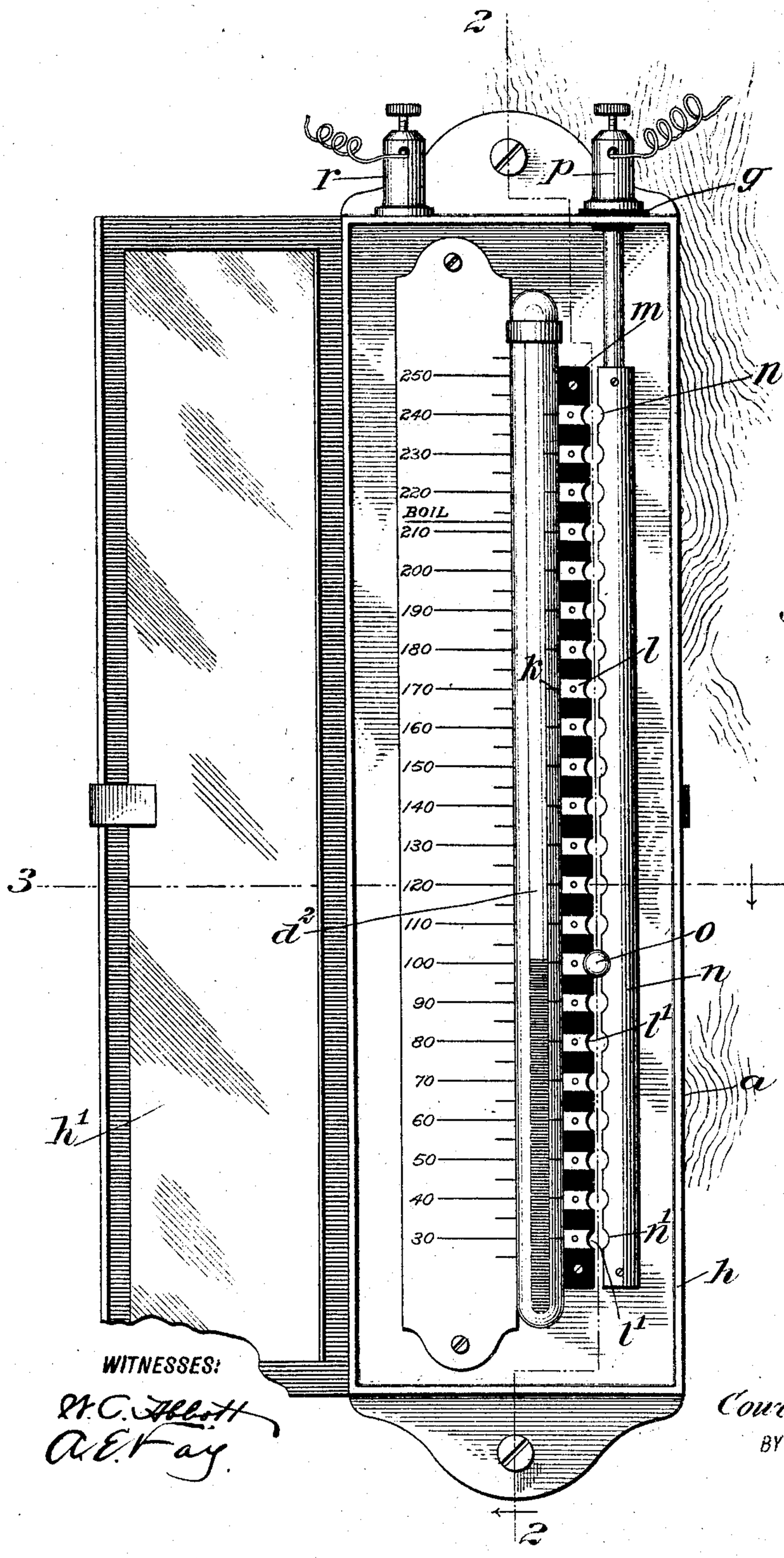

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

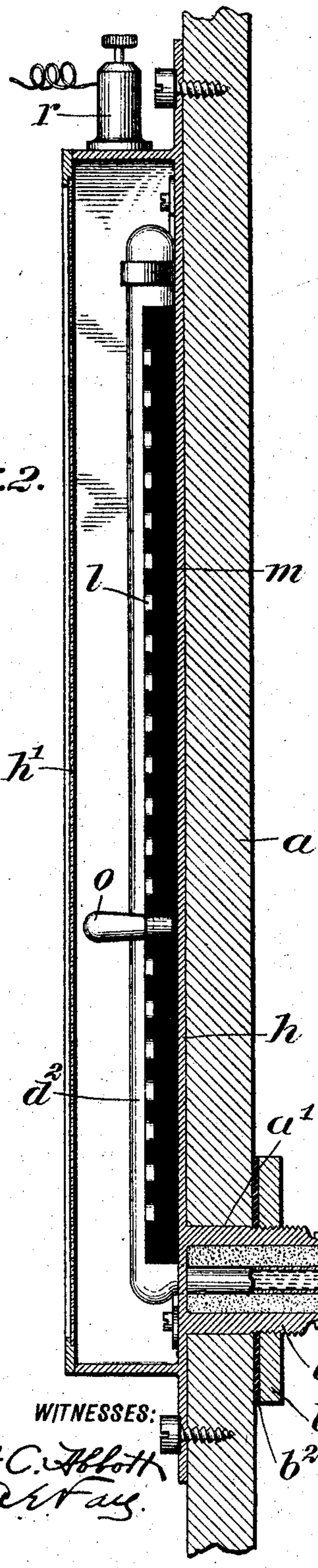
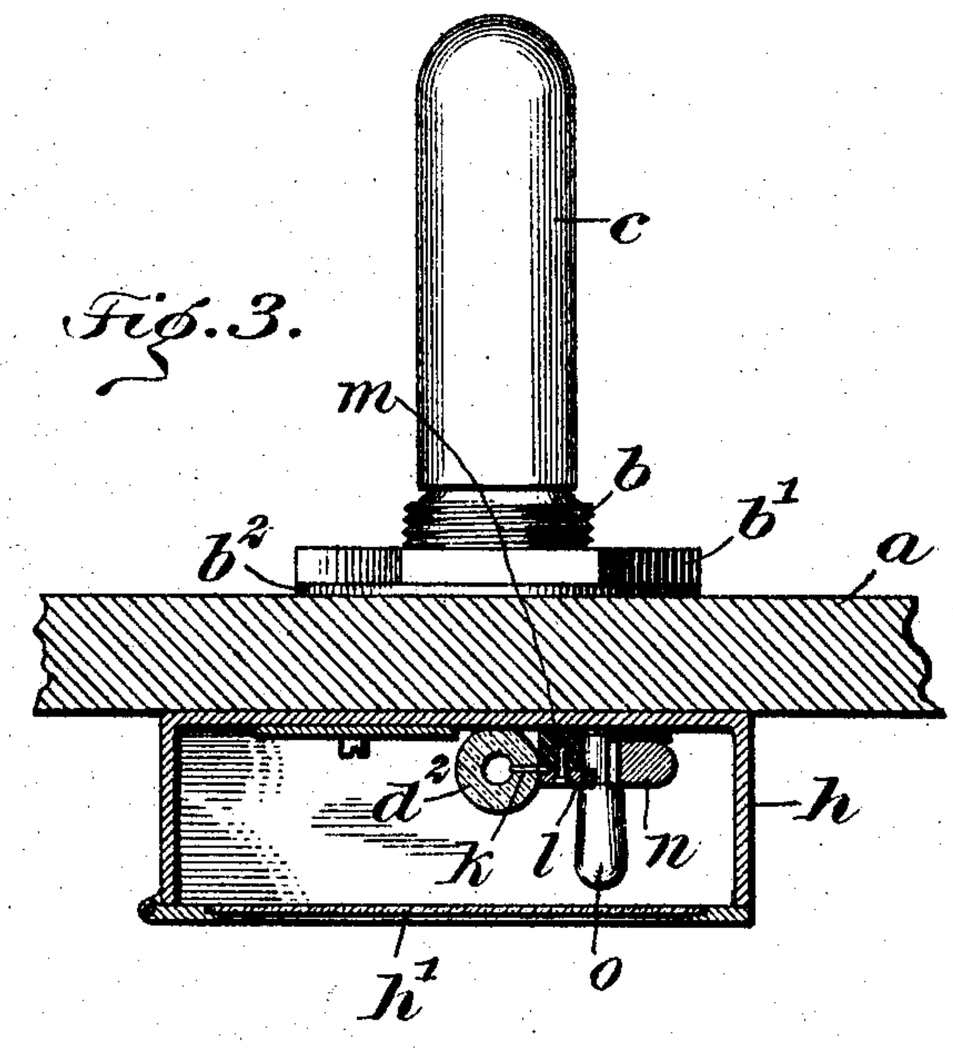


Fig. 3.



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UNITED STATES PATENT OFFICE.

COWAN P. HEPLER, OF SMITHTON, PENNSYLVANIA.

ELECTRIC TEMPERATURE-ALARM.

SPECIFICATION forming part of Letters Patent No. 794,012, dated July 4, 1905.

Application filed February 6, 1905. Serial No. 244,463.

To all whom it may concern:

Be it known that I, COWAN P. HEPLER, a citizen of the United States, and a resident of Smithton, in the county of Westmoreland and State of Pennsylvania, have invented a new and Improved Electric Temperature-Alarm, of which the following is a full, clear, and exact description.

My invention relates to an alarm device for application to a receptacle and designed to give a signal when any certain predetermined temperature is reached in the receptacle.

The principal objects of the invention are to provide an alarm of the character indicated which can be readily set for any desired temperature, which will be entirely automatic in operation, which will be useful in a large number of different kinds of business—as, for example, distilleries, breweries, bakeries, confectioneries, &c.—and which at the same time will be exceedingly simple in construction and easy to maintain.

Heretofore alarm devices for analogous uses have been made by simply attaching a wire to the bulb. If this wire is made of any metal except iron, steel, or platinum, the mercury will gradually amalgamate with it, and thereby soften it, so as to force its way out. If, on the other hand, the wire is made of iron, steel, or platinum and attached to a mash-tub in a distillery or brewery, the mash will corrode the wire, as nothing but brass or copper will withstand the chemical action of the mash. With my device a platinum, iron, or steel wire is inserted in a bulb and protected from the mash. The connections are therefore of such a nature as to withstand long usage and are not exposed to the action of the mash. In its preferred form my device is also so constructed that the brass which is employed to protect it from the mash is not exposed at any place to the action of the mercury. I also provide means for insuring a positive electrical connection for the device, such connection being protected from the action of the mash.

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

Figure 1 is a front elevation of a device embodying the principle of my invention. Fig. 2 is a sectional view of a portion of a mash-tub, showing my device applied thereto; and Fig. 3 is a transverse sectional view of the parts shown in Fig. 2.

The mash-tub is provided with an opening a', in which is located a plug b. This plug is provided with a nut b' and with a packing b^2. It is screw-threaded upon its outer end, and a cap c is applied to the screw-thread. The cap is of small-enough diameter to permit the nut to pass over it. The plug and cap are preferably made of brass or copper in order that they may not be attacked by the mash or other material contained in the mash-tub. They may be covered by porcelain or any other inert substance upon their exterior surfaces to further protect them from said mash or other material and the cap with an iron lining to protect it from mercury therein. A thermometer-bulb d, of glass or similar material, is located within the cap c and is provided with a platinum contact-piece e, extending through a wall thereof. This bulb is filled with mercury f, and the space between the bulb and the cap is also filled with mercury f'. It will be seen that the platinum piece e insures an electrical connection between the two bodies of mercury. The space between the neck d' of the mercury-bulb and the plug a is filled with plaster-of-paris g or any other similar material in order to seal the body of mercury f' from the outside of the mash-tub. The neck d' extends to the exterior of the tank and is provided with a straight portion d^2, forming a thermometer for the purpose of showing the temperature within the tank. The operation of this thermometer will be readily understood. It is preferably contained in a casing h, fastened to the exterior of the tub and provided with a glass cover h'. Through the walls of the thermometer are sealed a series of platinum wires k. On their outer ends these wires each connect with a metal block l. These metal blocks are arranged in a series along the thermometer and are insulated from each other by being inlaid in a hard-rubber strip m. A contacting strip n is placed adjacent to the hard rubber strip,

and this and the blocks are provided with notches l' and n' for the reception of a contact-plug o. The strip n is insulated from the casing h and is provided with a binding-post p, insulated by means of a rubber washer q from the casing h. The casing h, being in electrical contact with the plug b, is provided with a binding-post r, and it will be obvious that these two binding-posts are normally insulated from each other, the current being broken unless the plug o is inserted in one of the pair of notches l' and n'. The blocks l and their platinum connectors k also being insulated from the casing by the rubber strip m and the glass tube d^2 the circuit will also be broken at the end of the platinum connector opposite the block with which the plug is connected unless the mercury within the thermometer is sufficiently high to come into contact with that particular platinum connector. It will be seen, therefore, that by placing the plug o in any desired one of the notches the whole device is so set that an alarm will be given when the temperature reaches that point provided the binding-posts p and r are properly connected up with a source of electric energy and a signal device of any desired kind.

It will be seen that by the construction of a temperature-alarm according to the principle set forth above, whether in the form illustrated or in any other form coming within that principle, a device of great simplicity and cheapness, as well as efficiency, is obtained; that the electric contact in the bulb is made in a manner which renders that part of the device practically indestructible from ordinary usage, and that all the connections are fully protected from all kinds of corrosion from the materials desired to be employed in the receptacle.

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

1. A temperature-alarm, comprising a receptacle for an expansible material, a series of contact-blocks located adjacent thereto and insulated from each other, means for connecting each block with the interior of the receptacle, a conducting-strip adjacent to the blocks, and means for connecting the strip with any one of the blocks.

2. A temperature-alarm, comprising an insulating-receptacle for expansible material, a series of conducting contact-blocks located adjacent thereto and insulated from each other, means individual to each block for connecting it with the interior of the receptacle, a conducting-strip located adjacent to the blocks, each of said blocks having a notch and said conducting-strip having a series of notches one adjacent to each of said blocks, and a plug adapted to be inserted in said notches for connecting the conducting-strip with any desired one of the blocks.

3. A temperature-alarm, comprising a conducting-casing, an insulating-receptacle for expansible material located in the casing, a series of contact-blocks located adjacent to the receptacle and insulated from each other and from the casing, means for connecting each block with the interior of the receptacle, a conducting-strip located adjacent to the blocks and insulated from the receptacle, and means for connecting the said strip with any one of the blocks.

4. A temperature-alarm, comprising a conducting-casing, an insulating-receptacle for expansible material located in the casing, a series of contact-blocks located adjacent to the receptacle and insulated from each other and from the casing, means for connecting each block with the interior of the receptacle, a conducting-strip located adjacent to the blocks and insulated from the receptacle, means for connecting the said strip with any one of the blocks, a bulb connected with said receptacle and projecting therefrom, a body of mercury located outside said bulb, and means within the walls of the bulb for connecting the material inside the bulb with said mercury.

5. A temperature-alarm, comprising a conducting-casing, an insulating-receptacle for expansible material located in the casing, a series of contact-blocks located adjacent to the receptacle and insulated from each other and from the casing, means for connecting each block with the interior of the receptacle, a conducting-strip located adjacent to the blocks and insulated from the receptacle, means for connecting the said strip with any one of the blocks, a bulb connected with said receptacle and projecting therefrom, a metallic cap located outside of said bulb, a body of conducting liquid located between the bulb and cap, a liquid connection between the cap and said casing, and an electric connection between the liquid inside the bulb and the liquid outside it.

6. The combination with a tank having a passage therethrough, of a casing located on the outside of said tank, a thermometer in said casing, a series of contact-pieces located in the walls of said thermometer and extending outside thereof, a conducting-strip, means for connecting any desired one of said contact-pieces with said conducting-strip, a plug in electrical connection with said casing and extending through the wall of said tank to the inside thereof, the bulb of said thermometer being located inside the tank and passing through said plug, and means for protecting said bulb from the contents of the tank.

7. The combination with a tank, of a conducting-casing located on the outside thereof, a thermometer in said casing, means for setting said thermometer to form an electrical connection when the mercury rises beyond any desired point, the bulb of said thermometer passing through the wall of the tank and being located inside thereof, a plug in the

wall of said tank for receiving the bulb, a cap connected with said plug and containing the bulb, a body of conducting liquid located in said cap and in contact with the exterior of said bulb, and an electrical connection between the inside and outside of the bulb.

8. A temperature-alarm, comprising a thermometer-bulb adapted to be mounted inside a tank, a plug for holding said bulb provided with a packing material for engaging the walls thereof, a metallic cap connected with said plug and containing said bulb, a body of conducting liquid located within said cap in contact with the exterior of said bulb, and a conducting material passing through the wall of said bulb.

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

COWAN P. HEPLER.

Witnesses:
S. L. HOUGH,
JOSEPH SMITH.