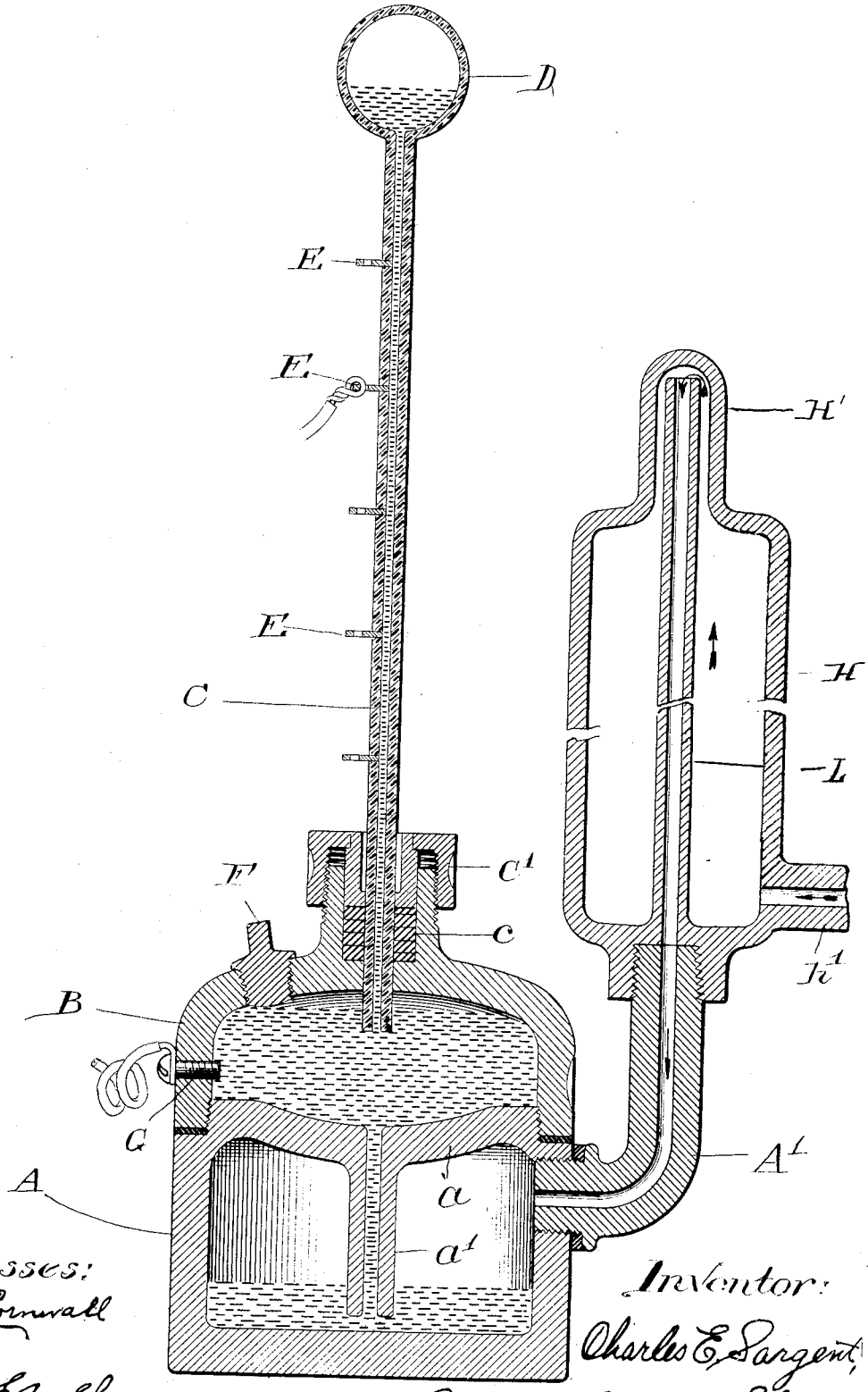
No. 785,438. PATENTED MAR. 21, 1905.

C. E. SARGENT.

PRESSURE GAGE.

APPLICATION FILED SEPT. 24, 1904.



Witnesses:
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No. 785,438. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

CHARLES E. SARGENT, OF CHICAGO, ILLINOIS.

PRESSURE-GAGE.

SPECIFICATION forming part of Letters Patent No. 785,438, dated March 21, 1905.

Application filed September 24, 1904. Serial No. 225,734.

To all whom it may concern:

Be it known that I, CHARLES E. SARGENT, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pressure-Gages, of which the following is a specification.

My invention relates to certain new and useful improvements in pressure-gages; and its object is to produce a device of this class which shall have certain advantages, which will appear more fully and at large in the course of this specification.

To this end my invention consists in certain novel features, which are described herein and illustrated in the accompanying drawing, which represents a vertical section through my improved device.

Referring to the drawing, A is a mercury-chamber, preferably made of some non-conducting material. The chamber has a top *a*, from which a tube *a'* extends downward, terminating just above the bottom of the chamber. An inlet-pipe A' opens into the mercury-chamber at one side. A cap B is screwed over the top of the mercury-chamber, and the said cap, together with the said top of the mercury-chamber, forms a compression-chamber. A tube C extends through the cap B into the compression-chamber and is held in place by packing *c*, held under compression by a thimble C'. The tube C is provided at its top with a bulb D and along its side with a plurality of contact-points E. A plug F is provided to give access to the chamber, and a contact-point G, entering the liquid, is secured to the mercury-chamber.

In practice the mercury-chamber A is filled with mercury approximately to the level of the bottom of the compression-chamber, and pressure is applied to the inlet-pipe A'. As the pressure increases it is transmitted by the mercury to the air in the compression-chamber, tube, and bulb, which of course is compressed, in accordance with Boyle's law, affording a space for the rise of the mercury in the compression-chamber. The mercury reaches the lower end of the tube C just before the pressure which the gage is intended to indicate is reached. As the pressure increases from this point the mercury rises very rapidly through the length of the tube and passes in succession the contact-points therein, any or all of which may be connected with electrical apparatus, as desired. Still further increase of pressure will cause the mercury to enter the comparatively large bulb at the top of the tube, and its further rise will become very slow indeed.

My improved device is particularly designed for use and in connection with automatic sprinklers and the like, where it is necessary that a continuous high pressure of water be maintained. The parts are arranged so that the normal pressure holds the mercury just within the bulb and keeps the electrical circuit closed. If for any reason the pressure is diminished, the mercury falls in the tube and opens the circuit, thereby starting the pumps, which raise the pressure until the circuit is closed.

The tube C is made adjustable in the compression-chamber, so that the point at which the mercury reaches the tube can be varied to accommodate the device to systems of standard pressure.

In some cases it may be desirable to prevent the grounding of the electrical circuit through the water of the pressure system. To produce this result, it is desirable that the water be removed from contact with the mercury, and this is accomplished by means of a chamber H, interposed between the inlet-pipe A' and the water-pipes of the system. This chamber, it will be seen, has a long tube *h*, which is practically a continuation of the inlet-pipe A', and a pipe *h'* is provided at the lower end of the chamber H, which can be connected with one of the water-pipes of the pressure system. The pressure of the water will then be transmitted through the air in the chamber H to the mercury, and the water itself will never come in contact with the mercury. The chamber H is made of sufficient size that the water will never rise above the end of the tube *h*, and the upper end of the chamber H is constricted at the end H' to prevent water from splashing over the end of the tube, and so reaching the mercury.

It will be evident that many variations in

the construction of my device are possible and that any desired liquid can be substituted for mercury, although I greatly prefer mercury on account of its superior advantages as an electrical conductor. My device is particularly advantageous because of the fact that the device is of small size, and the rapid movement of the indicating medium is obtained at and near the point when accurate indication is desirable and comparatively slow movement is obtained elsewhere.

I realize that considerable variation is possible in the details of this construction without departing from the spirit of the invention, and I therefore do not intend to limit myself to the specific form herein shown and described.

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

1. In a device of the class described, the combination with a chamber for containing liquid and an inlet-pipe opening into the same, of a compression-chamber opening into the lower part of the said liquid-chamber, containing a tube extending upward from said compression-chamber, and a comparatively large bulb at the upper end of said tube.

2. In a device of the class described, the combination with a chamber for containing liquid and an inlet-pipe opening into the same, of a compression-chamber opening into the lower part of said liquid-containing chamber, a tube of small diameter extending from the top of said compression-chamber, and a comparatively large bulb at the upper end of said tube.

3. In a device of the class described, the combination with a liquid-containing chamber and an inlet-pipe opening into the same, of a compression-chamber above the liquid-containing chamber, a tube extending downward from the bottom of the compression-chamber to the lower part of the liquid-containing chamber, a tube of small diameter extending from the upper part of the compression-chamber, and a bulb at the end of said second tube.

4. In a device of the class described, the combination with a liquid-containing chamber and an inlet-pipe opening into the same, of a compression-chamber above the liquid-containing chamber, a tube extending downward from the bottom of the compression-chamber to the lower part of the liquid-containing chamber; a tube of small diameter extending from the upper part of the compression-chamber, a bulb at the end of said second tube, and means for adjusting said second tube within said compression-chamber.

5. In a device of the class described, the combination with a mercury-chamber and inlet-pipe opening into the same, of a compression-chamber above the mercury-chamber, a tube extending downward from the compression-chamber to the lower part of the mercury-chamber, a tube extending upward from the upper part of the compression-chamber, a contact-point in the second tube, and a bulb at the upper end of the second tube.

6. In a device of the class described, the combination with a mercury-chamber and inlet-pipe opening into the same, of a compression-chamber above the mercury-chamber, a tube extending downward from the compression-chamber to the lower part of the mercury-chamber, a tube extending upward from the upper part of the compression-chamber, a plurality of contact-points in the second tube, and a bulb at the upper end of the second tube.

7. In a device of the class described, the combination with a mercury-chamber, and an inlet-pipe opening into the same, of a compression-chamber above the mercury-chamber, a tube extending downward from the compression-chamber to the lower part of the mercury-chamber, a tube extending upward from the upper part of the mercury-chamber, a contact-point in the second tube, a bulb at the upper end of the second tube, an inlet-pipe opening into the mercury-chamber, an air-chamber opening into the said inlet-pipe and a tube communicating with the inlet-pipe, and extending to the top of the air-chamber.

In witness whereof I have signed the above application for Letters Patent, at Chicago, in the county of Cook and State of Illinois, this 21st day of September, A. D. 1904.

CHARLES E. SARGENT.

Witnesses:
RUSSELL WILES,
CHAS. O. SHERVEY.