

JOHN L. PILLSBURY & JOHN S. SHORB.
 Improvement in Hydraulic-Pressure Alarms.
 No. 114,849. Patented May 16, 1871.

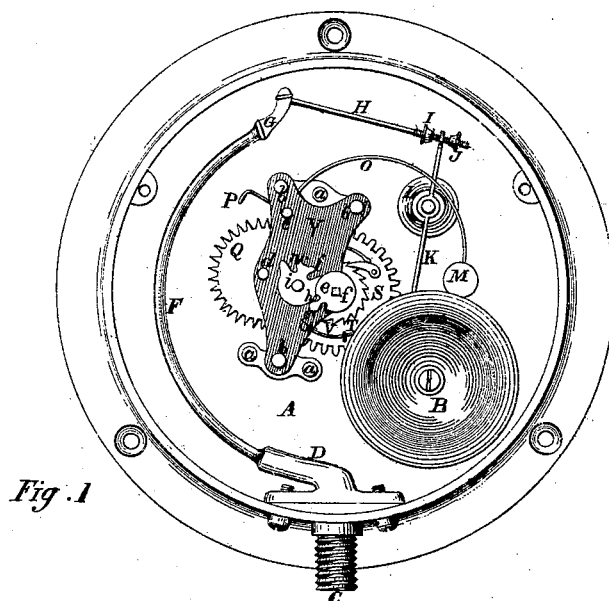


Fig. 1

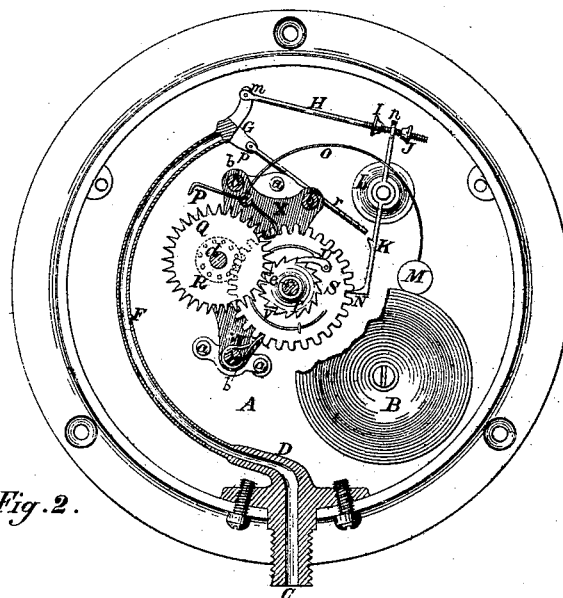


Fig. 2.

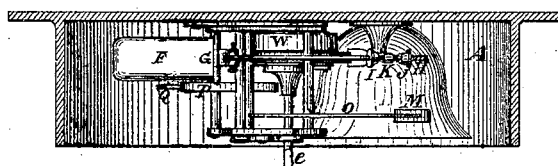


Fig. 3.

Ruth H. Abbott.
 Andrew Choffin } Witnesses.

Joseph L. Pillsbury } Inventors.
 John S. Shorb }
 by Jos Abbott } Attorney.

United States Patent Office.

JOSEPH L. PILLSBURY, OF COLUMBUS, AND JOHN S. SHORB, OF CANTON, OHIO.

Letters Patent No. 114,849, dated May 16, 1871.

IMPROVEMENT IN HYDRAULIC-PRESSURE ALARMS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that we, JOSEPH L. PILLSBURY, of Columbus, Franklin county, and JOHN S. SHORB, of Canton, Stark county, Ohio, have invented an Improved Fluid-Pressure Indicator, to which we have given the name of "Hydraulic Fire-Alarm" as being the most appropriate one to designate the particular purpose for which the apparatus was designed; and we do hereby declare the following to be a full, clear, and exact specification thereof.

Our invention relates to an improved means of operating an alarm for giving notice of any desired maximum or minimum of pressure of liquids or gases under varying degrees of pressure.

The particular object for which our invention is intended (although its application is obviously not confined to this purpose) is to give an alarm for the increased pressure termed "fire-pressure," which is used during time of fire on water-work systems worked under any system of mechanical pressure in which machinery is used to create the hydrostatic head, or in water-work systems in which the head is obtained by means of an elevated distributing-reservoir, to be connected, during fires, with a lower system of pipes; as, by placing our hydraulic fire-alarms at different points on a system of water-pipes in a town or city, notice will be given at such points whenever a fire breaks out, and the increased or fire-pressure is put on the system of water-pipes.

The nature of our invention consists in the combination, with an alarm apparatus, of a hollow elastic spring tube, which is connected with the pipe or reservoir containing the liquid or gas, and which is so connected with the alarm apparatus as that, by reason of its change of form from an increased or decreased pressure of the liquid or gas, it shall liberate the alarm apparatus, and thus cause an alarm to be sounded upon the liquid or gas reaching any required limit of pressure, as is hereinafter more fully shown.

Description of Accompanying Drawing.

Figure 1 is a front view of an apparatus embodying our invention.

Figure 2 is another front view of the same, with the front plate of the clock-work removed to show the gearing, and with the spring tube shown in section.

Figure 3 is a plan of the same with the upper half of the case removed.

General Description.

A is a cast-iron case, similar in construction to those used for the ordinary steam-gauge;

C is the stem by which the apparatus is connected with the pipe or reservoir; and

D F G is the hollow spring tube, which is connected by its base D to the stem C, and has the rod H, secured by a pin, *m*, in its other end G.

The base plate X of the alarm apparatus is secured by screws *a a a* in the case A, and is united by the pillars *b b b* to the front plate Y.

The main shaft *e*, escapement-wheel shaft *d*, and pallet-shaft *c*, are journaled in the plates X Y, and on the main shaft *e* are arranged the ratchet-wheel T and gear-wheel S, the first being fastened on the shaft, and the second being connected to the first by the pawl U pivoted on the wheel S, and held down by the spring V.

The coiled spring W has one end attached to a pillar, *b*, and its other end is attached to the main shaft *e*, around which it is coiled.

The wheel S meshes into a pinion, R, on the shaft *d*, on which is the escapement-wheel Q, the rotation of which causes the vibrations of the pallet P with its shaft *c*, and thus causes the hammer M on the arm O, secured in the shaft *c*, to strike on the bell B secured in the case A, by which means an alarm is sounded; the construction and operation of the alarm apparatus just described being the same as that of the ordinary clock-alarm.

On a standard, L, in the case A is pivoted the lever K, at the lower end of which is a hook, N, which hooks into the teeth of the wheel S, and thus holds the alarm apparatus from any movement except when an alarm is to be sounded.

The eye *n* is formed on the upper end of the lever L, and through it passes the rod H, on which are placed the adjusting-nuts I and J, one on each side of the lever K.

The stop-wheel *f* with the single tooth *g* is secured on the main shaft *e*, and acts in combination with the stop-wheel *h* pivoted on a pin, *i*, in the frame-plate Y, and having the notches *n'* and *l* formed in the sides thereof, for the purpose of preventing the alarm from being wound up more than three turns of the main shaft, to the end of which the winding-key is applied to wind up the alarm.

The body F of the spring tube D F G being made of spring brass, or steel, or stiff rubber, it will be seen that an increase of pressure on the liquid in the tube will tend to straighten the tube out, and will thus cause the head G to move back toward the rim of the case A, from which it is seen that if the nut J be set so as to come in contact with the eye *n* on the lever K, when the head G is moved back by the pressure of the liquid in the spring F, the hook N will be drawn back from the teeth of the wheel S, which will liberate the alarm apparatus and allow it to sound the alarm, and it will be also seen that, by adjusting the position of the nut J to suit the movement of the head G, due to any de-

terminated pressure of the fluid in the spring F, the apparatus will give an alarm whenever the fluid in the spring reaches such pressure.

By reversing the relative positions of the spring D F G and alarm apparatus P Q R S K so as to bring the spring F on the right-hand side of the lever K, with its concave side toward said lever, it will be seen that the nut I may be made to move the lever K and draw the hook N from the wheel S whenever the pressure on the liquid in the spring F falls to a sufficient degree to allow the head G to approach the eye *n* to an amount sufficient to draw the hook N away from the wheel S, thus making the apparatus an alarm for low pressure.

It may be sometimes desirable to have the apparatus arranged to give an alarm for either a certain high pressure or a certain low pressure, and for this purpose the rod *r*, shown in fig. 2, is secured, by a pin, *p*, to the head G, and extends down over one of the pillars *b* nearly to the lever K, at some distance below the pivot L of said lever.

Under this last-described arrangement the liquid in the spring F is supposed to be under a medium pressure under ordinary circumstances, and the limit of high pressure causes an alarm by the action of the rod H with its nut J on the lever K, as before shown, while in case the pressure falls to the limit of low pressure the head G will approach the lever K, and the rod *r* will push the lower end of said lever back so as to liberate the alarm, as is readily seen.

Having thus fully described the construction and operation of one form of our improved alarm, it will be evident to any mechanic that various modifications in the mechanism for combining the hollow spring tube with the alarm apparatus can be made without changing the general principle of construction; or that other

and different alarm apparatus may be substituted in place of the ordinary clock-alarm herein shown—as, for example, in adapting our alarm to a steam-boiler, a steam-whistle can be used as the alarm apparatus, the same being put in operation at certain limits of steam pressure by the change of form in the hollow spring tube, the general principle of construction, to wit, the combining of a hollow spring tube with an alarm apparatus in such a manner as that the change of form in the spring tube shall act to release the alarm apparatus at certain limits of pressure of the liquid or gas, remaining the same in all cases.

Claim.

What we claim as our invention, and desire to secure by Letters Patent, is—

The within-described alarm for indicating certain limits of pressure on liquids or gases, the same consisting of a suitable alarm apparatus and of a hollow spring tube in communication with the liquid or gas, and the said spring tube and alarm apparatus being so connected and combined as that the change of form in the spring tube due to certain limits of pressure on the contained liquid or gas shall act to liberate the alarm apparatus at said limits, as is hereinbefore set forth.

As evidence of the foregoing witness our hands, each in the presence of two witnesses, respectively.

JOSEPH L. PILLSBURY.

JOHN S. SHORB.

Witnesses to PILLSBURY's signature:

J. R. ARMSTRONG,

CHARLES AMBOS.

Witnesses to SHORB's signature:

JOB ABBOTT,

RUTH K. ABBOTT.