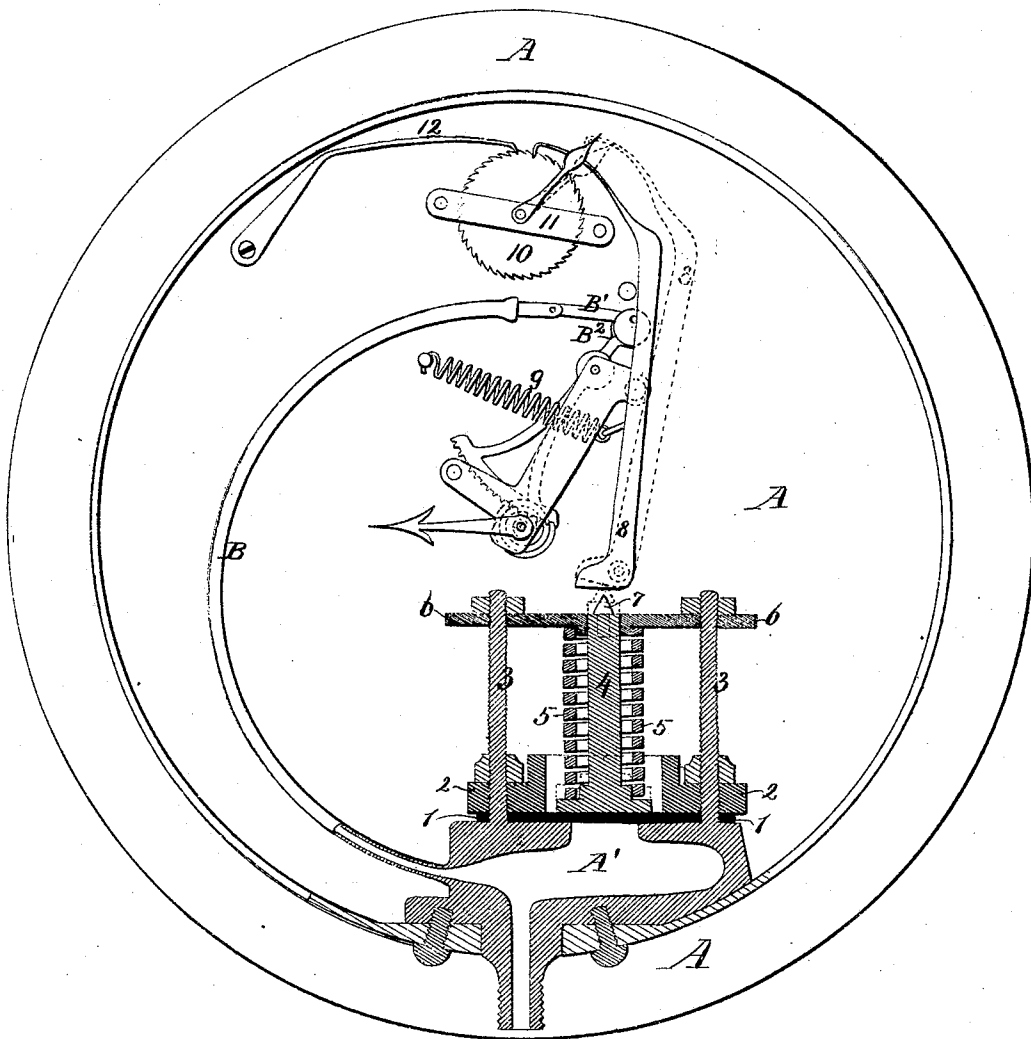


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Improvement in Registering Steam Gauges.

No. 123,855.

Patented Feb. 20, 1872.



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IMPROVEMENT IN REGISTERING STEAM-GAUGES.

Specification forming part of Letters Patent No. 123,855, dated February 20, 1872.

Specification describing a certain Improvement in Recording Steam-Pressure Gauges, invented by EDWARD H. ASHCROFT, of Boston, in the county of Suffolk and State of Massachusetts.

This invention relates to that class of steam-gauges which are intended to indicate at all times the pressure of the steam within the generator to which they are attached, and at the same time to indicate and record any excess of pressure over and above that which the engineer is allowed to carry as a maximum; and it consists in the combination and arrangement of some of the parts of which it is composed, as will be more fully explained herein-after.

The drawing shows a sectional elevation of the steam-gauge, with the indicating-dial removed for the purpose of showing the operating parts.

The importance of this character of gauge is well known and generally acknowledged, and consequently need not be enlarged upon here.

In constructing these gauges, I use a case, A, of the form shown in the drawing, or of any other suitable form, it being so constructed that its face can be covered with a dial-plate, upon which figures are formed or placed, so that an indicator point or finger will at all times show to the person in charge the amount of pressure to which each square inch of the surface of the generator is subjected. Within the case A there is placed a reservoir, A', into which the steam is conducted from the generator through a suitable pipe. Extending from the reservoir there is a flattened bent tube or chamber, B, which acts as a spring upon the entrance of the steam into it, its outer end being attached, by means of a link, B¹, to the outer end of a sector-arm, B², the opposite end of which has teeth formed upon its periphery for the purpose of meshing into a pinion upon the shaft which carries the index-finger or pointer upon the outside of the dial, which at all times enables the attendant to see at a glance the amount of pressure he is carrying. The parts above described are old and well known, they being in general use, and consequently they need not be more particularly described here. The parts hereinafter described are those which form the subject-mat-

ter of the present invention, they being used, in combination with those heretofore alluded to, for the purpose of producing the result aimed at. For the purpose of enabling the novel features of this gauge to be added, there is formed in the top of the steam-chamber A an opening, which is covered by a flexible diaphragm, 1, said diaphragm being made of rubber or other suitable material, and held upon the surface of the chamber by means of a cap, 2, and screw-bolts 3 3, as shown. Through the center of the cap 2 there is an aperture, which is large enough to admit of the passage of rod 4, which has upon its lower end a flange, the diameter of which is greater than that of the opening in the chamber A, so that when the parts are in the position shown in the drawing no steam can pass from said chamber under the diaphragm. Surrounding the rod 4 there is a spiral spring, 5, the lower end of which rests upon the flange upon the bolt 4, while its upper end rests against a plate or cap, 6, which has upon its lower surface a projection, which enters the spring and holds it in position. The joint between the lower cap 2, the diaphragm 1, and the case A is made by screwing down the lower nuts upon the bolts 3 3, while the compression of the spring, and consequently the amount of pressure at which the rod 4 and the diaphragm will rise from the seat, are regulated by the nuts upon the outer ends of the bolts 3 3 acting upon the plate 6, the spring 5, and the rod 4, upon or within which there is a knife-edge, 7, which at certain times presses against the short arm of a bell-crank lever, 8, which is pivoted to the case A near the end of the rod 4. This lever extends from its pivoted point in one direction far enough to allow the knife-edge 7 to press upon its surface when the pressure of steam is sufficient to bring them in contact, and in the other or in a vertical direction far enough to permit a hook which is formed upon its outer reduced end to engage the teeth or notches formed upon the periphery of a wheel, soon to be described. By referring to the drawing, it will be seen that the upper or outer end of lever 8 is very much reduced in thickness, in order that it may form a spring and have a hook upon its end, as shown. At some suitable point between the pivotal point of the lever 8 and its upper end there is at-

tached a spring, 9, for the purpose of returning said lever to its original position after it has been operated upon by the knife-edge 7. Near the upper portions of the case A there is affixed a ratchet-wheel, 10, it being so arranged with reference to the lever 8 that the hook upon its upper end will readily engage the teeth upon its periphery, and cause the wheel to partially rotate when the short arm of the lever is raised. This wheel is to be hung upon a shaft, which has its bearings in a frame, 11; or it may be arranged in any other suitable manner which will permit the shaft to rotate with the wheel. Upon that portion of this shaft which protrudes through the dial-plate of the gauge there is affixed an indicator-hand, which, each time the steam has been allowed to attain a pressure greater than the amount prescribed, will, as a consequence, be turned the distance which the action of the hook upon the lever 8 will carry it, the figures being arranged upon the dial to correspond with the movements of said hand or pointer. To prevent the indicator from being turned backward, and thus a false record obtained, a spring, 12, is pivoted to the case A, as shown, its outer end resting upon and engaging with the teeth of the wheel 10, which will at all times prevent a backward movement of such wheel. The arrangement of the parts last described, and their relation to the other parts of the gauge, are such that, while the gauge proper will at all times indicate the pressure of steam in the generator, the parts which constitute the present invention will not be moved from the position in which they are set until the pressure has exceeded the limits prescribed by the proper authority; but so soon as that limit is exceeded, the rod 4 will be raised by the pressure upon the diaphragm 5, and the knife-edge 7 upon its upper end will come in contact with the short arm of the bell-crank lever 8, pressing it upward, which will cause its upper end to be moved outward far enough to cause the wheel 10 to be moved sufficiently

to carry the pointer on the end of the shaft to which the said wheel is secured from one figure on the dial to another; and thus the number of times that the excess of pressure has occurred will be accurately recorded; and this record will be continued even though the other parts of the gauge should become entirely inoperative from the breaking or derangement of its parts.

The two divisions of the gauge, or the parts which indicate the ordinary pressure, and the parts which register the extraordinary pressure, although located in the same case, being entirely independent in their action, and not affected either by the other in their action or in the results produced, as the mechanism which operates the registering-pointer is only brought into use, or caused to move when there is an extraordinary amount of pressure, it follows that there is not the same danger of derangement of these parts, or of their deterioration, that there would be in gauges in which such parts are constantly in motion.

What I claim as my invention, and desire to secure by Letters Patent, is—

In combination with a steam-gauge, the supplementary steam-chamber, A', and pressure-spring, actuating a registering index by means of a suitable pawl, 8, and ratchet-wheel 10, for indicating each time the pressure has been allowed to exceed a certain limit; the whole being so arranged that while the ordinary range of pressure is constantly indicated in the usual manner, the said supplementary steam-chamber, with its dependent mechanism, is called into action for registering extraordinary pressures.

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

EDWARD H. ASHCROFT.

Witnesses:

C. F. CLAUSEN,
B. EDW. J. EILS.