G. H. CROSBY.

Registering Steam-Gages.

No. 140,018. Patented June 17, 1873.

Fig. 1.

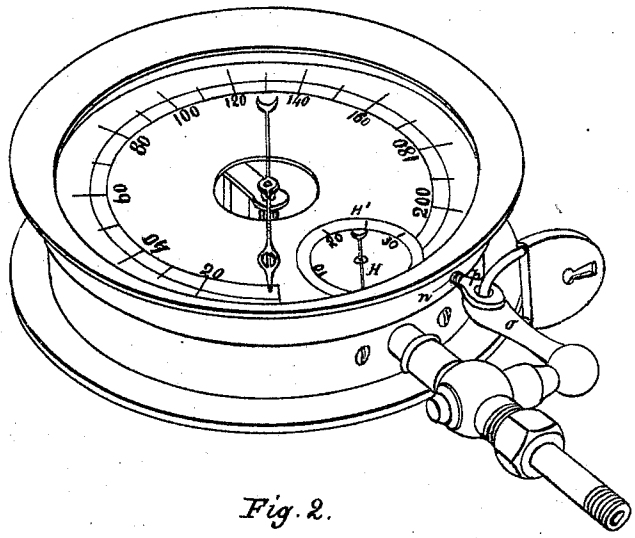
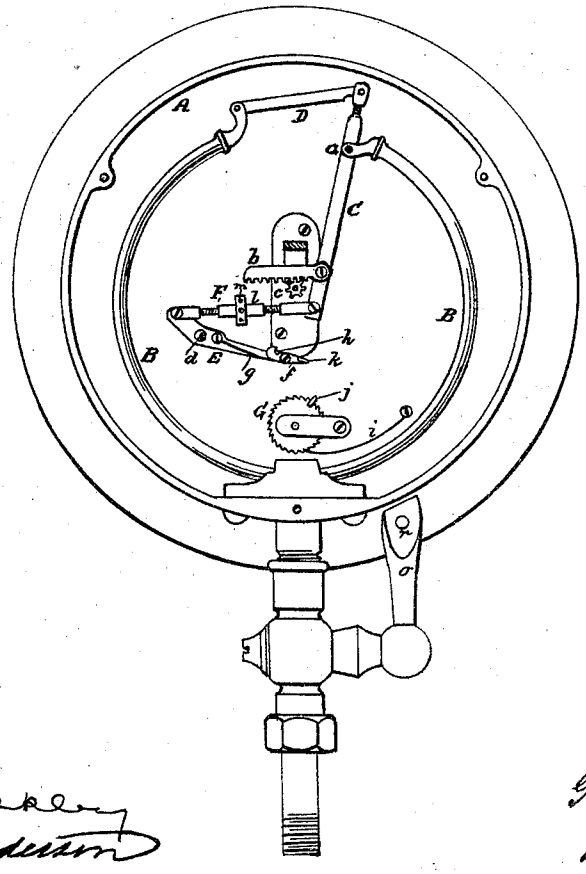


Fig. 2.



Witnesses.

Inventor.

Geo. H. Crosby

by Atty

UNITED STATES PATENT OFFICE.

GEORGE H. CROSBY, OF EAST SOMERVILLE, MASSACHUSETTS.

IMPROVEMENT IN REGISTERING STEAM-GAGES.

Specification forming part of Letters Patent No. **140,018**, dated June 17, 1873; application filed February 11, 1873.

To all whom it may concern:

Be it known that I, GEORGE H. CROSBY, of East Somerville, Middlesex County, Massachusetts, have invented certain new and useful Improvements in Registering Steam-Gages, of which the following is a specification:

This invention relates principally to pressure-gages made in accordance with the patent of T. W. Lane, of February 22, 1859; and it mainly consists in a novel combination, with a gage of this construction, of a registering mechanism, substantially as hereinafter described. Another portion of my invention is applicable to pressure-gages in general, and consists in the combination of the means hereinafter specified for locking the case and the steam-cock, to prevent them from being moved or tampered with.

The nature of my invention, and the manner in which the same is or may be carried into effect, will be readily understood by reference to the accompanying drawing, in which—

Figure 1 is a perspective view of the gage. Fig. 2 is a plan of the same with the dial-plate removed, the top of the central bridge or frame which supports the indicating mechanism being broken away.

A is the case of the gage. B B are the two branches of the Bourdon tube. C is the transmitting-lever for operating the pressure-index, pivoted, at *a*, to one of the branches of the Bourdon tube, and connected with the outer branch by means of a connecting-arm, D, pivoted at one end to the outer extremity of the lever, and at the other end to the head of the opposite branch of the tube. The lever carries, at its or near its other end, a rack, *b*, which is pivoted to the lever, and serves to put in motion the pinion *c* of the pressure-index shaft.

The parts thus far named are similar in construction and organization to those of Lane gages heretofore in use. I prolong the transmitting-lever C beyond the point where it is joined to the rack; and to the extremity of this prolongation I hinge or joint one end of a connecting-rod, F, the other end of which is pivoted or jointed to the shorter arm of a registering-lever, E, a lever designed to actuate at proper times the ratchet-wheel G, which is fixed on the vertical shaft of the registering-index H. The registering-lever vibrates upon an axis, *d*, fixed to the case, and its longer arm carries at its outer extremity a hinged pawl, *f*, held in place by a spring, *g*. The distance between the axis of the lever E and the end of the pawl is slightly in excess of the distance between said axis and the tooth of the ratchet-wheel nearest the said axis, so that the pawl, when the lever swings outwardly, will overlap the tooth.

The arrangement of the pawl is such that when the lever moves outwardly past the ratchet-wheel, it (the pawl) will ride over the tooth or teeth of the ratchet with which it may be brought in contact. After passing the ratchet, however, it will be pressed back into position by its spring *g*, against a stop-pin, *h*, on the lever, and it will, consequently, when the lever swings back toward the center, be caused to engage the ratchet-wheel, and rotate it a distance of one tooth. A spring-detent, *i*, prevents the ratchet from moving back, and thus the registering-index H will be caused to register on the dial H′ the number of times the pawl engages the ratchet—that is to say the number of times the pressure has exceeded the prescribed degree. For the purpose of preventing the index from making a full revolution, and of thus returning to the zero-point, a projecting finger, *j*, is provided on the upper face of the ratchet-wheel, against which a stud, *k*, on the pawl, will come in contact before the index can make a full revolution. When this takes place, the pawl will be turned down so far that its tail will be thrown out from under the spring *g*, and therefore it will be incapable of engaging further with the ratchet until the gage is opened, and it is again adjusted and returned to its proper position by hand. The connecting-rod F is so constructed and united with the transmitting and registering levers, that its working length—that is, its length between the points where it is jointed to said levers—may be increased or lessened at pleasure, for the purpose of determining the length of movement which the registering-lever must have before it can engage the ratchet-wheel of the registering-shaft. When less movement is required for this purpose, the index H will register at a less pressure, and as the

movement is increased, so, proportionately, will be increased the degree of pressure at which the hand or index H will register.

The increase and decrease of the working-length of the connecting-rod can readily be effected. A simple arrangement for this purpose is shown in the drawing. The rod is made in two parts—the one pivoted to the transmitting-lever, the other pivoted to the registering-lever—with their contiguous ends united by means of an internally right-and-left screw-threaded coupling-sleeve, *l*, screwing into the ends of the divided rod, the end of one part having a right-hand screw-thread to engage the corresponding right-hand thread in one end of the sleeve, the end of the opposite part having a left-hand screw-thread, to engage the left-hand thread in the other end of the sleeve. The object of this arrangement is to effect the adjustment quickly. It is manifest, however, that the coupling-sleeve may be simply swiveled to the end of one part of the rod, so as to turn on the same, being provided, as before, with a screw-thread, to engage the screw-threaded end of the opposite part. A hub on the sleeve is provided with holes *m*, for receiving a suitable tool, by which the sleeve may be rotated. A hole should be formed in the dial-plate over the hub, to permit the tool to be inserted therethrough for this purpose. The arrangement of the mechanism shown in drawing is such, however, as to permit access to be had to the hub through the central hole formed in the dial-plate around the indicating index-hand.

I shall now describe my improvement in the manner of locking the top of the case and the steam-cock, to prevent them being moved or tampered with, which improvement, as before said, is applicable to steam-gages of any ordinary or suitable construction. Through the case and its top, after the latter has been screwed tightly on the case, I drill or tap a hole, indicated at *n*, in Fig. 1, at a point in the side of the case, and the top over the handle *o* of the steam-cock, in which a hole, *r*, is formed. Into the hole in the case a small eyebolt, *p*, is screwed, until its eye is brought over and so as to coincide with the hole *r* in the handle of the cock. The handle is then brought up to the eyebolt and through the hole in the handle and the eye of the bolt the loop or tongue of a padlock is passed, as shown in Fig. 1, and then locked in the usual manner. The lock, of course, may be of any suitable construction, such as used on steam-gages. In this way the top of the case and the handle of the steam-cock are locked most securely together, preventing either from being moved or tampered with so long as the lock remains in its place.

In lieu of the arrangement shown, the eyebolt may be turned to a position at right angles to that which it occupies in the drawing, and the handle so shaped as to be brought up alongside of the eye instead of underneath it. In this case the hole *r* should, of course, be formed to pass through the handle from side to side, instead of from front to rear, as shown in the drawing.

Having described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. In a steam-gage, substantially such as described, the combination, with the transmitting-lever, which communicates motion to the pressure-indicating mechanism, of a registering-lever, operating in conjunction with the ratchet-wheel of the registering-index, as set forth, and connected with the transmitting-lever by a divided connecting-rod jointed to said levers, and having its two parts united by a screw-threaded coupling-sleeve, by means of which the working-length of the said rod can be increased and lessened at pleasure, substantially as and for the purposes specified.

2. The herein-described mode of locking together the steam-cock and body and removable top of a steam-gage by means of an eyebolt, *p*, or its equivalent, passing through and binding together the top and body of the case, and arranged so that its eye will be opposite to and in coincidence with a corresponding eye or hole in the handle of the steam-cock, to permit the passage through both bolt and handle of the tongue or loop of the lock, by which they are bound together, as set forth.

GEO. H. CROSBY.

Witnesses:
M. BAILEY,
A. MOORE.