

W. Stamp,
 Steam Gage,
 No 62,083,
 Patented Feb. 12, 1867

Fig. 1.

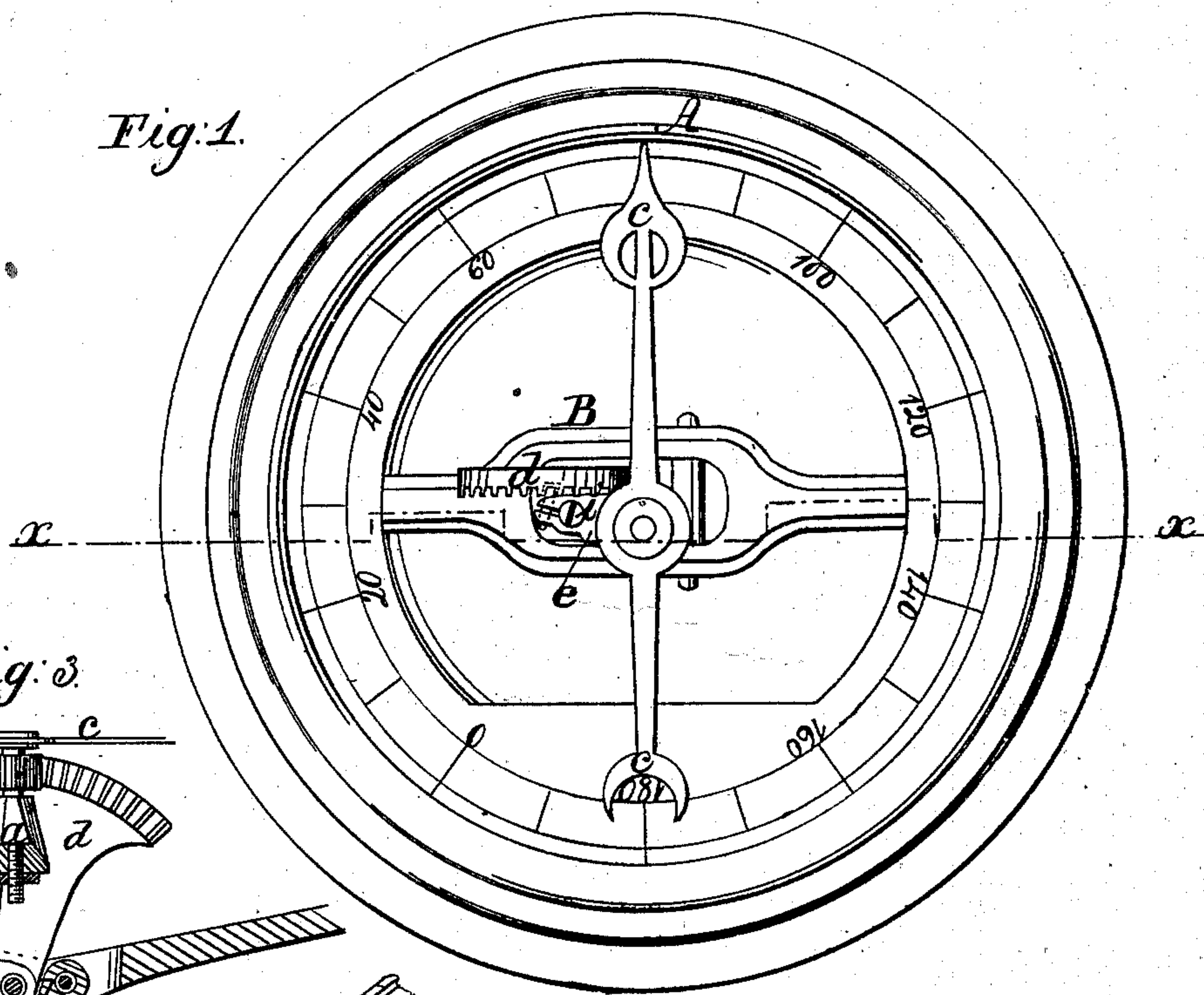


Fig. 3.

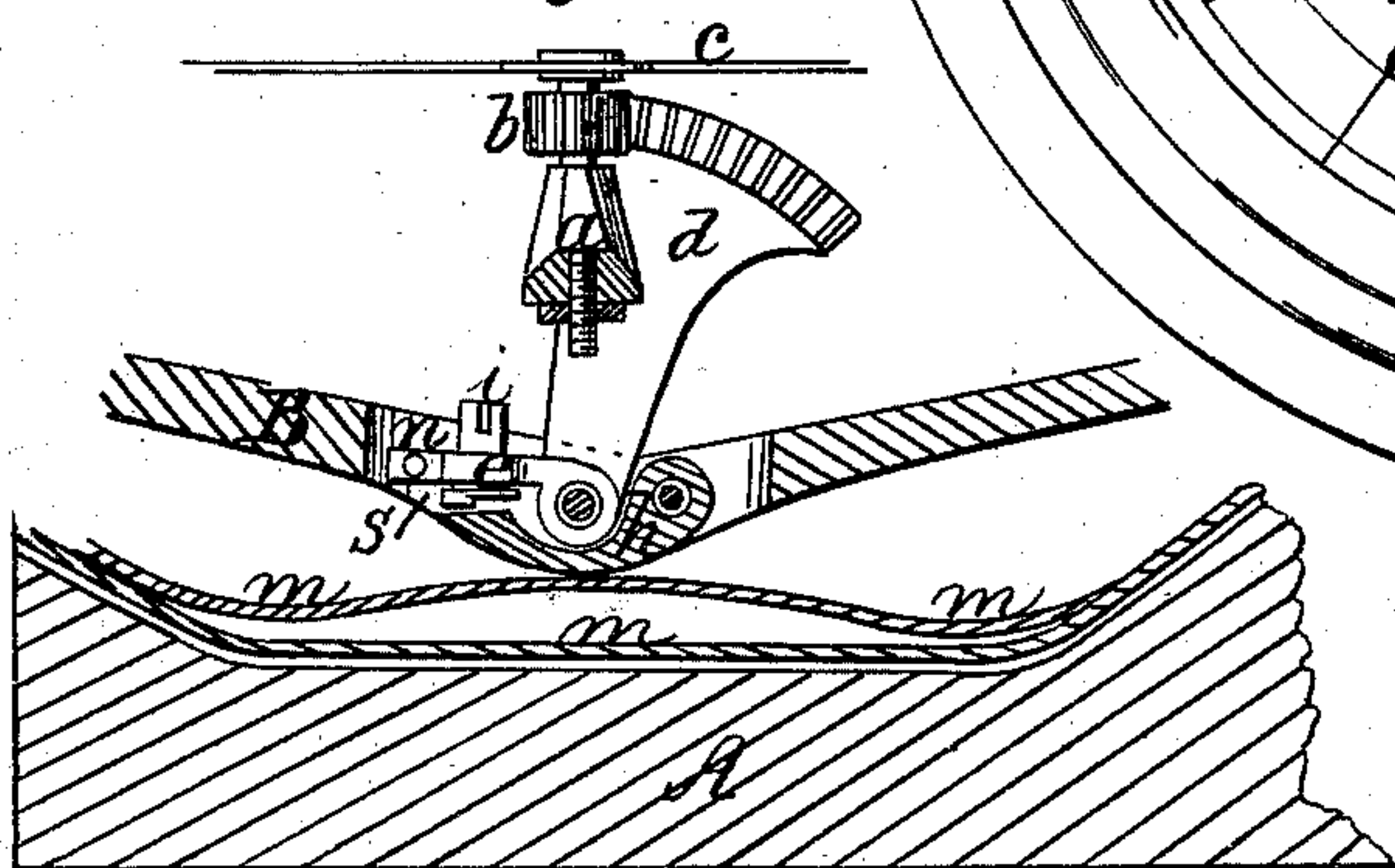
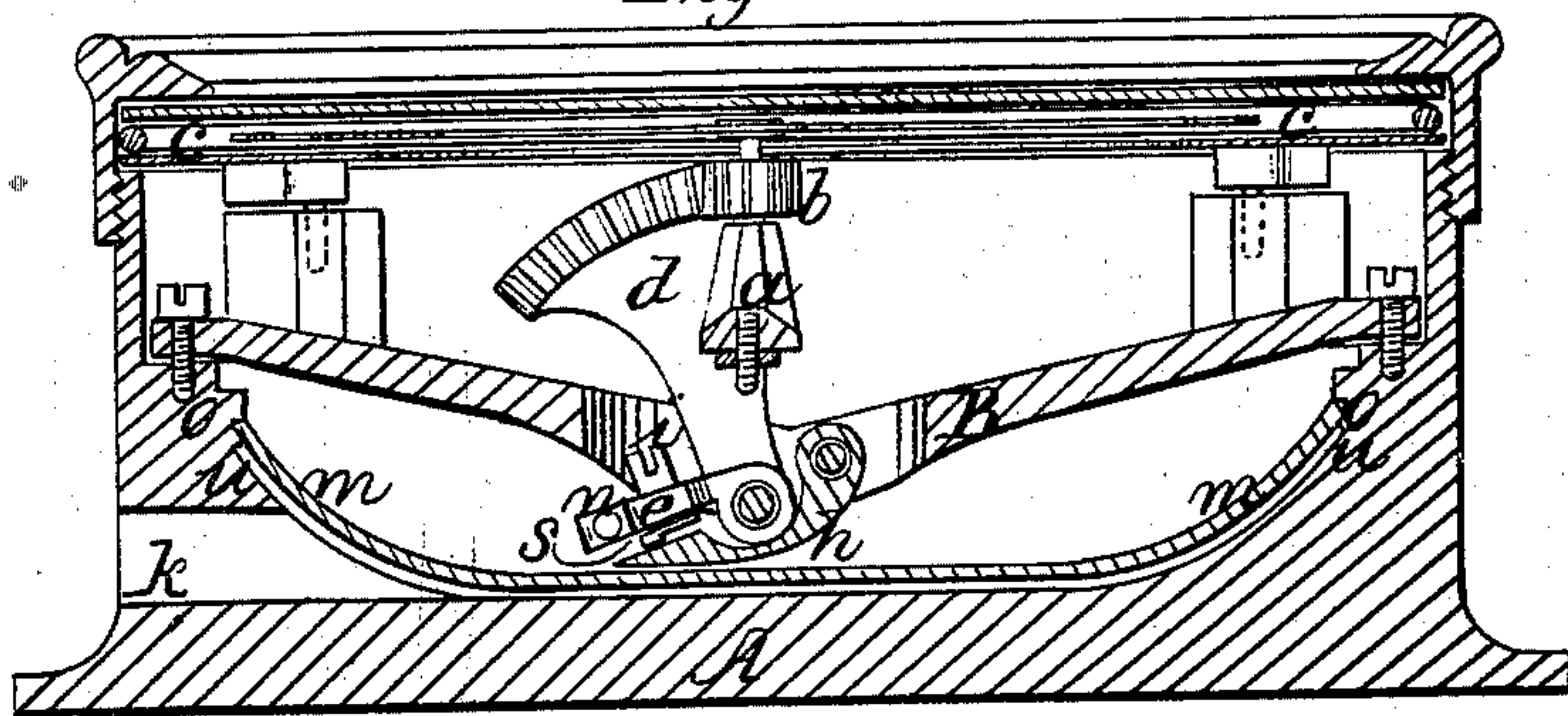


Fig. 2.



Witnesses;
 Thos. Truch.
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Fig. 4.



United States Patent Office.

WILLIAM STAMP, OF SUSQUEHANNA DEPOT, PENNSYLVANIA.

Letters Patent No. 62,083, dated February 12, 1867.

IMPROVEMENT IN STEAM GAUGES.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM STAMP, of Susquehanna Depot, in the county of Susquehanna, and State of Pennsylvania, have invented a new and useful Improvement in Steam Gauges; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top view of the steam gauge.

Figure 2 is a central section taken in the plane of the line *x x*, fig. 1, showing the gauge inoperative.

Figure 3 is a similar partial section, showing the gauge when operated on by the pressure of steam.

Figure 4 is a detached view of one of the parts.

Similar letters of reference indicate like parts.

This invention relates to improvements in the construction of gauges for indicating the pressure of steam in boilers, and consists of a novel form and arrangement of a steel diaphragm or partition-plate, upon which the steam acts by expansion, and also the means of adjusting the moving apparatus of the dial to indicate the degree of pressure with minute accuracy. The diaphragm is a thin steel disk, cut out of fine sheet steel, and swaged with dies into a concave flat-bottomed or saucer-shaped form, which is set in an ordinary circular brass steam-gauge case, the bottom of which, under the diaphragm, is made to conform thereto, with an equal steam space between them. The edge of the diaphragm is set in a shoulder on the interior of the case so as to make a perfectly steam-tight joint, and by the peculiar conformation of the diaphragm the effect of the pressure of the steam upon it tends to make the joint tighter instead of to open it, as is the case with the flat or corrugated diaphragm. The uniform expansion and contraction of my concave diaphragm from the circumference to the centre obviates the breaking or cracking of the steel plate, which is a common fault in diaphragms of other forms of construction subject to excessive steam pressure and action at particular points; and the narrow steam chamber, not exceeding the sixteenth of an inch between the case and the bottom of the diaphragm, prevents all danger from injury by the freezing of condensed steam. Ordinary steam gauges do not generally register the pressure with accuracy below 20° nor above 200°, but my improved diaphragm is so delicately sensitive and uniform in its expansion that it will register accurately from 5° to 300° steam pressure, upon a dial properly scaled. By means of an eccentric-pin I am enabled to adjust the indicating apparatus with the nicest precision.

A represents the steam gauge case, which is provided with the ordinary dial-plate and indicator, covered by glass. B is a central cross-bar in the case, of usual or any suitable form and position for supporting the indicating apparatus, which, as usual, consists of an upright, *a*, surmounted with a small pinion, *b*, that turns the needle indicator *c*, by engaging in a toothed segment, *d*, pivoted at the lower end upon the cross-bar B, within a central space, as seen in fig. 1. At the lower end of the segment *d*, projects, at right angles, a short arm, *e*, as shown clearly in fig. 4; a stout, hardened steel, adjustable eccentric-pin, *i*, passes through the arm *e*, and is fitted nicely to be turned by a screw-driver for adjustment, and held in place, when adjusted, by means of a set-screw, *n*, or in any suitable manner. On the lower end of the pin *i* is a small nib, *s*, placed near the circumference, which nib bears upon the upper face of one end of a curved steel lever, *h*, which is pivoted at the other end to the cross-bar B, and sets under the segment *d*, so that the rounded lower end of the segment turns freely in a concave seat on the upper side of the lever *h* when it is moved upward by the pressure of the steam, as hereinafter explained. The steel-plate diaphragm *m*, the construction of which has already been described, is turned with a perfectly square edge, which fits against a corresponding shoulder, *o*, turned on the inside of the case, as shown in fig. 2. The plate may be sprung into place under the shoulder, or it may be set in by heating and expanding the case to admit it more readily. When the diaphragm is cold and in place, a narrow steam chamber, *w*, will be underneath, between it and the bottom of the case, coextensive with its convex surface, to receive steam from the boiler, as usual, through an aperture, K, on one side of the case. When the diaphragm is in place, and not acted upon by steam, the indicating needle will point to zero on the dial-plate, and the free end of the pendent lever *h* will lie down upon the upper or concave side of the diaphragm, as seen in fig. 2, the adjustment of the needle being effected by turning the pin *i* to bring the eccentric-nib *s* nearer or farther from the fulcrum of the lever *h*, as required. Now when steam is admitted

into the chamber *w* it will press the diaphragm upward in a regular and uniform curve, from the circumference to the centre, as indicated in red, in fig. 3, and thus push up the lever *h* against the nib *s*, on the pin *i*, in the arm *e*, and cause the segment *d* to turn the pinion *b*, and move the indicating needle *c* on the dial-plate to point to the degree of steam pressure.

Having thus fully described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. I claim a concave flat-bottomed or saucer-shaped steel-plate diaphragm, fitted in a steam gauge, and constructed substantially as herein described.

2. I claim also the eccentric adjusting pin *i*, or its equivalent, in combination with the pendent lever *h*, and the segment *d*, constructed and operated substantially as herein described.

The above specification of my invention signed by me this 25th day of September, 1866.

W. STAMP.

Witnesses:

WM. F. McNAMARA,

ALEX. F. ROBERTS.