

J. B. EADS & H. FLAD.

Improvement in Pressure-Gauges.

No. 130,705.

Patented Aug. 20, 1872.

Fig. 1.

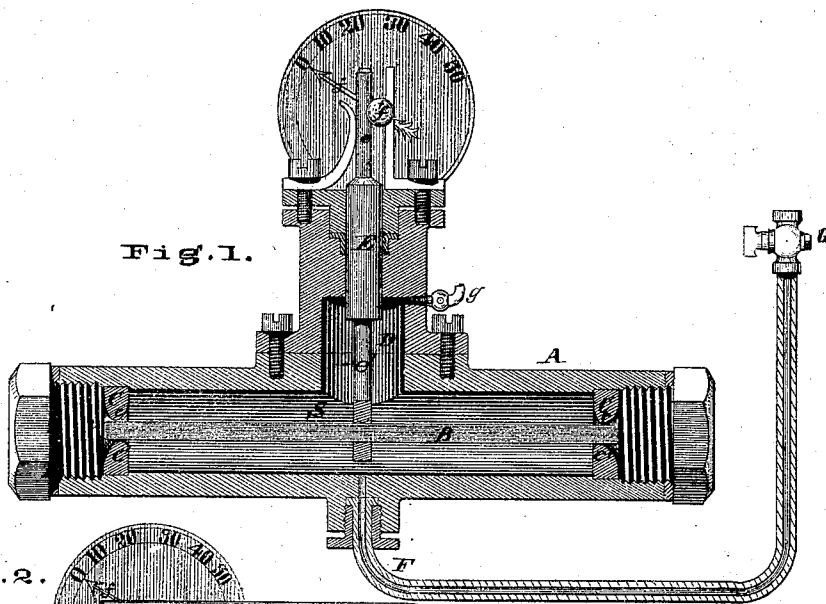


Fig. 2.

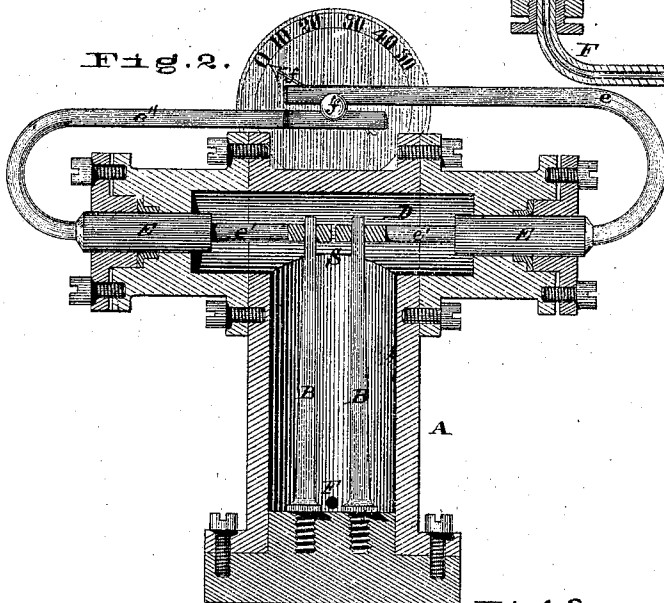
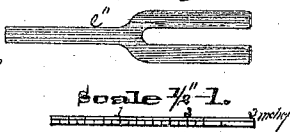


Fig. 3.



ATTEST.
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JAMES B. EADS AND HENRY FLAD, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN PRESSURE-GAGES.

Specification forming part of Letters Patent No. 130,705, dated August 20, 1872.

Specification describing a certain Improvement in Pressure-Gages, invented by JAMES B. EADS and HENRY FLAD, both of the city and county of St. Louis and State of Missouri.

This improvement consists in the attachment of a piston similar to that of a hydraulic ram to a spring within the chamber of the cylinder, the spring tending to draw the piston inward and the pressure of the fluid within the cylinder forcing the piston outward. The movement of the piston is indicated by a similar arrangement to that of our patent No. 117,394, dated July 25, 1871.

Figures 1 and 2 are axial sections of our improvement. Fig. 3 is a plan of the supporting-fork of the indicator in Fig. 2.

A is the cylinder containing the spring B, secured at each end in any suitable manner. We propose to support the ends of the bar in rings C C', having rounded or knife-edge bearings *c c'* for the bar, the lower bearing *c'* being somewhat nearer to the middle of the bar so as not to pinch the bar in the bending of the latter upward. D is the cylinder of the piston E, whose upper end *e* projects from the cylinder and turns an indicator, *f*, similarly arranged to that in our patent No. 117,394, to which reference is made for description of this part of the gage. The piston may be made of any desired size and the spring of any suitable strength, so as to indicate either high or low pressures. In some cases, particularly when very high pressures are to be gaged, the piston would not have greater sectional area than the portion *e'* connecting the piston proper E to the spring B. The spring B may be of prismatic or of any suitable form, or may be enlarged at the point of the greatest strain; and the metal composing it may be round or angular in section. The chamber S of the cylinders may be filled with liquid; or vapor (from a steam-boiler, for instance) may be allowed to enter; but we prefer to use liquid as the medium acting directly upon the piston. F is the pipe through which the pressure is communicated to the gage. G is a stop-cock in the pipe F. *g* is a shifting or escape cock in the cylinder. The object of these cocks is to enable the reduction of the pressure within the chamber S to that of the outer atmosphere by first closing the cock G to cut off commu-

nication between the gage and the hydraulic ram, steam-boiler, &c., and then opening the cock *g* to reduce the pressure within the chamber S. The finger *f* may then be adjusted to the zero-mark if it prove to be out of place.

In Fig. 2 the pistons E are attached to the upper ends of the fixed springs B. The action is similar to that shown in Fig. 1; but the movement of the finger *f* would be twice as great, because it is held between the two moving rods *e e''* forming the projecting portions of the pistons. These rods have return bends, as shown, and the end of the lower one is forked, as shown in Fig. 3, so as to make a good bearing for the cylindrical part of the indicator.

The employment of the friction of bent rods pressing on a roller to operate the indicator has several advantages over the use of the rack and pinion, or their equivalents, among which may be mentioned the obviating of friction at the pivotal point of the pinion and the extreme sensitiveness of the parts, by means of which the smallest pressures are indicated, which the play of the pinion in the rack would prevent in the use of the latter gear. These differences in operation render the employment of the friction-gear more advantageous than the rack and pinion or their equivalents. We are aware, however, that friction-gear, *per se*, is not new; but by our construction of rebending the rods we are enabled to get twice the range of motion of our indicator as is attained in the friction-gear, where but one rod and roller are employed, while, at the same time, we obtain all the advantages of the sensitive friction-gear.

We claim as new and of our invention—

The rebent rods *e e''*, pistons E E, connecting-rods *e' e'*, roller-spindle *f'*, and indicator *f*, in combination with the springs B B, whereby the movement of the indicator would be twice as great as when one rod is used, substantially as described.

In testimony of which invention we have hereunto set our hands.

JAS. B. EADS.
HENRY FLAD.

Witnesses:

SAML. KNIGHT,
JAMES ANDREWS.