G. FABER.

GAGE FOR INDICATING PRESSURE OF STEAM, &c.

No. 8,361 Patented Sept. 16, 1851.

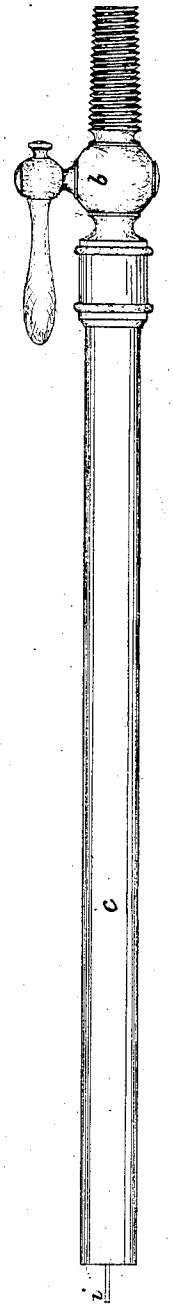

FIG. I

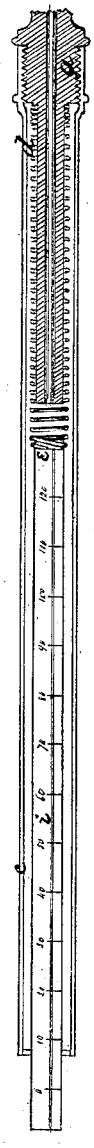

FIG. II

UNITED STATES PATENT OFFICE.

GEORGE FABER, OF CANTON, OHIO.

GAGE FOR INDICATING PRESSURE OF STEAM, &c.

Specification of Letters Patent No. 8,361, dated September 16, 1851.

To all whom it may concern:

Be it known that I, GEORGE FABER, of Canton, county of Stark, and State of Ohio, have invented an Improvement in Apparatus for Indicating the Pressure of Steam and other Fluids; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawing, making a part of this specification, in which—

Figure I is an elevation. Fig. II is a sectional view.

Similar letters refer to similar parts throughout.

This invention is for the purpose of ascertaining the degree of pressure to which elastic fluids are subjected under certain circumstances, as for example in the generation of steam in ordinary steam boilers, and is chiefly intended for application to such boilers. The principle upon which the invention is based is, the power produced by a free current of an elastic fluid impinging upon an inelastic substance, as a disk of metal, &c., the velocity or pressure being ascertained by the distance the disk has been moved by the force of the current.

In all attempts to make a permanently operating indicator by means of a close fitting piston and cylinder, the operation has failed by reason of the accumulation of dirt, oil, &c., in and about the working parts, by which the friction has been so greatly increased as to render the indications no longer reliable. By my invention this can never occur, as the disk or piston is never in contact with the tube, or cylinder which contains it.

It is constructed as follows: I prepare a short tube as seen at (*a*); the lower part terminating in a screwed plug and cock as shown at (*b*). Over this tube a cylinder of about twice its length is screwed as seen at (*c*). On the outside of the tube (*a*) a spiral spring (*d*) is coiled, one end being attached to the tube at bottom, and the other end fastened to a small disk or piston (*e*) sufficiently large to cover the mouth of the tube but of less diameter than the cylinder (*c*) so that there is free play about it. Thus the spring on being expanded plays over the tube, which acts as a guide to keep it in place. To the piston I next fix a scale (*i*) marked in degrees indicating the extent to which the disk is projected by the force of the issuing current. The degrees are marked with numbers indicating pounds per square inch, corresponding with the actual pressure the fluid would exert if injected into a closed vessel with a corresponding velocity.

The operation is as follows: The instrument if applied to ascertain the pressure of steam, is attached to the boiler in some convenient way to receive an unobstructed flow of the steam to the tube (*a*). Steam being generated the pressure it exerts is ascertained by opening the cock (*b*) which permits a current of steam to pass through the tube (*a*) and press upon the piston (*e*), this latter is then forced up in the cylinder until the reacting force produced by the expansion of the spiral spring (*d*) is equal to the power of the issuing current. When an equilibrium is produced the degree of pressure in the boiler required to propel the current with sufficient velocity to elevate the piston and expand the spring to different degrees is ascertained by reading the numbers on the scale as they are exhibited above the top of the cylinder.

It will be readily seen that the degree of expansion of the spring will be far less than would take place were the piston and cylinder closely fitted to each other; the piston in the present instance being elevated by the momentum of those particles of steam which actually impinge upon its surface, therefore the scale is a comparative one only, and the actual values of the degrees marked are the different weights which would be required to expand the spring and raise the valve the several distances indicated. One side of the scale might therefore be marked to show those weights and coincident to them on the opposite side might be marked the pressures required in the boiler to give those degrees of expansion to the spring by the momentum of the issuing current.

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

Combining with the steam tube the disk and spring so arranged that the force of the current of steam impinging upon said disk can be ascertained by the extent to which the spring is expanded and thus can be known the comparative pressure in the boiler or other vessel necessary to give the required velocity to the current to produce different degrees of expansion of the spring, substantially as herein set forth.

GEORGE FABER.

Witnesses:

MEIER ROSE,

HORACE P. DUNBAR.