G. FABER.

Steam Gage.

No. 4,288. Patented Nov. 26, 1845.

Plate 2

Fig. 1

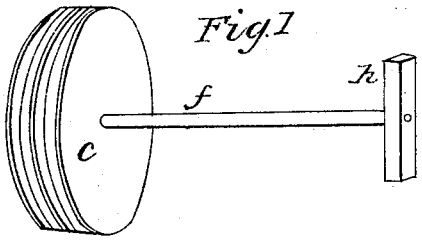


Fig. 2

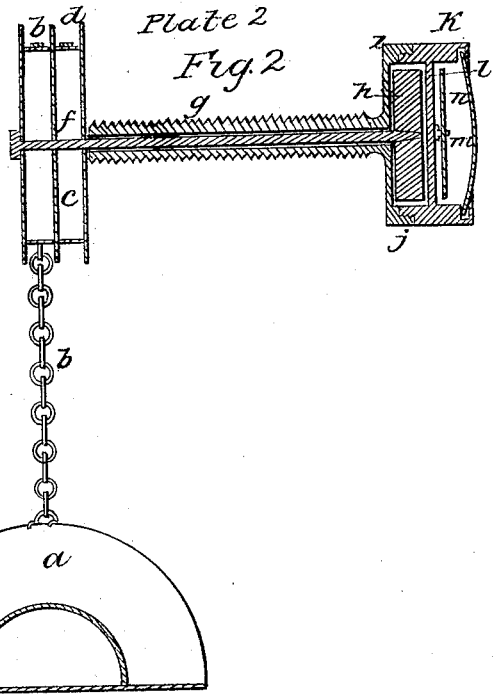


Fig. 3

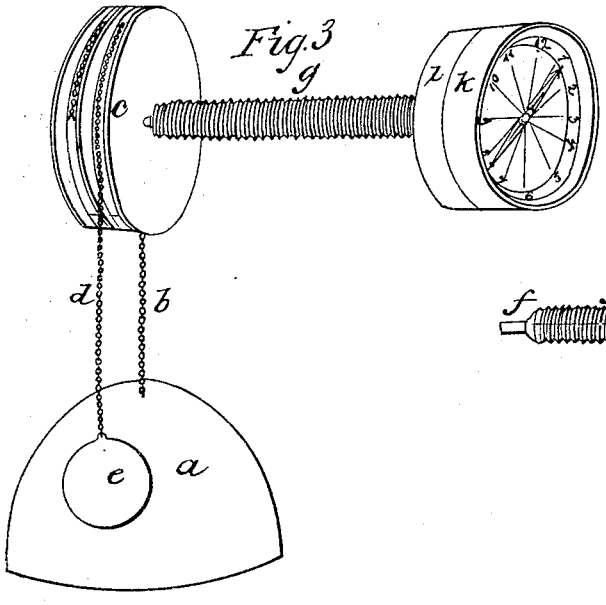
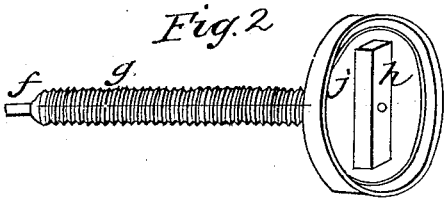


Fig. 2



UNITED STATES PATENT OFFICE.

GEORGE FABER, OF CANTON, OHIO.

MAGNETIC WATER-GAGE FOR BOILERS.

Specification forming part of Letters Patent No. **4,288**, dated November 26, 1845.

To all whom it may concern:

Be it known that I, GEORGE FABER, of Canton, in the county of Stark and State of Ohio, have invented a new and useful Method of Ascertaining the Height of Water in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the principle or character thereof which distinguishes it from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, Plate 1, is a perspective representation of my apparatus detached from the boiler. Fig. 1, Plate 2, is a longitudinal vertical section through the apparatus attached to a steam-boiler; and Figs. 3 and 4, Plate 1, are separate parts represented in perspective.

The same letters are used in all the figures to indicate like parts.

The importance of a reliable means of indicating the height of water in steam-boilers is now universally admitted by engineers, for the reason, indicated by science and established by experience, that the deficiency of water in boilers is the principal, if not the only, source of explosions, and hence the many attempts which have been made to obtain an apparatus for this purpose, which, while it can be relied on, will at the same time be in such a condition as to insure the observance of the engineer; but, so far as I am informed, all the attempts heretofore made have failed, because of the difficulty of forming the connection between the water inside the boiler and an indicator, which, to be practically available to the engineer, must be outside. A float resting on the water and communicating with an index, a lever, or other device outside, through a stuffing-box, has generally been resorted to; but it is evident that the friction of the stuffing-box will prevent the working of such an apparatus, which must be sensitive, and which necessarily possesses very little power, as the buoyancy of the float is its only actuating force. To avoid this difficulty attempts have been made to put the indicator within the boiler by covering it with glass, but with as little success, for the action of high temperatures, it is known, renders the glass opaque.

My invention, it is believed, will avoid all these difficulties; and it consists simply in attaching a magnet to the axis of motion of a wheel or lever to which the float is suspended or attached, to communicate motion by attraction and repulsion to an index-needle turning on an axis outside the boiler and separated from the magnet by a steam-tight plate.

In the accompanying drawings, *a* represents a float, made in the usual manner, which is suspended by a chain, *b*, to a wheel, *c*, having two grooves to receive the chains *b d*, the latter having a counter-weight, *e*, by which, as the float rises, the wheel is turned to keep the chain *b* tight and insure the turning of the wheel by the movement of the float up and down, the chains for this purpose being attached to the periphery of the wheel and winding thereon in opposite directions, as represented in the drawings. This wheel *c* is attached to one end of a spindle, *f*, that passes through and turns in a metal tube, *g*, and its other end is provided with a natural or artificial magnet, *h*, with its poles at right angles with the spindle *f*. The tube *g* has a screw cut on its outer surface, by which it is inserted into the head of the boiler, and its outer end, *i*, is enlarged to form a box, *j*, in which the magnet rotates and in which it is confined by another box, *k*, which screws into it with a ground or packed joint, which effectually prevents all escape of steam through the tube *g*, in which the spindle *f* of the magnet rotates freely.

From the outer face of the plate *l* of the box *k*, which incloses the magnet, projects a stud-pin, *m*, in a line with the axis of the magnet, on which is hung a metallic needle or pointer, *n*, that is carried around by the attraction of the magnet and indicates by graduations on the plate *l* the quantity of water in the boiler. The graduations may indicate the rise and fall of the float by inches or parts of an inch at the discretion of the constructor.

The needle or pointer *n* should be inclosed in a glass case for protection, which, being removed to some distance from the head of the boiler, will not be seriously affected by the temperature thereof, and will therefore retain its transparency.

The magnet may be made of steel, magnetized in the usual manner, or of loadstone, and the surrounding-case, if desired, may consist of copper or any other substance which, in the

judgment of the constructor, will most tend to preserve the magnetism of the magnet.

To prevent the float from sinking or rising too high, pins can project from the back face of the box *j* to prevent the magnet *h* from making more than any desired portion of a revolution.

To avoid the float from being affected by the foaming of the water in the boiler, it may be inclosed in a tube closed at the bottom and perforated at the sides for the circulation of the water. The metal tube *g*, instead of being screwed into the head of the boiler, may be secured by flanges or any other known means of forming steam-tight connections; and the connection between the spindle of the magnet and the float, instead of being effected, as described above, by a chain passing over a pulley, may be variously arranged—as, for instance, the float may be attached to an arm projecting from the spindle of the magnet. In short, this connection can be made in any manner which will insure the rotation of the magnet by the movement of the float.

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

The method herein described, or any other substantially the same, of indicating the rise and fall of water in a steam boiler or generator by means of an indicator outside thereof actuated by a magnet connected with a float or any other body within the boiler that rises and falls with the water and connected with the magnet, substantially as herein described.

GEORGE FABER.

Witnesses:

DANIEL DEEVEATTY,

HIRAM GRISWOLD.