G. T. PARRY.

PREVENTING INCRUSTATION OF STEAM BOILERS.

No. 50,773. Patented Oct. 31, 1865.

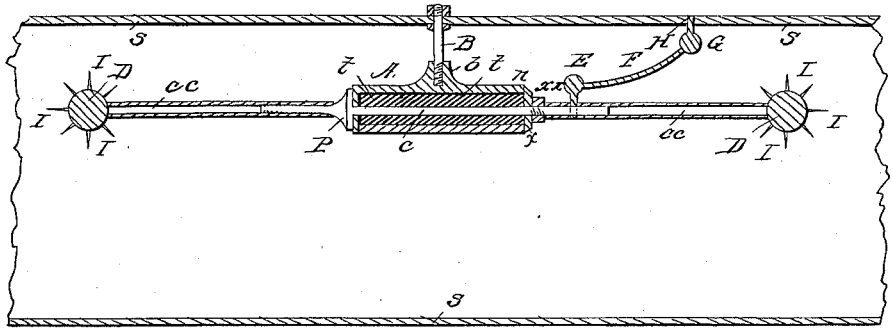


Fig. 1

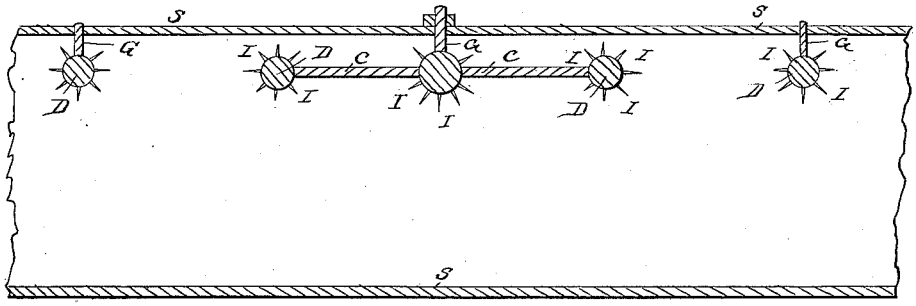
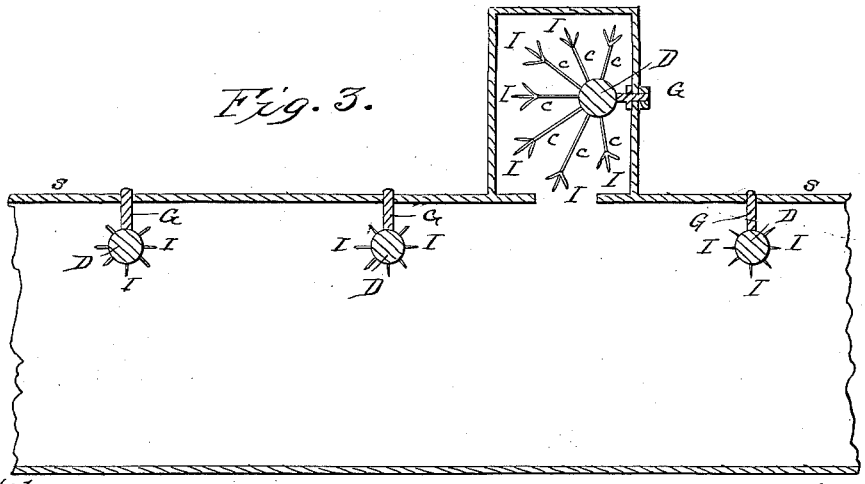


Fig. 2.

Fig. 3.



Witnesses

R. B. Dilworth

Inventor

George T. Parry

UNITED STATES PATENT OFFICE.

GEORGE T. PARRY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO ROBERT B. BAKER, OF SAME PLACE.

IMPROVEMENT IN PREVENTING INCRUSTATION OF STEAM-BOILERS.

Specification forming part of Letters Patent No. **50,773**, dated October 31, 1865.

To all whom it may concern:

Be it known that I, GEORGE T. PARRY, of the city of Philadelphia and State of Pennsylvania, have invented a new and useful Mode of Preventing the Formation of Scale or Incrustation within Steam-Boilers; and I hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure S represents the outside shell of a steam-boiler.

Fig. A is a hollow box, made of cast-iron, the inside of which is covered or lined with a thick enamel of glass or other good non-conducting material, *t*. This enamel extends from the inside over the ends and to some distance over the outside of the box. B is a metallic rod, having a screw at each end, one of which is screwed into the projection *b* and the other into the boiler, or otherwise made fast by a nut and washer on the outside of the boiler. C is a brass or copper rod running entirely through the box A. The box is filled with ground glass or any non-conducting material, *t*, so as to make the rod C, which passes through the box A, perfectly insulated from contact with the surrounding metals. A cap or cover, X, is then placed on at *n*, and by turning the nut *x x* in the end of the rod C the collar P on the rod C, as well as the cap X, is pressed firm and steam-tight, making by this arrangement a cheap, durable, and perfectly-insulated rod running through the said hollow box A. The extreme ends of C are fitted with a screw-thread; so as to permit a hollow brass or copper tube, *c c*, to be screwed firm on the ends of the rod C. D is a brass or copper projection or knob on the ends of *c c*. Into this knob I screw any convenient number of permanent magnets, I I I, each one having a negative or south-pole attraction. E is a pin or plug of brass or copper, having a screw at one end and a globe shape at the other. A small hole is drilled through the globe end of E for the purpose of receiving the end of F, which is a copper wire. G is a pin or plug the same shape as E. This pin is screwed into the steam-room of the boiler at H. The pin E is screwed into the rod C. One end of the wire F is put through the hole in the ball end of E and twisted firm and tight around the wire F, while the other end is put through the hole in the end of the pin G and made equally firm and tight against the wire F.

Having described the mode of making the parts appertaining to this invention, as well as the way I attach it to a steam-boiler, I wish it understood that I may not in all cases follow through all its minutia.

Fig. 2 shows the magnets attached to the horizontal rod C, without the insulated box A, the supporter *g* being used in this plan in lieu of the wire F to convey the electrical current to the shell of the boiler.

Fig. 3 is the attachment in the steam-drum of a boiler, and the current conducted in the same manner as shown in Fig. 2.

As nearly all boilers vary in their construction, many circumstances may arise which will cause a deviation without, however, departing from the general principles of the invention.

My reason why such an attachment to a steam-boiler throws off old scale, as well as preventing it from re-forming or adhering to the interior of a boiler is as follows: A close inspection shows nearly all kinds of scale or incrustation found within steam-boilers is as a mass or sheet of crystals or of crystalline formations; and as many scientific persons admit (or do not deny it) that crystals found in rocks and crevices throughout the universe owe their existence or their formation to electrical attraction or precipitation, I very naturally concluded that the scale (crystal) found within a steam-boiler arose from a similar cause—*i. e.*, electrical attraction or precipitation—also that the matter which formed such scales or crystals was released from its combination with water the moment said water was transposed into steam. The particles thus released, being extremely light and infinitely small, float about the water until there is sufficient positive electricity liberated or set free by ebullition to act upon these minute particles, and thus cause their precipitation to the negative iron of the boiler. Experiment proves that positive electricity expels or throws off, while negative attracts or collects together, small particles. Therefore, when, by ebullition or otherwise, positive electricity is liberated or formed within the steam-room of a boiler, its action is to

precipitate to the bottom, flues, &c., the released particles, as aforesaid, in the form of crystals or scales.

Now, to counteract the negative condition of the boiler and to charge or convey to it a current of positive electricity, I place the horizontal rod C, with its connections, as before described, in the steam-room of a boiler, and, if possible, place one of the knobs D, having the south-pole magnets in it, directly over the fire-bridge wall or the hottest part of the boiler, and these magnets, having a powerful attraction, induce a negative electric or magnetic current, which is carried by the insulation of the rod C to the ball screwed into said rod C, and thence along the wire F to the pin or plug attached to the boiler at H. The current by this plan becomes reversed, and a positive current enters the shell of the boiler, and, it being induced under a greater heat than the spot where it is delivered to the boiler, it becomes by this arrangement a thermo-electrical current of great quantity, but of more feeble intensity than a direct shock, which, by reason of its extreme rapidity, would fail to perform what this does. This current, thus entering the shell of the boiler at H, then finds its way by its own laws to all the tubes, sheets, and flues of the boiler, sometimes making vibrations or tremblings similar to that experienced from the poles of a battery, and these tremblings being incessant, although strong or weak, as the current within the boiler may determine, they have the effect of causing the old scale to fall off, while they or it effectually prevents it from re-forming or again adhering to the interior of a steam-boiler.

I may or may not be altogether correct as regards my theory of the formation of scale, (crystals,) or of the precise action of this invention while it is within the boiler; but as experiment often repeated and of long duration, as well as that I have it in use on many boilers, where it has proved that it does cause old scale to fall off, while it prevents it from re-forming or adhering to the interior of the boiler, I know that I have made a most singular and useful invention, whatever may be its rationale.

Having described the making and the operation of this invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Suspending within a steam-boiler one or more permanent magnets for the purpose of inducing an electrical current, to operate as described.

2. The hollow box A, with its insulated lining, together with the manner of packing and insulating the rod C, which passes through the said box.

GEORGE T. PARRY.

Witnesses:

ANDREW J. HOLMEAD,

R. B. DILWORTH.