(No Model.)

J. B. HANNAY.

INCRUSTATION PREVENTIVE.

No. 285,615. Patented Sept. 25, 1883.

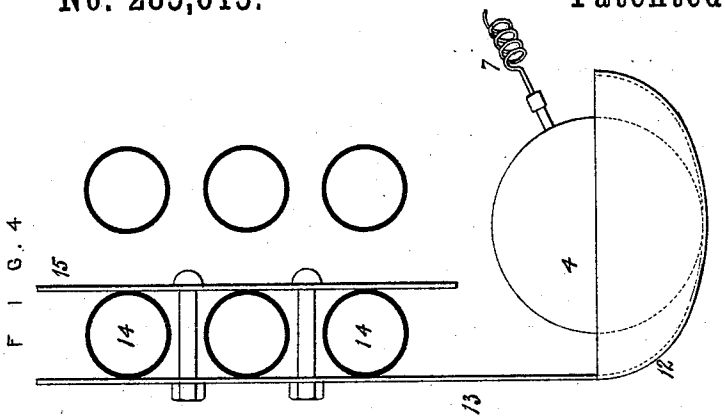


FIG. 4.

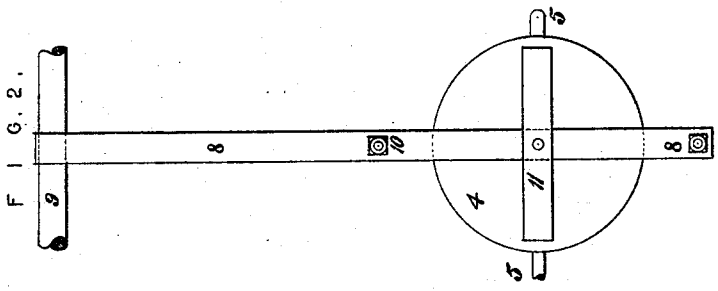


FIG. 2.

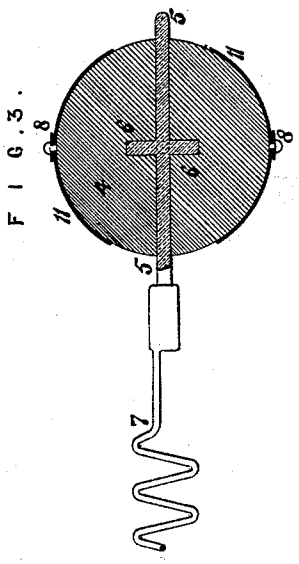


FIG. 3.

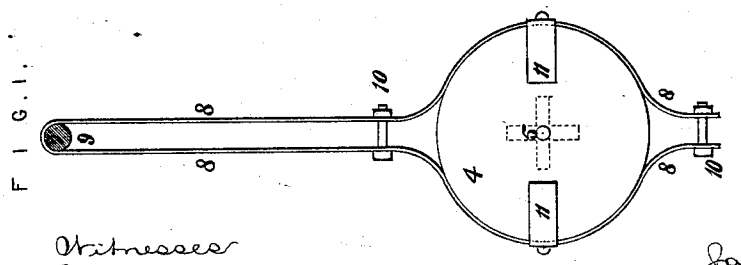


FIG. 1.

Witnesses
Harry Drury
Harry L. Ashenfelter.

Inventor.
James B. Hannay
by his Attys.
Howson and Sons

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JAMES B. HANNAY, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

INCRUSTATION-PREVENTIVE.

SPECIFICATION forming part of Letters Patent No. 285,615, dated September 25, 1883.

Application filed April 9, 1883. (No model.) Patented in England June 11, 1881, No. 2,544; in France December 15, 1882, No. 152,645, and in Italy December 18, 1882, No. 14,907.

To all whom it may concern:

Be it known that I, JAMES BALLANTYNE HANNAY, a subject of the Queen of Great Britain and Ireland, and residing at Glasgow, county of Lanark, Scotland, have invented certain Improvements in Applying Zinc for Preventing Corrosion in Steam-Boilers, (for which I have obtained the following patents: Great Britain, dated June 11, 1881, No. 2,544; France, dated December 15, 1882, No. 152,645; Italy, dated December 18, 1882, No. 14,907,) of which the following is a specification.

When zinc is used in steam-boilers as an anti-corrosive agent, it becomes itself corroded through its mass, and when employed in the form of plates or other comparatively thin extended form it rapidly disintegrates and portions become detached from the main body. I believe that the maintenance of a proper and sufficient metallic connection between the zinc and the shell or other part of the boiler is essential, or at any rate of great importance, for the obtainment of the desired anti-corrosive or protective action; and to secure this result the zinc is by my invention applied in blocks or masses which are of a spherical or spheroidal or polyhedral or cubical form or other form having but small difference of thickness in different directions, preference being given to the simple spherical form. Each sphere or block is by preference three inches, or more, in diameter, and has a wire metallically united to it, so as to extend to or beyond its center, the union being effected by casting the block upon the wire, or in some other sufficient manner. The wire, which may be of copper or of other suitable metal or alloy which is a good conductor of electricity, has its other end attached, by soldering or brazing or other equivalent means, to the shell or tubes or other part of the boiler which it is wished to protect from corrosion. The spheres or blocks are placed in the water in the boiler in any convenient situation, and are suspended or supported in any convenient way, but by preference not by means of the conducting-wires. The blocks or masses of zinc are cast; but in order to render them more durable and efficient they are subsequently brought into the condition known as "malleable." For this purpose the masses are hammered or forcibly pressed or rolled, the operation being by preference effected suddenly. Thus a convenient and satisfactory means for the purpose consists of a powerful screw-press fitted with a heavy fly-wheel or heavily-weighted arms and provided with suitably-shaped dies. The blocks or masses are by preference submitted to the hammering or compressing operation when heated to a temperature between 120° and 160° centigrade. By a further improvement the zinc is made more susceptible of being rendered malleable by being alloyed with a small portion—say not more than ten per centum—of lead, tin, or copper.

Figures 1 and 2 on the accompanying sheet of drawings are front and side elevations of a spherical block of zinc as suspended in a boiler, and Fig. 3 is a horizontal section.

In these drawings the same reference-numerals are used to mark the same or like parts wherever they are repeated.

The sphere or ball 4, of zinc, is cast upon a brass core, 5, formed, by preference, as shown, with projections 6 radiating from the center. To one end of this core 5 there is soldered or brazed a copper wire, 7, the other end of which is soldered to the shell of the boiler. The ball 4 is suspended by means of an iron strap, 8, from one of the boiler-stays, 9, the ball being held or clipped between the lower ends of the strap 8 by means of screw-bolts 10, and by means of cross-pieces 11, riveted to the strap ends. Another very convenient mode of holding the zinc ball is shown in Fig. 4. According to this modification the ball 4 is simply placed in a ladle, 12, having a handle, 13, which is attached to some of the tubes 14 of the boiler by a clamping-bar, 15, and screw-bolts.

I claim as my invention—

The combination of the shell of a steam-boiler and zinc blocks of a spherical or other form having small difference of thickness in different directions, supported in the boiler, with a conducting-wire distinct from the supports connecting each block to the shell of the boiler, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

J. B. HANNAY.

Witnesses:
EDMUND HUNT,
D. FERGUSON.