No. 800,296. PATENTED SEPT. 26, 1905.

A. HARRIS & F. A. ANDERSON.

ANTICORROSION DEVICE FOR SURFACE CONDENSERS.

APPLICATION FILED APR. 25, 1905.

Fig. 1.

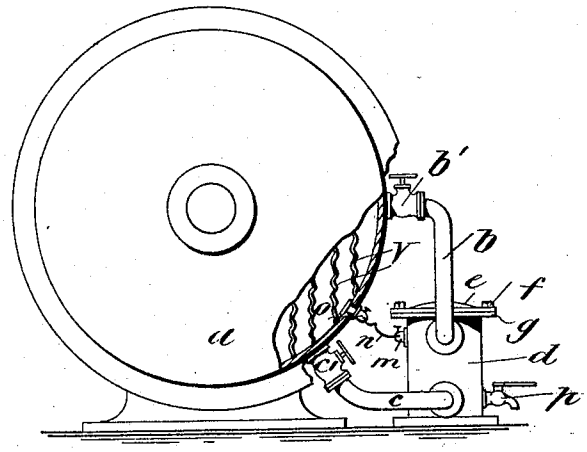



Fig. 2.

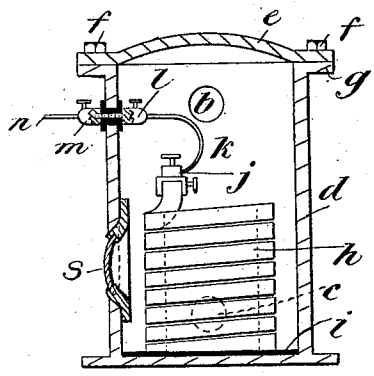
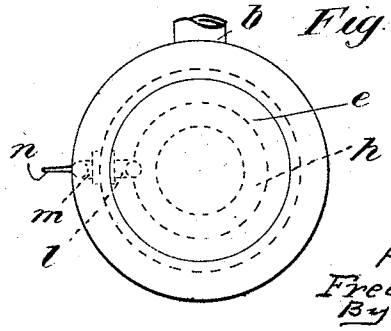



Fig. 3.

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# UNITED STATES PATENT OFFICE.

ANTHONY HARRIS, OF GREENOCK, SCOTLAND, AND FREDERIC ALFRED ANDERSON, OF WESTMINSTER, ENGLAND.

## ANTICORROSION DEVICE FOR SURFACE CONDENSERS.

No. 800,296. Specification of Letters Patent. Patented Sept. 26, 1905.

Application filed April 25, 1905. Serial No. 257,374½.

*To all whom it may concern:*

Be it known that we, ANTHONY HARRIS, residing in Greenock, Scotland, and FREDERIC ALFRED ANDERSON, residing in the city of Westminster, England, subjects of the King of Great Britain and Ireland, have invented certain new and useful Improvements in Anticorrosion Devices for Surface Condensers, of which the following is specification.

This invention relates to anticorrosion devices for use in connection with surface condensers. Heretofore when employing devices of this nature it has been customary to place the metal employed to protect the surfaces of condensers or the like within the said condenser. Under these circumstances the removal of the said metal for inspection or renewal could not be readily effected without throwing the condenser out of action.

It is the object of the present invention to avoid these disadvantages by providing means whereby the protective device may be located outside the condenser or the like and access thereto readily effected for the purposes of inspection or renewal.

In carrying the invention into effect we construct a metal or other vessel of cylindrical or other convenient form, within which is placed the mass of metal designed to protect the surfaces of the condenser against the corrosive action of the circulating water, such mass being placed in contact with the surfaces to be protected by means of a suitable connection, one end of which is secured to the mass and the other to the aforesaid condenser-surfaces. The vessel is provided with admission and discharge orifices, which by means of tubes are placed in communication with the condenser, so that the circulating water therein is free to pass therefrom through the vessel aforesaid and back to the condenser. The protective mass is preferably insulated by means of vulcanite or other non-conductor from the vessel. Taps or cocks are provided whereby the flow of water to and from the vessel may be shut off, and a cover is provided for the said vessel of such form and arrangement as to permit it to be readily removed for the purpose of inspection or renewal of the protective mass contained therein. If desired, the vessel may be provided with an aperture or apertures in which is or are secured sheets of glass or other transparent material in order that the contents of the vessel may be inspected without removing the cover thereof and during the operation of the condenser.

In order that the invention may be the better understood, drawings are appended illustrating an embodiment of the invention, in which—

Figure 1 is an end view of a condenser with the invention applied thereto. Fig. 2 is an enlarged vertical section of the device. Fig. 3 is a plan of same to the same scale as Fig. 2.

Referring to the appended drawings, *a* indicates generally the condenser, to which are connected the pipes or tubes *b c*, such pipes being preferably arranged as shown in Fig. 1, in order that the water may circulate through the vessel *d*, to which the pipes *b c* are connected. The vessel *d* comprises a cylindrical body preferably formed of metal and provided with a cover *e*, secured to the flange *g* by means of bolts or the like *f*.

*h* indicates a mass of protective metal preferably formed of a length of metal of rectangular outline coiled or bent into spiral form. The protective metal is more electropositive than the metal lining of the condenser. By this means a surface of considerable area is exposed to the action of the circulating water. The coil rests upon a disk *i*, of vulcanite or other non-conductor of electricity, in order to avoid any metallic contact between the vessel itself and the aforesaid coil *h*. The upper end of the coil *h* is provided with a terminal *j*, to which is connected one end of a conductor *k*, leading to a terminal *l*, secured to but insulated from the vessel *d*. A second terminal *m* serves for the attachment of a second conductor *n*, which in its turn is attached to a terminal *o*, secured to but insulated from the shell of the condenser. From the terminal *o* a conductor may be led to the surfaces within the condenser which it is desired to protect. A tap or cock *p* may be provided upon the vessel *d* in order that, if desired, water may be drawn therefrom for test or other purposes.

It will be evident that by means of the device above described not only are the surfaces of the condenser preserved against cor-

rosion, but the difficulty heretofore experienced when it was desired to inspect or renew the protective metal are obviated, as the communication between the condenser and the vessel *d* may be readily shut off and the renewal or examination of the protective metal readily effected upon removing the cover *e*, the above operations being effected without interfering with the action of the condenser.

It is obvious that the arrangement and construction of the device may be varied as may be found in practice to be necessary or advisable.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. An anticorrosion device for surface condensers comprising a vessel in communication with the condenser and a mass of protective metal within such vessel and in metallic communication with the surfaces to be protected.

2. An anticorrosion device for surface condensers comprising a vessel provided with a removable cover, admission and discharge orifices in communication with the condenser, a mass of protective metal within the vessel and means for placing the mass in metallic contact with the surfaces to be protected.

3. An anticorrosion device for surface condensers comprising a vessel provided with a removable cover, admission and discharge orifices in communication with the condenser, means for closing the communication with the condenser, a mass of protective metal within the vessel and means for placing the mass in metallic contact with the surfaces to be protected.

4. An anticorrosion device for surface condensers comprising a vessel provided with admission and discharge orifices, tubes or pipes connecting such orifices with the condenser, taps or valves governing the admission of water to the vessel, a removable cover, a mass of protective metal within the vessel and means for placing the mass in metallic contact with the surfaces to be protected.

5. An anticorrosion device for surface condensers comprising a metallic vessel provided at its upper end with a flange and a cover secured thereto by means of bolts or the like, discharge and admission orifices in the vessel, pipes or tubes placing such orifices in communication with the condenser, taps or cocks for governing the flow and discharge of water to and from the vessel, a mass of protective metal within the vessel but out of metallic contact therewith, a terminal upon said mass, a wire connected thereto and leading to a second terminal secured to but insulated from the vessel a second terminal and a second wire connected thereto, and leading to a terminal secured to but insulated from the condenser-shell, such terminal being in metallic contact with the surfaces to be protected.

6. An anticorrosion device for surface condensers comprising a vessel in communication with the condenser and provided with a removable cover, a mass of protective metal within such vessel in metallic communication with the surfaces to be protected and windows or glazed apertures whereby the contents of the vessel may be inspected.

7. An anticorrosion device for surface condensers comprising a vessel provided with a removable cover, admission and discharge orifices in communication with the condenser, a mass of protective metal within the vessel and means for placing the mass in metallic contact with the surfaces to be protected, and windows or glazed apertures whereby the contents of the vessel may be inspected.

8. An anticorrosion device for surface condensers comprising a vessel provided with a removable cover, admission and discharge orifices in communication with the condenser, means for closing the communication with the condenser, a mass of protective metal within the vessel and means for placing the mass in metallic contact with the surfaces to be protected, and windows or glazed apertures whereby the contents of the vessel may be inspected.

9. An anticorrosion device for surface condensers comprising a vessel provided with admission and discharge orifices, tubes or pipes connecting such orifices with the condenser, taps or valves governing the admission of water to the vessel, a removable cover, a mass of protective metal within the vessel and means for placing the mass in metallic contact with the surfaces to be protected, and windows or glazed apertures whereby the contents of the vessel may be inspected.

10. An anticorrosion device for surface condensers comprising a metallic vessel provided at its upper end with a flange and a cover secured thereto by means of bolts or the like, discharge and admission orifices in the vessel, pipes or tubes placing such orifices in communication with the condenser, taps or cocks for governing the flow and discharge of water to and from the vessel, a mass of protective metal within the vessel but out of metallic contact therewith, a terminal upon said mass, a wire connected thereto and leading to a second terminal secured to but insulated from the vessel a second terminal and a second wire connected thereto, and leading to a terminal secured to but insulated from the condenser-shell, such terminal being in me-

tallic contact with the surfaces to be protected, and windows or glazed apertures whereby the contents of the vessel may be inspected.

11. An anticorrosion device for surface condensers comprising a vessel in communication with the condenser and provided with a removable cover, a mass of protective metal within such vessel in metallic communication with the surfaces to be protected and windows or glazed apertures whereby the contents of the vessel may be inspected.

In witness whereof we have set our hands in the presence of two witnesses.

ANTHONY HARRIS.
FREDERIC ALFRED ANDERSON.

Witnesses to signature of Anthony Harris:
WILLIAM GEORGE CLEGG,
ALLAN M. WILSON.

Witnesses to signature of Frederic Alfred Anderson:
FRED. C. SHORT,
E. BAMBRIDGE.