Patented Feb. 28, 1928. 1,660,597

UNITED STATES PATENT OFFICE.

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PROCESS FOR TREATING BRASS CONDENSER TUBES.

No Drawing. Application filed June 16, 1925. Serial No. 37,591.

This invention relates to a novel process for treating brass condenser tubes to prevent corrosion and deterioration thereof.

It is well known that sea water rapidly corrodes the brass tubes of condensers and that the life of a brass condenser tube is usually from sixty to ninety days, after which time it will be found to have deteriorated to such an extent as to require replacement. The present invention, therefore, has as one of its objects to evolve a novel process whereby such a tube may be provided with a permanent lining of an alloy which will resist the corrosive action of the saline and other impurities present in sea water, and by which process such tubes may be quickly and economically treated so as to be proof against corrosion and deterioration.

Another object of the invention is to provide a lining for brass condenser tubes in the nature of an alloy which will possess the properties of cohering to the wall of the tube when applied by the process of the invention, and in a manner such that there will be no likelihood of the lining or coating peeling from the wall of the tube or becoming cracked, the alloy possessing such a degree of malleability as to insure against such deterioration and yet being sufficiently hard to resist the abrasive action of sand and other solid particles which might be present in the condensing apparatus.

The invention contemplates, generally speaking, providing the inner surface of a brass condenser tube with a lining of an alloy which will possess the properties recited above, and this alloy consists of equal parts, by weight, of tin, lead, and zinc, the alloy being, of course, prepared in the usual manner by reducing the stated proportions of these metals to a molten state.

In carrying out the process, the tube to be treated is first swabbed interiorly with muriatic acid which has been cut with a suitable quantity of zinc, and the purpose of this swabbing step is, of course, to remove from the inner surface of the wall of the tube, all impurities and foreign matter such for example as grease, which may be present as a result of the steps employed in manufacturing the tube, so that when the tube is treated by this step, it will possess a clean and bright interior surface. In the next step of the process, the tube is supported for rotation above a heater such for example as a gaseous fuel burner which is positioned to direct its flame against the tube throughout the entire length of the tube, and while the burner is in operation and the flames are directed against the tube, the tube is rotated at approximately one hundred revolutions per minute and this step is continued until the tube has reached a temperature of 212° Fahrenheit, or a slightly higher temperature. At this point, a suitable quantity of the alloy in a molten state is poured slowly into one end of the tube and the speed of rotation of the tube is increased to approximately twelve hundred revolutions per minute, so that the molten alloy is spread, by centrifugal force, evenly over the inner surface of the wall of the tube. While the tube is still rotating, a suitable wiper saturated with oil, is inserted into the tube and moved from end to end thereof, and at this time the burner is cut out of operation and the swabbing step performed by the reciprocation of the wiper is repeated approximately five times and the wiper withdrawn. In this swabbing step, the molten alloy is evenly distributed over the inner surface of the wall of the tube, the oil upon the swab employed in this step serving to prevent sticking of the swab to the wall of the tube. The tube thus acted upon will, when cooled, be found to be coated with a smooth and bright film-like layer of the alloy, and the tube is then ready for installation in the condenser.

Inasmuch as the tin in the alloy has an affinity for the copper in the brass, the coating of the alloy will be more in the nature of a cohering surface film than in the nature of a lining. The lead in the alloy resists corrosion as it is not affected by the saline and other impurities in sea water, and the zinc of the alloy renders the coating sufficiently hard to resist the abrasive action of sand and other foreign solid particles.

Having thus described the invention, what we claim is:

1. The method of providing a condenser tube with an interior coating to prevent corrosion, which comprises the steps of simultaneously slowly rotating the tube and heating the same, and, when the tube has become heated, increasing the speed of rotation of the tube, introducing therein a quantity of molten metal capable of resisting corrosion, continuing the rotation of the tube

until the introduced metal has coated the wall thereof through centrifugal force, and, while the tube is still rotating, discontinuing the heating of the tube and reciprocating a wiper therethrough to effect even distribution of the molten metal.

2. The method of providing a condenser tube with an interior coating to prevent corrosion which comprises the steps of rotating the tube at approximately one hundred revolutions per minute about its axis and simultaneously applying heat to the exterior of the tube, increasing the speed of rotation of the tube to approximately twelve hundred revolutions per minute and simultaneously pouring into the tube a quantity of molten metal capable of resisting corrosion, continuing the rotation of the tube until the introduced metal has coated the wall thereof through centrifugal force, and, while the tube is still rotating, discontinuing the heating of the tube and reciprocating a wiper therethrough to effect even distribution of the molten metal.

In testimony whereof we affix our signatures.

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