UNITED STATES PATENT OFFICE.

JAMES M. WISHART, OF BOONE, IOWA.

IMPROVEMENT IN COMPOUNDS FOR REMOVING BOILER-INCRUSTATIONS.

Specification forming part of Letters Patent No. **169,219**, dated October 26, 1875; application filed September 7, 1875.

To all whom it may concern:

Be it known that I, JAMES M. WISHART, of Boone, in the county of Boone and State of Iowa, have invented a new and Improved Process for Removing Boiler-Incrustations; and I do hereby declare that the following is a full and exact description of the same.

This invention is a new process for removing incrustations from boilers, consisting mainly, first, in the employment of chlorine in the water in the boiler, for the purpose of cleansing it by neutralizing or throwing down the lime; second, in the employment of magnesia and spirits of sea-salt, for softening the incrustations upon the boiler-surface; and, third, in the employment, in connection with the magnesia and sea-salt, of vinegar for hastening the process.

These materials are used in connection with each other in a peculiar manner, as will be fully described hereinafter.

To enable others to employ my process, I will now proceed to fully describe the same.

To remove the incrustations from a boiler of twenty-horse power I proceed as follows: First, put into the boiler three full gages of water, in order to have an ample supply for the operation; then introduce therein, for the purpose of cleansing the water, three (3) pounds of chlorine-water, and heat the whole to a temperature of about 100° Fahrenheit, at which point it should remain about one (1) hour. For the purpose of softening the incrustations, then introduce one-half (½) pound of carbonate of magnesia, with twelve (12) pounds spirits of sea-salt, and let it remain another hour at the same temperature. Then introduce, for the purpose of hastening the operation, two (2) gallons of common vinegar, or three (3) pounds of concentrated vinegar.

The materials now having all been introduced into the boiler, the latter may be closed steam-tight by properly securing the man-hole plate and dome-covers in place, and closing the throttle-valve. The safety-valve lever may be set to allow the escape of steam at eighty (80) pounds pressure. The fire may now be started gently under the boiler, and the steam be raised to twenty (20) pounds pressure, at which point it should remain for about six (6) hours. The pressure may then be gradually raised to forty (40) pounds pressure, about at which point it should remain for six (6) hours more. Then increase the pressure to eighty (80) pounds, and let it remain one-half (½) hour. Then blow off the water from the boiler, and, removing the hand-hole and man-hole plates and dome-covers, let the boiler cool. Then take cleaners or scrapers, and draw from the boiler all incrustations that have been loosened by the operation. Then, as soon as the boiler is cool enough to accept of water, apply the hose with as much pressure as possible, for the purpose of removing the softened incrustations from the crown-sheet, stay-bolts, and flues.

If necessary, this operation, of course, may be repeated.

This process, of course, may be applied to vessels of any form or kind in which calcareous deposits are formed from the generation of steam.

The materials used in this process will not in any way affect the metal with which they may come in contact, but will act only on the calcareous and sedimentary incrustations.

The amount of material may be varied, of course, for boilers of different size; but the proportions should remain essentially the same.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The described process, consisting, essentially, in the employment of chlorine, carbonate of magnesia, spirits of sea-salt, and vinegar, in connection with heat, substantially as described.

This specification signed and witnessed this 17th day of August, 1875.

JAS. M. WISHART.

Witnesses:
V. H. GIBSON,
L. W. REYNOLDS.