UNITED STATES PATENT OFFICE.

CHAS. F. SIBBALD, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN PAINT COMPOUNDS.

Specification forming part of Letters Patent No. **9,717**, dated May 10, 1853.

To all whom it may concern:

Be it known that I, CHARLES FRASER SIBBALD, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful compound for preventing the formation of hard crust upon the inner surfaces of steam-boilers and for arresting the corrosion of the same, and which may be used with advantage for other purposes; and I do hereby declare that the following is a full, clear, and exact description of my said invention and of the manner of compounding and using the same.

It is a well-known fact that steam-boilers in general are subject to the deposit upon their interior surfaces of the earthy and other impurities of the water they evaporate. When boilers under such circumstances—as, for example, those of sea-steamers—are used uninteruptedly for any length of time, the coating or incrustation formed by the deposit becomes so thick that it seriously impairs their evaporating powers, and consequently impairs the efficiency of the engine and diminishes the speed of the vessel, while it also renders necessary the expenditure of a much larger quantity of fuel to evaporate a given quantity of water than would be required if the incrustation was not formed. The incrustation also becomes extremely hard, and hence requires a heavy expenditure of labor to clean the boilers at the conclusion of a voyage. As the incrustation is a very bad conductor of heat, it retards the transmission of the heat from the boiler-plates to the water, and hence the tubes or flues of boilers are frequently burned or seriously injured by the excessive fire kept up in order to produce sufficient steam. These and other evils accruing from the formation of the hard incrustation are so serious that many attempts have been made to find some convenient and cheap method of detaching it from the boiler-plates or to prevent its formation. The only effectual means hitherto discovered of detaching the incrustation has been the free use of the chipping-hammer, as the deposit is sufficiently hard to resist the action of wire brushes or scrapers. Various attempts have been made to prevent the formation of the deposit by introducing some substance into the boiler to act chemically upon the impurities in the water, and thus prevent their deposit. Some of the substances thus tried have had the effect of corroding the boiler with great energy, and thus doing greater injury than that they prevented. Others have acted to increase the solidity and hardness of the deposit, and all attempts of this character have hitherto proved ineffectual. Various attempts have also been made to prevent the formation of the deposit by coating the plates of the boiler with some preparation which should have that effect. Linseed-oil and white lead are among the substances that have been applied to the boiler-plates for this purpose. All these attempts have proved ineffectual, and on experimenting with these substances myself I have found that they speedily become detached from the boiler-plates by the boiling of the water, which of itself is sufficient to account for their inefficiency.

The object of my invention is to furnish a simple and efficient means of obviating the disadvantages and defects which arise from the formation of the hard incrustation upon the inner surfaces of boilers; and it consists of a mixture termed by me "Sibbald's metalline compound," which, when applied to a clean boiler, effectually prevents the formation of a hard deposit, and which, when applied to a foul boiler, has the effect of softening the deposit or incrustation to such a degree that it can easily be removed by scrapers or wire brushes without requiring the employment of the chipping hammer.

In order to prepare this compound, I take of tallow or such one pound; graphite, (a black lead, finely pulverized,) one pound; charcoal, finely pulverized, one-eighth of a pound. I first melt the tallow or the suet, and then add the other ingredients, which are thoroughly incorporated with the tallow by stirring. In order to make the mixture spread more easily over the surfaces of boilers to which it is applied, I sometimes mix oil gas-tar with it in the proportion of one gill to the quantities of materials above specified. In order to apply this compound, it is warmed and applied by means of a brush or other suitable means to the whole interior of the boiler, which may be slightly warmed to facilitate the operation. When applied it dries almost instantly, and

forms, when dry, a thin coating, resembling in appearance a coat of ordinary black paint. If the boiler be foul, the compound is to be applied directly upon the deposit or incrustation, and after using the boiler for a few days it will be found that the compound has so thoroughly disintegrated and softened the deposit that it can be easily removed from the boiler-plates by a scraper or wire brush. When applied to clean boilers it has the effect of preventing the formation of any hard incrustation, and has been found to adhere to the boiler-plates, notwithstanding the continued application of heat thereto. When the boiler is in operation the compound appears to assume a semi-fluid form and to increase the evaporating powers of the boiler. It has the effect also of stopping leaks at the seams of the boiler-plates and of preventing the corrosion of the metal.

From experiments I have found that it is expedient to apply the compound as often as once in two weeks, taking care before each application to clean the boiler thoroughly of any mud or other matters that may have subsided from the water after the boiling has been stopped.

The compound may also be applied occasionally to the exterior of boilers for the purpose of preventing rust, and, in fact, it may be applied with advantage to all metals which are placed in situations liable to corrode or rust. Thus, for example, the bolts used in ship-building may be coated with it, and to render the coating effectual the interior of the bolt-holes should be coated with the compound before the insertion of the bolt by applying the mixture in a fluid state and by rubbing it into the wood with a rod rather smaller than the bolt.

The mixture may also be used to advantage in coating the adjoining faces of timber used in ship-building, as the charcoal is an effectual disinfectant and absorbent, and the application also tends to prevent leakage. Its employment will have the effect of rendering vessels more healthy, prolonging their duration, and rendering them more serviceable.

The peculiarity which distinguishes my compound from other substances hitherto applied to steam-boilers is the property it possesses of adhering to the boiler-plates, notwithstanding the action of the heat. This property I believe to result from the combination of the three substances above enumerated, substantially in the proportions I have given. In the course of my experiments I have found that when these proportions were materially varied the compound was not found to possess the property of adhering to the boiler-plates with sufficient firmness to prevent the formation of a hard incrustation.

It is well known that many fatty substances have properties assimilating to those of suet and tallow, and such may be used in place of the latter; but I am not prepared to state that any are as good for the purpose. It is also well known that some substances possess in a greater or less degree the peculiar absorbent and disinfecting properties of charcoal, and such may be used to replace it in manufacturing this compound. Among the latter it may be suggested that pulverized coke might be employed; but, while I mention this material, I wish it to be understood that I have not had the opportunity of testing it, and therefore cannot recommend it as a perfect equivalent of charcoal in manufacturing my compound, although it would from analogy appear to possess the same properties.

Having thus described the manner in which my metalline compound may be made and pointed out a few of its uses, I do not claim either of its elements separately; but

What I claim as my invention, and desire to secure by Letters Patent, is—

The compound of tallow, plumbago, and charcoal herein specified, substantially in the manner and for the purpose herein set forth.

CHAS. F. SIBBALD.

Witnesses:
EDWARD S. PENNICK,
P. H. WATSON.