

# UNITED STATES PATENT OFFICE.

MAX BECKER, OF MANNHEIM, GERMANY.

## BOILER COMPOUND.

No. 907,954.

Specification of Letters Patent.

Patented Dec. 29, 1908.

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*To all whom it may concern:*

Be it known that I, MAX BECKER, subject of the German Emperor, residing at Mannheim, Germany, have invented new and useful Improvements in Boiler Compounds, of which the following is a specification.

The present invention relates to means for preventing incrustation in boilers and for loosening scale which is already present in boilers. Many means have already been proposed for the same purpose; none of these had the desired effect however, and besides having some good results they were so injurious in other respects that they could not be employed in practice. For example methods have been known according to which waste metal was to be put into the boiler for exercising cleansing action on the sides of the boiler. In a similar manner it was hoped that by means of triturated mixtures of sand, glass, wood or pieces of pumice-stone freshly deposited scale would be mechanically removed. As a matter of fact these means had a very injurious effect, since they settled down and burned together with the loosened mud and thus partly stopped up the valves and pipes or were carried away into the steam engines. It has also been proposed to put graphite mixed with the most different fatty materials into the boiler. As the graphite was mechanically bound, it alone could exercise absolutely no favorable action, whereas on the other hand the fatty admixtures have proved very injurious, as is well known.

In accordance with the present invention the new means consists of a mixture of about  $\frac{1}{12}$  to  $\frac{1}{10}$  ground pumice-stone, about  $\frac{1}{20}$  to  $\frac{1}{12}$  finely divided aluminium and about  $\frac{1}{4}$  to  $\frac{1}{10}$  graphite.

The mixture may for example be composed as follows:—ground pumice-stone 8%, finely divided aluminium 5%, graphite 87%.

The dry constituents are mixed well and put into the boiler. Each time the boiler is filled only a small quantity of the means is necessary. As the means does not dissolve or otherwise chemically change in the boiler, it becomes unusable in time only by it being gradually diluted too much with boiler scale

in the form of mud. Also a part of it particularly the graphite forms a smooth coating on the sides of the boiler, which latter in this manner remain black and free from incrustation as if the iron were quite new.

If the boiler already contains scale when the means is employed, the means causes the scale or fur to fall from the sides, which action is explained as follows: When the boiler is at full pressure the metal expands in consequence of the heating and, as the incrustation does not expand, cracks are produced therein and the compound fills said cracks and prevents their closure when the metal of the boiler cools. In this way the incrustation is detached from the sides of the boiler.

The new means possesses the further advantage that it also prevents all formation of rust in the boiler, and when such exists tends to prevent it increasing or entirely prevents the same.

The means has already proved satisfactory in various practical tests made with it. It is also distinguished in addition to the circumstances already mentioned particularly by it being approximately free from acid and therefore not attacking the boiler.

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

1. The hereindescribed compound for preventing incrustation in boilers and for loosening existing boiler-scale, consisting of graphite, pumice-stone and aluminium, substantially as described.

2. The hereindescribed compound for preventing incrustation in boilers and for loosening existing boiler-scale, consisting of ground pumice-stone eight per cent., finely divided aluminium five per cent., and graphite eighty-seven per cent., substantially as described.

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

MAX BECKER.

Witnesses:

GEORG KONRAD SCHÄFER,  
JOS. H. LEUTE.