(No Model.)

J. C. A. MARCKMANN.

STEAM BOILER AND FLUE SCRAPER.

No. 530,621. Patented Dec. 11, 1894.

Fig. 1.

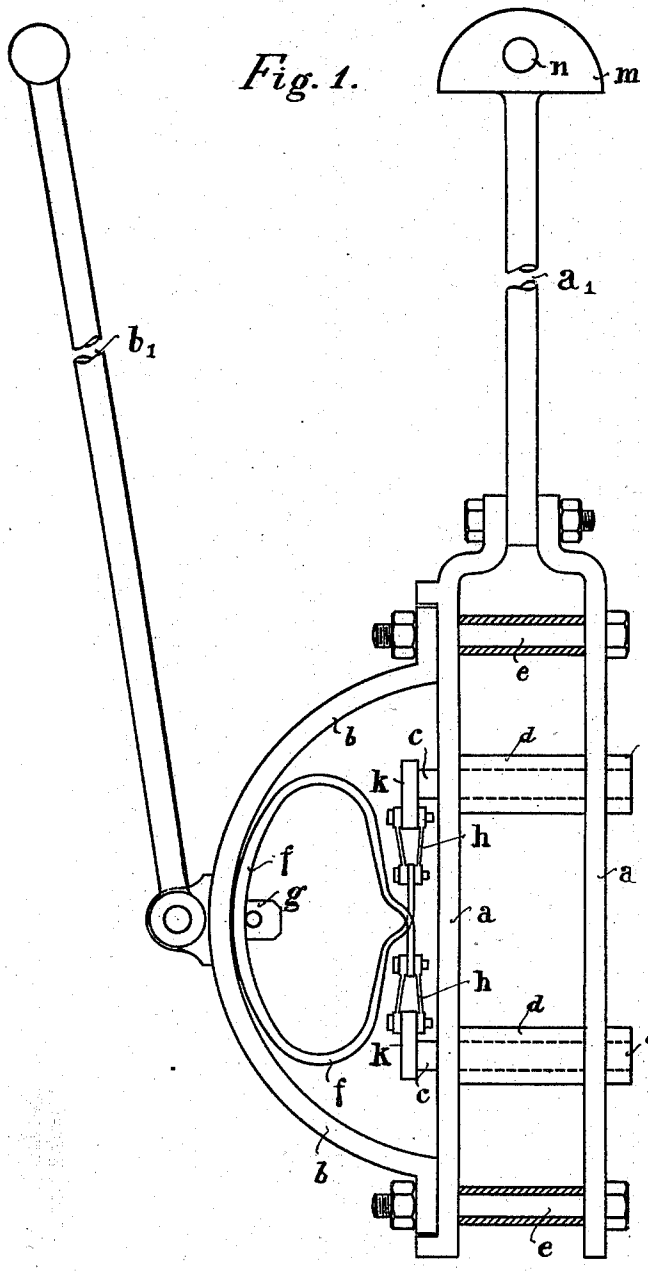
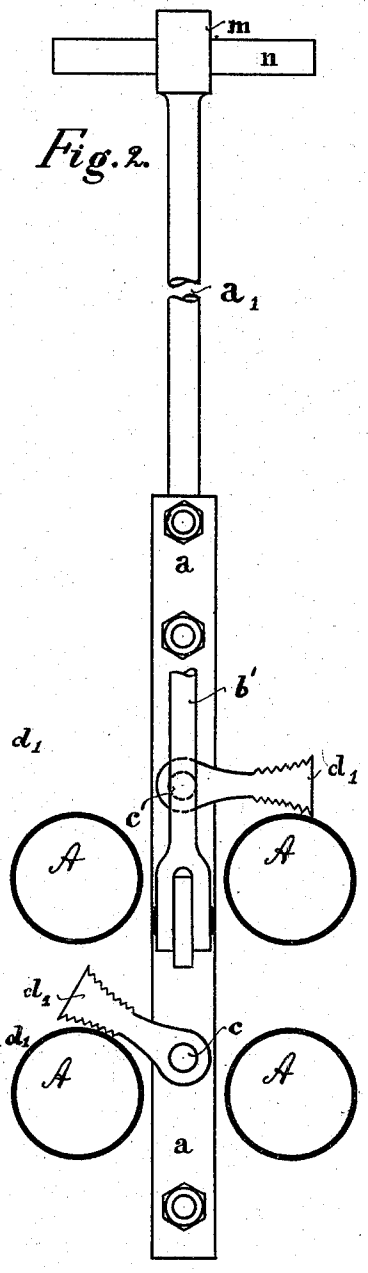


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHANNES CORNELIUS AMANDUS MARCKMANN, OF HAMBURG, GERMANY.

STEAM-BOILER AND FLUE SCRAPER.

SPECIFICATION forming part of Letters Patent No. 530,621, dated December 11, 1894.

Application filed July 19, 1894. Serial No. 517,973. (No model.)

To all whom it may concern:

Be it known that I, JOHANNES CORNELIUS AMANDUS MARCKMANN, residing at Hamburg, Germany, have invented new and useful Improvements in Steam-Boiler and Flue Scrapers, of which the following is a specification.

This invention relates to an improved apparatus for effectively removing the accumulations of salt, boiler scale and other deposits from the corners or pockets formed by the walls and fire tubes of steam boilers.

In the accompanying drawings: Figure 1 is a side elevation, partly in section, of my improved apparatus. Fig. 2 is a front elevation of part of the same.

The letter *a*, represents a frame carrying rotary shafts *c*, on which are fixed scrapers *d*, each of which consists of a broad body situated within the frame and of a narrow end *d'*, situated outside the frame, each part being formed with saw-like teeth on both sides.

b, is a bent piece or stirrup fixed by screw bolts *e*, to the frame *a*. An operating rod *b'*, is pivoted to the piece *b*, and an operating rod *a'*, is pivoted to the frame *a*.

f, is a leaf spring held in position inside the stirrup *b*, by means of a pin or stud *g*. The ends of this spring cross each other and are connected by means of small links *h*, to cranks *k*, fixed on the shafts *c*, so as to hold the scrapers *d*, in their central position. A strong cross piece or head *m*, perforated for the reception of a handle *n*, is formed on the end of the operating rod *a'*.

The operation of the apparatus is as follows: The frame *a*, is forced down between any two rows of tubes, as shown, by means of blows of a hammer upon the cross piece *m*, or otherwise, so that the toothed scrapers are caused to clean the upper halves of the tubes, by being drawn forcibly over them. Each scraper, upon leaving one tube is forced rapidly by the spring *f*, into contact with the next tube. The apparatus is then driven in an upward direction by means of hammer blows upon the under side of the cross piece *m*, or otherwise, and the lower halves of the tubes are thus freed from scale. The spring *f*, presses the scrapers forcibly against the tubes, which are scraped clean by the sharp teeth sliding over them. The wider parts of the scrapers serve for cleaning the tubes themselves, while the narrow parts *d'*, have for their object to remove the incrustations of salt or scale from the corners of the tube plates. To effect this object, the apparatus is driven against the tube plate by means of blows delivered upon the head of the obliquely held rod *b'*, so that the scrapers are enabled to penetrate with their side edges deeply into the corners and pockets.

In order to render the apparatus more effective, the number of scrapers may be increased if desired.

What I claim is—

The combination of a frame, with serrated scrapers pivoted thereto, a stirrup bolted to the frame, a spring secured to the stirrup and connected at its ends to the scrapers, a handle secured to the top of the frame, and a handle secured to the stirrup, substantially as specified.

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

JOHANNES CORNELIUS
AMANDUS MARCKMANN.

Witnesses:
WILHELM ROCH,
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