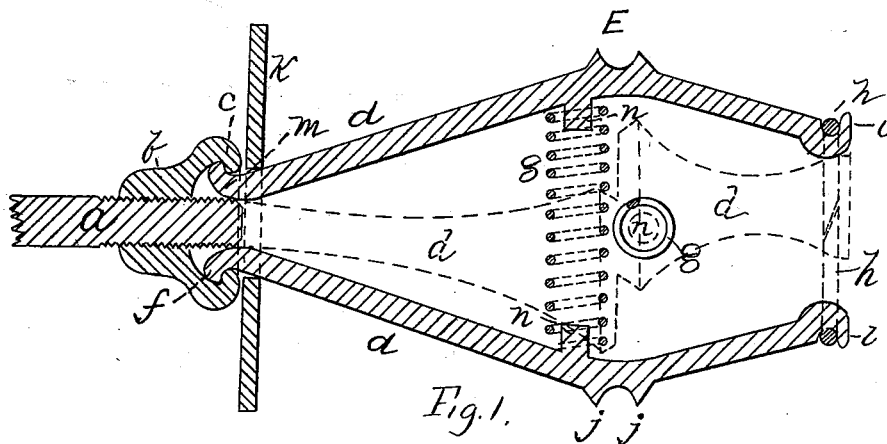
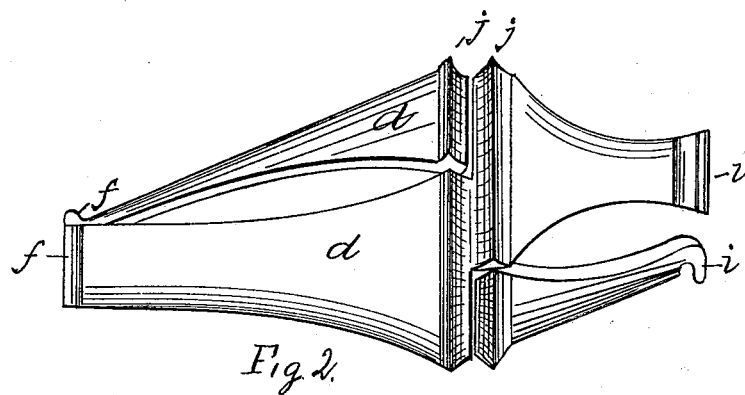


D. SULLIVAN.  
Boiler-Tube Cleaner.

No. 217,911.

Patented July 29, 1879.



Witness  
J. M. R. Mason  
Geo. F. Godfrey

Inventor  
Daniel Sullivan  
by Wm. Franklin & Co. Atty

# UNITED STATES PATENT OFFICE.

DANIEL SULLIVAN, OF BANGOR, MAINE.

## IMPROVEMENT IN BOILER-TUBE CLEANERS.

Specification forming part of Letters Patent No. **217,911**, dated July 29, 1879; application filed May 13, 1878.

*To all whom it may concern:*

Be it known that I, DANIEL SULLIVAN, of Bangor, in the county of Penobscot and State of Maine, have invented certain new and useful Improvements in Boiler-Tube Cleaners; and I do hereby declare that the following is a full, clear, and exact description of the invention, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 shows a longitudinal section; Fig. 2, a plan of scraper.

Same letters show like parts.

My invention aims at the production of a boiler-tube cleaner which shall be adjustable to tubes varying slightly in diameter and automatically adjustable to inequalities in diameter occurring in the same tube. It is so constructed as to adapt itself to the tube both when being inserted and withdrawn, and is made entirely without rivets or permanent joints. It can therefore be readily repaired when broken or worn, is comparatively inexpensive, and is simple and durable.

My invention will be readily understood by reference to the accompanying drawings, in which *a* shows the rod by which the cleaner is operated, screwing into a hole through a cup, *b*, having an inwardly-turned flange, *c*. At *d* are the scrapers, preferably four in number, forming, when united, a cleaner approaching the general shape of two cones united at their bases *E*.

The ends of the scrapers are provided at *f* with outwardly-turned lips, which are placed within the flange *c* of the cup *b*, and by screwing up the rod *a* are loosely held therein, forming a joint, *m*. At the bases *E* of the cones is a double row of scraping-edges, *j*, breaking joints, as shown.

The scrapers *d* are kept spread by springs *g g*, held in place by lugs projecting from the interior surface of the scrapers, as at *n*, and are kept together by a contracting spring-ring, *h*, passing over lips *i* at the outer ends of the scrapers.

At the cup end I place a disk, *k*, surrounding the scrapers, formed of rubber or similar material, slightly larger in diameter than the tube to be cleaned, which, following the scrapers *d*, removes all the loose dirt from the tubes.

To take the cleaner apart, it is only necessary to press the scrapers together, remove the ring *h*, permitting them to spread, then remove the expanding-springs *g g*, and unscrew the rod *a* until the lips *f* can be removed from the cup *b*. To replace the parts the operation is reversed.

I do not claim a cleaning-disk, broadly, as I am aware that similar devices have been used before; but I claim the manner of attachment to my cleaner, my disk being held in place on the one side by the conical shape of the united scrapers, and on the other by the joint *m*.

I do not claim double scrapers of the kind shown in the patent of Freeman and Arm-buster, No. 133,578, in which the joints are broken by rings surrounding the middle of the cleaner.

In my invention the joints between the scrapers are broken in a different manner, each scraper being cast in one piece in such form that when united its edges at the base of the double cone overlap the scrapers on each side. The form and construction will be best understood by reference to Fig. 2 in the drawings.

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

1. In a boiler-tube cleaner, the combination of the screw-rod *a* and inwardly-flanged cup *b* with the scrapers *d*, provided with the outwardly-turned lips *f*, forming in combination the joint *m*, substantially as shown, for the purposes specified.

2. In a tube-cleaner, the scrapers *d*, substantially of the form shown in Fig. 2, each cast in one piece, forming, when united, a double cone, provided with a double row of cutting-edges at their bases, breaking joints, as shown and described, substantially as set forth.

3. The combination of the scrapers *d*, jointed at *f*, expanding-springs *g g*, lips *i*, and contracting-spring *h*, substantially as set forth.

4. In a tube-scraper, the combination of the rubber disk *k*, the inwardly-flanged nut *b*, and the tapering scrapers *d*, adapted to carry and hold said disk in position, in the manner set forth and described.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of May, 1878.

Witnesses: DANIEL SULLIVAN.  
WM. FRANKLIN SEAVEY,  
G. L. SEAVEY.