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APPARATUS FOR SCALING AND CLEANING STEAM BOILER, SUPERHEATER, AND LIKE TUBES.

APPLICATION FILED FEB. 8, 1912.

1,028,075. **Patented May 28, 1912.**

Fig. 1.

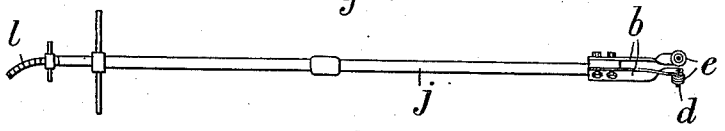


Fig. 2.

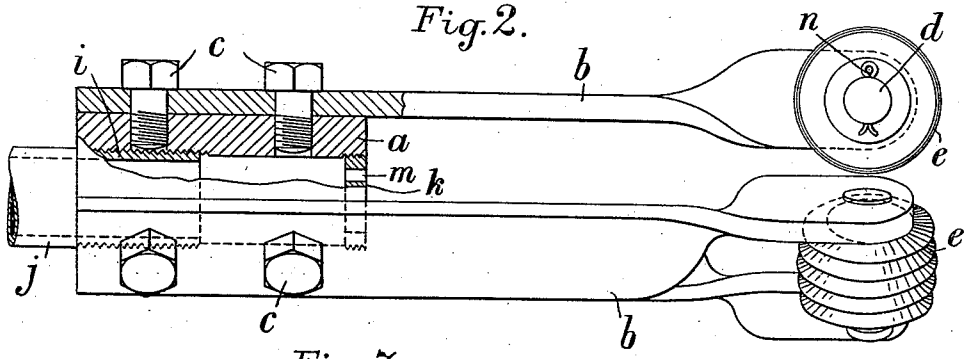


Fig. 3.

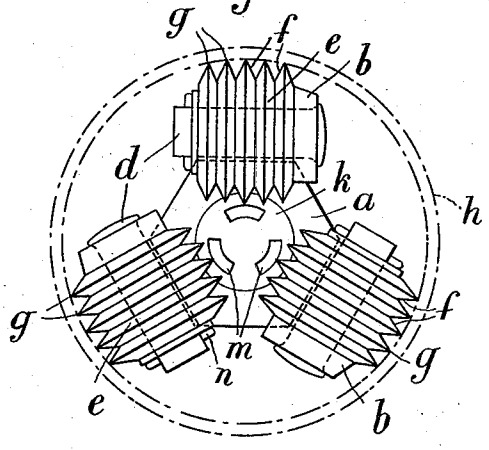
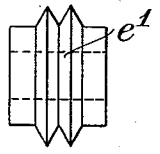


Fig. 4.



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ARTHUR BARNHART KENDAL, OF WELLINGTON, AND JAMES ARTHUR COLLINSON, OF HADLEY, ENGLAND.

APPARATUS FOR SCALING AND CLEANING STEAM-BOILER, SUPERHEATER, AND LIKE TUBES.

1,028,075. Specification of Letters Patent. Patented May 28, 1912.

Application filed February 8, 1912. Serial No. 676,346.

To all whom it may concern:

Be it known that we, ARTHUR BARNHART KENDAL, a subject of the King of Great Britain, residing at Wellington, Shropshire, England, and JAMES ARTHUR COLLINSON, a subject of the King of Great Britain, residing at Hadley, Shropshire, England, have invented new and useful Improvements in Apparatus for Scaling and Cleaning Steam-Boiler, Superheater, and Like Tubes, of which the following is a specification.

This invention relates to apparatus for scaling and cleaning steam-boiler, superheater and like tubes, and comprises a series of rollers revolubly mounted on spring arms fixed to a hollow handle through which water can be supplied during the scaling and cleaning operation. Each roller is furnished with cutting edges formed by a number of annular grooves in its periphery, and the rollers are so mounted that their cutting edges lie in planes that are parallel to the axis of the tube to be cleaned. These rollers bear against the inner wall of the tube to be cleaned and the cleaning is effected by moving the handle by hand or otherwise longitudinally to and fro in the tube, water being simultaneously supplied and directed on to the rollers to prevent the latter from becoming clogged by scale or other matter removed from the tube.

Referring to the accompanying drawing:—Figure 1 is a general view of our improved scaling and cleaning apparatus. Fig. 2 is a side view drawn to a larger scale, of the operative or head end thereof. Fig. 3 is an end view of the parts shown in Fig. 2. Fig. 4 illustrates a modified form of roller hereinafter referred to.

As shown in this drawing, *a* is a hollow hub having spring arms *b* fixed thereto, for example, by set screws *c*. At the outer or free end of these arms pivot-pins *d* are provided, on which rollers *e* are rotatably mounted. The peripheries of these rollers *e* have annular grooves *f* formed therein and the general outline of the said rollers conforms to a circle of suitable diameter so that all the cutting edges *g* between the grooves *f* will bear closely against the curved wall of the tube to be cleaned as illustrated in Fig. 3 wherein the tube is indicated by broken lines *h*. It should be noted that the cutting edges *g* are arranged in planes parallel to the longitudinal axis of the hub *a* and the tube to be cleaned. The spring arms *b* are twisted about their longitudinal axes as shown so as to bring the pivot pins *d* to the required positions the said arms being also made of a length sufficient to insure the required flexibility or resiliency thereof.

The hub *a* is screw-threaded at *i* to receive a hollow handle *j* and is provided at the other end with a perforated end wall or plate *k*. Water supplied to the apparatus under the control of a tap or valve (not shown), through a flexible hose pipe *l* connected to the hollow handle *j* by means of a suitable coupling, is distributed on the rollers *e* through orifices *m* in the plate *k*, to prevent clogging of the rollers, the flush of water also serving to wash out the scale or mud detached from the walls of the tube being cleaned. If desired the apparatus may be used without water jets.

In the arrangement shown three rollers are provided, but two or any other convenient number of rollers may be employed if preferred. Also each roller is shown formed with several cutting edges, but when the apparatus is employed to dislodge very hard scale, rollers having only two cutting edges as shown in Fig. 4 are preferable. The rollers are retained on the pivot pins *d* by linch pins *n* so that different sets of rollers may be readily interchanged. If desired, the arms carrying the rollers may be so mounted on the hub that they can be adjusted as regards spread.

This scaling and cleaning apparatus is suitable for cleaning slightly bent tubes as well as straight tubes, and it is unnecessary to remove the appliance for the purpose of washing down the tube until the scaling is completed.

The apparatus will not damage the tubes, it is easily worked, no special knowledge being required, and its manufacture is cheap. Moreover, it is very efficient in use as the scale is cut through to the surface of the tube instead of being removed in layers as in the usual scraping methods heretofore adopted.

What we claim is:—

1. Apparatus for scaling and cleaning steam boiler and like tubes, and apparatus comprising in combination a hollow

hub having a perforated end wall through which water can be delivered, a tubular operating handle secured to said hub, a series of spring arms fixed to said hub, and each of which arms carries at its free end a pin and a roller revolubly mounted on said pin, each of said rollers being grooved around its periphery to provide a multiple number of cutting edges in planes perpendicular to the axis of the roller, said rollers being further arranged with their axes in the same plane, which is perpendicular to the axis of the operating handle, and with their annular grooves and cutting edges in planes that are parallel to the axis of the operating handle.

2. Apparatus for scaling and cleaning steam boiler and like tubes, said apparatus comprising in combination a hollow hub having a perforated end wall through which water can be delivered, a tubular operating handle secured to said hub, a series of spring arms fixed to said hub, and each of which arms carries at its free end a pin and a roller revolubly mounted on said pin, each of said rollers being grooved around its periphery to provide a multiple number of cutting edges in planes perpendicular to the axis of the roller, said rollers being further arranged with their axes in the same plane, which is perpendicular to the axis of the operating handle, and with their annular grooves and cutting edges in planes that are parallel to the axis of the operating handle, the said rollers having a barrel shaped outline so that all the cutting edges may bear against the curved wall of the tube to be cleaned.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."