

(No Model.)

J. PLATT & T. THORP.
APPARATUS FOR REMOVING SCALE FROM TUBES IN STEAM BOILERS.
No. 452,802. Patented May 26, 1891.

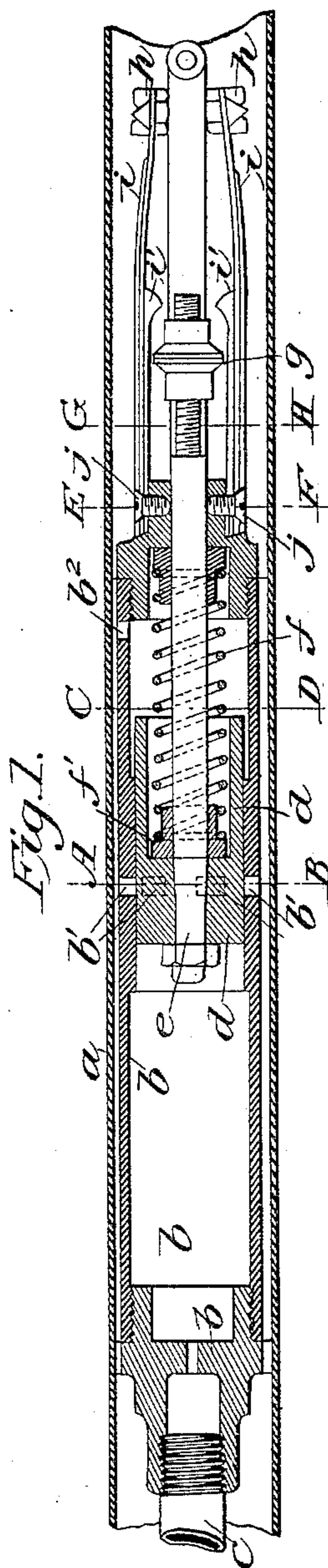
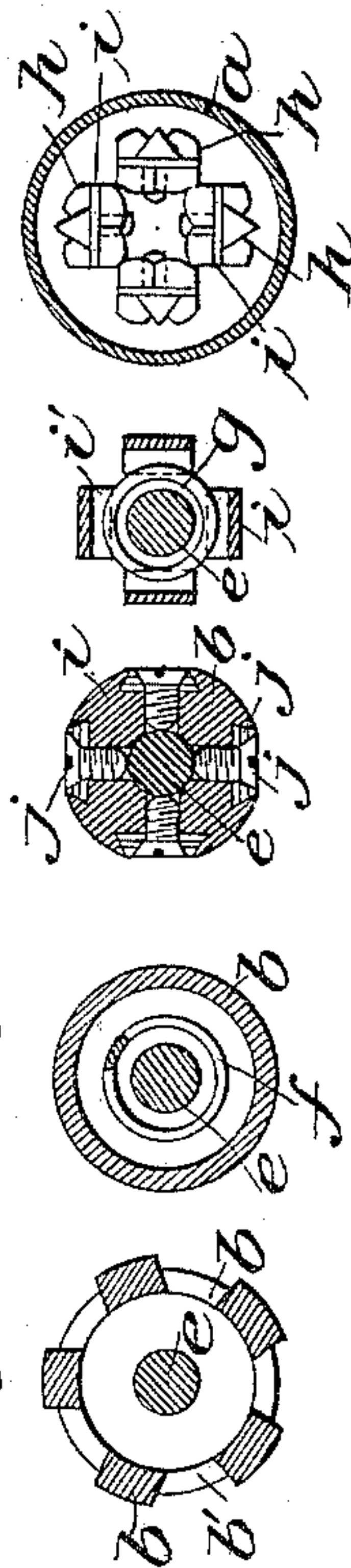


Fig. 3. Fig. 4. Fig. 5. Fig. 6. Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN PLATT AND THOMAS THORP, OF SALFORD, ENGLAND.

APPARATUS FOR REMOVING SCALE FROM TUBES IN STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 452,802, dated May 26, 1891.

Application filed March 18, 1890. Serial No. 344,322. (No model.) Patented in England July 26, 1889, No. 11,867, and in France September 10, 1889, No. 200,688.

To all whom it may concern:

Be it known that we, JOHN PLATT and THOMAS THORP, both subjects of the Queen of Great Britain, residing at Salford, in the county of Lancaster, England, have invented certain new and useful Improvements in Apparatus for Removing Scale and Incrustation from the Inside and Outside of Tubes and from other Parts of Steam-Boilers and the Like, (for which we have obtained Letters Patent in Great Britain bearing date July 26, 1889, No. 11,867, and in France September 10, 1889, No. 200,688,) of which the following is a specification.

Our improved apparatus is particularly adapted for removing scale and other incrustation from the interior of tubes; but it is also applicable for cleaning the exterior of tubes and other surfaces; and it consists, essentially, of a small steam or compressed-air cylinder. The cylinder is provided with a piston, the rod of which passes through the head at the opposite end to which steam is admitted. Exhaust-passages are made round the periphery of the cylinder a short distance from the admission-port. A spring or springs is confined between the piston and the other head of the cylinder. To the projecting end of the piston-rod is secured an adjustable cam or equivalent means for giving motion to the chipping-tools, which in one arrangement are carried on spring-pieces which are secured to the cylinder. These spring-pieces are bent or have suitable pieces secured to them, on which the piston-rod cam or its equivalent acts.

In order that our invention may be fully understood and readily carried into effect, we will describe the accompanying sheet of drawings, reference being had to the letters marked thereon.

Figure 1 is a longitudinal section, and Fig. 2 an end view, of a boiler or other tube and our improved apparatus for removing scale therefrom; and Figs. 3, 4, 5, and 6 are transverse vertical sections taken, respectively, on the lines A B, C D, E F, and G H, Fig. 1.

In the views, *a* designates the tube to be cleaned; *b*, the steam-cylinder; *b'*, the ex-

haust-ports made therein; *c*, a tube or hollow stem through which steam, compressed air, or other fluid under pressure is admitted to the interior of the cylinder *b*; *d*, the piston; *e*, the piston-rod; *f*, the spring coiled thereon and confined between two collars *f'*, one abutting against the cylinder-head and the other against the piston.

g is the cam or tappet screwed or otherwise adjustably secured upon the piston-rod *e*. *h* are the chipping or cutting tools carried on the spring-pieces *i*, which are fixed by screws *j* to the head of the cylinder *b*, and are provided with shoulders or projections *i'*.

In operation steam is admitted to the cylinder *b* through the hollow stem *c*, the effect of which is to drive the piston *d* outward until it uncovers the exhaust-ports *b'*, any fluid in front of the piston escaping through the port or aperture *b'*. As soon as sufficient steam has escaped the spring *f*, which has been compressed by the outward movement of the piston *d*, forces the piston and piston-rod *e* back, and thus a rapid reciprocating motion is set up and the tappet *g* constantly acts upon the projections *i'* on the spring-pieces *i*, by which means the chippers or cutters *h* are caused to give a series of rapid light blows to the scale on the tube *a* so long as steam is admitted to the cylinder. For convenience in manipulating the apparatus steam is preferably admitted to the cylinder through a flexible tube or through a flexible joint or joints. The operator, who holds the steam-admission pipe in his hand, can always move the apparatus backward or forward and turn it within the tube *a*.

We may or may not fix a ring (or rings) of cutters round the cylinder-heads, which act upon the tube *a* after the chipping-tools *h*.

Various modifications may be made in the means for actuating the chipping-tools from the reciprocating piston-rod.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim, and desire to secure by Letters Patent of the United States, is—

The combination, with the cylinder *b*, provided with exhaust-ports *b'*, the piston *d*, spring *f*, piston-rod *e*, and tappet *g*, of the chipping-tools *h*, supported on spring-pieces
5 *i*, secured to the cylinder *b*, and provided with projections *i'*, all substantially as and for the purposes herein set forth.

In witness whereof we have hereunto set hands in presence of two witnesses.

JOHN PLATT.
THOS. THORP.

Witnesses:

H. B. BARLOW,
S. W. GILLET.