

June 3, 1930.

B. SPRATT

1,761,371

BOILER SCALE REMOVING DEVICE

Filed July 3, 1928

2 Sheets-Sheet 1

Fig. 1.

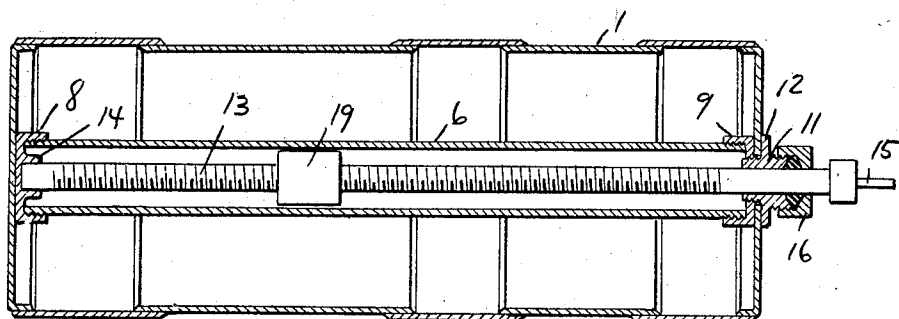
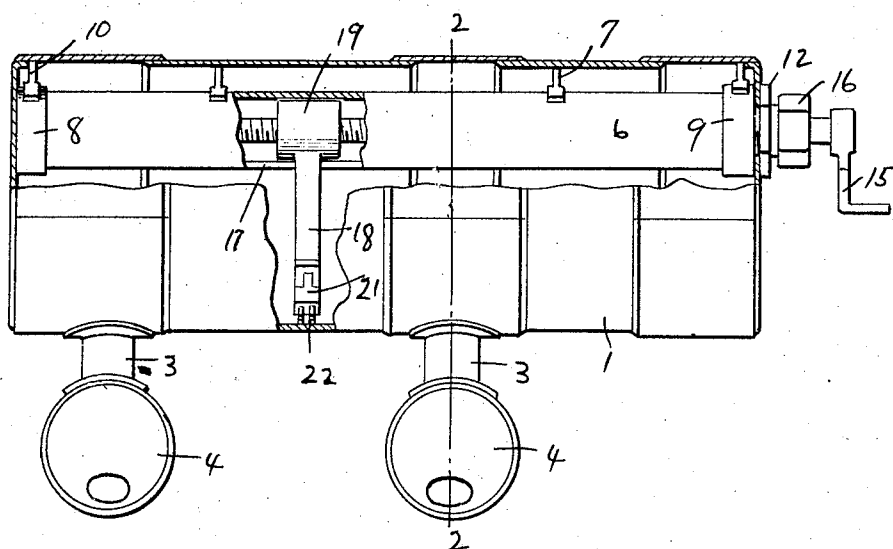


Fig. 3.

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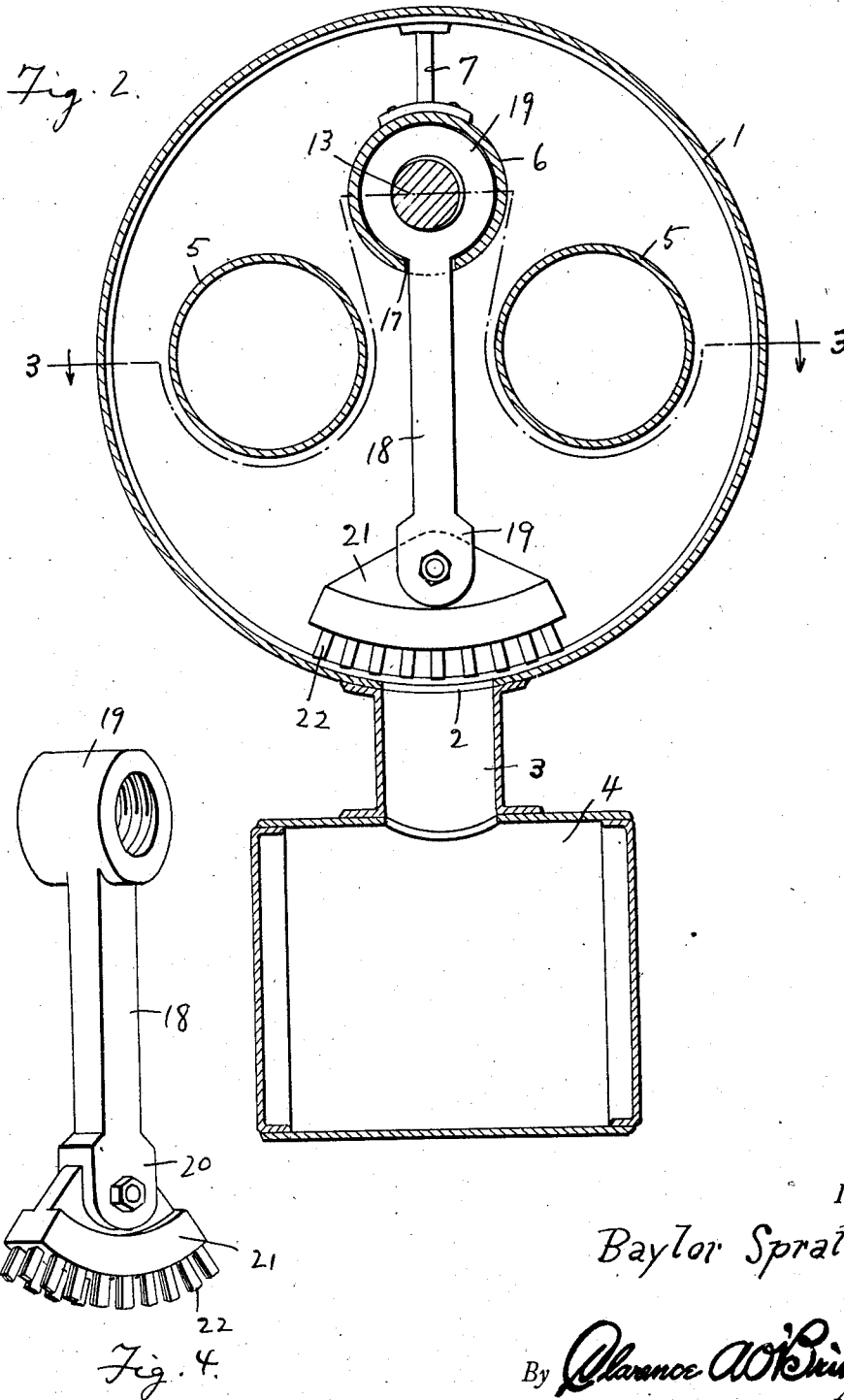
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# UNITED STATES PATENT OFFICE

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## BOILER-SCALE-REMOVING DEVICE

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The present invention relates to improvements in scale removers for boilers.

It is a well known fact that the scale and sediment will collect on the bottom of a boiler, which portion of the boiler is exposed to the fire and tremendous heat. The scale and sediment collect in small piles and keeps the water from coming in contact with the bottom of the shell of the boiler and consequently the plates become overheated and the pressure in the boiler causes the boiler plates to bag or burn.

It is therefore one of the important objects of the present invention to provide a means that will remove the scale and sediment from the bottom of the shell of the boiler and discharge the same into the usual mud drums or settling chambers located below and in communication with the boiler.

A further object is to provide a boiler scale removing device that can be readily and easily installed without necessitating any material alteration, said device including a travelling scraper member and is operable within the boiler from the outside.

A further object is to provide a boiler scale removing device wherein means is provided for preventing of the rotation of the scraper element during its longitudinal movement so that the scraper per se will be maintained in contact with the bottom of the boiler at all times.

Still a further object is to provide a boiler scale removing device which is simple in construction, inexpensive, strong, and durable and further well adapted to the purposes for which it is designed.

Other objects and advantages will become apparent during the course of the following description.

In the accompanying drawing, forming a part of this specification, and in which like numerals indicate like parts throughout the same:

Figure 1 is a view partly in elevation and partly in section of the boiler scraping device embodying my invention showing the same positioned in marine steam boiler.

Figure 2 is an enlarged sectional view tak-

en approximately on the line 2—2 of Figure 1,

Figure 3 is a sectional view taken on the line 3—3 of Figure 2 looking downwardly and

Figure 4 is a detail perspective view of the scraper carrying arm showing the scraper attached to the lower ends thereof.

In the drawings, wherein for the purpose of illustration I have shown a preferred embodiment of my invention, the numeral 1 designates the cylindrical shell of a two flue marine steam boiler which is formed in its bottom with the usual sediment discharge opening 2 around which extend the depending mud drum legs or pipes 3 having communication with the conventional mud drums or settling chambers 4 in the manner well known in the art.

The usual fire tubes extend longitudinally through the shell as indicated at 5 in Figure 2 and the water circulates around in the shell in a manner also well known in the art.

My improved boiler scale removing device includes a tubular casing 6 which is disposed longitudinally within the shell 1 at the central portion thereof above the horizontal plane of the fire tubes and this casing is suspended from the top of the shell by means of the hangers 7 as suggested very clearly in Figures 1 and 2 of the drawings.

The ends of the casing are open and are internally threaded for receiving the internally threaded caps 8 and 9 respectively. A hanger 10 is associated with the rear cap 8 as indicated in Figure 1.

The forward cap 9 is formed with a central opening into which is threaded the sleeve 11 and is provided with a flange 12 and engages with the outer side of the forward end of the shell and extending longitudinally within the casing is the feed screw 13, the rear end being journaled in a suitable bearing 14 provided therefor on the cap 8.

The forward end of this feed screw which is unthreaded extends through the sleeve 11 and has an actuating crank 15 secured there-

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on for facilitating the turning of the feeding screw although it is to be understood that this feed screw may be driven by an electric motor not shown if so desired.

5 A stuffing box 16 is associated with the outer end of the sleeve 11 and the un- threaded portion of the feed screw as clearly suggested in Figures 1 and 3. The casing 6 is formed with a longitudinally extend- 10 ing slot 17 in the bottom thereof which slot extends for substantially the full length of the casing and the purpose of this slot will be presently described.

The invention further comprehends the 15 provision of a vertically disposed arm 18 and is formed at its upper end with a hori- zontally disposed interiorly threaded hub 19 for receiving the feed screw 13, the arm 18 being disposed through the slot 17 for slid- 20 able movement therein.

The lower end of this arm is formed with a bifurcated head 20 in which is removably secured the segmental scraper unit 21, the 25 scraping elements 22 being adapted for en- gagement with the bottom of the shell 1 at all times.

The operation of my improved scale re- moving device may be briefly stated as fol- 30 lows: Starting with the arm 18 and the segmental scraper unit 21 carried thereby positioned at the forward end of the boiler, it will be observed that when the crank 15 is actuated, the feed screw 13 will cause the 35 internally threaded hub 19 to be fed rear- wardly in the casing 6 and thus cause the scraper unit to force any scale or sediment that may have collected on the bottom of the water to be separated therefrom and 40 brushed toward one of the outlet openings 2 and when the scrapers 22 pass over this opening 2, the scale and sediment drops through the mud drum or sediment chamber 4 where it is blown out through the mud drum valve not shown.

45 In this manner, the bottom of the shell of the boiler will at all times be kept free of scale or sediment so that the water will be properly heated. The simplicity of my device enables the same to be readily and 50 easily installed without necessitating any material operations and furthermore will at all times be positive and efficient in carrying out the purpose for which it is designed.

55 While I have shown the preferred embodi- ment of my invention, it is to be understood that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of the in- 60 vention and the scope of the appended claim.

Having thus described my invention, what I claim as new is:

65 In combination with a boiler of the fire tube type wherein the bottom thereof has communication with the usual sediment chamber, of a scraping device comprising

a casing arranged longitudinally within the boiler above the horizontal plane of the tubes and formed with a slot in the bottom there- of, vertically supporting brackets support- 70 ing the casing from the top of the boiler, a feed screw arranged in the casing, an arm having its upper portion disposed through said slot, an internally threaded hub formed on the upper end of the arm for receiving 75 the feed screw, means for actuating the feed screw to effect the movement of the hub along the feed screw in the casing from one end of the boiler to the other, said arm ex- tending downwardly to a point adjacent the boiler bottom, and a scraper unit carried by 80 the lower end of the arm for engagement at all times within the bottom of the boiler to remove the sediment therefrom and dis- charge the same into the sediment chamber, said scraper unit including a segmental body 85 portion detachably secured on the lower end of the arm, and scraping elements protrud- ing from the arcuate body at the bottom thereof.

In testimony whereof I affix my signature. 90

BAYLOR SPRATT. 95

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