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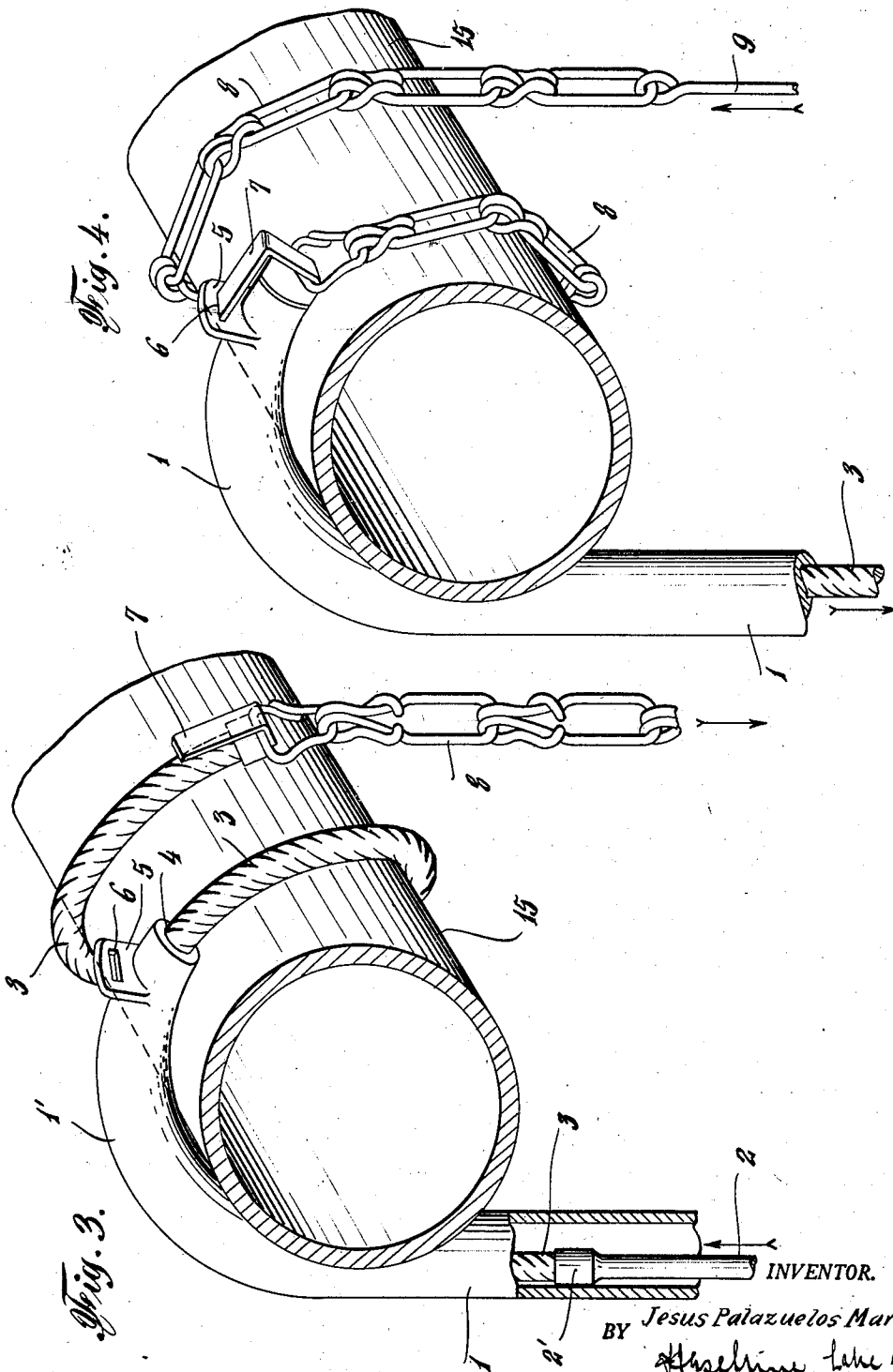
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TUBE CLEANER

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2 Sheets-Sheet 2



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TUBE CLEANER

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5 Claims. (Cl. 15—104.04)

The main purpose of the invention is to provide a simple, useful and easily handled device for cleaning soot and other unwanted accumulations on steam boiler tubes or boilers of the so-called "water tube type"; such cleaning being effected more efficiently than by the usual methods employing steam blasts or jets.

Further advantages of the invention will become evident from the following description with reference to the accompanying drawings, wherein like reference characters refer to identical parts in all views.

In the drawings:

Fig. 1 is a partial front view of the device according to this invention;

Fig. 2 is a vertical, longitudinal section taken along the line 2—2 of Fig. 1.

Fig. 3 is a perspective of a detail, partly in section, of the device according to this invention in working position.

Fig. 4 shows in perspective another detailed view of the device according to this invention in operating position.

Fig. 5 is a detailed view of one of the elements of the invention.

And Fig. 6 is a perspective view partly broken away showing the device according to this invention with the several parts thereof shown in working position.

Numeral 1 designates a longitudinal tubular member having a relatively long substantially straight portion and a curved end portion 1'. Interiorly and movably disposed in tubular member 1 is a rod 2 at the end 2' whereof is joined a flexible element 3 such as a steel tape or cable which has been previously formed into a helix or screw-thread convolution, and which tends to resume this form immediately that it emerges from tubular member 1 through aperture 4 at the curved end portion 1' as described hereinafter. Close to said aperture 4 a lug 5 provided with slot 6 is mounted on the end portion 1' of tubular member 1. Attached to the free end tape or cable 3 is a hook 7. A chain, 8, is detachably connected at one end thereof to hook 7 and at the other to a connecting rod 9 which, in turn, is joined by means of spring 10 to the lower or straight end portion of tubular member 1, for example, by means of an arm 11 extending from member 1. Rod 2 is provided with handle 12 preferably slidably guided in guide slot 13 of tube 1. Tube 1 terminates at support 14.

The device constituting the subject matter of this invention, as above described, is operated as follows: Tubular member 1 is introduced sideways

between adjacent boiler tubes of a group of tubes 15, then rotated 90 degrees whereupon its curved end portion 1' rests upon and partially surrounds the exterior surface of the tube in the group 15 that is to be cleaned. Handle 12 occupies the position shown by the dotted lines in Fig. 6 and the end of hook 7 is lodged in slot 6 of lug 5. By movement of handle 12 to the position shown by the full lines in Fig. 6, in the direction of the arrow (likewise shown in full line) rod 2 is moved within tube 1 forcing tape or cable 3 to emerge from aperture 4. As tape or cable 3 emerges from tubular member 1 it assumes or recuperates the helical form previously impressed upon it, and curls around the tube 15, to be cleaned, after which stage chain 8 is connected to hook 7. By an alternate motion of handle 12 in the opposite directions shown by arrows in Fig. 6, chain 8 will occupy successively on tube 15 the position of tape or chain 3, producing a rubbing or scraping of the surface of tube 15, through tension caused by spring 10, thus effecting removal of soot accumulated thereon.

This device can also be used for the sole purpose of winding a chain around tube 15. For example, by operating lever handle 12 in the direction indicated by the dotted arrow (Fig. 6) cable 3 may be pulled into curved end 1' of the tube. This will cause chain 8 to wrap around tube 15. Once this is accomplished, the tubular member 1 may be rotated 90 degrees, and pulled, thus forcing it to drag along, hooked to lug 7, said chain 8. Chain 8 may then be disengaged from hook 7 and, as said chain is sufficiently long, both its ends will drop loosely within easy reach of the operator who by merely pulling alternately on its ends can provoke a scraping action adequate for cleaning or de-sooting the tube.

Having thus described the invention and the manner of operating it, it is evident that several variations may be made without departing from the substantial idea of the invention as embodied in the following claims.

I claim:

1. A device for cleaning the exterior surface of tubes, such as boiler tubes, comprising, in combination, a longitudinally extending tubular member having a substantially straight portion and a curved end portion, said tubular member being adapted to pass between adjacent tubes and said end portion, when said tubular member is turned about its longitudinal axis, being adapted to fit around a surface portion of the one of said tubes to be cleaned, a rod movably disposed within said straight portion and a flexible cable one end

thereof being connected to one end of said rod and being movable into and out of said end portion of said tubular member upon movement of said rod in opposite directions, said cable being resilient and preformed to assume the shape of a helix and adapted to surround said tube when said cable is moved out of said tubular member, the diameter of said helix being greater than that of said tubular member.

2. A device as claimed in claim 1 in which the end portion of said tubular member opposite said curved end portion has a longitudinal slot, and in which a handle extends through said slot and is slidably guided therein said handle being secured to the rod for actuating the same.

3. A device as claimed in claim 1 in which a chain has one end thereof detachably connected to the free end of the cable after said cable is in position around the tube to be cleaned, said chain being adapted to be moved around said tube in opposite directions by corresponding movement of said cable, whereby said chain is adapted to scrape the exterior surface of said tube.

4. A device for cleaning the exterior surface of tubes, such as boiler tubes, comprising in combination a longitudinally extending hollow mem-

ber having a straight portion and a curved end portion, said member being adapted to pass between adjacent tubes and, when said member is turned about its longitudinal axis, to fit around a surface portion of the one of said tubes to be cleaned, means slidably disposed within said straight portion, flexible means connected to one end of said slidable means and adapted to be moved in and out of said end portion by movement of said slidable means, said flexible means being resilient and preformed to assume the shape of a helix around said tube when said flexible means is moved out of said end portion, and means for moving said slidable means.

5. The device as claimed in claim 4, in which the slidable means is rigidly connected to one end of said flexible means, hook means mounted on the opposite end of said flexible means, and a chain detachably connected to said hook means, when the flexible means is in position around the tube, movement of said flexible means in opposite directions causing similar movement of said chain around said tube, whereby said chain is adapted to clean said surface of said tube.

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