

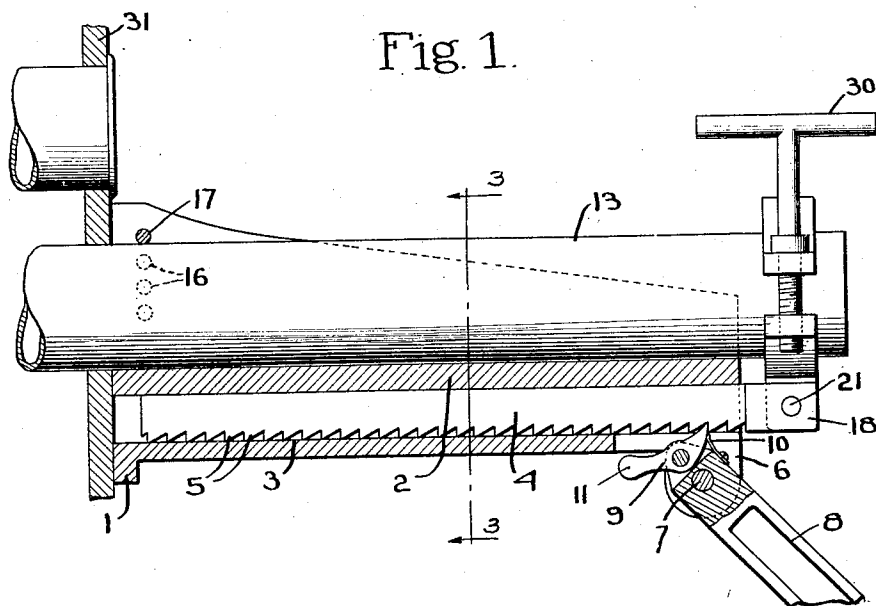
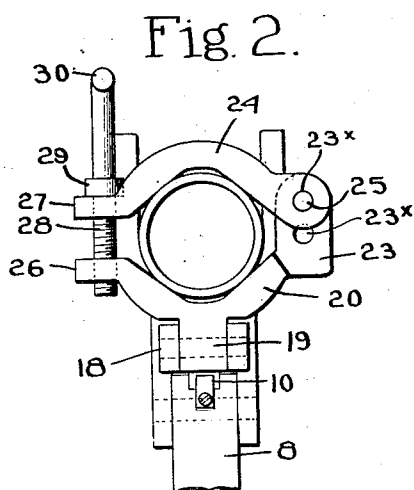
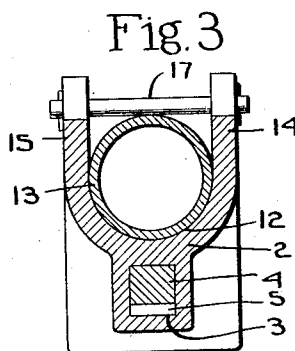
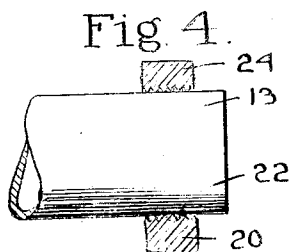
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TUBE EXTRACTING JACK

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TUBE-EXTRACTING JACK.

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This invention relates to improvements in tube extracting and setting devices and the object thereof is to provide a simple and economical device which can be readily applied to a boiler tube or the like and operated to extract the tube from the boiler head or which may be employed to set the tube in the boiler head.

The usual process of removing boiler tubes from boiler heads consists in first cutting away the upset end of the tube which passes through one of the boiler heads, then carefully removing the incrustation upon the exterior of the tube adjacent the other boiler head and thereafter manipulating the tube by means of wrenches, levers, or other devices to force the tube through such boiler head. As the tube is progressively forced along through the head the scale and incrustations have to be scraped away so that a great deal of time is required to remove the tube.

One of the objects of the present invention is to provide an extracting device in the form of a jack which can be readily supported upon the tube and through which sufficient power can be applied to the tube to pull it through the boiler head notwithstanding the scale which has accumulated upon the tube. The device is also so arranged that it can be applied to the external surface of the boiler head after the tube has been projected a sufficient distance through it and thereafter the extraction of the tube quickly completed.

Another object of the invention is to provide a device of the character described in which the tube can be readily drawn through the boiler and inserted into the opposite head in like manner and with much greater rapidity than has heretofore been possible.

A further object of the invention is to provide a device of this character which can be detachably supported upon the boiler tube irrespective of its size and the force applied to the tube in substantially the direction of its axis.

Another feature of the invention consists in providing the lifting member of the jack with a novel means for engaging the tube which will insure a positive clamping action thereupon.

Other objects and features of the invention will more fully appear from the following description and the accompanying drawings and will be particularly pointed out in the claims.

In the drawings:

Fig. 1 is a view, mainly in longitudinal section, of a preferred form of tube-extracting and setting device supported upon a boiler tube which projects through the head of the boiler, the boiler head being also shown in section, while the tube is shown in elevation;

Fig. 2 is an end view of the device illustrated in Fig. 1;

Fig. 3 is a vertical sectional view on line 3—3 Fig. 1 viewed from the right toward the left; and,

Fig. 4 is a detail view showing a section of a boiler tube with the clamping jaws engaging the same and illustrating the jaws in section.

The tube extracting and setting device illustrated in the accompanying drawings is in the form of a jack having a base 1 provided with a recess to receive the boiler tube and a standard 2 having a longitudinally extending strengthening rib provided with an aperture 3 which forms a guideway for the lifting member 4 which desirably is in the form of a rack having teeth 5. The upper end portion of the standard is provided with ears 6 which form supports for the pivotal shaft 7 of an actuating lever 8, a dog 9 being pivotally mounted upon the end of the lever and normally held in engagement with the rack by a spring 10. The dog 9 may also be provided with a handle member 11 which may be of sufficient weight to aid in the holding of the pawl in engagement with the rack and which also may be actuated to release the pawl from the rack.

The standard 2 is in the form of a channel and desirably presents an inner cylindrically curved surface 12 to engage the boiler tube 13 and parallel webs 14 and 15 constitute tangential continuations of the curved surface 12. These webs desirably are provided near the base of the jack with a series of aligned holes 16 to receive a pin 17 by means of which the jack can be supported upon the tube. The free end of the rack is

provided with a bifurcated head 18 in which an extension 19 of a clamping jaw member 20 is pivotally mounted upon a pin 21. The clamping jaw member desirably is of substantially semi-cylindrical form and its concave face is provided with semi-circular ribs or teeth 22 to engage the surface of the pipe.

The jaw member 20 has a lateral extension 23 to which a complementary jaw 24 is pivotally connected by a pintle 25. The extension 23 desirably is provided with a plurality of holes 23* for the pintle 25 to permit adjustment of the movable jaw for different sizes of tubes. The free ends of the jaw members 20 and 24 are provided with flanges 26 and 27.

Suitable means are provided for forcing these flanges toward each other to clamp the jaw members upon the pipe. A convenient means which is illustrated herein comprises a bolt 28 which passes through the jaw flange 27 and is provided with screw threads which engage the jaw member 26, a collar 29 upon the bolt 28 providing a shoulder which engages the flange member 27. The bolt 28 is provided with a handle 30 of any suitable form by means of which it may be rotated.

In Fig. 1 the sectional pipe 13 is illustrated as having been partially pulled through the boiler head 31. The webs 14 and 15 of the jack embrace the sides of the tube and the jack is supported upon the tube by the pin 17 which passes through the complementary apertures 16 which are located next beyond the diameter of the pipe as measured from the concave face 12 of the standard. As shown in this figure the clamping jaws 20 and 24 have been tightly set upon the pipe. In order to extract the pipe from the boiler head the lever 8 is manipulated manually to force the rack lengthwise of the standard. Such movement exerts a force substantially in the direction of the axis of the pipe and the pivotal mounting of the jaw member 20 upon the head 18 of the rack permits such movement of the clamp relative to the axis of the pipe as to insure a positive clamping action much greater than could be obtained if the jaw members were rigid with the head of the rack. By reason of this construction so great force may be applied to the boiler tube that it can be pulled through the boiler head rapidly and without the necessity of removing the scale and incrustations from the tube before its extraction.

A jack of this character may be made of such size that it can be employed within the boiler particularly after one or more tubes have been removed to give room for the manipulation of the handle. A boiler tube may be forced through the boiler head into the boiler in a similar manner by providing a suitable abutment for the base of

the jack or by applying the base of the jack to the inner face of one of the boiler heads when it is feasible to do so.

By reason of the present construction vise jaws can be readily applied to the tube and when the rack bar has been drawn out to its limit can be readily released, the rack bar telescoped within the standard and the vise jaws again quickly attached to the tube.

It will be understood that the embodiment of the invention disclosed herein is of an illustrative character and is not restrictive and that various changes in form, construction and arrangement of parts may be made within the spirit and scope of the following claims.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A tube extractor and setter comprising a jack having a channel shaped standard to receive the tube, means for detachably securing the standard upon the tube, a lifting member, means for reciprocating the same longitudinally of said standard and means for clamping said tube pivotally connected to said lifting member.

2. A tube extractor and setter comprising a jack having a channel shaped standard to receive the tube, means for detachably securing the standard upon the tube, a lifting member, means for reciprocating the same longitudinally of said standard, a clamp pivotally mounted upon said lifting member provided with hinged jaws to embrace the tube and means for engaging the free ends of said jaws to clamp them upon the tube.

3. A tube extractor and setter comprising a jack having a standard provided with a wall to engage the tube and with webs extending from said wall to receive the tube therebetween, means engaging said webs for detachably securing the standard upon the tube, a rack reciprocably mounted in said standard, means for actuating the same, a clamp pivotally mounted upon said rack, having a pair of hinged jaws to embrace the tube and means for clamping the jaws upon the tube.

4. A tube extractor and setter comprising a jack having a standard provided with a rectangular guideway extending longitudinally thereof, parallel longitudinal webs extending from one of the walls of said standard to provide a tube-receiving channel, a rack reciprocable in said guideway, a lever pivotally mounted on said standard having a pawl engaging said rack, a clamp pivotally mounted upon said rack, having a pair of hinged jaws to embrace the tube and means for clamping the jaws upon the tube.

5. A tube extractor and setter comprising a jack having a standard provided with a rectangular guideway extending longitudinally

nally thereof, parallel longitudinal webs extending from one of the walls of said standard to provide a tube-receiving channel, pairs of alined openings in said webs to receive a pin for detachably securing said jack 5 upon the pipe, a rack reciprocably mounted in said guideway, a lever pivoted to said standard having a pawl engaging said rack, a clamp pivotally mounted upon said rack, having a pair of hinged jaws to embrace 10 the tube and means for clamping the jaws upon the tube.

In testimony whereof, I have signed my name to this specification.

DAVID SMITH.