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CLINKER TONGS

Filed March 11, 1941

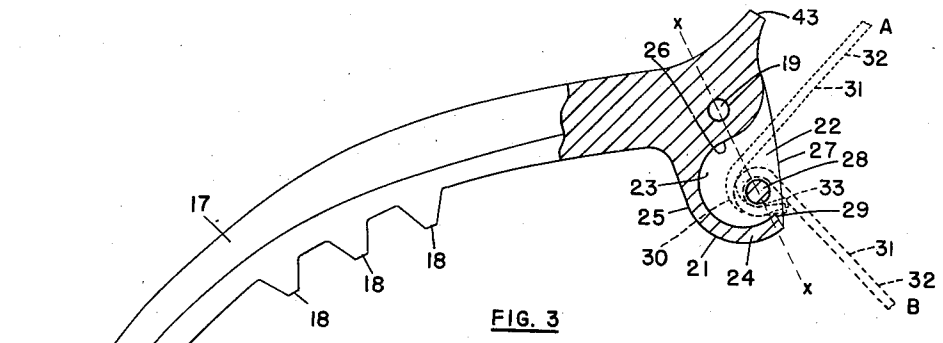


FIG. 3

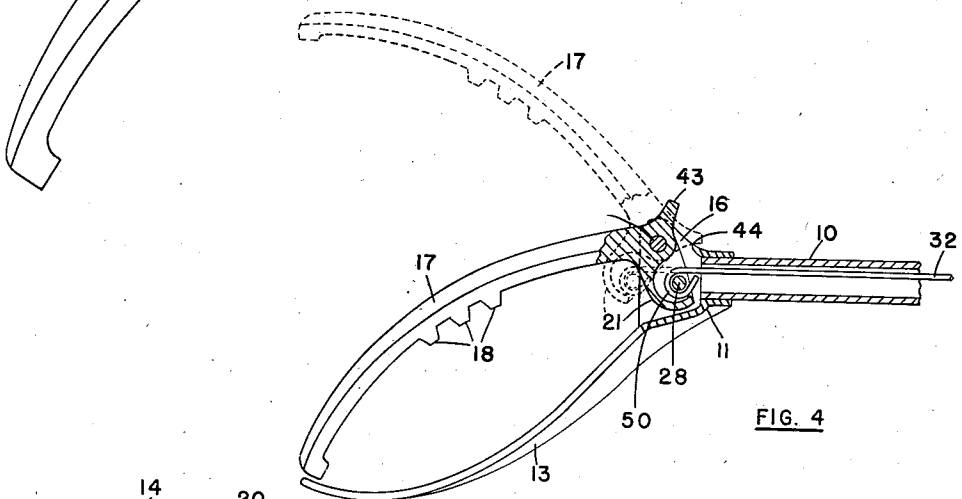


FIG. 4

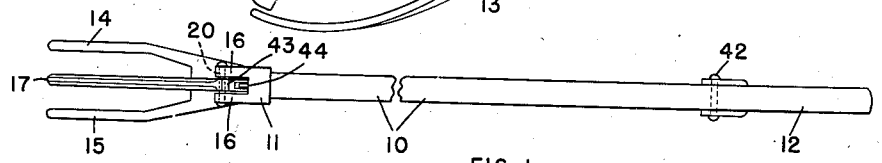


FIG. 1

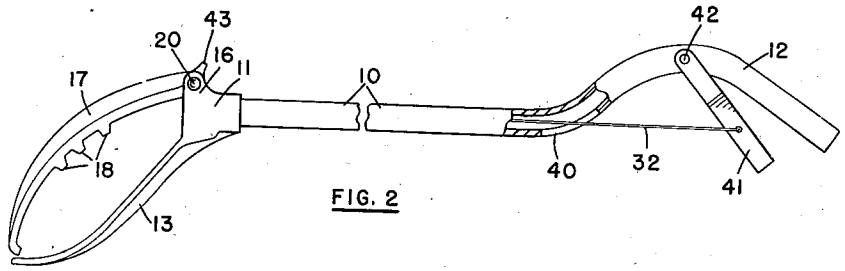


FIG. 2

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CLINKER TONGS

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10 Claims. (Cl. 294—11)

This invention relates to improvements in tongs of the type generally referred to as clinker tongs, and which comprise, generally speaking, an elongated body portion one end of which terminates in a gripping head including a fixed jaw and a movable jaw under the control of an actuator rod which is operable from the other end of said body portion.

Heretofore it was not uncommon for the actuator rod of clinker tongs to be injuriously affected by the intense heat condition existing in the fire box of a furnace into which the forward or gripping head end of the device was inserted incident to the removal of clinkers therefrom.

The present invention is directed, among other things, to the provision of a movable jaw for clinker tongs which is so designed as to effectively protect the forward end of an actuator rod from the injurious effects of the heat of a furnace firebox into which the tong is inserted for accomplishing the removal of clinkers.

Another object of the invention is to provide a movable clinker tong jaw having the hereinabove described characteristics, and which includes integral stop means for limiting the maximum amount by which said jaw may be opened relative to the fixed jaw, thereby effectively precluding the abuse to which actuator rods were heretofore subjected when the movable jaws were forced open beyond their designed and intended full open positions.

Still another object of the invention is to provide a movable clinker tong jaw having the hereinabove described characteristics, and which is so designed as to facilitate and simplify the process of anchoring an actuator rod thereto.

A further object of the invention is to provide a movable jaw for clinker tongs which is so designed that the connection between the movable jaw and the actuator rod will become tighter and more secure as the pull, or load on the actuator rod is increased.

Still a further object of the invention is to provide a movable clinker tong jaw having the hereinabove described characteristics which is durable, yet inexpensive.

These and other objects are attained by the means described herein and disclosed in the accompanying drawing in which:

Fig. 1 is a plan view of a clinker tong embodying the present invention.

Fig. 2 is a side elevation of the tong of Fig. 1, with a part thereof being broken away for clarity of detail.

Fig. 3 is a side elevation of the movable jaw or finger element of the tong of Fig. 1, with the upper part broken away and shown in longitudinal section for clarity of detail.

Fig. 4 is an enlarged view of the forward, or left end of the tong of Fig. 2, with parts shown in longitudinal section.

At the outset it should be noted that the present invention is not concerned with, nor directed to, the specific details of construction of a clinker tong except in so far as such structure relates to the movable jaw. However, for clarity of detail and understanding, a complete tong is disclosed in Figs. 1 and 2, wherein the numeral 10 represents an elongated tubular body portion, the forward end of which terminates in collar 11, and the rearward end of which terminates in a hand grip portion 12. Collar 11 may be formed as an integral part of a bifurcated fixed jaw element 13, the individual furcations of which are denoted generally by the numerals 14 and 15. The uppermost portion of the collar may terminate in a pair of upstanding, spaced, parallel ears 16, from and between which the upper end of a movable jaw 17 may be pivotally supported.

With reference to Fig. 3 it will be observed that movable jaw 17 comprises an extended body portion which is of a longitudinally arcuate form and having a plurality of teeth 18 projecting from its concave surface, as shown. A depending actuator ear 21 may be formed integrally with the upper end of jaw 17, said ear being provided with a hollow box or chamber 22 which is open only along its rear edge 27. Chamber 22 may be defined by a pair of spaced parallel side walls 23, bottom wall 24, a front wall 25 and a top wall 26, all formed as an integral part of jaw 17. A pin 28 may be provided as an integral part of and extending laterally between spaced side walls 23.

With particular reference to Fig. 3 it will be noted that the rear edge 29 of bottom wall 24 of chamber 22 preferably terminates to the rear of, that is, to the right of a line X—X drawn through the center of pin 28 and pivot-pin hole 19. This construction facilitates and greatly simplifies the task of anchoring the forward end of actuator rod 32 to and around pin 28.

As diagrammatically disclosed in Fig. 3, the forward end of the actuator rod may be bent to provide a U-shaped hook 30 having a long leg 31 and a short leg 33. Hook 30 is preferably first disposed around pin 28, as disclosed in the short dashed lines, with short leg 33 extending over and projecting rearwardly of edge 29 of bottom wall 24, and with long leg 31 projecting from

chamber 22 in an upwardly direction as at A. Long leg 31 may then be bent downwardly, in a clockwise direction, about pin 28 to assume position B. It will be noted that during this last operation short leg 33 abuts edge 29 which effectively precludes any relative motion between said leg and pin 28. It will likewise be observed that a well formed, closed loop will be provided around pin 28 at the forward end of the actuator rod when it has been lowered from position A to position B, thereby eliminating entirely any and all necessity of wrapping or entwining the short leg around the long leg as was heretofore common practice.

Movable jaw 17 may be associated with collar 11 by first introducing the free, rear end of the actuator rod into tubular body 10 from which it may emerge via an opening 40 formed therethrough, as illustrated in Fig. 2. Jaw 17 may be pivotally mounted between ears 16 of collar 11 by means of a pivot pin 20. The rear end of the actuator rod may be pivotally secured to a shiftable actuator lever 41 pivotally attached to hand grip 12 by means of a pivot pin 42.

As best disclosed in Figs. 2, 3, and 4, the upper portion of the rear end of jaw 17 is preferably provided with an upstanding stop or lug denoted generally by the numeral 43. The physical dimensions of this lug preferably, are such as to substantially block off or close the collar opening defined by ears 16 and edge 44 when jaw 17 has been swung to its full open position, as hereinafter more fully set forth.

With reference to Fig. 4, it will be observed that the forward, looped, end of actuator rod 32 is shielded from the action and effects of the high temperature encountered in a furnace fire box. By reason of the physical structure of chamber 21 the forward end of the actuator rod and its loop 50 will not become heated any appreciable amount incident to normal use, regardless of the intensity of heat existing in the fire box from which clinkers are being removed. Experiment has conclusively proven that by thus shielding the actuator rod from the effects of fire box heat the useful life of such a rod is materially increased over the useful life expectancy of similar actuator rods the forward ends of which are not so protected.

With reference to Fig. 4 it will likewise be observed that when jaw 17 has been moved away from fixed jaw 13 to its full open position as indicated by the broken lines, the rear face of lug 43 engages edge 44 of collar 11 thereby precluding further opening of the jaw, and at the same time the opening between ears 16 of said collar is substantially closed by an amount sufficient to effectively lessen the tendency for a draft to be established to the rear of pivot pin 20. In this manner a blast of hot gases will be prevented from passing over and incidentally heating rod 32 while the gripping head is placed in a fire box with the movable jaw in a full open position.

It will be observed that by thus limiting the amount by which the movable jaw can be opened relative to the fixed jaw by means of lug 43, no distortive stresses are transmitted to the actuator rod, such as formerly existed when such movable jaws were capable of being forced in a clockwise direction about pivot 20 until the forward end of the actuator rod would be wrapped around the boss of the upper end of said jaw.

Loop 50 is effectively precluded from opening up incident to a pull on rod 32 by reason of the relationship between short leg 33 of said loop and the rear edge 29 of bottom wall 24 of chamber 22. Experiment has demonstrated that any tendency for the loop to become undone or straighten out is checked when the short leg 33 abuts edge 29.

From the foregoing it is apparent that I have provided a movable jaw for clinker tongs, and the like, which includes a chambered actuator ear designed as to effectively preclude the transmission of heat to the forward end of an actuator rod anchored thereto and therein, and which precludes unintentional or accidental separation of the actuator rod therefrom incident to use. Said jaw also includes an integral stop lug which effectively limits the maximum amount by which said jaw may be opened.

It should be understood that various modifications and changes in the structural details of the device may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed is:

1. A clinker tong comprising an elongated body portion one end of which terminates in a hand grip portion, the other end of which terminates in a collar, an actuator lever pivotally secured to said hand grip portion, a fixed jaw projecting from said collar and a pair of spaced ears projecting upwardly therefrom, a movable jaw having one end pivotally mounted between said ears for movement relative to the fixed jaw, an actuating ear formed integral with said movable jaw and disposed between said ears, a hollow chamber provided in said actuator ear, said chamber including bottom, front, top and spaced side walls being open only along its rear edge, an actuator rod extending between and interconnecting said actuator ear and said actuator lever, and means disposed interiorly of said actuator ear chamber to which the forward end of the actuator rod is pivotally secured, the walls of said chamber adapted to shield the forward end of said actuator rod from the direct action of the flame and hot gases of a fire box into which said tongs are introduced incident to the removal of clinkers therefrom.

2. A clinker tong comprising an elongated body portion one end of which terminates in a hand grip portion, the other end of which terminates in a collar, an actuator lever pivotally secured to said hand grip portion, a fixed jaw projecting from said collar and a pair of spaced ears projecting upwardly therefrom, a movable jaw having one end pivotally mounted between said ears for movement relative to the fixed jaw, a stop lug formed integral with said movable jaw, said stop lug adapted to abut said collar when the movable jaw has been moved to its full open position relative to said fixed jaw, an actuating ear formed integral with said movable jaw and disposed between said ears, a hollow chamber provided in said actuator ear, said chamber including bottom, front, top and spaced side walls being open only along its rear face, an actuator rod extending between and interconnecting said actuator ear and said actuator lever, and means disposed interiorly of said actuator ear chamber to which the forward end of the actuator rod is pivotally secured, the walls of said chamber adapted to shield the forward end of said actuator rod from the direct action of the flame and hot gases of a fire box into which said tongs are introduced incident to the removal of clinkers therefrom.

3. As a new article of manufacture a movable jaw for clinker tongs, and the like, which tongs

comprise a body portion, and a gripping head which includes a fixed jaw and a movable jaw under the control of an actuator rod which is operable from said body portion at a location remote from said head, said movable jaw including an upstanding stop lug adapted to abut portions of the gripping head for establishing the maximum amount by which said jaw may be opened relative to the fixed jaw, and a chambered actuator ear to which the forward end of said actuator rod is pivotally secured, said chamber adapted to shield the forward end of said actuator rod from the injurious effects of the high temperatures existing in a fire box into which said gripping head is inserted incident to the removal of clinkers therefrom.

4. As a new article of manufacture a movable jaw for clinker tongs, and the like, which comprises an elongated body portion one end of which terminates in a gripping head including a fixed jaw and a movable jaw operatively secured to and under the control of an actuator rod operable from the other end of said body portion, said movable jaw including an actuator ear having a chamber provided therein, and means in said chamber to which one end of an actuator rod may be pivotally secured, said chamber adapted to shield said actuator rod adjacent said pivotal connection from direct exposure to the flame and hot gasas of a fire box into which said tongs are introduced incident to removal of clinkers therefrom.

5. As a new article of manufacture a movable jaw for the gripping head of clinker tongs, said jaw including a longitudinally arcuate body portion having a forward and a rear end, said rear end including a pivot receptive hole and an actuator ear, said actuator ear having a chamber provided therein which is closed on all sides except the rear side which is open, a pivot pin extending laterally of said chamber and around which one end of an actuator rod may be looped, said chamber adapted to shield the forward looped end of an actuator rod from direct exposure to the heat conditions existing in a fire box into which the gripping head is inserted incident to the removal of clinkers therefrom.

6. As a new article of manufacture a movable jaw for clinker tongs which includes a depending chambered actuator ear adjacent its pivoted end, said chamber including bottom, front, top and spaced side walls being open only along its rear edge, a pivot pin extending laterally of said chamber and between said side walls for receiving and housing the forward end of an actuator rod pivotally secured to said pivot pin.

7. As a new article of manufacture a movable jaw for clinker tongs of the type wherein the operating characteristics of a movable jaw pivotally secured relative to a fixed jaw are controlled by an actuator rod pivotally secured thereto, said jaw including an actuator ear having a chamber provided therein defined by bottom, front, top and spaced side walls, a pivot pin provided in said chamber extending laterally between said side walls, said bottom wall extending beneath and projecting rearwardly of a straight line extending through said pivot pin and the pivotal connection with the fixed jaw whereby the relationship between the rear edge of said bottom wall and said pivot pin is such as to preclude the opening up of a loop provided in the end of an actuator rod and disposed around said pivot pin.

8. As a new article of manufacture a movable jaw for clinker tongs of the type wherein the operating characteristics of a movable jaw pivotally secured relative to a fixed jaw are controlled by an actuator rod pivotally secured thereto, said jaw including an actuator ear having a chamber provided therein defined by bottom, front, top and spaced side walls, a pivot pin provided in said chamber extending laterally between said side walls, said bottom wall extending beneath and projecting rearwardly of a straight line extending through said pivot pin and the pivotal connection with the fixed jaw whereby the relationship between the rear edge of said bottom wall and said pivot pin is such as to facilitate looping the end of an actuator rod around said pivot pin by initially providing a U-shaped hook in the end of said rod and then introducing said hook around said pivot pin with the free end of the hook projecting rearwardly over said bottom wall, then lowering the other leg of said hook toward said free end whereby a closed loop is provided around said pivot pin.

9. A clinker tong comprising an elongated body member one end of which terminates in a hand grip portion, the other end of which terminates in a gripping head which includes a fixed jaw and a movable jaw under the control of an actuator rod which is operable from said hand grip portion, said movable jaw including an upstanding stop lug adapted to abut portions of said gripping head for establishing the maximum amount by which said movable jaw may be opened relative to the fixed jaw, and a chambered actuator ear into which the forward end of said actuator rod extends and is pivotally secured, said chamber adapted to shield the forward end of said actuator rod from the injurious effects of the high temperatures existing in a fire box into which said gripping head is inserted incident to removal of clinkers therefrom.

10. As a new article of manufacture a movable jaw for clinker tongs which includes a depending chambered actuator ear, said chamber adapted to receive and house the forward end of an actuator rod pivotally secured therein from direct exposure to the flame and hot gases of a fire box into which said tongs are introduced incident to the removal of clinkers therefrom.

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