No. 654,931. Patented July 31, 1900.

H. AIKEN.

TONGS.

(Application filed Jan. 2, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1

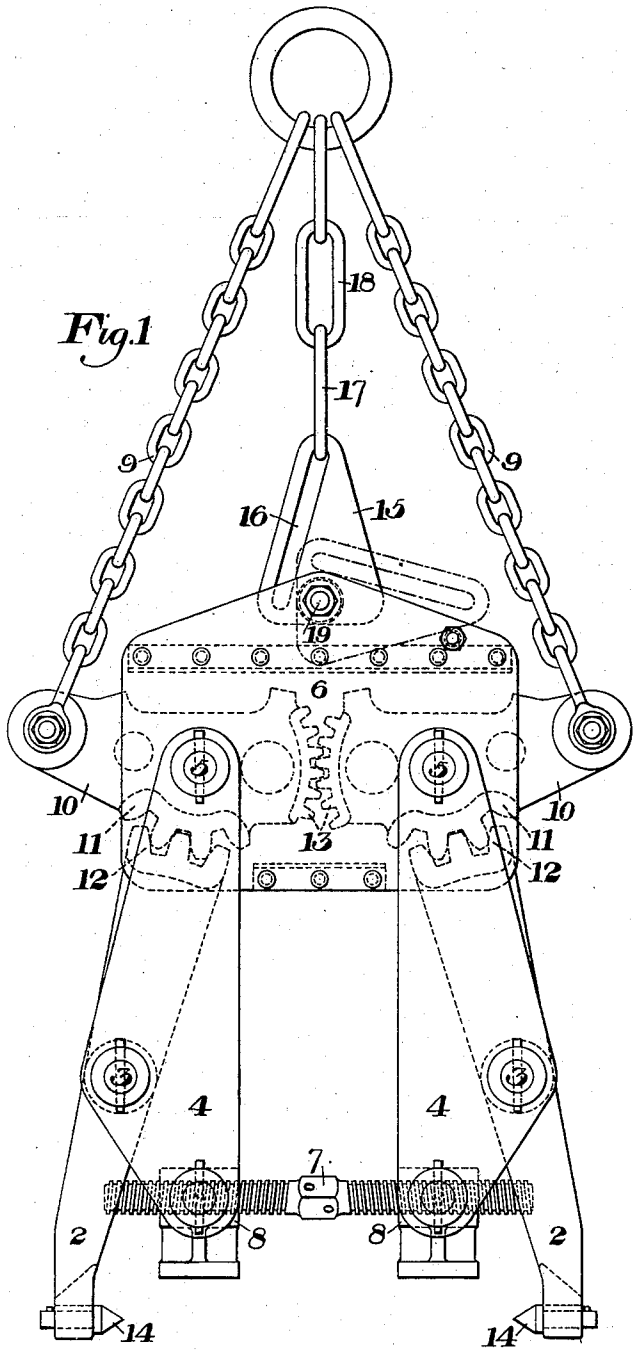
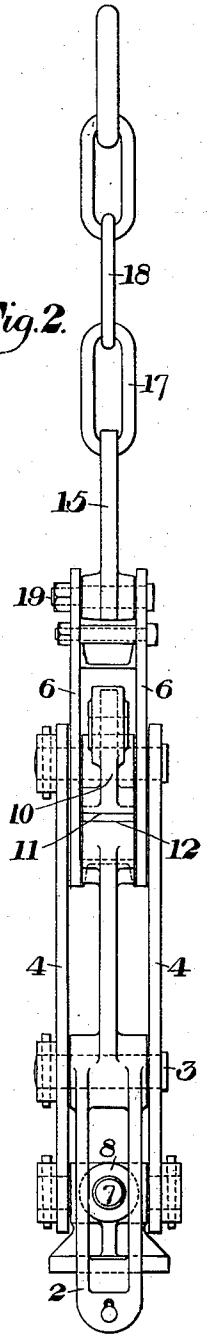


Fig. 2.



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Fig. 3.

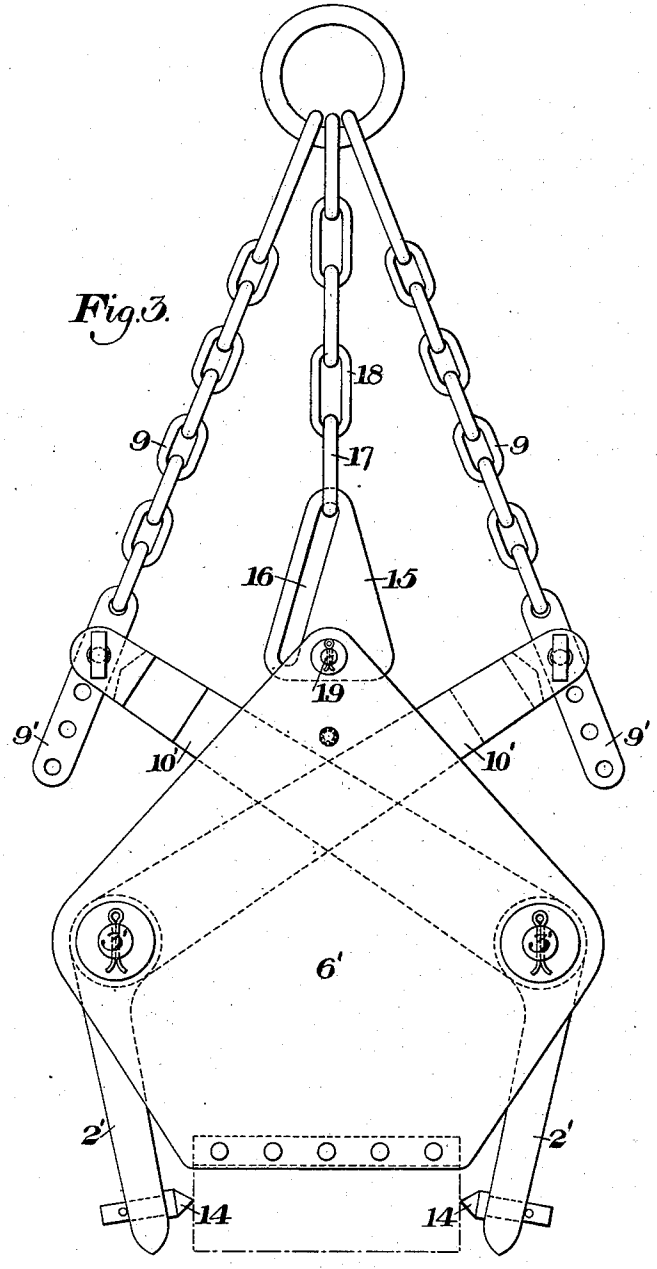
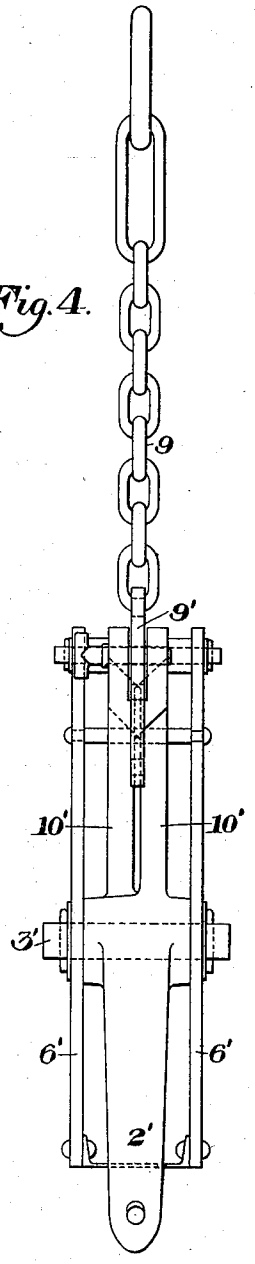


Fig. 4.



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UNITED STATES PATENT OFFICE.

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TONGS.

SPECIFICATION forming part of Letters Patent No. 654,931, dated July 31, 1900.

Application filed January 2, 1900. Serial No. 38. (No model.)

To all whom it may concern:

Be it known that I, HENRY AIKEN, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Tongs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 shows in front elevation tongs constructed in accordance with my invention. Fig. 2 is a side elevation thereof. Figs. 3 and 4 illustrate a modification of one of the parts of my invention.

In Figs. 1 and 2, 2 2 are the pivoted arms of the tongs, which are fulcrumed on pins 3 to cheek-pieces or frames 4, which are preferably made double, so as to fit on both sides of said arms, respectively. The cheek-pieces are pivoted on pins 5 to the frame or head 6 of the tongs and are adjustable laterally toward or away from each other by an adjusting connecting device consisting of a right and left hand screw 7, passing through nuts 8 8, which are swiveled to the lower portions of the cheek-pieces, so that by turning said screw the cheek-pieces may be drawn together or caused to diverge, and thus cause the approach or divergence of the fulcrums of the tongs. The tongs-arms are connected by suitable means with suspending chains or rods 9, which depend from the usual trolley of an overhead crane. I prefer for such purpose levers 10 10, having segmental gear-teeth 11, by which they are geared with teeth 12, formed at the end of the tongs-arms, and having also gear-teeth 13, by which they are geared together, so as to move in unison. If the tongs be lowered so that the jaws 14 of the arms inclose an ingot and the crane from which the tongs are suspended then raised, the draft of the chains upon the levers 10, acting through the intermediate gearing, will cause the arms to move together and to bite upon the ingot, and as the ingot is lifted thereby the arms will be pressed inward with a pressure depending for degree upon the weight of the ingot and tongs. It is often desirable to adjust the tongs in order to adapt them to ingots of different sizes than can be accommodated by the mere motion of the tongs-arms. Efficient and easily-operated mechanism for this purpose is provided in the screw 7 and pivoted cheek-pieces 4, for by turning the screw, as above explained, the cheek-pieces may be swung on their fixed pivots 5 and the fulcrums 3 rapidly adjusted. I believe I am the first to construct tongs having cheek-pieces carrying the fulcrums of the tongs-arms and swung on fixed pivots on which they are adjustable, combined with suspending-chains or like means for actuating the tongs-arms toward the burden. I also illustrate in Figs. 1 and 2 another important feature of my invention, adapted automatically to effect the setting of the tongs either in open position, in which their arms are spread, so as not to engage an ingot or other burden, or in working position, in which the arms are free to act. The simple device which I have invented for this purpose accomplishes a work which heretofore has been laborious and troublesome and has required the workman to approach near the red-hot ingots carried by the tongs and to set the tongs-arms in open position or release them by means of hand-operated tools.

My improved device consists of a link 15, having an elongated or slotted opening 16, in which fits the lowest link 17 of a third suspending-chain 18, which extends from the trolley, and the link 15 is pivoted at 19 to the head 6 of the tongs, so that when it is lying in dropped position (shown by dotted lines in Fig. 1) the lower end of its slot 16 shall be substantially above the pivot 19 and so that when tension of the chain 18 ceases the link will drop over edgewise, as shown. When the tongs-arms are in working condition, the link 15 is upright, in which case the suspension device constituted by said link and the chain 18 is sufficiently long to allow the entire weight of the tongs to be borne by the chains 9 and levers 10, thus causing the arms 2 to be closed when the tongs are raised. If now the crane be lowered, so that the ingot which is carried by the tongs is deposited upon the ground, the ends of the cheek-pieces 4 will rest upon the ingot, the chains 9 will slacken, the arms 2 will open, and as the crane is lowered further the chain 18 will slacken, so that the link 17 thereof will travel to the end of the slot 16 and the link 15 will drop into the position shown in dotted lines. If now the crane be

raised, the weight of the tongs will be borne by the chain 18, which has been shortened by dropping of the link 15, and as the end of the slot 16 is above the pivot the link 15 will not be lifted by the tightening of the chain 18, but will hold the link 17 at the end of the slot. The arms 2 will therefore not close as the tongs are lifted, but will remain in open position. To cause the tongs to engage another ingot, they are lowered upon the same until the ends of the cheek-pieces rest thereupon and slacken slightly the chain 18, and the trolley is moved so as to swing the slackened chain a little to the right, as shown in Fig. 1, causing the end link 17 to move in the slot 16 a short distance from the end thereof. Then if the crane be raised the link 17, being no longer directly above the pin 19, will raise the link 15 into upright position, permitting the link 17 to run to the end of the slot. This will cause the weight of the tongs to be carried by the chains 9, and the tongs-arms will therefore close upon and grip the ingot.

The skilled mechanic will be able, within the scope of my broader claims, to modify the application of the principle above explained and to construct the link 15 and its slot in other forms, even fixing the link to or making it integral with the head, properly shaping the slot, so that it will accomplish the same purpose; but I have illustrated what I deem to be the preferable construction and intend to claim the same specifically. By use of the word "chains" I include rods or their equivalents.

In Figs. 3 and 4 I show the automatic device last described applied to tongs made without adjustable cheek-pieces, the arms 2′ 2′ being pivoted directly at 3′ to the tongs-head 6′, the lower end of which is so shaped that it can bear upon the ingot. In this case the extent of motion of the arms may be varied by providing the chains 9 with adjustable links 9′, adapted to be engaged at different points with the levers 10′, which in this case I show crossing each other and connected directly with the arms 2′ without any intermediate gearing.

The differential drop-link 15 is not limited in its application to tongs.

I claim—

1. In tongs, the combination of a frame or head, cheek-pieces pivotally mounted thereon on fixed centers, arms fulcrumed on the cheek-pieces, means for adjustably moving the cheek-pieces on said centers, and means for moving the arms on their fulcrums toward the burden; substantially as described.

2. In tongs, the combination of a frame or head, cheek-pieces carried thereby, arms fulcrumed on the cheek-pieces, and a screw connected with the cheek-pieces and adapted to adjust them, and means for moving the arms on their fulcrums toward the burden; substantially as described.

3. In tongs, the combination of a frame or head, cheek-pieces carried thereby, arms fulcrumed on the cheek-pieces, and a screw connected with the cheek-pieces by swiveled nuts, and adapted to adjust the cheek-pieces; substantially as described.

4. The combination with a suspending device, of a slotted drop-link applied thereto adapted when dropped to vary the working length of the suspending device; substantially as described.

5. The combination with two sets of suspending devices, of a drop-link applied to one of them and adapted when dropped to vary the working length of its suspending device; substantially as described.

6. In tongs, the combination of a head or frame, gripping-arms and their chains, a second chain adapted to bear the weight of the tongs and to permit the first chains to slacken, and a slotted connection between the second chain and the tongs head or frame, adapted when the chain is slackened to engage the same at a lower portion of the slot; substantially as described.

7. In tongs the combination of a head or frame, gripping-arms and their chains, a second chain adapted to bear the weight of the tongs and to permit the first chains to slacken, and a slotted connection between the second chain and the tongs head or frame, adapted when the chain is slackened to engage the same at a lower portion of the slot, and adapted to permit lateral movement of the chain to free the latter, said head or frame being adapted to bear upon the burden when the chains are slackened; substantially as described.

8. In tongs the combination of a head or frame, gripping-arms and their chains, a second chain adapted to bear the weight of the tongs and to permit the first chains to slacken, and a slotted drop-link connecting the second chain to the tongs-head and adapted, when dropped, to bring the end of the slot into holding engagement with the chain and to permit lateral movement thereof when the chain is slackened; substantially as described.

In testimony whereof I have hereunto set my hand.

HENRY AIKEN.

Witnesses:
H. M. CORWIN,
THOMAS W. BAKEWELL.