Sept. 4, 1945. F. PEYER 2,384,396

INGOT TONGS

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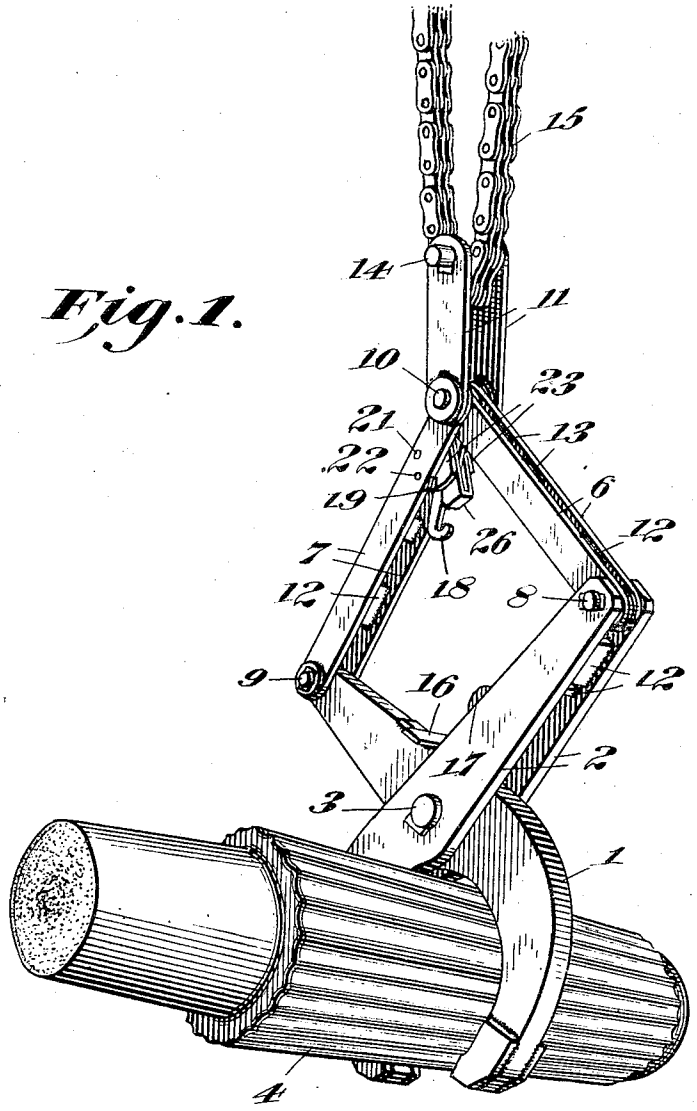
Fig. 1.

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INGOT TONGS

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Fig. 2.

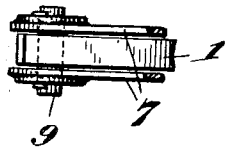



Fig. 3.

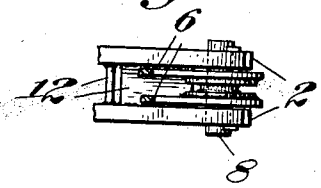
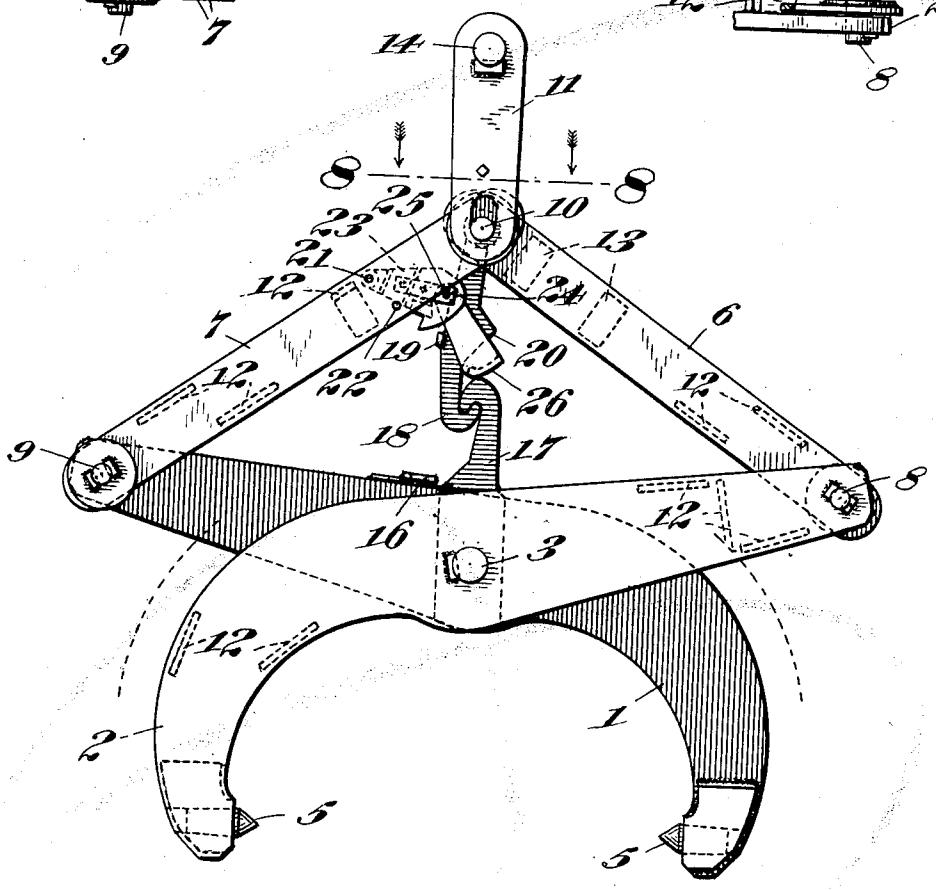



Fig. 4.

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INGOT TONGS

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Fig. 5.

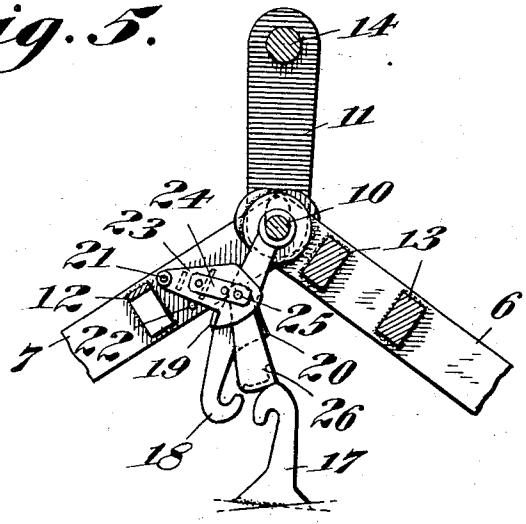



Fig. 6.

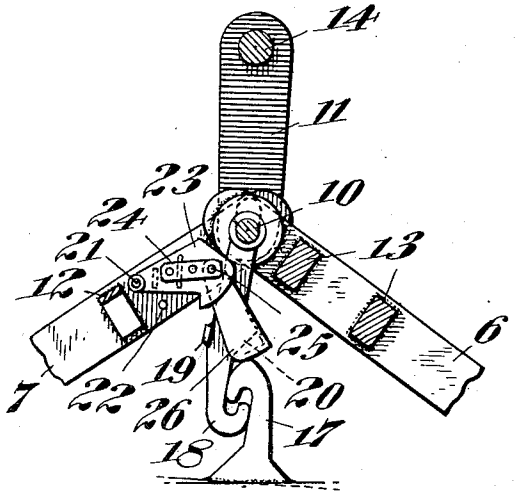
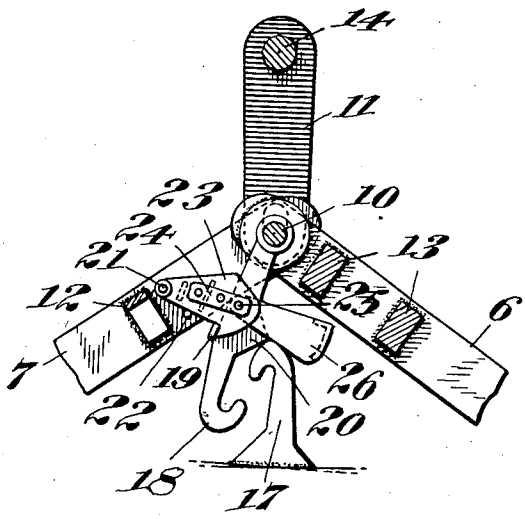



Fig. 7.

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INGOT TONGS

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Fig. 8.

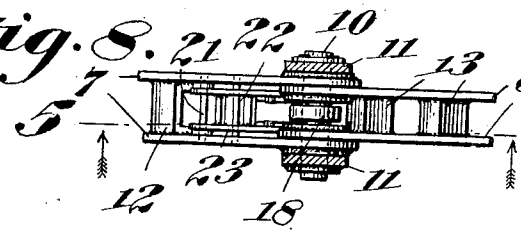


Fig. 12.

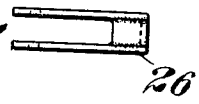


Fig. 13.

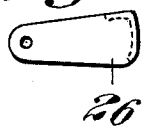


Fig. 9.

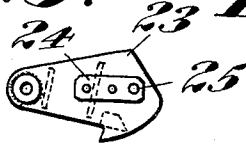


Fig. 10.

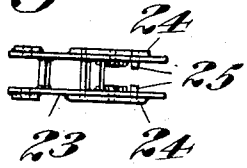


Fig. 11.

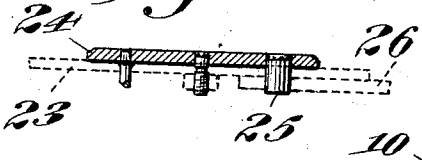


Fig. 14.

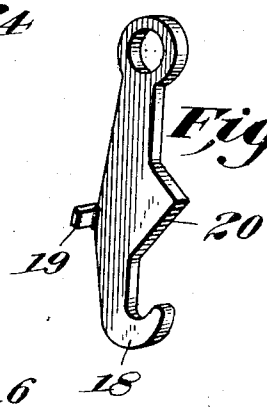


Fig. 15.




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Patented Sept. 4, 1945

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# UNITED STATES PATENT OFFICE

2,384,396

## INGOT TONGS

Frank Peyer, Bethlehem, Pa.

Application November 23, 1944, Serial No. 564,741

3 Claims. (Cl. 294—110)

My invention relates in general to apparatus for lifting heavy objects, and more particularly to improved automatic tongs for manipulating steel ingots and the like.

The large tongs employed in steel plants for handling heavy hot blooms and ingots usually are equipped with locking means, for holding their jaws apart, which locking means may be either manually or automatically operated. Each type has its special advantages and disadvantages. The manual type is more flexible and adaptable to operating situations, but requires the assistance of at least one floorman working under rather hazardous conditions. Most of the automatic types are too complicated and liable to mechanical failure, and some are operable only through a fixed cycle which the craneman cannot vary.

One object of my invention, therefore, is to provide gripping means which are automatic in action yet flexibly controlled.

Another object is to provide tongs with easily manipulated locking and unlocking means.

Still another object is to provide ingot tongs which are very simple, rugged and efficient for their purpose.

Other objects and purposes of my invention will appear hereinafter in this specification and in the appended claims.

Having thus explained briefly certain advantages of my invention, I shall now in order to make the same more clear refer to the four sheets of drawings hereto annexed and desired to be considered as integral herewith, in which drawings like characters of reference will designate like parts:

Figure 1 is a perspective view of the tongs shown lifting a fluted round ingot;

Fig. 2 is a partial or broken top plan view showing the lower male tong pivoted to the upper female link;

Fig. 3 is a side elevation of tongs adapted for grasping a round ingot as shown in Fig. 1 but locked in open position;

Fig. 4 is a partial top plan view similar to Fig. 2 but showing the pivoted connection of the lower female tong with the upper male link;

Fig. 5 is a partial sectional view taken along the line 5—5 of Fig. 8, showing the initial locking step, with the hanging hook still held by the latching hook;

Fig. 6 is a sectional view similar to Fig. 5, but showing the hanging hook released and locking almost completed;

Fig. 7 is a sectional view similar to Figs. 5 and 6, with the hanging hook again held after unlocking the tongs.

Fig. 8 is a partial sectional view taken on the line 8—8 of Fig. 3;

Fig. 9 is a side elevation of the latching hook;

Fig. 10 is a top plan view of said latching hook;

Fig. 11 is an enlarged sectional view of one of the hinge plates on said latching hook;

Fig. 12 is a top plan view of the latching lever;

Fig. 13 is a side elevation of said latching lever;

Fig. 14 is a perspective view of the hanging hook; and

Fig. 15 is a side elevation of tongs adapted for grasping a rectangular ingot.

Referring to Figs. 1 to 4, inclusive, it will be noted that the grasping mechanism of this device has a simple lever-and-scissors action somewhat resembling conventional ice-tongs. The pair of male and female tongs 1 and 2, shaped as in Fig. 3 to hold a round ingot, or as in Fig. 15 to hold a rectangular one, are adapted to pivot together on the pin 3 and grasp the ingot 4 in the pointed bottom spuds 5. The diagonal male and female links 6 and 7 are pivotally connected by pins 8 and 9 to the female and male tongs 2 and 1, respectively, and are connected together at the top by the pin 10 to the shackle 11. Said tongs and links consist of steel plates cut to the desired contour, and held in properly spaced relation by welded connecting plates 12 and blocks 13. The shackle 11 is attached by the pin 14 to the chain 15 of an overhead crane or the like (not shown).

The male tong 1 is provided also with the stop-plate 16 and the standing hook 17, the latter being positioned centrally upright above the lower pivot-pin 3. From the upper pivot-pin 10 is suspended the hanging hook 18, shown in Fig. 14, provided with the cross-bar 19 and inclined or projecting portion 20, and adapted to engage with the standing hook 17. Pivoting on pin 21 in female link 7 above stop-pin 22 is the small latching hook 23, shown in Figs. 9 and 10, and adapted to engage the cross-bar 19 of the hanging hook 18. Said latching hook 23 is provided with a hingle-plate 24 secured as shown in Fig. 11 on each side, to which on pin 25 is pivoted the latching lever 26 of Figs. 12 and 13, smoothly rounded and otherwise adapted to glide easily over the standing hook 17.

In operation, the latching hook 23 is normally engaged with the cross-bar 19 to hold back the hanging hook 18. When the device is lowered slowly in contact with the floor or similar surface, the latching lever 26 will first make contact with and glide over the standing hook 17,

as shown in Figs. 5 and 6, thereby pushing up the latching hook 23 and releasing the hanging hook 18. The hanging hook 18 will then swing into engagement with the standing hook 17 to lock the tongs open.

By lowering the tongs to open them still wider, the hanging hook 18 will be deviated by the projecting portion 20 in contact with the standing hook 17, as shown in Fig. 7, until the latching hook 23 is tripped and again holds back the hanging hook 18. The tongs can then be used to grasp the ingot or other object in the usual manner.

It will be noted especially that the locking and unlocking operations are at all times subject to the will of the craneman, depending only upon the distance the tongs are lowered after engaging the object.

Although I have described my invention hereinabove in considerable detail, I do not wish to be limited narrowly to the exact and specific details which I have shown and described, but I may use also such substitutions, modifications, or equivalents thereof as are embraced within the scope and spirit of the invention or pointed out in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A lifting device comprising, in combination, suspension means, a pair of tongs pivoted together, diagonal links connecting the suspension means with the tongs, a fixed hook positioned upright on one member of the pair of tongs, a latching hook pivoted to one of the diagonal links, a swinging hook pivoted to the suspension means engageable with the upright hook and having an inclined face adapted to permit the standing hook to divert it into engagement with the latching hook, and a latching lever adapted to slide over the fixed hook to release the swinging hook.

2. A lifting device comprising, in combination, a pair of tongs adapted to pivot together and grasp the object to be lifted, diagonal links pivotally connected to said tongs, suspension means pivotally connecting said diagonal links, a standing hook positioned centrally upright on one member of the pair of tongs, a hanging hook adapted for locking engagement with the standing hook pivoted to the suspension means and provided with a cross-bar, a latching hook adapted to engage the cross-bar pivoted to one of the diagonal links, and a latching lever pivoted to the latching hook adapted to release the cross-bar on contact with the standing hook.

3. A lifting device comprising, in combination, a suspension shackle, male and female tongs pivoted together, female and male links pivoted to the respective tongs and the suspension shackle, an upright hook on the male tong, a hook swinging from the suspension shackle engageable with the upright hook, a latching hook pivoted to the female link engageable with the swinging hook, and a lever pivoted to the latching lever adapted to release the latching hook when lifted by the upright hook.

FRANK PEYER.