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H. P. HORN.

TONGS.

APPLICATION FILED SEPT. 23, 1904.

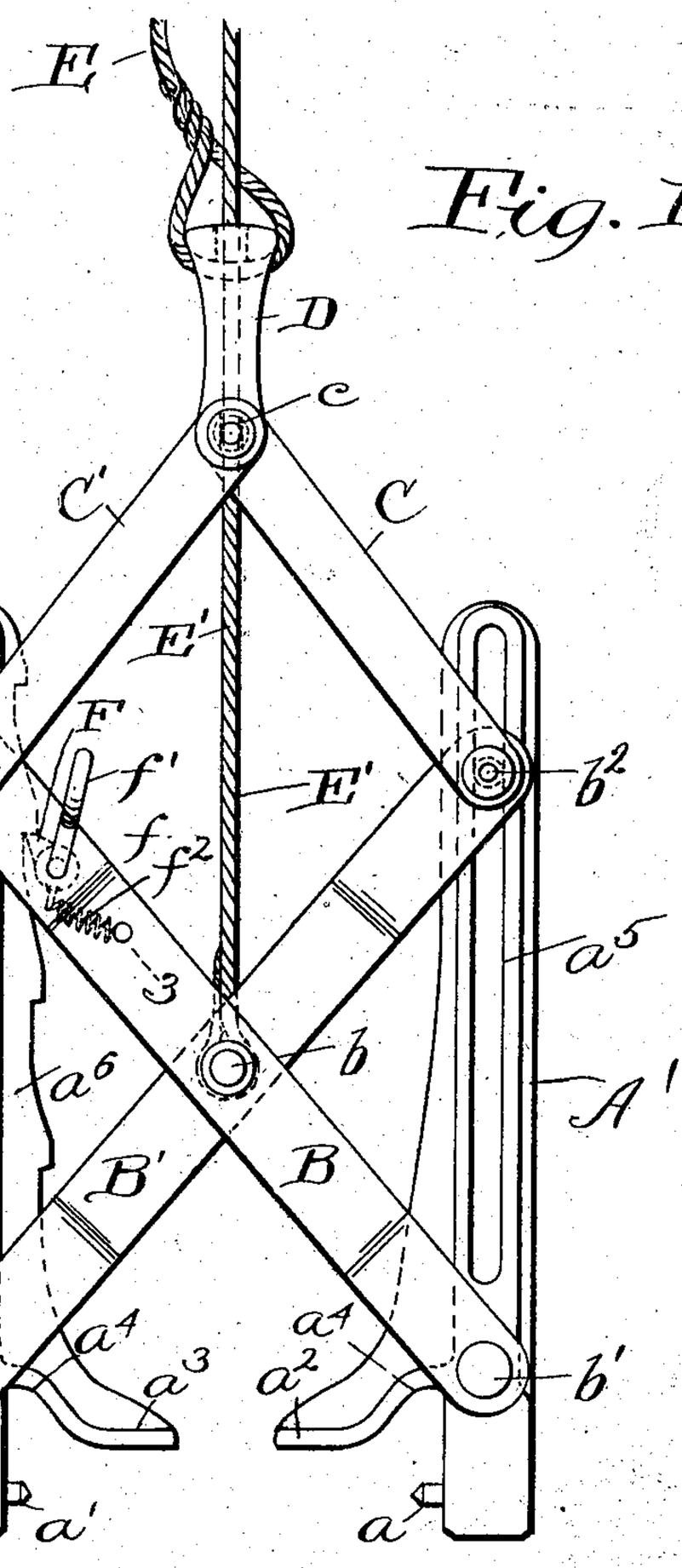


Fig. 1.

Fig. 2.

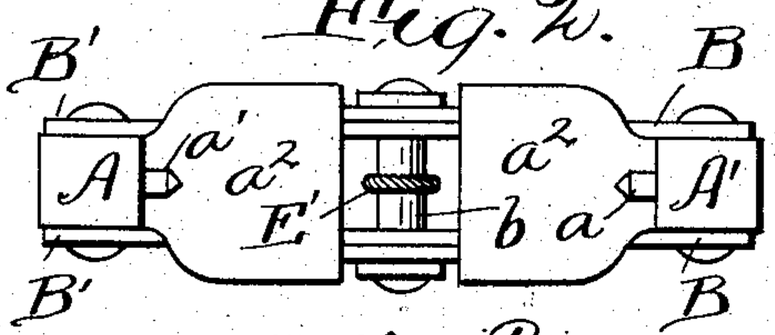
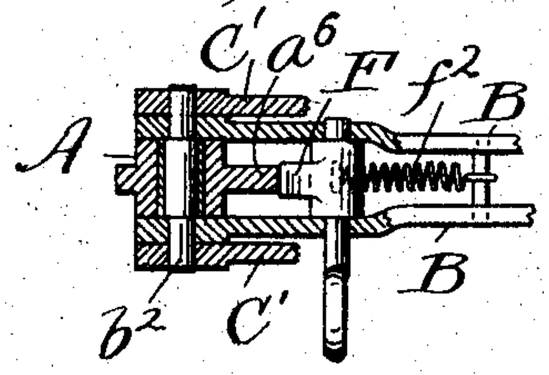


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

HENRY P. HORN, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO JOHN HORN, OF CLEVELAND, OHIO.

TONGS.

SPECIFICATION forming part of Letters Patent No. 791,266, dated May 30, 1905.

Application filed September 23, 1904. Serial No. 225,565.

To all whom it may concern:

Be it known that I, HENRY P. HORN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Tongs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates generally to tongs or grapples which are designed for the purpose of grasping objects to be lifted or drawn from one place to another, as examples of which there may be cited ice-tongs, ingot-tongs, grip-tongs for wire benches, &c.

The invention is well adapted for tongs which are used for the purpose of grasping ingots when they are in the soaking-pit or any other place and move them about as desired. Such tongs are arranged so that when the jaws with their bits are opened to grasp an ingot the operating mechanism for the jaws will not extend beyond the jaws at any point and the closing operation will draw the entire device into smaller compass, and thus facilitate its operation and render the device effective in close places.

In carrying out my object of making efficient and compact tongs I provide a pair of jaws adapted to engage the article to be operated upon and also with suitable toggle-operating mechanism, whereby these two jaws may move in parallel lines to bring the jaws together or to separate them, as the case may be. In instances where two ropes or cables are used one rope is used for closing the jaws and elevating the ingot and the other is used for opening the jaws and releasing the ingot.

It is also an object of the invention to provide a certain mechanism whereby when it is possible to have only a single operating rope or cable, which may be used for closing, elevating, and lowering the tongs. In such instance it is necessary that the tongs should be first locked in their open position and then lowered by the closing-rope and finally unlocked and permitted to close upon the object. This locking mechanism is only used, as stated, when there is a single rope for closing the tongs and elevating the object.

The invention may be also briefly summarized as consisting in the construction and combination of parts hereinafter more fully explained, and set forth in the claims.

In the drawings, Figure 1 is a side elevation of my device. Fig. 2 is a bottom plan, and Fig. 3 is a detailed view of the locking device for holding the tongs in their open position.

In the embodiment shown in the drawings, A A′ represent the jaws, which are provided at their lower ends with bits a and a', facing each other and arranged to engage and hold the ingot. The jaws A and A′ are further provided upon their faces just above the bits with gage-plates a^2 and a^3, arranged to rest upon the top of the ingot and prevent the tongs from sliding down too far when grasping the same. Each of these gage-plates is supported by a recessed bracket a^4 above its corresponding bit, and the recess in this bracket permits any burs or flanges which have been cast upon the ingots to enter these recesses and still allow the gage-plates a^2 and a^3 to rest upon the top of the ingot and insure the jaws and their bits being at the proper point to grasp it.

Each of the jaws A A′ is provided with a longitudinally-disposed slot a^5 extending for a greater part of its length, and these slots serve to guide the jaws by the pins of the toggle mechanism passing therethrough and in so doing produce parallel movement of the jaws.

The toggle mechanism consists of a pair of cross toggle-levers B and B′, pivoted at substantially their central points to a pin b and at their lower ends to pins b', passing through the jaws near their lower ends, and at their upper ends to pins b^2, which are arranged to travel in the guiding-slot a^5 of the jaws. Pivoted to the pins b^2 are a pair of closing toggle-arms C C′, swiveled to a pin c, connected to a load ring or clevis D, to which is secured the closing-rope E. The opening mechanism consists of a rope E′, fastened around the pin b and extending through the pin c and clevis D, whereby the opening-rope is arranged to retain a position centrally with respect to the tongs.

It will be seen from the foregoing descrip-

tion that in operation the tongs are first lowered by the opening-rope E′, in their expanded position, into the soaking-pit until the bits carried by the jaws extend down below the top of the ingot and the gage-plates rest thereon. Then the opening-rope is slacked and the closing-rope is tightened, whereby the toggle-arms are drawn up, thus pulling upon the pins b^2 and operating the cross toggle-levers B and B′, and thereby pulling the lower ends of the jaws A and A′ toward each other to grasp the ingot. As these jaws move toward each other, however, their opposite ends are guided upon the pins which engage in the slots thereof, and this guiding operation insures the parallel movement of the jaws until they firmly grasp the ingot. Then upon the further applying of power to the closing-rope E the tongs, together with their load, will be elevated out of the soaking-pit, when the ingot may be moved as desired.

Should it be desirable to do away with the opening-rope for any reason, then there should be some mechanism provided for locking the tongs in their open position before being lowered into the pit, and this open-locked position should correspond to the different size of the ingots, so that the tongs will occupy no more space than is necessary while in the soaking-pit. Such mechanism consists of a pawl F, secured to a rock-pin f, journaled in the links B and having secured to it a looped rock-arm f', the eye of which provides convenient means for its operation. On the inner face of the jaw A is formed a flange a^6, having shoulders on its edge, as shown. A spring f^2 draws the pawl toward this flange, and it is adapted to engage any of the shoulders and hold the tongs open at that point. It will be noticed that the shoulders are formed continually farther from the slot a^5 as one progresses downward. This is to accommodate the changing position of the pawl-pivot with the opening or closing of the toggle-links.

In using the tongs without the rope E′ they are lowered and rested on some object until spread to the desired amount, then being raised the pawl F holds them in this position ready to grasp the object. In practice the setting of the tongs for one ingot is made at the time the preceding ingot is released. The pawl F being at one side of the tongs is very conveniently operated by a suitable implement entering the eye of the arm f'.

Having described my invention, I claim—

1. In combination, a pair of tongs consisting of a pair of slotted jaws, links pivoted intermediately together and pivoted at two of their extreme ends to the jaws and at their other extreme ends to pins occupying the slots.

2. The combination of a pair of tongs consisting of a pair of jaws, links pivoted intermediately together and pivoted at two of their ends to the jaws and at their other ends slidably and pivotally connected to said jaws, and operating-links pivoted at one end to the links first mentioned and pivoted together at the other end.

3. The combination of a pair of tongs consisting of a pair of slotted jaws, links pivoted intermediately together and pivoted at two of their extreme ends to the jaws and at their other extreme ends to pins occupying the slots, and operating-links pivoted to said pins at one end and pivoted together at the other end.

4. In combination, a pair of tongs, jaws for said tongs, means for moving said jaws toward and from each other, bits carried by said jaws, a gage-plate, and a recessed supporting-bracket therefor above the bit whereby said plate may engage the article and determine the extent of grasp of said jaws.

5. In combination, a pair of tongs consisting of a pair of jaws adapted to move in parallelism, toggle mechanism for bringing about such movement, and means for holding the jaws in various open positions.

6. The combination of a pair of jaws, toggle-links for moving them toward or from each other, one of said jaws carrying a series of shoulders, and a pawl on one of the links adapted to engage in one of said shoulders.

7. The combination of a pair of jaws, toggle-links for causing the approach thereof, a member on one jaw carrying a series of shoulders, and a pawl on one of the links adapted to engage said shoulders, and a spring acting on the pawl and tending to cause such engagement.

8. The combination of a pair of jaws, toggle-links for causing the approach thereof, a member on one jaw carrying a series of shoulders, and a pawl on one of the links adapted to engage said shoulders, said shoulders being formed continually farther from the line of the jaws toward the grasping end thereof.

9. The combination of a pair of slotted jaws, toggle-links pivoted to said jaws and to pins occupying said links, a flange on one jaw carrying a series of shoulders, said shoulders being formed continually farther from the slot of the jaw toward the grasping end thereof, and a pawl on one of the links adapted to engage said shoulders, a spring tending to cause such engagement, and means for releasing the pawl.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

HENRY P. HORN.

Witnesses:

ALBERT H. BATES,

JOHN HORN.