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E. K. HOLMES

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DRAWBENCH TONGS

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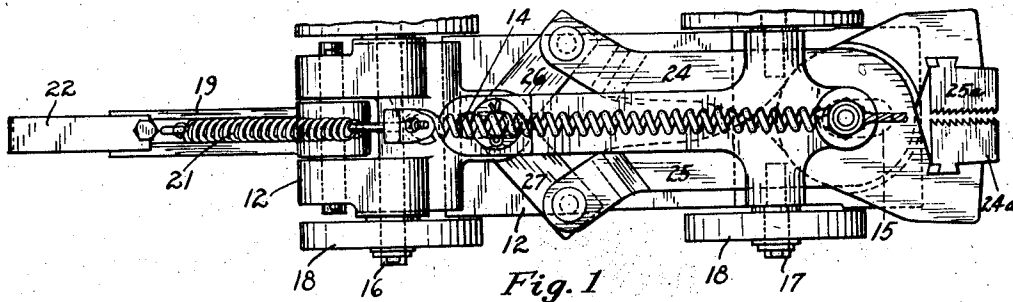


Fig. 1

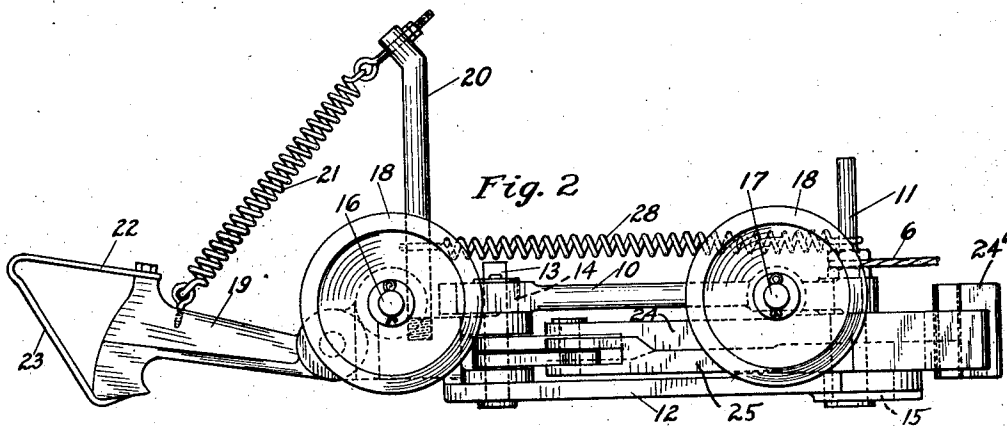


Fig. 2

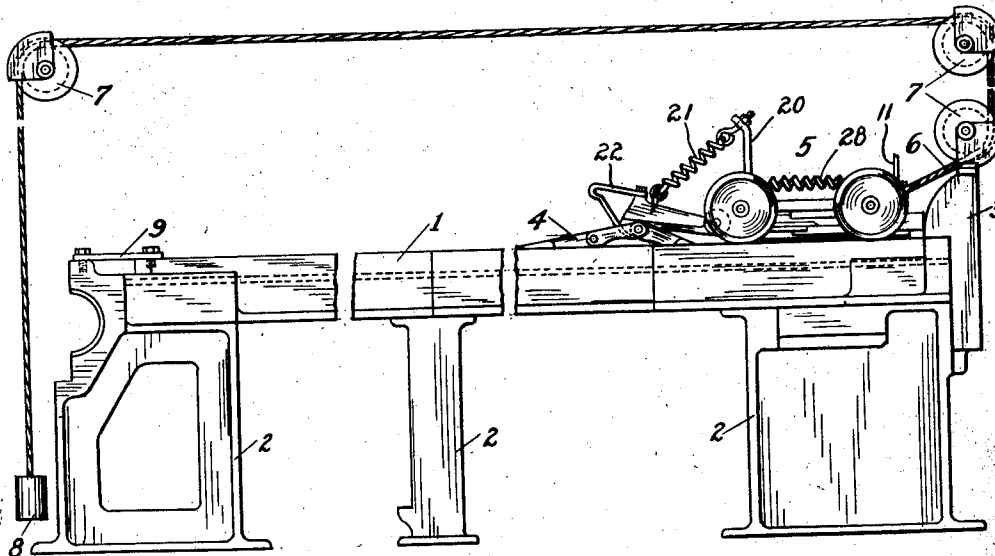


Fig. 3

INVENTOR
Carl K. Holmes
BY Richey Watts
ATTORNEYS

UNITED STATES PATENT OFFICE

EARL K. HOLMES, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
STEEL AND TUBES, INC., OF CLEVELAND, OHIO, A CORPORATION OF OHIO

DRAWBENCH TONGS

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This invention relates to draw benches such as are used in the manufacture of pipes, tubes, bars, rods and the like, and more particularly to the means which engage the end of the article being drawn and the chain or similar member which draws this piece through the forming dies.

An object of the invention is to provide gripping means for drawing an article through a die, which means will grip the article firmly while it is being drawn, and will automatically release the same when the drawing operation is completed.

Another object is to provide gripping means which will be automatically released from the chain or the like by which it is drawn along the draw bench.

Another object is to provide means which will prevent the gripping means from overrunning the end of the bench.

Another object is to provide means for automatically returning the gripping means to the end of the bed at which it receives the article to be drawn.

Other objects will hereinafter appear.

The invention will be better understood from the description of one practical embodiment thereof for drawing pipe, illustrated in the accompanying drawings, in which—

Fig. 1 is a plan view of a carriage provided with pipe gripping means and chain engaging means;

Fig. 2 is a side elevation of the device shown in Fig. 1; and

Fig. 3 is a side elevation of a draw bench, showing the parts illustrated in Figs. 1 and 2 in operative relation thereto and in the position they occupy at the start of a drawing operation.

Referring first to Fig. 3, the draw bench consists of a top 1 supported on legs 2. At the end of the bench, which is shown to the right in the drawings, dies 3 are provided through which the pipe is drawn. A chain 4 is provided which moves along the top of the bench to the left as shown in Fig. 3. A carriage, indicated generally at 5, moves along the top of the table and carries means for gripping the pipe end, and other means

for engaging the chain so that the carriage and article may be drawn along the bench. These means will be more particularly described in connection with Figs. 1 and 2. The carriage has attached thereto a cable 6 which runs over sheaves 7 and carries at its end a weight 8 which returns the carriage to the position shown in Fig. 3 whenever it is released from the chain. The table is also provided at the end shown to the left, and hereinafter called the rear end, with a plate or the like 9 adapted to be engaged by a part of the carriage to release the same from the chain, providing the chain has drawn it to the extreme end of the table.

The carriage comprises two horizontal members 10 and 12 each provided with two wheels upon which the carriage moves along the top of the bench. The upper frame member 10 carries rigidly a vertical post or pin 11 at its forward end which extends both above and below the frame member. The lower frame member 12 carries rigidly a post or pin 13 at its rearward end which extends upwardly. The frame members 10 and 12 are provided with elongated slots 14 and 15, respectively. The post 11 can be moved longitudinally in slots 15 and the post 13 can be moved longitudinally in slots 14 thus moving the frame members 10 and 12 longitudinally with respect to each other and thereby moving the axes 16 and 17 on which the wheels 18 are mounted toward and from each other to a limited extent. On the rear end of frame member 12 is pivoted a hook 19 for engaging the chain 4. Extending upwardly from the rear end of frame member 12 is a post 20 and between the upper end of the post and the outer end of the hook a spring 21 is provided which tends to raise the hook out of engagement with the chain. The hook has secured to its outer end a metal strap 22 bent to provide an inclined face 23 for contacting plate 9 to cam the hook up and thus disengage it from the chain when the carriage reaches the extreme rear end of the draw bench.

Two levers 24 and 25 are positioned between the frame members 10 and 12 and pivoted on post 11. The forward end of

these levers are provided with jaws 24a and 25a for gripping the pipe end. The levers cross, as most clearly indicated in Fig. 1, and the rear ends of the levers are connected by links 26 and 27, respectively, to post 13, the levers and links forming toggles controlled by relative movement of posts 11 and 12. A tension spring 28 connects posts 11 and 20 above the upper frame member.

The operation of the device is as follows:

With the carriage in the position shown in Fig. 3, the end of the pipe is placed between jaws 24a and 25a, and hook 19 is engaged with a cross-roller of chain 4 which is moved toward the rear end of the bench. Due to the high tension the chain tends to assume a straight line from the pivot of the hook to the end of the bench and therefore pulls up off the bench, as shown at 4. The motion of the chain draws frame member 12 to the left in respect to member 10, separating posts 11 and 13 and thus causing the toggles, formed by links 26 and 27 and levers 24 and 25, to close the jaws tightly upon the end of the pipe, and also placing the spring 28 under tension. The pressure between the chain link and hook prevents spring 21 from disengaging these. The carriage is drawn along the bench by the chain and draws the pipe through the die 3. When the rear end of the pipe passes through the die, even with the ordinary type of carriage, the pipe and carriage leap along the bed, due to the release of tension created during the drawing operation. With the carriage above described this action is increased, as when the resistance to the forward motion of the carriage is very materially decreased the spring 28 contracts, throwing the upper frame member toward the rear end of the bench. This expands the toggles which open the jaws, releasing the pipe. The momentum of the upper frame member and parts carried thereby carries them rearward, driving the lower frame member and parts carried by it rearward. Even with the prior types of carriage the leaping motion of the carriage was sufficient to relieve the pressure between hook 19 and the chain, and thus allowing spring 21 to disengage the hook from the chain and releasing the carriage, and, as above stated, this motion is increased by the spring and renders the release more certain. The weight 8 is then free to return the carriage to its starting position. Should the carriage fail to release itself from the chain, it will be carried along therewith until inclined surface 23 engages plate 9 at which time the hook will be released from the chain and the carriage returned by the weight, as above described.

As the carriage is automatically returned the operator, whose duty it was to return the carriage, may now be dispensed with and

the apparatus operated by one man whereas two have always been required heretofore. The production of the one operator is substantially the same as that of two with prior devices and the reduction in labor cost is therefore very material.

While I have described one embodiment of my invention in some particularity, obviously many other variations and modifications thereof will occur to those skilled in the art and I do not, therefore, limit myself to the precise details herein described but claim as my invention all such variations and modifications falling within the scope of the subjoined claims.

What I claim is:

1. A draw bench carriage comprising two relatively movable sections each provided with a pair of wheels, means connecting the sections for relative movement including rigid members carried respectively by the sections and each member having a lost motion connection with the other section, a pair of gripping jaws pivoted on one of said sections, a pair of links pivoted on the other of said sections and to said jaws, and resilient means connecting said sections.
2. A draw bench carriage comprising two relatively movable sections each provided with a pair of wheels, means connecting the sections for relative movement including rigid members carried respectively by the sections and each member having a lost motion connection with the other section, two oppositely disposed toggles each provided with one of a pair of gripping jaws and pivoted to each section, resilient means between said sections for normally maintaining them in one relative position, and engaging means carried by one of the sections for engaging a traction chain.
3. A draw bench carriage comprising a frame composed of two relatively movable members, a pivot pin carried by each member and projecting through an elongated slot in the other, and two oppositely disposed toggles pivoted on said pivot pins and extending beyond one of them to form a pair of gripping jaws.
4. A draw bench carriage comprising two frame members each provided with a pair of wheels, a pivot post fixed to each frame member and projecting through a longitudinal slot in the other, two oppositely disposed toggles between the frame members and pivoted to said posts, the toggles extending beyond one of said posts and forming a pair of gripping jaws, and resilient means between the members maintaining the posts normally at respectively opposite ends of the slots.
5. A draw bench carriage comprising upper and lower relatively movable members each provided with a pivot pin fixed thereto and movable in a longitudinal slot in the

other, two levers pivoted to one pin intermediate their ends, two links pivoted to the other pin at their ends, the ends of the links and levers being pivoted together, and a
5 spring connecting the frame members.

6. A draw bench carriage comprising relatively movable upper and lower frame members each provided with a pair of wheels, a downwardly extending pivot post
10 fixed to the upper frame member and projecting through a longitudinal slot in the lower, an upwardly extending pivot post fixed to the lower frame member and extending through a longitudinal slot in the
15 upper, two levers pivoted to the downwardly extending post intermediate their ends and two links pivoted to the upwardly extending post at one end, the other end of the first link being pivoted to the longer end of one
20 lever and the other end of the second link to the longer end of the other lever, a chain engaging hook pivoted to the lower frame member, a spring between the hook and lower frame member urging the hook up-
25 wardly and a spring between the upper and lower frame members urging the frame members toward each other.

In testimony whereof I hereunto affix my signature this 20th day of May, 1926.

EARL K. HOLMES.