

June 21, 1949.

A. J. PARK

2,473,764

CLAMP

Filed April 6, 1945

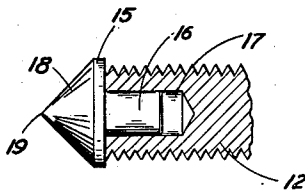
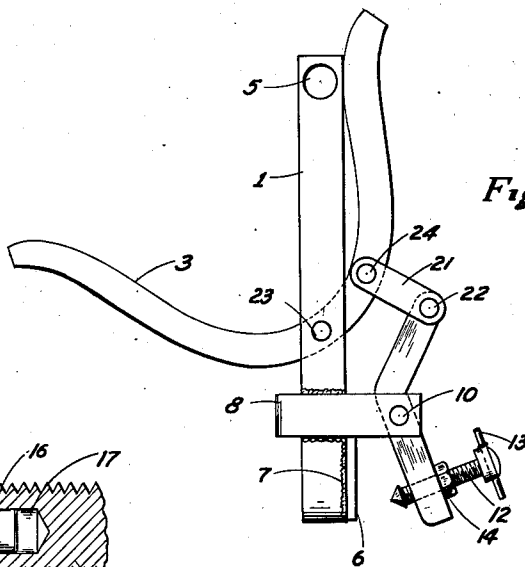
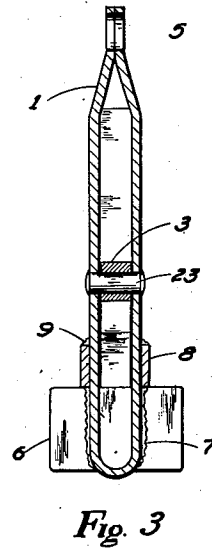
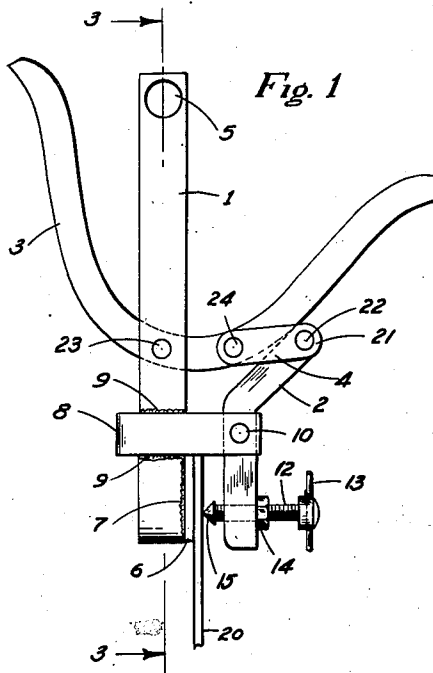


Fig. 4

INVENTOR.
ALLAN J. PARK
BY *Ridley & Watts.*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,473,764

CLAMP

Allan J. Park, Lakewood, Ohio.

Application April 6, 1945, Serial No. 586,975

4 Claims. (Cl. 24-248)

1

The present invention relates generally to clamps, and particularly to clamps for suspending metal articles while they are being conveyed thru a furnace.

Many different types of hanger clamps have been proposed heretofore for supporting freshly painted sheet metal articles while they are being conveyed thru paint drying furnaces. None of these clamps, with which I am familiar, has been entirely satisfactory. Certain of these prior clamps relied on spring tension for holding the work pieces. Since it is necessary that the clamps should retain the articles when a certain specified pull was exerted on the articles, the springs were fairly stiff and required exertion of considerable force by the operator to open and close the clamps when work pieces were being placed in or removed from the clamps. The spring tension could not be adjusted. The rate and amount of production obtainable when such clamps were used, was limited by the strength and fatigue resistance of the operators.

Other prior clamps which relied on mechanical action as contrasted with spring tension were awkward to operate. In opening or closing them the operators had to use both hands. This meant slow operation for after the clamp was opened the work piece had to be placed in position and held there while the clamp was being closed.

The present invention aims to avoid the disadvantages of prior suspension clamps and achieves this aim by providing a clamp which can be opened or closed by a light gripping action by one hand of the operator, which may be adjusted to exert a clamping force which can be varied widely without material variation in the force required to open and close the clamp and which leaves one hand of the operator free to handle the work piece during the opening and closing of the clamp.

The present invention will be understood by those skilled in the art from the following description and from the drawings which accompany and form a part of this specification and in which

Figure 1 is a side elevational view of one embodiment of the present invention with the parts disposed in closed or clamping position;

Figure 2 is a view similar to Fig. 1 but showing the device in open position;

Figure 3 is a sectional view taken on line 3-3 of Fig. 1; and

Figure 4 is a fragmentary view, partly in section, showing a detail of the clamping point carried by the movable clamping jaw of the device of Figs. 1 and 2.

2

The embodiment of the present invention which is shown in the drawings comprises a main jaw 1, a movable jaw 2, a U-shaped lever 3 and means 4 pivotally connecting lever 3 and movable jaw 2.

Main jaw 1, as shown, consists of a piece of strap iron bent into U-shape with its upper free ends provided with an opening 5 to receive the hook of a conveyor. An abutment plate 6 is disposed on one side of the jaw at its lower, looped end and is secured in place, as by weld metal 7. Plate 6 affords a flat surface against which a work piece may be clamped. Leg 8, which may consist of a piece of strap iron bent into U-shape, is attached to the outer sides of leg 1, as by weld metal 9 and projects laterally from the leg past the top adjacent edge of plate 6. At its free end, leg 8 carries a pivot 10 on which is pivotally mounted movable jaw 2. This jaw carries an adjustable screw 12, a rod 13, welded or otherwise secured to the head of screw 12, serves to rotate the screw while lock nut 14 serves to maintain the screw in axially adjusted position in jaw 2. At its inner end, screw 12 carries a clamping head 15. This head 15 is preferably composed of hardened steel and has a shank 16 which may be pressed into place in socket 17 at the inner end of screw 12. The exposed surface of head 15 is preferably conical, as is shown at 18, and terminates in point 19 which is to engage one side of a work piece 20 (Fig. 1) and press it against the opposed surface of clamping plate 6 of main jaw 1. When a larger contact area is required, as when heavier articles are to be held by the clamp, the head 15 may be larger or heavier or have a surface other than conical opposed to the article.

The lower portion of movable jaw 2, that is between pivot 10 and its lower end, is preferably vertical and parallel to main jaw 1 when the two jaws are in work holding position. The upper portion of jaw 2, that is, the portion above pivot 10, extends upwardly and outwardly at an angle to main jaw 1 and a top free end is pivotally connected to a pair of links 21, as by pivot pin 22. The U-shaped lever 3 extends between the sides of main jaw 1 and is secured in place by pivot pin 23 which extends thru lever 3 between its ends. One arm of lever 3 is pivotally connected, as by pivot 24, to links 21.

It will be noted from Fig. 1 that when the clamp is in closed position with work piece 20 clamped between jaws 1 and 2, the center line of pivot 24 is in or just below the plane in which the center lines of pivot pins 22 and 23 are located. Such positioning insures that the jaws will not

3

be accidentally moved from clamped to unclamped position. It will also be noted from Figs. 1 and 3 that each arm of lever 3 is close enough to the upper portion of main jaw 1 for an operator to grasp both of these parts in one hand. When the clamp is closed, as shown in Fig. 1, an operator may open it by grasping jaw 1 and the right arm of lever 3 in one hand and pressing the arm toward the jaw. Movement of lever 3 about pivot 23 pivots jaw 2 about its pivot 10 thereby releasing a work piece between the screw 12 and plate 6. When the clamp is in opened position, as is shown in Fig. 2, the lefthand arm of lever 3 and main jaw 1 may be grasped by one hand of the operator and the arm pressed toward the jaw about pin 23 to actuate the movable lever 2 into clamping position. As is shown in Fig. 1, the righthand arm of lever 3 may bear against the adjacent end of movable jaw 2 when the jaws are in clamping position and thus pivoted movement of the lever may be limited.

It will be understood that by axial adjustment of the screw 12 in jaw 2, work pieces 20 of various thicknesses may be clamped between the jaws of the device, or more or less clamping force may be exerted on work pieces of a given thickness. However, considerable variations in clamping pressure make comparatively little difference in the force which must be exerted on the arms of lever 3 to open or close the clamp since all the force that is required for this purpose is to break the toggle comprising lever 3, jaw 2 and the connecting means 4.

While jaw 1 is shown as being straight, and provided with an opening 5 for reception of a hook extending transversely of the conveyor, which would position the device of Fig. 4 with its lever 3 parallel to the direction of travel of the conveyor, it will be understood that when this device is to extend transversely to the direction of travel of the conveyor the upper end of jaw 1 may be turned thru 90° and will then receive a hook lying in the plane of travel of the conveyor instead of transversely thereto as is the case with the device of Fig. 1.

Altho jaw 2 and lever 3 are shown as solid bars, it will be understood that they may be sheet metal stampings, or flat pieces of metal, depending on the service conditions which are to be satisfied. Similarly, jaw 1 and leg 8 may be made of solid bars or stampings if desired. Various other modifications of the specific embodiment shown and described herein, and not involving invention, may be made by those skilled in the art without departing from the spirit of the present invention.

Having thus described my invention so that others skilled in the art may be able to understand and practice the same, I state that what I desire to secure by Letters Patent is defined in what is claimed.

What is claimed is:

1. A clamp comprising main and movable jaws spaced apart and pivotally connected together between their ends, a lever pivoted to the main jaw on one side of said pivotal connection, means between and pivotally connected to the movable jaw and lever on the same side of said pivotal connection, the lever being movable about its pivotal connection to the main jaw to move the parts of the jaws on the other side of their pivotal

4

connection into clamping position by moving the center of the pivotal connection of said means to the lever just beyond a plane joining the centers of the pivotal connections of the lever to the main jaw and said means to the movable jaw and to lock the jaws in clamping position by abutting against the movable jaw.

2. A clamp comprising main and movable jaws spaced apart and pivotally connected together between their ends, a lever pivoted to the main jaw, a link pivoted to the adjacent end of the movable jaw and to the lever between the jaws, one jaw having near the clamping end thereof adjustable work engaging means projecting therefrom toward the other jaw, the lever being movable about its pivotal connection to the main jaw to move the opposite ends of said jaws into clamping position by moving the center of the pivotal connection of the link to the lever just beyond a plane joining the centers of the pivotal connections of the lever to the main jaw and the link to the movable jaw and to lock the jaws in clamping position by abutting against the movable jaw.

3. A clamp comprising main and movable jaws pivotally connected together between their ends, the portions of said jaws on one side of said pivotal connection being work engaging and parallel portions when in clamping position and the portions on the other side of said connection being diverging portions, a lever pivoted to the divergent portion of said main jaw, a link between the divergent portions of said jaws and pivotally connected to the movable jaw and to the lever, the lever being movable about its pivoted connection to the main jaw to move the clamping portions of said jaws into clamping position by moving the center of the pivotal connection of the link to the lever just beyond a plane joining the centers of the pivotal connections of the lever to the main jaw and the link to the movable jaw and to lock the jaws in clamping position by abutting against the movable jaw.

4. A clamp comprising main and movable jaws spaced apart and pivotally connected together between their ends, a lever pivoted to the main jaw and having portions diverging from opposite sides of said jaw, a link pivoted to the movable jaw and to one diverging portion of the lever, the lever being movable about its pivoted connection to the main jaw to move the jaws into clamping position by moving the center of the pivotal connection of the link to the lever just beyond a plane joining the centers of the pivotal connections of the lever to the main jaw and the link to the movable jaw and to lock the jaws in clamping position by abutting against the movable jaw.

ALLAN J. PARK.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
737,527	Teilborg	Aug. 30, 1905
790,880	Boyer	May 30, 1905
1,580,083	Boadle	Apr. 6, 1923
1,580,578	Berry	Apr. 13, 1926
2,197,128	Harrison	Apr. 16, 1940
2,327,368	Olson	Aug. 24, 1943