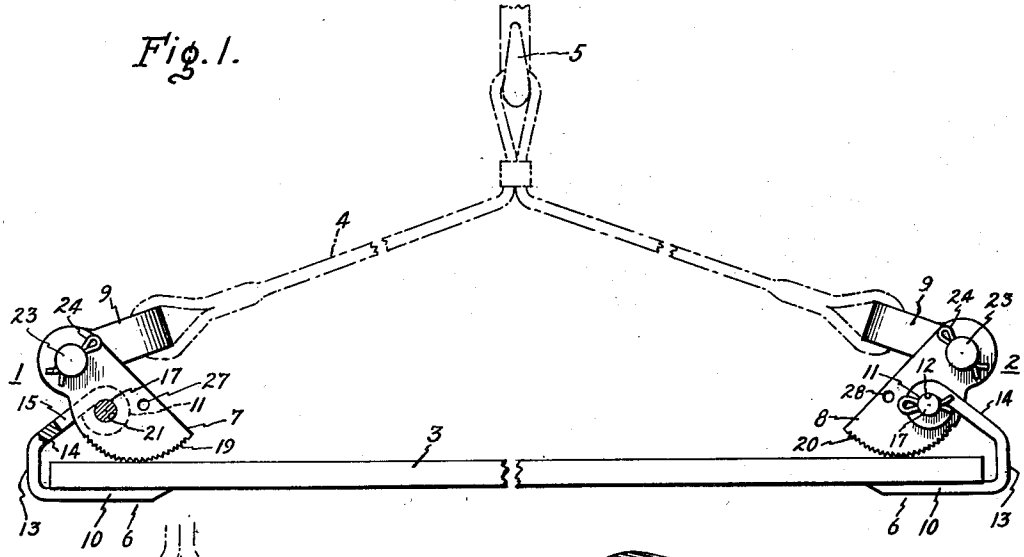
Oct. 6, 1953 J. C. RENFROE 2,654,629

HORIZONTAL PLATE LIFTING CLAMP

Filed May 27, 1952

Fig. 1.



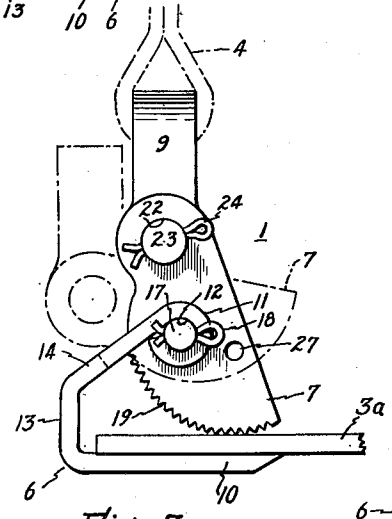
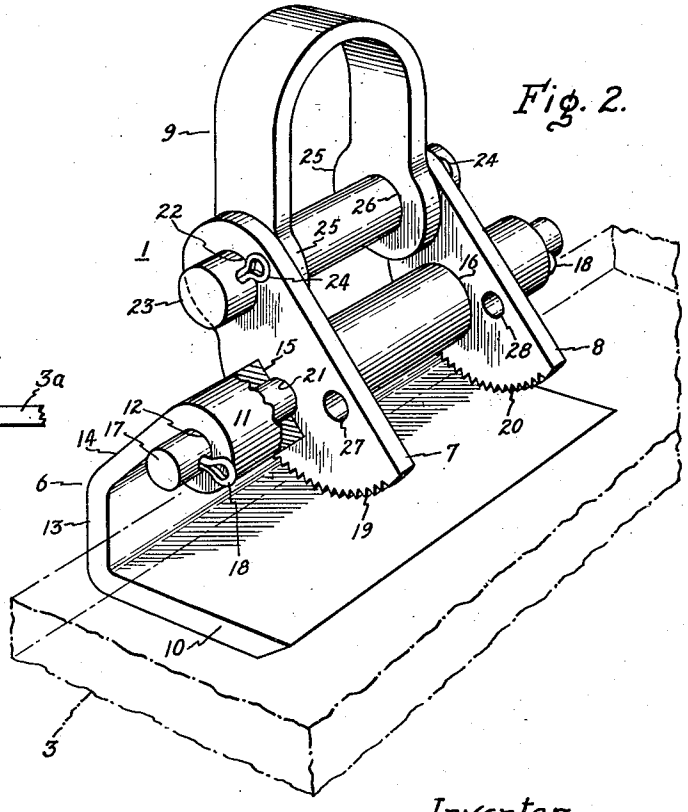


Fig. 3.

Fig. 2.



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HORIZONTAL PLATE LIFTING CLAMP

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2 Claims. (Cl. 294—101)

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My invention relates to clamps for lifting steel plates in horizontal position, and more particularly to improved horizontal plate lifting clamps which are adapted to be used in pairs at opposite edges of the plate to be lifted.

A general object of my invention is to provide an improved horizontal plate clamp.

A more specific object is to provide a maximum of strength, safety, and clamping force in a horizontal plate lifting clamp, with a minimum of complexity and of materials.

Another object of my invention is to provide an improved horizontal plate lifting clamp, of the general type intended for use in pairs at opposite edges of a plate being lifted, which will have a unitary, readily fabricated, and strong body member, and which will be so constructed as to be readily disassembled.

A still further object of my invention is to provide a horizontal plate lifting clamp which will be balanced to fall into open condition automatically upon the setting down of the plate being lifted, and which may have auxiliary means to release the jaws in case of any failure automatically to open.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the appended claims. My invention itself, however, both as to its organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawing, in which Fig. 1 is a side view of a pair of clamps in accord with my invention as they may be applied in lifting a horizontal plate; Fig. 2 is an isometric enlarged view of one of the clamps of Fig. 1; and Fig. 3 is a side view of the clamp of Fig. 2, somewhat reduced in scale, and shown engaged on a plate of less thickness than the plate of Figs. 1 and 2.

With reference to the drawing, in which similar parts are similarly identified in each of the figures, the general manner of use is exemplified in Fig. 1, wherein clamps 1 and 2, each in accord with my invention, are shown in clamping engagement with opposite edges of a horizontal plate 3, the clamps and plate being supported through a cable hitch 4 from crane hook 5. Each clamp comprises a main body portion 6 and two spaced, eccentric jaw members 7, 8. Clevis 9 of each clamp forms the connection between the ends of the lifting cable 4 and the respective jaws 7 and 8 and so transfers the lifting force to the jaws that the jaws grip or clamp the edge of the plate 3 against the platform portion 10 of the clamp.

The body member 6 of each clamp comprises a rolled-over, pin-receiving portion 11 forming a cylindrical opening from side to side of the clamp. The rolled-over, pin-receiving portion 11 is connected to the platform or bill portion 10 by a

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generally vertical back portion 13, extending upwardly from the rearward edge of the platform portion, and an upwardly and forwardly inclined intermediate portion 14 extending from the upper edge of the back portion 13 into the rolled-over, pin-receiving portion 11.

In forming the body member 6 of the clamp, a flat steel plate of suitable thickness, and of rectangular shape, is bent to form angles which separate the platform portion 10 from the back portion 13, and similarly separate the back portion 13 from the intermediate portion 14. One end of the plate is rolled over at the upper forward edge of the intermediate portion, the direction of rolling being successively forwardly and downwardly, and finally backwardly and upwardly until the extreme end of the body member meets the under side of the intermediate portion 14 to complete the formation of the circular opening 12.

Slots 15 and 16 are formed completely through the rolled over portion 11 and into the intermediate portion 14 to permit the insertion of jaws 7 and 8 respectively. It will be seen that these slots are spaced toward the sides of the body member and are bounded by parallel vertical walls. A jaw member bearing pin 17 is disposed completely through the cylindrical opening 12 of the portion 11 which spans the slots and extends at both sides of the portion 11 of the clamp body. A cotter pin 18 is provided through each of the extending end portions of pin 17 to retain the pin in its desired position.

The jaw members 7 and 8 are provided with toothed or serrated portions 19 and 20 to engage the plate being lifted, as seen in Figs. 1 and 2, and these edges are brought into position by rotation of the jaw members 7 and 8 about pin 17. Openings 21 in the jaw members receive the pin at the aforementioned slots. Additional openings 22 are provided toward the upper rearward ends of the jaw members to receive a clevis pin 23, and the clevis pin 23 extend beyond the jaws at its respective ends and is provided at each end with a suitable cotter pin 24 to retain the clevis pin in position. Arms 25 of clevis 9 are bored, at 26, adjacent the lower ends of the arms to receive clevis pin 23 therethrough. As best seen in Fig. 2, the arms 25 are disposed immediately adjacent the inner sides of respective jaw members 7 and 8. This position of the clevis arms causes the force exerted by the lifting cable to be substantially equally divided between the respective jaw members 7 and 8, minimizes any tipping tendency, reduces the stresses on the clevis pin 23, and maintains the clevis centered between the jaws 7 and 8.

Tag line receiving apertures 27 and 28 are provided in the respective jaw members at a point generally forwardly of the bearing pin pivot opening 21 of each member.

The clamp 1 as shown in Fig. 3 in gripping condition in respect to a thin plate 3a will be under-

stood to be so balanced that the downward force resulting from the weight of the clevis 9 and clevis pin 23, this weight being centered slightly to the left of bearing pin 17, is sufficient is cause the jaw 7 and jaw 8 to pivot about pin 17 into the jaw position indicated in broken lines in Fig. 3 whenever the lifting force applied through cable 4 is removed, as by setting down plate 3a and relaxing the cable 4. It will thus be apparent that it is not ordinarily necessary to actuate a tag line engaging in aperture 27 to open the clamp jaws at the time of removal of the clamps from the plate, but that the jaws will ordinarily open automatically upon relaxation of cable 4. An examination of the position of the clamp jaws with the thicker plate 3 in Fig. 1 will indicate that the automatic opening feature of this clamp is even more effective when thicker plates are handled by the device of this invention.

Operation of the clamp is believed to be apparent from an examination of the drawing, a pair of clamps being ordinarily swung from a cable hitch of the type indicated in Fig. 1, although it may be preferable to utilize a cable of greater relative length than therein indicated to provide a smaller angle between the portions of the cable extending toward the respective clamps. The platform or bill portions 10 of the two clamps are manually inserted under opposite edges of the plate 3 or 3a which is to be lifted while the cable is slack and the jaws are open. When the clamps are so positioned on the plate, taking up on crane hook 5 serves to pivot both jaws 7 and 8 of each of the two clamps into substantially equally firm engagement with the plate, gripping the edges of the plate against the platform portions 10. Because the jaws 7 and 8 of each clamp are separated toward the edges of the platform, the plate 3 is safety held against tipping even though there may be more weight in the plate toward one side or the other of the clamps. The provision of two jaw members further reduces the tendency of the clamp to bend or otherwise damage the edges of the plate.

While I have shown only certain preferred embodiments of my invention by way of illustration, many modifications will occur to those skilled in the art, and I therefore wish to have it understood that I intend, in the appended claims, to cover all such modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A horizontal plate lifting clamp comprising a unitary body member shaped to form a flat horizontal platform portion to engage under a plate, a back portion extending vertically upwardly from a rear edge of said platform portion, an intermediate portion extending angularly upwardly and forwardly from the upper edge of said back portion, and a generally cylindrical, hollow, pin-receiving rolled-under portion extending transversely of the intermediate portion at the upper forward edge of said intermediate portion, said pin-receiving portion and the contiguous upper section of said intermediate portion having two spaced vertical slots, an eccentric jaw member in each said slot, each said jaw member having an aperture therethrough aligned with the hollow interior of said pin-receiving portion, a bearing pin disposed in said pin-receiving portion through said apertures and extending beyond said pin-receiving portion at each end, fastening means in each end of said pin outside of said pin-receiving portion to retain said bearing pin in position through said portion, said jaw members having respectively similar second apertures spaced from said respective first apertures, a clevis pin extending through and beyond both said second apertures, means to retain said clevis pin in position through said second apertures, and a clevis having an upper, lifting-device-receiving portion and two downwardly extending arm portions spaced to lie respectively immediately adjacent the inner faces of said respective jaw members, said arm portions being apertured adjacent their lower ends and receiving said clevis pin therethrough, each said jaw member having means to receive a trip line for manually disengaging said jaw members from said engaged plate, the said hollow cylindrical pin-receiving portion of said body member being wider than the distance between said eccentric jaw members and extending laterally on both sides thereof.

2. A horizontal plate lifting clamp comprising a unitary body member, said body member being formed with a flat rectangular platform portion, a generally V-shaped back portion including said platform portion, and a rolled-under bearing-pin-receiving cylindrical portion extending transversely of the intermediate portion at the upper forward edge of said intermediate portion terminating at the under side of said intermediate portion, said edges being parallel and extending from side to side of said body member, said rolled-under and intermediate portions being slotted to provide two spaced, parallel, co-extensive, jaw-receiving slots toward respective opposite sides of said body member completely through said rolled-under portion and into said intermediate portion, said slots having parallel, vertical side walls perpendicular to said edges, a bearing pin positioned in said rolled-under portion to span said slots and protruding at its ends beyond respective sides of said rolled-under portion, an eccentric pivotal jaw carried on said bearing pin in each respective one of said slots, each said jaw having a generally downwardly disposed curved edge serrated to engage a plate to be carried, said edges being disposed above said platform portion, and each said jaw having a generally upwardly and rearwardly extending clevis-pin-engaging portion, a clevis pin engaged in and spanning between said last portions and extending therebeyond, a clevis having two spaced parallel arm portions positioned respectively immediately adjacent said clevis-pin-engaging portion of each said respective jaw and between said jaws, said arms being connected by a lifting-device-engageable portion of said clevis, means to retain said eccentric pivotal jaw on said bearing pin and means to retain said arm portions on said clevis pin the said rolled-under bearing-pin-receiving cylindrical portion of said body member being wider than the distance between said eccentric jaw members and extending laterally on both sides thereof.

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