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DEVICE FOR HOISTING BEAMS

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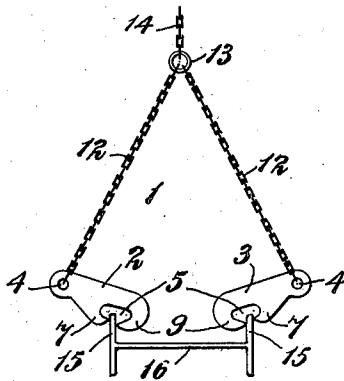


Fig. 1

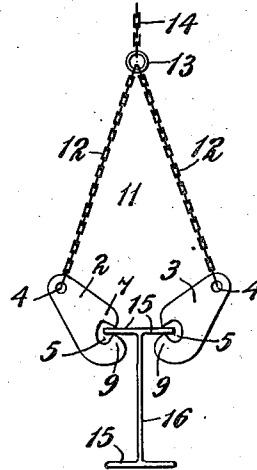


Fig. 3

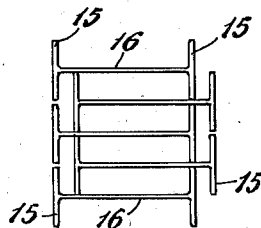


Fig. 2

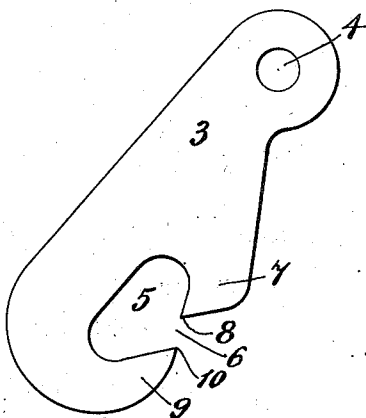


Fig. 4

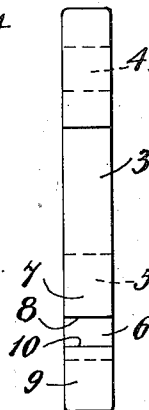


Fig. 5

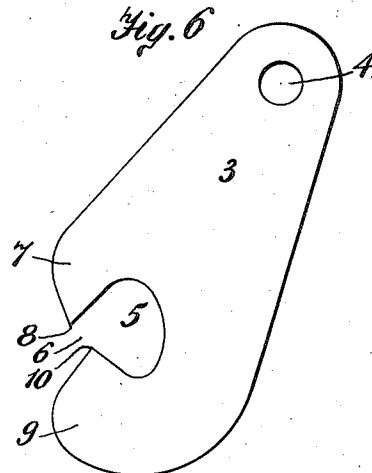


Fig. 6

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DEVICE FOR HOISTING BEAMS

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2 Claims. (Cl. 294—92)

This invention relates to a device for therewith hoisting structural flanged beams, such as I-beams, channel beams, etc., and its principal object is to provide a simplified, conveniently and economically manufacturable, conveniently utilizable, inexpensive, strong, durable, reliable, and improved device for the above purpose.

Other objects and advantages will hereinafter appear.

In the accompanying drawing,—

Fig. 1 is a front elevation of the device of this invention, showing it as utilized for stacking and unstacking I-beams, with their flanges disposed vertically.

Fig. 2 illustrates the usual manner of stacking I-beams, when handled by the device shown in Fig. 1.

Fig. 3 is a front elevation showing an adaptation of the invention when it is used for engaging, lifting, and hoisting beams for structural working, their flanges being then disposed in horizontal state.

Figs. 4, 5 are a front and side elevation, respectively, of one of the cooperating members of the device shown in Fig. 1.

Fig. 6 is a similar front elevation, in an enlarged scale, of one of the cooperating members of the device shown in Fig. 2.

The device 1, Fig. 1, comprises a pair of members 2, 3, that are similar to each other but oppositely formed as shown. Each member, Figs. 1, 4, is provided with an eye 4, a notched portion 5 having a reduced opening 6, an upper jaw 7 having a tooth 8 at said opening, and a lower jaw 9 having a tooth 10 at said opening. Chains 12 passing through the eyes 4 of both members 2, 3 are joined to a ring 13, which is in turn suspended from a vertical chain 14 leading to a hoisting drum operating from an engine or motor, not shown.

When it is desired to hoist beams that are stacked in the manner illustrated in Fig. 2, with the flanges 15 of each beam 16 protruding upwardly vertically, the device 1 is lowered directly over the topmost beam, and both members 2, 3 are placed by an operative over the beam-flanges 15 in such manner that the latter enter the notches 5 of the former, as illustrated in Fig. 1. Upon the device 1 being then elevated by the hoisting machinery, the members 2, 3 firmly engage the beam 16 by the teeth 10 of lower jaws 9 biting indently into the inner surfaces of both flanges 15, and the teeth 8 of the upper jaws 7 of both members 2, 3 simultaneously biting similarly into the outer surfaces

of said flanges. The beam 16 being thus efficiently engaged and lifted from its place, may be conveniently and securely directed to its required location and released from the device.

When it is desired to hoist beams for construction work, with their flanges disposed horizontally, a device 11 is utilized having its cooperating members 2, 3 configured as shown in Figs. 3, 6. The device is lowered directly over the upper flange 15, and the opposed members 2, 3 are placed by an operative over both sides of said flange so that they enter the notches 5 of said members. Upon the device being then elevated, it engages the beam 16 by the teeth 10 of both members biting indently into the under surfaces of the flange 15 and the teeth 8 simultaneously biting similarly downwardly into the upper surface of said flange, as illustrated in Fig. 3. In the manufacture of the members 2, 3, their teeth 8, 10 are specially hardened to insure their efficient biting indently into the surface of the beam.

I am aware that prior to this invention, various types of lifting clamps or dogs have been made for engaging and gripping the flatwise or horizontally disposed flanges of beams and other articles and accordingly make no claim to being the originator of a clamp or dog operating on a flatwisely disposed beam flange. The problem of engaging a heavy beam and raising it in a direction parallel to the plane of the flange engaged by the clamp is one which has not been heretofore solved and is of the greatest importance in the industry. It is common in this industry, both for safety and convenience, to stack beams in nested relationship substantially as shown in Fig. 2. When beams are so stacked, their longitudinal edge flanges 15 are disposed vertically and in order to enable these beams to be raised by clamps which engage horizontally disposed flanges it becomes necessary to lift the beams out of their nested positions and place them in the position disclosed in Fig. 3. Consequently, to hoist the beams, two operations by two different types of clamp are required unless a clamp is utilized which will engage over the upper edges of vertically disposed flanges on the beams and lift the beams by an upward pull in a direction substantially parallel to the planes of the flanges so engaged.

The clamp of Figs. 1, 4 and 5 is adapted to engage over the upper edges of the vertically disposed flanges 15 of the beam and lift the beam by direct upward pull, or in a direction substantially parallel to the plane of flanges 15. Thus,

the clamps are extremely effective for, and have been found so in actual practice, separating and lifting nested beams by engaging over the upper edges of their vertically disposed flanges.

5 When the clamps are disposed in their operative positions, substantially as shown in Fig. 1, it will be seen that their eyes 4 are located considerably farther apart than the width of the beam which they engage. This is due to the
10 elongated form of the member 3 wherein the eye is disposed at one end of the member at a considerable distance from the notch 5, said distance being greater than the widest portion of the notch. The elongated formation of the
15 members 3 and the relative positions of their notches 5 and eyes 4 provides great leverage when an upward pull is exerted on the chains 12 and 14 so that the vertically disposed flanges on the beams are firmly gripped by the teeth 7 and
20 9 when the clamps move pivotally under the pull of the chains. It will be observed that the chains exert a vertical pull far to one side of the notches and thus the great leverage exerted causes the clamps to firmly grip the vertically disposed
25 flanges.

Variations may be resorted to within the scope of the invention.

Having thus described my invention, I claim:—

30 1. A device for hoisting flanged beams comprising, a pair of opposed gripping members, each of said members comprising an elongated plate-like body portion having a notch formed in one of its longitudinal edges near one end thereof and an eye formed near the opposite end of
35 the member, said notch fitting over the top edge of a vertically disposed flange on a beam, said

notch having a reduced opening, the sides of which form teeth to bite indentingly into the vertical sides of the vertically disposed flange of the beam when the member is moved pivotally
5 by pull exerted substantially parallel to the plane of the engaged flange while in position over the vertically disposed flange of the beam, the two members when fitted over a pair of vertically
10 disposed parallel flanges on a beam, having their eyes disposed at points located wider apart from one another than the width of the beam and connected by lifting chains which exert a lifting
15 pull in a plane parallel to the planes of the vertically disposed flanges engaged by the members to thereby raise the beam by engagement with its vertically disposed flanges only.

2. In a device for engaging vertically disposed flanges and hoisting flanged beams comprising, a gripping member of elongated form having a notch formed in one of its longitudinal edges
20 near one end thereof and an eye formed near its opposite end, said notch having a contracted entrance opening, the sides of said opening being formed with teeth to bite indentingly into the faces of a vertically disposed beam flange
25 over which the notch is fitted, a hoisting chain connected to the eye and extending in a direction away from the edge of the member in which the notch is formed, said eye being spaced at a substantial distance to one side of the notch and at
30 a distance from the outer face of the engaged flange on the beam whereby pull on the hoisting chain will impart a pivotal movement to the member and cause the teeth thereon to engage
35 the sides of the vertically disposed flange of the beam to thereby grip the beam.

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