Oct. 13, 1953 A. J. BYRON 2,655,400

SELF-DISENGAGING LIFT HOOK

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FIG. 1.

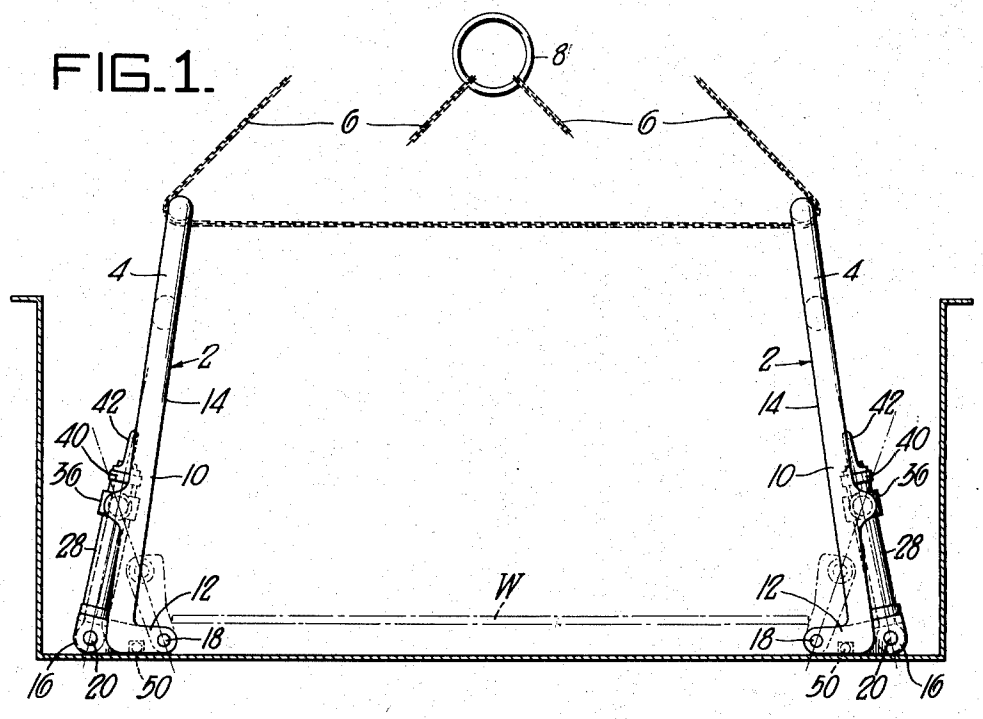


FIG. 4.

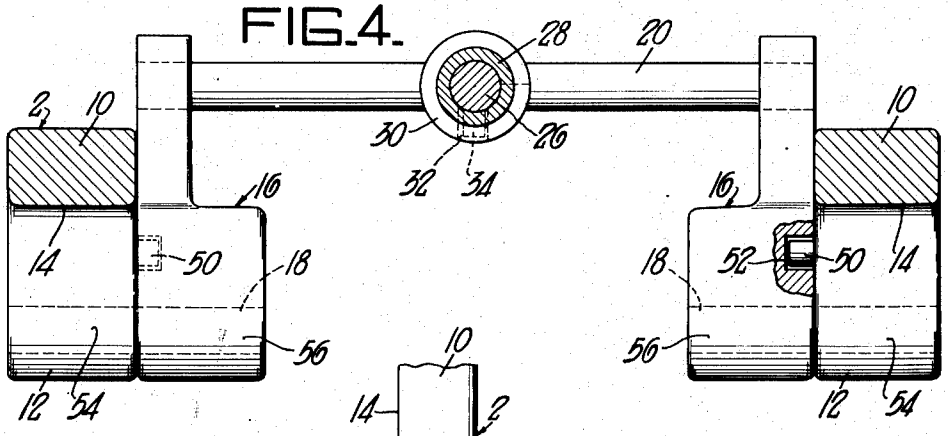
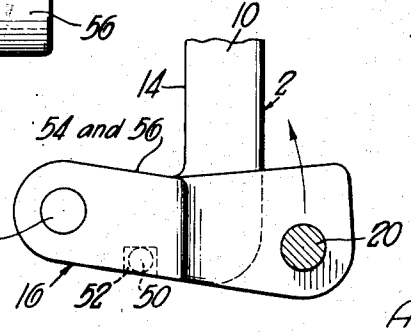


FIG. 5.



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FIG. 2.

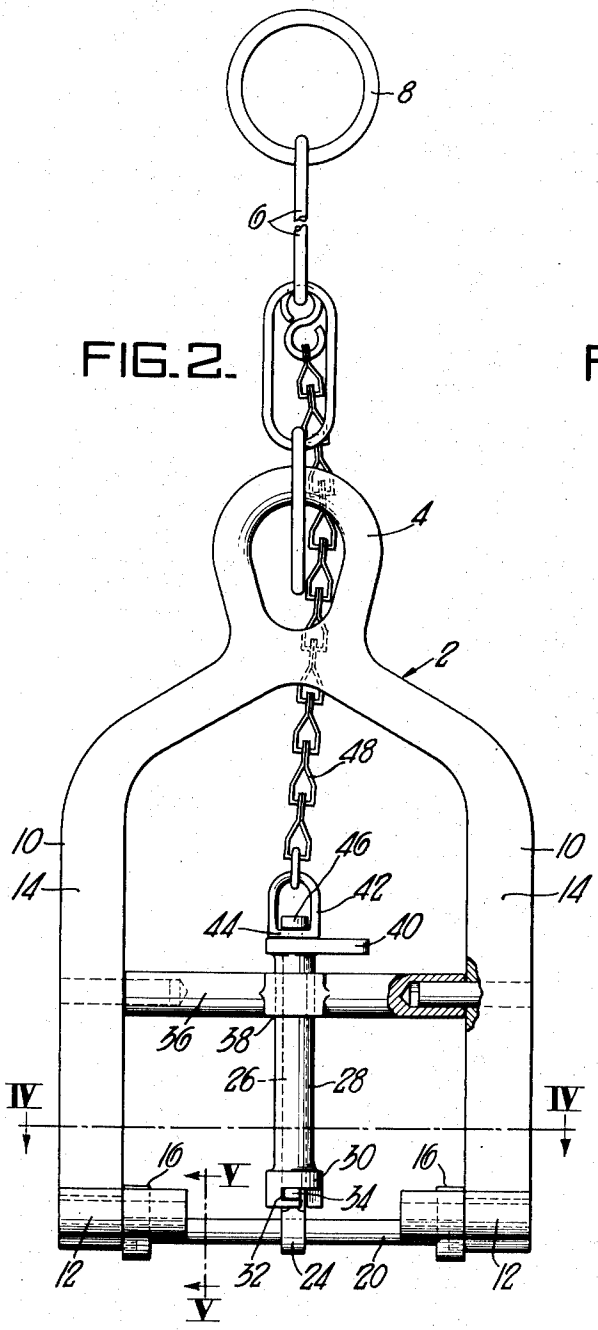
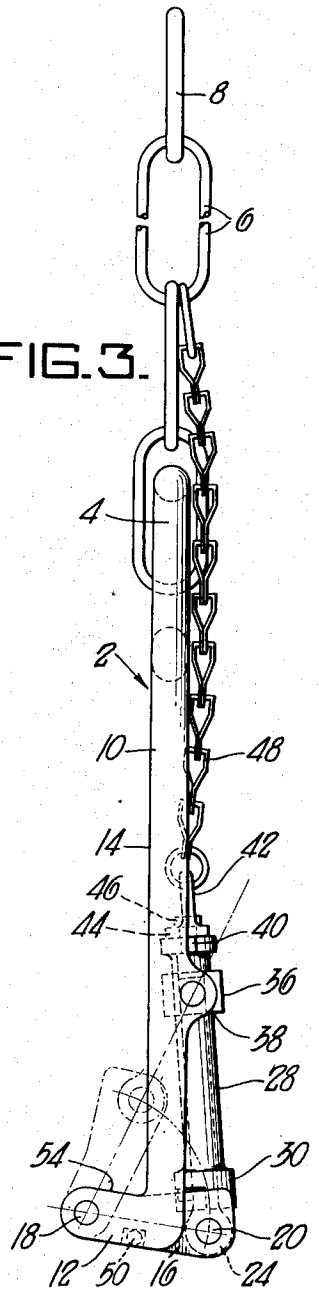


FIG. 3.



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SELF-DISENGAGING LIFT HOOK

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4 Claims. (Cl. 294—83)

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The present invention relates to apparatus for handling heavy flat plates or the like and more particularly to self-disengaging lift hooks.

Prior to my invention, apparatus for handling material such as heavy steel plates or slabs consisted of a pair of U-shaped hooks which were supported at their upper ends by a common chain carried by a crane hook. The leg portions of the hooks were provided with a foot element integral with the bottoms thereof which supported the sides of the plates or slabs being handled. After the material being handled was carried to its destination, such as an open top railway car or to a storage area, the hooks were disengaged from the material by lowering the crane hook so that the tops of the lifting hooks tilted toward each other and thereby released the feet portions from underneath the load. The hooks were then raised and moved away. To remove the lifting hooks normally required clearance of at least the length of the supporting feet on either side of the flat material being handled. If this clearance was not available, it was necessary to remove the hooks by prying or sledging. This practice required considerable manual effort and was at best quite hazardous. The prying or the sledging also frequently caused damage to the hooks, the load being carried or the mill structure adjacent the storage area, or the wall of the gondola car if the material was being loaded for shipment.

It is accordingly an object of my invention to provide lifting hooks for flat materials having incorporated therein releasing mechanism which may be set to automatically release the load after it has been lowered at its destination.

It is another object of my invention to provide a lifting hook which can disengage itself from a load of flat material in a limited clearance area with a minimum of manual manipulation.

These and other objects will become more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a side elevation showing a pair of hooks of my invention in use;

Figure 2 is a front elevation;

Figure 3 is a side elevation;

Figure 4 is an enlarged sectional view taken on the line IV—IV of Figure 2; and

Figure 5 is a cross sectional view taken on the line V—V of Figure 2.

Referring more particularly to the drawings, reference numeral 2 indicates an inverted U-shaped hook member having an eye 4 formed in the upper portion thereof for engaging a lifting

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chain 6 which may be attached, by means of a ring 8, to a crane hook not shown. The two parallel legs 10 of the U-shaped member are each provided with a foot portion 12 integral with the bottom thereof and extending normally to the broad or face portion 14 of the leg 10. A dog member 16 is pivotally mounted, by means of a pin 18, adjacent the inner surface of each of the foot portions 12. The dogs 16 extend rearwardly from the pivotal connection with the pin 18 to a point rearward of the legs 10. A shaft 20, having its ends rotatably fitted in the rearward portions of the dogs, connects them together for simultaneous movement.

A rod member 26 is attached to and projects upwardly from the collar 24 to fit slidingly in a sleeve 28 which surrounds substantially the entire length of the member 26. The bottom of the rod 26 is formed in the shape of an eye 24 which is loosely fitted around the shaft 20. The bottom of the sleeve 28 has a collar 30 thereon in which is formed at least one bayonet-type slot 32. A pin 34 projects laterally from the bottom of the rod 26 for engagement with the slot 32. A rocker shaft 36 extends between the middle portions of the legs 10 and is provided with a central opening 38 for slidingly accommodating the sleeve 28.

A handle 40 is attached to the upper end of the sleeve 28 and extends normal thereto. An eye 42 is disposed above the handle 40. The base 44 of the eye fits between the handle 40 and an enlarged head 46 on the end of the rod 26.

A chain 48, see Figures 2 and 3, is attached to the eye 42 and extends therefrom to an attachment with an upper link of the lifting chain 6.

A stop pin 50 is attached to and projects from the inner lateral surface of each of the foot portions 12 to engage recessed slots 52, located in the bottom face portion of each dog 16 for limiting the downward movement of the dogs.

In their lowermost position the upper bearing surfaces or faces 54 of the feet and the uppermost faces 56 of the dogs, lie in the same plane. Thus, any load carried by the hook is carried by both the feet and the dogs.

In operation, two of the above described lifting hooks are supported from a crane, not shown, in spaced opposed relation as shown in Figure 1. The lifting hooks 2 are lowered adjacent each side of a plate W which it is desired to move from one location to another. The lift hooks are guided into position so that the feet portions 12 engage the plate under its two sides. The lifting hooks are then raised and the load is transported

to the desired destination. When the hooks 2 are loaded, the sleeve member 28 is not in engagement with the pin 34, but when the load has reached its destination lowering the hooks 2 slackens the chain 48 and permits the sleeve 28 to drop on the rod 26. While the sleeve 28 is in its lowermost position the handle 40 is turned so that the bayonet slot 32 engages the pin 34. Then when the chain 6 is lifted slightly it rotates the opposed dogs 16 on each lifting hook simultaneously, through the chain 48 and shaft 20, causing the plate W, which heretofore was resting on the feet 12, to be transferred to the upper faces 56 of the dogs 16. Continued lifting of the shaft 20 rotates the dogs 16 further so that the load is continually being shoved off the upper faces of the dogs 16 and at the same time the dogs and the feet 12 are being gradually and positively retracted from under the plate. Thus it is possible to easily and quickly remove the supporting hooks or feet 12 from beneath the load in a confined space without sledging or prying or endangering the life of any workmen.

Once the hooks are removed from the load, handle 40 is turned to disengage the slot 32 from the pin 34 to prepare the lifting hooks to receive another load. If desired, more than one slot 32 and a corresponding number of pins 34 may be provided so as to insure positive engagement of the sleeve with the rod 26.

While one embodiment of my invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. Apparatus for handling flat plates or the like having a pair of lifting hooks each supported at its upper end by a flexible member, each lifting hook comprising a U-shape member having an eye in the upper portion thereof and two legs in spaced parallel relation, a foot portion integral with the bottom of each of said legs and extending normal thereto for supporting one edge of said flat plate, a dog pivotally mounted at one end adjacent the inner side of each of said foot portions, each of said dogs extending from said pivoted end to a point rearward of said legs, a rotatable shaft connecting the rearward portions of said dogs with its ends fitted therein, a collar mounted for rotational movement on said shaft intermediate its ends, a vertical pin element attached to said collar and extending upwardly therefrom, and means for lifting said pin to rotate said dogs to thereby disengage said hook from contact with the plate.

2. Apparatus for handling flat plates or the like as defined in claim 1 characterized by said pin lifting means including a stop pin projecting laterally from the bottom portion of said vertical pin, a sleeve member slidingly fitted on said vertical pin, said sleeve having a bayonet type slot in the bottom thereof adapted to engage said stop pin, handle means for turning said sleeve to engage and disengage the stop pin, an eye affixed to the top of said sleeve, and a flexible member attached to said eye and extending therefrom to said common flexible member whereby said shaft will be raised when the hooks are raised and the stop pin is engaged by said bayonet slot.

3. Apparatus for handling flat plates or the like as defined in claim 2 characterized by a brace member attached to and extending between said legs spaced above said shaft, said brace member having an opening therethrough intermediate its ends for slidingly accommodating said sleeve, and stop means projecting inwardly from each of said foot portions for limiting the movement of said dogs.

4. Apparatus for handling flat plates or the like having a pair of lifting hooks each supported at its upper end by a flexible member, each lifting hook comprising a U-shape member having an eye in the upper portion thereof and two legs in spaced parallel relation, a foot portion integral with the bottom of each of said legs and extending normal thereto for supporting one edge of said flat plate, a dog pivotally mounted at one end adjacent the inner side of each of said foot portions, each of said dogs extending from said pivoted end to a point rearward of said legs, a rotatable shaft connecting the rearward portions of said dogs with its ends fitted therein, a vertical pin element pivotally mounted by one end to the intermediate portion of said shaft and extending upwardly therefrom, and means for lifting said pin to rotate said dogs and thereby disengage said hook from contact with the plate.

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