May 15, 1951 D. L. CONNER 2,553,133

QUICK CHANGE HOOK

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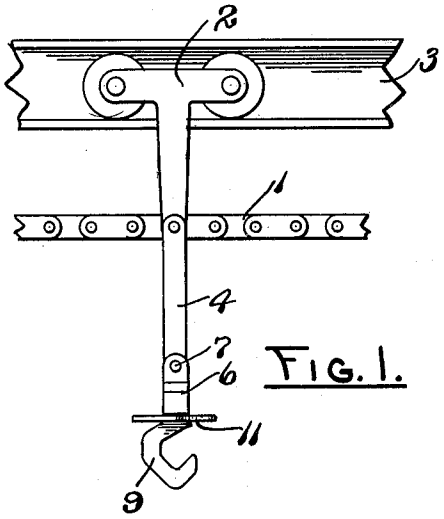


FIG. 1.

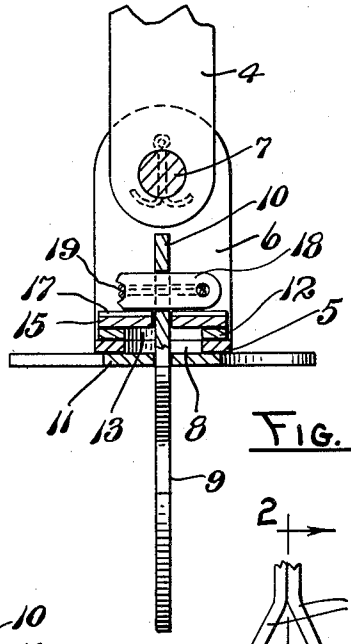


FIG. 2.

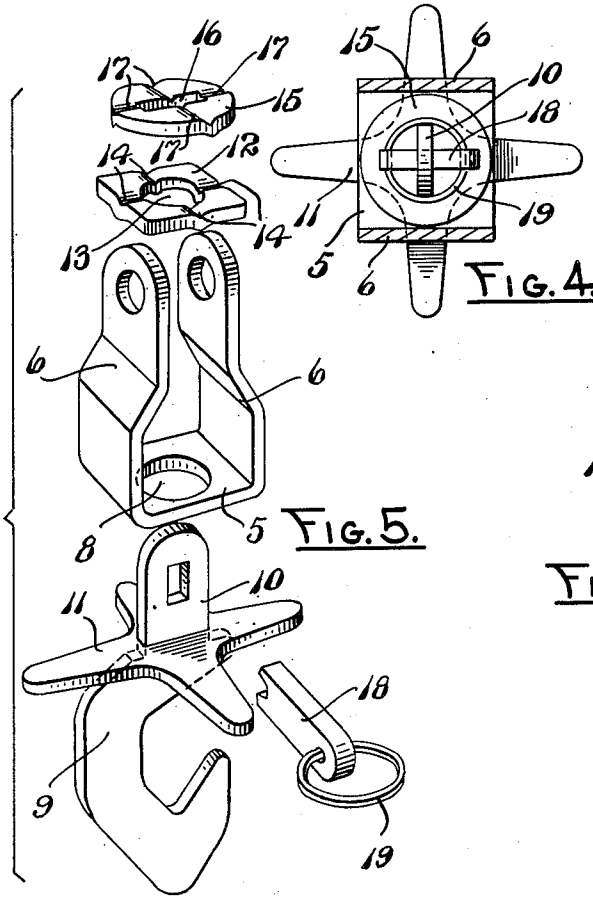


FIG. 4.

FIG. 5.

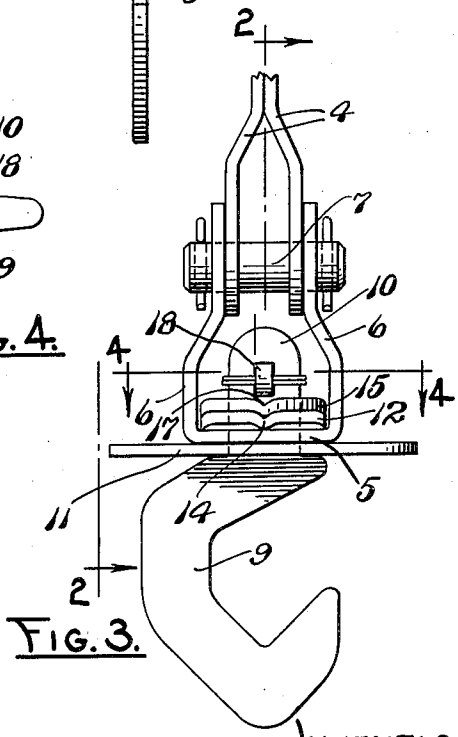


FIG. 3.

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QUICK-CHANGE HOOK

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3 Claims. (Cl. 198—177)

1

The present invention relates to a quick change hook structure by means of which hooks, from which work is suspended and is carried along by a conveyor, may be replaced whenever desired by other hooks of different dimensions and designs to hold and suspend special work which the first type of hook does not properly handle.

As an example, in the spray painting of many articles, a conveyor moves the articles suspended in spaced succession in the length of the conveyor in a predetermined direction of movement, and during such movement the paint or other finishing material is sprayed upon the articles. A very great many articles thus processed can be carried by a standard design of holding hook, but other articles which the standard hook will not properly take care of, require specially designed hooks for them. One of the purposes of the present invention is the production of simple and effective means for interchange of the hooks needed whenever required.

In the spray painting or other equivalent spraying of covering material upon articles to be thus treated, which are vertically suspended from hooks carried by a conveyor chain, it is desirable that the articles be automatically turned about a vertical axis as their movement in the direction taken by the conveyor takes place so as to present all sides and surfaces of the article to the spray guns to receive the material sprayed. Further in some cases, such turning should take place automatically at predetermined intervals of time in the conveyor movement, the time varying in accordance to the articles thus sprayed. Therefore, a further object and purpose of the invention is to equip a quick change hook structure with novel and very effective means to accomplish such automatic turning at the times when needed and to hold them against aimless or accidental movement between the stations or points of turning. Such means is available for use with any or all of the different types of hooks which may be interchangeably used. Of course, the invention further contemplates a change hook structure which permits a substantially continuous turning of the article sprayed about a vertical axis as well as a periodic or intermittent turning.

An understanding of the invention may be had from the following description taken in connection with the accompanying drawing in which

Fig. 1 is a fragmentary side elevation illustrating an application in use of my invention with an endless chain conveyor.

2

Fig. 2 is a vertical section, enlarged, of the quick change hook structure, substantially on the plane of line 2—2 of Fig. 3.

Fig. 3 is a somewhat enlarged side elevation of the quick change hook structure.

Fig. 4 is a horizontal section on the plane of line 4—4 of Fig. 3.

Fig. 5 shows in perspective the several parts of the structure in disassembled, separated relation.

Like reference characters refer to like parts in the different figures of the drawings.

In Fig. 1, a portion of the length of a conveyor chain 1 is shown to which, at spaced intervals, roller carriages 2 are connected to ride upon a channel track 3, thereby maintaining the run of the conveyor chain below it against sagging. Each of said carriages has a downwardly extending arm connected with a pivot which in turn connects adjacent links of the chain together.

A pair of vertical bars 4 at their upper ends are connected with the same chain link pivot to which the carriage 2 is connected, extending downwardly therefrom and at their lower ends passing between the upwardly extending sides of a stirrup member of flat metal having a horizontal bottom 5 and upwardly extending sides 6. Through the lower ends of the bars 4 and the upper portions of the sides, a pin 7 is passed, best shown in Fig. 3, to connect the parts together. The lower side 5 of the stirrup member has a circular opening 8 through it (Fig. 5).

A hook 9, preferably of flat form, has a vertically extending shank 10, likewise flat, which passes upwardly through the opening 8 and may be turned freely therein about a vertical axis. As shown in Fig. 5, a star wheel 11 having a plurality of equally spaced outwardly extending radial arms is provided with a central opening of a shape such that the shank end 10 of the hook 9 may pass therethrough until the star wheel at its lower side rests upon the hook.

At the upper side of said lower part 5 of the stirrup member, a square plate 12, with a circular opening 13 therethrough, may be placed over the shank 10. It is held from rotation by two of its opposite edges being located in substantially parallelism to and in close proximity with the sides 6. Said plate 12 is formed with a plurality of radially disposed downwardly pressed ribs at its lower side and with complementary grooves 14 at its upper side as shown. Above the plate 12 a circular plate or disk 15 is positioned having an opening 16 through it for the passage

of the shank 10 of approximately the same rectangular shape and dimensions as the cross section of said shank. Similarly to the plate 12 it has a plurality of radial downwardly spaced ribs being adapted to seat in the grooves 14 of the lower plate 12. Any turning of the hook 9 about a vertical axis requires an accompanying turning of the plate 15 while the plate 12 is held against movement.

The shank 10 at a point above the upper surface of the plate 15 when the parts are assembled has a rectangular opening for the passage of a short bar 18 rectangular in cross section. Bar 18 is notched at one end and adjacent the other end has wire rings 19 as shown connected with and extending therethrough. After passage through the transverse opening in the shank 10, said rings 9 may be swung over the upper end of the shank and seated in the notched end of the bar 18 (Fig. 2).

The removal of the bar 18 at any time desired and the quick disassembly and reassembly of the several parts is readily accomplished at any time desired. The reassembly will be with a different hook 9 having a shank identical with shank 10. This permits the use of the desired hooks, standard or otherwise in connection with the articles which are to be suspended therefrom.

In practice the arms of the star wheel 11, in the movement of the chain are brought in succession to spaced apart fixed projections, and engaging thereagainst, the hook is turned automatically about a vertical axis. This requires an elevation of the downwardly extending ribs of the plate 15 from the grooves 14 in the plate 12 underneath and, as in the drawing there are four arms on the star wheel, a like number of ribs and depressions on the plates 12 and 15 and a turning through an arc of ninety degrees takes place at the end of each turning movement. Accidental or otherwise undesired turning until the next projection is reached by the star wheel is prevented.

It is to be understood that the star wheel is not limited to four arms nor the number of radial ribs and depressions, at 14 to 17, to four; but that any variation of the number of star wheel arms will be matched by like variation in the number of such cooperating ribs and grooves.

In those cases where a continuous rotation of the hook is desired while the conveyor chain is continuously moving, the star wheel may be replaced by a gear or pinion meshing with a horizontal rack at one side, in which case the plates 12 and 15 will be flat with no ribs or grooves therein. Of course, if no rotation of the work, either periodically or continuously, is wanted, a star wheel or pinion will not be used but instead a flat circular plate.

The construction described is very practical and useful. It is economical to produce and of a sturdy and durable character.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In a structure as described, a stirrup member having a horizontal bottom with a circular opening therethrough and spaced vertical sides, a hook member having a flat shank extending through said opening and turnable therein about a vertical axis, means for releasably connecting said shank with the stirrup member, a rectangular plate non-rotatably located upon said horizontal bottom of the stirrup and between said vertical sides and having a round central opening therethrough of substantially the same diameter as the opening through said bottom of the stirrup member and formed with a plurality of spaced radially extending grooves at its upper side, and a second circular plate located above the first plate having an opening shaped for the passage of said flat shank whereby said second plate and shank are movable together, said second plate having at its lower side a plurality of spaced radially extending ribs adapted to enter the grooves in the first mentioned plate.

2. A structure as defined in claim 1, said means for releasably connecting the shank comprising, an opening through said shank, a horizontal bar member to pass through said opening and means connected to the bar member at one end and releasably engageable therewith at its other end.

3. A structure as defined in claim 1, said means for releasably connecting said shank comprising, an opening through said shank, a bar member extending through said opening above the bottom of the stirrup, a notch in one end of said bar member and a retaining ring pivoted to the other end of the bar member and adapted to snap into said notch.

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