

Dec. 17, 1957

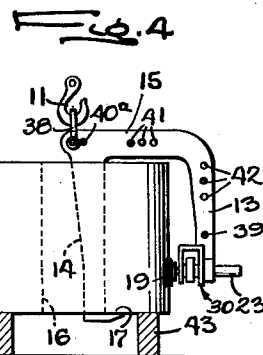
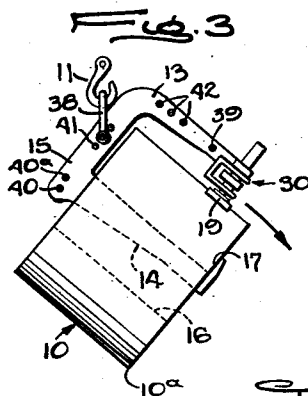
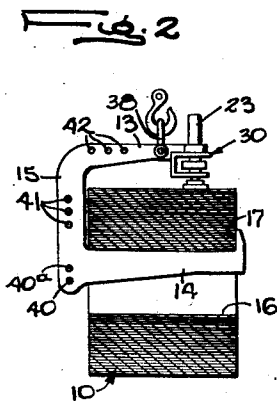
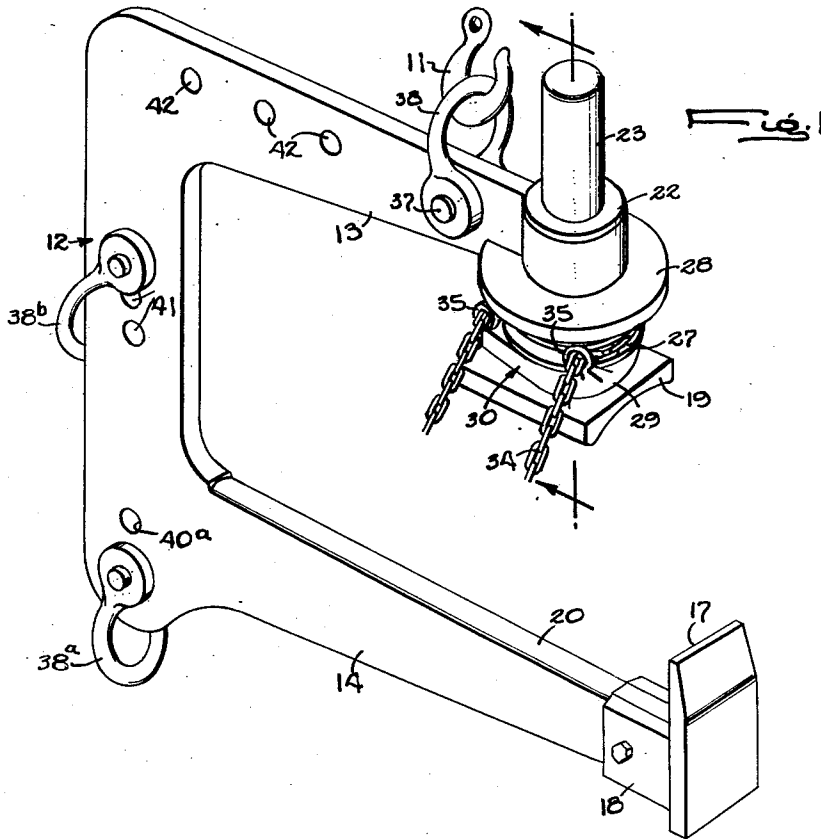
P. H. DIXON

2,816,792

COIL HANDLING DEVICE

Filed Feb. 19, 1954

2 Sheets-Sheet 1



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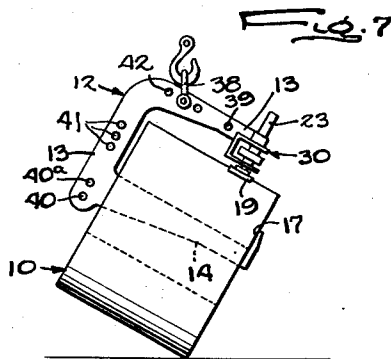
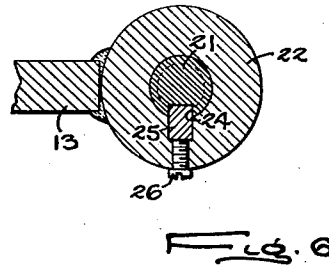
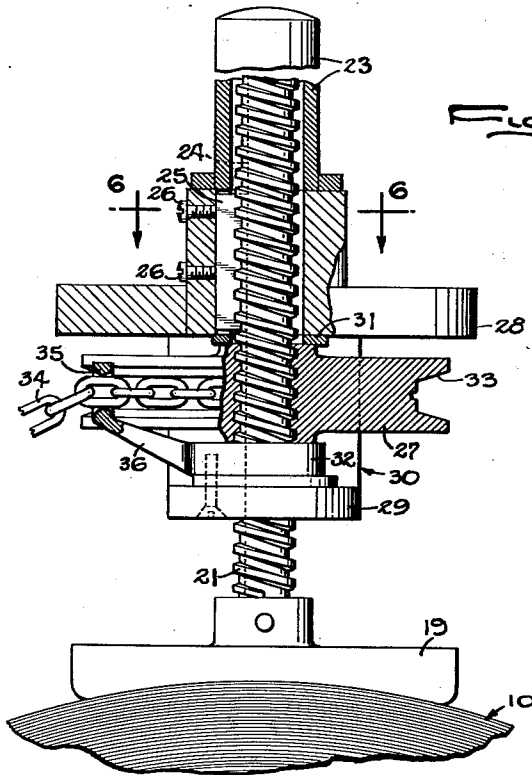
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P. H. DIXON
COIL HANDLING DEVICE

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2 Sheets-Sheet 2



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1

2,816,792

COIL HANDLING DEVICE

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3 Claims. (Cl. 294—103)

This invention relates to a device for handling coils of strip material and the like and particularly to a device of the type which is clamped to the coil and is attached to a lifting mechanism such as a crane for moving the coil from one place to another.

The principal object of the invention is to provide a new and improved coil handling device of the above character which may be used to carry a coil when the latter is in either of two different angular positions and which may also be used to turn the coil from one position to the other automatically as an incident to the application of a lifting force to the device.

A more detailed object is to form the device from a rigid member which is clamped to the coil being handled and which may be attached to the lifting mechanism selectively at any one of a plurality of points angularly spaced around the member and hence around the coil so that, by attaching the lifting mechanism at the proper point on the member, the coil may be lifted while in the desired position or turned to a new position.

The invention further aims to provide a device in which the lifting mechanism may be attached to the member at one point generally axially aligned with the center of gravity of the coil, at a second point generally radially aligned with the center of gravity and also at a point between the first two points whereby the coil may be carried with its axis vertical or horizontal and, in addition, may be turned from one of these positions to the other.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of a handling device embodying the novel features of the present invention.

Fig. 2 is a side view on a reduced scale of the device applied to a coil to carry the latter with its axis horizontally disposed, the coil being shown in section.

Fig. 3 is a view similar to Fig. 2 but shows the coil in full and illustrates the manner in which the device is used to turn a coil from the horizontal to the vertical position.

Fig. 4 is a view similar to Fig. 3 showing the device in position to carry a coil with its axis vertically disposed.

Fig. 5 is a fragmentary sectional view taken along the line 5—5 in Fig. 1.

Fig. 6 is a fragmentary sectional view taken along the line 6—6 in Fig. 5.

Fig. 7 is a view similar to Fig. 3 but showing the device as used to tilt the coil in the opposite direction.

The invention is embodied in a device for handling coils and, as illustrated in the drawings, is particularly useful in lifting, transporting and shifting large coils 10 (Fig. 2) of strip material such as sheet metal. Devices of this type are clamped to the coil and then are engaged by the hook 11 of a crane (not shown) which lifts the coil and moves it to the desired position. In handling coils of this type, it sometimes is desirable to have the coil disposed horizontally, that is, with its axis extending horizontally as shown in Fig. 2, while at other times it is convenient to upend the coil so that its axis is disposed vertically as illustrated in Fig. 4.

The present invention contemplates the provision of a novel handling device which is capable of carrying a coil when the latter is in either of two angular positions, which

2

may be used to turn the coil from one position to the other as an incident to lifting of the coil and which holds the coil securely when in either position as well as while the coil is being turned. Thus, when used to handle the coil 10, the device may hold the coil selectively in either the horizontal or the vertical position and may be employed to tilt the coil through a right angle between the two positions. To these ends, the device comprises a rigid generally C-shaped member 12 which is clamped to the coil and which may be engaged by the crane hook 11 selectively at a plurality of spaced points, engagement at these points being effective respectively to lift the article in each of its two positions and to turn the article from one position to the other.

In the present instance, the member 12 is formed by two elongated arms 13 and 14 paralleling each other and projecting laterally from and at right angles to a cross-piece 15 at the opposite ends thereof. The two arms are spaced apart so that the arm 14 projects into the central hole 16 in the coil 10 while the arm 13 extends along the outside of the coil as shown in Fig. 2. The arm 14 is longer than the arm 13 so as to extend completely through the hole 16 and on the outer end of this arm is an abutment 17 which projects laterally from the arm and engages the end of the coil to hold the latter on the member 12. Herein, the abutment is in the form of a small flat plate fast on the end of a generally rectangular collar 18 which is fitted over the outer end of and bolted to the arm 14.

To clamp the coil 10 to the member 12, a jaw 19 is mounted on the outer end of the upper arm 13 for movement toward and away from the opposing edge 20 of the lower arm, this edge thus constituting the fixed jaw of the clamp. Herein the movable jaw 19 is a block having a curved clamping surface for engaging the outside of the coil 10 and is pinned to the lower end of a screw shaft 21 (Figs. 5 and 6). The latter parallels the crosspiece 15 and is disposed within a collar 22 welded to the end of the upper arm 13 and closed at its upper end by a tubular cap 23. Cut along one side of the screw from end to end is a squared notch or keyway 24 which receives a key 25 disposed within the collar 22 and pressed into the keyway by set screws 26. The key 25 holds the screw against turning while permitting the screw to slide up and down axially in the collar.

Sliding of the screw 21 to shift the jaw 19 into and out of clamping engagement with the coil 10 is effected by turning a nut 27 threaded on the screw and held against axial shifting relative to the collar 22. To this end, the nut is disposed between the legs 28 and 29 of a generally U-shaped bracket 30, the upper leg 28 being annular in shape and rigidly attached to the collar 22 at the lower end thereof. The nut 27 is seated between a plate 31 on the lower end of the collar and a plate 32 bolted on top of the lower leg 27 of the bracket 30. The plates permit the nut to turn freely but prevent the nut from shifting axially. Around its outer periphery, the nut is formed with an annular groove 33 so that the nut constitutes a sheave. A chain 34 (Fig. 1) is wrapped around the nut in the groove and is guided by eyelets 35 fast on the outer ends of short arms 36 which project laterally from the plate 32. Thus, by pulling one end of the chain or the other, the nut is turned backward or forward and this slides the screw 21 up or down in the collar 22 so that the jaw is moved toward or away from the coil 10.

Means are provided to attach the member 12 to the crane hook 11 at different points around the member to carry the coil 10 selectively in either the horizontal or the vertical position and to tilt the coil from one position to the other. Preferably, separate means are provided to attach the hook to the member for tilting the coil and,

3

herein, two such means are employed, one for tilting the coil from the horizontal position to the vertical position and the other for tilting the coil back to the horizontal position. In the present instance, the various means for attaching the crane hook to the member 12 comprise a plurality of surfaces formed on and spaced around the exposed part of the member, that is along the upper arm 13 and the crosspiece 15, and these surfaces are selectively connected to the hook. The surfaces may, as illustrated, be the surfaces around a plurality of holes formed in the member in which case the holes receive the pin 37 of a clevis 38 which is engaged by the hook. With this arrangement, the clevis may be attached to the member at selected points around the latter to carry the coil in one position or the other or to tilt the coil as the latter is lifted.

To attach the crane hook 11 to the member 12 for lifting the coil 10 while in the horizontal position, a hole 39 (Figs. 3 and 4) is formed in the upper arm 13 near the outer end thereof. This hole is disposed approximately over the center of the lower arm 14. Thus, the hole is at or near a point midway between the ends of the coil so as to be generally radially aligned with the center of gravity of the coil. Similarly, a hole 40 (Figs. 2 and 3) is located adjacent the intersection of the crosspiece 15 and the lower arm 14 where it lies more or less along the axis of the coil so as to be approximately axially aligned with the center of gravity of the coil and, preferably, a second clevis 38^a is mounted in this hole. When the clevis 38^a is engaged by the hook 11, the coil will be held in the vertical position as illustrated in Fig. 4. If desired, a second hole 40^a may be located next to the hole 40 for use in handling coils with a smaller central hole in which case the axis of the coil would be more in line with the hole 40^a than with the hole 40.

The means for attaching the crane hook 11 to the member 12 to tilt the coil from the horizontal position to the vertical position comprises a plurality of holes 41, in this case three, spaced along the central portion of the crosspiece 15. When a clevis is secured in any one of the holes 41, the choice of hole depending upon the size of the coil being handled, lifting the coil results in the latter being turned from the horizontal position shown in Fig. 2 through the tilted position illustrated in Fig. 3. By attaching the hook to the member 12 at the crosspiece 15, the coil is turned far enough by this lifting so that, when it again is laid down on the floor or other horizontal support 43 (Fig. 4) it continues to turn, as indicated by the arrow in Fig. 3, in the same direction and comes to rest on the support in the vertical position shown in Fig. 4. In other words, the center of gravity of the coil is turned from one side to the other of the point 10^a which is the point on the coil first to engage the support.

A similar series of holes 42 disposed along the upper arm 13 intermediate the ends thereof constitute the means for attaching the hook 11 to the member 12 for turning the coil 10 from the vertical position to the horizontal position. When a clevis is secured in one of these holes and engaged by the crane hook, the coil as it is lifted will turn from the vertical position toward the horizontal position in the direction indicated by the arrow in Fig. 7. As when turning the coil in the opposite direction, lifting of the coil tilts the latter far enough so that it assumes its new position, the horizontal position in this instance, when it is set down on a support. Herein, a third clevis 38^b, which is easily detachable, is provided for selective mounting in the holes 41 and 42 and is secured in the proper hole depending upon the direction of tilting and the size of the coil 10.

It will be observed that a handling device constructed in accordance with the invention is not only easy to use but also is extremely versatile since it may be employed for carrying a coil in different positions as well as for turning the coil from one position to the other. Such

4

versatility is achieved merely by engaging the crane hook 11 with the C-shaped member 12 at selected points around the latter and this may be accomplished easily by mounting the clevises 38, 38^a and 38^b in one of the holes 39, 40, 40^a, 41 or 42. Thus, heavy coils, which normally are rather awkward to handle, may be moved in or turned to the desired position automatically as the coil is lifted.

I claim as my invention:

1. A coil handling device having, in combination, an elongated member adapted to be disposed radially along one end of the coil, a first arm rigidly connected to and projecting laterally from one end of said member to extend through the coil to the opposite end thereof, a second arm projecting laterally from the other end of said member and paralleling said first arm to lie along the outside of the coil, an element projecting laterally from the outer end of said first arm toward said second arm to engage said opposite coil end and hold the coil on said first arm, a jaw mounted on said second arm and movable toward said first arm to clamp the coil against the opposing surface of said first arm, means for attaching a lifting device to the member adjacent the inner end of said first arm and behind said surface to be approximately in axial alinement with the center of gravity of the coil, and means for attaching a lifting device to said second arm adjacent the outer end thereof and approximately in radial alinement with said center of gravity.

2. A device for handling coils having a central hole, said device comprising a first arm adapted to project into said hole, a second and parallel arm spaced from said first arm to be disposed outside the coil, a crosspiece rigidly joining said arms and extending from one end of said first arm to the adjacent end of said second arm, opposed jaws on said first and second arms respectively, means for relatively moving said jaws toward or away from each other to clamp and loosen the coil, an element adapted for engagement with a lifting mechanism, means for mounting said element on said device at a point adjacent the intersection of said first arm and said crosspiece to be approximately axially aligned with the center of gravity of the coil, second and similar means for mounting said element on said second arm at a point intermediate the ends thereof to be approximately radially aligned with said center of gravity, and a third means for mounting said element on said device between said points.

3. A device for handling coils having a central hole, said device comprising first and second elongated members rigidly connected together at adjacent ends and disposed generally at right angles to each other to lie respectively along one side and along the end of the coil, means operable to connect said device to a lifting mechanism and disposed adjacent the outer end of said first member, second and similar means disposed adjacent the outer end of said second member, third connecting means disposed along one of said members adjacent the intersection of said two members, a third member paralleling said first member and rigidly connected to said second member at the outer end thereof to project into the hole in the coil, opposed jaws on said first and third members respectively, and mechanism for moving said jaws relatively toward or away from each other to clamp and release a coil between the jaws.

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