This invention relates in general to new and useful improvements in feed mechanisms and more specifically to an improved feed mechanism for raising and lowering standards and the like.

There are many occasions where it is desired to feed members along their axes, particularly members of circular cross-section. However, in order to feed such members it is necessary that there be provided either special carriages for carrying the members or special jaws so as to progressively feed the members. The other alternative is to thread the member to be fed. However, it is not desired to thread the external surface of the members in many instances.

It is therefore the primary object of the invention to provide a mechanism which is extremely simple in construction and which may be utilized to feed a circular cross-sectional member along its axis at any predetermined desired rate.

Another object of this invention is to provide an improved feed mechanism for use in conjunction with circular cross-sectional members, the feed mechanism employing a screw principle and then utilizing a cable spirally wrapped around the member to be fed, the cable being entrained over suitable power drums to effect the movement thereof around the member to be fed.

Still another object of this invention is to provide an improved mechanism for use in conjunction with piling or other supporting standards, the mechanism being mounted with respect to a barge hull whereby the standards may be raised or lowered as necessary to effectively support the barge hull with respect to a bottom in which the standards may be urged.

A further object of this invention is to provide an improved feed mechanism for circular cross-sectional members, the feed mechanism being rotatably mounted for rotation about the member to be fed whereby the member may be fed without being rotated.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a fragmentary vertical sectional view taken through a barge equipped with standards for supporting the same from the bottom of a body of water in which it is normally floated, there being provided a raising and lowering mechanism for positioning the standards as desired, the cable portion of the raising and lowering mechanism being shown as a line for purpose of clarity;

Figure 2 is an enlarged fragmentary elevational view of the standard of Figure 1 and shows the specific details of the cable as applied thereto;

Figure 3 is an enlarged fragmentary sectional view of the cable and shows the specific details of the same;

Figure 4 is an enlarged fragmentary sectional view taken substantially upon the plane indicated by section line 4—4 of Figure 3 and shows the specific details of one of the friction blocks which forms a part of the cable and the manner in which it is attached to strands of the cable:

Figure 5 is a horizontal sectional view taken through a modified form of feed mechanism and shows the general arrangement of the guide mechanism and the cables thereof and

Figure 6 is a fragmentary vertical sectional view taken substantially upon the plane indicated by the section line 6—6 Figure 5 and shows further details of the feed mechanism for rotatably mounting the same for rotation about the standard to be fed thereby, the cables being shown as lines as in the case of Figures 1 and 5.

Referring now to the drawings in detail, it will be seen that there is illustrated in Figure 1 a barge construction which is referred to in general by the reference numeral 10. The barge 10 includes a bottom 12 and a deck 14. The barge construction 10 also includes a side 16. It is to be understood that the barge construction 10 will also include compartments and other features which are conventional and not a part of this invention. Accordingly, these features have not been illustrated or described. Carried by the bottom 12 and projecting upwardly into the interior of the barge 10 is a generally frusto-conical lower guide 18. The lower guide 18 has positioned thereon in a packing assembly 20 for sealing the bottom 12 against leakage around a standard 22 passing therethrough. The standard 22 passes through the guide 18 and up through an upper guide 24 depending from the deck 14. The guide 24, like the guide 18, is of a frusto-conical outline and differs from the guide 18 only in the length thereof.

The guides 18 and 24 are provided with opposed ends 26 and 28, respectively. The ends 26 and 28 are disposed at opposite angles to the common axis of the guides 18 and 24 to form suitable guides for an endless cable 30. The cable 30 is entrained about the standard 22 in spiral form and the upper portion of the cable 30 is engaged with the end 28, the lower portion of the cable 30 being engaged with the end 26, the ends 26 and 28 forming guides for the cable 30.

Extending between the bottom 12 and the deck 14 is a column 32. Secured to the column 32 are vertically spaced brackets 34 and 36. Carried by the brackets 34 and 36 are power drums 38 and 40, respectively. Entrained over the power drums 38 and 40 are portions of the endless cable 30. It is to be understood that the cable 30 passes over the power drums 38 and 40 several times in order to assure proper gripping of these power drums.

In order that the power drums 38 and 40 may be driven, there is provided an electric motor 42 or other similar power unit. The motor 42 includes a drive sprocket 44 which is aligned with a drive sprocket 46 connected to the power drum 40. Entrained over the sprockets 44 and 46 is a drive chain 48.

In the operation of the present invention, the motor 42 is rotated in the desired direction. When the lower part of the cable 30 moves to the right, as viewed in Figure 1, the standard 22 is rotated in a counterclockwise direction and is fed downwardly through the barge 10. On the other hand, when the lower portion of the cable 30 is moved to the left, the standard 22 is rotated in a clockwise direction and is fed upwardly through the barge 10.

Referring now to Figures 2, 3 and 4 in particular, it will be seen that there is illustrated the details of the cable 30. The cable 30 includes a pair of spaced strands 52 and 54. The strands 52 and 54 are identical and have secured thereto at relatively close intervals friction blocks which are referred to in general by the reference numeral 56.

Each friction block 56 includes a body portion 58 hav-
3

In order that the friction blocks 56 may be clamped on the strands 52 and 54, there is provided a clamp plate 62 which overlies that face of the body portion in which the grooves 60 are formed. The clamp plate 62 is clamped against the body portion 58 by a suitable fastener 64. The clamp plate 62 clamps the strands 52 and 54 against the body portion 58 to position the friction blocks 56. Each friction block 56 also includes a friction pad 66 secured to the face of the body portion 58 remote from the clamp plate 62. The friction pad 66 and each friction block 56 is intended to engage the exterior surface of a standard, such as the standard 22, or other similar circular cross sectional members to be fed.

Referring now to Figures 5 and 6, in particular it will be seen that there is illustrated a modified form of barge and feed mechanism. The barge is referred to in general by the reference numeral 68 and will be of a construction similar to the barge 10. The barge 68 includes a deck 70 which has extending downwardly therefrom a sleeve 72. It is to be understood that the sleeve 72 will extend downwardly through the bottom (not shown) of the barge 68 and form a seal to prevent entrance of water into the barge 68. Passing downwardly through the sleeve 72 in guided relation is a standard 74.

Overlying the deck 70 and supported thereon in alignment with the sleeve 72 is a base 76 for a turntable 78. The base 76 and the turntable 78 are provided with aligned openings 80 and 82 respectively, which are aligned with the sleeves 72. The turntable 78 is recessed within the base 76 and supported with respect thereto for rotation by bearings 84 and 86.

Suitably mounted above the deck 70 is another base 88 which is identical with the base 76. Carried by the base 88 is a second turntable 90 identical with the turntable 78.

The turntables 78 and 90 are provided with ring gear portions 92 and 94, respectively. The ring gear portions 92 and 94 have engaged therewith drive gears 96 and 98 which are carried by vertical shafts 100. The shafts 100 extend between the deck 70 and a suitable super-structure (not shown) supporting the base 88 and are journaled with respect thereto. It is to be noted in Figure 5 that the shafts 100 are circumferentially spaced about the turntables 78 and 90.

In order to effect rotation of the turntables 78 and 90, there is provided a power unit in the form of an electric motor 102. The electric motor 102 is suitably supported on the deck 70 and includes a drive sprocket 104. The drive sprocket 104 is horizontally aligned with the drive sprocket 106 mounted on one of the shafts 100. Entrained over the sprockets 104 and 106 in driving relation is a drive chain 108.

While the turntables and their respective rotating mechanisms have been described as being disposed above the deck 70 of the barge 68, it will be understood that all of this mechanism can be housed between the deck and the bottom of the barge 68 in the same manner as that illustrated in Figure 1 with respect to the feed mechanism of that figure.

In order that the standards 74 may be selectively raised and lowered, there is carried by the turntables 78 and 90 a first pair of power drums which include power drums 110 and 112. These power drums include shafts 114 and 116, respectively, which extend between the turntables 78 and 90 and are suitably journaled with respect thereto. Entrained over the power drums 110 and 112 is an elongated endless cable 118 which is identical with the endless cable 30. The endless cable 118 is entrained over the power drums 110 and 112 a plurality of times. The cable 118 leaves the power drum 110 and is returned to the upper portion of the power drum 112. In this manner the cable 118 may be spirally entrained about the standards 74, as is best illustrated in Figure 6. Carried by the turntables 78 and 90 is a second pair of power drums which include power drums 120 and 122. The power drums 120 and 122 are carried by shafts 124 and 126, respectively, which extend between and are suitably journaled with respect to the turntable 78. Entrained over the power drums 120 and 122 is a second cable 128 which is identical with the endless cable 118 and the endless cable 30. The endless cable 128 leaves the upper part of the power drum 120 and passes spirally around the standard 74 in the manner best illustrated in Figure 6. The endless cable 128 then returns to the lower part of the power drum 122.

In order that the power drums 110, 112, 120 and 122 may be suitably driven, there is provided a power unit in the form of an electric motor 130 carried by suitable supports 132 extending upwardly from the turntable 78. The electric motor 130 includes an armature shaft 132 on which there is mounted a pair of vertically spaced gears 134 and 136. Aligned with the gear 134 is a gear 138 carried by the shaft 124. A similar gear 140 is carried by the shaft 114 in alignment with the gear 136. Entrained over the gears 134 and 136 is a drive chain 142.

A stand for drive chain 144 is entrained over the gears 134 and 136.

In operation of this form of the invention, the cables 118 and 128 are moved by their respective power drums so as to urge a screwing action on the standards 74 to rotate the same and move it vertically through the sleeve 72. However, in order that the standards 74 may stand still the turntables 78 and 90 are turned in an opposite direction so that the power drums and the cables are turned about the standards 74 to counteract the turning tendency of the standards 74. Thus the standards 74 may be fed through the sleeve 72 without turning. In order to accomplish this synchronization, it is necessary that the electric motors 120 and 130 be properly synchronized.

If desired, the lower ends of the standards 74 may be provided with suitable auger heads. The use of these auger heads is to firmly attach the standards in the bottom of the body of water in which the barge is to be anchored. Once the augers on the end of the standards 74 have been firmly secured in the bottom, the standards will provide suitable supports for the barge and, if desired, the barge can then be lifted above the water by permitting it to climb on the standards. Further, the auger will facilitate the driving of the standards further into the bottom than that which would be possible due to the weight of the barge alone. Also, the augers would facilitate the removal of the standards from the bottom.

While the present invention has been illustrated and described with respect to standards for barges and wet finds specific application to barges of the type illustrated and described, particularly those intended for use in conjunction with oil well drilling operations, it is not intended that the invention be so limited. The two feed mechanisms illustrated and described may be utilized for feeding any type of circular cross sectional stock. For example, it may be utilized in feeding stock to a lathe or other power tool.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed is as new as is follows:

1. A mechanism for selectively advancing and retracting circular portion of the power drums, said mechanism comprising a guide for the member, a cable being entrained about the member in spiral arrangement, said cable being endless, power drums, said cable being entrained over said power
5. In combination with a barge including a plurality of circular cross sectional support members extending upwardly threethrough, a mechanism for selectively advancing and retracting said circular cross sectional members, said mechanism comprising a guide for the members, a cable entrained about the member in spiral arrangement, said cable being endless, a power drum carried by said barge, said cable being entrained over said power drum, said cable being provided at spaced intervals with friction blocks, whereby rotation of said power drum will cause movement of said cable and resultant relative vertical movement between said support members and said barge to selectively raise and lower said barge on said support members.

5. The barge structure of claim 4, said member guide having an end surface forming a guide for said cable, said end surface being disposed at an angle to the axis of said member guide.

References Cited in the file of this patent

UNITED STATES PATENTS

377,484 Gandy ........................ Feb. 7, 1888
1,194,962 Crowe ........................ Aug. 15, 1916
2,112,865 Putnam ........................ Apr. 5, 1938
2,198,178 Postlewaite .................... Apr. 30, 1940
2,592,448 McMenimen .................... Apr. 8, 1952