March 24, 1942. P. F. MURRAY 2,277,500

CASING OR DRILL PIPE SPINNING ROPE

Filed Sept. 20, 1939

Fig. 1.

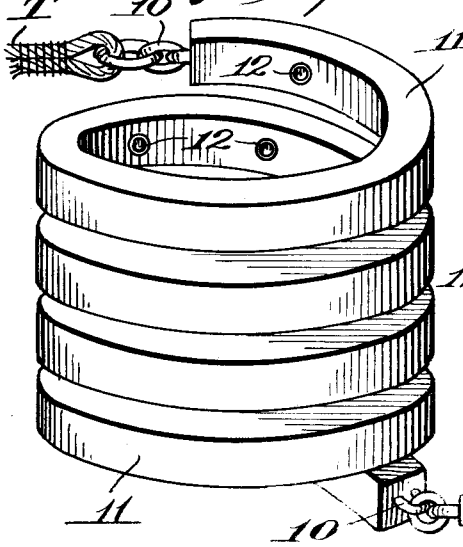


Fig. 2.

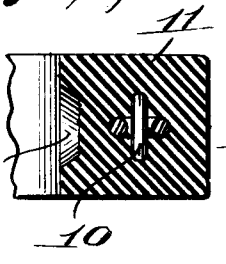
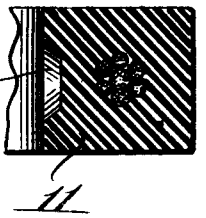
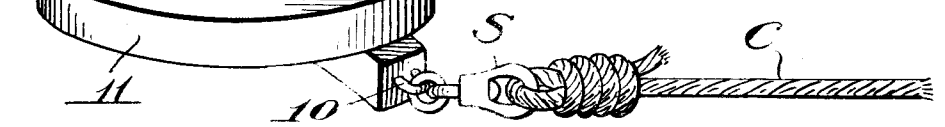
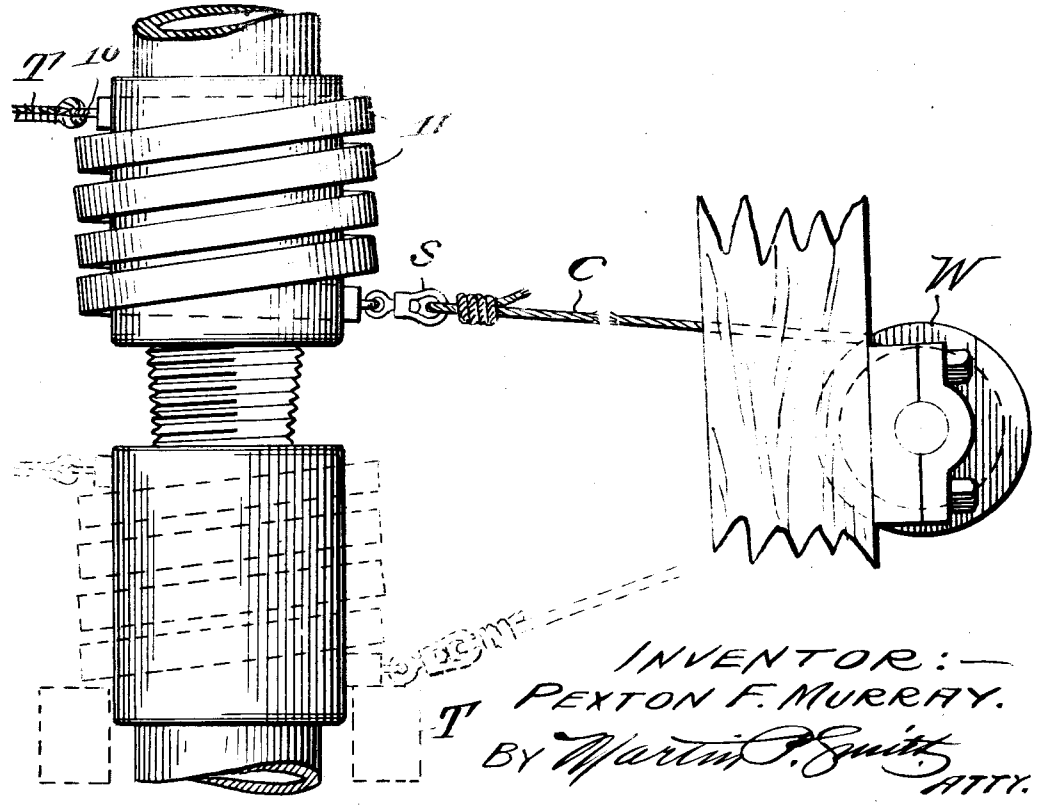


Fig. 3.







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CASING OR DRILL PIPE SPINNING ROPE

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9 Claims. (Cl. 255—35)

My invention relates to a flexible member generally termed a rope and which is utilized for imparting rapid rotary or spinning movement to the sections or stands of oil well casing, drill pipe, and the like, when said sections are being connected or "made up" before being run into the well and also for spinning the stands of casing or drill pipe in order to disconnect the same as they are withdrawn from the well.

Heretofore, it has been the general practice to utilize ordinary Manila rope for spinning casing and drill pipe, but the use of such rope has certain disadvantages, for instance, rapid wear which necessarily shortens the life or period of service of the rope and further, the tendency of the rope to slip during operation, particularly after it has been in use a short time and its surface has worn smooth and further, where ordinary Manila rope is used it involves considerable time and labor to wrap the rope around the sections of casing or drill pipe that are being rapidly rotated during the connecting and disconnecting operations.

The principal object of my invention is, to provide a flexible member or rope comprising a length of wire cable, chain, or the like, that is embedded in a body of rubber, preferably by the pressure molded process so that said member is self-coiling in order that it will immediately return to its normal coiled condition after the release of pulling strains that cause the member to uncoil and assume a practically straight line condition.

The self-coiling feature of the flexible member is particularly advantageous by reason of the fact that it materially reduces the time and labor involved in applying the rope to the casing or drill pipe and the cable or chain that is embedded in the rubber takes all of the strains that are impressed on the member while the same is in service.

A further object of my invention is, to provide a casing and drill pipe spinning rope wherein the main body portion thereof is composed of rubber, or composition of which rubber is one of the principal ingredients, in order that when the member is applied to casing or drill pipe it will frictionally grip the surface thereof so as to minimize the tendency of slippage, particularly when the pipe or casing is wet or coated with mud, oil, or the like.

A further object of my invention is, to provide a flexible member of the character referred to that is provided on its inner face or the face which contacts the surfaces of the casing and drill pipe with recesses or pockets which act as vacuum suction cups so as to materially increase the gripping effect of the flexible member when the same is tightly coiled upon casing, drill pipe, or the like.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawing in which:

Fig. 1 is a perspective view of a self-coiling casing and drill pipe spinning member constructed in accordance with my invention.

Fig. 2 is a cross sectional view of the flexible member and showing the embedded member in the form of a chain.

Fig. 3 is a cross section similar to Fig. 2 and showing a wire cable as the embedded member.

Fig. 4 is an elevational view of the adjacent ends of two stands of casing or drill pipe with the spinning member applied to the lower end of the upper stand so as to spin said member when the sections of the casing or pipe are made up or connected and also showing the cat head or winch that imparts movement to the spinning member.

Referring by numerals to the accompanying drawing which illustrates a preferred embodiment of my invention, 10 designates a chain, preferably formed of steel and capable of withstanding heavy strains in direct pull, and this chain is embedded in an elongated body 11 of rubber or, composition of which rubber is the principal ingredient.

The formation of the body of rubber with the embedded member 10 is accomplished by the pressure molded process and the rubber body when completed is substantially square in cross section. The molding of the rubber by the pressure method imparts to the body internal strains that cause the body to normally maintain a spiral shape as illustrated in Fig. 4 and after the strains that were used to uncoil the member have been released, said member will immediately assume its normal coiled condition.

In order to increase the tendency of the coiled member to grip the surface of casing or drill pipe, the flat inner face of the body of rubber 11 is provided with suitably spaced recesses or shallow pockets 12 which, when the member is applied to a casing or drill pipe, function as vacuum suction cups to counteract tendency of the member to slip while in service and particularly when the pipe is wet or coated with mud or oil.

At one end of the coiled member, one or two of the links of chain 10 project beyond the end of the enclosing body of rubber in order to form a convenient point of attachment for the tail rope T utilized during the casing and tube spinning operations. At the other end of the flexible member, a link or two of the chain projects in order to provide anchorage for a conventional swivel S to which is connected one end of a rope or cable C that extends to the winch or cat head W that is used for spinning casing, drill pipe, and the like.

In some instances, a wire cable 13 is embedded in the body of rubber 11 and takes the place of chain 10.

In the operations incident to the making up or connecting of stands of casing or drill pipe, it will be understood that the upper end of a casing or tube section projects approximately two feet above the rotary table from which the casing or pipe is suspended by means of suitable slips and that the upper end of the suspended casing or tube section carries the box of a conventional tool joint.

A stand or section of pipe with the tool joint pin at the lower end thereof is now hoisted into position above the stand that is suspended from the rotary table. Before the stand of pipe with the tool joint pin at its lower end is lowered to engage in the box of the joint on the stand suspended from the rotary table, the flexible member in loosely coiled condition is slipped over the box member of the tool joint on the pipe suspended from the rotary table with the cable C extending to the winch or cat head and the tail rope T is engaged by a workman, usually one of the operators of the tongs.

In Fig. 4, the flexible member is shown applied to the box member of the tool joint by dotted lines and likewise dotted lines show the tongs that are used for subsequently elevating the flexible member.

The stand of pipe that carries the tool joint pin at its lower end is now lowered a sufficient distance to engage the threads of the pin with the internal threads of the box and the tongs are now elevated so as to lift the coiled flexible member into position so that it surrounds the tool box having the threaded pin as shown by solid lines in Fig. 4.

The driller has the drawworks rotating at slow speed and the workman that operates the cat head now exerts a pull upon the cable C and causes the same to wrap around the drum of the winch or cat head, thereby drawing the coils of the flexible member tightly around the tool box upon which it is engaged, and this action is completed due to the fact that one of the workmen is exerting pull on the tail rope T.

The cat head is now caused to rotate rapidly so as to unwind the coils of the flexible member surrounding the tool box on which it is mounted, thus imparting rotary or spinning movement to the stand of pipe suspended in the derrick so that the pin at the lower end of said stand of pipe is screwed into the box of the tool joint on the stand suspended from the rotary table and when the shoulders of the tool joint members contact one another, the pull on the tail rope ceases, at which time the flexible member has been wholly unwound from the tool joint and said member will drop onto the floor and immediately resume its normal coiled condition.

When using the rope to break joints between the sections or stands of casing or drill pipe as the same is being pulled from the well, the flexible member is applied to the tool joint member having the threaded pin with the end of the member to which the cable C is connected, uppermost in order that when said cable winds onto the cat head the engaged pipe section will be rotated so as to unscrew the pin from the box of the other tool joint member.

Inasmuch as that portion of the flexible member that contacts the pipe is formed of rubber and the face of the member that engages the pipe is provided with the vacuum suction cups, the gripping effect of the member on the pipe is tremendous and possibility of slippage is reduced to a minimum. Further, by reason of the greatly increased degree of frictional grip of the rubber on the pipe, less coils or convolutions of the device on the pipe are required in comparison to the conventional spinning ropes that are composed of Manila fiber.

Due to the fact that all of the pulling strains developed while the device is in use are imparted to the embedded chain or cable, there is very little, if any, wear upon the rubber sheath or covering, thus imparting to the flexible member a comparatively long life or period of service.

Thus it will be seen that I have provided a self-coiling flexible member for spinning casing, drill pipe, and the like, that is relatively simple in construction, in expensive of manufacture and very effective in performing the functions for which it is intended.

It will be understood that minor changes in the size, form and construction of the various parts of my improved casing or drill pipe spinning rope, may be made and substituted for those herein shown and described, without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. As a new article of manufacture, a flexible member for use in spinning casing, drill pipe, and the like, comprising an elongated member formed of rubber, a flexible member of metal embedded in said body of rubber and extending lengthwise therethrough, the ends of which flexible metal member project beyond the ends of the body of rubber, means carried by the projecting ends of the flexible metal member for receiving cables or the like and one of the faces of said elongated body of rubber having recesses formed therein to provide vacuum suction cups.

2. As a new article of manufacture, a self-coiling flexible member for use in spinning casing, drill pipe, and the like, comprising an elongated body of rubber shaped to form a helix having internal strains that yieldingly resists forces that tend to uncoil said flexible member, a flexible reinforcing member embedded in said helically shaped member and extending lengthwise therethrough and means on the ends of said flexible member to provide points of attachment for cables or the like.

3. As a new article of manufacture, a self-coiling flexible member for use in spinning casing, drill pipe, and the like, comprising an elongated body of rubber shaped to form a helix having internal strains that yieldingly resists forces that tend to uncoil said flexible member, a flexible reinforcing member embedded in said helically shaped member and extending lengthwise therethrough, the convolutions forming the helix having flat inner faces, and means on the ends of said flexible member to provide points of attachment for cables or the like.

4. As a new article of manufacture, a self-coiling flexible member for use in spinning casing, drill pipe, and the like, comprising an elongated body of rubber shaped to form a helix that yieldingly resists uncoiling strains, a flexible reinforcing member embedded in said helically shaped member and extending lengthwise therethrough, the inner faces of the convolutions of said helical member being flat and provided with recesses to form vacuum suction cups.

5. As a new article of manufacture, a flexible member for use in spinning casing, drill pipe, and the like, comprising an elongated body of rubber shaped to form a helix, a reinforcing member embedded in and extending lengthwise through said helical body, the latter having internal strains that yieldingly resist change of its normal helical shape, and means on the ends of said flexible member to provide points of attachment for cables or the like.

6. As a new article of manufacture, a flexible member for use in spinning casing, drill pipe, and the like, comprising an elongated body of rubber shaped to form a helix, a reinforcing member embedded in and extending lengthwise through said helical body, the latter having internal strains that yieldingly resist change of its normal helical shape, the convolutions of said helical body being provided with flat inner faces and means on the ends of said flexible member to provide points of attachment for cables and the like.

7. As a new article of manufacture, a flexible member for use in spinning casing, drill pipe, and the like, comprising an elongated body of rubber shaped to form a helix, a reinforcing member embedded in and extending lengthwise through said helical body, the latter being formed so as to yieldingly resist change of shape, the convolutions of the helical body being provided with flat inner faces and there being recesses formed in said flat inner faces to provide vacuum suction cups.

8. The herein described member for use in spinning casing, drill pipe, and the like, comprising a flexible self-coiling helical member composed of rubber having internal strains that yieldingly resist forces tending to uncoil said member, a flexible reinforcing member embedded in said self-coiling member and extending lengthwise therethrough, and means on the ends of said flexible member to provide points of attachment for cables or the like.

9. The herein described member for use in spinning casing, drill pipe, and the like, comprising a self-coiling helical member composed of rubber, a flexible reinforcing member embedded in said self-coiling member and extending lengthwise therethrough and there being recesses formed on the inner face of said self-coiling helical member to provide vacuum suction cups.

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