REEL FOR ROPE AND SIMILAR MATERIAL

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This invention relates to a rope winding machine and particularly to a novel rope winding reel. While the novel reel could be used for winding various materials in various applications, it is illustrated as applied to a machine for dispensing a plurality of kinds of rope.

When a coil of rope is wound upon a member, or reel it engages the portion at the center or the core with considerable friction. It is difficult to remove the wound coil from the member at the center thereof. In some cases it has been necessary to apply great force to the coil to remove it. It is an object of this invention to provide a simple and efficient structure of reel for winding rope or similar material from which the wound coil can be easily and quickly removed.

It is another object of the invention to provide a reel for winding rope or similar material comprising a central port or core on which a coil of rope may be wound, an end port for holding said coil on said central port, said end portion comprising members which are moveable outwardly into alignment with said central portion so that the coil can be removed thereafter. It is another object of the invention to provide such a reel as set forth in the preceding paragraph in which the members forming the central port and the members forming the end frame are moved into substantially aligned positions in lines converging from the rear side of the reel, thus relieving any grip of the coil thereon so that the coil may be free and easily removed.

It is a further object of the invention to provide a reel for winding rope or similar material comprising a rear end frame, a central portion on which a coil of rope is wound comprising circumferentially spaced members pivotally secured to said rear end frame and a front end frame comprising circumferentially spaced members pivotally connected respectively to said last mentioned members, all of said members being swingable into positions to form a frame tapering toward the front of said reel.

It is more specifically an object of the invention to provide a reel comprising a central shaft, a rear end frame comprising circumferentially spaced members secured to said shaft, a central portion on which a coil of rope may be wound comprising circumferentially spaced members pivotally secured to said first mentioned members, a front end frame comprising circumferentially spaced members pivotally secured to said last mentioned members respectively and normally disposed in substantially vertical plane, means slideable on said shaft to which the last mentioned members are also pivotally connected and resilient means on said shaft for moving said first mentioned means to hold said last mentioned members in a substantially vertical plane, said last mentioned members being swingable outwardly from their outer ends against pressure of said spring to facilitate removal of said coil.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings in which like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a plan view of said reel and a portion of the machine to which it is attached;

Fig. 2 is a view in side elevation, the reel being shown in a different position in dotted lines;

Fig. 3 is a view in front elevation showing the reel in discharging position, some parts being shown in dotted lines;

Fig. 4 is a vertical section taken on line 4—4 of Fig. 1 as indicated by the arrow;

Fig. 5 is a partial view in side elevation showing a modification, some parts being shown in different positions in dotted lines;

Fig. 6 is a partial view in front elevation of the structure shown in Fig. 5; and

Fig. 7 is a vertical section taken on line 7—7 of Fig. 6.

Referring to the drawings a machine is shown having a frame comprising longitudinally extending parallel base members 10. While these members might be variously made, in the embodiment of the invention illustrated they are shown as made from angle bars having their horizontal flanges extending toward each other. Bars 11 are secured to the rear ends of members 10 at their outer sides and extend vertically therefrom, the same being joined by an integral portion 11a extending horizontally at some distance above members 10, the bars 11 and 11a thus forming one member. A similar member 12 is disposed some distance in front of member 10 also having a horizontal portion 12a and vertical portions secured at their lower ends to the member 10. Members 13 are secured to the vertical portions of members 11 and 12 at the inner sides thereof by the screws 14 and extend some distance forwardly of member 12. While members 13 might be variously made, they are also shown as formed of angle bars having their horizontal flanges at the top and extending towards each other. A bar 15 extends between the forward ends of members 13, the same being shown as an angle bar having its horizontal flange secured to the top of members 13 by the screws 16 and having its vertical flange extending downwardly over the ends of members 13. A bar 17 extends transversely above and between the bars 13, being supported on spacing blocks or thimbles 18 and secured by headed and nutted bolts 18, said thimbles resting on bars 13. Bar 17 is illustrated as in the form of an angle bar, the horizontal flange of which rests on thimbles 18 and the vertical flange of which projects upwardly forwardly of
said thimbles. Bar 17 is provided with a series of spaced V-shaped notches in which are disposed respectively rope guide members 20. Members 20 are formed of angle bars having their angles directed upwardly with the bisector of each angle extending vertically. Members 20 are secured by welding or otherwise in bars 17 and the forward angle thus having a forwardly projecting horizontal portion and a downwardly directed rear portion. Pawl members 21 are secured to the underside of portion 11a by headed and nutted bolts 22 and extend downwardly into the angle of members 20 respectively at their short portion thereof. A horizontal brace member 23 extends between the vertical portions of members 11 and 12 at each side of the frame and a diagonal brace member 24 extends between said vertical portions at each side of the frame. A bar 26 is secured to the vertical portions of members 11 and 12 at one side thereof and as shown in Fig. 1 is bent outwardly and has a forwardly extending terminal portion 26a. A bar 27 is secured to the vertical portions of members 11 and 12 at the side opposite bar 26, the same extending forwardly and being apertured to receive one end of a cylindrical rod 28 which also extends through an aperture in portion 26a. A reel-carrying frame is provided, the same being formed by a U-shaped bar 30 having one end apertureed to receive and be slidably on bar 28. The other side portions 30a of member 30 is bent at a right angle to extend substantially parallel to rod 23 and has a terminal portion 30b again bent at a right angle and apertureed to receive rod 23 on which it is slidable. The side portions of member 30 are connected by a bar 31 connecting to the portion 30a by the rivets 22 and being bent at a right angle and connected to the other side of member 30 by the rivet 33. The base members 10 are extended outwardly and the vertical flanges thereof are cut away and a member 35 is secured to members 10 by the rivets 36c, member 36 extending between members 10 and some distance beyond member 10 at the right as shown in Fig. 1. A bar 36 is provided pivotally connected by rivets 37 to the outer side of member 30 and extending downwardly in a diagonal direction, being bent to extend vertically at its lower portion and pivotally connected at said lower portion by a rivet 38 to the end of a bar 39, which bar 39 is pivotally connected at its other end by rivet 49 to member 36a. A pin 41 is secured in member 39 and adapted to engage the upper side of member 39a. Member 30 has short bars or blocks 43 connected to the inner sides thereof adjacent its bight portion by the rivets 44. A shaft 45 is journaled in member 30 and blocks 44, the same having an outer threaded end for receiving a crank arm 46 to which a handle 47 is secured by the headed and nutted bolt 48 passing therethrough. A washer 49 engages the outer side of member 30, being secured by a nut 50 and a nut 51 is placed on the outer end of shaft 45 to hold crank arm 46 in place. A pair of washers 52 are disposed at the inner side of member 30. A rear end frame 54 forming part of the reel proper is provided which comprises radially extending flat bars 54a and spaced 90 degrees apart. Bars 54a have secured thereto by rivets 54b short bars 54c, said bars 54a and 54c being formed to surround shaft 45 and being firmly secured thereto by welding or any other suitable means. Bars 55 are provided along one side of the flat bars having rounded ends and these bars are the same in number as bars 54a and are pivotally connected thereto by rivets 55 some distance from shaft 45. Bars 55 form the central portion or core of the reel on which the coil of rope or similar material will be wound. Bars 55 are pivotally connected by rivets 57 at their forward ends to radially extending flat bars 56 which normally are in a horizontal angle thus being a forwardly projecting horizontal portion and a downwardly directed rear portion. Pawl members 21 are secured to the underside of portion 11a by headed and nutted bolts 22 and extend downwardly into the angle of members 20 respectively at their short portion thereof. A horizontal brace member 23 extends between the vertical portions of members 11 and 12 at each side of the frame and a diagonal brace member 24 extends between said vertical portions at each side of the frame. A bar 26 is secured to the vertical portions of members 11 and 12 at one side thereof and as shown in Fig. 1 is bent outwardly and has a forwardly extending terminal portion 26a. A bar 27 is secured to the vertical portions of members 11 and 12 at the side opposite bar 26, the same extending forwardly and being apertured to receive one end of a cylindrical rod 28 which also extends through an aperture in portion 26a. A reel-carrying frame is provided, the same being formed by a U-shaped bar 30 having one end apertureed to receive and be slidably on bar 28. The other side portions 30a of member 30 is bent at a right angle to extend substantially parallel to rod 23 and has a terminal portion 30b again bent at a right angle and apertureed to receive rod 23 on which it is slidable. The side portions of member 30 are connected by a bar 31 connecting to the portion 30a by the rivets 22 and being bent at a right angle and connected to the other side of member 30 by the rivet 33. The base members 10 are extended outwardly and the vertical flanges thereof are cut away and a member 35 is secured to members 10 by the rivets 36c, member 36 extending between members 10 and some distance beyond member 10 at the right as shown in Fig. 1. A bar 36 is provided pivotally connected by rivets 37 to the outer side of member 30 and extending downwardly in a diagonal direction, being bent to extend vertically at its lower portion and pivotally connected at said lower portion by a rivet 38 to the end of a bar 39, which bar 39 is pivotally connected at its other end by rivet 49 to member 36a. A pin 41 is secured in member 39 and adapted to engage the upper side of member 39a. Member 30 has short bars or blocks 43 connected to the inner sides thereof adjacent its bight portion by the rivets 44. A shaft 45 is journaled in member 30 and blocks 44, the same having an outer threaded end for receiving a crank arm 46 to which a handle 47 is secured by the headed and nutted bolt 48 passing therethrough. A washer 49 engages the outer side of member 30, being secured by a nut 50 and a nut 51 is placed on the outer end of shaft 45 to hold crank arm 46 in place. A pair of washers 52 are disposed at the inner side of member 30. A rear end frame 54 forming part of the reel proper is provided which comprises radially extending flat bars 54a and spaced 90 degrees apart. Bars 54a have secured thereto by rivets 54b short bars 54c, said bars 54a and 54c being formed to surround shaft 45 and being firmly secured thereto by welding or any other suitable means. Bars 55 are provided along one side of the flat bars having rounded ends and these bars are the same in number as bars 54a and are pivotally connected thereto by rivets 55 some distance from shaft 45. Bars 55 form the central portion or core of the reel on which the coil of rope or similar material will be wound. Bars 55 are pivotally connected by rivets 57 at their forward ends to radially extending flat bars 56 which normally are in a horizontal angle thus being a forwardly projecting horizontal portion and a downwardly directed rear portion. Pawl members 21 are secured to the underside of portion 11a by headed and nutted bolts 22 and extend downwardly into the angle of members 20 respectively at their short portion thereof. A horizontal brace member 23 extends between the vertical portions of members 11 and 12 at each side of the frame and a diagonal brace member 24 extends between said vertical portions at each side of the frame. A bar 26 is secured to the vertical portions of members 11 and 12 at one side thereof and as shown in Fig. 1 is bent outwardly and has a forwardly extending terminal portion 26a. A bar 27 is secured to the vertical portions of members 11 and 12 at the side opposite bar 26, the same extending forwardly and being apertured to receive one end of a cylindrical rod 28 which also extends through an aperture in portion 26a. A reel-carrying frame is provided, the same being formed by a U-shaped bar 30 having one end apertureed to receive and be slidably on bar 28. The other side portions 30a of member 30 is bent at a right angle to extend substantially parallel to rod 23 and has a terminal portion 30b again bent at a right angle and apertureed to receive rod 23 on which it is slidable. The side portions of member 30 are connected by a bar 31 connecting to the portion 30a by the rivets 22 and being bent at a right angle and connected to the other side of member 30 by the rivet 33. The base members 10 are extended outwardly and the vertical flanges thereof are cut away and a member 35 is secured to members 10 by the rivets 36c, member 36 extending between members 10 and some distance beyond member 10 at the right as shown in Fig. 1. A bar 36 is provided pivotally connected by rivets 37 to the outer side of member 30 and extending downwardly in a diagonal direction, being bent to extend vertically at its lower portion and pivotally connected at said lower portion by a rivet 38 to the end of a bar 39, which bar 39 is pivotally connected at its other end by rivet 49 to member 36a. A pin 41 is secured in member 39 and adapted to engage the upper side of member 39a. Member 30 has short bars or blocks 43 connected to the inner sides thereof adjacent its bight portion by the rivets 44. A shaft 45 is journaled in member 30 and blocks 44, the same having an outer threaded end for receiving a crank arm 46 to which a hand-
all pressure on the coil is relieved. The coil can now be easily removed from the reel by merely sliding the same over the bars 58. When the operator wishes to restore the reel to normal position he merely moves the outer ends of bars 58 away from each other a short distance and spring 62 then moves sleeve 51 and frame 60 to bring bars 58 to their normal position. Herefore it has often been a very difficult task to remove a coil of rope from a reel. The coil grips the core part or central part of the reel very firmly and extreme force is often necessary to remove the coil. With the present structure all friction or grip of the coil on the reel is relieved and the coil can be very easily and quickly removed.

When the machine is not in use the reel can be swung to a position over the frame as indicated in dotted lines in Fig. 2. The frame 30 is moved to the right as shown in Fig. 1 so that bar 30a at its outer portion is beyond the base member 10. The frame 30 can then be swung upwardly and rearwardly about rod 28 and will take the position shown in dotted lines in Fig. 2.

In Figs. 5, 6 and 7 a modification is shown in which the handle for the reel is placed on the front end of shaft 45 or on the end opposite that in which it is shown in Figs. 1 to 3. Shaft 45 is provided with a slot 45a extending centrally therethrough and open at the front end of the shaft. A crank arm 65 is provided and while this might be variously made, in the embodiment of the invention illustrated it is shown formed of a flat bar having one end thereof disposed in slot 45a and pivotally connected to shaft 45 by the headed pivot rivet 56. Arm 65 normally extends at right angles to shaft 45 as shown in Fig. 5 and carries a small lug 65a which engages one side of shaft 45. Arm 65 is shown as twisted through 90 degrees and the same has secured adjacent its outer end a handle member 61. A headed and nutted bolt 65 extends through handle 61 and arm 65, securing handle 61 in place.

When the rope is to be wound on the reel the operator will turn the reel by taking hold of handle 61 and rotating shaft 45. When the coil of rope is to be taken from the reel members 58 will be swung as already described and the crank arm 65 will be swung to the position shown in dotted lines in Fig. 5. The said coil when taken away from the reel can thus be readily moved over the crank arm and handle. One advantage of having the crank on the front end of shaft 45 is that the operator does not have to walk around the reel after winding the rope thereon. The operation is thus made more rapid.

From the above description it will be seen that I have provided quite a simple and very efficient structure of reel on which rope or similar material may be wound and from which a coil of the wound material may be easily and quickly removed. The reel is rugged in construction and made from simple structural material. The reel has been amply demonstrated in actual practice, found to be very successful and efficient and has been commercially marketed.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts, without departing from the scope of applicant's invention, which generally stated, consists in a device capable of carrying out the objects above set forth, in the parts and combinations of parts disclosed and defined in the appended claims.

This application is a division of applicant's copending application for "Rope winding and measuring machine," filed May 31, 1938, Serial Number 210,907, now Patent No. 2,238,067, for all parts common thereto.

What is claimed is:

1. A reel for winding rope or similar material having in combination, a central shaft, a rear end frame extending about said shaft and disposed in a substantially vertical plane, a central portion for receiving a coil of rope comprising circumferentially spaced members pivotally connected to said rear frame, a front end frame comprising circumferentially spaced bars respectively pivotally connected intermediate their ends to said last mentioned members, means including a member slideable longitudinally of said shaft for holding said bars in position in a substantially vertical plane, said bars being pivotally connected at their inner ends to said member and swingable away from said rear frame to move said member toward said rear frame for bringing said bars and said circumferentially spaced members into substantial alignment in converging lines extending away from said rear frame.

2. A reel for winding rope or similar material having in combination, a central shaft, a rear end frame disposed in a substantially vertical plane, a central portion comprising circumferentially spaced members extending substantially at right angles to said frame and a front end frame comprising circumferentially spaced bars normally disposed in a substantially vertical plane and pivotally connected intermediate their ends respectively to the front ends of said spaced members, a member slideable on said shaft to which the inner ends of said bars are pivotally connected and a spring surrounding said shaft and engaging said member and said rear end frame to urge said member away from said rear frame to hold said bars in a vertical plane, said bars being swingable to move their free ends away from said rear end frame and move said member toward said rear end frame against the tension of said spring to discharge a coil of rope from said central portion.

3. A reel for winding rope or similar material having in combination, a central shaft, a rear end frame secured to said shaft, a central portion about said shaft on which a coil of rope may be wound comprising circumferentially spaced members pivotally connected at their ends to said rear end frame, a front end frame comprising circumferentially spaced bars pivotally connected intermediate their ends to the outer ends of said members respectively, a member slideable on said shaft to which the outer ends of said bars are pivotally connected and yielding means on said shaft normally holding said last mentioned member in position away from said rear end frame with said spaced bars in substantially vertical position, said bars being swingable outwardly away from said rear end frame about their pivotal connection to said members to move said last mentioned member toward said rear end frame and bring said members and bars into substantially aligned and converging position extending away from said rear frame for discharging a coil of rope wound on said central portion.

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