United States Patent

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[73] Assignee **United States Steel Coporation**

[54] **SPINNER-TYPE WIRE UNCOILING APPARATUS**
6 Claims, 2 Drawing Figs.

[52] **U.S. Cl.** **242/128,** 242/129.72
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[50] **Field of Search** 242/128, 129.6, 129.8, 129.72, 54

[56] **References Cited**

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ABSTRACT: Apparatus especially suitable for paying off wire from a cored bundle or coil or wire positioned eye-up on a skid or a pallet. The apparatus includes a hat member consisting of a plate with a centrally disposed crown adapted to be positioned with the plate resting on the upper surface of the coil and the crown fitting into the eye of the coil. Holddown rods are provided which are anchored at their bottom ends to the skid or pallet with their upper ends passing through the crown of the hat member when the apparatus is positioned on a coil of wire. Helical coil springs surround the portion of each of the rods above the crown and a wing nut threaded on the upper end of each rod holds the spring in compression so that the crown of the hat member is constantly urged inwardly of the eye of the coil of wire. A spindle extends centrally from the bottom of the crown to a point above the plate of the hat member. A spinner payoff mechanism is rotatably mounted on the spindle and a brake is provided for controlling the speed of rotation of the spinner payoff mechanism.

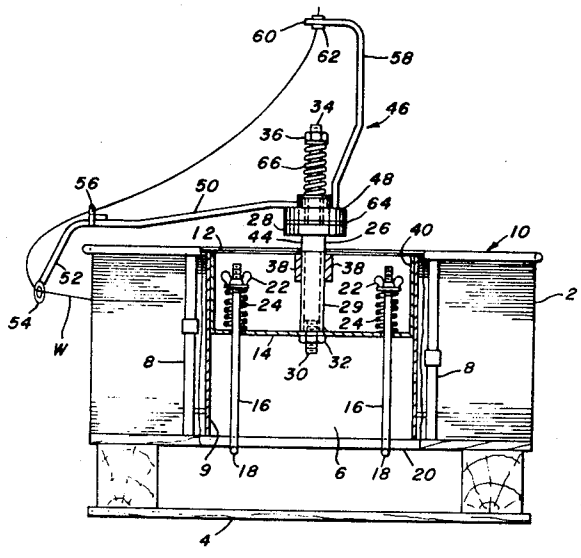


FIG. 1.

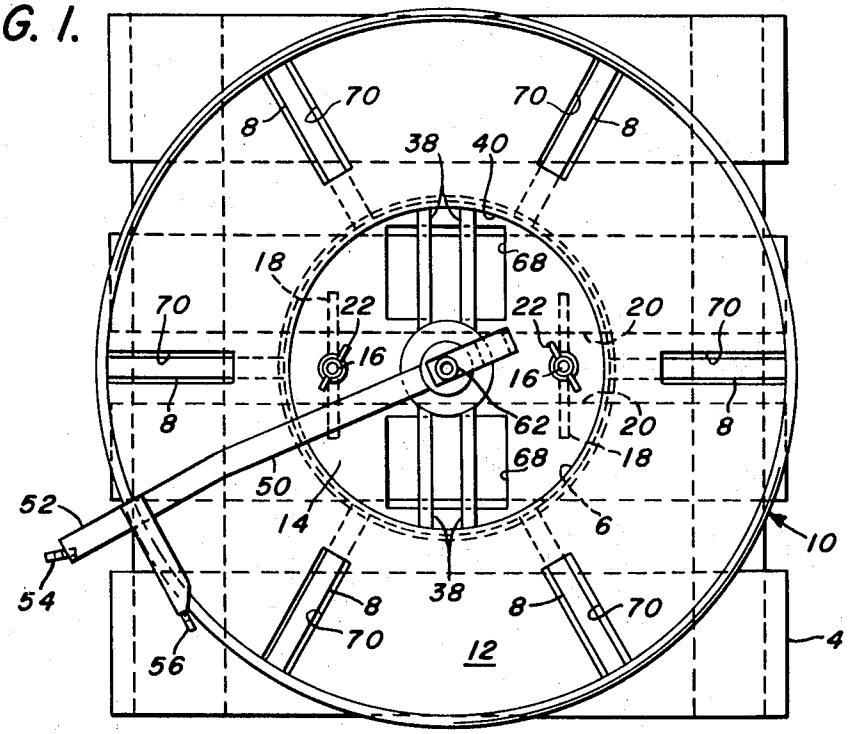
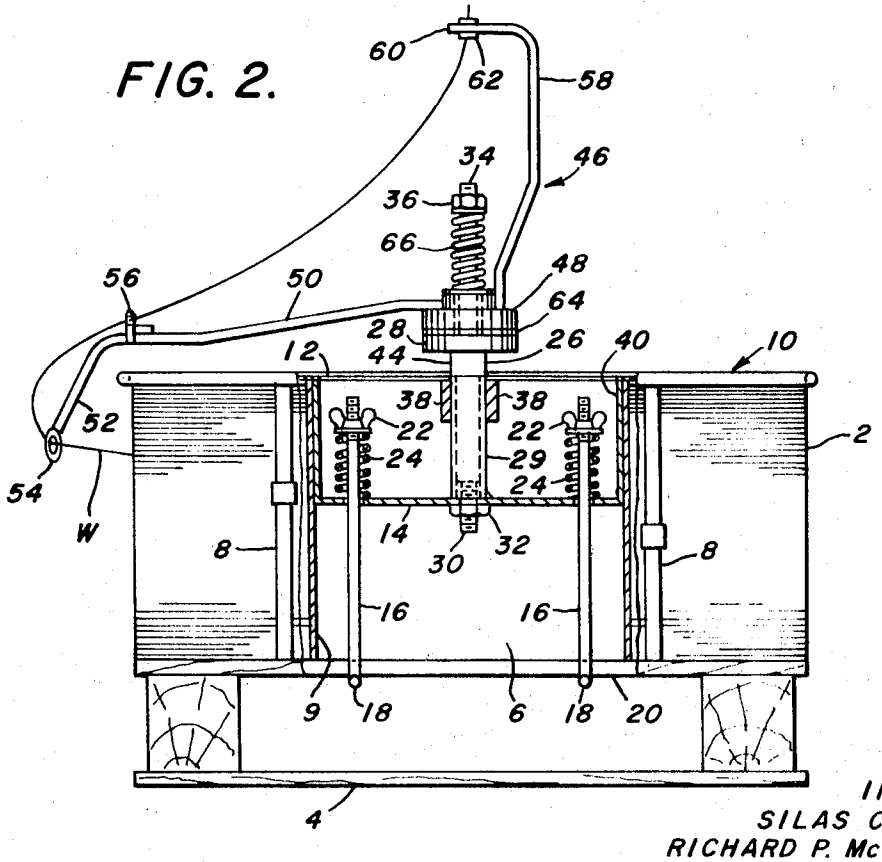


FIG. 2.



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SPINNER-TYPE WIRE UNCOILING APPARATUS

BACKGROUND OF THE INVENTION

The present invention relates to the handling of wire and more particularly to apparatus for paying off wire from a cored coil of wire.

Prior to my invention, much difficulty was encountered in the transportation of bundles or coils of wire, particularly heavy bundles of tempered wire used in the manufacture of springs for mattresses, furniture and the like. Manufacturers of such items obviously find it to their advantage to be supplied with large and heavy bundles of wire so that their operations can be run for long periods of time without interruption.

Heretofore, it has been usual practice to spool wire at its source of manufacture on a suitable reel and then ship the wire bundle, which would weigh approximately 1,000 pounds, with the reel contained therein. After the customer had used the wire, he was to ship the reel back to the wire manufacturer. This was a costly procedure since the reels were frequently damaged in transport or were not returned at all, which, of course, increased the wire manufacturer's cost.

SUMMARY OF THE INVENTION

It is, accordingly, the primary object of my invention to provide a payoff mechanism which may be used to pay off wire from a reelless wire bundle.

It is a more specific object of my invention to provide a spinner-type payoff apparatus for a reelless wire bundle resting on a base support with its eye directed vertically. The payoff mechanism of the invention includes a hat member consisting of a plate and a crown which is adapted to be disposed with the plate resting on the upper surface of the wire bundle and the crown fitted into the eye of the bundle. Spring-loaded means are provided for connecting the crown with the base support and constantly urging the crown inwardly of the eye of the coil. A spindle connected with the crown at its lower end and projecting upwardly of the plate of the hat member supports a spinner-type payoff mechanism. A brake is provided for controlling the rate of rotation of the spinner-type payoff mechanism.

BRIEF DESCRIPTION OF THE DRAWING

These and other objects will become more apparent after referring to the following specification and attached drawing, in which:

FIG. 1 is a plan view of a pallet supported bundle of wire with the uncoiling apparatus of the invention installed thereon; and

FIG. 2 is an elevational view, partly in section, of FIG. 1 with parts broken away to better show the uncoiling apparatus of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring more particularly to the drawing, reference numeral 2 designates a cored bundle or coil of wire resting on a pallet 4 with its eye 6 directed vertically. The bundle 2 of wire is held in compressed condition by means of a plurality of axially directed metal straps 8 spaced around the body of the bundle and has a sleeve 9 of cardboard or similar material lining its eye 6.

The apparatus of the invention includes a hat member, designated generally by reference numeral 10, formed with a substantially circular plate 12 and an integral crown 14 centrally disposed on the plate. The hat member 10 is disposed on the bundle 2 with the plate 12 resting on the top of the bundle and the crown 14 fitted into the eye 6. A pair of holddown T-bolts 16 are anchored to the pallet 4 with the T-heads 18 of the bolts 16 engaged under two adjacent slats 20 of the pallet 4, as best shown in FIG. 1. The T-bolts extend upwardly from the pallet 4 and pass through suitable openings in the crown 14. A wing nut 22 is threaded on the upper end of each of the T-bolts 16 and a helical compression spring 24 is circumferentially disposed on the portion of each of the T-bolts between the wing nut 22 and the crown 14. The springs 24 constantly urge the crown inwardly of the eye of the bundle. The tension exerted by the springs 24 can be adjusted by turning the wing nuts 22.

A spindle 26 having a circular flange 28 formed thereon intermediate its ends extends upwardly from substantially the center of the crown 14 to a point above the plate 12. The bottom portion of the spindle 26 is fitted into and supported by an upstanding tube 29 which in turn is centrally affixed at its lower end, as by welding or the like, to the crown 14. The lower end 30 of the spindle 26 projects through the crown and is of reduced diameter, is threaded, and has a nut 32 threaded thereon affixing the spindle to the crown. The upper end 34 of the spindle 26 is also threaded and has a nut 36 threaded thereon for a purpose which will become apparent. A pair of spaced parallel elongated metal braces 38 extends diametrically between the upper sidewalls 40 of the crown 14 and also serve as lateral supports for the upper end of the tube 29. The spindle projects upwardly of the two braces 38.

A spinner-type payoff mechanism, indicated generally by reference numeral 46, having a hub 48 is mounted on the spindle with the hub rotatably disposed around the body of the spindle supported by the flange 28. A generally horizontal arm 50 is connected with the hub 48 at one end and extends radially therefrom to terminate in a downwardly projecting end portion 52. The free end 52 of the arm 50 is disposed adjacent but spaced from the periphery of the bundle 2. An eyelet 54 is provided on the end of the arm portion 52 for passage of a strand of wire W from the bundle 2. Another eyelet 56 is disposed on the end of the horizontal portion of the arm 50 for receiving and guiding the strand of wire after it passes through the eyelet 54. A generally vertical arm 58 is connected by one end to the hub 48. The upper portion 60 of the arm 58 is bent approximately normal to the body of the arm. An eyelet 62 is provided adjacent the end of the portion 60 of the arm 58 for receiving and guiding wire from the eyelet 56.

A friction disc 64 of leather or similar material may be provided between the bottom of the hub 48 and the upper surface of the flange 28 so as to provide some resistance to the rotation of the hub 48 when wire is being paid off from the bundle 2. A brake mechanism consisting of a spring 66 circumferentially disposed on the spindle between the nut 36 and the hub 48 may be provided for increasing the friction between the hub and the flange and thereby control the speed of rotation of the payoff mechanism. The compression exerted by the spring 66 may be adjusted by turning the nut 36.

As best shown in FIG. 1, two viewing ports 68 may be provided in the crown 14 for the purpose of facilitating placement of the T-bolts 16 when the hat member 10 is initially installed on the bundle 2.

Elongated closed end radially extending slots 70 are formed in the plate 12 spaced about its periphery for a purpose which will become apparent.

In operation, the hat member 10 is placed on the bundle 2 with the crown 14 fitted in the eye 6 of the bundle and the plate 12 resting on its upper surface. The plate is so disposed that an elongated slot 70 overlies each of the straps 8. At this time, the metal straps 8 are intact and the bundle is in compressed condition. The T-bolts which have already been inserted through the crown are manipulated to cause the T-heads 18 thereof to engage the undersides of adjacent slats 20 of the pallet 4, as best shown in FIG. 1. The wing nuts 22 are then tightened to compress the springs 24 and hold the hat member in position with the plate resting on the upper surface of the bundle 2. After the device of the invention has thus been installed, the lead wire W of the bundle 2 is inserted manually through the eyelets 54, 56 and 62 from whence it is passed to the wire-forming machine (not shown). Before the wire-forming machine is started in operation, the straps 8 are cut preferably near the upper ends thereof on the outside of the bundle. The upper portions of the cut straps are then inserted through the slots 70 in the plate 12 so as to be out of the

way of the periphery of the wire bundle. The lower end of each of the cut straps is bent away from the bundle so that it will not interfere with the payoff operation. Then the wire-forming machine is started in operation which causes the wire W to be pulled from the bundle 2 and fed into the machine. Pulling of the wire W through the eyelets on the spinner payoff mechanism causes rotation of the payoff mechanism about the outer periphery of the bundle 2 so that the wire is guided therefrom without kinks or snarls.

The bundle as strapped is under compression and portions thereof extend above the sleeve 9 and as the payoff operation proceeds the compression is relieved and the height of the coil diminishes slightly so that the plate 12 is brought into contact with and thereafter supported by the sleeve 9. Because of this, it may be necessary to readjust the compression of springs 24 by turning wing nuts 22.

While we have shown but one embodiment of our invention, other adaptations and modifications may be made without departing from the scope of the following claims.

We claim:

1. In a coil of strand material resting with its eye directed vertically on a base support and having a sleeve lining its eye the improvement therewith of apparatus for uncoiling said coil, said apparatus comprising a rigid hat member including a plate and an integral crown disposed centrally of said plate, said plate being adapted to rest on the top of said coil with said crown fitting in the eye of the coil, elongated spring-loaded means resiliently anchoring said crown to said base support, said means constantly urging said crown inwardly of the eye of said coil, a centrally disposed fixed spindle projecting upwardly of said crown and plate, a spinner payoff mechanism rotatably mounted on said spindle, said spinner mechanism having a radially extending first arm disposed with the free end thereof adjacent the periphery of said coil, the free end of said first arm having an eyelet therethrough for passage of said strand material, said spinner mechanism having a substantially vertical second arm, said second arm having an eyelet in the free end thereof for the passage of strand material therethrough after said strand material passes through said first mentioned eyelet, the free end portion of said radially extending arm of said spinner mechanism being adapted to rotate about the periphery of said coil as strand material is drawn from said coil through said first and second mentioned eyelets.

2. Apparatus as defined by claim 1 including adjustable brake means on said spindle in contact with said spinner mechanism effective to exert frictional force on said spinner mechanism and thereby control its rotation.

3. Apparatus as defined by claim 2 in which said spinner mechanism includes a hub, said arms being connected to and projecting from said hub, said spindle being formed with a flange intermediate its ends, said hub resting on said flange, said brake means including a nut threaded on the upper end of said spindle and a helical coil spring circumferentially disposed around the portion of said spindle bearing against said nut and said hub, said nut being adjustable along said spindle to thereby increase and decrease the compression of said spring on said hub for increasing and decreasing the friction between said hub and said flange.

4. Apparatus as defined by claim 1 in which said elongated spring-loaded means includes at least a pair of rods each having a nut threaded on its upper end, a helical spring surrounding the portion of said rod between said crown and said nut, and means on the bottom of said rod engaging said support base to anchor the rod thereto.

5. Apparatus as defined by claim 1 in which said plate is formed with radially extending closed end slots spaced about its periphery.

6. Apparatus as defined by claim 1 in which said crown is formed with viewing ports therethrough.

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