March 23, 1954 W. P. LEWIS 2,673,046

APPARATUS FOR UNCOILING WIRE

Filed Nov. 5, 1952

FIG. 1.

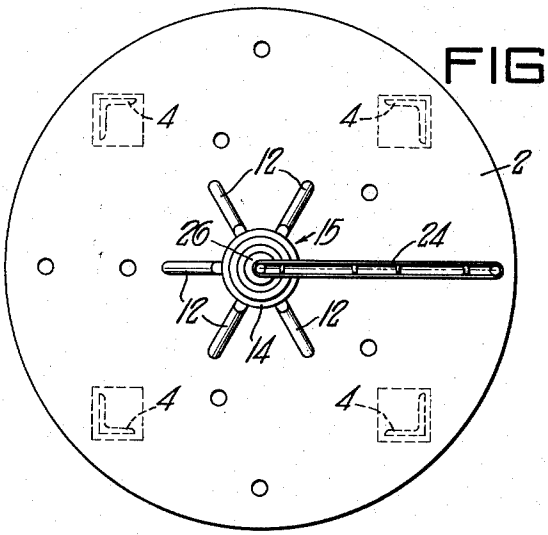


FIG. 3.

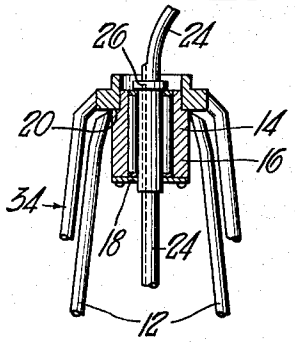


FIG. 2.

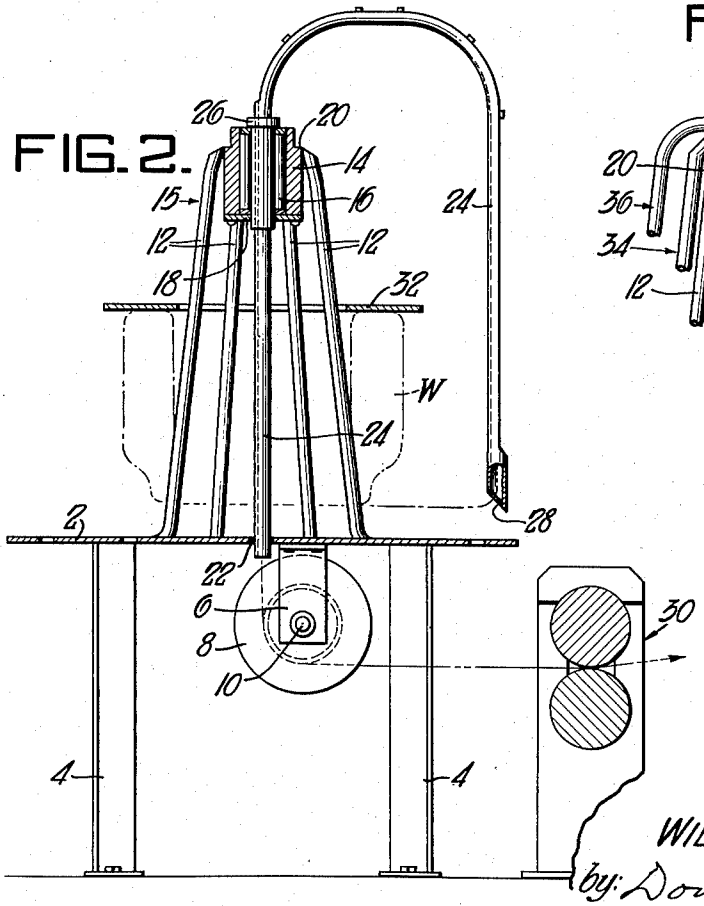


FIG. 4.

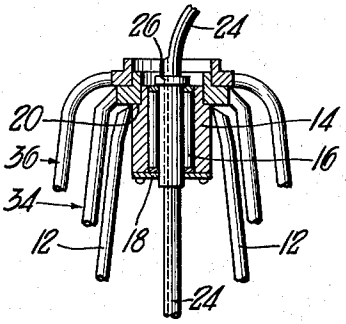
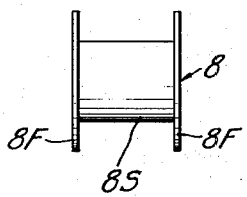


FIG. 5.



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APPARATUS FOR UNCOILING WIRE

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4 Claims. (Cl. 242—128)

1

This invention relates to apparatus for uncoiling bundles of wire and is a continuation-in-part of my copending application, Serial No. 228,919, filed May 29, 1951. The invention is particularly suited to the uncoiling of bundles of hard drawn wire such as rope wire and spring wire of small diameter which is to be fed to a processing machine such as a spooler. Uncoilers of this general type are in common use but all have various disadvantages. For example, the tension applied to the wire as it is being unwound may vary and the wire may kink or become snarled when the spooling mechanism is stopped. The size of coil which can be handled and the speed of the pay-off reel are limited. The wire is generally pulled from the top of the coil or in some instances from the outside surface between the top and bottom of the coil. This in many instances results in uneven tension and kinking of the wire due to the fact that the angle of feed is constantly varying.

It is an object of my invention to provide uncoiling apparatus which can handle large coils of wire at high speeds.

This and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a top plan view of my device;

Figure 2 is a vertical sectional view;

Figure 3 is a fragmentary sectional view showing a detail of my device;

Figure 4 is a fragmentary sectional view showing a further detail of my device; and

Figure 5 is a detailed view of the sheave of Figure 2.

Referring more particularly to the drawings, the reference numeral 2 indicates the base plate of the uncoiling device. The base 2 is preferably mounted on four legs 4. Spaced angle brackets 6 are fastened to the underside of the base 2 for supporting a sheave or rotatable guide 8 which is mounted on shaft 10. As best shown in Figure 5, the rotatable guide 8 has a wire supporting surface 8S much greater in width than the diameter of the wire and a flange 8F at each end thereof so as to form a deep wide groove. A plurality of bars 12 are fastened to and extend upwardly from the base 2 and are welded around the periphery of a hub 14 to form a block 15. The block 15 has a maximum diameter at its base which is greater than the inside diameter of the coil W and tapers upwardly to a minimum diameter. A bearing 16 is mounted in the hub 14 and is held in place by means of a plate 18. A shoulder 20 is provided at the top of the hub 14 for a purpose which will be explained later.

2

A central opening 22 is arranged in the plate 2 directly beneath the opening in the bearing 16 and substantially in line with the supporting surface of the sheave 8. A U-shaped tubular guide 24 has one leg passing through these aligned openings with its lower end extending for a short distance through the plate. A collar 26 is fastened to this leg and bears against the top of bearing 16, thus holding the U-shaped member in position. The other leg extends downwardly on the outside of the block 15 to a point adjacent the bottom of the coil W. A tungsten carbide guide 28 is preferably mounted in the lower end of the U-shaped member. A standard take-off mechanism 30 may be provided adjacent the machine for pulling the wire from the uncoiling device. In some instances the processing machine itself will act to pull the wire from the block 15.

The operation of the device is as follows:

The U-shaped member 24 is removed by pulling it upwardly out of the opening in the bearing 16 and a coil of wire W is placed on the reel and its ends freed. A hold-down ring or plate 32 is then placed on top of the coil W around the reel, after which the starting end of the coil is threaded from the bottom of the coil through the tungsten carbide guide 28 and through both legs of the U-shaped member 24. The ring 32 may be provided with lugs which engage the bars 12 to prevent rotary movement of the ring. The U-shaped member 24 is placed in position through the bearing 16 and hole 22 as shown. The wire is pulled around the sheave 8 to the take-up mechanism 30 from whence it is taken to the processing equipment such as a spooler (not shown).

It will be seen that the coil of wire W has a smaller inside diameter than the diameter at the bottom of the block 15 so that wire will not rest upon the base 2 but will be supported by the block 15 a short distance above the base. The entrance end of the tubular guide 24 is approximately at the same level as the bottom of the coil. The hold-down ring 32 acts as an automatic feed device by keeping the lower convolutions of the bundle or coil W tight against the tapered side of the block and continuously forcing the coil downwardly as it is unwound. The wire is always fed to the entering orifice of U-shaped member 24 substantially at right angles thereto. In other words the wire is always being payed off at substantially the same point and at the same uncoiling diameter and speed and since the rotating speed of the tubular guide 24 is constant the tension on the wire is substantially uniform.

When a coil has run out the take-off mecha-

nism is stopped with the last few convolutions of wire projecting from the feed end of the guide **24**. The guide **24** and hold-down ring **23** are removed after which a new coil is loaded on the block **15** and the tubular guide **24** and hold-down ring **32** replaced. The end of the first wire is then welded to the end of the new coil and the feeding of the wire to the processing equipment is resumed.

For larger coils of wire a reel block **34** of larger diameter having a hub shaped to fit over the hub **14** and rest on the shoulder **20** may be provided as shown in Figure 3. Holes may be provided in the plate **2** to receive the lower part of the rods making up the block and thus prevent rotation thereof. For still larger coils an additional reel block **36** is placed over block **34** as shown in Figure 4.

While one embodiment of my invention has been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. Apparatus for uncoiling coils of wire comprising a base plate, a block fastened to and extending upwardly from said base plate for receiving a coil of wire, said block having a maximum diameter at its base greater than the inside diameter of said coil and tapering upwardly to a minimum diameter, a bearing mounted in the top of said block and having a vertical opening therein, a horizontal bearing surface on the upper part of said block, said base plate having an opening therein aligned with the opening in said bearing, a tubular U-shaped member having one leg passing through and rotatably mounted in said aligned openings and the other leg extending downwardly on the outside of said block to a point adjacent the bottom of said coil, a collar fastened to said first leg and bearing on the top of said bearing surface to support said U-shaped member, said wire passing from the bottom of said coil through the outer leg of said U-shaped member and downwardly through the central leg of said U-shaped member.

2. Apparatus for uncoiling coils of wire comprising a base plate, a block fastened to and extending upwardly from said base plate for receiving a coil of wire, said block having a maximum diameter at its base greater than the inside diameter of said coil and tapering upwardly to a minimum diameter, a bearing mounted in the top of said block and having a vertical opening therein, a horizontal bearing surface on the upper part of said block, said base plate having an opening therein aligned with the opening in said bearing, a tubular U-shaped member having one leg passing through and rotatably mounted in said aligned openings and the other leg extending downwardly on the outside of said block to a point adjacent the bottom of said coil, a rotatable guide mounted beneath said base plate, and means for pulling said wire from the bottom of said coil through said U-shaped member and around said rotatable guide.

3. Apparatus for uncoiling coils of wire comprising a base plate, a block fastened to and extending upwardly from said base plate for receiving a coil of wire, said block having a maximum diameter at its base greater than the inside diameter of said coil and tapering upwardly to a minimum diameter, a hold-down ring surrounding said block and adapted to rest on top of said coil, a bearing mounted in the top of said block and having a vertical opening therein, said base plate having an opening therein aligned with the opening in said bearing, a tubular U-shaped member having one leg passing through and rotatably mounted in said aligned openings and the other leg extending downwardly on the outside of said block to a point adjacent the bottom of said coil, a collar fastened to said first leg and bearing on the top of said bearing surface to support said U-shaped member, said wire passing from the bottom of said coil through the outer leg of said U-shaped member and downwardly through the central leg of said U-shaped member.

4. Apparatus for uncoiling coils of wire comprising a base plate, a block fastened to and extending upwardly from said base plate for receiving a coil of wire, said block having a maximum diameter at its base greater than the inside diameter of said coil and tapering upwardly to a minimum diameter, a hold-down ring surrounding said block and adapted to rest on top of said coil, a bearing mounted in the top of said block and having a vertical opening therein, said base plate having an opening therein aligned with the opening in said bearing, a tubular U-shaped member having one leg passing through and rotatably mounted in said aligned openings and the other leg extending downwardly on the outside of said block to a point adjacent the bottom of said coil, a rotatable guide mounted beneath said base plate, and means for pulling said wire from the bottom of said coil through said U-shaped member and around said rotatable guide.

WILDER P. LEWIS.

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