

Fig. 1

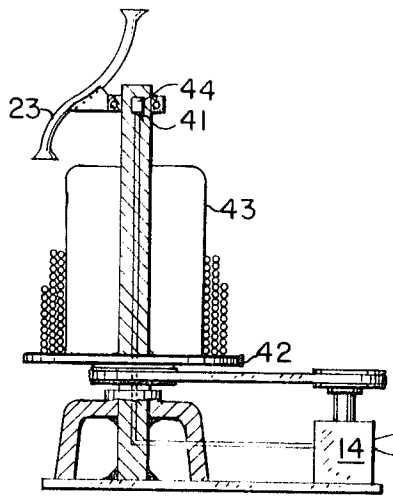


Fig. 2

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HIS AGENT

## COIL PAY OFF

## BACKGROUND OF THE INVENTION

This invention is directed to means for paying wire from coils as opposed to reels or spools. In the nomenclature of the trade a wire coil refers to a bundle of turns of wire that can be shipped free from any supporting reel hub or flange structure. Wire, particularly steel wire, is commonly shipped in the form of coils, to avoid the cost of reels, but upon delivery to a cable factory, is paid off of the coils and wound upon reels for use on the stranding machines. In paying off the wire it has been known to lay the coils on rotating platforms and pull the wire through a guide mounted high above the center of the platform. Where the coils are very deep, or where a plurality of coils are stacked above each other, a coil frame may be fixed to the platform to retain the coils in position. The coils are not wound over this frame, and each turn of the coil is not tight around it, but are lowered onto the platform with the frame fitting through the open cores of the coils. Although the pulling of the wire through the overhead guide may cause sufficient rotation of the platform under some circumstances, it has also been known to drive the platform to rotate at the approximate speed required for delivery of wire without introducing additional twists at the overhead guide. To adjust to variations in coil diameter the speed of rotation of the platform can be adjustable.

This known apparatus for paying off wire from coils has the serious defect that it results in more or less frequent snarls or tight loops of wire that will not pass through the overhead guide. In addition, if the wire is pulled even momentarily faster than the platform and frame can rotate, the wire will be stretched or even break with the danger of personal injury. If a break occurs, the reel winding wire drawing, or other operation into which the coil wire is being paid, will also be interrupted.

## SUMMARY

I have overcome the defects of prior wire coil pay offs of the types described and invented apparatus capable of substantially complete freedom from snarls and stoppages by inventing an apparatus for paying off wire from a coil comprising rotatable means, such preferably as a platform supporting a tapered coil frame, horizontally supporting the coil, drive means, which may comprise a manual speed adjustment, rotating the supporting means around a vertical axis, and guide means for the wire mounted substantially centrally above the supporting means. Means are provided for pulling the wire through the guide means and means such as a tube surrounding a length of the wire, directing it from the coil to the guide means. My directing means is freely rotatable around a vertical axis within the coil, such as the axis of rotation of the supporting means. The means, such a central post, that rotatably supports the directing means may be mounted on the platform or other supporting means and rotate with it, or the post may be fixed to the ground and project through the supporting means while the latter rotates around it. My apparatus may advantageously also comprise means that are sensitive to the rotation of the directing means for controlling the speed of rotation of the supporting means.

## BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 shows a side view of the apparatus of my invention.

FIG. 2 shows a side view, partly in section of a feature of an embodiment of my invention.

## DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

A coil pay-off, indicated generally by the numeral 10 comprises a rotating platform 11 mounted on a journal 12 and driven to rotate by a motor 13 and variable speed control unit 14 with a hand wheel 16. A coil frame 17 is mounted on the platform 11 surrounding and fastened to an upright post 18. A

coil 19 of turns of wire 21 has been deposited over the frame 17 and is supported horizontally on the platform 11. A ball bearing 22 supports a section of tube 23 flared at ends 24, 25 for directing the wire 21 from the coil 19 to a guide 26 which comprises a pair of rolls 27, 28 suspended from a fixed gallow 29. The strand 21 is pulled through the tube 23 and the guide 26 by a capstan 31 which pays into a reel winder or other device not shown. The flared end 25 of the tube 23 opens under the guide 26 which is centered over the platform 11 and the flared end 24 opens over the body of the coil 19. The tube 23 has a double curvature, shown in the drawing, that enables it always to clear the top 32 of the frame 17 as it rotates. My apparatus has particular utility for coils of the type in which the steel wire is customarily shipped, such as wire used for the manufacture of steel reinforced aluminum conductor for electrical power transmission. Each turn of such a coil is formed around a block and has substantially the same length as the other turns in the coil. The opening of the coil 19, itself, which fits over the frame 17, is however, substantially smaller than the loop formed by any one turn since the turns are laterally displaced from each other. During coil formation and shipment some turns may become enlarged at the expense of neighboring turns in the coil so that if the variable speed drive 14 is set at a desired average speed determined by the average length of wire in a turn, whenever there is an oversize turn more wire will pay from the platform than is being pulled into the guide 26 by the capstan 31, which has a constant speed. The absence of the directing tube 23, this excess wire might loop or snarl, particularly if two oversize turns should be unwound in succession. In the present apparatus, however, when more wire is paid off than is being pulled the tube 23 merely rotates in the same direction as the platform 11 to wind the excess wire around the frame 17. Normally, when all the turns of wire are precisely the same size the tube 23 does not rotate at all, relative to the ground, but when undersize turns occur it rotates against the rotation of the platform and unwinds some extra length of wire from the coil. Since the post 18 of FIG. 1 is constantly rotating with the platform 11 the tube 23, in order to remain fixed must have the post rotating within the bearing for the support of the tube 23. In FIG. 2, however, a post 41 is fixed while a platform 42 and frame 43 rotate around it. The tube 23 will then normally have no movement relative to the post 41 except when an adjustment is being made to compensate for variations in turn diameters.

When it is desired to pay off coils where the turns are not all equal, but have been built up on an arbor, so that the diameters of the turns become progressively smaller as the coil pays off, my apparatus will also be useful. Similarly, where the coil being paid off is not pulled by a constant speed device such as the capstan 31 but is wound directly onto a reel so that the speed of pulling off keeps increasing. In such cases it is advantageous to vary the speed of the motor 13 or the speed control unit 14 to adjust to the progressive changes in the pay-off or take-up loop diameters. I have accomplished this by means of a master-slave control 44 of conventional design wherein the master is mounted in the post 41 and senses the speed and direction of rotation of the directing unit 23 and the slave increases or decreases the speed of the platform 42 by adjusting the speed control unit 14.

The foregoing description has been exemplary, rather than definitive, of my invention for which I desire an award of Letters Patent as defined in the following claims.

I claim:

1. An apparatus for paying off wire from a coil comprising:
  - A. rotatable means horizontally supporting said coil;
  - B. drive means rotating said supporting means around a vertical axis;
  - C. guide means mounted substantially centrally above said supporting means;
  - D. means pulling said wire from said coil through said guide means;
  - E. means directing said wire from said coil to said guide means, said directing means being freely rotatable around a vertical axis within said coil; and

- F. mounting means for said directing means supported on said supporting means and rotating therewith.
- 2. The apparatus of claim 1 wherein said directing means comprises a tube surrounding a length of said wire paying from said coil. 5
- 3. The apparatus of claim 1 wherein said supporting means comprises a platform supporting a coil frame.
- 4. The apparatus of claim 1 comprising manual means for adjusting the speed of said drive means.
- 5. An apparatus for paying off wire from a coil comprising: 10
  - A. rotatable means horizontally supporting said coil;
  - B. drive means rotating said supporting means around a vertical axis;
  - C. guide means mounted substantially centrally above said supporting means; 15
  - D. means pulling said wire from said coil through said guide means;
  - E. means directing said wire from said coil to said guide means, said directing means being freely rotatable around a vertical axis within said coil; and 20

- F. means sensitive to the rotation of said directing means for controlling the angular speed of said supporting means.
- 6. An apparatus for paying off wire from a coil comprising:
  - A. rotatable means horizontally supporting said coil;
  - B. drive means rotating said supporting means around a vertical axis;
  - C. guide means mounted substantially centrally above said supporting means;
  - D. means pulling said wire from said coil through said guide means;
  - E. means directing said wire from said coil to said guide means, said directing means being freely rotatable around a vertical axis within said coil; and
  - F. mounting means for said directing means projecting fixedly upwardly through said supporting means.
- 7. The apparatus of claim 6 wherein said supporting means comprises a platform supporting a coil frame.
- 8. The apparatus of claim 6 comprising manual means for adjusting the speed of said drive means.

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