May 3, 1960 W. S. PEARSON 2,935,274

WIRE REEL PAY-OFF DEVICE

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FIG. 2

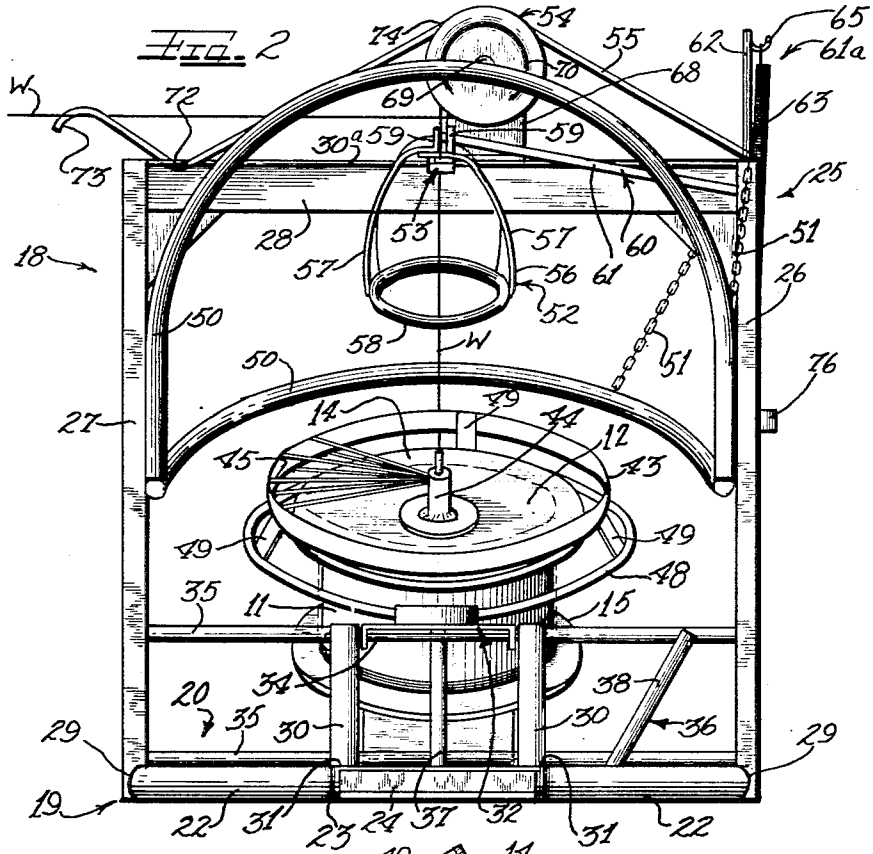
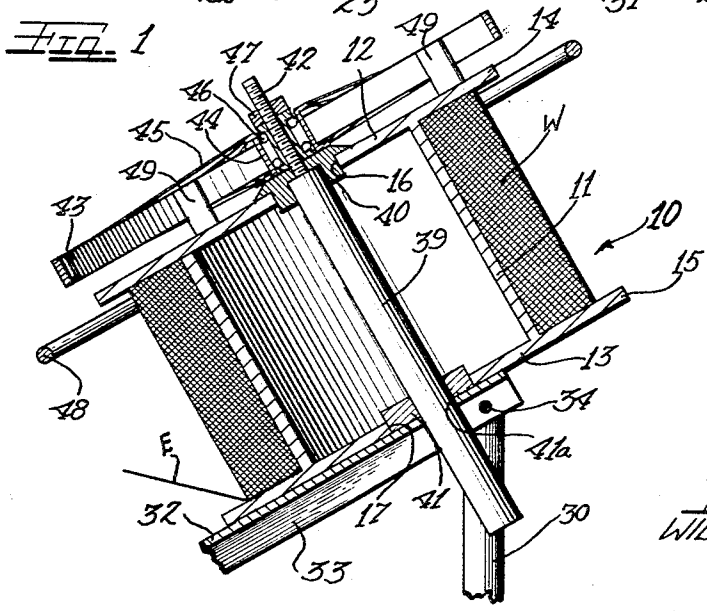


FIG. 1



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FIG. 3

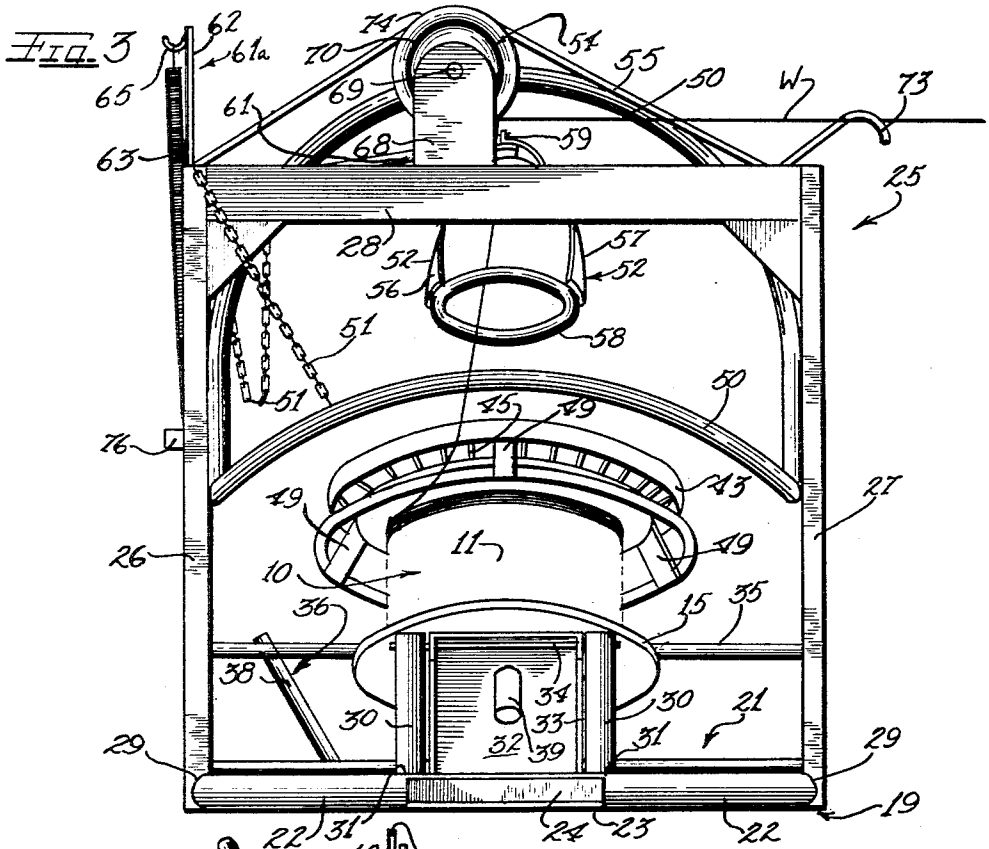
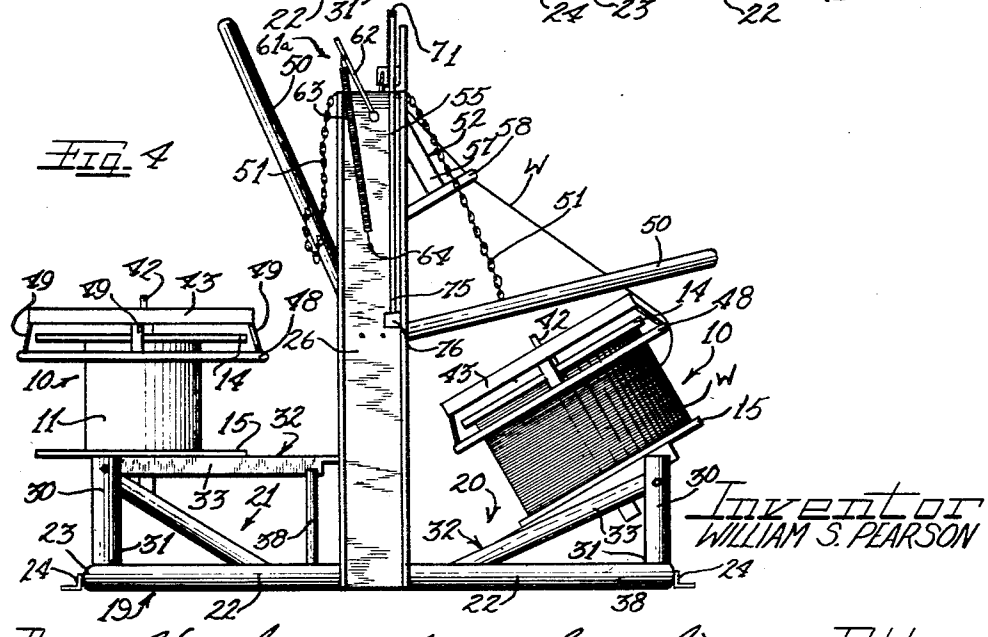


FIG. 4



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WIRE REEL PAY-OFF DEVICE

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Fig. 6

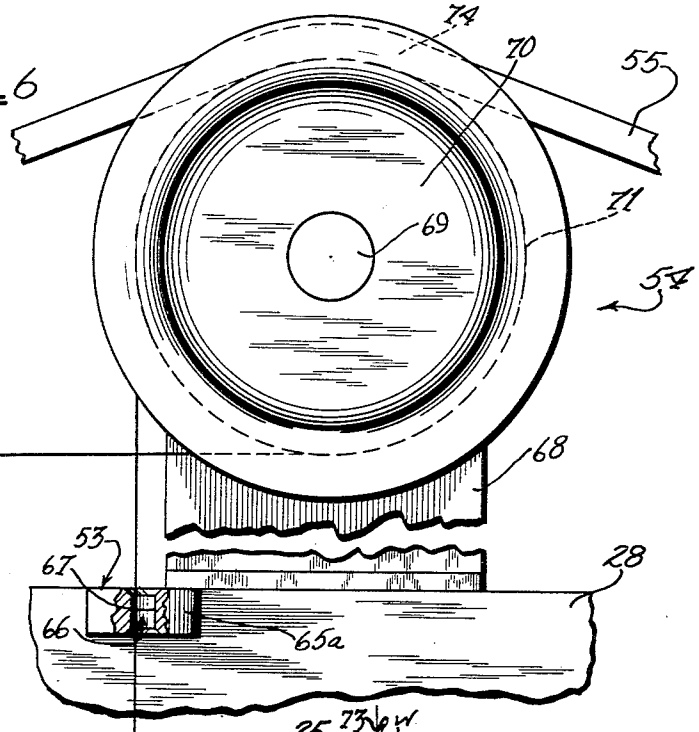
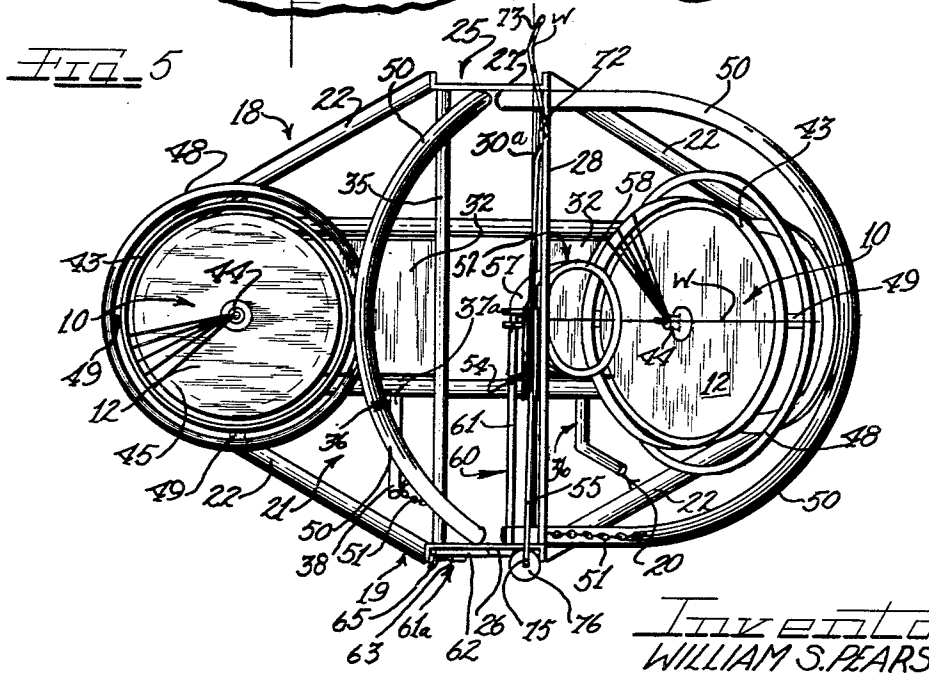


Fig. 5



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WIRE REEL PAY-OFF DEVICE

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Application June 17, 1955, Serial No. 516,123

5 Claims. (Cl. 242—128)

The present invention relates to a new and improved device for removing wire from a reel and more particularly to improved apparatus for effecting a controlled pay-off of wire generally axially from a reel and for directing the payed-off wire to a site where it is to be used.

The conventional structure of most spool-like wire reels has limited the manner and method which may be used efficiently for effecting pay-off of the wire therefrom. Most conventional reels of wire comprise a cylindrical body upon which the wire is wound. Parallel, opposed, usually circular end plates are affixed to the ends of the cylindrical body and usually have a diameter greater than the total diameter of the spool and the wire wound therearound. In this manner the end plates provide a radially outwardly projecting radial end flange on each end of the cylindrical body which act to retain the wire upon the body against axial movement.

These annular wire retaining end flanges, however, make it substantially impossible with any ease to remove or pay-off wire axially over the end of the reel. This is due to the fact that the wire as it is being payed-off will almost inevitably contact the peripheral edge of the end flange which, particularly if the wire is of a light enough gauge, can lead to damaging or even fracturing of the wire during pay-off.

Since the outwardly projecting wire retaining end flanges are almost inevitably present on most commercially available spool-like reels, the common practice in removing wire from a reel has been to mount the reel on a horizontal axis about which the reel could freely rotate. Wire has then been payed-off the reel by pulling the wire strand tangentially away from the reel in a direction generally perpendicular to the vertical plane of the reel axis and generally parallel to and between the end flanges.

In thus removing the wire through pulling force directed in this manner the reel is caused to rotate about the axis. As the rate at which wire is removed from the reel is increased, however, the inertia of the revolving reel, likewise, increases.

Not uncommonly, however, the rate of wire pay-off accelerates to such an extent that the inertia of the heavy revolving reel becomes so great that it is extremely difficult, without special braking means, to decrease the rate of wire pay-off, for a decrease in pay-off rate without a commensurate braking of the revolving reel causes the reel to spin off large amounts of the wire wound therearound resulting in an unfortunate lashing and tangling of the wire.

In accordance with the general features of the instant invention there is now provided an improved apparatus for effecting controlled pay-off of wire from a reel having at least one radially outwardly projecting annular wire-retaining end flange thereon in such a manner that the wire is payed-off generally axially of the reel. In the instant invention this is accomplished primarily by providing annular pay-off guide means which are adapted to be carried in association with the reel in outwardly spaced

generally concentric relationship thereto circumjacent the wire retaining end flange on that end of the reel from which the wire is being payed-off. These annular pay-off guide means, which are preferably disposed to rotate about the reel relative thereto, provide means for directing the wire movement from the reel over and around the wire retaining flange during pay-off and to prevent engagement therewith. In addition to the pay-off guide means there are also provided means for directing linear and gyrational movement of the wire from the pay-off guide means axially away from the reel and for tensioning the wire during movement through and away from said pay-off device toward a site at which the wire is to be removed.

It is, therefore, an object of this invention to provide a new and improved device for effecting controlled pay-off of wire from a reel in a manner which has been hitherto unavailable.

Another object is the provision of an improved pay-off device for effecting a controlled removal of wire from a reel having a wire retaining flange thereon, in which an annular pay-off guide ring is mounted for rotational movement about the reel in spaced circumjacent relation to the flange to provide means for directing wire movement over and around the flange axially of the reel and in which means are also provided for tensioning and guiding movement of the payed-off wire axially away from the reel and laterally toward a site at which it is to be used.

Other objects, features and advantages of the present invention will be readily apparent from the following detailed description of a preferred embodiment thereof taken in conjunction with the accompanying sheets of drawings, in which:

Figure 1 is a diametric sectional view, with parts in section and parts in elevation, of a wire reel removably carried in association with the instant apparatus and showing the annular pay-off guide means associated therewith;

Figure 2 is an end elevational view of apparatus embodying the invention;

Figure 3 is an end elevational view of apparatus embodying the invention taken opposite to the view shown in Figure 2;

Figure 4 is a side elevational view of apparatus embodying the invention;

Figure 5 is a top plan view of the apparatus shown in Figure 4; and

Figure 6 is an enlarged, fragmentary, more or less schematic view of a guide eye and guide wheel employed in directing linear movement of the wire after it has been payed-off of the reel.

By way of illustration the instant invention is shown for use in effecting controlled unwinding or pay-off removal of wire from a reel of wire, such as shown in Figure 1. As seen therein a reel of wire, shown generally at **10**, has, as its component parts, a hollow, generally cylindrical body portion **11** and parallel, opposed circular end plates **12** and **13** mounted integrally on the end portions of the cylindrical body **11**. Each of the circular end plates **12** and **13** is dimensioned to have a diameter greater than the total outer diameter of the body portion **11** and the wire W wound therearound. This dimensioning of the circular end plates **12** and **13** provides a radially outwardly projecting wire-retaining annular end flange **14** and **15** on the end plates **12** and 13, respectively.

The annular end flanges **14** and **15** prevent axial disengagement of the wire W which is tightly wound generally helically around the outer peripheral surface of the body portion **11**.

Most of the conventional large reels of wire, such as

the reel 10, are supplied commercially to consumers with means therein for mounting the reel upon an axle for rotatable movement during conventional pay-off of the wire from the spool, as previously described. As shown best in Figure 1 such means include a centrally disposed aperture 16 formed in the circular end plate 12 and an aperture 17 formed in the opposite circular end plate 13; the apertures 16 and 17 being coaxially aligned and of substantially equal diameter.

As shown best in Figures 2–4 apparatus embodying the instant invention employed in removing wire from the reel 10 is shown generally as a pay-off device 18. The pay-off device 18 includes, as one of its component parts, a generally diamond-shaped, open horizontal supporting frame work or frame 19 having a pair of diametrically opposed, generally V-shaped reel support portions 20 and 21. Each of the V-shaped reel support portions 20 and 21 include a pair of outwardly projecting inwardly converting horizontal legs 22 and an integral or intermediate end leg 23. An angular brace 24 is mounted integrally on the generally outer surface of the intermediate leg 23 to aid in stabilizing the device 18.

An arch-like super-structure is provided for supporting a number of component parts of the pay-off device 18. To this end a generally inverted U-shaped support structure, shown generally at 25, is constructed to have a pair of generally upright, parallel opposed side legs 26 and 27 and an integral cross beam or top leg 28. Each of the upright side legs 26 and 27 is attached to the free end portion of each of the horizontal legs 22 of the frame 19, as at 29, adjacent the bottom marginal portions of the side legs on either side thereof.

In the embodiment shown in Figure 2 a generally horizontal brace bar or rod 30*a* is provided between the upright side legs 26 and 27 adjacent the top edge portions thereof to aid in bracing the support structure 25 against lateral movement.

As seen best in Figures 4 and 5, the arch-like support structure 25 is disposed generally centrally on the base 19 in super-posed spanning relation thereto, and thus divides the base 19 into the pair of diametrically opposed reel support portions 20 and 21 corresponding generally to the area described by the horizontal legs 22 on either side of the upright side legs 26 and 27.

Means are provided on the reel support portions 20 and 21 for supporting a reel of wire in association with the device during wire pay-off. As shown best in Figures 2–4, such means include a pair of generally upright, parallel support legs 30 of substantially equal height integrally mounted on each side of the frame 19 generally at the arcuate junction of the horizontal legs 22 and the intermediate end leg 23, as at 31.

A reel supporting platform or shelf 32 having downturned integral side flanges 33 formed on the side edges thereof is mounted at one end for pivotal movement between the upright support legs 30. As seen best in Figures 2 and 3 such pivotal mounting of the platform 32 on each of the reel support portions 20 and 21 of the frame 19 may be accomplished by means of a pin or the like 34 extending through aligned apertures in the flanges 33 and journaled in suitable aligned bores formed in the upper marginal portion of each of the upright support members 30.

Means are provided to restrict or minimize lateral shimmy movement of each of the platforms 32 when wire is being payed-off from a reel disposed thereon. As shown in Figures 2 and 3 such means include a generally horizontally disposed bar or rod 35 carried by the inner edge portion of each of the platforms 32. The rod 35 is so dimensioned as to extend transversely across the frame 19 and between the upright side legs 26 and 27. The rod 35 preferably has only a small slip-fit clearance between the end edge surfaces thereof and the inner surface of the adjacent upright side leg 26 or 27 so as to allow only small lateral limited movement.

Force multiplying means are provided for raising and lowering each of the platforms 32. Such means include a generally U-shaped pivotally mounted movable prop shown generally at 36 disposed generally beneath each of the platforms. Each of the movable props 36 includes a first leg 37 disposed directly beneath the platform 32 intermediate the side flanges 33 thereof, and a second leg 38 joined integrally with the first leg 37 by means of an intermediate leg 37*a*. The second leg 38, which is adapted to project laterally angularly away from the platform 32, provides a lever handle by which the first leg 37 may be moved to a generally upright position as seen in Figure 2, and in the left hand portion of Figure 4. When thus vertically disposed the first leg 37 provides a strut or brace for supporting the platform 32 in a generally horizontal position. The fulcruming power afforded by the lever 38 aids materially in pivotally raising and lowering each of the platforms 32, particularly when a reel of wire is disposed thereon.

Means are provided for removably mounting a reel of wire 10 on each of the platforms 32. As seen in Figure 1, such means include a cylindrical axle 39 having an annular bushing 40 provided thereabout adjacent the upper marginal portion thereof. A lower or second annular bushing 41 having an inner diameter substantially equal to the outer diameter of the axle 39, is mounted on the upper surface of the platform 32 in such a manner that the bore in the annular bushing 40 is in circumferentially aligned communication with an aperture 41*a* formed in the platform 32.

The annular bushings 40 and 41 are preferably diametrically dimensioned to have an outer diameter which will provide a slip-fit within the apertures 16 and 17 in the circular end plates 12 and 13, respectively, of the reel 10.

In mounting a reel of wire 10 on either of the platforms 32, the handle 38 of the movable prop 36 is swung inwardly toward the center of the device 18, thereby to raise or aid in raising the platform 32 to a generally horizontal position as shown in Figure 2, and to support the platform in this position atop the end portion of the first leg or movable strut portion 37.

A reel of wire 10 is then placed on the top surface of the platform 32, such as through the aid of a hydraulic or the like lift apparatus, and positioned thereon so that the bushing 41 on the platform is slip-fitted within the aperture 17 in the circular end plate 13. The abutting contact of the outer peripheral surface of the bushing 41 with the wall defining the aperture 17 in combination with the heavy weight of the reel effectively holds the reel 10 against unintentional radial movement on the platform 32.

The axle 39 is then inserted through the aperture 16 in the upper end plate 12 of the reel 10 and through the bore in the bushing 41 and the aperture 41*a* in the platform 32. The bushing 40 on the upper end portion of the axle 39 is then slip-fitted within the aperture 16 in the reel end plate 12.

Means are provided in association with the axle 39 for preventing wire being payed-off the reel from contacting the outwardly projecting annular end flange 14 of the end plate 12. In the embodiment shown in the drawings, such means include a threaded shaft 42 integrally carried by the upper end portion of the axle 39 and projecting coaxially upwardly therefrom. An annular pay-off guide support member or wheel 43 having a cylindrical hub 44, to which the wheel 43 is attached by means of a plurality of circumferentially spaced radial spokes 45, is removably carried by the shaft 43 by means of the hub 44.

The wheel 43 is adapted for rotational movement about the shaft 42 relative to the reel 10. To this end the hub 44 is preferably provided with anti-friction elements interposed between the inner periphery of the hub and the outer periphery of the shaft. In the embodiment shown

in Figure 1 such anti-friction elements may comprise ball bearings 46 housed within suitable annular cages.

The wheel 43, which is preferably held against outward axial movement on the shaft by means of a nut 47 threadedly engaged on the shaft 42, is so disposed and diametrically dimensioned as to be positioned axially above and radially concentrically generally outwardly of the circular end plate 12 of the reel 10 in spaced relation thereto.

An annular, ring-shaped, wire pay-off guide member or ring 48 is attached to the wheel 43 axially inwardly thereof by means of a plurality of circumferentially spaced connecting members 49 each being affixed at their opposite end portions to the inner peripheral surface of the wheel 43 and the pay-off guide ring 48, respectively, in such a manner that the pay-off guide ring 48 is disposed just slightly axially inwardly or below the annular end flange 14 of the upper circular end plate 12 of the reel 10.

The pay-off guide ring 48 is dimensioned to have an outer diameter larger than the outer diameter of the end flange 14. In this manner the pay-off guide ring is adapted to be disposed concentrically about the reel 10 in spaced relation thereto adjacent the top thereof. By having the pay-off guide ring disposed axially inwardly of or below the radially outwardly projecting end flange 14, the payoff guide ring is adapted to guide and control the circumferential unwinding and gyrational pay-off of the wire W from the reel 10 up over and around the end flange 14 thereby to prevent contact of the wire being payed-off the reel with the end flange 14.

As noted previously, it has not been practicable heretofore to pay-off wire axially over the end of the reel because the wire tends to continually rub against the outwardly projecting end flange. This rubbing or sliding frictional movement of the wire over the end flange of the reel, particularly with light gauge wire, in some instances causes the wire to fracture, or at least bind.

In the instant invention, however, through the provision of the pay-off guide ring 48 circumjacent the reel 10, it is now possible to pay-off wire from a reel in a direction generally axially therefrom without the accompanying danger of wire breakage due to frictional engagement with the reel and flange.

In addition to guiding the wire strand over and around the end flange 14, the pay-off guide ring 48 also functions to control and guide the circumgyrational and linear movement of the wire being payed-off the reel 10, thereby to aid in directing movement of the wire to a site at which it is to be used.

In the embodiment shown in the drawings the support wheel 43 to which the pay-off guide ring 48 is attached is shown as assuming the shape and configuration of a bicycle wheel. It will be appreciated, however, that the wheel 43 may assume other shapes, or if desired, may be completely dispensed with and the pay-off guide ring 48 attached directly to the shaft 42 by suitable means.

Means are provided for limiting outward radial movement of the wire as it is being payed-off the reel in order to prevent outward gyrational lashing or whipping of the wire. Such means include a pair of generally semiannular U-shaped guard bars 50 each being pivotally attached at its free end portions to the inner surface of the upright side legs 26 and 27 of the support structure 25 generally intermediate the top and bottom portions thereof.

The guard bar 50 is thus provided on both sides of the support structure to overlie each of the reel support portions 20 and 21 of the frame 19.

When that reel support portion of the frame which the guard bar 50 overlies is not in use, as for example support portion 21 as shown in Figure 4, or when a reel of wire is being placed on or removed from the platform 32, the guard bar 50 is swung upwardly out of the way to an at-rest position generally between the upright side legs 26 and 27 and held there through frictional engagement between the outer edge surface of the guard bar 50 and the inner surface of the upright side legs 26 and 27, or by some other suitable means.

When a reel of wire is disposed on the platform 32 of one of the reel support portions, such as for example the reel support portion 20 in Figure 4, the guard bar 50, on that side of the support superstructure 25, is swung pivotally downwardly to overlie the reel 10 in generally super-posed outwardly spaced relation circumjacent thereto. The guard bar is held in this position by suitable means, such as a chain or the like 51 attached at one end to the guard bar 50 and at the other end to the support structure cross beam 28.

When thus positioned above and about the reel 10 the guard bar 50 provides a highly desirable safety feature for operators working with the pay-off device 18. Although the instant wire pay-off device 18 is so constructed as to provide substantially complete control of wire movement continually during pay-off from the reel, it may occur, though infrequently, that wire will tend to whip or lash outwardly from the reel 10 during gyrational unwinding movement therearound. This infrequent lashing, which may be due in part to variations in the rate of release of coiled potential energy of the wire relative to fluctuations in the rate of pay-off, if not controlled could cause serious injury to an operator standing close to the pay-off device 18. By providing the guard bars 50 in surrounding disposition to the reel 10, however, the incidents of injury to an operator from lashing of the wire is reduced to a negligible minimum, for any outward gyrational lashing or whipping of the wire during pay-off is effectively restricted within the confines of the arc described by the inner circumferential surface of the guard bar 50. It will thus be apparent that the guard bar 50 provides a desirable safety feature on the pay-off device 18.

Means are provided for guiding the wire axially away from the reel 10 and tensioning the wire after it has been payed-off the reel over and around the pay-off guide ring 48 and for directing and controlling gyrational and linear movement of the wire above the pay-off device 18 to a site at which the wire is to be used. In the instant embodiment such means include a pilot member, shown generally at 52, a guide eye 53, a guide wheel member 54, and, braking means in the form of a weighted cord 55 for snubbingly tensioning the wire W moving in association with the guide wheel member 54.

The pilot member 52 includes a bail-like support yoke 56 comprising a pair of arcuately upwardly and inwardly converging depending support or hanger straps 57 carried in association with the upper marginal portion of the support structure cross beam 28 intermediate the upright side legs 26 and 27. A pilot ring 58 is carried by and between the straps 57 on the inner marginal surface of the depending free end portions thereof.

The pilot ring 58 preferably has a generally circular or curvilineal cross sectional configuration so as to present no sharp edges in resistance to wire movement over the surface thereof. The pilot ring 58 preferably has an inner diameter substantially smaller than the outer diameter of the pay-off guide ring 48. Being thus dimensioned the pilot ring 58 is adapted to receive payed-off wire therethrough on the inner circumferential surface thereof. The inner circumferential surface of the pilot ring 58 provides a smooth curved guide shoulder for guiding and supporting lineal and gyrational movement of the wire in its passage through the ring. The pilot ring 58 also acts to decrease the radius of the gyrational movement of the wire W from the relatively large swing permitted by the outer circumference of the pay-off guide ring 48 down to the relatively small annular path provided by the inner circumferential surface of the pilot ring. It will thus be seen that the pilot ring 58 not only

guides linear movement of payed-off wire, but also limits the radius of gyrational movement thereof.

The support yoke **56** is attached to the upper portion of the support structure cross beam **28** in such a manner that the support yoke and pilot ring may be swung to and held in an angularly outwardly depending position on either side of the cross beam **28** so that the pilot ring **58** is in generally aligned super-posed, parallel, relationship to the upper circular end plate **12** of the reel **10** and the pay-off guide ring **48**. To this end the marginal upper end portion of each of the hanger straps **57** is provided with an upwardly projecting integral flange portion **59** which is disposed in parallel spaced relation to the other flange **59** on the opposite hanger strap.

Swinging movement of the support yoke **56** and pilot ring **58** from one side of the cross beam **28** to the other is provided for by mounting the support yoke in journaled disposition on an angularly laterally depending rod **60** having the inner end or shank portion **61** thereof received in suitably aligned apertures (not shown) formed in the parallel flanges **59**.

Means are provided for firmly holding or more or less locking the support yoke on either side of the cross beam **28** in an angularly outwardly depending position in which the pilot ring **58** is in generally aligned parallel relationship to the reel **10**. As seen best in Figures 2 and 4, such means include an over center spring biased structure shown generally at **61***a*. This apparatus includes the rod **60** having a laterally angularly depending shank portion **61**, the inner end portion of which carries the parallel flanges **59** of the hanger straps **57**, and a preferably integral, generally upright lever portion **62** adapted to project above the support structure **25**.

The rod **60** is mounted on the inner surface of the side leg **26** through the provision of suitable means (not shown) disposed preferably in association with the junction of the shank **61** in the upright lever **62**. This mounting is effected in such a manner that the lever **62** may swing through an arc of substantially equal distance on either side of the support structure cross beam **28** in a path generally coplanar to the side leg **26** and parallel to the longitudinal axis of the frame **19**. The magnitude or outer limit of the arc through which the lever **62** can swing on either side of the cross beam **28** is such that the arc subtends an angle aqual to the angle at which the support yoke **56** is dependingly disposed when the pilot ring **58** is in the wire-receiving position above and generally aligned with and parallel to the reel **10** as described previously.

It will thus be apparent that when the lever **62** is swung to its pivot limit on one side of the cross beam **28**, as in Figure 4, the integral shank **61** will be rotated an equal number of degrees, which, in turn, will pivot the depending support yoke **56** attached thereto to the opposite side of the cross beam **28** and to a position at which the angular disposition of the yoke is equal but in negative relation to the angle to which the lever **62** has been swung.

Biasing means are provided in association with the upright lever **62** to hold the lever firmly at the outer limit of its pivot swing so as to more or less lock the support yoke **56** and the pilot ring **58** in the proper wire-receiving disposition during wire pay-off from the reel **10**. As shown best in Figures 3 and 4 such means include an elongated helical coil spring **63** having one end thereof attached to the outer surface of the side leg **26** generally intermediate the ends thereof, as at **64**, and having the other end attached to an upwardly opening laterally outwardly projecting hook **65** carried integrally by the upper end portion of the lever **62**.

As seen best in Figure 4, the coil spring **63** is of the type that resists expansion and as such is adapted to exert a downwardly and inwardly directed biasing force on the upper end portion of the lever **62** which tends to force the lever downwardly and outwardly in opposition to its pivotal limits. This biasing action firmly holds and more or less resiliently locks the support yoke **56** and the pilot ring **58** in the proper wire-receiving position.

The means for guiding linear movement of the payed-off wire also includes the guide eye **53**. As shown more or less schematically in Figure 6, the guide eye **53** comprises a somewhat elongated relatively thick ear or tab **65***a* having a generally upright, preferably cylindrical bore **66** therethrough, defined by a cylindrical side wall **67**. The guide eye **53** is mounted on the side portion of the support structure cross beam **28** adjacent the upper surface thereof and projects laterally therefrom generally intermediate and just slightly below the parallel upright flanges **59** on the support yoke hanger straps **57**. The distance to which the guide eye projects laterally from the cross beam **28** is preferably such that the longitudinal axis of the cylindrical bore **66** in the guide eye **53** is generally aligned with the center of the pilot ring **58** when the hanger straps **57** of the support yoke are disposed in a vertical position with the pilot ring **58** being parallel to the surface upon which the pay-off device is supported.

The guide eye **53** is adapted to guide linear movement of the payed-off wire after it has passed through the pilot ring **58**. The substantially small diameter of the bore **66** also acts to limit or abate gyrational movement of the payed-off moving wire W, and provides an accurate guide path for directing linear movement of the wire W into engagement with the guide wheel member **54**.

The guide wheel member **54** includes a generally upright wheel supporting member **68** mounted on the top side of the support structure cross beam **28** adjacent the same side as that upon which the guide eye **53** is mounted and contiguous thereto. An axle **69**, having a guide wheel **70** carried thereby, is mounted on the wheel supporting member **68** adjacent the upper marginal portion thereof.

The guide wheel **70**, which is mounted for rotational movement on the axle **69**, comprises a pulley or sheave having means defining an annular wire guideway groove **71** in the form of an annular channel-like recess formed in the peripheral surface thereof of the wheel.

The guide wheel **70** and its supporting member **68** are preferably so positioned on the cross beam **28** relative to the guide eye **53** (Figure 6) that the axis of the cylindrical bore **66** in the guide eye provides approximately an approach tangent to the bottom surface of the annular wire guideway groove **71** in the guide wheel **70**.

The guide wheel **70**, and particularly the annular wire guideway groove **71** formed therein, provide means for controlling the generally vertical guided linear movement of the wire W as it progresses upwardly through the pay-off device. The guide wheel **70** also provides means whereby the upward movement of the wire W directed generally axially from the reel **10** may be translated and redirected into generally horizontal movement laterally away from the pay-off device **18**. This translating or redirecting of wire movement is effected by having the wire, after it has passed through the cylindrical bore **66** in the guide eye **53**, directed into contact with the guide wheel **70** and looped therearound with the wire bottomed in the annular guideway groove **71**. After its travel around the guide wheel **70** the wire W is then drawn preferably off the bottom of the guide wheel (Figures 2, 3 and 6) and directed laterally and generally horizontally away from the pay-off device **18** to the site at which the wire is to be used. In order to avoid rubbing of the vertical and horizontal runs of the wire looped over the wheel **70** the axis **69** of the wheel is preferably angled slightly obliquely relative to a vertical plane along the horizontal run of the wire.

Brake means are provided for snubbingly tensioning the wire during its passage through the pay-off device **18** and around the tensioning or guide wheel **70**. Such brake means include, primarily, a rope **55** or the like

cord positioned in the annular guideway of the guide wheel 70 and adapted to overlie the wire in the upper circumferential portion of the guide way groove. One end of the cord is attached to or disposed in retained association with the upper portion of the support structure 25 on one side thereof. The body of the cord is positioned to span the top of the support structure and lie in the annular guideway groove of the guide wheel with the unrestrained end portion of the cord depending freely on the opposite side of the support structure.

Suitable weights are attached to the unrestrained end of the cord so that the downward force exerted thereby will increase the downward pressure exerted on the wire which the cord overlies in the guide wheel. This downward pressure exerted by the cord on the wire in the guide wheel produces a braking effect through increased frictional sliding engagement set up between the wire and the cord and the wire and bottom of the annular guideway groove. By properly adjusting the amount of weight attached to the depending free end of the cord it is possible to regulate the snubbing tension on the wire to substantially any desired degree.

In the particular embodiments shown in the drawings a rope or the like cord 55 is provided so as to have one end portion thereof disposed in restrained association with the cross beam 28 adjacent the upright leg 27. As shown best in Figure 2 such retention is effected by having the cord 55 grippingly wrapped or entwined about the bracing rod 30*a* as at 72. The adjacent end of the cord, as at 73, may if desired, be draped or lapped over the wire W moving laterally away from the pay-off device and that end portion of the cord, if desired, provided with a suitable weight or the like for exerting downward pressure on the wire W to hold it taut.

The cord 55 spans the support structure 25 and is so positioned as to have the generally medial portion thereof disposed in the top circumferential portion of the annular guideway groove 71, as at 74, and to overlie the wire disposed therein.

The non-restrained end of the cord 55, as at 75, depends freely from the support structure along the outer surface of the upright leg 26. A weight 76, having a suitable mass, is carried by the free, depending end portion 75 of the cord. The downward force exerted by the weight 76 is transmitted to the medial portion 74 thereof disposed in the annular guideway groove 71. This downward force on the medial portion of the cord, which may be varied by varying the mass of the weight 76, exerts, in turn, downward frictional resistance on the wire thereby to provide resistance to movement of the wire W around the guide wheel 70. In this manner the weighted cord 55 acts as a braking force in snubbingly tensioning the wire.

Another important advantage of this invention resides in that change-over from one reel to another is enabled without shutting down or slowing down of the machine, even when the rate of pay-off is quite rapid as, for example, up to over 1,000 feet per minute. This is accomplished by connecting, as by butt welding, a trailing end E (Fig. 1) of the reel being payed out to the leading end of a full reel on the opposite platform of the device. The transition from a spent reel to a full reel is thus uninterrupted and instantaneous.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. In a device for effecting controlled pay-off removal of wire from a reel having a radially outwardly projecting annular wire-retaining flange on at least one end thereof, a platform pivotally carried by said device for removably supporting said reel in association therewith, a pay-off guide ring mounted for rotational movement about said reel in spaced relation circumjacent to said flange, said pay-off guide ring providing means for directing wire pay-off movement from said reel radially outwardly over and around said flange and generally axially away from the reel to prevent the wire from engaging the flange during pay-off, a guard ring disposed about said reel in spaced relation to said pay-off guide ring to protect an operator against outward gyrational lashing of the wire from the reel during pay-off, means for guiding payed-off wire away from said pay-off guide ring, said means including: a pilot ring for directing payed-off wire axially away from said reel; a guide wheel for directing linear movement of the wire away from the pay-off device toward a site at which it is to be used; common means supporting said guard ring and said guide means and including upstanding generally co-planar legs on opposite sides of said platform, said guard ring being supported on said legs for positioning alternatively in an operable position adjacent the reel and a retracted position generally adjacent the plane of said legs; a guide eye intermediate the pilot ring and guide wheel for guiding linear movement of the wire from the former to the latter, and brake means for snubbing the wire in association with said guide wheel for tensioning said wire during movement through and away from said device.

2. In a wire reel pay-off device for controlled removal of wire from a reel axially, means for guiding payed-off wire including: a pilot ring for directing payed-off wire axially away from said reel; a guide wheel for directing linear movement of the wire away from the pay-off device toward a site at which it is to be used; a guide eye intermediate the pilot ring and said guide wheel for guiding linear movement of the wire from the former to the latter; rigid support means rigidly secured to said pilot ring and extending upwardly therefrom, the upper end of said support means having pivot means with a generally horizontally directed pivotal axis for permitting said pilot ring to pendulously rock about said pivotal axis; and means acting on said support means for firmly holding said pilot ring in a first pendulous position wherein the greater part of said pilot ring is disposed on one side of said horizontal axis, and thereafter in a second pendulous position on the opposite side of said horizontal pivotal axis; said pilot ring in both of said positions being generally adjacent to said guide eye for directing payed-off wire from a plurality of spaced reel stations.

3. In a pay-off device for paying off wire from reels having end plates, a wire guide ring, a plurality of stations supporting said reels in operating positions of relatively inclined relationship such that the end plates of the reels generally face said guide ring, said guide ring being pendulously mounted about a generally horizontal axis generally perpendicular to the axis of said ring to permit it to be swung into and between first and second positions respectively towards either of the reel stations, and over-center spring means releasably holding said guide means in either of its said first and second positions against the force of gravity.

4. In a device for controlled pay-off of wire from a reel having an end plate and an outwardly projecting wire-retaining flange thereon, pivoted support means for retaining said reel in association with said device, an annular pay-off guide ring carried in radially outwardly and axially inwardly disposed association with said flange for rotational movement relative thereto in spaced relation circumjacent to said flange for preventing wire contact therewith during pay-off, a guard ring disposed about said reel in spaced relation to said pay-off guide ring for protecting an operator against outward lashing of the wire during pay-off from the reel, means for hingedly supporting said guard ring, a free-turning guide wheel disposed above said guide ring and having an annular wire guideway and back-up groove in the outer periphery thereof for receiving wire from said guide ring in lapped around engagement on said guide wheel, said guide wheel being adapted for translating movement of the wire and

to direct the same laterally away from the pay-off device, and a stationary friction member adapted to exert a constant radial force against the wire in said groove, said force being radially reacted to by said free-turning wheel, whereby the wire is tensioned during movement away from the device.

5. In a device for axially paying-off wire from a stationary coil of wire, the improvement of a free-turning guide wheel disposed spacedly adjacent to the coil and having an annular wire guideway and back-up groove in the outer periphery thereof for receiving wire from the coil in lapped around engagement on said guide wheel, and a stationary friction member adapted to exert a constant radial force against the wire in said groove, said force being radially reacted to by said free-turning wheel, whereby the wire is tensioned during movement away from the coil.

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