June 16, 1942. R. W. BROWN 2,286,460

REEL

Filed Feb. 5, 1941 2 Sheets-Sheet 1

FIG. 1.

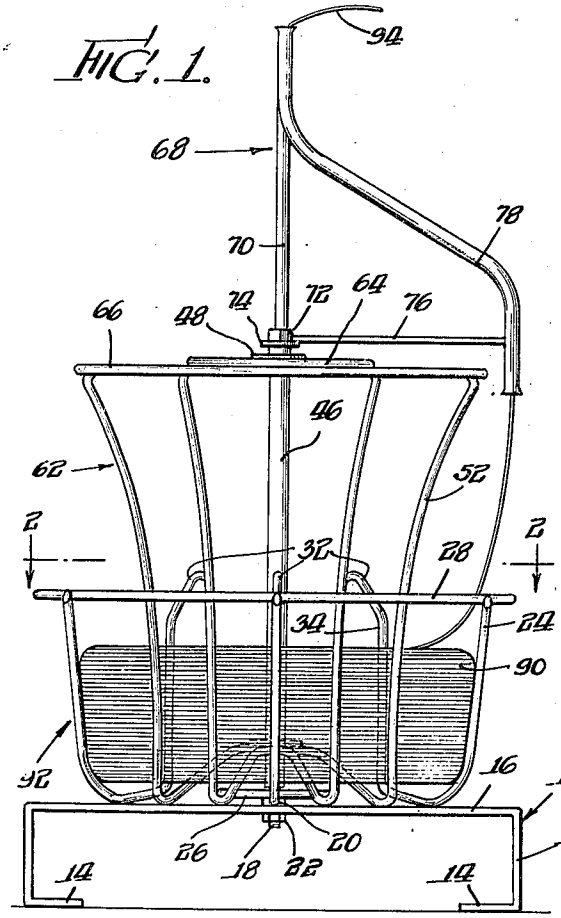


FIG. 3.

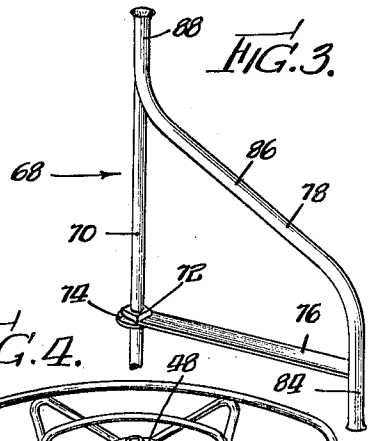


FIG. 4.

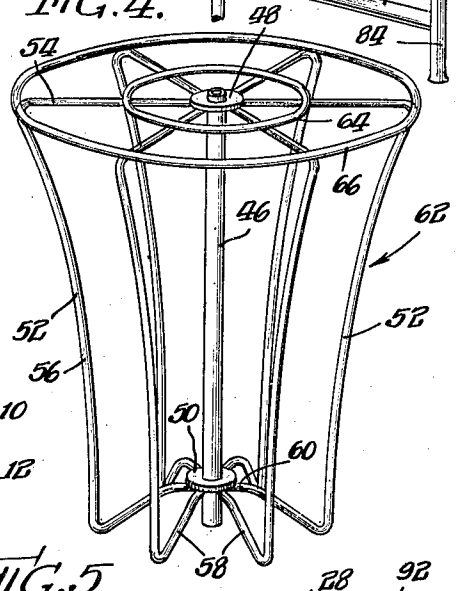


FIG. 2.

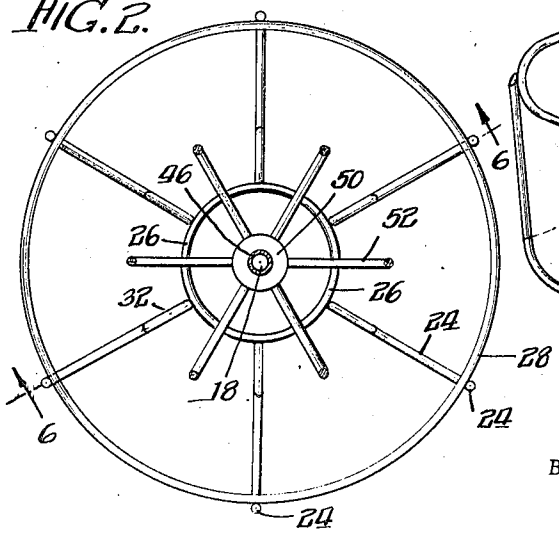
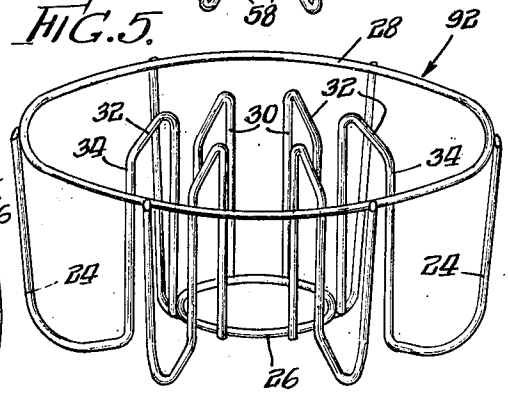


FIG. 5.



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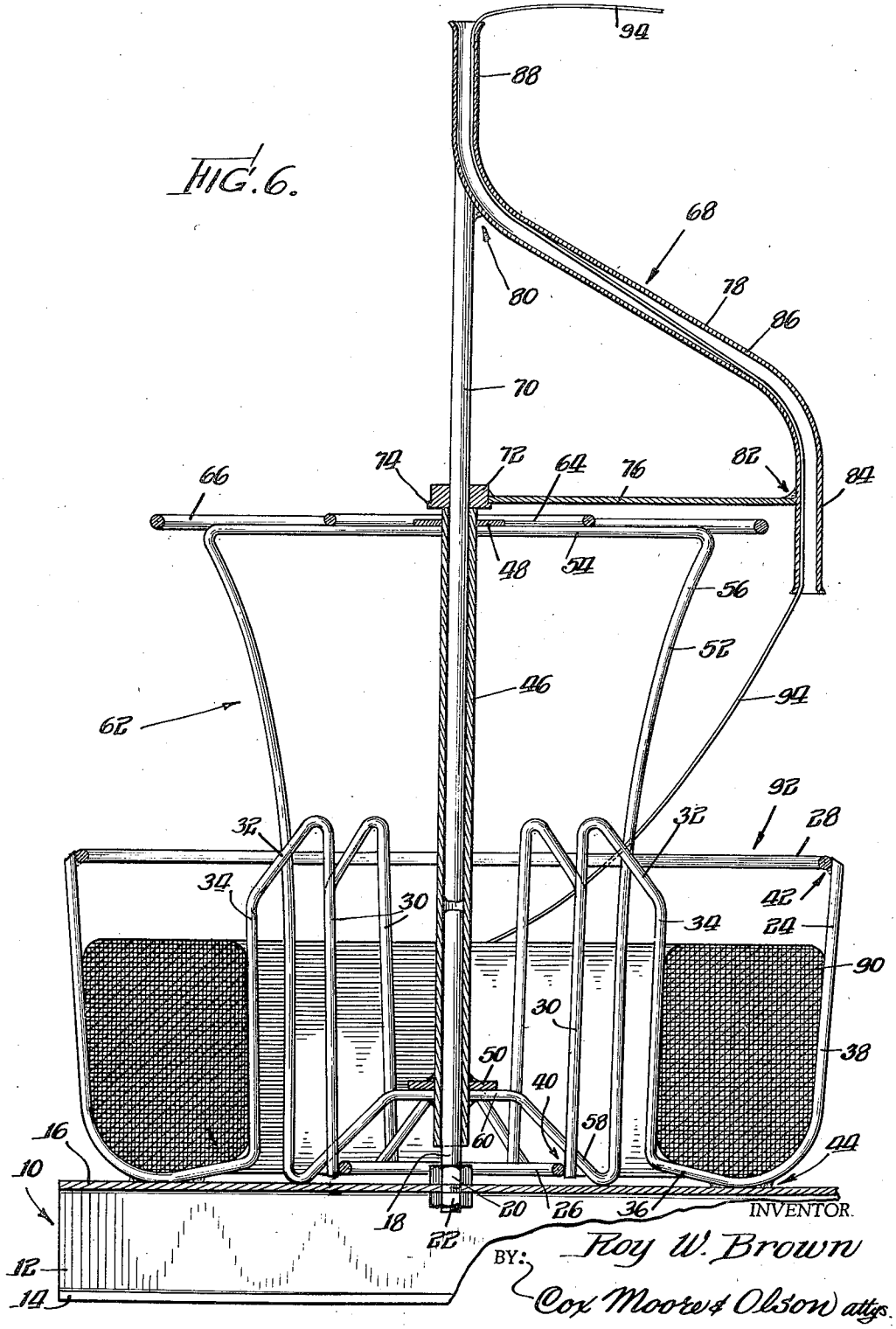
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June 16, 1942. R. W. BROWN 2,286,460

REEL

Filed Feb. 5, 1941 2 Sheets-Sheet 2

FIG. 6.



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UNITED STATES PATENT OFFICE

2,286,460

REEL

Roy W. Brown, Chicago, Ill.

Application February 5, 1941, Serial No. 377,413

13 Claims. (Cl. 242—128)

This invention relates to devices for uncoiling wire. More particularly, it relates to a device for uncoiling wire wound in an unsupported reel.

Many devices are known in the art which are designed to be used for uncoiling wire. Included among these are devices adapted to be used in uncoiling unsupported reels, as well as devices intended to be used with wire wound on a spool or other similar support.

As might be expected, it is considerably more expensive to supply wire in spools than in unsupported reels. One factor contributing to this greater cost is the limited quantity of wire which can be wound on a single spool as a practical matter. On the other hand, due to the difficulties encountered with the previously known devices for uncoiling wire from unsupported reels, the wire spools have proven more attractive commercially than the unsupported reels, particularly to users of relatively fine wire, despite the increased cost.

The devices heretofore in use for uncoiling wire from unsupported reels are not only quite heavy but, in addition, have the disadvantage, particularly in the case of fine wire, that they tend to be jerky in operation and slap back when the pull is released. In the case of staple wire, for example, it has been found that in the known types of devices for unreeling the wire, if the stitch on the stapling machine is not perfect, the wire will tangle and in the case of large reels will back up around the reel. The speed of operation of the known reels is also quite decidedly limited.

It is therefore an object of this invention to provide a device for uncoiling wire from unsupported reels, which may be operated at high speed and which has little or no tendency to back-slap, jerk or tangle the wire where the speed of operation is varied, either regularly or irregularly.

A more specific object is to provide a device for uncoiling fine wire from unsupported reels, both large and small, which may be operated at high speed and in which there is little or no tendency for the wire to back-slap, tangle or jerk where the speed of uncoiling is varied for any reason.

Another object is to provide a reel for uncoiling wire which is light in weight and relatively simple in construction.

Another object is to provide a device for uncoiling wire in which the coil of wire remains stationary and is drawn off through tubular means revolving about the axis of the coil.

Another object is to provide a device for uncoiling wire, in which means is provided for preventing the coil from riding up off its support when the wire is uncoiled rapidly.

Another object is to provide a device for uncoiling wire, in which means are provided for preventing back-slapping, jerking and tangling, particularly at high speeds of operation.

Another object is to provide a device for uncoiling wire, in which the means for guiding the wire away from the coil and the means for preventing the coil from riding up away from its support are centrally removably supported.

Another object is to provide a device for uncoiling wire, in which means are provided for preventing the coil from riding up off its support at high speeds of operation, which means are, however, centrally supported and vertically shiftable for ease in removal and to decrease strains during high speed operation.

Other objects will appear hereinafter.

It has been found that the foregoing objects may be accomplished by a device such as that illustrated in the accompanying drawings which form a part of this specification and in which

Figure 1 is an elevation of a device for uncoiling wire, involving features of the present invention;

Figure 2 is a horizontal section on the line 2—2 in Figure 1;

Figures 3, 4 and 5 are views in perspective of three parts of the device shown in Figure 1; and

Figure 6 is a vertical section on the line 6—6 in Figure 2.

The improved reel illustrated in the drawings is mounted on a base 10. The base 10, as shown, is a relatively thin metal plate bent downwardly on either side, as at 12, and inwardly, as at 14, so as to support the central portion 16 of the plate in an elevated position. Centrally of the central portion 16 a short, vertically extending rod 18 is mounted in an opening in the plate 16 and secured in position by a pair of nuts 20 and 22. The nuts 20 and 22, as can be seen, are threaded onto the lower end of rod 18, the nut 20 being located above the plate 16 and the nut 22 below, so that when they are drawn up tight the rod 18 is rigidly supported.

Extending outwardly in radial planes about rod 18 as an axis is a series of six bent rods 24, the inner and outer ends of which rods 24 are respectively secured to circularly disposed rods 26

and 28. As may be seen, each rod includes an inner, vertically extending portion 30 spaced outwardly a short distance from the rod 18. At the upper end of the vertical portion 30 the rod 24 is bent outwardly and downwardly to provide a short section 32 and thence from the end of the section 32 the rod again extends vertically downwardly to provide a section 34. The section 34 terminates a short distance above the lower end of the section 30 and at this point rod 24 bends sharply outwardly and slightly downwardly to provide a section 36, and from the section 36 it curves gradually into another section 38 which extends generally vertically but has a slight slope outwardly.

The inner end of each rod 24, that is, the lower end of each section 30, is secured as, for example, by welding, at 40 to the ring 26 at equal distances about its center. The outer ends of the rods 24, that is, the upper ends of the sections 38, are similarly secured, for example, by welding, as at 42, to the ring 28. This provides a structure shown in Figure 5. This structure in turn is secured to the plate 16 by securing each rod 24 to the plate 16 at approximately the point where sections 36 and 38 merge. The securing means may take the form of a weld, as at 44.

Slidingly mounted on the rod 18 is a hollow tube 46 which extends upwardly a substantial distance above the ring 28. Adjacent the upper end of the tube 46 a washer 48 is affixed thereto as by welding, for example, and another washer 50 is similarly secured to the tube 46 a short distance above the lower end thereof. Extending between washers 48 and 50 is another set of six bent rods 52. Rods 52 also extend in radial planes about tube 46 and are equally spaced. They include an upper horizontal section 54 extending outwardly from the tube 46 to a point located about over the middle of the space between the vertical section 34 and the vertical section 38 of rods 24. From this point they bend sharply inwardly and a downwardly extending section 56 is formed which curves gradually inwardly for most of its length, becoming substantially vertical adjacent the lower end which is located a short distance below the lower end of tube 46. The rods 52 then bend sharply upwardly and inwardly to provide a section 58 and then on a level with the under surface of washer 50 they again turn to provide a horizontal section 60, terminating at the tube 46.

The rods 52 are firmly secured in position by welding or otherwise securing their upper and lower ends, respectively, to the washers 48 and 50. Additional strength may be imparted to the structure by extending the weld or other securing means so as to affix the rods 52 to the tube 46 at both ends, as well as to the washers 48 and 50. To give additional strength to the flaring annular form, designated generally 62, and which includes as parts the tube 46 and the rods 52, a pair of rings 64, 66 is provided at the top. Ring 66, which is of relatively large diameter, is secured to the rods 52, as by welding or other suitable means, at the point where sections 54 and 56 intersect. The ring 64 is similarly secured to the rods 52 at points spaced a short distance outwardly from the tube 46. As may be seen, the form 62 is supported on the base 10 through the rods 52 which rest on this base at the point where sections 56 and 58 intersect. Since the form 62 is to be removable, the rods 52 are not, however, secured to the base 10.

Mounted above the form 62 and supported thereby is tubular guide means 68 for the uncoiled wire. The guide means 68 includes a rod 70 extending vertically in the upper portion of the hollow tube 46. As is shown, the portion of the tube 46 in which rod 70 extends is preferably somewhat greater than that in which rod 18 extends due to the greater twisting force exerted on the rod 70. The rod 70, which has about the same diameter as rod 18, is freely received within the tube 46 so that it may be turned therein but is preferably large enough to be held substantially vertically in the tube 46.

The guide means 68 is supported in the desired position vertically by a nut 72 and washer 74 welded or otherwise secured thereon. The lower face of the washer, as may be seen, rests against the upper end of tube 46 and turns thereon. Also secured in and forming part of the nut and washer assembly 72, 74 is a flat, horizontally extending bar 76 which projects outwardly a short distance beyond the ring 66. The bar 76, together with the upper end of the rod 70, supports a hollow tube 78 which is secured to the rod 70 and the bar 76, respectively, at 80 and 82, by welding or other securing means.

The tube 78, as may be seen, includes a short, vertically extending section 84 located radially outwardly a short distance beyond the ring 66. Above the short vertical section 84 the tube 78 curves gradually into an inwardly and upwardly extending section 86 which, at the point where the tube 78 is secured to the rod, curves gradually upwardly into another vertically extending section 88, the axis of which is substantially coincident with the axis of the rod 70.

To load into the device a coil of wire 90 to be uncoiled, the form 62 and the guide means 68 are separated from the supporting bed, designated generally 92, simply by lifting the hollow tube 46 vertically from the rod 18. The coil 90 may then be positioned in the bed 92, as shown in Figures 1 and 6. The form 62 and guide means 68 are then replaced. The free upper end 94 of the coil may thereupon be threaded up through the tube 78, passing first through the section 84, then the section 86, and eventually being brought out at the top of section 88 as shown. As the wire is drawn out the guide means 68 revolve on rod 70 as a pivot.

The guide means 68, in addition to serving to prevent tangling and back-slapping of the wire, also serves to take out a substantial portion of the curl, delivering the wire in the desired condition for whatever use it may be intended. The guide means 68 also cooperates with the bed 92, particularly the portion formed by the outer, vertically extending sections 38 of rods 24, to prevent jerking, back-slapping and tangling. Due to the sections 38, the tendency for the wire to overrun and continue to uncoil, even after the pull on the end 94 has stopped which results in back-slapping and tangling, is greatly minimized.

The device illustrated has been operated with very fine wire, such as is used for stapling, at speeds as great as 2200 R. P. M. without encountering any undesirable back-slapping, tangling or jerking. The flaring form 62 also assists in making possible high speeds of operation since it tends to prevent the coil 90 from riding up, as will be clear to those skilled in the art. It is, however, free to give slightly to any such force since it is slidably mounted on the rod 18. The outwardly flaring form of the rods 52 tends, however, to wedge the coil more tightly if it rises

vertically at all and thus provides an increasing resistance.

Although the parts may be constructed of any desirable material, it has been found that sheet-iron is suitable for the base 10, and that soft and somewhat resilient iron rods may be very satisfactorily employed to form the rods 24 and 52, as well as the rings 26, 28, 64 and 66, the rings 26, 28, 64 and 66 being formed simply by bending a suitable length of the rod material into a circle and welding or otherwise securing the ends together. The hollow tube 46 may be formed with cast-iron pipe, for example. The tube 68, rod 70 and rod 18 may be formed of any desired material. Preferably, the rod 18 and rod 70 will be slightly larger in diameter and formed of a more rigid material than the rods 24, 52, et cetera.

The advantages of the device will be apparent from the foregoing description. The great and outstanding advantage is, of course, that wire, particularly fine wire, may be uncoiled from unsupported reels at very high speeds or slow speeds, as desired, without undesirable back-slapping, jerking and tangling. The outer, vertically extending portion of the bed 92 materially assists in preventing over-running of the wire with resultant tangling, back-slapping, et cetera. The inner flaring form 62, as has been repeatedly point out above, tends to prevent the coil from riding up out of the bed, thereby retaining it in position where the bed 92 may be effective to prevent tangling and back-slapping. The guide means 68 also cooperate in guiding the wire away from the coil in a uniform manner and in taking out some of the curl, delivering it centrally where the rate of rotation is less manifest.

It is apparent that many widely different embodiments of this invention may be made without departing from the spirit and scope thereof and therefore it is not intended to be limited except as indicated in the appended claims.

The invention is hereby claimed as follows:

1. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, means for limiting vertical movement of said coil of wire, including a centrally located annular form flaring outwardly in an upward direction and adapted to contact the inner surface of said coil of wire, and guide means for the uncoiled wire including a hollow tube rotatable on an axis substantially coincident with the axis of said flaring form, and including a portion extending outwardly from the center beyond the large upper portion of said flaring form and thence downwardly below said large upper portion.

2. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, means for limiting vertical movement of said coil of wire, including a centrally located annular form flaring outwardly in an upward direction and adapted to contact the inner surface of said coil of wire, and guide means for the uncoiled wire including a hollow tube rotatable on an axis substantially coincident with the axis of said flaring form, said tube including a portion extending vertically at a substantial distance from said axis, a portion extending vertically substantially along said axis, and a third portion extending upwardly and inwardly and connecting the upper end of the outer vertical portion of said tube and the lower end of the inner vertical portion of said tube.

3. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, means for limiting vertical movement of said coil of wire, including a centrally located annular form flaring outwardly in an upward direction and adapted to contact the inner surface of said coil of wire, and guide means for the uncoiled wire including a hollow tube rotatable on an axis substantially coincident with the axis of said flaring form, said flaring form including spider means on its upper and lower ends and a plurality of rods extending therebetween.

4. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, means for limiting vertical movement of said coil of wire, including a centrally located annular form flaring outwardly in an upward direction and adapted to contact the inner surface of said coil of wire, and guide means for the uncoiled wire including a hollow tube rotatable on an axis substantially coincident with the axis of said flaring form, said flaring form including spider means on its upper and lower ends, and a plurality of rods extending therebetween, and said hollow tube including a portion extending vertically at a substantial distance from said axis, a portion extending vertically substantially along said axis, and a third portion extending upwardly and inwardly and connecting the upper end of the outer vertical portion and the lower end of the inner vertical portion.

5. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, including an annular bed of generally U-shaped cross-section, and guide means for guiding the uncoiled wire and preventing premature unwinding thereof.

6. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, including an annular bed of generally U-shaped cross-section, and guide means for guiding the uncoiled wire and preventing premature unwinding thereof, said guide means including a hollow tube rotating on an axis substantially coincident with the axis of said annular bed.

7. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, including an annular bed generally U-shaped in cross-section, and guide means for guiding the uncoiled wire and preventing premature unwinding thereof, said annular bed including a plurality of rods located in radial planes about an axis including a portion bent into a generally U shape, and a portion extending from the inner end of the U-shaped portion to a ring centered on said axis, the outer ends of the U-shaped portion being connected to another ring centered on said axis, and said guide means including a hollow tube rotatable on an axis substantially coincident with said first-named axis.

8. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, including an annular bed generally U-shape in cross-section, and guide means for guiding the uncoiled wire and preventing premature unwinding thereof, said annular bed including a plurality of rods located in radial planes about an axis including a portion bent into a generally U shape, and a portion extending from the inner end of the U-shaped portion to a ring centered on said axis, the outer ends of the U-shaped portion being connected to another ring centered on said axis, and said guide means including a hollow tube rotatable on an axis substantially coincident with said first-named axis, said hollow tube including a portion extending vertically at a substantial distance from said last-named axis, a portion extending vertically substantially along

said last-named axis, and a third portion extending upwardly and inwardly and connecting the upper end of the outer vertical portion and the lower end of the inner vertical portion.

9. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, including an annular bed of generally U-shaped cross-section, and means for limiting vertical movement of said coil of wire, including an annular form concentric with said bed and flaring outwardly in an upward direction and adapted to contact the inner surface of said coil of wire.

10. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, including an annular bed of generally U-shaped cross-section, means for limiting vertical movement of said coil of wire, including an annular form concentric with said bed and flaring outwardly in an upward direction and adapted to contact the inner surface of said coil of wire, and guide means for the uncoiled wire including a hollow tube rotatable on an axis substantially coincident with the axis of said annular bed.

11. A device for uncoiling wire, comprising in combination means for supporting a coil of wire, including an annular bed of generally U-shaped cross-section, means for limiting vertical movement of said coil of wire, including an annular form concentric with said bed and flaring outwardly in an upward direction and adapted to contact the inner surface of said coil of wire, and guide means for the uncoiled wire including a hollow tube rotatable on an axis substantially coincident with the axis of said annular bed, said hollow tube including a portion extending vertically at a substantial distance from said axis, a portion extending vertically substantially along said axis, and a third portion extending upwardly and inwardly and connecting the upper end of the outer vertical portion and the lower end of the inner vertical portion.

12. A device for uncoiling wire, including in combination means for supporting a coil of wire, including an annular bed of generally U-shaped cross-section, means for limiting vertical movement of said coil of wire, including an annular form concentric with said bed and flaring outwardly in an upward direction and adapted to contact the inner surface of said coil of wire, and guide means for the uncoiled wire including a hollow tube rotatable on an axis substantially coincident with the axis of said annular bed, said bed, said form, and said guide means being supported on a base, and said bed and said form each comprising a plurality of rods, the rods in said bed having portions bent to a U shape and the rods in said form having portions flaring upwardly and outwardly.

13. A device for uncoiling wire, comprising in combination a base, a rod extending vertically centrally of said base, means for supporting the coil of wire, including an annular bed of generally U-shaped cross-section formed of a plurality of rods extending in equally spaced radial planes about said first-named centrally located rod as an axis, each of said rods including a portion bent into a U shape to provide said bed, said rods extending between and being secured to a pair of rings concentric with said first-named centrally located rod, means for limiting vertical movement of said coil of wire, including an annular form concentric with said first-named centrally located rod and flaring outwardly in an upward direction, said annular form including a hollow tube mounted on said first-named centrally located rod, and a plurality of rods each extending outwardly from said last-named hollow tube in radial planes to points located about the same distance from the first-named centrally located rod as are the inner arms of the said U-shaped rod sections and thence flaring upwardly and outwardly to points well above the upper ends of said U-shaped rod sections, and thence extending inwardly again to said hollow tube, and guide means for the uncoiled wire including a rod rotatable in the upper end of said hollow tube and supporting another hollow tube for rotation, said last-named hollow tube including a portion extending vertically over said annular bed, a portion extending vertically substantially along the axis of said first-named hollow tube, and a third portion extending upwardly and inwardly and connecting the upper end of said outer vertical portion and the lower end of said inner vertical portion.

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