Oct. 8, 1963 D. E. LEHMANN 3,106,358

FENCE WINDING APPARATUS

Filed Oct. 9, 1961

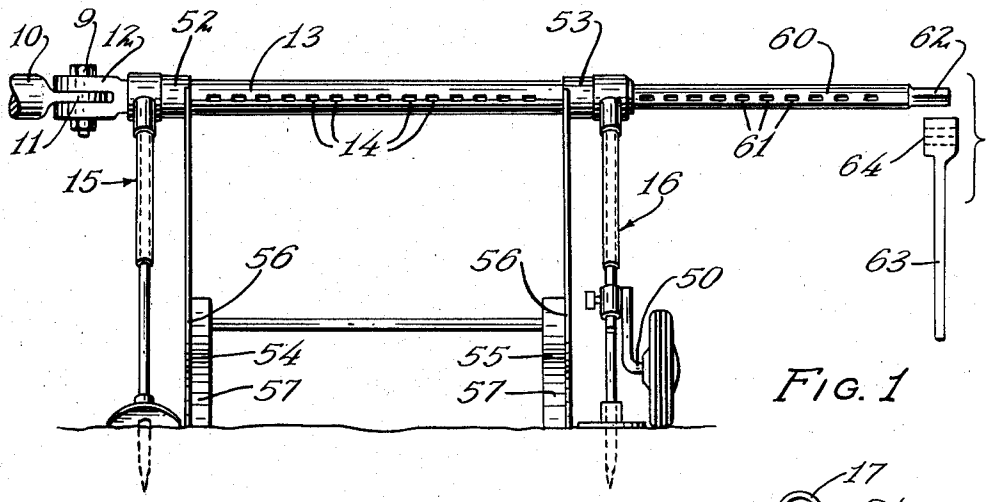


FIG. 1

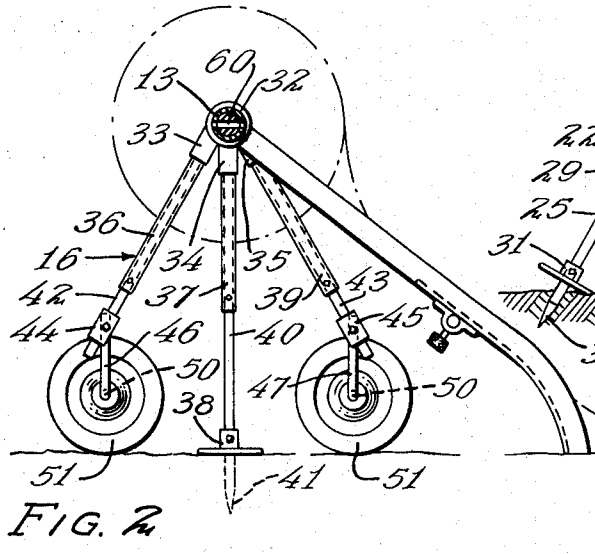


FIG. 2

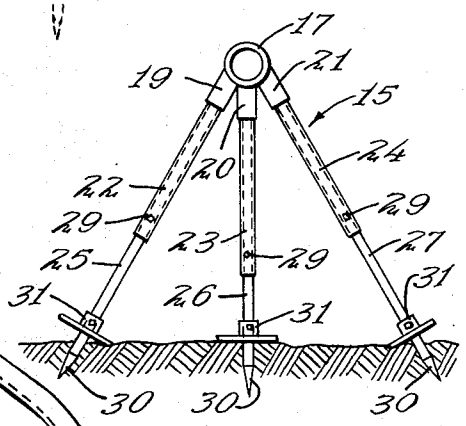


FIG. 3

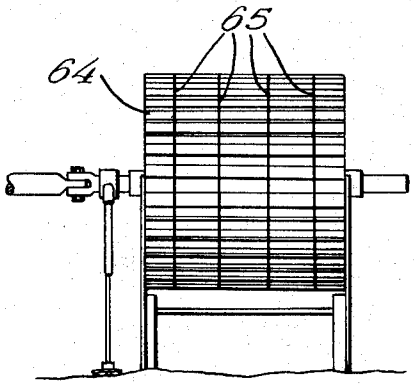


FIG. 4

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United States Patent Office 3,106,358 Patented Oct. 8, 1963

3,106,358

FENCE WINDING APPARATUS

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Filed Oct. 9, 1961, Ser. No. 143,669
11 Claims. (Cl. 242—56)

This invention relates to an improvement in fence winding apparatus and deals particularly with a device capable of reeling snow fences and the like to simplify the operation of winding and storing such fences when they are not in use.

Fences such as snow fences are usually constructed with spaced vertical slats which are connected by a series of horizontally extending wires. Fences of this type are usually erected in territory which usually has severe snowfalls, the fences being put up parallel to the roadways in order to cause drifts of snow on the sides of the roadways rather than over them. Each fall, the fences are unwound and erected in parallel relation to the roadway with suitable metal stakes. Each spring the fences are disconnected from the stakes and are wound into coils of a size which may be readily handled and the fences are then stored until the next winter season.

An object of the present invention resides in the provision of a simple and effective means of winding fences of this and other types so that they need not be wound by hand. While the winding operation is relatively simple, it is necessary to attach the inner end of the fence to a winding drum, and then to provide some means of disconnecting the inner end of the fence from the winding drum after the winding operation has been completed. It is an object of the present invention to provide a winding device which may be used for fences of this type, and which includes a means of automatically disconnecting the inner end of the fence wires from the winding drum when the winding operation has been completed.

A further feature of the present invention resides in the provision a simple and effective means of guiding the fence onto the winding drum so that the fence will be properly wound in convolute relation. The vertical slats which form the fence are normally connected by a series of spaced wires which extend horizontally when the fence is in use. My device for winding such fences includes a shaft having a series of spaced apertures therethrough through which the ends of these wires may extend. The shaft includes an inner hollow tubular shaft which is provided with a similar series of apertures therethrough which are in alignment with the apertures in the outer shaft when the two shafts are properly positioned. In winding the fence upon the winding drum comprising the inner and outer shafts, the ends of the wires connecting the slats are inserted through the aligned apertures in the inner and outer shafts, or at least are inserted partially through both shafts. The wires are bent adjoining the shafts so that as the shafts are rotated, the fence will wind up thereupon. When the desired length of fence is wound upon the shafts, the inner shaft is rotated relative to the outer shaft, the edges of the apertures of the inner shaft combining with the edges of the apertures in the outer shaft to form cutting means for cutting off the ends of the wires between the inner and outer shafts. When this has been done, the roll of fence may be removed from the shafts, and another section of fence may be wound in the same manner.

A feature of the present invention resides in the provision of an apparatus which may be connected to the power take-off of a truck or the like, and which is provided with supporting tripods which may serve to anchor the shafts in proper relation relative to the truck or tractor during the fence winding operation. In normal operation, the fence is placed flat upon the ground, and

the ends of the wires connecting the various slats are inserted through the apertures in the winding shafts. The shaft is then rotated to pull the fence over the surface of the ground and to wind it up upon the rotating shafts. The tripods are designed to hold the shafts in proper position, and to counteract the frictional engagement of the fence with the surface of the ground.

A further feature of the present invention resides in the provision of guides which are capable of directing the fence onto the winding shafts. These guides preferably extend in an inclined relation to the shaft and are angular in cross sections so that the slats are held in proper axial relation as the fence is wound upon the shafts.

An added feature of the present invention resides in the fact that one of the tripods may include wheels so that the device may be drawn over the surface of the ground from one location to another as needed.

These and other means and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of the specification:

FIGURE 1 is an elevational view of the apparatus, showing the inner shaft drawn outwardly for the purpose of illustration.

FIGURE 2 is an end elevational view of the apparatus illustrated in FIGURE 1.

FIGURE 3 is an elevational view of the inner tripod removed from the remainder of the apparatus.

FIGURE 4 is an elevational view showing a section of fence wound upon the winding shafts.

The apparatus is actually extremely simple in form, and is connected to the power take-off shaft of a truck or tractor by means of a power shaft **10** which usually extends laterally of the truck or tractor, but which may extend rearwardly therefrom. The power take-off shaft **10** is provided with a tongue **11** which is secured in a clevis **12** at the end of the shaft or drum **13** by means of a bolt **9** or other similar means. As is indicated in the drawings, the shaft **13** is provided wtih diametrically opposed slots **14** which extend throughout the major portion of the shaft **13**, the space between the slots **14** being sufficient to hold the parts of the shaft connected.

The shaft **13** is supported by an inner tripod unit **15**, illustrated in detail in FIGURE 3 of the drawings, and an outer tripod unit **16** which is illustrated somewhat in detail in FIGURES 1 and 2 of the drawings. The inner tripod **15** includes a sleeve bearing **17** through which the shaft **13** may rotate, the sleeve **17** including a series of angularly spaced sockets **19**, **20**, and **21**. The sockets described are designed to support hollow tubes **22**, **23**, and **24**, respectively. The angles between the sockets **19** and **20** and between the sockets **20** and **21** are preferably equal so that the tube **23** may extend vertically and the other tubes **22** and **24** may extend at equal angles to the vertical.

Rods **25**, **26**, and **27** are slidably supported in the tubes **22**, **23**, and **24**, respectively, and are held in adjusted relation by set screws such as **29**. The rods **25**, **26** and **27** are preferably provided with pointed ends such as **30** which are designed to extend into the ground, and flanged hubs **31** are adjustably mounted upon the rods **25**, **26**, and **27** so as to limit the penetration of the rods into the ground. In other words, the flanged hubs **31** are designed to engage the ground and to prevent the rods from extending into the ground more than a predetermined distance.

In preferred form, the outer tripod **16** also includes a bearing sleeve **32** which freely encircles the shaft **13** and includes a trio of angularly spaced bosses **33**, **34**, and **35**. These bosses are designed to accommodate the upper ends of the tubular sleeves **36**, **37**, and **39** respectively. A rod

40, similar to the rods 25, 26 and 27 is slidably supported in the sleeve 37 and is provided with a pointed end 41 and an adjustable flange 38 which is designed to limit the penetration of the pointed end 31 into the ground.

The sleeves 36 and 39 are designed to adjustably support rods 42 and 43 which support sleeves 44 and 45 to which are connected vertically extending arms 46 and 47 having horizontally extending ends such as 50. Wheels 51 are mounted upon the horizontally extending portions 50 of the arms 46 and 47, the wheels being designed to extend over the surface of the ground and to act as an outer support for the shaft 13.

In order to guide the fence on to the shaft 13, the shaft 13 is provided with collars 52 and 53 to which are secured angle members 54 and 55, respectively. The angle members 54 and 55 are provided with vertical flanges 56 which are in outer opposed relation, and inclined flanges 57 which act to support the fence as it is drawn upwardly over the guides. The angular flanges 54 and 55 terminate at a point spaced from the shaft 13 sufficient to accommodate the largest diameter of fence roll which is to be wound upon the shaft 13.

As is indicated in FIGURE 1 of the drawings, an inner hollow tubular shaft 60 is provided within the shaft 13. FIGURE 1 of the drawings shows the shaft 60 drawn outwardly from the shaft 13, but it will be understood that in actual practice, the shaft 60 is fully telescoped into the shaft 13. The shaft 60 includes a series of longitudinally spaced apertures 61 which are arranged to register with the apertures 14 in the shaft 13 when the two shafts are in telescoped relation. The shaft 60 is provided with a rectangular end 62, and this rectangular end 62 is designed to accommodate a wrench, or a tool 63 having an end 64 which may fit on the rectangular end 62 of the shaft 60 so that the shaft 60 may be rotated relative to the shaft 13 when the tool 63 is applied.

In operation, the tripods 15 and 16 are properly located relative to the truck or tractor so that the drive shaft 10 may rotate the shaft 13. The hollow shaft 60 is in telescoping relation with a shaft 13 and the apertures 61 in the shaft 60 are in register with the corresponding apertures 14 in the shaft 13. The fence 64, best illustrated in FIGURE 4 of the drawings, includes a series of slats which are tied together by wires 65 which are horizontal when the fence is in use. The ends of the wires 65 are inserted through the apertures 14, and also through the corresponding aperture 61 of the inner shaft 60. The two shafts are rotated so that a clamping action is provided between the two shafts.

When the ends of the wire 65 have been inserted in the aligned apertures 14 and 61, the drive shaft 10 is rotated in a direction to wind the fence upon the shaft 13. When a desired length of the fence has been wound upon the shaft, or when the entire length of fence has been wound upon the shaft 13, the handle 63 is applied to the end 62 of the shaft 60, and this shaft 60 is rotated relative to the shaft 13, the shaft 13 being held stationary.

As a result of this operation, the ends of the wire 65 which had extended through both sleeves are sheared off and the roll of fence may be readily removed from the shaft 13 by removing the outer tripod 16 and the outer guide 55. It is true that short ends of the wire extend through the apertures 14, but these ends are readily bent out of position during the removal of the fence from the reel.

With the arrangement described, a snow fence can be wound upon a reel in a matter of seconds, and the reel of fence can be readily removed from the shaft in an extremely short period of time. The time required to roll the fence into a compact shape is considerably less than required by accomplishing the task manually, and the resulting coils of fence are more tightly wound than if these coils were wound by hand.

In accordance with the patent statutes, I have described the principles of construction and operation of my improvement in fence winding apparatus, and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A fence reeling apparatus for use with a fence having spaced parallel wires, the apparatus including a hollow shaft, an inner shaft within said hollow shaft, means supporting said shafts in a generally horizontal relation, means connected to one end of the said hollow shaft adapted to be engaged by a shaft rotating means, said shafts being rotatable in relation to each other and also rotatable in unison, a series of axially spaced registrable apertures in said shafts through which ends of said spaced parallel wires can extend and engage, the rotation of said shafts in unison reeling the fence onto the said shafts, the rotation of one shaft relative to the other shearing the said wires extending and engaging into the said apertures.

2. The structure of claim 1 and in which the said means supporting the said shafts includes tripod supporting means having a collar bearing means through which said shafts extend.

3. The structure of claim 2 and in which said collar bearing means includes socket means connected to said collar bearing, legs attached in said socket means, said legs being adjustable in length.

4. A fence reeling apparatus for use with a fence having spaced parallel wires, the apparatus including a hollow shaft, an inner shaft within said hollow shaft, tripod supporting means having a collar bearing means through which said shafts extend, socket means connected to said collar bearing, legs attached in said socket means, means connected to one end of the said hollow shaft adapted to be engaged by a shaft rotating means, said shafts being rotatable in relation to each other and also rotatable in unison, a series of axially spaced registrable apertures in said shafts through which ends of said spaced parallel wires can extend and engage, the rotation of said shafts in unison reeling the fence onto the said shafts, the rotation of one shaft relative to the other shearing the said wires extending and engaging into the said apertures.

5. The structure of claim 4 and in which said tripod supporting means includes legs in which two of said legs have pivotal wheel attaching means adjustably fastened to the end of said two legs, wheels on the said wheel attaching means, the other leg having a detachable disc adjustably fastened near the end of said leg to prevent the said leg from digging into the ground.

6. The structure of claim 4 and in which said tripod support means includes detachable legs.

7. The structure of claim 4 and in which said supporting means is positioned at the end of said shafts.

8. A fence reeling apparatus for use with a fence having spaced parallel wires including a hollow shaft, an inner shaft within said hollow shaft, tripod means supporting said shafts including a collar bearing means through which said hollow shaft extends, socket means on said tripod means, adjustable legs having one end of each fastened in said socket means, two of said legs having wheel attachment means near their lower end, wheels on said attachment means, the other said legs having discs adjustably fastened near the lower end of said legs, said lower ends being pointed, said discs being adapted to prevent the said legs from entering the ground too deeply, said tripod means supporting said shafts in a generally horizontal relation, means connected to one end of the said hollow shaft and designed to engage a shaft turning means, said shafts being rotatable in relation to each other and also rotatable in unison, a series of axially spaced registrable apertures in said shafts through which ends of said spaced parallel wires can ex-

tend and engage, the rotation of said shafts in unison reeling the fence onto the said shafts, the rotation of one shaft relative to the other shearing the said wires extending and engaging through the said apertures.

9. The structure of claim 8 and in which said inner shaft includes a handle means attached to one end of said shaft by which said inner shaft may be turned relative to said hollow shaft.

10. The structure of claim 8 and in which said fence reeling apparatus includes means for guiding the said fence onto the said shafts during reeling.

11. A fence reeling apparatus for use with a fence having a series of longitudinally extending wire strands including a fence having spaced parallel wires, said apparatus including a hollow shaft, an inner shaft within said hollow shaft, a handle means on one end of said inner shaft, means on one end of said hollow shaft connected to a shaft rotating means such as a power take off, tripod supporting means near the ends of said hollow shaft, said tripod means including collar bearings through which said shafts extend, said tripod means including leg

attaching sockets attached to said bearings, legs detachably fastened into said sockets, said legs being adjustable as to length, said hollow shaft and said inner shaft having a series of axially spaced registrable apertures through which ends of said wire strands may be inserted and engaged, parallel fence guide means having collars encircling the said hollow shaft, said shafts, when rotated in unison, reeling the said fence onto the said shafts, said inner shaft, when rotated relative to said hollow shaft, causing said wires inserted and engaged in said axially spaced apertures to be sheared, said tripod means being detachable from said hollow shaft, the said reeled fence being thereby readily removed from the said shafts.

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