May 4, 1948. M. I. KARP ET AL 2,440,719

AUTOMATIC WIRE TAKE UP DEVICE

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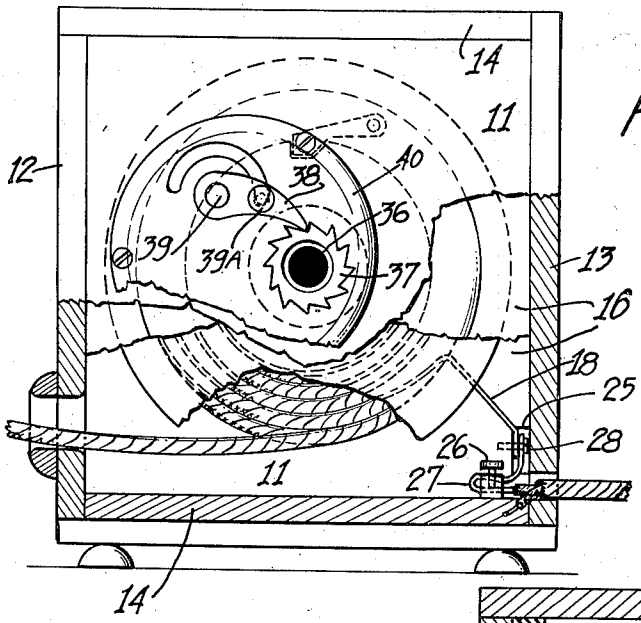


FIG. 1.

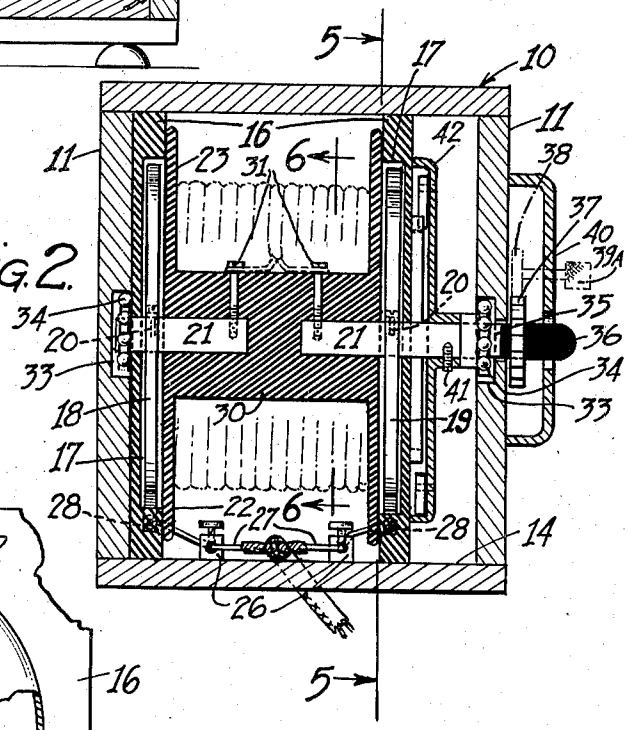
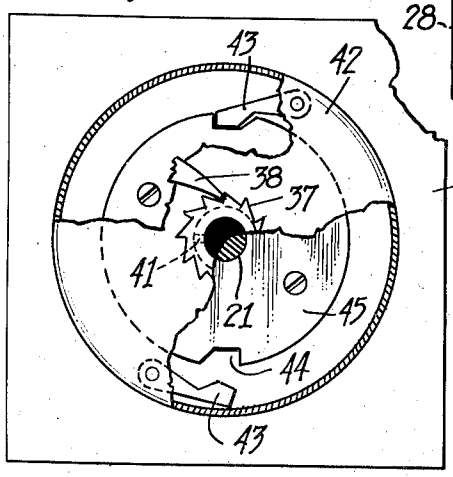


FIG. 2.

FIG. 3.



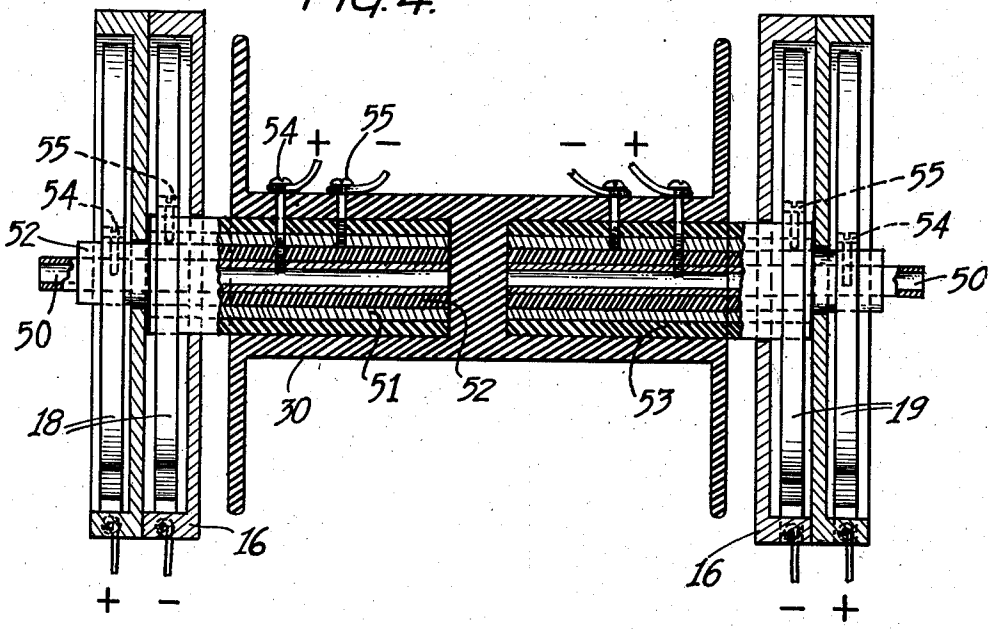
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Fig. 4.



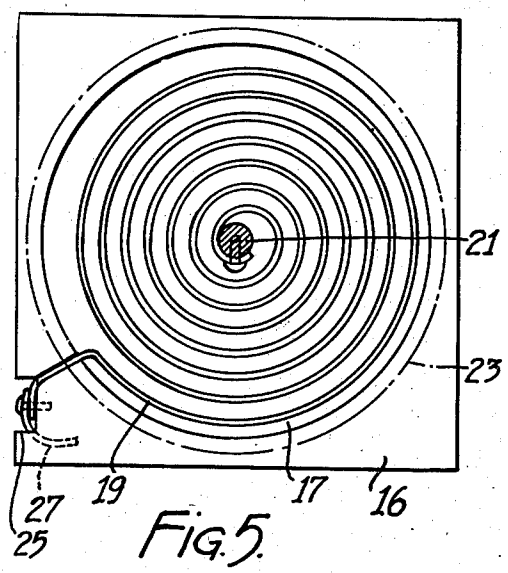


Fig. 5.

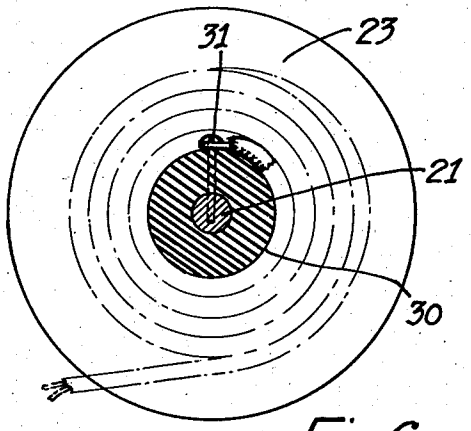


Fig. 6.

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AUTOMATIC WIRE TAKE-UP DEVICE

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Application September 16, 1944, Serial No. 554,399

1 Claim. (Cl. 191—12.2)

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This invention relates to winding devices and in particular to one that is used in maintaining the electrical wire employed in service uses, coiled within the device ready for extension to any desired length.

The use of winding devices upon which can be stored a length of wire to be extended for the remote use of a tool or fixture from the source of current supply is well known, but the ones in present use maintain the circuit through the reeling device and wire through the medium of a sliding or rolling contact that is subject to arcing and presents a fire hazard not only while the device is in use but when it is not in use, due to the fact that when reeling ceases, the contacting members may be close enough together to arc if the device is subjected to ordinary vibration and may cause short circuits in the power or supply line.

It is an object of the present invention to provide a reeling device which is automatic in use, that is permits the unreeling of the wire any length desired and the winding thereof as rapidly or as slowly as necessary. A further object is to provide a construction in which there are no moving parts that rub against each other to complete a circuit thereby eliminating the danger of arcing and doing away with all fire hazard. Still further objects are to provide a device that may be made in a few parts, may be made of insulating material for the most part and which may be employed as a unit with a sewing machine, vacuum cleaner or other device to take up slack wire or may be built as a unit into a wall to provide an extension wire for any purpose.

A further object of our invention is to use a reel in which the revolving agent is a set of springs which are coiled by the unwinding pull on the coiled wire and the tension of which is used to wind up the extended wire as it is released for reeling in movement. The springs are arranged to be part of the circuit from which the current passes from its source through the wire for use with an implement, the contacts being so arranged that no moving parts are employed in making the contact necessary for completing the circuit.

Our invention is not to be restricted to the precise details of construction shown since various changes and modification therein may be made without departing from the scope of the invention or sacrificing the advantages derived from its use. A preferred embodiment of the invention

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is illustrated in the accompanying drawing, in which:

Figure 1 is a view in sectional elevation of the housing and mechanism of the reeling device.

Figure 2 is a view in front elevation showing the relative arrangement of the parts,

Figure 3 is a fragmentary view in side elevation showing the spring action controlling means, and

Figure 4 is a fragmentary view showing a modified form of reel construction showing diagrammatically how the capacity of the reel may be enlarged,

Figure 5 is a section on the line 5—5 of Figure 2 showing the spring retaining recess, and

Figure 6 is a section on the line 6—6 of Figure 2 showing the reel and shaft contact means.

Referring to the drawing in detail, 10 indicates generally the housing which comprises side walls 11, front wall 12, rear wall 13, top and bottom walls 14 and inner walls 15, all secured together by any fastening means such as screws or cement. The wall construction may be of molded plastic parts if desired and the material from which the housing and other associated parts is made consists of any suitable insulating material that is fireproof and shock-proof for durability.

The inside of the housing is provided with the spaced inner walls 16, one of which abuts a side wall 11 and the other of which is spaced from the opposite side wall. Both walls 16 on their inner faces are recessed as at 17 to provide a space in which is positioned the springs 18 and 19. One end of each spring is attached by a screw 20 to an axle 21 made of metal, which protrudes from the opposite sides of a reel 22 made from insulating material and shaped to provide flanges 23 which constitute closures for the recesses 17 of the walls 16 in which are journalled the said axles 21. The opposite or outer ends of the springs are fastened to the notched portions 25 formed in the walls 16 and adjacent to which is fixed on the bottom wall 14 of the housing, the contact posts 26 which are connected by wires 27 to the screws 28 which secure the ends of the springs to said walls 16.

The hub or drum portion 30 of the reel provides an insulation between the ends of the axles 21 which may be force fitted or otherwise secured in said reel. If deemed advisable a single axle may be employed having its ends insulated from each other. The portion 30 carries screws 31 which are threaded into the metal axles and to which screws the ends of the wire that is

reeled on the drum is secured. Hence a circuit is established through a lead-in or source of current wire 27, through one spring 18, through one axle 21, through a screw 31 to the reel carried wire and back through the same means at the opposite side of the reel and housing. In this manner no current carrying contacts provide dangerous arcing which is absent as a fire hazard in our construction.

The side walls 11 are each provided with a pocket 33 on their inner face for the reception of ball bearing units 34 mounted on the axles 21, the axle at one side being extended as at 35 to project through the side wall 11 to carry on an insulated tip 36 thereof, the ratchet gear 37 which is arranged to be engaged by the pawl 38 pivoted as at 39 to the side wall and movable for ratchet engagement by a finger piece 39A which projects through a cover 40 in which the ratchet gear and pawl are housed. The same axle has secured thereto as at 41 a detent disk 42 which revolves with the shaft and carries on its inner face the diametrically disposed detents 43 which are arranged for gravitational engagement with peripheral recesses 44 in the edge of a disk plate 45 fixed to the adjacent wall 16 when the axle is revolving slowly, but prevented from dropping into said recesses when the axle is revolving rapidly as caused by the centrifugal force of a rapid winding action of the reel. Hence, a slight resistance on the wire to reeling action will cause the reel to be latched and if it is desired to reel in rapidly, a tug on the wire will release the detents and they will be swung away from the plate by the centrifugal force caused by the revolving movement of the axle. The wire of the reel can thus be extended to any length desired and held in extended position and can thereafter be reeled in fully or adjusted as desired. The reeling action does not effect the circuit and produces no sparking or arcing that would produce the fire hazard which is highly objectionable.

The flanges of the reel and the inner walls provide a complete housing for the bare spring which carries the current at each side of the reel and hence the springs are completely insulated from the other parts of the device.

In the construction illustrated in Figure 4, the same housing and control devices may be employed, and the inner and outer sleeves 50 and 51 of metal are separated from each other by sleeves of insulating material 52 and 53. The inner sleeve or solid shaft 50 is tapped by the contact screws 54 which provide a circuit through the springs and reel and the outer sleeve 51 is tapped by the screws 55 which provide a circuit through another set of springs and the reel so that two different wires may be reeled as in telephone use.

It is evident therefore that we have provided a reeling device in which arcing and friction of the contacting surfaces is eliminated, which arcing and friction pit and wear the surfaces and limit the life of the device, and produce a fire hazard that our construction eliminates entirely. The life of our structure is thus increased and its use is safe at all times and under all conditions.

What we claim is:

In an automatic wire reeling device, a housing, inner walls shaped to provide concentric recesses opening at the inner sides of said inner walls, outer walls, a flanged wire holding reel of insulating material positioned between and in contact with the inside surface of said inner walls to form a closure for said recesses, insulated metal stub axles projecting from the ends of said reel passing through said inner walls and journalled in said outer walls, a coil spring in each recess connected at its inner end to an adjacent axle and at its outer end to the inner wall, binding screws for securing the outer and inner ends of the springs to the wall of the housing and the axles, respectively, binding screws on the outer surface of the reel for connection to the ends of a wire wound on the reel and to said axles, whereby a circuit may be completed through the springs, the axles and the wire wound on said reel, wire contact posts in the reel chamber formed by said inner walls and to which may be connected a lead in wire fixed to the binding screws securing the springs to the wall, a hollow detent disk attached to one of the axles and abutting one of the inner walls to form a chamber, a notched disk plate secured to the abutted inner wall, detents pivoted to the disk for centrifugal and gravitational operation with respect to said detent disk to control the action of the reel, a ratchet gear fixed to one axle, a pawl for engagement with the gear, a slotted cover abutting the housing to which said pawl is pivoted, and a finger piece on the pawl passing through the slot of the cover by which the pawl can be moved to disabled position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
977,192	Hull	Nov. 29, 1910
1,102,164	Parker	June 30, 1914
1,247,358	Zwilling	Nov. 20, 1917
1,247,672	Hallberg	Nov. 27, 1917
1,978,734	Apple et al.	Oct. 30, 1934
2,374,457	Reeves	Apr. 24, 1945