

[54] **CABLE DISPENSING REEL ASSEMBLY**

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[58] Field of Search 191/12.2 R, 12.4; 248/86.2, 86.4; 137/355.26, 355.27

[56] **References Cited**

UNITED STATES PATENTS

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[57] **ABSTRACT**

A cable reel for use in areas having restricted height, such as in low coal mines, and where there may be an accumulation of explosive gases or mixtures which could be ignited by an electrical arc incorporating a supporting leg assembly, handle and reel so that the device may be stationarily supported on the legs or towed or pulled through areas having restricted vertical height with the reel having rubber peripheral tires thereon to prevent an incendiary arc. The reel is provided with a connection with sound powered phones because there is no voltage source required for operation of the phones which eliminates the danger of an incendiary arc from the unit igniting an explosive mixture of gases in the surrounding atmosphere.

5 Claims, 4 Drawing Figures

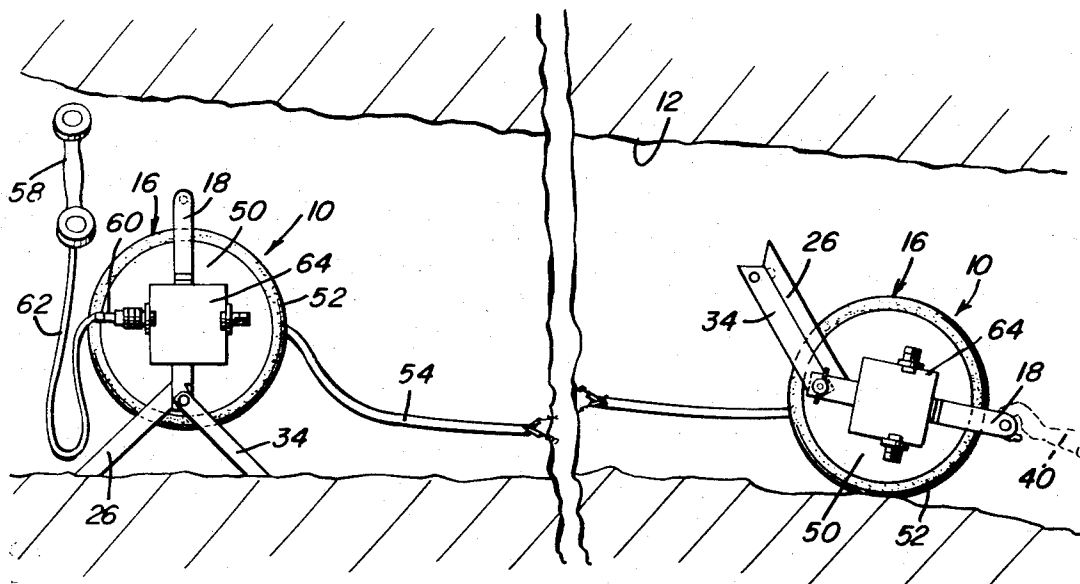


Fig. 1

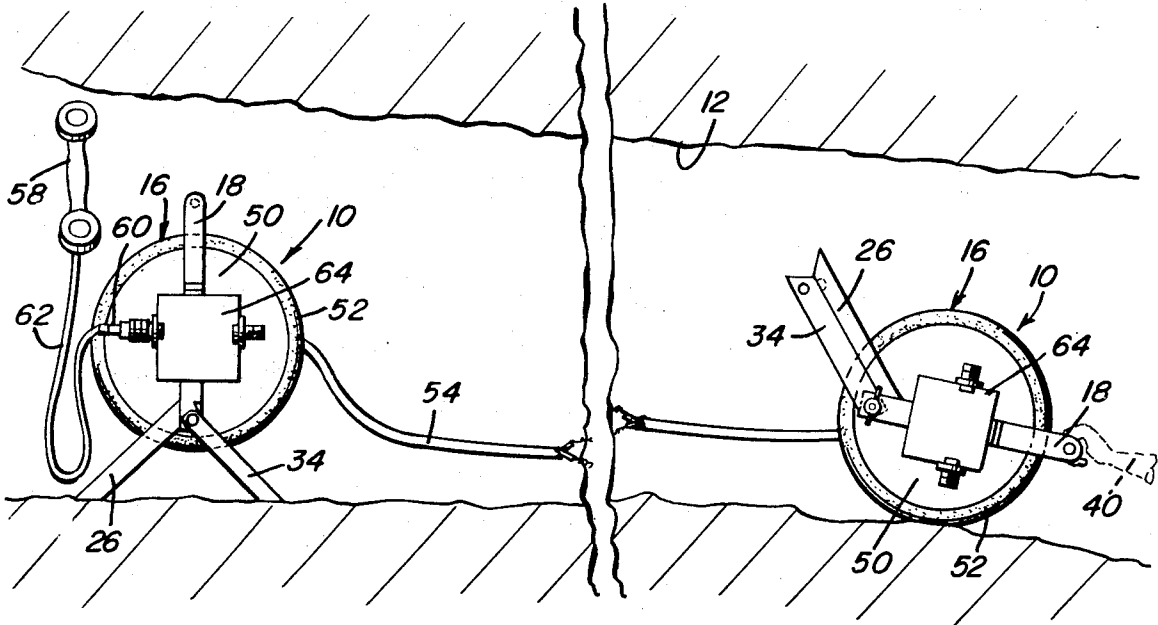
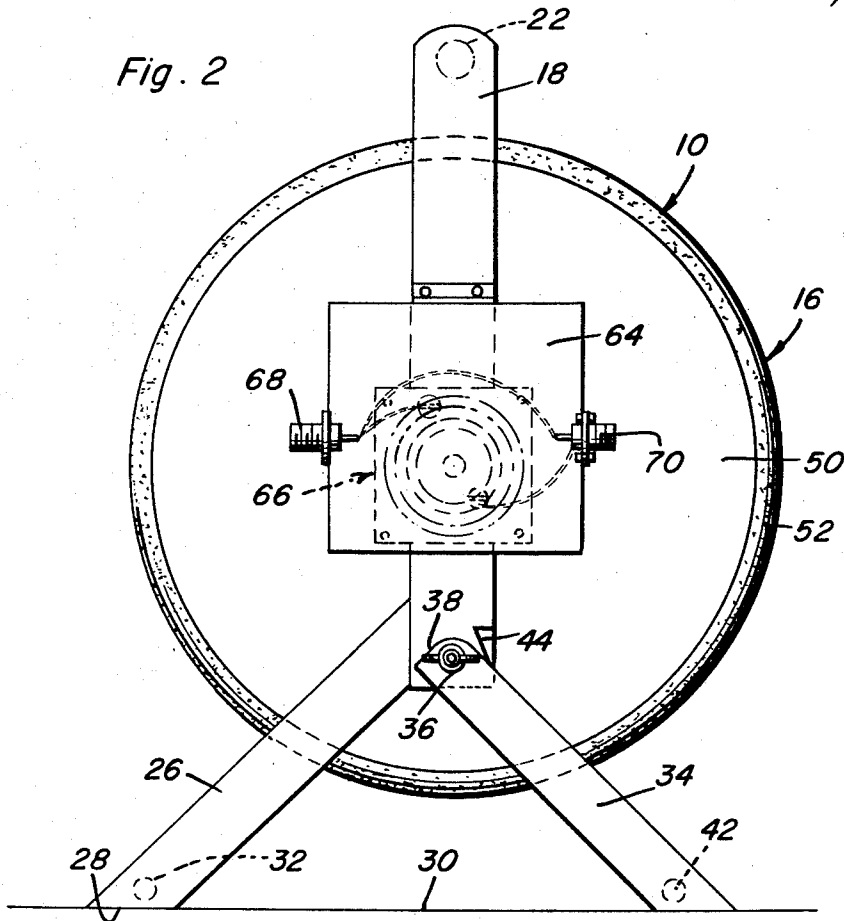
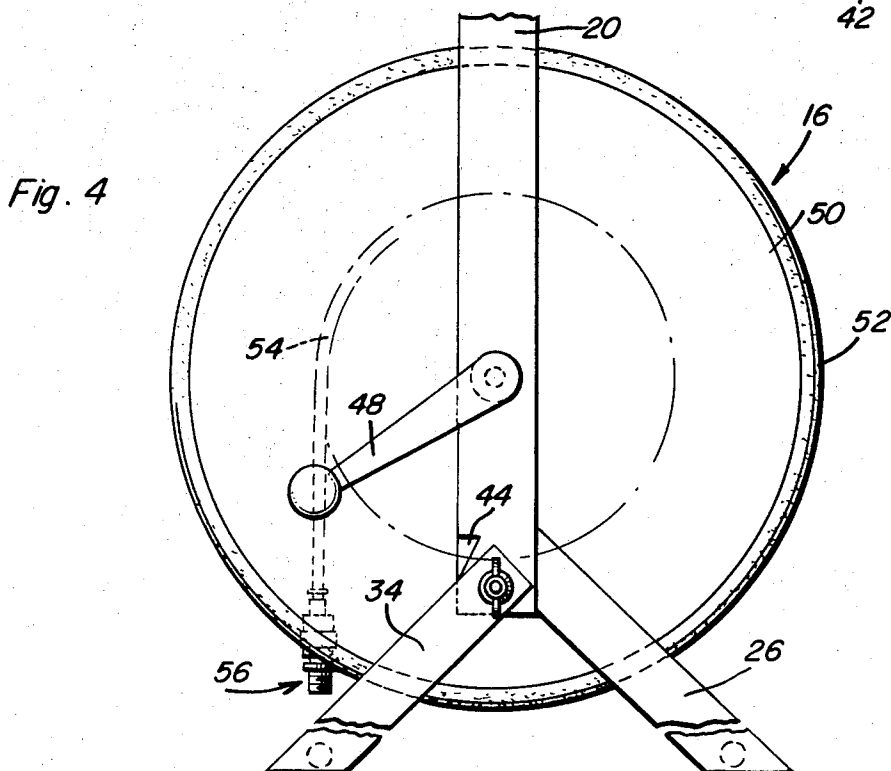
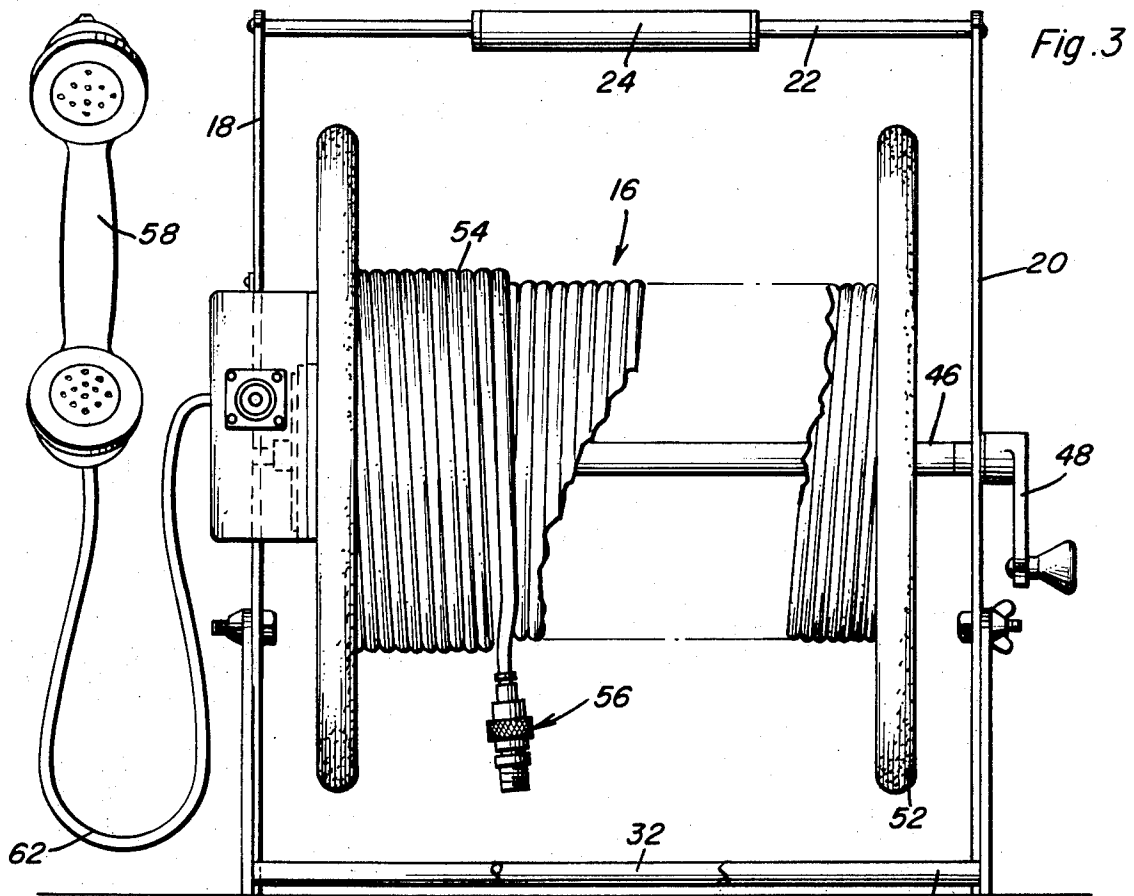


Fig. 2





CABLE DISPENSING REEL ASSEMBLY

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to a cable dispensing reel assembly and more particularly such a reel which may be supported on a supporting leg structure or towed along a supporting surface with the reel itself rollingly engaging the supporting surface with the assembly having a low vertical profile to enable the assembly to be pulled through or moved through low coal mines, utility tunnels or any other area having a relatively short vertical clearance and subject to an accumulation of explosive gases or the like with the reel assembly being constructed to eliminate the possibility of occurrence of incendiary arcs occurring.

2. Description of the Prior Art

Prior patents have been granted on various types of reels for electrical conductors in which the reel is provided with a supporting structure to rotatably journal the reel to enable the electrical conductor to be wound onto or pulled off of the reel. Such reels usually employ a rotary collector ring and brush assembly to transmit electrical energy from the electrical conductor wound on the reel through the hub thereof to a stationary conductor which may be connected to a source of electrical energy or to a device which utilizes electrical energy. Exemplary of such patents are U.S. Pat. Nos. 1,740,035, issued Dec. 17, 1929 and 1,139,557, issued May 18, 1915. Also, reels for various other devices are well known in which various types of supporting structures are provided to rotatably support the reel while flexible elements are wound onto or reeled off of the reel.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a cable dispensing reel assembly employing a rotatable reel supported by a pivotal leg assembly and including a handle structure associated therewith which will alternatively support the reel in a stationary manner on a supporting surface or be collapsed so that the reel may be rolled along a supporting surface with the handle and leg structure being oriented in a manner that it will not project vertically above or below the reel thereby enabling the reel assembly to be pulled through low clearance areas such as a low coal mine or other types of mines having low clearance areas, utility tunnels, conduits or the like or through any other area in which a low clearance occurs.

A further object of the invention is to provide a reel assembly in which the reel includes end flanges of circular configuration having a peripheral resilient tire thereon to engage the supporting surface as it is pulled thereover to eliminate the possibility of an incendiary spark or arc being formed by rolling contact or striking engagement of the reel with rocks, metal components or other obstructions that may be disposed in the path of movement of the reel as it is pulled along a supporting surface.

A further important object of the present invention is to provide a cable dispensing reel assembly employing a rotary hub structure associated with the rotational axis thereof which includes an annular collector ring or rings and corresponding brush assemblies to provide flow of electrical energy from a conductor on the reel to a conductor extending stationarily from the hub or

adapter box associated with the hub of the reel thus adapting the device especially for use in coal mines where explosive gas mixtures may exist or accumulate and in conjunction with sound powered phones which do not employ a voltage source for transmission of messages. The sound powered phone conductor, which is relatively small and enables a relatively long length thereof to be wound onto a relatively small reel, to be used as a life line to persons which may be entrapped as a result of an underground explosion or the like in a mine in order to facilitate a trapped person to find his way out of the area in which he is entrapped or enable rescuers to gain access to the area in which a person may be entrapped.

Still another important feature of the present invention is to provide a reel assembly in accordance with the preceding objects which is relatively simple in construction, flexible in utility, dependable and long lasting and relatively inexpensive to manufacture, operate and maintain.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of the cable reel assembly of the present invention illustrating the manner in which the cable reel assembly may be employed either in a stationary position or in a rolling position with the two reel assemblies being connected together if desired.

FIG. 2 is an end elevational view of the cable reel assembly of the present invention.

FIG. 3 is a side elevational view of the cable reel assembly.

FIG. 4 is an end elevational view, with portions broken away, illustrating the end of the cable reel assembly opposite from FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now specifically to the drawings, the cable dispensing reel assembly of the present invention is generally designated by the numeral 10 and, in FIG. 1, is illustrated in its two conditions in an area having relatively small vertical height such as a low coal mine passage 12 which has a short vertical clearance or height such as are normally formed during coal mining operations. The reel assembly 10 includes a rotatable reel 16 rotatably supported between a pair of side frame members 18 and 20 which extend transversely of the axis of rotation of the reel with one end of the frame members 18 and 20 being interconnected by a rod 22 having a handgrip 24 thereon which may be in the form of an enlarged cylindrical member rotatably journaled on the rod 22 or otherwise secured thereto in any suitable manner.

The ends of the side frame members 18 and 20 remote from the handle 24 terminate inwardly of the periphery of the reel 16 but each of the side frame members 18 and 20 includes a leg member 26 that is disposed in angular relation to the longitudinal axis of the side frame members 18 and 20 as illustrated in FIG. 2 with the leg members being rigidly secured thereto as

by welding or the like and each of the leg members 26 is provided with an inclined outer end 28 for engagement with a supporting surface 30 when the reel assembly is supported in a stationary manner. To rigidify the leg members 26, they are interconnected by a rod 32. Pivotally attached to the end of each frame member 18 and 20 remote from the handle 24 is a second leg 34 that is pivotally attached to the respective side frame members 18 and 20 by a pivot bolt 36 having a wing nut or the like 38 thereon to retain the legs 34 in diverging relation to the legs 26 as illustrated in FIG. 2 for supporting the reel 16 in a stationary condition as illustrated in the left portion of FIG. 1 or to enable the legs 34 to be pivoted to a position alongside of the legs 26 by loosening the wing nut 38 to enable the legs 34 to pivot and then retightening the wing nuts to retain the legs 26 and 34 alongside of each other as illustrated in the right portion of FIG. 1 so that the reel assembly 10 may be pulled along the supporting surface by a hand 40, a tow rope or the like connected with the handle 24 or rod 22 with the reel assembly in this condition defining a low profile or low vertical height so that it may be easily pulled through the low coal mining mine tunnel or passage 12. The legs 34 are also interconnected by a rod 42 to rigidify the legs and retain them in spaced relation and to provide a stable support for the reel 16. When the legs 34 and 26 are disposed in adjacent relation to each other, the rods 32 and 42 may be used as a handle for pulling the reel along a supporting surface. Also, a stop lug 44 is provided on each of the side frame members 18 and 20 to limit the swinging movement of the legs 34 to an angular position that is equal to the angular position of the legs 26 on the opposite side of the frame members 18 and 20 so that the legs 26 and 34 diverge in such a manner that the inclined or angle ends thereof will engage the supporting surface 30 in a manner to support the reel 16 for rotation.

The reel 16 includes a center shaft or axle 46 that is rotatably supported from the side frame members 18 and 20 in any suitable manner with one end of the shaft or axle 46 having an offset handle 48 connected thereto outwardly of the frame member 20 in order to provide manual rotation of the reel 16. Also, the reel 16 includes circular end flanges 50 having a rubber peripheral tire 52 mounted on the outer periphery thereof which may be accomplished by the outer periphery of the circular flange or plate 50 having an arcuate flange thereon of any suitable construction or with the tire 52 being bonded or otherwise secured to the periphery of the circular flange or plate 50 so that the tires 52 will be permanently and securely retained on the periphery of the flanges 50 so that they will roll along the surface 30 and prevent any possibility of an incendiary spark or arc being formed by striking a rock or other obstruction along the surface.

Mounted on the reel 16 is an electrical conductor 54 of the type used in conjunction with sound powered telephones with a coupling or connector 56 on the free thereof to which a sound powered telephone set such as designated by numeral 58 may be connected through a connector 60 on the end of a flexible conductor 62 connected with the set 58. Thus, the telephone cable 54 can be unwound and connected to a telephone handset or the handset may be connected to the cable and unreeled therefrom either by pulling on the cable or by manually rotating the reel by using the handle 48.

The handle 48 is also used for winding the telephone cable 54 onto the reel.

At the end of the reel opposite from that having the handle 48 attached thereto, there is a cover or box 64 for a conventional collector ring and brush assembly generally designated by numeral 66 with there being two collector rings rotatable with the reel and two brush assemblies engaged with the collector rings and connected to receptacles or adapters 68 and 70 carried by the box 64 so that one or more telephone handsets 58 may be connected thereto or a plurality of reel assemblies may be interconnected by connecting the connector 56 to a connector on a remote reel assembly. The specific details of the collector ring and brush assembly as well as the sound powered phones and the couplings provided thereon are not illustrated inasmuch as these are conventional components and form no particular part of the present invention except by virtue of their association to form the cable reel assembly.

In operation, the length of the cable 54 may be 1,000 feet and in its simplest use, the cable 54 may be unwound so that the connector 56 is at a position remote from the reel assembly. Then by having a phone connected to one of the adapters or connectors 68 and another phone connected to the connector or adapter 56, a conversation may be conducted over the phones in the usual manner. If desired, a plurality of reel assemblies may be connected at 1,000 foot intervals and multiple phones may be connected to each reel assembly. Also, the telephone cable may be used as a life line by which miners or the like may be guided through an underground passageway or the like. The construction of the reel assembly enables it to be converted rapidly to an arrangement where the reel assembly may be rolled along the ground surface which will enable the cable to be unreeled as the reel assembly is pulled along the surface. The resilient tires 52 as well as the carbon brush assemblies will eliminate any possibility of an incendiary arc which could possibly ignite explosive mixtures of gases which sometimes occur in mine passageways, tunnels or the like. In addition, the device may be used for supporting and dispensing other types of cables, electrical conductors, flexible members or the like and has special utility for use by persons engaged in underground tunnels such as in connection with public utilities in which conduits, cables or the like are frequently strung in underground tunnels and the like. The specific leg structure enables stable support of the reel and also easy collapse to the condition where the reel assembly can roll along a supporting surface.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. A reel assembly comprising a reel upon which a flexible member may be wound and unwound, a pair of side frame members extending transversely of the reel on which the reel is rotatably journaled, said side frame members having one end thereof projecting beyond the reel and being interconnected by a handle means, the other end of each side frame member including leg

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means mounted thereon for supporting the side frame members and reel from a supporting surface, each leg means including at least one pivotal leg to enable folding thereof to a retracted position, said reel including peripheral tire means for rollingly engaging a surface when the pivotal legs are in retracted condition and the reel assembly is pulled along a supporting surface by the handle means, said tire means including a circular plate on each end of the reel and a resilient tire on the outer edge of the plate, said handle means including an elongated rod extending rigidly between the side frame members adjacent the outer end portions thereof, and a cylindrical member attached to the central portion of the rod to form a handle for the reel assembly, each leg means including a rigid leg disposed in angular relation to the side frame members with the pivotal leg being movable to a position alongside of the rigid leg thus enabling the legs to be disposed in diverging relation when supporting the reel assembly from a supporting surface and enabling both legs to be disposed to the same side of the side frame members when in the retracted position to enable the reel assembly to be rolled along the surface with the tires on the reel engaging the supporting surface, said reel including an electrical conductor wound thereon provided with a connecting adapter on the free end thereof, the other end of the cable being connected to a collector ring and brush assembly associated with the axis of rotation of the reel and connected with a stationary connecting adapter to enable sound powered telephones to be connected to the reel assembly for transmitting messages in areas subject to accumulation of explosive gas mixtures without forming incendiary sparks or arcs by rotation of the reel or by rolling movement of the reel along a supporting surface, said reel assembly including clamp means retaining the pivotal leg in extended and retracted positions, and a stop lug to limit the pivotal movement of the pivotal leg to its extended position thereby forming a rigid support for the pivotal leg.

2. The structure as defined in claim 1 wherein the rigid legs and pivotal legs have inclined outer ends disposed in horizontal alignment with each other when in position for engaging a supporting surface and supporting the reel in elevated relation to the supporting surface, said rigid legs being interconnected by a rod adjacent the outer ends thereof and said pivotal legs being interconnected by a rod adjacent the outer ends thereof, said rods interconnecting the ends of the rigid legs and pivotal legs being disposed adjacent to each

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other when the legs are pivoted to retracted position for use as a handle disposed in remote relation to the handle on the rod interconnecting the ends of the side frame members.

3. The structure as defined in claim 2 wherein said rigid legs and pivotal legs have their inclined ends substantially equally spaced on opposite sides of a vertical plane passing through the rotational axis of the reel when the legs are in engagement with a supporting surface thereby providing equal stability to the reel assembly in both lateral directions.

4. A cable reel assembly for sound powered telephone cable employed in a low coal mine passage or other area having restricted vertical space and subject to accumulation of explosive gases which could be ignited by an incendiary arc or spark, said reel assembly comprising a supporting frame, a reel spool journaled on said frame, a length of telephone cable on said reel spool, said frame including supporting leg means movable between a supporting position providing a stable support for the reel spool adjacent the periphery thereof during rotation and a collapsed position to enable the reel spool to roll along a supporting surface, said frame including handle means adjacent the periphery of the reel spool in order to carry the reel assembly when the leg means is in supporting position and to roll the reel spool and frame along a supporting surface when the leg means is in collapsed position, and non-metallic peripheral means on said reel spool to enable rolling movement of the reel spool along a supporting surface without forming incendiary sparks, said reel spool and frame including a collector ring assembly and brush assembly to provide conductive communication from the telephone cable to the brush assembly for transmitting a message without relying on an external voltage source, said leg means and handle means being disposed on opposite sides of the spool to enable the reel assembly to assume a low profile in both positions.

5. The structure as defined in claim 4 wherein said leg means includes a pair of stationary legs rigidly connected with said frame, and a pair of pivotal legs pivotally connected with said frame, means securing the pivotal legs in supporting position in diverging relation to the stationary legs and in collapsed position alongside the stationary legs, said frame and handle means being disposed in a plane substantially bisecting the included angle between the diverging legs.

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