March 26, 1946. M. CAMRAS 2,397,087

WIRE REEL AND HOLDING MEANS

Filed July 4, 1942 2 Sheets-Sheet 1

Fig. 1

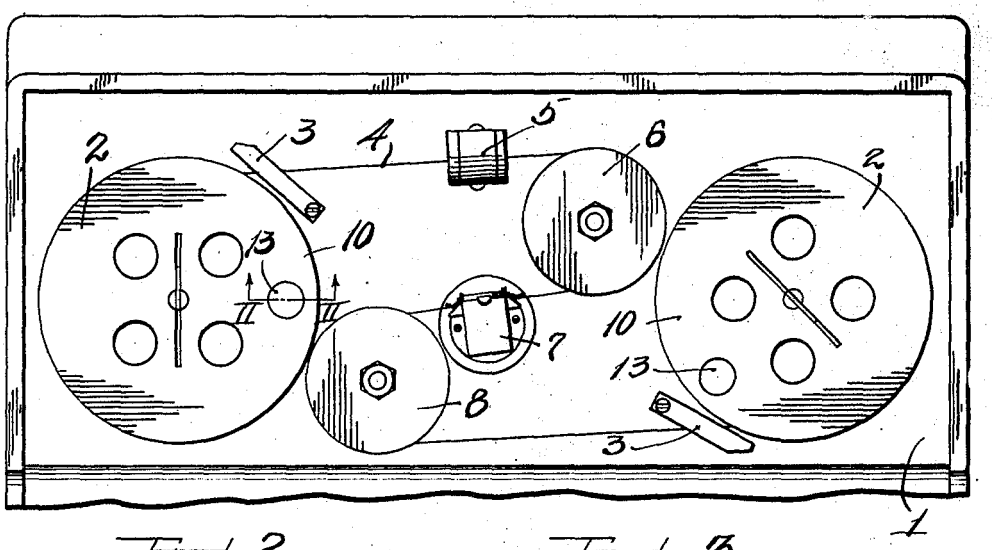

Fig. 2

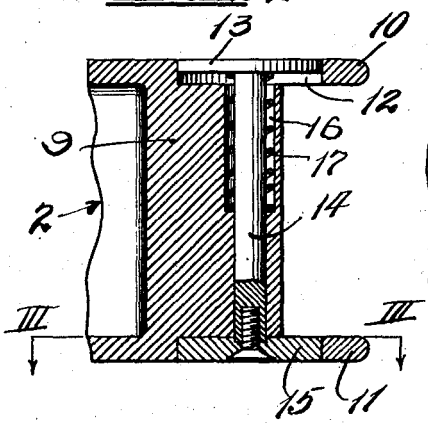

Fig. 3

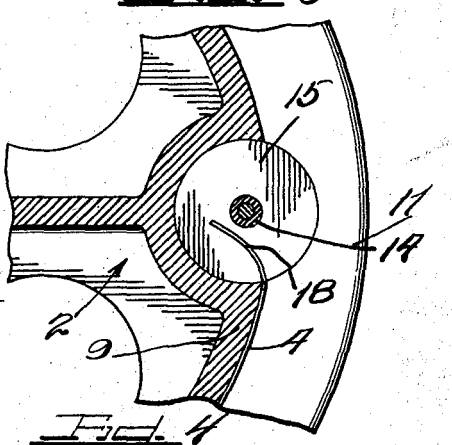

Fig. 4

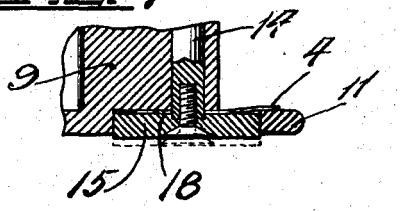

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Fig. 5

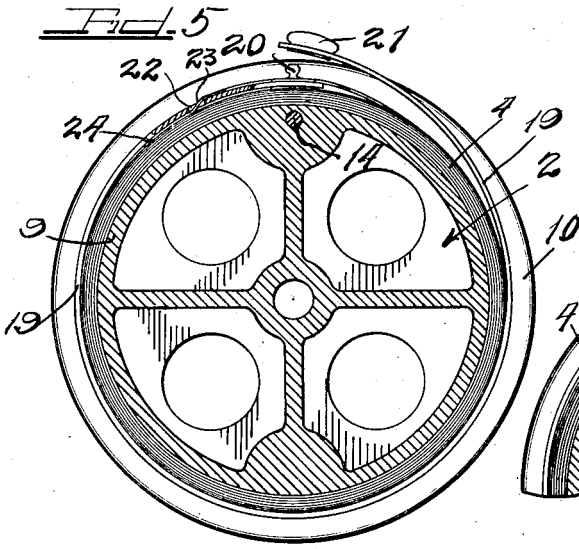


Fig. 6

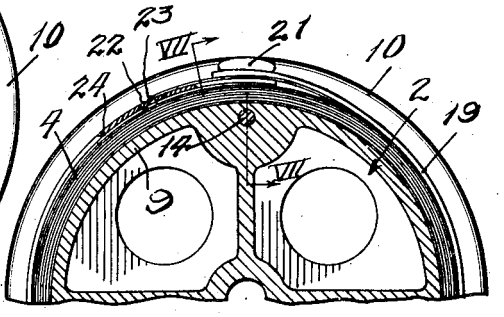


Fig. 7

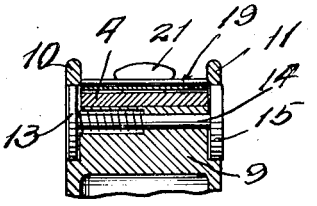


Fig. 8

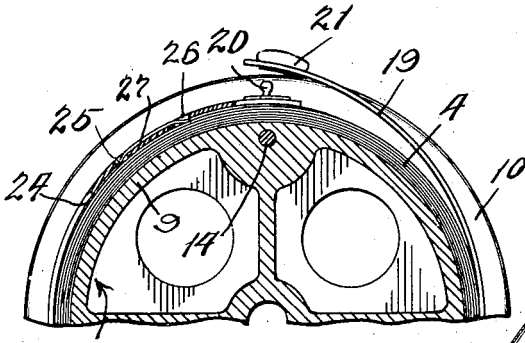


Fig. 9

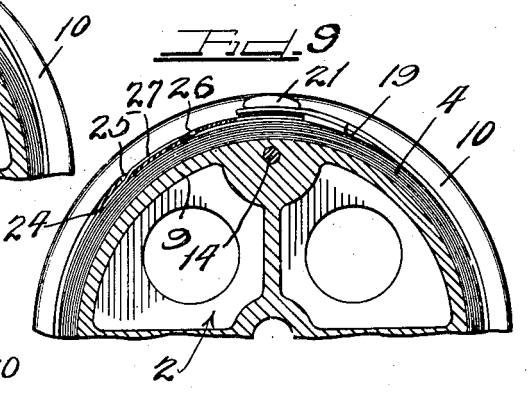
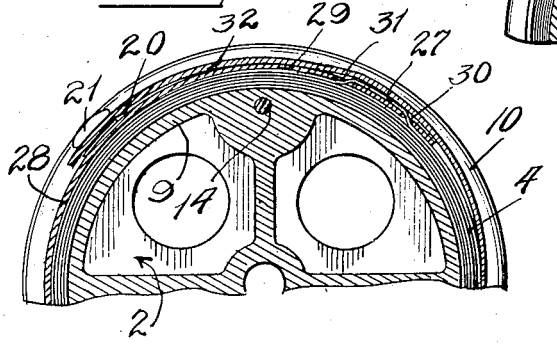


Fig. 10



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Patented Mar. 26, 1946 2,397,087

UNITED STATES PATENT OFFICE

2,397,087

WIRE REEL AND HOLDING MEANS

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Application July 4, 1942, Serial No. 449,733

3 Claims. (Cl. 206—53)

This invention relates to improvements in a wire reel and holding means, and more particularly to a reel having means associated therewith for anchoring the end of a wire to be wound on the reel, and additional means for holding the ultimate free end of the wire after the winding operation, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

With certain types of wire, such as wire used for magnetic recording purposes, wire made of precious or semi-precious metals for use in jewelry construction, etc., it is highly desirable that the wire be carefully preserved when winding on a spool, and that the surface of the wire remain undamaged. Especially in the case of wire used for magnetic recording purposes, no abrupt bends should be made in the wire, no interlocking of layers or strands should occur so that one surface of the wire is rubbed against another surface, and even the ends of the wire should be carefully preserved so that a recording of an important conversation, an oration, or some other important reproduction that may never again be reproduced with exactness, may be kept indefinitely. Wire reels in holders, in the past, have proven objectionable in that they were incapable of adequately holding a wound wire without injury to some portion of the wire, or difficult to manipulate, or were not effective in adequately protecting wire of material value.

With the foregoing in mind, it is an important object of the instant invention to provide a wire reel and holder so arranged as to positively hold a wire wound therearound without any abrupt, permanent or reverse bends in the wire.

Another object of the invention resides in the provision of a wire reel and holder to maintain a coil of fine wire in rolled position without any injury resulting to the wire, including the outer surfaces of the wire, and permit the wire to be transported on the reel from place to place.

A further object of the invention resides in the provision of a reel and holder for wire which not only anchors the wire to the reel for winding purposes, but also protects the entire outer surface of the wire after winding upon the reel.

A further feature of the invention resides in the provision of a wire reel and holder which effectively anchors one end of the wire prior to winding, and the other end of the wire after winding, and yet permits the wire to be rewound from time to time on another similar reel and holder with the same protection.

Also a feature of the invention resides in the provision of a reel equipped with holding means to carry a roll of wire in a manner preventing injury to any portion or to the surface of the wound wire, and eliminate any necessity of abrupt bends in the wire, or interlocking of one strand with another.

It is also an object of this invention to provide a wire reel and holder of such character that one end of the wire may be locked to the reel almost instantaneously, and the other end of the wire, after winding, may not only be anchored in position but the entire outer surface of the wound wire protected in a single operation.

It is also an object of the invention to provide a wire reel equipped with a combination wire end anchoring member and protector for the entire outer surface of the wound wire.

While some of the more salient features, characteristics and advantages of the instant invention have been above pointed out, others will become apparent from the following disclosures, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a somewhat diagrammatic elevational view illustrating an instrument, by way of example only, in which wire is unwound from one reel, and rewound upon another reel, such reels embodying principles of the instant invention;

Figure 2 is an enlarged fragmentary vertical sectional view taken substantially as indicated by the line II—II of Figure 1, looking in the direction of the arrows;

Figure 3 is a fragmentary plan sectional view taken substantially as indicated by the line III—III of Figure 2;

Figure 4 is a fragmentary vertical sectional view in the same plane as Figure 2, but illustrating the anchoring of a wire end by the means shown in Figure 2;

Figure 5 is a vertical sectional view of one of the reels of Figure 1 illustrating the holding means for the other end of the wire and the protective covering for the wound wire, with the cover in unsecured position;

Figure 6 is a vertical sectional view, similar to Figure 5, but illustrating the final holding and protective member in secured or locked position on the reel;

Figure 7 is a fragmentary sectional view taken substantially as indicated by the line VII—VII of Figure 6 illustrating the locking of both ends of the wire upon the reel;

Figure 8 is a vertical sectional view, similar in character to Figures 5 and 6, but showing a slightly different form of construction for the outer wire anchoring and cover member, with the cover member in unsecured position;

Figure 9 is a vertical sectional view, similar to Figure 8, but showing the outer anchoring and covering member in secured or locked position; and

Figure 10 is a view similar in character and location to Figures 8 and 9, but showing another difference in construction.

As shown on the drawings:

The illustrated embodiment of this invention

is shown in Figure 1, by way of example and not by way of limitation, associated with a magnetic recording device which records sound waves on a wire by magnetizing a traveling wire as it is unwound from one reel and wound upon another reel. After a recording of a sound production has been made upon the wire, it may later be reproduced by again rewinding the wire in connection with an amplifying system. Wire used for sound recording purposes is of an extremely delicate character. That is, the wire will have adequate tensile strength so as to avoid unwelcome breakage, but the wire, nevertheless, is of very small size, frequently but a very few thousandths of an inch in diameter. Any mishandling of such a wire, such as by an abrupt bend, such as marring, cutting or breakage, obviously would interfere with the later use of the wire to faithfully reproduce what is recorded on the wire. The wire must therefore be handled in a careful manner, but one permitting quite expeditious and facile use of the wire, and at times it is necessary to transport the wire from place to place, and even store it for a considerable length of time before it is desired to reproduce the recording. To this end, the present invention in part provides an improved wire reel and holding means.

In the apparatus shown in Figure 1 there is included a housing 1 containing a rotatably mounted reel 2 embodying principles of the present invention, located near one end of the housing, and a like reel 2 also rotatably mounted adjacent the other end of the housing. Each reel is provided with a suitable level winding apparatus 3 to insure an even winding of a wire 4 on either of the spools 2—2. With this particular apparatus, the wire 4 may travel in either direction so that it may be wound upon one of the reels or spools 2, and then rewound in reverse direction upon the other.

Assuming that the wire is moving from left to right, as seen in Figure 1, it first passes through a demagnetizing or erasing head 5, then around a suitable pulley 6, through a magnetizing or recording head 7, over another pulley 8, and thence to the right-hand reel or spool 2. If the apparatus is equipped with an amplifying and reproduction arrangement, the wire may be wound in reverse direction after having a recording made upon it, then re-run again in its first direction, and a reproduction made. However, if the wire is to be retained after magnetizing for later reproduction in the same or some other locality, the wire will ultimately all be wound on the right-hand spool, and this spool may be removed from the apparatus and preserved until desired for reproductive use.

The present invention centers itself with the construction of the reels 2—2, and the means associated with the reels for holding the wire in proper position upon the reels against any injury to the wire. With reference to Figure 2 it will be seen that the reel 2 comprises the customary barrel 9, a radially extending flange 10 on one side of the barrel, and a similar flange 11 on the opposite side. In the illustrated instance, the flange 10 is provided with an opening 12 to accommodate the head 13 of a slidable plunger 14 which extends substantially through the barrel 9, and is provided at its other end with another head 15 also seatable in a suitable opening in the flange 11. A recess 16 is provided in the barrel around a portion of the plunger 14, and a coil spring 17 inserted in this recess urges the plunger at all times to a position such that the outer surface of the head 13 is flush with the outer surface of the flange 10, as seen in Figure 2. It will be noted that the head 13 is of reduced thickness to thereby permit a reciprocating movement of the plunger 14.

When it is desired to anchor the end of the wire 4 to the reel to start winding the wire upon the reel, it is a simple expedient to press inwardly with the thumb or finger on the head 13, thereby pushing the head 15 outwardly as indicated in dotted lines in Figure 4. The end of the wire 4 may then be turned inwardly preferably in a gentle bend as indicated at 18 in Figure 3, and not in the nature of an abrupt or reverse bend. The end portion 18 is then placed in the space between the head 15 and the barrel 9, and pressure on the head 13 is released, permitting the spring 17 to restore the parts as nearly to their former position as the thickness of the wire permits, as shown in full lines in Figure 4. The end of the wire is thus clamped by the spring pressure between the head 15 and the barrel 9 and firmly retained in position so that it may readily be wound on the spool or reel 2. With reference to Figure 3 it will be seen that the wire is smoothly wound upon the reel or spool 2, assuming that the spool turns in a counter-clockwise direction as viewed in this figure. There is no abrupt bend at the point where the end portion 18 of the wire curves inwardly from the outer surface of the barrel 9, and the clamping pressure on this end portion of the wire is merely two relatively large flat surfaces engaging the wire therebetween, so that there is little if any likelihood of the slightest injury to the surface of even the end portion of the wire.

After the wire 4 has been evenly wound upon the reel 2, the coil of wire will appear as seen in Figures 5 and 6. Recording may have occurred throughout the full length of the wire, and therefore the end of the wire opposite the end 18 must be prevented from injury also. The same would be true in the event the wire was of some valuable metal, so as to avoid unnecessary and expensive waste. Likewise, the entire outer surface of the coil of wire 4 should be protected as much as possible.

To this end, with reference to Figures 5 and 6, I have provided a cover member in the form of a band 19 which, as best seen in Figure 7, is preferably of such a width as just to fit between the reel flanges 10 and 11 so that the band will overlie the entire outer surface of the coiled wire 4. The band 19 may be made of any suitable material such as metal, plastic, a treated fabric, a rubberized composition, etc.

The band is sized to circumscribe the coil of wire upon the reel, and one end of the band is provided with a male snap member 20 while the other and preferably the outer end of the band is provided with a complemental female snap member 21. With reference more particularly to Figure 5 it will also be seen that the band is also provided with an aperture 22 spaced a short distance away from the male snap member 20. The outer end portion of the wire 4 is brought over the outer surface of the band, and then threaded through the aperture 22, as indicated at 23, so that the extreme end portion 24 of the wire underlies the band 19 after the threading operation. It will be especially noted that this threading operation provides no abrupt bending of the wire, but only what may be termed an oblique or gentle bend. After the free end of the wire has been so anchored, the opposite end of the band is brought

around, and the female snap member 21 snaps over and into engagement with the male snap member 20, as shown in Figure 6. The wire is then firmly secured to the reel in a manner that will effectively protect the wire, leaving only a very small portion of the wire, that between the outer end of the band and the aperture 22 exposed. This exposed portion of the wire is sufficient to indicate not only that the reel contains a coil of wire, but also to indicate the kind, character, color, or various other characteristics of the particular wire on that reel.

After once being wound upon the reel, and the cover member 19 applied, the wire is prevented from shifting in any manner since one end of the wire is clamped between the head 15 of the plunger 14 and the barrel 9, as seen in Figures 4 and 7, and the outer free end of the wire is firmly held by threaded engagement with the cover band 19. The reel may then be freely transported from place to place, placed in storage for a length of time, handled in substantially any other feasible manner, and the wire will remain in the same condition it was when placed upon the reel.

In the event it is desired to more tightly wind the wire around the reel, or in the event a somewhat heavier wire may be used, it might be desirable to more firmly anchor the free end of the wire. To this end, I have illustrated a slightly modified form of construction in Figures 8 and 9 wherein the same outer covering member 19 with the same snap members 20 and 21 is provided. In this instance, however, the band 19 is provided with a pair of spaced apertures 25 and 26 adjacent the inner end of the band, the apertures being spaced longitudinally of the band. With this arrangement, the free end portion of the wire 4 is first passed under the inner end of the band, upwardly through the first aperture 26, over the outer face of the band, and then threaded inwardly through the aperture 25, with the ultimate free end 24 underlying the band. This double threaded engagement with the band provides a firmer anchorage of the free end portion of the wire, and it will be noted that no injury results to the wires since only gentle oblique bends are used in threading the wire through both apertures. This arrangement leaves a small portion 27 of the wire exposed between the apertures 25 and 26, which exposed portion will denote that the spool contains a coil of wire, the color, size, kind, character, and so forth, of the particular wire on that reel. After the threading of the wire, the snap members 20 and 21 are engaged with each other, as explained above.

In some instances, especially in the case of sound recordings, the reel may be tagged or some identifying legend may be written directly on the outside of the cover member. In such event, it is not necessary that an exposed portion of wire be available for identifying the character, kind, etc. of wire upon the reel. It may even be desirable under certain circumstances to completely enclose every part of the wire.

To this end, in Figure 10, I have shown a cover 28 engaged around a wound spool of wire. This cover band has the male snap member 20 spaced back from the inner end portion 29 of the band, and this inner end portion is provided with a pair of spaced apertures or the equivalent 30 and 31. The wire is threaded through the apertures 30 and 31 as above described in connection with the showing in Figures 8 and 9, but the portion of the wire 27 outside of the end portion 29 of the band will be completely covered by the outer end portion 32 of the band which carries the female snap member 21. The only difference between this band and the one described in connection with Figures 8 and 9 is that it is sufficiently longer to permit the inner end portion with the apertures to underlie the outer end portion so that the entire wire is completely covered by the band.

It is obvious that in the event only one aperture or the equivalent is desired, and this may most frequently be the case with a band construction such as illustrated in Figure 10, one of the apertures 30 and 31 may be omitted, or only one of them need be used in the manner above described in connection with Figures 5 and 6.

From the foregoing, it is apparent that I have provided a novel reel for wire or the like, which reel not only gently but firmly holds the inner end of the wire, permitting it to be wound smoothly about the reel, and then is equipped with an outer covering member which firmly anchors the outer end of the wire and protects the outer exposed surface of the wire coil on the reel barrel. It will be noted that the structure is extremely simple and may be operated very expeditiously and with a minimum of effort, so that it is a simple expedient to wind a reel of wire, place it in storage or handle it in some other desirable way, substitute a differently wound reel for the first one, and wind the wire on that reel, and handle the various wound reels or emptly reels in a continuous easy fashion, the wound reels not only being firmly held at both ends, but also protected during handling. It will be further noted that the entire reel together with its holding means is simple in construction, highly efficient and durable, and may be economically manufactured and used.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. In combination, a flanged spool upon which an elongated member may be wound, and a band-like cover member of a size to fit between the flanges of the spool and circumscribe a wound coil, said cover member having longitudinally spaced apertures adjacent an end thereof through which the free end portion of the wound member may be successively threaded in opposite directions to anchor the same.

2. In combination, a spool upon which an elongated member may be wound, and a cover member arranged to circumscribe and conceal the wound member, one end of said cover having means for engagement with the free end portion of the wound member, said cover member being sufficiently long for the other end to overlap such engagement, and fastening means for engaging said other end with a portion of the cover member back of said means.

3. In a reel for a thin strand of material wound thereon in multi-strand layers, a barrel, a radially extending flange on each end of the barrel, and a cover positionable around the wound strand between said flanges, said cover having means for an interlocking engagement with the outer end of the coiled strand to hold that end firmly.

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