

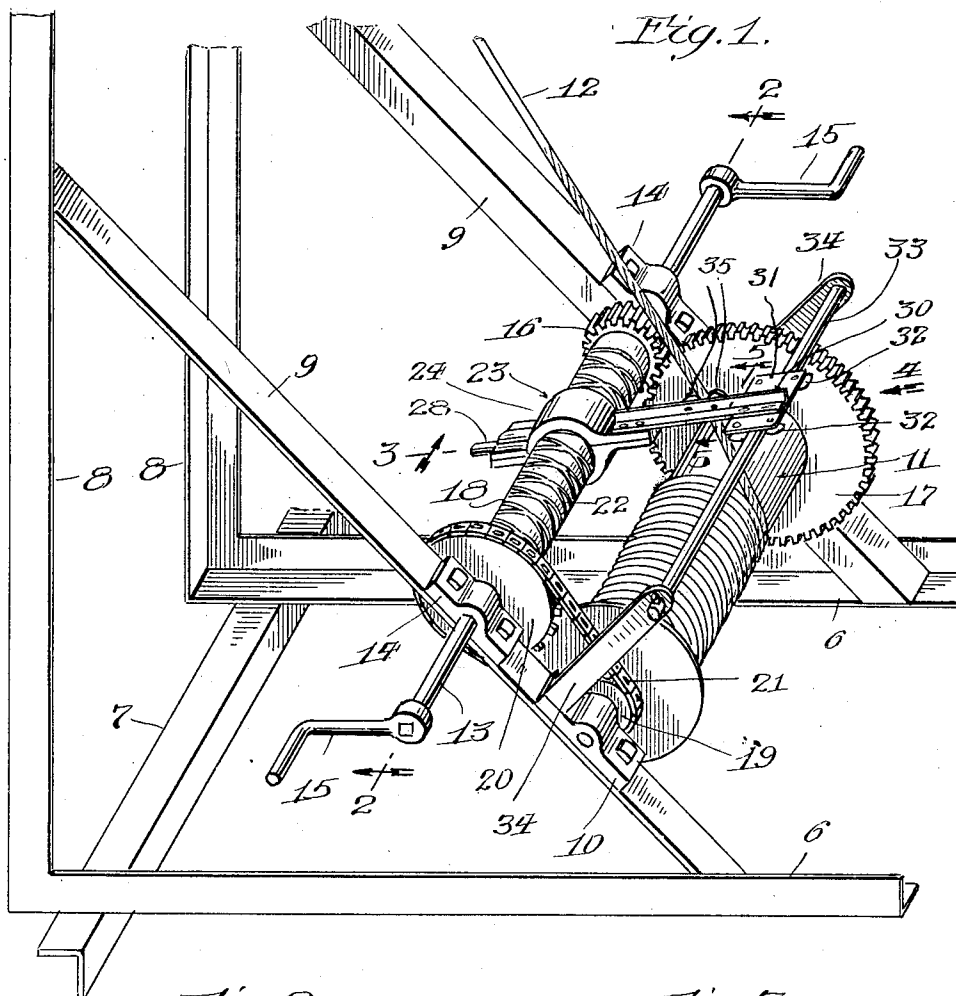
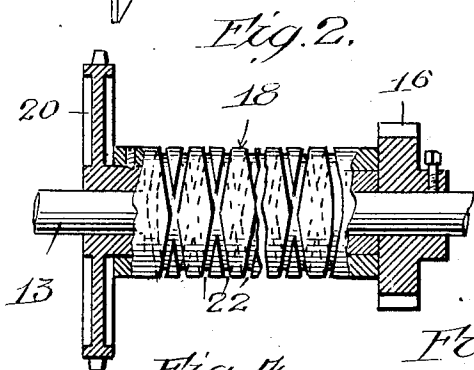
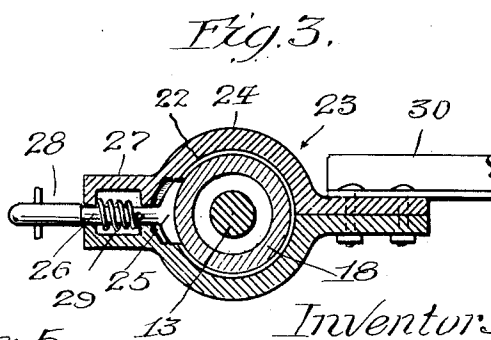
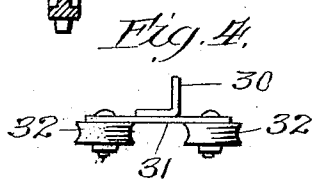
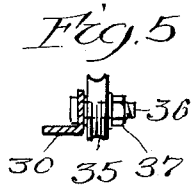
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LEVEL WINDING MECHANISM FOR SEWER CLEANERS

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LEVEL WINDING MECHANISM FOR SEWER CLEANERS

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This invention relates to level winding mechanism for sewer cleaners; and its principal object is the provision of novel mechanism for guiding a cable to a winding drum in such manner that the convolutions may be wound evenly along the length of the drum during the winding operation. Much difficulty has been encountered in sewer cleaning machinery and other machinery employing a cable in performing its work because of the tendency of the convolutions of the cable to pile up unevenly on the drum with the result that it frequently becomes tangled.

According to the present invention, cable guiding mechanism, operated by the drum, has been provided, which mechanism serves to guide the cable to the drum in a helical manner, so that when the several layers are wound upon the drum, each assumes a level condition.

The invention consists in the several novel features hereinafter fully set forth and claimed.

The invention is clearly illustrated in the drawing accompanying this specification in which—

Figure 1 is a perspective view of a portion of the framework of a sewer cleaning machine and its winding drum showing a simple embodiment of the present invention in connection therewith;

Fig. 2 is a detail fragmental longitudinal section taken through the cable guiding mechanism on the line 2—2 of Fig. 1, a certain cable guiding arm being omitted from view;

Fig. 3 is a detail vertical cross section through the cable guiding mechanism taken on the line 3—3 of Fig. 1;

Fig. 4 is a detail end elevation of the cable guiding arm showing certain guide rollers used in connection with the cable guiding arm, the view being taken in the direction of the arrow 4 in Fig. 1; and

Fig. 5 is a detail cross section through the arm taken on the line 5—5 of Fig. 1, showing one of the cable guiding rollers.

Referring to said drawing, the reference characters 6, 6 designate longitudinally extending frame members which are connected by transverse frame members, one of which is shown at 7, and 8, 8, designate upright frame members connected to longitudinal frame members 6, 6, by diagonal brace members 9, 9. Said frame members comprise part of the frame of a sewer cleaning machine which is usually provided with wheels (not shown) whereby the machine may be transported from place to place.

Journaled in brackets 10 mounted upon the diagonal brace members 9 is a winding drum 11 upon which a cable 12 is wound during the operation of the machine. The cable usually extends over a sheave (not shown) mounted at the upper end of the upright frame members 8, and said cable extends to a bucket or other implement (not shown) used in performing the work. Suitable motor operated means may be provided for rotating the drum, or it may be rotated by manual power, as desired. As shown, the means for rotating the drum comprises a drive shaft 13 journaled in bearings 14 mounted on the diagonal brace members 9 and having hand cranks 15 secured upon its outer ends. The shaft 13 and drum 11 extend parallel with each other and are connected by gearing, here shown as comprising a pinion 16 fast on the shaft 13 and a gear wheel 17 which is made rigid with the drum 11 and meshes with the pinion 16.

Rotatably mounted on the shaft 13 is a cylindrical member, such as a sleeve 18, which is driven from the drum 11 at a certain predetermined speed ratio. One form of gearing between the drum and sleeve may comprise sprocket wheels 19 and 20 rigidly connected with the drum 11 and sleeve 18, respectively, and a sprocket chain 21 trained over said

sprocket wheels. A continuous helical trackway or groove 22 is formed in the outer face of the sleeve, certain of the convolutions of which groove run in one helical direction from the one end of the sleeve to the other, whereas the other convolutions of the groove run in the opposite direction and join with the first mentioned convolutions adjacent the ends of the sleeve, thereby making a continuous groove having right and left hand turns. The spacing of the convolutions of the grooves and the gear ratio between the drum and sleeve should be so proportioned that the cable guiding arm, hereafter described, is caused to travel along the sleeve at the same rate of speed as the convolutions of the cable are wound upon the drum, so that with each complete revolution of the drum, the cable feeding arm is moved a distance equal to the diameter of the cable.

Traveling upon the sleeve 18 is the cable guiding arm 23 which is provided with a split collar 24 that surrounds the sleeve and contains a swiveled shoe 25 (see Fig. 3) which travels in the helical groove 22. The shoe 25 is provided with a stem 26 which extends out through a chambered boss 27 formed on the collar 24 and has a handle 28 upon its outer end by means of which the shoe may be retracted from the groove in case it is desired to manually shift the position of the cable guiding arm. A coiled compression spring 29 surrounding the stem 26 bears against a pin adjacent the shoe and serves to hold the latter in the groove. The shoe is swiveled in the collar so that it may follow the groove at the ends of the sleeve where the groove reverses its direction of inclination.

From the collar 24 projects a bar 30 which forms a part of the cable guiding arm, and to the outer end of said bar 30 is secured a plate 31 on which are journaled two or more groove rollers 32. The grooved rollers 32 travel along a guide rod 33 which extends parallel with the axes of the drum and sleeve and is mounted in bracket arms 34 secured to and extending up from the diagonal brace members 9. The rollers 32 co-operate with the guide rod 33 to prevent tilting of the arm 23 in any direction.

Rotatably mounted on the arm are grooved cable guiding rollers 35 between which the cable passes to and from the drum. At least one of said rollers is so mounted that it may be readily disconnected from the arm to permit the cable to be inserted between the rollers or removed therefrom. In Fig. 5 the grooved roller 35 is shown as secured upon its spindle 36 by a nut 37. Any other equivalent means may be provided for removably securing at least one of the grooved rollers 35 upon its spindle.

In the operation of the machine, the shaft 13 is rotated by mechanical or manual power in the proper direction to rotate the drum.

When winding the cable upon the drum, the arm 23 is reciprocated back and forth along the sleeve 18 as a result of the propelling action of the helical groove on the shoe 25, and the cable being guided between the grooved rollers 35 on the arm 23 is fed along the face of the drum at a speed equal to that in which the convolutions are laid on the drum. In this manner, the cable is wound upon the drum in an even manner, and the usual tendency for the cable to pile up thereon is entirely eliminated.

It is to be observed that when the shoe 25 has traveled to either end of the sleeve, the direction of movement of the cable guiding arm is reversed, because of the change of direction of the groove. The shoe being swiveled in its support, it is free to turn slightly so as to follow the change of direction of the groove at the ends of the sleeve, this turning movement being facilitated by widening the groove slightly at the ends of the sleeve.

The grooved rollers 32 at the free end of the cable guiding arm 23 effectively prevent the arm from binding on the sleeve which might otherwise occur because of the lateral strain of the cable against the bar. The guide rod 33, being parallel with the axis of the sleeve 18, and since the grooved rollers 32 run on the rod, the arm 23 is caused to move in a direction parallel with the axis of the sleeve, and any tendency for the cable to swing the arm relative to the sleeve in any direction is effectively prevented. When unwinding the cable, the guiding mechanism operates in the same manner as above described and permits the cable to pay out freely from the winding drum. Wishing to set the cable guiding arm at any desired place on the sleeve, the attendant retracts the shoe from the groove and moves the arm to the desired position.

More or less variation of the exact details of construction is possible without departing from the spirit of this invention. We desire, therefore, not to limit ourselves to the exact form of the construction shown and described, but intend, in the following claims to point out all of the invention disclosed herein.

We claim as new, and desire to secure by Letters Patent:

1. Winding mechanism for sewer cleaners comprising in combination a drum upon which a cable is wound, a drive shaft extending parallel with the drum, power transmitting gearing between said power shaft and drum, a sleeve rotatably mounted on said drive shaft and having a continuous helical trackway formed in its face, drive mechanism for said sleeve operated by said drum, a cable guiding arm having a collar surrounding said sleeve and provided with a shoe traveling in the groove of said sleeve, and guid-

ing means for said arm arranged to impart right line movement to said arm.

2. Winding mechanism for sewer cleaners comprising in combination a winding drum upon which a cable is wound, a drive shaft and gearing between said drive shaft and drum, a cable guiding arm, rotatory arm-actuating means mounted upon said drive shaft and geared to said drum, there being drive connections between said rotatory means and the cable guiding arm for reciprocating the latter in a plane parallel with the axis of the drum.

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