

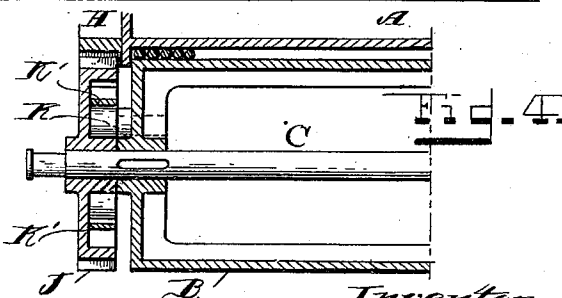
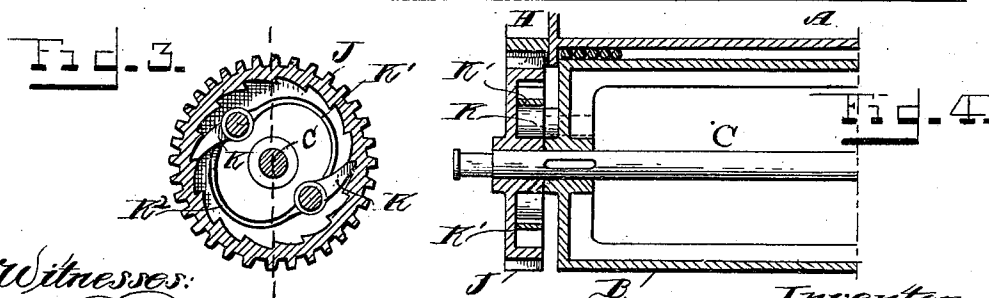
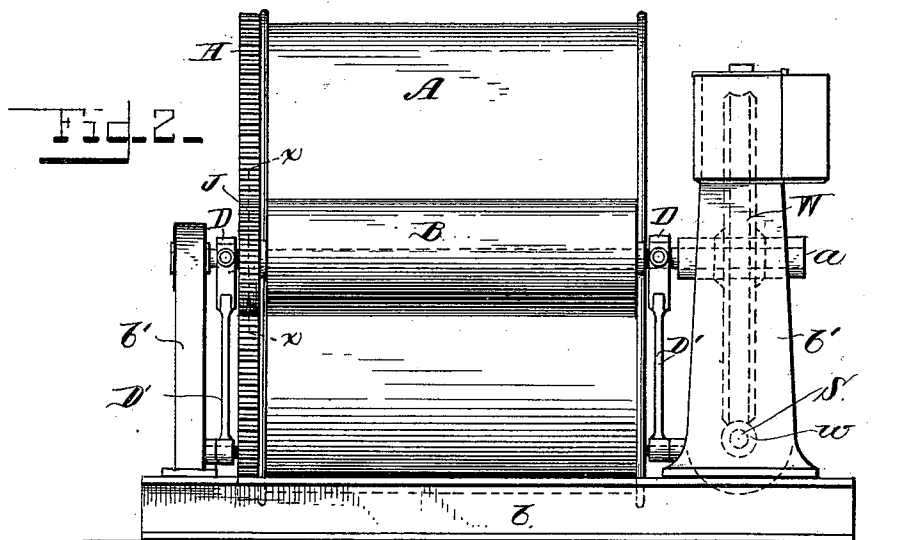
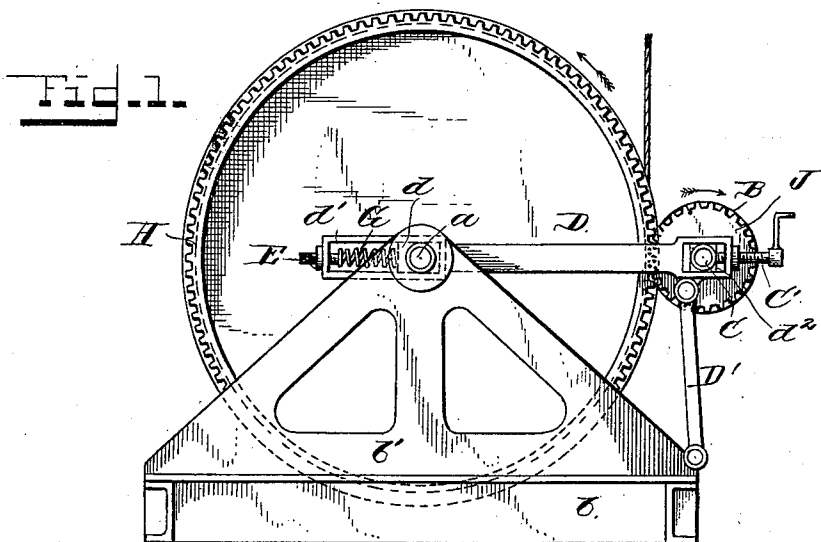
(No Model.)

2 Sheets—Sheet 1.

R. SCHULZ.
ROPE WINDING DRUM.

No. 402,688.

Patented May 7, 1889.



Witnesses:
J. Thomson Cross.
Will. E. Rouse

Inventor
Richard Schulz.
per *Henry M. M.*
Att'y.

(No Model.)

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Fig. 5.

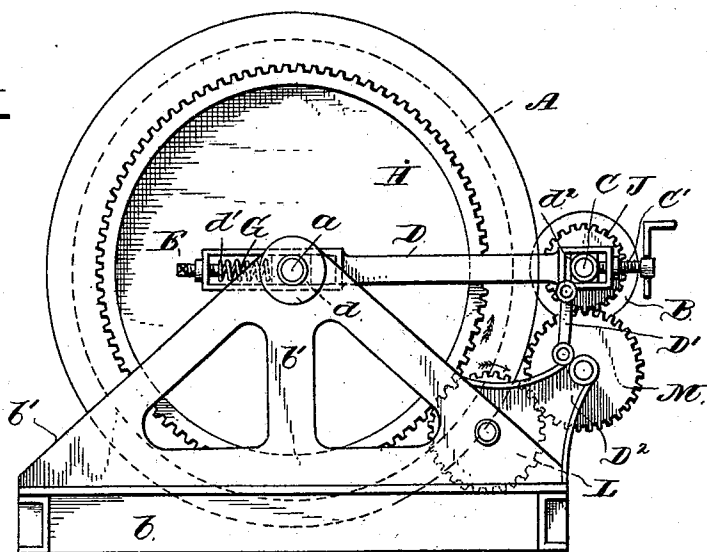
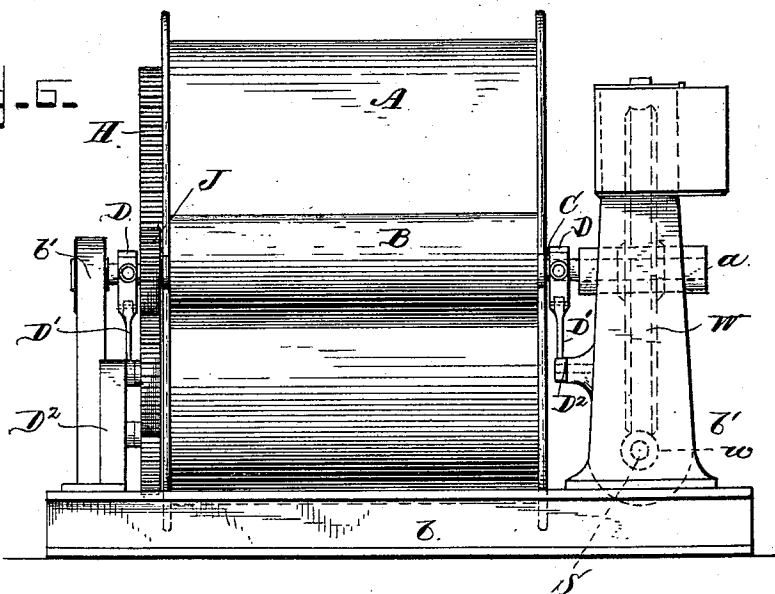


Fig. 6.



Witnesses:

J. Thomson Cross.
Milk & Ranzee

Inventor:

Richard Schulz.
per Henry W. W.
Att'y.

UNITED STATES PATENT OFFICE.

RICHARD SCHULZ, OF TEGEL, NEAR BERLIN, GERMANY.

ROPE-WINDING DRUM.

SPECIFICATION forming part of Letters Patent No. 402,688, dated May 7, 1889.

Application filed June 23, 1888. Serial No. 278,068. (No model.) Patented in Germany February 18, 1888, No. 44,206; in France February 18, 1888, No. 188,830; in England May 22, 1888, No. 7,539; in Italy June 30, 1888, XLVI, 308, XXII, 23,529, and in Austria-Hungary October 6, 1888, No. 21,602 and No. 39,080.

To all whom it may concern:

Be it known that I, RICHARD SCHULZ, engineer, a subject of the Emperor of Germany, residing at Tegel, near Berlin, Germany, have
5 invented certain new and useful Improvements in or relating to Rope-Winding Drums, (for which I have obtained Letters Patent in the following countries: Germany, February 18, 1888, No. 44,206; France, February 18, 1888, No.
10 188,830; Italy, June 30, 1888, vol. 46, No. 308, and vol. 22, No. 23,529; Austria-Hungary, October 6, 1888, No. 21,602 and No. 39,080; Great Britain, May 22, 1888, No. 7,539;) and I do hereby declare the following to be a full, clear,
15 and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked
20 thereon, which form a part of this specification.

In the drawings, Figures 1 and 2 show by an end elevation and a front elevation, respectively, a winding-engine embodying my invention, the motor and connections or the
25 means for rotating the drum being omitted. Fig. 3 is a section on line *xx* of Fig. 2. Fig. 4 is a longitudinal section of a portion of the roller B, drum A, and gear-wheel H, the gear-wheel J being shown in full section and a
30 part of shaft C in elevation. Figs. 5 and 6 are views similar to those shown in Figs. 1 and 2, illustrating a modified arrangement of devices.

The object of my invention is to provide
35 means for evenly winding and unwinding a rope on or from a winding-drum, whether such rope is under tension all the time during the operations of winding or unwinding, or for winding or unwinding a slack rope or a
40 rope liable to become slack during these operations.

The invention consists in the combination, with the winding-drum, of a pressure-roller exerting a yielding pressure upon the periphery of the drum, and of mechanism for imparting to the said roller a greater speed than
45 that of the drum, substantially as hereinafter fully described, and as set forth in the claims.

The invention further consists in structural
50 features and combination of parts, substantially as hereinafter described and claimed.

In the above-described figures of drawings, A indicates the winding-drum mounted on a shaft, *a*, that has its bearings in standards *b'*, rising from a suitable bed-plate, *b*, and H is the
55 gear-wheel or toothed portion of the periphery of the drum, that serves to positively rotate a pressure-roller, B. The pressure-roller B has its bearings in the outer end of arms D, journaled on the roll-shaft *a*. The bearing-blocks *d* of the arms D are fitted in a longitudinal slot, *d'*, formed in said arms, a
60 spring, G, whose tension is adjustable through the medium of the adjusting-screw E, being interposed between the bearing and the end wall of the slot *d'*, so that said spring will draw the pressure-roller B against the drum and hold it there with a yielding pressure. The outer end of each of the arms D is also
65 provided with a slot, *d''*, for the reception of the bearing-blocks for the shaft C of the roller B, said blocks being held in position by a screw, C', and said outer ends of the arms D are supported from rods D', pivotally connected therewith and with the standards *b'*,
70 as shown in Fig. 1, or with said arms and a bracket-arm, D², projecting from said standards, as shown in Fig. 5.

K¹ K² are springs on the pawl-pivots, so arranged that the spring on one pivot will
80 bear against a pawl on the other pivot to hold said pawls K in engagement with the ratchet-teeth of wheel J. By means of this pivotal connection the arms are free to yield under strain.

The pressure-roller B is of the same length
85 as the winding-drum, and as it is held against the periphery of said drum with some force it not only prevents the coils of rope from doubling in winding, but when the rope becomes slack during the winding said roller
90 prevents the rope from uncoiling and from coiling loosely on the drum, the pressure-roller performing the function of a rolling traction device and pressure-bar and exerts a
95 continuous strain on the rope by frictional contact therewith.

In unwinding, especially when the drum A is rotated at a comparatively great speed, the pressure-roller B may prevent the rope from
100 unwinding in a regular or uniform manner when said rope becomes slack. To avoid this,

I provide means for positively rotating the pressure-roller, either at a peripheral speed equal to or, preferably, slightly greater than that of the winding-drum. To this end a pinion, J, Figs. 2, 3, and 4, loose on the shaft C of the pressure-roller, gears with the toothed wheel or rim H, and is held against rotation on the roller-shaft by a pawl or pawls, K, engaging teeth on the inner periphery of the pinion, said pawls being pivoted to the end of the roller, so that in unwinding the pinion will be locked to the roller and revolve the same positively, while in winding said pinion will revolve idly, the roller revolving by frictional contact with the drum or the rope thereon.

Where a great length of rope is used, and two or more rows of coils required to wind it on the drum A, the above-described arrangement of pinion J gearing with the toothed rim or wheel H of the drum would not answer, as said pinion would be thrown out of gear on an increase in the diameter of said drum. To avoid this, I employ the gearing shown in Figs. 5 and 6, in which L is the driving-pinion, and M a transmitting-pinion for transmitting motion to the pinion J on the roller-shaft C, so that any number of rows of coils may be wound on the drum without throwing the pinion L out of gear with the toothed wheel or rim H, since any longitudinal displacement of the arms D, due to variations in the diameter of the drum A, will not affect the pinion L, the pinion J being simply displaced on the pinion M without moving out of gear therewith, as will be readily understood.

Instead of the arrangement of yielding bearings for the pressure-roller shown and described, any other equivalent devices may be employed. A weight may, for instance, be employed and connected by cord or chain with the bearing-blocks d of the arms D, or said arms may be rigidly connected to the standards and bearing-blocks for the drum-shaft fitted in slots in the outer ends of said arms, and springs or equivalent devices used to hold the roller B with a yielding pressure against the periphery of the drum.

W indicates the driving-gear or worm-wheel, (shown in dotted lines in Fig. 2,) said wheel being mounted on the drum-shaft a and gearing with a pinion or worm, w, on the main driving-shaft S, also shown in dotted lines in Fig. 2.

It will be seen that the mechanism for positively rotating the roller B comes into operation when the winding-drum rotates in a given direction, while when said drum rotates in a reverse direction the roller is rotated by frictional contact with the drum or the rope thereon when the mechanism shown in Figs. 5 and 6 is employed.

Having described my invention, what I claim is—

1. In a winding-engine, the combination, with the winding-drum, of a pressure-roller, supporting-arms for said roller hung on the

drum-shaft, springs operating to draw the roller toward the periphery of the drum, and gearing to revolve said roller, substantially as and for the purposes specified.

2. In a winding-engine, the combination, with the winding-drum, of a pressure-roller adapted to be rotated by friction when the drum rotates in one direction, and gearing for positively rotating the roller when the drum rotates in a reverse direction, substantially as and for the purposes specified.

3. In a winding-engine, the combination, with the winding-drum, of a pressure-roller adapted to be rotated by friction when the drum rotates in one direction, springs arranged to draw the roller against the periphery of the drum, and gearing for positively rotating the roller when the drum rotates in a reverse direction, substantially as and for the purposes specified.

4. In a winding-engine, the combination, with the winding-drum, of a pressure-roller adapted to be revolved by friction when the drum revolves in one direction, and a multiplying-gearing for positively revolving the roller at a greater speed than that of the drum when the latter revolves in a reverse direction, substantially as and for the purposes specified.

5. In a winding-engine, the combination, with the winding-drum, of a pressure-roller adapted to be revolved by friction when the drum revolves in one direction, springs arranged to draw the roller against the periphery of the drum, and a multiplying-gearing for positively revolving the roller at a greater speed than that of the drum when the latter revolves in a reverse direction, substantially as and for the purposes specified.

6. In a winding-engine, the combination, with the winding-drum, and a pressure-roller adapted to be rotated by friction when the drum revolves in one direction, of gearing for positively rotating the roller when the drum revolves in a reverse direction, comprising a driving-gear revoluble with the drum, the transmitting-gear L M, a pinion meshing with the gear M, mounted loosely on the roller-shaft, and a locking device to lock the pinion against rotation on said shaft in one direction, substantially as and for the purposes specified.

7. The combination, with the drum A, and a gear-wheel revoluble therewith, of the pressure-roller B, the spring-actuated pawls K, pivoted thereto, the slotted arms D, hung on the drum-shaft, the springs G, the pivoted supports D' for said arms, the gearing L M, and the pinion J, said parts being arranged for operation substantially as described, and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

RICHARD SCHULZ.

Witnesses:

B. ROY,

A. DEMCLINS.