L. N. HAMPTON.

REELING DEVICE.

APPLICATION FILED DEC. 13, 1920.

1,418,706. Patented June 6, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

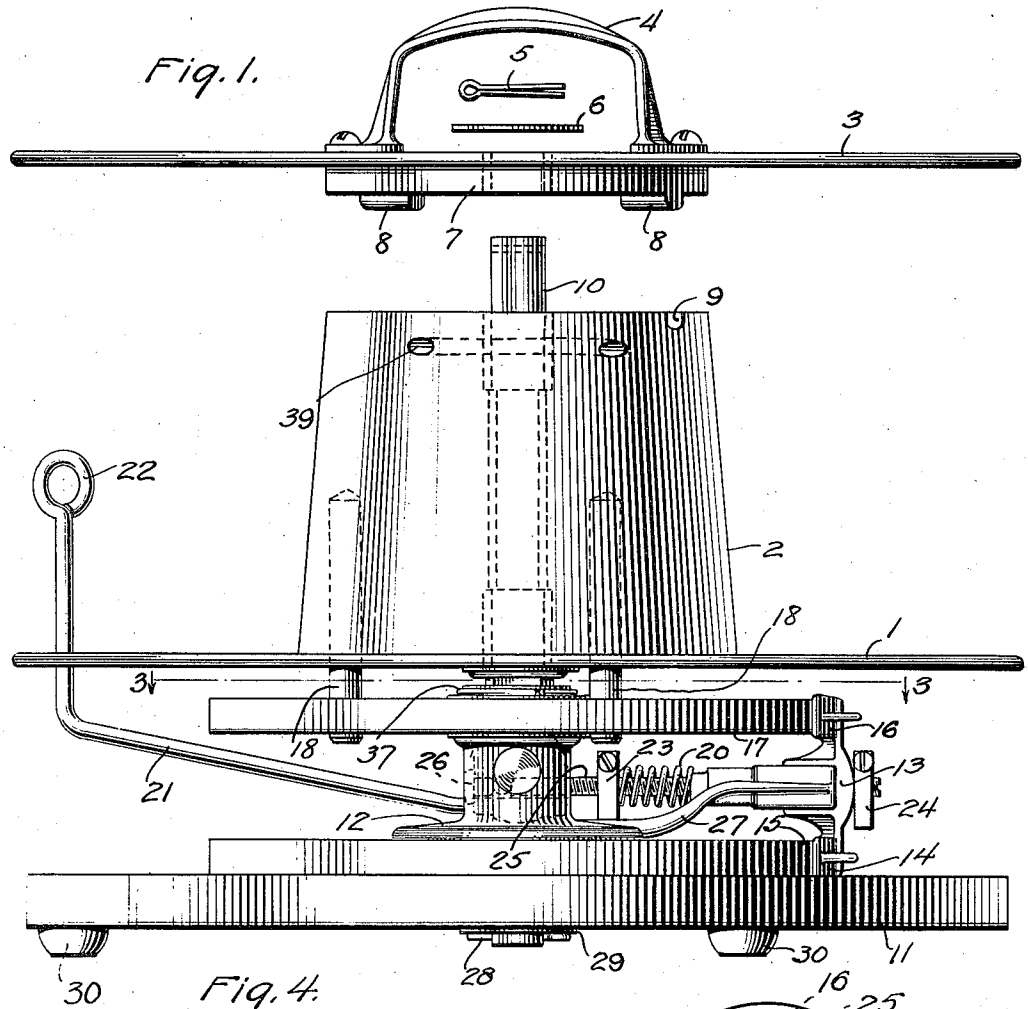


Fig. 4.

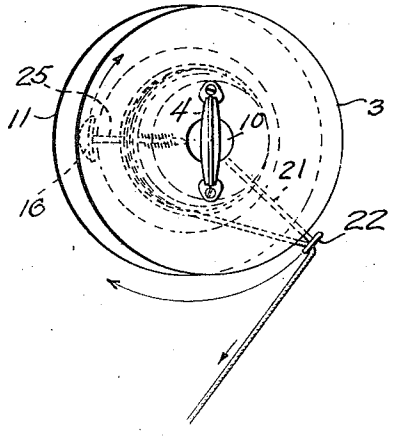
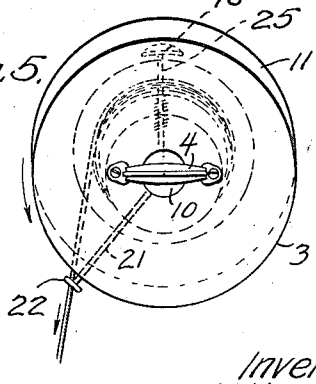


Fig. 5.



Inventor:
Leon N. Hampton,
by Joel C. Palmer
Atty.

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2 SHEETS—SHEET 2.

Fig. 2.

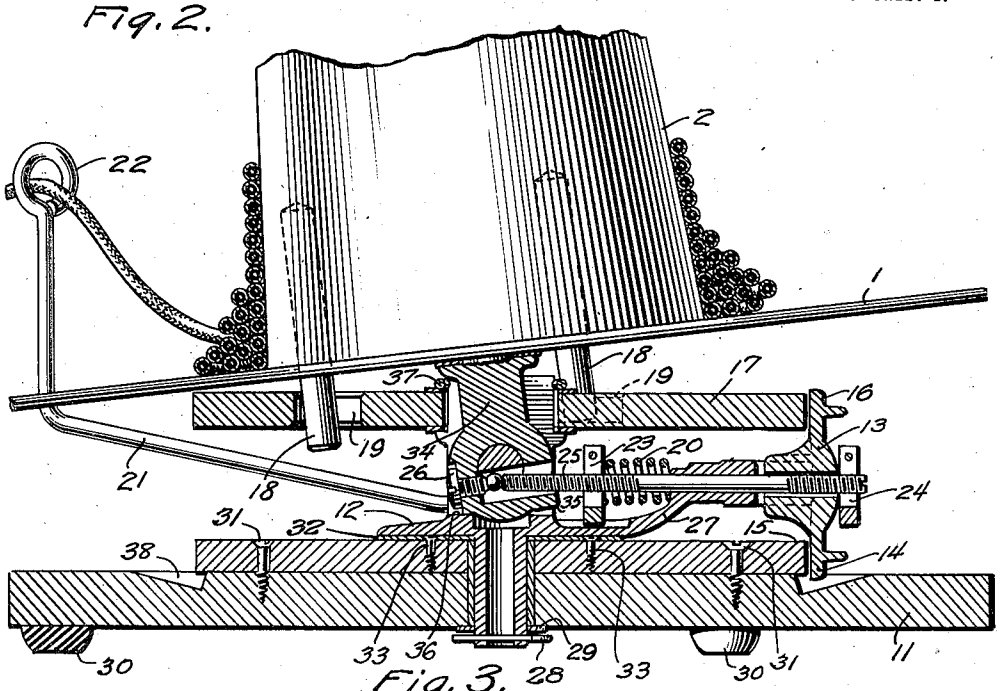
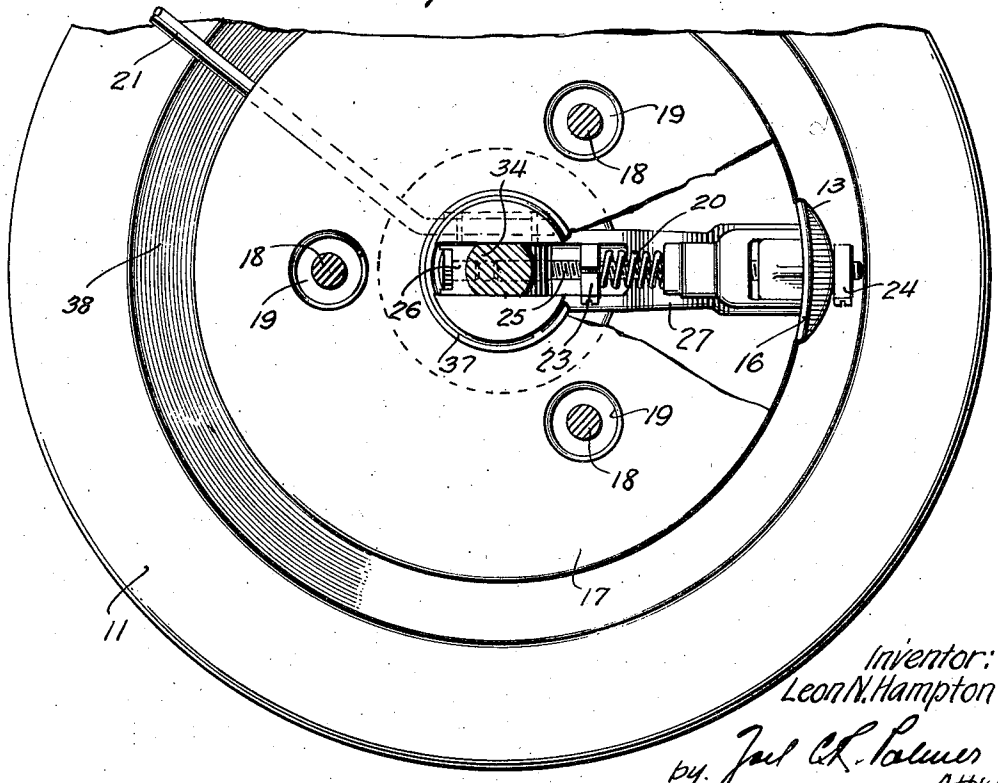


Fig. 3.



Inventor:
Leon N. Hampton
by Joel C. L. Palmer
Att'y.

UNITED STATES PATENT OFFICE.

LEON N. HAMPTON, OF NEW YORK, N. Y., ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

REELING DEVICE.

1,418,706. Specification of Letters Patent. Patented June 6, 1922.

Application filed December 13, 1920. Serial No. 430,132.

To all whom it may concern:

Be it known that I, LEON N. HAMPTON, a citizen of the United States, residing at New York, in the county of Bronx, State of New York, have invented certain new and useful Improvements in Reeling Devices, of which the following is a full, clear, concise, and exact description.

This invention relates generally to wire reels, and more particularly to a type of reel employing an automatic braking feature as a means for controlling the serving of the wire.

In many reels in use at the present time it is extremely difficult, if not impossible, to prevent over-running when the wire is served, thus introducing considerable labor and loss of time as a factor in the use of such a reel. The present invention relates to a wire reel provided with a suitable braking feature which will reduce rotary momentum sufficiently to prevent overrunning and which is controlled by the tension exerted on the wire as it is unreeled.

It is one object of the invention to provide a reel which is light and portable, efficient in operation, and which is provided with an automatic braking feature designed to prevent overrunning.

In the preferred form of the invention there is provided a reel of the vertical spindle type with flanges, core, base and brake drums preferably of wood. The top flange, which is removable, is provided with a handle to render the reel portable, and the core is tapered in order that coils of wire may be easily and quickly placed in position directly as prepared without the usual rewinding operation. The brake is operated through a tipping action of the reel against a spring. The actual braking drag is obtained through the action of a brake shoe casting provided with two friction surfaces, one of which engages a wooden brake drum fastened to the base, and the other, a similar drum which is universally driven by the reel, rotating on a base casting as a bearing. An arm is fastened to the base casting to provide a guide for the wire whereby this casting together with the brake shoe casting and its associated parts may be swung around as a unit until the maximum tipping effect of the tension is acting on the spring. The reel will then tip and the brake will be released.

The invention will be better understood from a consideration of the following description taken in connection with the accompanying drawings and the appended claims.

Fig. 1 is a front elevation of the assembled reel; Fig. 2 is a longitudinal section setting forth some of the features of the invention; Fig. 3 is a section taken on the line 3—3 of Fig. 1; and Figs. 4 and 5 are views showing the effect of tension in the wire to swing around the base casting and its associated parts.

Referring first to Fig. 1; the reel consists essentially of a bottom flange 1 forming a seat for a coil of wire, a core 2 secured to the flange 1, and a top flange 3. The reel is made portable by the provision of a handle 4 secured to the top flange 3. The top flange 3, which is held in position by means of a pin 5 and flange bushing 6, is removable, and the core 2 is tapered so that a coil of wire may be easily and quickly placed in position for use. A drum 7 is fastened to the under part of the flange 3, and by means of projections 8 on the said drum, adapted to engage corresponding grooves 9 on the core 2, the flange 3 is prevented from rotating with respect to the said core 2. The reel is rotated upon a vertical spindle 10 pivoted to the base 11 within the base casting 12.

The actual braking drag is obtained through the action of a brake shoe casting 13 provided with two friction surfaces one of which, indicated by the numeral 14, engages a wooden brake drum 15 fixed to the base 11; and the other, indicated by the numeral 16, engages a similar drum 17 which is universally driven by the reel, rotating on the base casting 12 as a bearing. The universal drive is provided by means of three rods or shafts 18 extending downwardly through the flange 1 and adapted to engage corresponding slots 19 of the drum 17, more clearly shown on Figs. 2 and 3. This universal drive permits the drum 17 to maintain its plane of rotation no matter at what angle the reel may be tipped. The brake is controlled through a tipping action of the reel. This tipping action is governed by the tension in the wire and a spring 20 opposed to the tipping effect of the tension. An arm 21 having a loop or eyelet 22 formed at its end is fastened to the base

casting 12 and is adapted to act as a guide for the wire. Two adjustments are provided; a nut 23 serves to adjust the strength of the spring 20, and the nut 24 is adapted to adjust the clearance between the friction members 14 and 16 and the drums 15 and 17, respectively. Both the nut 23 and the nut 24 are adjustably mounted upon a rod or bolt 25, one end of which is adapted to engage the spherical end of the bolt or screw 26 within the base casting 12. The brake shoe casting 13 is loosely mounted on the rod 25 and thus is freely movable on the said rod through the distance between the nut 24 and the brake drums 15 and 17. The rod 25 is held in position by means of an arm 27 supported on the base casting 12, and the said base casting 12 is rotatably held to the base drum 15 by means of the removable pin 28 and washer 29. Rubber castors 30, fixed to the base 11 act as a rest or support for the reel.

The operation of the automatic brake may be better understood by referring to Figs. 2 and 3. The brake drum 15 is here shown rigidly mounted on the base 11 by means of screws 31. A tubular portion of the base casting 12 extends downwardly through the drum 15 and the base 11, and is rotatable upon a casting 32 held to the fixed drum 15 by means of screws 33. An auxiliary casting 34 is pivotally mounted within the base casting 12, and is provided with a flat edge 35 forming a stop adapted normally to rest upon the inner flat surface 36 of the base casting 12. It is desirable to provide means for holding the brake drum 17 in position on the base casting 12, and the clamping ring 37, engaging a groove in the said base casting is provided for this purpose. A coil of wire is shown seated on the flange 1, having been slipped over the core 2, the free end of the wire passing through the loop 22 of the guiding arm 21.

The brake shoe casting 13 as mentioned above, is loosely mounted on the rod 25, and the nut 24 is tightly held to the end of the rod 25 so that when the rod 25 is pushed in a direction away from the base casting 12, the nut 24 will be pushed in the same direction. When this is done the nut 24 exerts no pressure on the brake shoe casting 13, and consequently the friction members 14 and 16 thereof exert no pressure on the brake drums 15 and 17 respectively, and the drum 17 is free to rotate. When pressure is exerted on the rod 25 in such a way as to push it in a direction toward the base casting 12, the nut 24 is drawn along with the said rod 25 and draws the brake shoe casting 13 into engagement with the drums 15 and 17. When the reel is tipped on the pivoted casting 34, the bolt 26 which is fixed thereto is drawn upward, and this motion forces the rod 25, the end of which engages the circular end of the said bolt 26, in a direction away from the base casting 12. The spring 20 exerts a pressure on an edge of the fixed arm 27 and on the nut 23. The nut 23 is fixed to the rod 25 and consequently any motion imparted to the said nut 23 is communicated to the movable rod 25. Thus when the tension which tips the reel along with the pivoted bearing 34 is released, the spring 20 exerts a pressure on the nut 23, this pressure is communicated to the rod 25, and the brake casting 13 is quickly moved into engagement with the brake drums 15 and 17 by means of the nut 24.

When the reel is in its normal position, the flange 1 will be in a plane substantially parallel to the drum 17, and hence parallel to the drum 15 and the base 11. This condition is clearly shown in Fig. 1. In this position the friction members 14 and 16 are engaging respectively the drums 15 and 17, preventing rotary motion of the reel. It has been noted that the tipping action of the reel is governed by the tension in the wire and the spring 20 opposed to the tipping effect of this tension. Since the brake is operated through the tipping of the reel against this spring 20, it follows that the reel must always tip in the same direction with respect to the said spring, and since the tipping is dependent upon the tension of the wire, the reel is so constructed that a maximum tipping effect of the tension will be gotten in that direction. Wire may be taken from the reel at any angle with respect to the base 11, and therefore, the point of braking reaction on the said base will have to change with the position of the user. Thus, when a tension is applied to the wire in the direction of the arrow in Fig. 4, the arm 21 together with the base casting 12 to which said arm is attached, and the brake shoe casting 13 with its associated parts, held to the casting 12 by means of the arm 27, will be swung around as a unit to the position indicated in Fig. 5. Sufficient clearance for rotating is obtained between the friction member 14 and the base 11 by the provision of a slot 38 disposed in the said base. In this position the maximum tipping effect of the tension is acting on the spring 20 and the reel will therefore tip and the brake will be released. When no tension is applied to the wire the brake remains set, and the brake shoe casting 13 joins the two drums 15 and 17 under the pressure of the set spring 20. The braking reaction is therefore equalized between the fixed base 11 and the reel. The point of friction on the fixed drum 15, however, will automatically change to suit the position of the user, as this said drum 15 does not rotate with the drum 17 and the base casting 12 and its associated parts.

The clearance between the brake shoes 14 and 16 and the drums 15 and 17 respectively, should be adjusted so that the spring 20 can return the reel to the vertical position before the brakes set. It would be preferable to allow the spindle 10 to fall a little back of the vertical in order to give more clearance and allow more variation at the brake shoes 14 and 16.

The pressure of the spring 20 should be adjusted, by means of the nut 23, so that it will return the reel to its normal position as quickly as possible, keeping in mind that the tension in the wire must overcome the spring in the worse condition, that is, when the wire is led from the bottom of a full spool of wire. When the spring 20 has returned the reel to its vertical position, the center of mass of the rotating reel crosses the center line and it will continue its motion thereafter under the effect of its own weight until it comes to rest against stops 35 and 36 within the base casting 12. Since the brakes are to be adjusted so that they will not take effect until the center position is reached, it is obvious that the full length of the spring 20 is then available for braking pressure.

The arm 21 is so mounted that the wire will be drawn from the reel in a plane substantially parallel to the plane of braking reaction, or to the rod 25, as shown in Fig. 5, and the loop 22 in the said arm 21 is positioned substantially at an equal distance between the flanges 1 and 3.

When only a small amount of wire remains on the reel, the wire may be inclined to rotate with respect to the core 2, and trouble may be experienced in operating the brake. In order to overcome this tendency there is provided a tubular opening 39 disposed in any part of the core 2, adapted to accommodate the end of the wire so that a tension in the wire will always produce a pressure tending to rotate the reel. Any notch or groove such as the groove 9 would serve equally as well.

Certain departures may obviously be made from the described details of construction and materials used, and therefore the invention is not limited except within the scope of the appended claims. It is to be understood that the word "wire" in the following claims includes thread, rope, cable, and all similar materials.

What is claimed is:

1. In a reeling device, a fixed brake drum, a casting mounted on said fixed drum and adapted to rotate thereon, a second brake drum adapted to rest on said casting and to rotate thereon, a rotatable reel pivotally mounted on said casting, means whereby the rotation of said reel is controlled by the rotation of said second brake drum, and means dependent upon the tipping action of said reel for controlling the rotation of said drum.

2. A reeling device comprising a fixed brake drum, a second brake drum rotatable with respect to said fixed drum, a pivoted reel adapted to rotate in unison with said second drum, a friction member adapted to engage said brake drums, a spring member adapted to exert a force upon said friction member to hold said member in engagement with said brake drums, and means actuated by the tipping action of said reel for controlling the action of said spring member.

3. In a reeling device, a pivoted reel, a base, a circular brake drum fixed to said base, a casting rotatably mounted on said fixed drum, a second brake drum adapted to rest on said casting and adapted to rotate thereon, and a friction member adapted to engage said brake drums, the braking reaction between said drums and said friction member being controlled by the tipping action of said reel.

4. In a reeling device, a fixed brake drum, a casting mounted on said brake drum, a second brake drum adapted to rotate upon said casting, a second casting pivotally mounted on said first casting, a reel rotatably supported by said second casting, a plurality of projecting members mounted on said reel, a plurality of slots disposed in said rotatable brake drum adapted to be engaged by said projecting members whereby said reel and said brake drum are adapted to rotate in unison, and means dependent upon the tipping action of said reel on said pivotally mounted casting for controlling the rotation of said drum and reel.

5. In a reeling device, a pivoted reel adapted to support a coil of wire, a braking mechanism for controlling the rotation of said reel, means whereby the action of said braking mechanism is controlled by the tipping action of said reel, and means whereby an initial tension exerted on the wire will establish said reel and said braking mechanism in such relation that the maximum tipping effect of the tension in the wire is obtained.

6. In a reeling device, a fixed brake drum, a casting mounted on said fixed drum and adapted to rotate thereon, a second brake drum adapted to rest on said casting and to rotate thereon, a pivoted reel mounted on said casting and adapted to support a coil of wire, means whereby the rotation of said reel is controlled by the rotation of said second brake drum, means dependent upon the tipping action of said reel for controlling the rotation of said second drum, and means whereby an initial tension exerted on the wire will establish said reel and said second-mentioned means in such relation that the maximum tipping effect of the tension in the wire is obtained.

7. In a reeling device a pivoted reel, said reel having a braking surface associated with a brake shoe movable into and out of contact with said braking surface, and means for operating said brake shoe controlled by the tipping action of said reel.

8. In a reeling device, a pivotally mounted rotatable reel, a rotatable drum member, means whereby the rotation of said reel is controlled by the rotation of said drum member, and means whereby the rotation of said drum member is controlled by the tipping action of said pivoted reel.

9. In a reeling device, a pivotally mounted rotatable reel, a rotatable drum member, a plurality of slots disposed in said drum member, a plurality of projecting members disposed in said reel and adapted to engage said slots whereby said reel and said drum member are adapted to rotate in unison, and means dependent upon the tipping action of said reel for controlling the rotation of said drum member.

10. In a device for reeling wire, a pivoted reel adapted to support a coil of wire, a fixed drum member, a second drum member rotatable with respect to said fixed drum member, a friction member adapted to engage said drum members to obtain a braking drag, said braking drag being an inverse function of the tension exerted on the wire on the pivoted reel, and means actuated by the tipping action of said reel for controlling the movement of said friction member.

In witness whereof, I hereunto subscribe my name this 3rd day of December, A. D., 1920.

LEON N. HAMPTON.