No. 856,614. PATENTED JUNE 11, 1907.

J. M. WRIGHT.

APPARATUS FOR CLEANING WIRE ROPES.

APPLICATION FILED JULY 24, 1906.

2 SHEETS—SHEET 1.

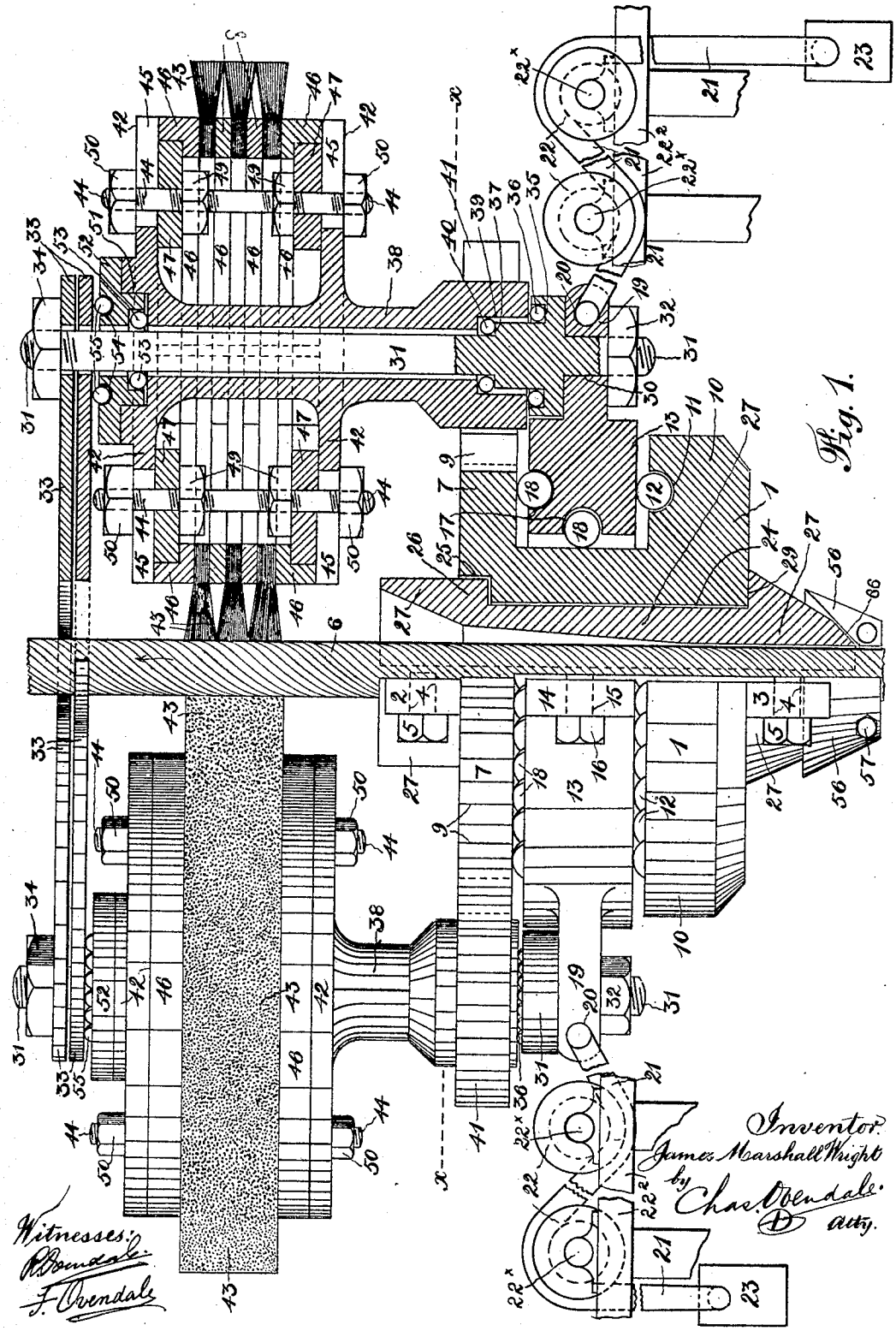


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

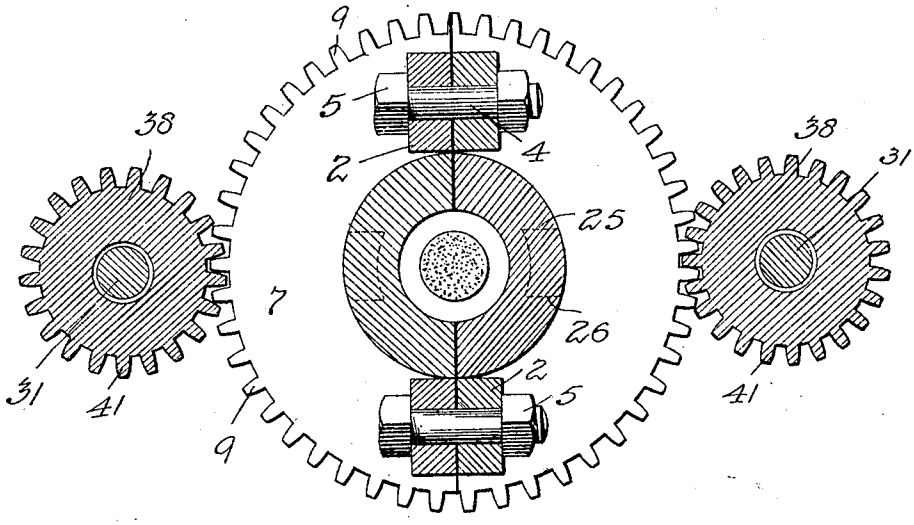


Fig. 4.

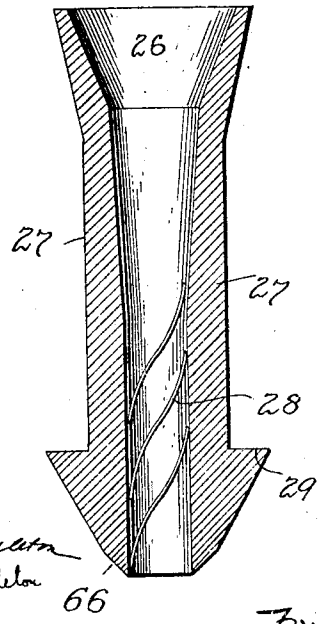
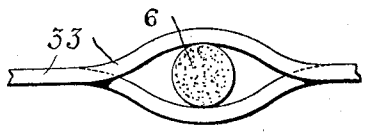


Fig. 3.



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APPARATUS FOR CLEANING WIRE ROPES.

No. 856,614. Specification of Letters Patent. Patented June 11, 1907.

Application filed July 24, 1906. Serial No. 327,569.

To all whom it may concern:

Be it known that I, JAMES MARSHALL WRIGHT, a subject of the King of Great Britain, and a resident of Johannesburg, Transvaal, have invented certain new and useful Improvements in Apparatus for Cleaning Wire Rope, of which the following is a specification.

This invention relates to apparatus for cleaning wire rope or removing therefrom any foreign matter, such as solidified grease, or any matter that may accumulate thereon.

The apparatus is capable of being quickly applied to or removed from the rope and is equally applicable either to vertical or inclined ropes.

To facilitate the detailed description of the apparatus I append drawings illustrative thereof, in which

Figure 1 represents an elevation, half in section, of the apparatus. Fig. 2 is a horizontal section of Fig. 1 on line x—x, with the pulleys 20 and ropes 21 attached to the ring 13, removed. Fig. 3 is a detail plan view showing the bars 33 between which the rope passes. Fig. 4 is an elevation of one half the device which operates to remove adhering matters from the surface of the rope.

In these drawings 1 represents a cylindrical clamp or two hemi-cylinders, each of which is constructed at the top and bottom with two snugs or projections 2, 3, through which are formed bolt holes 4 in which are placed bolts 5 for clamping the hemi-cylinders together round the hauling rope, indicated at 6. Each of the hemi-cylinders 1 is constructed to form half of a toothed or cog wheel 7, provided with the teeth 9 and which forms a complete wheel when the hemi-cylinders are bolted together round the rope as indicated in Fig. 1. The top snugs 2 are shown formed on the top of the toothed portions 7 and along the contiguous parallel edges, as shown in Fig. 2. In the lower portion, the hemi-cylinders 1 are constructed to form a flange 10, which on the inside is grooved to form a ball race 11 to receive the anti-friction balls 12. The bottom lugs 3 of the clamp 1 are formed on the inner parallel edges on the underside of the flange 10.

Round the clamp 1 and between the cog-wheel 7 and the flange 10, is arranged a ring 13 constructed in halves and provided with snugs 14, in holes 15 in which are placed bolts 16 for bolting the halves of the ring together round the clamp. Only one pair of the snugs 14 are shown but it will be understood that the ring is provided with another pair diametrically opposite the first pair. This ring 13 on the inside and at the top is constructed with two circular grooves 17, which constitute ball races for anti-friction balls 18 between said ring and the exterior of the central cylindrical portion of the clamp 1 and the underside of the toothed wheel 7, the ring also resting upon the balls 12.

The ring 13 is constructed with two diametrically opposite lugs 19 which latter at their outer extremities are constructed with holes 20 and have attached to them wire or other guy ropes or their equivalent 21 which pass over two guide pulleys 22 fixed to the rods 22^x carried by a suitable supporting frame 22^2. The ropes 21 have attached to their lower extremities weights 23 which operate to keep said ropes taut and maintain the whole of the apparatus in position round the winding rope 6. The ropes 21 are of sufficient length to allow the weights 23 to rise if the device should be raised or lowered. Thus the apparatus is yieldingly supported on the stationary pulleys 22.

The hole 24 in the center of the clamp exceeds the diameter of the winding rope 6 and in the upper end of said hole 24 are formed two recesses 25, shown in dotted lines in Fig. 2. In the hole in the clamp 1 and shaped with projections 26 fitting the recesses 25 is arranged the device which operates to remove adhering matters from the surface of the rope. This device as shown consists of a tubular or cylindrical piece 27 bored out conical for a portion of its length and then parallel and approximately the same diameter as the winding rope 6. As shown in the drawings this piece 27 is preferably formed of two semi-cylindrical parts. As shown in Fig. 4 each half of this bobbin or die 27 is constructed on its cylindrical inner portion with a helical projection or projections 28, the pitch of which corresponds to the pitch of the strands or wires of the rope for which it is designed. The helical projections or feathers 28 are preferably made about one third the pitch of the rope, that is to say if the pitch (one complete convolution of any one strand) is nine inches in length, then the helical projections or feathers 28 are made about three inches long. The halves of the bobbin 27 are shaped at their lower ends with semi-circular projections 29 abutting the underside of the clamp 1. When in position in

the clamp 1 and round the rope 6, the helical projections 28 fit the grooves or depressions formed between the strands or wires and so plow out the solid grease or other adhering matter off the exterior of the wire rope.

The ring 13, which by its connection with the ropes 21 is normally stationary, permits the clamp 1 and with it the bobbin or die 27 to rotate freely, the action of the convolutions of the winding rope as it passes through the bobbin 27 imparting rotary motion to these parts.

Into a square hole 30 in each of the lugs 19 of the ring 13 is placed a spindle 31. The ends of these spindles 31 are made square to fit the holes 30 and are fixed at the bottom by means of nuts 32. These spindles 31 are connected at their upper ends by means of two curved bars 33, through which the upper extremities of said spindles 31 pass, 34 being nuts screwed on the extremities of said spindles above the bars 33. The bars 33 are curved longitudinally to form an opening between them through which the hauling rope passes see Fig. 3. The spindles 31 in their lower portions rest upon the top of the lugs 19 and they are shaped to form an annular groove 35 for the reception of the anti-friction balls 36. They are also constructed to form an annular shoulder or projection 37.

On each of the spindles 31 is mounted a revolving circular brush comprising a tubular or cylindrical sleeve or centerpiece 38 which at its lower extremity runs on the balls 36. This tubular piece 38 is constructed at the bottom with a recess 39 forming a ball race for balls 40 located round the annular projection 37 on the spindle 31. At their lower ends the sleeves or center portions 38 of the brushes are constructed with cogs or teeth 41 which mesh or gear with the cog-wheel 7 or teeth 9 on the clamp 1. The sleeves 38 are constructed with the two flanges 42 between which are placed the bristles of the brushes 43. The brushes are each made up of a number of semi-circular rings 46 between which the bristles 43 are held and these rings are held between semi-circular rings 47 which engage with the inner sides of the flanges 42. The outermost rings 46 are recessed on the inside to receive the outer peripheries of the semicircular rings 47.

44 are bolts which pass through the rings 47 and through radial slots 45 in the flanges 42 and 49 and 50 are nuts on said bolts for clamping the rings 47 to the flanges 42. The bolts 44 being located in the radial slots 45 permit of any desired adjustment of the bristles 43 in relation to the winding rope 6.

The upper portion of the brush drum 38 is constructed with a recess 51 and arranged therein is a collar or circular plate 52 between which and the upper end of the spindle 31 are placed anti-friction balls 53. The upper surface of the plate 52 is constructed with an annular groove 54 in which are placed the anti-friction balls 55 which engage the underside of the bottom stay or longitudinally curved bar 33. The brushes are free to rotate on the spindles 31 and they have rotary motion imparted to them from the winding rope 6 through the medium of the clamp 1 and the toothed wheels 7, 41, so that the brushes are rotated in contact with the rope 6 and serve to complete the cleaning of the same or to effect the removal therefrom of any adhering matter that may have been loosened or be still adhering to the rope after it has passed through the die or bobbin 27.

56 is a split clamp which is fixed to the rope 6 by means of bolts 57, in the operation of assembling the parts or fixing the apparatus round the hauling rope, which operation is hereinafter explained.

In using the apparatus, the parts are arranged round the hauling rope 6 as illustrated in Fig. 1. In assembling the parts the clamp 56 is bolted on to the rope which is now held stationary. The halves of the clamp 1 in which have been placed the halves of the bobbin or die 27, are then placed round the rope with the pointed lower extremity of the bobbin or die seated in the conical recess in the top of the clamp 56. The halves of the clamp 1 are then bolted together and the helical projections or feathers 28 inside the bobbin or die 27 fit the lay, pitch or helical grooves formed by and between the strands of the rope. The ring 13 is now bolted round the clamp 1 and the ropes 21 fixed to the snugs 19 and placed round the pulleys 22,—provision being made for say a ten feet unobstructed rise and fall of the weights 23 fixed to the lower ends of said ropes. The brushes on the spindles 31 are now (or previously) mounted on the ring 13 and the spindles 31 connected by means of the bars 33. The necessary adjustment of the brushes having been effected and the clamp 56 removed from the rope the apparatus is now ready for use, and the rope 6 is hauled in or caused to travel at a suitable speed in the direction indicated by the arrow in Fig. 1. The matter adhering to the surface of the rope 6 is plowed out or removed by the helical projections 28 inside the bobbin or die 27 and at the same time the die and with it the clamp 1 have rotary motion imparted to them. This rotates the toothed wheel 7 which latter gearing with the teeth 41 on the lower extremities of the sleeves 38 rotate the same and with them the brushes. The bristles of the brushes being in contact with the rope 6 they complete the cleaning by removing any matter still adhering to the rope after it leaves the bobbin 27 and expose to view any imperfections therein. In the event of any strands or wires projecting to the outside of the rope

6 it will be evident that they will engage the lower extremity of the bobbin or die 27 and will raise the same and lift the weights 23 thereby clearly indicating that such obstruction is present and preventing injury to the device. The rope 6 is then brought to a standstill and the projecting wire cut off close to the rope and the operation proceeded with. In the event of a bulge or increase in the diameter of the rope it will in like manner raise the apparatus and so direct attention thereto. After examination of the rope the apparatus may be opened so as to allow the bulged part of the rope to pass through the bobbin or die 27. In the event of elongation or reduction in the diameter of the rope from any cause then it will be indicated by the reduction of speed of rotation of the apparatus, or in the event of the rope being sufficiently reduced to pass through without engaging the feathers or helical projections 28 in the bobbin 27, by not rotating the same.

In fixing the apparatus it is only necessary for the helical feathers or projections 28 to lightly grip the rope to cause it to revolve, the brushes subsequently effectively removing the matter from between the wires. It is found that if the bobbin or die 27 and the feathers or helical projections 28 be cast from a plaster-of-paris pattern taken from a rope say one and one eighth of an inch in diameter, the helical projections 28 will be of a suitable size for a one inch rope. At their lower extremities the halves of the bobbin 24—should be beveled off as indicated at 66 in Fig. 1 so that they are not more than one-sixteenth of an inch thick all round at the point. They can be adjusted to the rope by the interposition of liners or packings between them and the clamp 1 such packing is not shown in the drawing.

When using this apparatus the rope is preferably run at a speed of about sixty feet per minute and the gearing between the toothed wheel 7 and the wheels 41 is preferably about two to one. This imparts a velocity of about eighty revolutions to the clamp 1 and die or bobbin 27 and about one hundred and sixty revolutions to the brushes.

What I claim as my invention and desire to protect by Letters Patent is:—

1. In apparatus of the nature indicated, in combination, a die or bobbin constructed in halves and formed with internal helical projections or feathers corresponding to the pitch of the rope, a two part clamp for securing the halves of the die or bobbin round the rope and a two part ring surrounding the two part clamp for permitting the die or bobbin and clamp to rotate therein, and means for supporting the ring.

2. In apparatus of the nature indicated, in combination, a two part die or bobbin constructed with internal helical projections corresponding to the pitch of the rope and constructed with projections at the top and with a flange at the bottom, a two part clamp surrounding the parts of the bobbin or die, the clamp being constructed with recesses at the top to receive the projections on the top of the bobbin to fix the bobbin to the clamp, means for connecting the two parts of the clamp, a two part ring surrounding the clamp and means for supporting the ring.

3. In apparatus of the nature indicated, in combination, a two part die or bobbin constructed with internal helical projections corresponding to the pitch of the strands of the rope, a two part clamp for supporting said die or bobbin round the rope, a ring revolubly supporting the clamp and bobbin, means for supporting said ring, spindles stationarily supported by said ring, two circular brushes revolubly mounted on said spindles, means for driving the brushes from the two part clamp, and means for adjusting the brushes to the rope.

4. In apparatus of the nature indicated, in combination, a two part die or bobbin, means for supporting the die or bobbin round the rope, two spindles stationarily carried by said supporting means, brushes mounted on said spindles, and gearing driven by the die or bobbin and driving the brushes.

5. In apparatus of the nature indicated, in combination, a two part bobbin constructed with internal helical projections corresponding to the pitch of the strands of the rope, a two part clamp for securing the halves of the bobbin round the rope, the bobbin and clamp being so connected that the latter is compelled to rotate with the former, the upper portion of the clamp having teeth, a two part ring revolubly supporting the clamp, anti-friction bearings between the top, bottom and inside of the ring and clamp, the ring being constructed with lugs, ropes attached to the lugs, guide pulleys fixedly supported for the ropes and weights attached to the other ends of the ropes, spindles non-rotatably carried by the lugs, and two revolving circular brushes comprising sleeves arranged on the spindles, the sleeves having teeth at their lower ends gearing with the teeth of the clamp for driving the brushes from the die or bobbin.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAMES MARSHALL WRIGHT.

Witnesses:

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