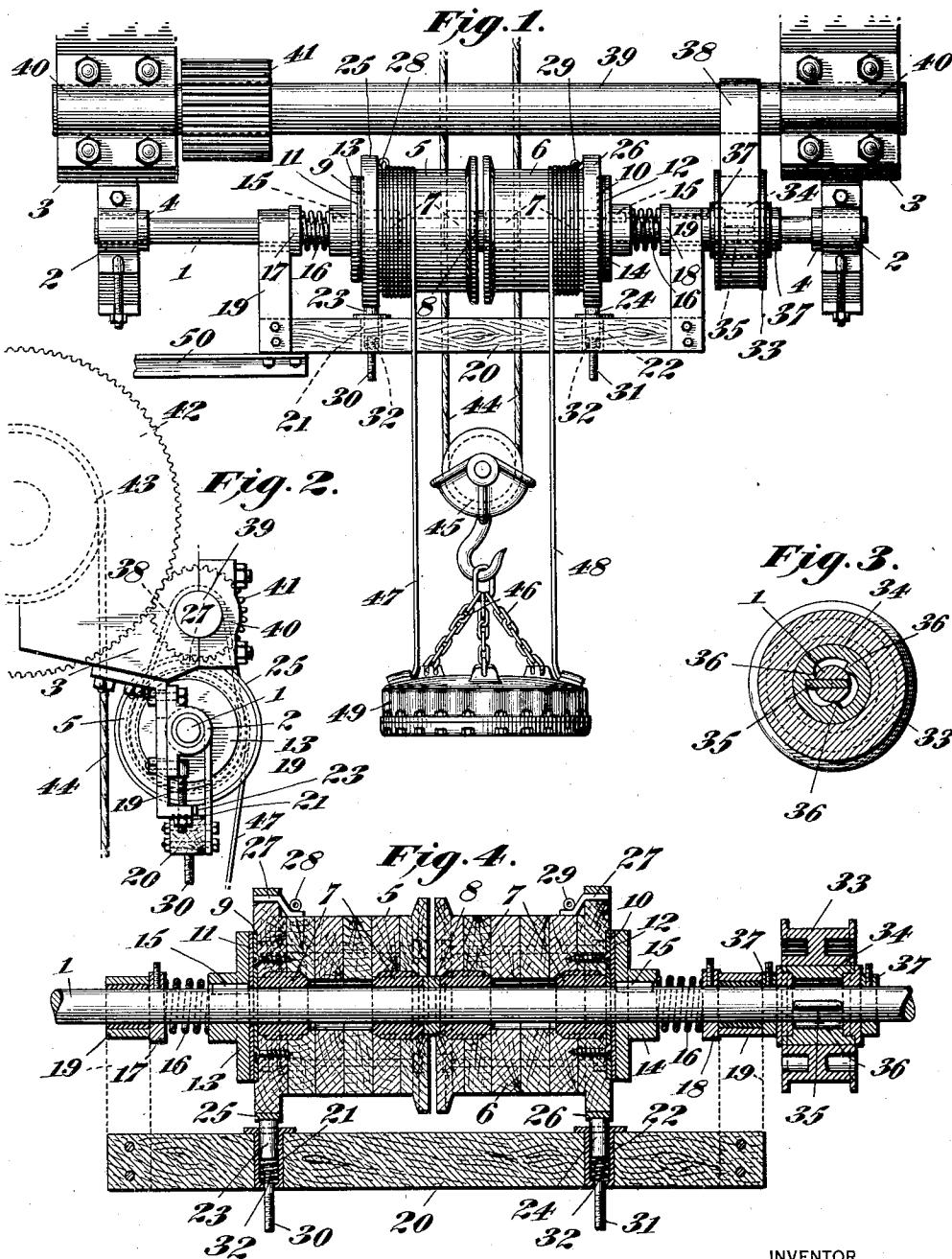


H. C. ROBINSON.
MAGNET WIRE RETRIEVER.
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1,360,686.

Patented Nov. 30, 1920.



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MAGNET-WIRE RETRIEVER.

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To all whom it may concern:

Be it known that I, HARRY C. ROBINSON, a citizen of the United States, residing in the city of Coatesville, in the county of Chester and State of Pennsylvania, whose post-office address is Coatesville, Pennsylvania, have invented certain new and useful Improvements in Magnet-Wire Retrievers; and I do hereby declare the following to be a full, clear, 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.

My invention relates to an apparatus for retrieving magnet wires or magnet wire cables in connection with lifting magnets of any of the well known types used with cranes, or other hoisting apparatus.

I prefer to provide the lifting magnet with two separate cables, one for the positive and the other for the negative current, and as the magnet is lowered to pick up its load, which may be composed of any magnetic material, particularly steel or iron in any shapes or forms, the magnet wire cables are paid out automatically from my apparatus. During the travel of the crane or trolley thereof, it frequently occurs that the magnet wires become fouled with the side stakes or other projecting portions of the railroad car or with the projecting ends of a pile or piece of steel or iron in any form or other obstruction, in such a way that as the trolley or crane is traversed or the magnet lifted, either one or both of the magnet wires might be pulled in such a way as to break and destroy them and it is the purpose of my invention to obviate this trouble and provide means whereby said wires may be paid out without any danger of their breakage or loss of working time of the apparatus.

Although I have shown and described my magnet wire retriever in connection with two cables, namely, a positive and a negative one, as before stated, I prefer to have them separate or spaced apart for the reason that when wires or cables of different polarities are so arranged apart from each other there is no danger of short circuiting and consequent burning of the wires as is the case when one cable is used, but at the same time my apparatus is equally applicable for use in connection with one magnet wire cable containing two wires or cables of different polarities.

In order to accomplish my purpose I provide an apparatus consisting of a spool or a pair of spools which are frictionally driven in one direction and which run at such speed that the magnet cables will be coiled upon said spools at about the same rate as the lifting cables are coiled on their drums so that the magnet cables and the hoisting cables travel at about the same speed so as to prevent either tension or slack in the magnet cables. By reason of the frictional drive of my spools, the magnet cables can pay themselves off automatically, as only a slight tension, when the magnet is lowered, will permit the spool to rotate in the direction opposite that in which they travel when frictionally driven.

My magnet wire retriever is superior to other forms, such as spring operated retrievers, by reason of the fact that if the spring is overhauled too far it is ruined, and a spring can only have a limited amount of rotation on account of the limitations of size of the spring itself due to the space permitted, whereas my apparatus can be provided with any amount of magnetic wire cable so that the same can be pulled out a hundred feet or more without becoming taut, thus allowing the operator much more latitude than with the other forms in which the magnet cable must necessarily be short. My retriever is also better than motor operated retrievers for the reason that such apparatus requires two more trolley wires and my retriever is simpler and more convenient to install and by reason of its construction requires practically no care or attention whatsoever. My retriever, as compared with gear operated retrievers, has the advantages that the magnet wire cables can be paid out if they should be caught on any obstructions during the traverse of the trolley or crane, whereas with the gear operated retrievers the drums are geared to the other mechanism in such a way that should the cables be caught when traversing they would be immediately broken.

Having thus given a general description of the invention, I will now in order to make the matter more clear, refer to the annexed sheet of drawings forming part of this specification and in which like characters refer to like parts:

Figure 1 is a front elevation of my improved retriever; Fig. 2 is an end elevation thereof; Fig. 3 is a transverse sectional view

of the ratchet pulley and shaft upon which it is mounted and Fig. 4 is a vertical longitudinal sectional elevation of my improved device drawn on a larger scale.

Referring now to the characters of reference on the drawings:—1 is a shaft upon which my drum or spool or a pair of the same and friction members are mounted, 2 are the supports or bearings for the shaft 1, 3 is a portion of the frame-work of the crane construction which carries a winding drum 43 for the lifting mechanism and the bearings 40 for the jack shaft, etc. 4 are collars on the shaft 1 adjacent to the bearings 2 to prevent endwise movement of the shaft, 5 and 6 are the drums or spools of my retriever which, as illustrated, are made of wood, but I wish it understood that they may be made of metal or other suitable material and provided with insulation, if necessary, in order not to short-circuit the cables in case the insulation thereof should become worn. The drums or spools 5 and 6 are provided with hub portions 7 which are preferably formed of metal to form bearings for said drums or spools on the shaft 1, 8 is a collar on the shaft 1 between the drums 5 and 6 to space them apart, 9 and 10 are friction disks provided on the exteriors of the drums 5 and 6, 11 and 12 are separate friction disks mounted on the shaft, as illustrated, and adapted to contact with the friction disks 9 and 10 aforesaid, and the friction members 13 and 14. These friction disks may be composed of leather, fiber, metal or any suitable material; 13 and 14 are flanged friction members which are mounted on the shaft 1, as shown, and prevented from rotation thereon by means of splines 15 so that they may have longitudinal movement on said shaft to a slight extent. Each of the friction members above mentioned is provided with a spring 16 adapted to keep it in frictional contact with the adjacent friction members, this spring being compressed and held to its work by means of the collars 17 and 18 which are secured on the shaft 1 by means of set-screws, as illustrated, or otherwise. Adjacent to the collars is a pair of frame members 19 which are connected together by means of the member 20 which is shown of wood but may be of metal provided with insulation where necessary. The beam or member 20 is provided with thimbles 21 and 22 in which are mounted the brushes or contact members 23 and 24 of the terminals 30 and 31, to which terminals are connected the cables which supply the positive and negative currents of electricity for the operation of the magnet. 25 and 26 are annular metal rings mounted on the flanges of the drums 5 and 6 which are adapted to contact with the brushes 23 and 24 both when the drums are stationary and when they are rotating.

The thimbles 21 and 22 are provided with springs 32 and adjusting means for the same, whereby the brushes 23 and 24 may be adjusted to a greater or less pressure against the annular collecting rings 25 and 26 both for the purpose of supplying current thereto and to act as brakes or retarders to prevent unnecessary rotation of the drums. Connected with the annular rings 25 and 26 are the pole pieces 27 which are provided with terminals 28 and 29, in which terminals the ends of the magnet wires are inserted and electrically connected for the purpose of receiving current from the main supply terminals 30 and 31 through the brushes 23 and 24, to and through the annular rings 25 and 26, thence to the pole pieces 27 and to the terminals 28 and 29. A ratchet pulley 33 is mounted on the shaft 1 provided with a hub 34 and with a mechanically operated pawl 35 which is adapted to drive the pulley in one direction by the ratchet teeth 36, but in case of reversal of the rotation of the jack shaft 39 the pulley 33, although driven in the reverse direction, would turn idly on the shaft 1 because of the ratchet and pawl construction as shown in Fig. 3. The pulley is also provided with the collars 37 on either side of the hub 34, as illustrated. This pulley 33 is driven by a belt 38 from the jack shaft 39 and the diameter of said pulley is so proportioned that the magnet wires 47 and 48 will be reeled upon the drums 5 and 6 by the frictional drive at substantially the same speed as the lifting cable 44 of the magnet 49. The jack shaft is provided with journal bearings 40, and a driving pinion 41, which is driven from any suitable source of power. The main lifting winding drum 43 is provided with a gear 42 for the purpose of rotating it, as customary. The lifting cables which are shown as wire cables are 44, the lifting pulley is 45, which is provided with a lifting hook as illustrated. The lifting magnet 49 is provided with lifting chains 46 whereby it is mounted on the lifting hook, as illustrated. 47 and 48 are the magnet wires or cables of different polarity, which supply current to the lifting magnet 49. 50 is a member shown as an angle but it may be of any form desired, whereby the frame composed of the members 19 and 20 is secured to the frame of the crane so that these parts will not rotate, thereby holding the terminals 30 and 31 in fixed position.

It should be noted that by reason of the construction of the overrunning clutch or mechanical pawl, the shaft 1 can be positively driven by the pulley 33 in one direction only, namely, that corresponding to the lifting of the magnet. When the magnet 49 is lowered the pulley 33, although rotated in the reverse direction by the jack shaft 39 and driving connection thereto, will turn idly

on the shaft 1, thus allowing the shaft 1 to rotate in the desired direction.

Although I have shown my apparatus in connection with the magnet wires of a crane, I wish it understood that it may be used for any apparatus whatsoever requiring the reeling or unreeling of cables, ropes, chains or any other constructions.

Assuming the position of the parts to be as indicated in Fig. 1, the operation of my apparatus is as follows:—In order to lower the magnet 49, the winding drum 43 is rotated in the required direction, whereupon the weight of the magnet produces a slight tension in the cables 47 and 48 and these cables are paid off the drums 5 and 6, as these drums are rotated by the slight pull of the cables 47 and 48 against the frictional resistance of the friction disks 9 and 10 the other friction disks 11 and 12 and the friction members 13 and 14 which are held in frictional contact by means of the springs 16. Meanwhile the pulley 33 will rotate because of its driving connection to the rotating jack-shaft 39, but this will not interfere with unreeling the magnet cables 47 and 48 for the shaft 1 will turn idly in the pulley 33 because of the mechanical pawl 35 and ratchet 36 construction, as shown in Fig. 3. When the magnet is lifted, the rotation of the winding drum is reversed and it now lifts the magnet, whereupon the pulley 33 is rotated from the jack shaft and the drums 5 and 6 are rotated by reason of the frictional driving contacts of the disks 9, 10, 11 and 12, and the frictional members 13 and 14. If now or if at any other time, one of the wire magnet cables such as 48 should be caught upon an obstruction while the crane or trolley is traversed, this wire would be paid out to any extent, the drum 6 being held only slightly by the frictional contacts, as above described, thus causing the wire to be unreeling from the drum and this would throw a bight or open loop into the wire. As the lifting magnet continues to rise, this loop or bight in the wire would remain until the lifting was completed, but when the magnet is again lowered the drum 6 would not be rotated and the slack in the magnet wire would be taken up until it became sufficiently taut, whereupon the various portions of the apparatus would be in their normal operative positions.

Although I have shown the position of the members 19 and 20 as hanging downwardly from the shaft 1, I wish it understood that they may be located in any position, and in some cases I have made these members substantially horizontal instead of vertical.

Although I have described and illustrated my invention in considerable detail, I do not wish to be limited to the exact and specific details thereof, as shown and described,

but may use such modifications in, substitutions for, or equivalents thereof, as are embraced within the scope of my invention, or as pointed out in the claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A cable retriever comprising an insulated spool, a current collecting ring electrically connected with the end of a cable, a continuously engaged spring pressed collar adapted to rotate said spool in one direction and also to automatically allow rotation of the spool in the reverse direction, means for supplying current to said ring, terminal brushes contacting with said ring, and means for adjusting the pressure of said brushes against the ring.

2. A magnet wire retriever comprising a spool rotatably mounted on a shaft, a continuously engaged spring pressed collar mounted on said shaft and adapted to drive said spool by frictional contact, means for rotating said shaft in one direction, a metal collecting ring mounted on said spool and connected with a magnet wire terminal, and means for supplying current to said ring.

3. A magnet wire retriever comprising a spool mounted on a shaft, a continuously engaged spring pressed collar mounted on said shaft and adapted to drive said spool by frictional contact, means for rotating said shaft in one direction, a metal collecting ring mounted on said spool and connected with a magnet wire terminal, a terminal brush, and means for adjusting the same in contact with said ring.

4. A magnet wire retriever comprising a pair of spools rotatably mounted on a shaft, a pair of continuously engaged spring pressed collars mounted on said shaft and adapted to frictionally engage said spools, and means for rotating the shaft in one direction.

5. A magnet wire retriever comprising a pair of spools rotatably mounted on a shaft, a pair of continuously engaged spring pressed collars mounted on said shaft and adapted to frictionally engage said spools, means for rotating the shaft in one direction, and a metal collecting ring mounted on said shaft and connected with a magnet wire terminal.

6. A magnet wire retriever comprising a pair of spools rotatably mounted on a shaft, a pair of continuously engaged spring pressed collars mounted on said shaft adapted to rotatively hold said spools to said shaft in one direction and also to allow said spools to automatically rotate on said shaft in the reverse direction when desired, means for rotating said shaft in one direction, a metal collecting ring mounted on said shaft and connected with a magnet wire terminal, terminal brushes contacting with said ring

and means for adjusting the pressure against the same.

7. A magnet wire retriever comprising a pair of insulated spools rotatably mounted
5 on a shaft, means for rotating said shaft in one direction, continuously engaged spring pressed collars mounted on said shaft and adapted to drive said spools in one direction and also to allow them to be rotated in the
10 opposite direction when desired, an annular collecting ring on each spool with terminals connected therewith, magnet wire cables

mounted on said spools and connected to the terminals aforesaid, a framework mounted on said shaft and secured to the stationary 15 portion of the apparatus, brushes mounted on said framework and provided with pressure springs adapted to contact said brushes with the annular rings aforesaid and means for supplying current to the brushes.

In witness whereof I hereunto affix my signature. 20

HARRY C. ROBINSON.