C. B. ANFINDSEN.

APPARATUS FOR WINDING WIRE.

APPLICATION FILED NOV. 16, 1917.

1,253,330.

Patented Jan. 15, 1918.

2 SHEETS—SHEET 1.

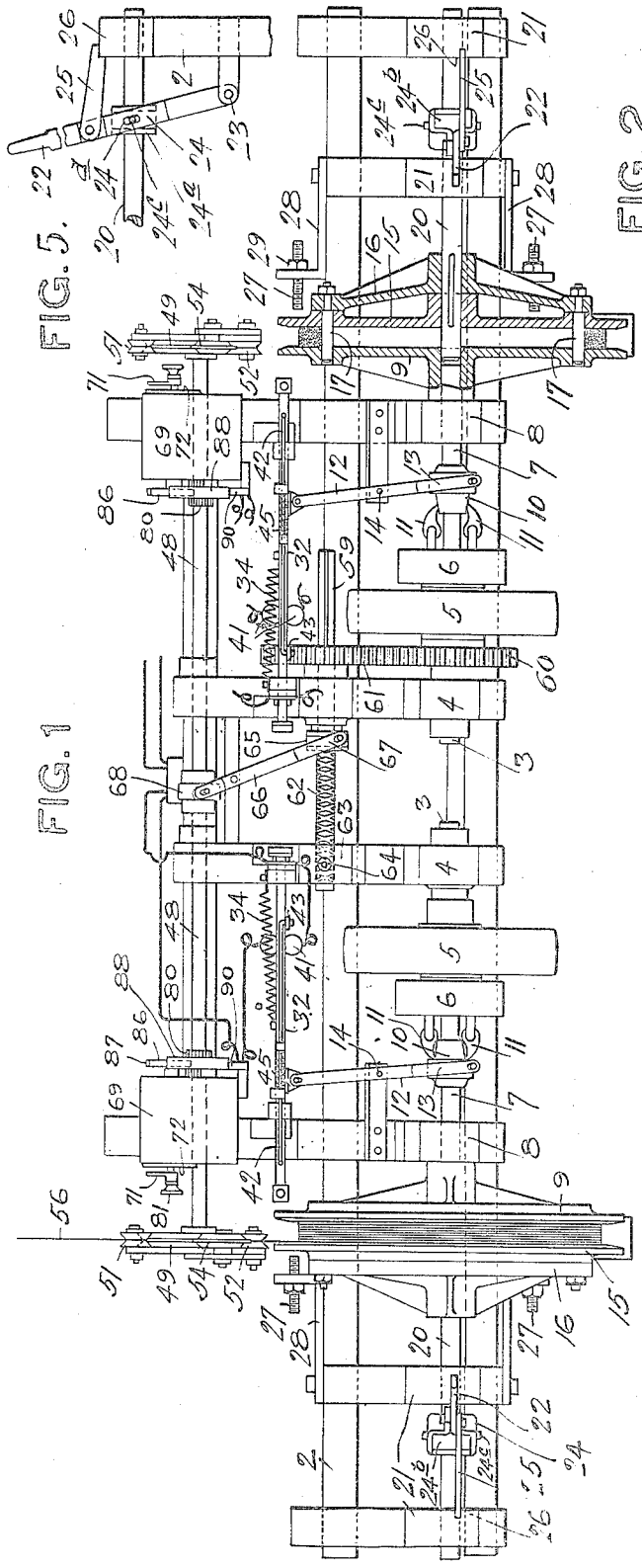


FIG. 1

FIG. 5.

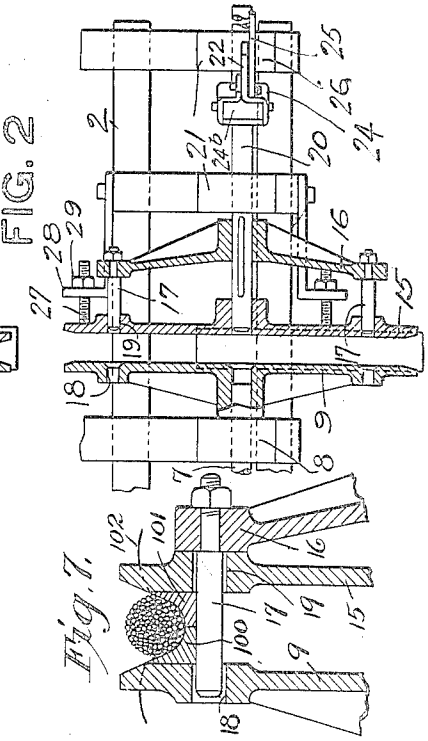


FIG. 2

Fig. 7.

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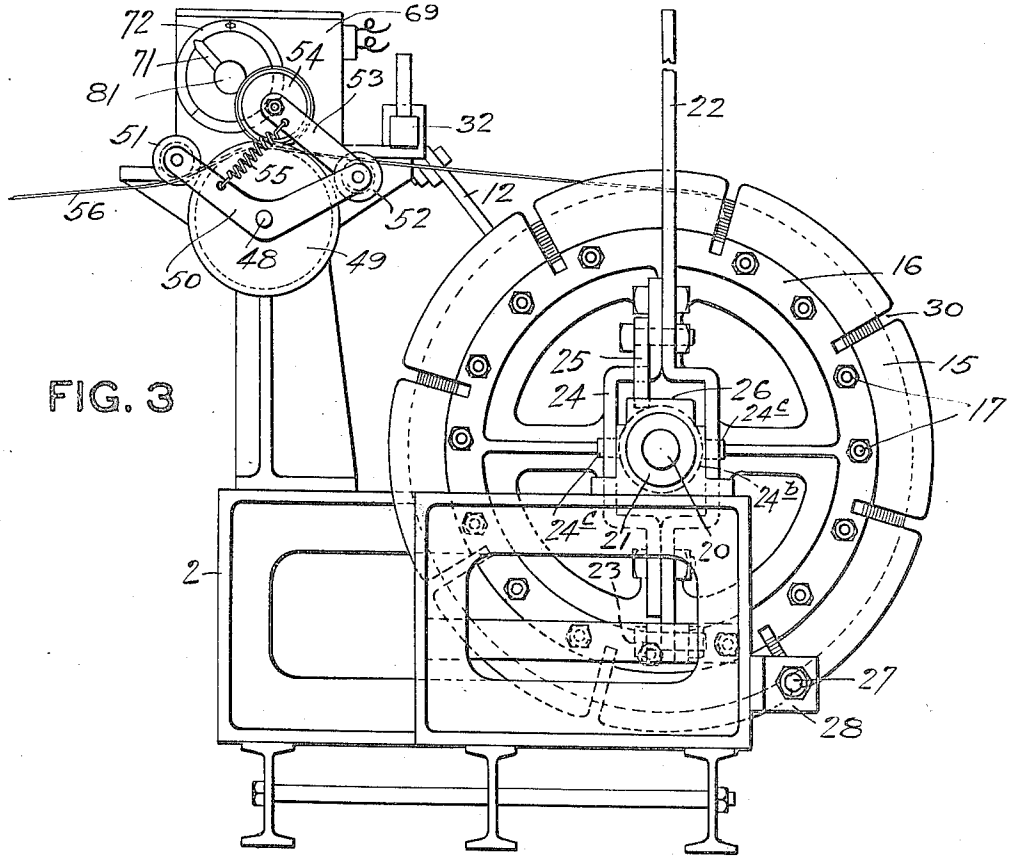


FIG. 3

FIG. 4

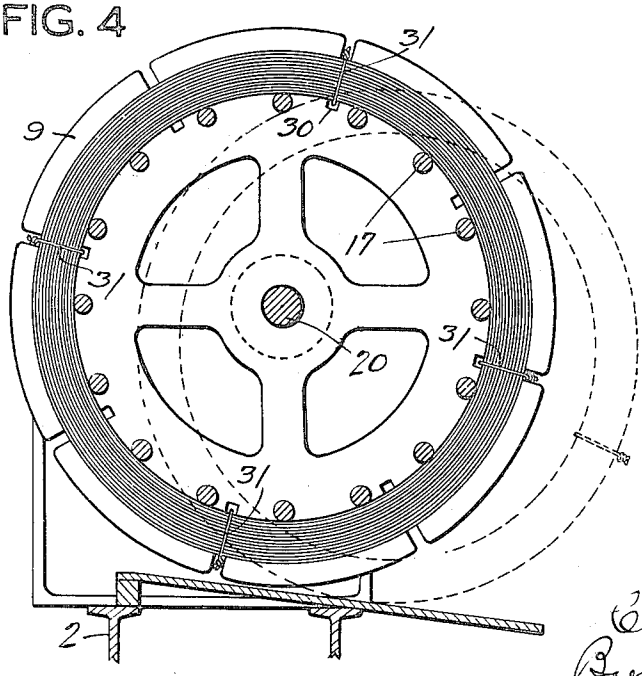
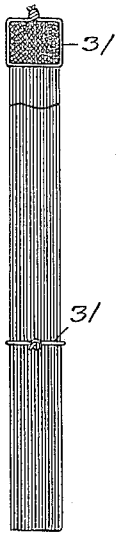


FIG. 6.



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UNITED STATES PATENT OFFICE.

CHRISTIAN B. ANFINDSEN, OF CHARLEROI, PENNSYLVANIA, ASSIGNOR TO PITTSBURGH STEEL COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

APPARATUS FOR WINDING WIRE.

1,253,330. Specification of Letters Patent. Patented Jan. 15, 1918.

Application filed March 16, 1917. Serial No. 155,253.

To all whom it may concern:

Be it known that I, CHRISTIAN B. ANFINDSEN, a subject of the King of Norway, and resident of Charleroi, in the county of Washington and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Winding Wire; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to winding apparatus, and has reference more especially to the winding of wire in bundles for shipment, one of the objects being to provide for the winding of the wire in a compact form, and square or rectangular in cross section, so as to provide a bundle which can be packed in less space and so requires less space in shipping.

A further object of my invention is to provide apparatus by means of which the bundle may be quickly released from the winding reel without the necessity of the removal of any bolts or other fastening devices.

In the accompanying drawings, Figure 1 is a plan view of my improved apparatus partly in section; Fig. 2 is a sectional view of the winding reel showing the parts in released position; Fig. 3 is an enlarged end view of my improved apparatus; Fig. 4 is a vertical sectional view of the reel with the bundle wound thereon and in position to be discharged therefrom. Fig. 5 is a side view of the lever mechanism and the latch for holding one of the reel sections in position during the winding operation; Fig. 6 is a view of the finished bundle; and Fig. 7 is a modified form of my invention.

In the drawings the numeral 2 designates a suitable frame or support for the apparatus, and as the apparatus is illustrated in duplicate, the same set of reference numerals will apply to like parts.

The shaft 3 is mounted in suitable bearings 4 and mounted on said shaft is the pulley 5 which may be connected up to any suitable source of power. A suitable friction clutch 6 is mounted on the shaft 3. As this clutch is of common construction, it has not been deemed necessary to illustrate the same in detail. This clutch connects the shaft 3 up with the shaft 7 mounted in bearings 8, said shaft carrying the reel head 9. The cone sleeve 10 is mounted to slide on the shaft 7 and the said cone operates the dogs 11 which tighten up and release the friction clutch 6. A clutch lever 12 has the yoke portion 13 which engages a groove in the cone sleeve 10, said clutch lever being pivoted at 14 and by the movement of said clutch lever, the clutch is thrown into engagement and released, all in the manner more fully hereinafter set forth.

The winding-reel is composed of three parts or heads 9, 15 and 16. The head 16 has a series of pins 17 arranged at suitable intervals and said pins are adapted to register with and engage an equal number of openings 18 and 19 in the heads 9 and 15, respectively. These pins form the support upon which the wire is wound and the line formed by the circle passing over the outside of these pins forms the inside diameter of the bundle.

The head 16 is keyed on the shaft 20, and said shaft is mounted to slide to and fro in the bearings 21, and for this purpose the lever 22 is provided which is pivoted at 23 to the frame. The lever 22 has the yoke portion 24 which fits around a collar 24^a keyed on the shaft 20. A split ring 24^b has the pins 24^c which fit into slots 24^d in the lever 22.

In order to control the movement of the head 15, stops 27 are provided, said stops being carried by the bracket 28 and adjusted therein by means of the nuts 29 to regulate the movement of the head 15. The head 15 is permitted to slide along with the head 16 when said head is withdrawn until said head 15 strikes the stops 27 whereby sufficient clearance is given so that the bundle may be readily dropped to the floor when wound and tied in the manner fully hereinafter set forth.

The slots 30 are provided in the heads to permit of the insertion of the ties 31 for tying bundles at intervals while still supported by the reel.

The clutch lever 12 is connected up to the slidable bar 32 mounted in guides 33, a spring 34 is connected to said bar and to the stationary frame 2. The bar 32 has the stop 35 which is adapted to be engaged by the dog 36 pivotally mounted at 37 on the frame 2. A rod 38 is connected to the outer end of the dog 36, said rod being connected at its lower end to the lever arm 39 pivoted at 40. The opposite end of the lever arm 39 is connected to the solenoid 41. Under ordinary conditions the dog 36 is operated electrically

to release the bar 32, but where it is desired to release said bar by hand, I provide the rod 42 with the bell-crank 43 at the outer end thereof, said bell-crank being pivoted to the bar 32 at 44 and the other arm of said bell-crank engaging the dog 36. The spring 45 is interposed between the collar 46 and the stop 47. It will be apparent that on pulling upwardly on the rod 42, the bell-crank 43 will act to lower the dog and release the frame 32.

The wire is distributed properly on the reel by mechanism which I will now describe. A shaft 48 is mounted to move back and forth in suitable bearings in the frame, and said shaft carries the sheave 49 over which the wire passes on its way from the supply reels to the bundling reel. The purpose of this sheave is to hold the winding speed between the heads 9 and 15 of the winding reel at such speed as to distribute the wire evenly and thus prevent the climbing of the wire. An arm 50 is mounted on the shaft 48, said arm carrying at its outer ends the idle rollers 51 and 52. An arm 53 is connected to one end of the arm 50 and said arm carries the sheave 54. A spring 55 connects the arm 53 with the arm 50. The wire 56 passes under the roller 51 up between the sheaves 49 and 54, and down over the roller 52. By this arrangement the wire is held under tension and is wound compactly around the winding reel.

As above stated, the shaft 48 is to be moved back and forth in its bearings to provide for the even distribution of wire on the winding reels and this is accomplished in the following manner. A shaft 59 is driven from the shaft 3 by the gear wheel 60 on said shaft meshing with the gear wheel 61 on the shaft 59. This shaft 59 has the right and left-hand screw-threaded portion 62 which passes through the bearing 63 in which is located a pin 64 which engages the threads of the shaft. As the shaft is rotated the pin engaging the threads will shift the shaft longitudinally until the end of the threads are reached whereupon the pin will move into the other set of teeth and by the further rotation of the shaft the said shaft will be returned to its former position. Mounted on the shaft 59 is the collar 65. A lever 66 has the bifurcated end portion 67 which engages the groove in said collar and the opposite end of said lever is connected to the sleeve 68 on the shaft 48. From the above it will be apparent that as the shaft 59 rotates the shaft 48 will be moved back and forth to provide for the proper and even distribution of the wire on the winding reel.

In order to determine just the amount of wire to be wound in each bundle, I provide suitable measuring apparatus which when properly set will fix just the amount of wire going to make up each bundle. This apparatus may be any of the well known types of measuring devices commonly employed with machines of this character. I have illustrated in a general way such apparatus which will be readily understood by those skilled in the art. The apparatus comprises a gear box 69 for housing gears which drive an indicator hand 71, which passes over a dial 72. The gears in the box are driven by the wire passing over the sheave 49, this spindle of the sheave carries a gear 80 which meshes with these gears. The gearing in the box actuates a disk indicated at 86. The disk is provided with a lug 87, and when said disk has traveled the required distance as set by the indicator hand, the lug contacts with an arm 88 which is rocked so as to close a switch 90, which closes the circuit to the clutch operating solenoid 41. A handle 81 is attached to the indicator hand spindle whereby this hand may be reset or moved for the required size of bundle.

In the operation of the machine, the head 16 is moved back far enough to have the free ends of the pins 17 at some point in the space between the heads 9 and 15, whereupon the wire with a loop formed on the end thereof is slipped over one of the pins. The head 16 is then moved forward and into the position indicated in Fig. 1 and locked in that position by the latch 25 engaging the stop 26, which prevents any backward movement of the head 16 during the winding operation. Power is then applied to rotate the shaft 3 and the winding operation begins. At the start the sheave 49 will be over at one side of the winding reels, as indicated in Fig. 1 and the winding takes place from left to right. As the winding proceeds the wire 56 is under tension and is wound compactly on the pins 17 and as the shaft 59 rotates the sheaves 49 are moved back and forth to give the proper and even distribution of the wire which in the case illustrated in Fig. 1 is wound into a bundle which is square or rectangular in cross section.

As above stated, the machine is timed to stop automatically when the bundle of the desired weight has been wound and this is accomplished by the action of the measuring apparatus and the movement of the arm 72 over the dial face, so that when the proper amount of wire has been wound the lug 87 on the disk 86 will engage the tripping arm 88 and close the switch 90 and energize the solenoid 41, whereby the rod 38 will be lowered and with it the dog 36 releases the frame, permitting the spring 34 to move said frame so as to operate the clutch lever 12 and throw the clutch out of engagement thereby stopping the rotation of the shaft 7 and the head 9 which gives rotation to the reel. When the reel has been brought to a standstill, the operator operates the lever 22 to withdraw the head 16, and as said head is

withdrawn, the head 15 moves with it a sufficient amount due to the tendency of the bundle to expand slightly when the pressure is released, thereby giving sufficient clearance for the bundle to be released and dropped to the floor as indicated in dotted lines, Fig. 4. In this manner the stripping of the bundle takes place by the mere withdrawal of the head 16 and without the removal of any bolts or other fastening devices and the bundle is discharged automatically from the reel, thereby greatly reducing the time required and largely increasing the output.

In Fig. 7 I have illustrated a modified form of my invention in which the reel is shown as adapted for making round bundles, and in this case two rings 100 and 101 are slipped over the pins. When the bundles are made and tied up the said rings will fall out with the bundle and can be taken off to slip on the pins for the next bundle. In this case the tie wires 102 will have to be placed in the grooves before starting the bundle.

What I claim is:

1. In apparatus for winding wire, the combination of a rotary head, a withdrawable head, pins carried by said withdrawable head, a loosely mounted third head interposed between said rotary head and said withdrawable head, said pins passing through openings in said third head and engaging openings in said rotary head forming a support for the wire wound between said rotary head and said third head.

2. In apparatus for winding wire, the combination of a rotary head, a reciprocatory shaft, a head fixed to said shaft, pins carried by said head, a head interposed between said first-named heads and loosely mounted on said shaft, said pins passing through openings in said interposed head and engaging openings in said rotary head forming a support for the wire wound between said rotary head and said interposed head.

3. In apparatus for winding wire, the combination of a rotary head, a reciprocatory head, a head movable with said shaft, pins carried by said last-named head, a head interposed between said first-named heads loosely mounted on said shaft, said pins passing through openings in said interposed head and engaging openings in said rotary head, and a stop in the path of said interposed head for positioning the head with respect to its spaced relation with the rotary head.

4. In apparatus for winding wire, the combination of a rotary head, a head movable to and fro, pins carried by said last-named head, a head interposed between said first-named head, said pins passing through openings, said interposed head and engaging openings in said rotary head, and means for locking said second-named head in position.

In testimony whereof, I the said CHRISTIAN B. ANFINDSEN have hereunto set my hand.

CHRISTIAN B. ANFINDSEN.

Witnesses:
ROBT. D. TOTTEN,
JOHN F. WILL.