Oct. 11, 1938. O. I. PRICE 2,132,698

PORTABLE REWINDING MACHINE

Filed June 25, 1936 7 Sheets-Sheet 1

FIG. 1

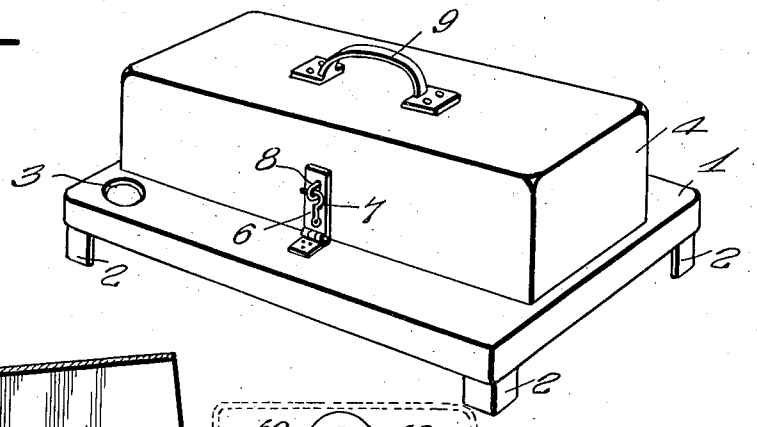


FIG. 4

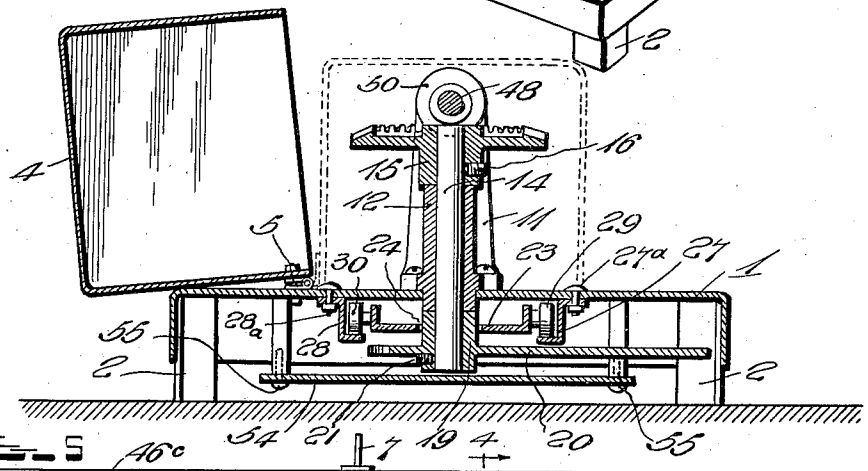
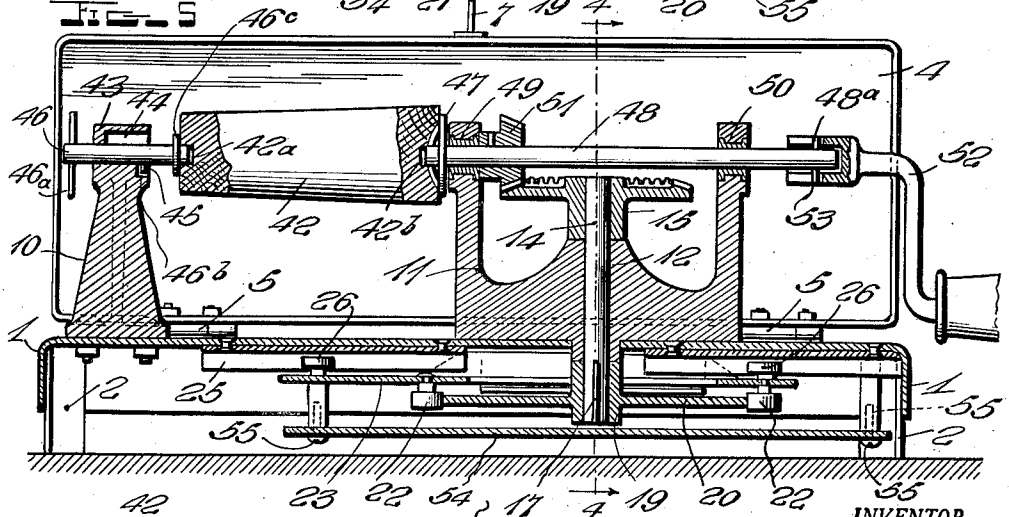


FIG. 5



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BY

John O. Brady

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FIG. 21

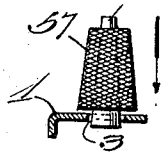
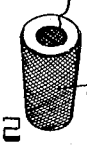


FIG. 22



Oct. 11, 1938. O. I. PRICE 2,132,698

PORTABLE REWINDING MACHINE

Filed June 25, 1936 7 Sheets-Sheet 2

FIG. 2

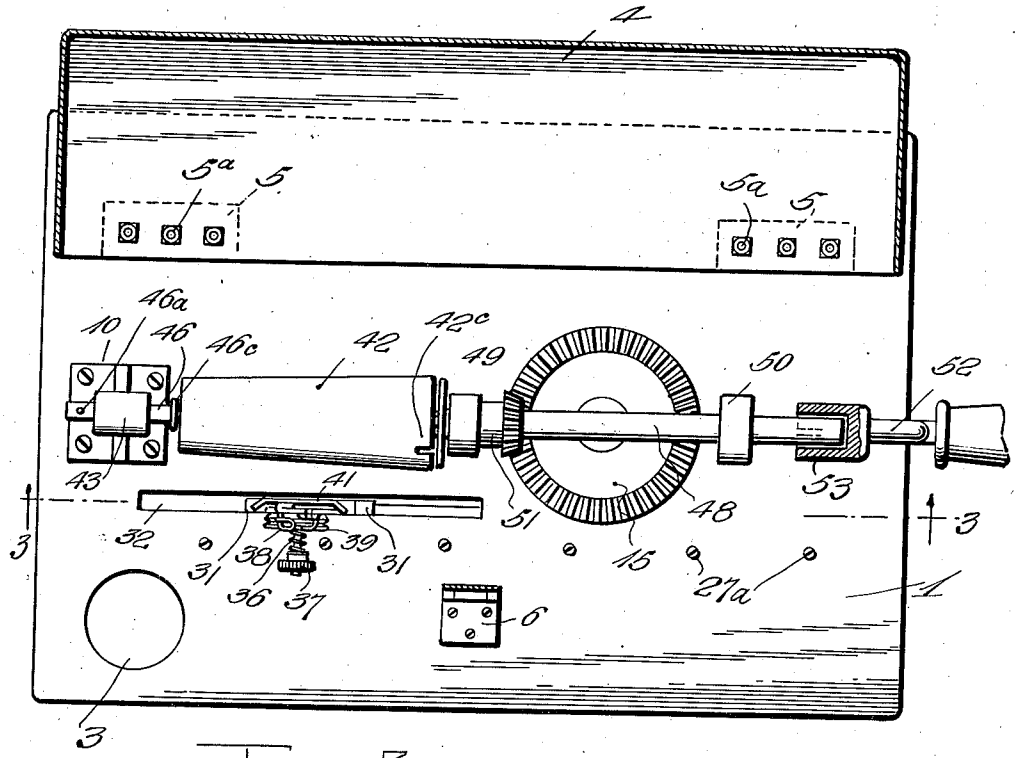


FIG. 3

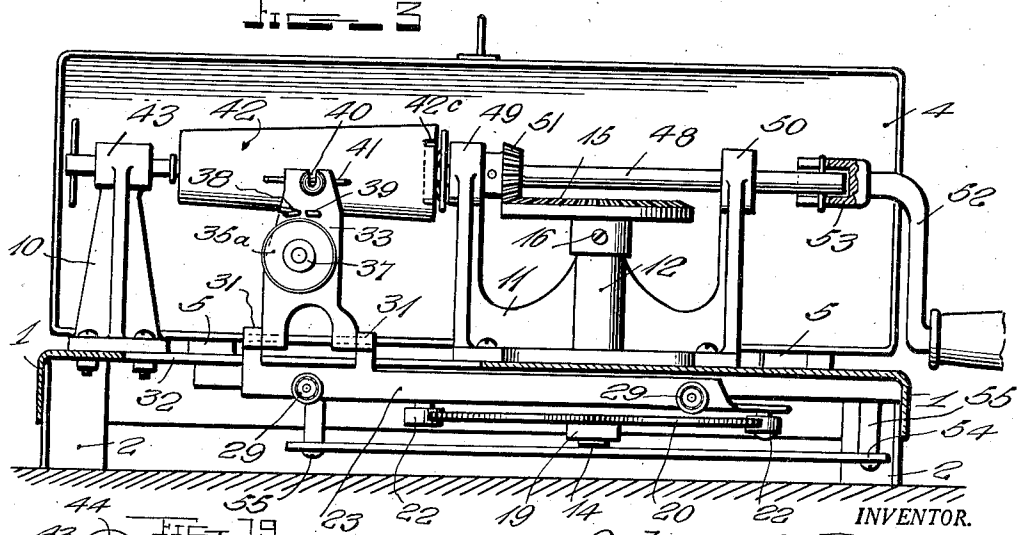


FIG. 19

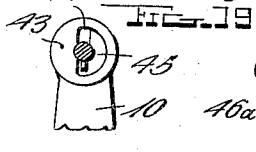
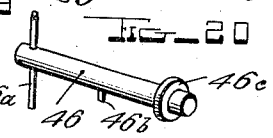


FIG. 20



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Oct. 11, 1938. O. I. PRICE 2,132,698

PORTABLE REWINDING MACHINE

Filed June 25, 1936 7 Sheets-Sheet 3

FIG. 6

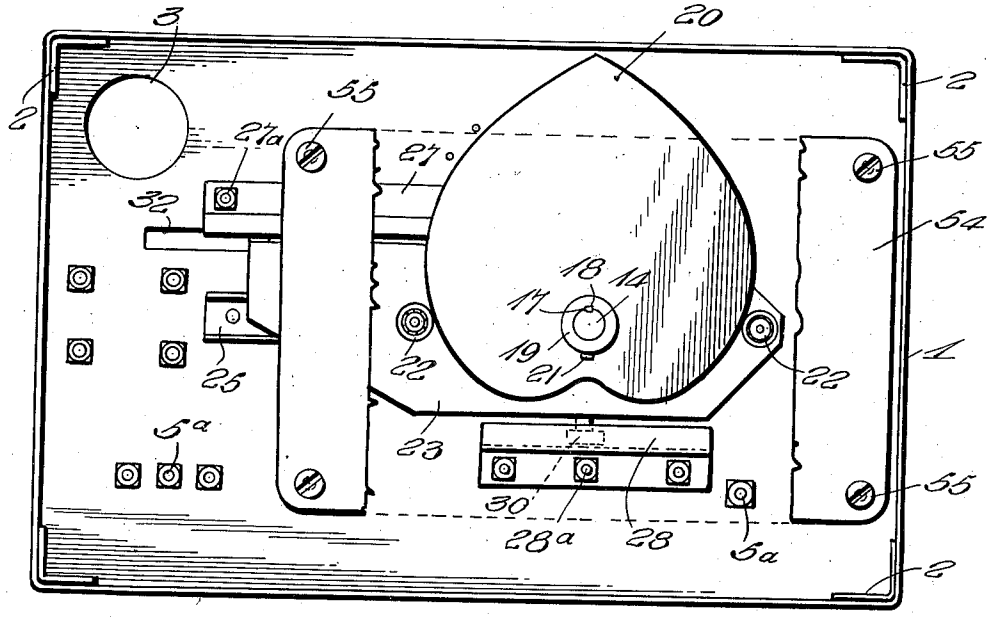


FIG. 7

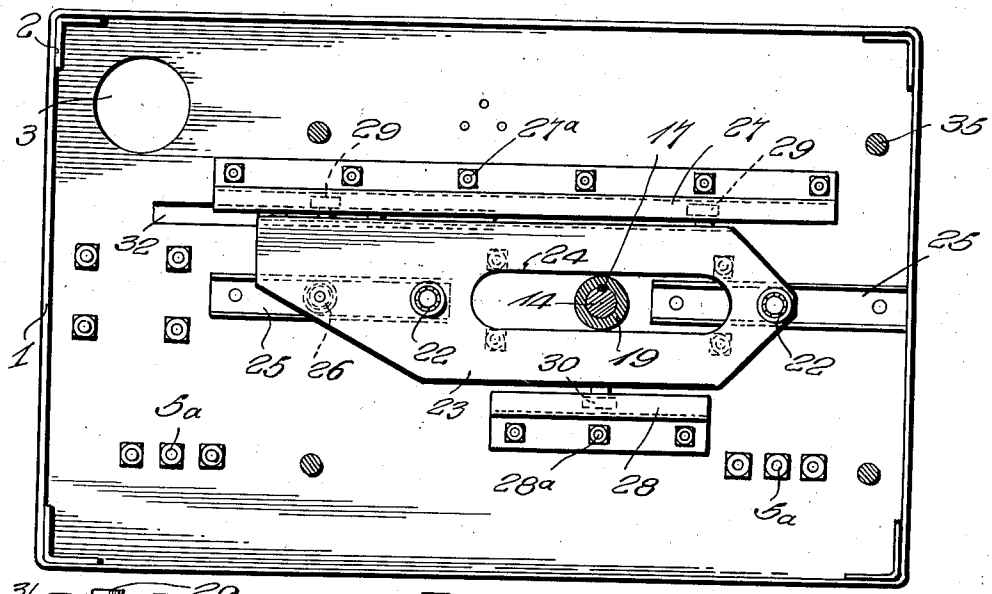


FIG. 8

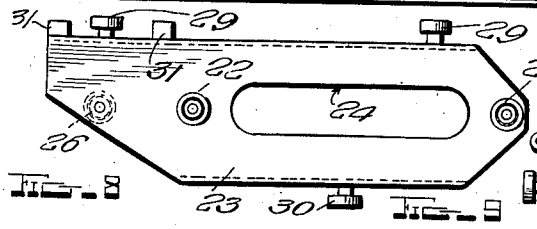
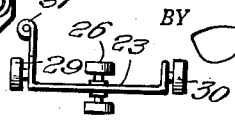


FIG. 9

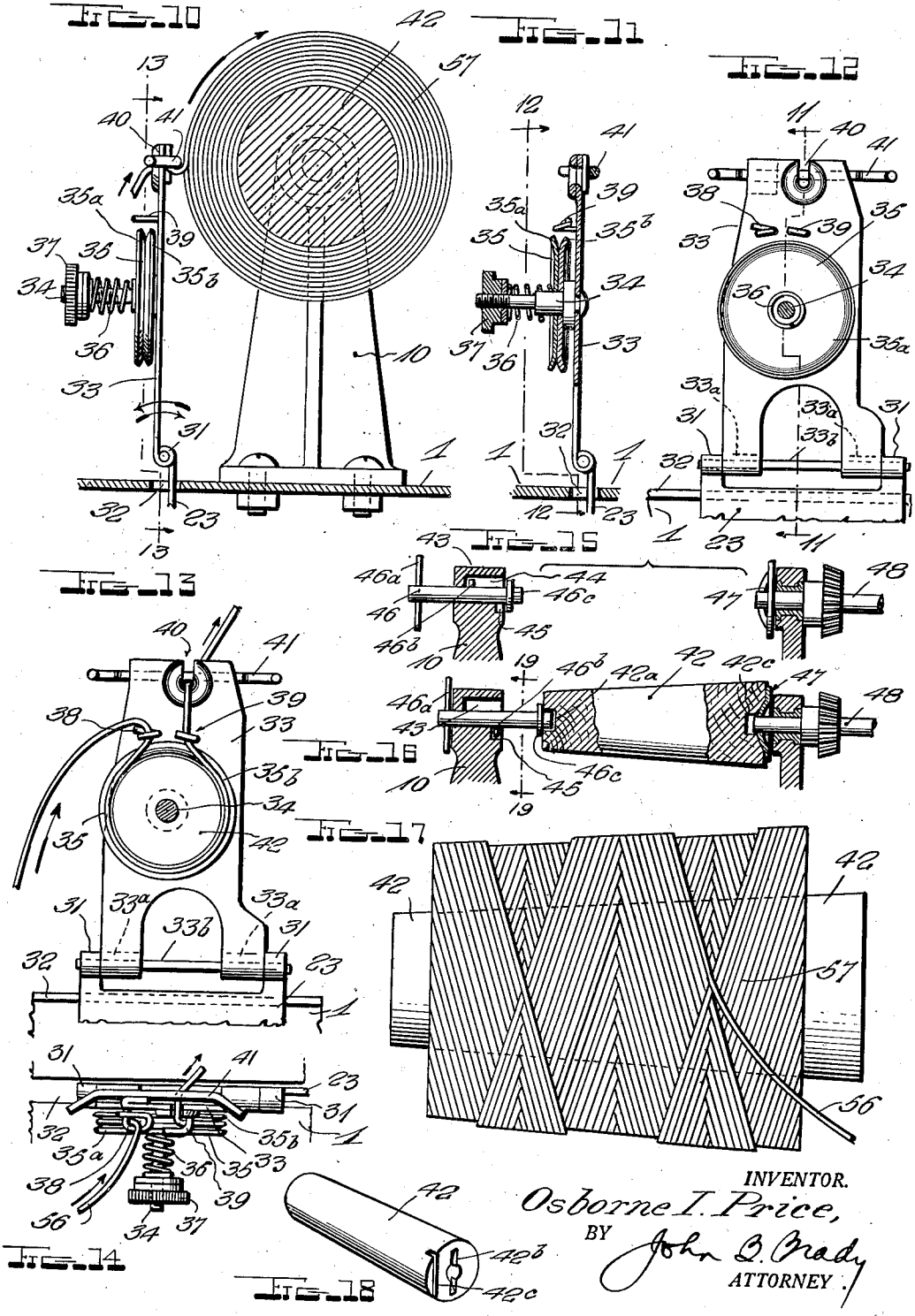


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Oct. 11, 1938. O. I. PRICE 2,132,698

PORTABLE REWINDING MACHINE

Filed June 25, 1936 7 Sheets-Sheet 4



Oct. 11, 1938. O. I. PRICE 2,132,698

PORTABLE REWINDING MACHINE

Filed June 25, 1936 7 Sheets-Sheet 5

FIG. 28

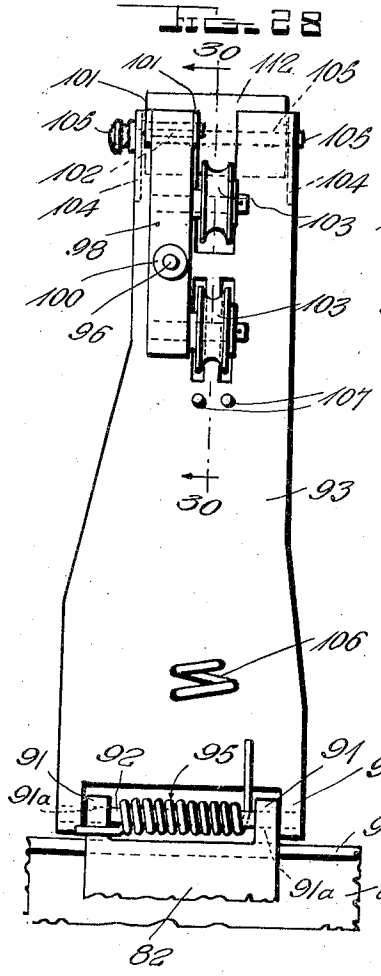


FIG. 29

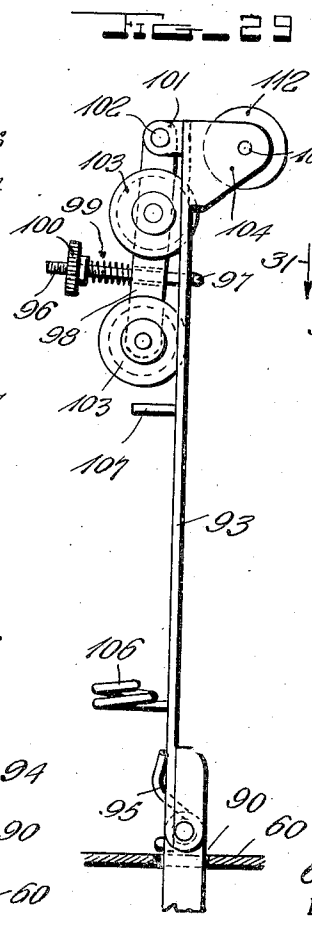


FIG. 30

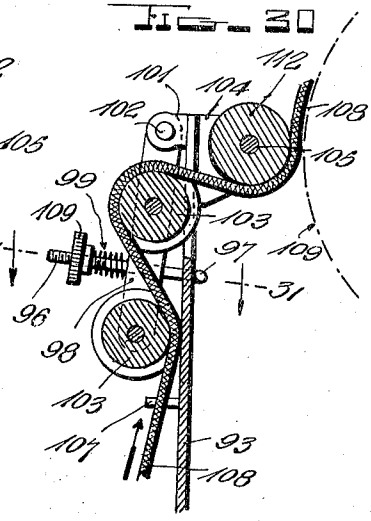


FIG. 31

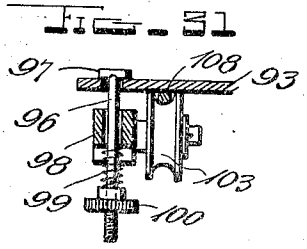
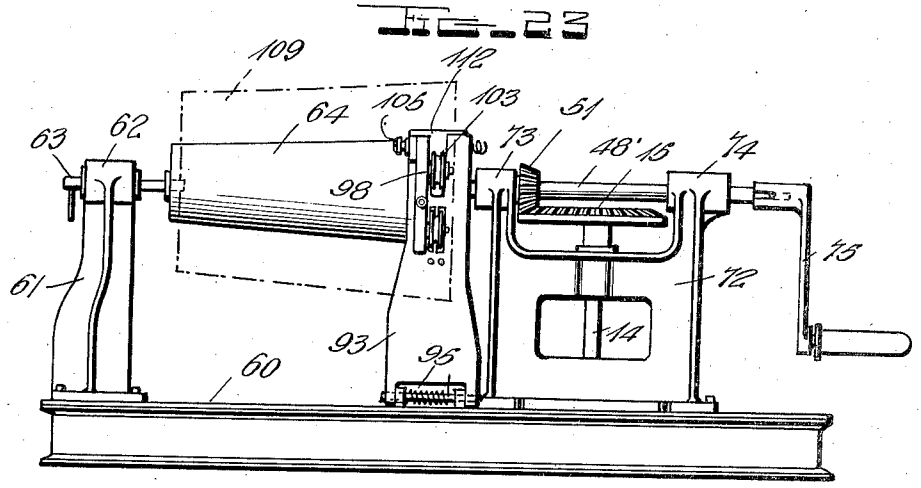


FIG. 23



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Oct. 11, 1938. O. I. PRICE 2,132,698

PORTABLE REWINDING MACHINE

Filed June 25, 1936 7 Sheets-Sheet 6

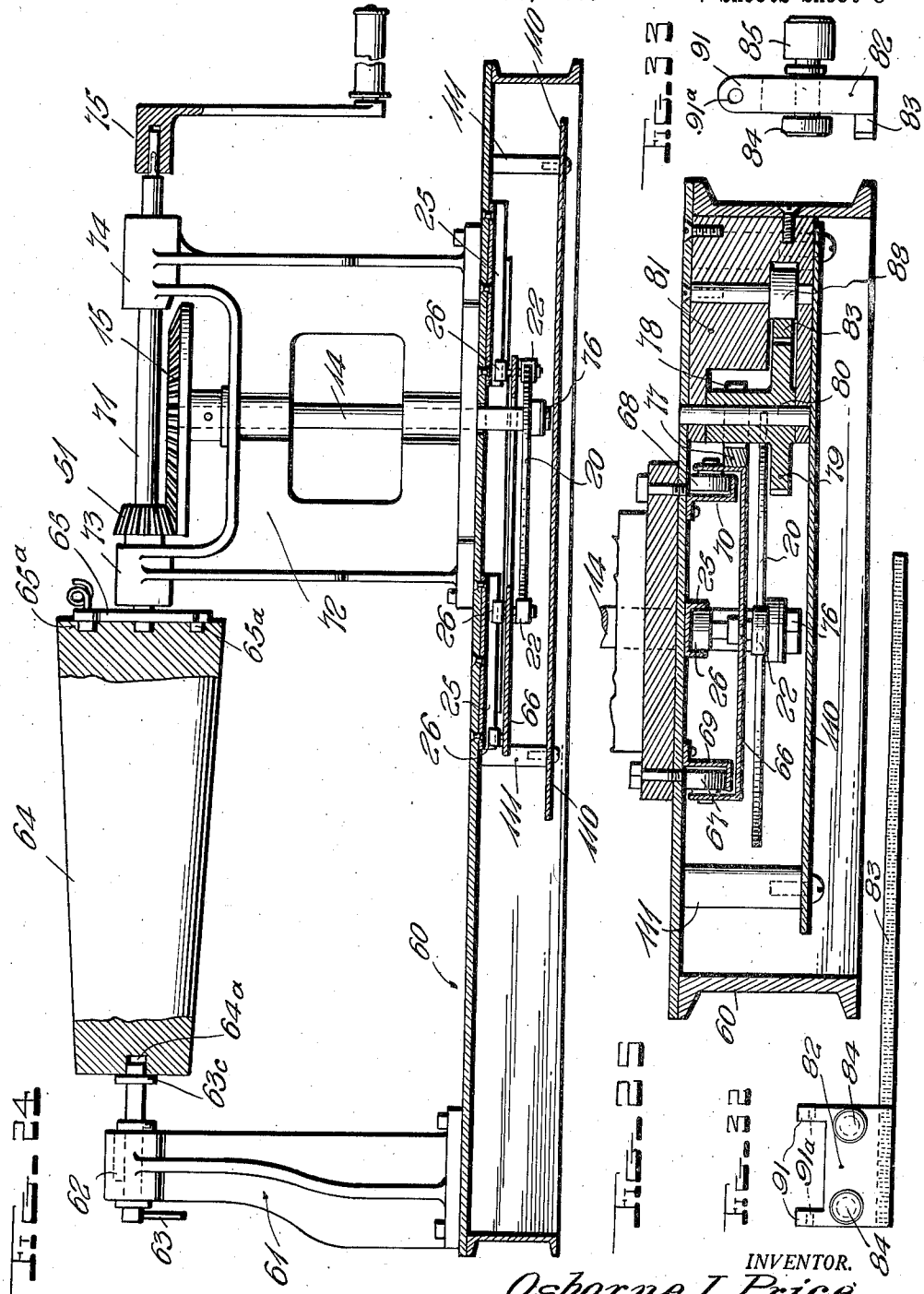


FIG. 24

FIG. 25

FIG. 32

FIG. 33

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Oct. 11, 1938. O. I. PRICE 2,132,698

PORTABLE REWINDING MACHINE

Filed June 25, 1936 7 Sheets-Sheet 7

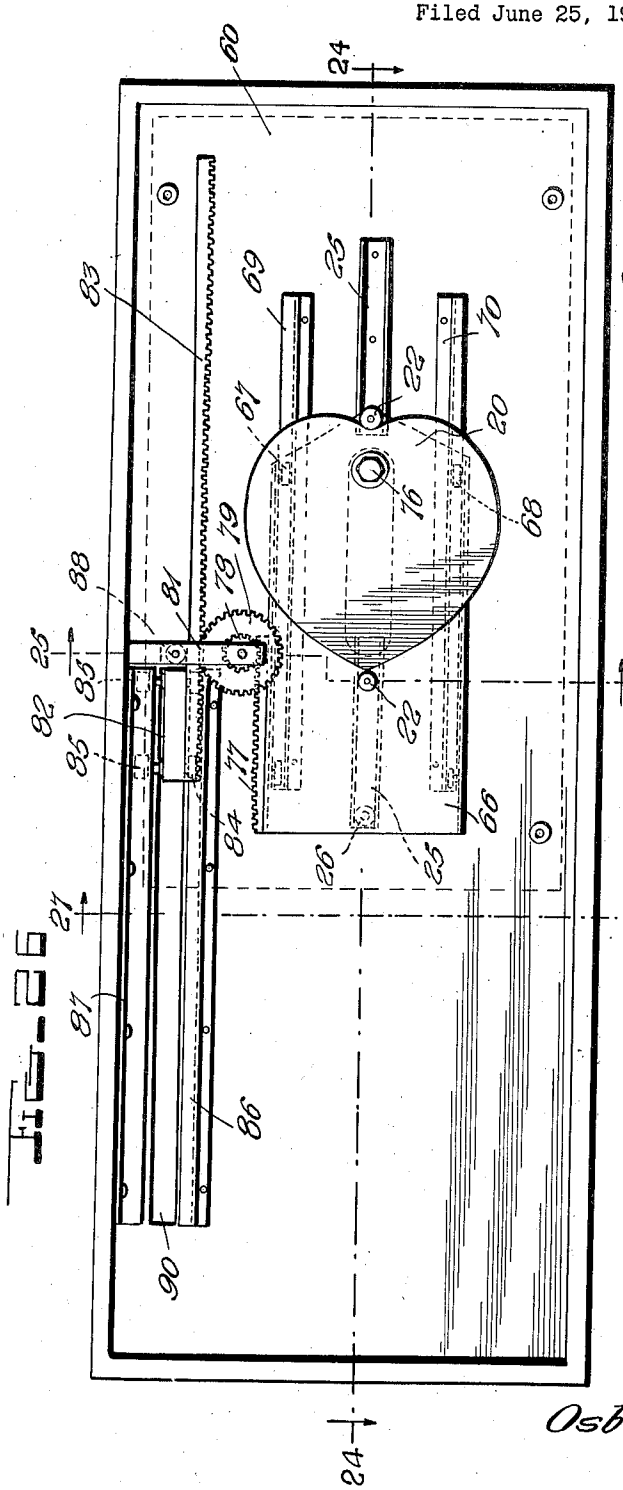


Fig. 26

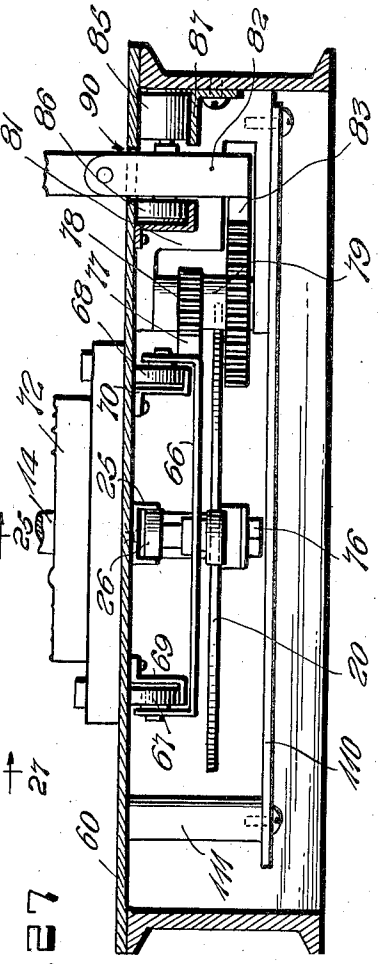


Fig. 27

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Patented Oct. 11, 1938 2,132,698

UNITED STATES PATENT OFFICE

2,132,698

PORTABLE REWINDING MACHINE

Osborne I. Price, Frederick, Md.

Application June 25, 1936, Serial No. 87,303

5 Claims. (Cl. 242—1)

My invention relates broadly to line-throwing equipment and more particularly to a portable rewinding machine for rewinding lines after they have been projected.

One of the objects of my invention is to provide a construction of portable rewinding machine for lines, which is simple in its construction and relatively light in weight and which is adapted to quickly rewind a line after it has been projected.

Another object of my invention is to provide a construction of rewinding machine for lines having means for accurately guiding the line upon the storage spindle in a rewinding process for insuring the quick return of the line to the spindle, with minimum entanglement of the line.

Still another object of my invention is to provide a construction of tensioning means for uniformly guiding a line upon the storage spindle of a portable rewinding machine for insuring quick restoration of the line to the spindle in uniformly tight loops about the spindle.

A further object of my invention is to provide a construction of cam mechanism, operative through a reduction gear for controlling the reciprocatory travel of a line guide with respect to the line storage spindle.

A still further object of my invention is to provide an arrangement of rack and pinion system, interposed between the reciprocatory cam control mechanism and the line guide in a rewinding machine for predetermining the rate of travel of the line guide with respect to the rotation of the line storage spindle.

Still another object of my invention resides in the construction of light, compact and portable line rewinding machine, which may be readily moved into position upon the deck of a ship, for rewinding a projected line, and suitably housed for protection of the moving parts against the elements.

Other and further objects of my invention reside in a construction of portable machine for rewinding line as set forth more fully in the specification hereinafter following by reference to the accompanying drawings in which:

Figure 1 is a perspective view of a kit containing the rewinding machine for line-throwing equipment; Fig. 2 is a top plan view on an enlarged scale; Fig. 3 is a longitudinal sectional view taken on line **3—3** of Fig. 2; Fig. 4 is a transverse vertical section taken on line **4—4** of Fig. 5; Fig. 5 is a longitudinal sectional view taken substantially on a line with the line storage spindle and associated parts; Fig. 6 is a bottom plan view with parts broken away, to more particularly show the cardioid shaped cam for causing the reciprocating movement of the line guide carriage; Fig. 7 is a similar view showing more particularly the reciprocating line guide carriage; Fig. 8 is a detailed plan view of the reciprocating line guide carriage; Fig. 9 is an end view; Fig. 10 is a transverse vertical section through the line storage spindle and associated parts; Fig. 11 is a transverse vertical section taken on line **11—11** of Fig. 12; Fig. 12 is a vertical sectional view taken on line **12—12** of Fig. 11; Fig. 13 is a vertical sectional view taken on line **13—13** of Fig. 10; Fig. 14 is a top plan view thereof; Fig. 15 is a sectional view showing more particularly the locking of the line storage spindle, the parts being shown in a position they assume before the insertion of the line storage spindle; Fig. 16 is a similar view after the insertion of the line storage spindle; Fig. 17 is a detailed view on an enlarged scale showing the line completely wound on the line storage spindle; Fig. 18 is a detailed perspective view of the line storage spindle; Fig. 19 is a detailed transverse vertical sectional view on line **19—19** of Fig. 16; Fig. 20 is a perspective view of the winding key; Fig. 21 is a sectional view showing more particularly the manner of removing the wound coil of line from the line storage spindle; Fig. 22 is a perspective view of the coil of line removed from the line storage spindle and ready to be inserted in an appropriate canister to be subsequently shot from a rifle; Fig. 23 is a side elevational view of a modified form of my invention; Fig. 24 is a central vertical longitudinal sectional view taken on line **24—24** of Fig. 26; Fig. 25 is a transverse vertical sectional view on an enlarged scale taken on line **25—25** of Fig. 26; Fig. 26 is a bottom plan view with the protection cover plate removed; Fig. 27 is a transverse vertical sectional view taken on line **27—27** of Fig. 26; Fig. 28 is a front elevation on an enlarged scale of the rope tensioning device and line packing roller; Fig. 29 is a side elevation thereof; Fig. 30 is a fragmentary vertical sectional view taken on line **30—30** of Fig. 28, the rope being shown in its place around the guide pulleys and passing around the line packing roller to be wound as a coil on the line storage spindle; Fig. 31 is a horizontal section taken on line **31—31** of Fig. 30; Fig. 32 is a side elevation of the line guide carriage and its associated gear rack; and Fig. 33 is an end elevation thereof.

My invention is directed to a rewinding machine which will efficiently wind the shot line within a very brief time interval. In Coast Guard operations and other marine activities, it is often necessary to project a lifeline or a line by which a lifeline may be hawled across a given distance. After the line has been used, the line may be subject to entanglement and knotting. However, with the machine of my invention, the line may be quickly rewound so as to be ready for instant use for the next shot. The rewinding apparatus of my invention is readily portable and is extremely light in weight so that the apparatus may be shifted to any desired position for use on the deck of a vessel or in places where space is limited. The mechanism is extremely simple so that the manufacture of the apparatus is inexpensive and there are but few parts to be replaced because of wear. I provide several different forms of my invention and for the purpose of illustration, I have shown two of these forms. One form of the invention comprises a small lightweight machine capable of rewinding a rope of relatively small size of a length of from 500 to 700 feet within a very short time. In the larger size rewinding machine illustrated herein, the rewinding mandrel or spindle will accommodate a much heavier rope of much greater length. Because of the difference in size of the rope adapted to be rewound by the different machines, the larger size machines are equipped with a driving gear for the rope guide adapted to drive the rope guide a greater distance and at a different rate than is the case with the rope guide in the smaller size machine. For this purpose, I provide a gear rack and pinion system interposed between the reciprocatory mechanism which carries the rope guide and the rope guide immediately adjacent the coil of rope on the spindle. The reciprocatory mechanism includes a cardioid shaped cam adapted to reciprocate the guide mechanism adjacent the spindle on which the rope is coiled. The spindle includes special means for retaining the rope in position thereon and special means for tensioning the rope as it is guided upon the coil carried by the spindle. For handling different size rope, I provide different kinds of tensioning means. For the smaller rope, I may provide guide and tensioning means which are very compact. For the larger size rope, I provide tensioning and guide means adjustable in position and adapted to guide the rope in proper tension upon the coil.

Referring to the drawings in detail, reference character 1 indicates the base of one form of the rewinding machine of my invention. The base 1 is pressed from sheet metal and is supported by the metallic angle members 2 forming supporting feet. There is an aperture 3 in one corner of the base which serves to receive the storage roller in removing the coil therefrom when it is desired to take off the coiled rope which has been received on the storage roller or mandrel. I provide a cover 4 which serves to protect the rewinding equipment from the elements and the weather and the sea. The cover 4 provides an enclosure which is hinged at 5 by means of hinges secured to the base 1 through means indicated at 5a. A hasp 6 is secured to the base 1 and is adapted to be looped over the hook 8 on the cover 4. A suitable catch 7 is adapted to be latched through the loop 8 in order to maintain the cover 4 in position. A handle 9 is arranged for carrying the rewinding equipment. The base 1 carries a standard 10 adjacent one end thereof and a triple standard 11 adjacent the other end thereof as shown. There is a central vertical bearing extending through the triple standard 11 as shown at 12 and in the bearing 12, there is journaled a vertical shaft 14.

The vertical shaft 14 carries a bevel gear 15 at the upper extremity thereof secured by any suitable means such as set screw 16 whereby the beveled gear 15 is adapted to be moved in unison with the shaft 14. That is to say, by driving gear 15, rotary motion is imparted to the central shaft 14. There is a keyway 17 which is adapted to be aligned with a keyway 18 formed in the hub 19 of the cardioid shaped cam indicated at 20. The hub 19 of the cardioid shaped cam 20 is adapted to be secured to shaft 14 by suitable means such as set screw 21 which coacts with a key which fits between the keyways 17 and 18 for positively locking the cardioid shaped cam 20 with respect to the rotatable shaft 14. The cardioid shaped cam shown at 20 is adapted to drive a cam driven car which I have indicated at 23 through the agency of a pair of cam followers or rollers indicated at 22. There is a longitudinally extending central slot 24 in the cam driven car 23 through which the shaft 14 and the surrounding hub 19 of the cardioid shaped cam 20 extends. I provide a pair of aligned U-shaped tracks 25 which are secured to the under side of the base 1 and have their side flanges depending downwardly to provide a pair of rail guides for the rollers 26 and the upper side of the cam driven car 23. That is to say, the rollers 26 engage within the U shaped tracks 25 so that the cam driven car 23 is adapted to be reciprocated longitudinally of the base 1 as the cam 20 rotates and engages the cam follower rollers 22. It will be observed that one of the rollers 26 is directly above one of the depending rollers 22 driven by the cardioid shaped cam 20. The other roller 26 is located adjacent the opposite end of the cam driven car 23 and serves to maintain the cam driven car in a predetermined path as the cardioid shaped cam 20 rotates. In order to assure the precision movement of the cam driven car 23, I provide a pair of track members on opposite sides of the cam driven car 23. A relatively long track member is shown at 27 which is a substantially Z type track for the line guide carriage at the long side of the line guide carriage. I provide a relatively shorter track 28 of the same Z type section for the shorter side of the line guide carriage. The rails 27 and 28 are secured to the base 1 by suitable means such as securing screws with attached nuts indicated at 27a and 28a passing through the base 1 for securing the rails 27 and 28 to the under side of the base 1. The carriage 23 is provided with rollers 29 on the longer side thereof engaging rail 27 and roller 30 on the opposite side thereof engaging rail 28. The line guide which is reciprocated by the line guide carriage 33 is driven by suitable attachment means indicated at 31 which extend through the base 1 passing through the longitudinally extending slot shown at 32.

The slot 32 extends along base 1 for the entire length of the reciprocating path of the line guide which I have shown at 33. The line guide 33 will be more clearly understood by reference to Figs. 2, 3, and 10–14. Line guide carriage 33 carries extension lugs 33a thereon which are adapted to be engaged with respect to the upwardly extending attachment means 31 projecting upwardly through base 1 from the line guide carriage 33. The extension means 33a connect

to the projection 31 by means of a pin 33b extending through the said projection 31 and lugs 33a in such manner that carriage 33 is permitted to rock angularly about the connecting attachment means 31 and laterally with respect to the coil of rope on the line storage roller 42.

The line guide carriage 33 carries a stud 34 projecting laterally therefrom and on which the line tensioning device 35 is mounted. The line tensioning device 35 is made up of two coacting members 35a and 35b which are pressed into continuous engagement to form a pulley around which the line is directed. The parts 35a and 35b are pressed into engagement by the soil spring 36, the tension on which is adjusted by means of adjustable screw 37 engaging screw threads on the stud 34. The line guide 33 also carries an eye 38 for guiding the line before it enters, and an eye 39 for guiding the line after it leaves the tensioning pulley 35. There is a line guide slot 40 in the line guide carriage 33. A packing roller engaging means and line guide shown at 41 is carried by the upper extremity of the line guide carriage 33 for continuously guiding the line and engaging the line on the line storage roller during the operation of the rewinding mechanism.

The line storage roller is shown at 42 and as illustrated more particularly in Fig. 18, there is an end slot 42c therein in which the end of the rope may be engaged before the coiling operation is commenced. The line storage roller 42 has the opposite ends thereof recessed as shown more particularly in Fig. 16 from which it will be seen that there is an end recess 42a in one end and a slot and recess 42b in the other end of the roller 42. It will be observed that recess 42a is substantially clindrical whereas recess 42b is substantially cylindrical with a radially extending slot on either side for engagement by the driving spindle head shown at 47. The standard 10 as shown more particularly in Figs. 15 and 16 carries a locking head 43 thereon which includes a locking slot 44 and a semicircular recess 45. A winding key 46 extends through the axial bore through the locking head 43. The winding key 46 includes a handle grip shown at 46a and illustrated more particularly in Fig. 20, and a pin 46b substantially midway of the length thereof and an end flange 46c which allows the end of the winding key to extend into the recess 42a in the storage roller 42.

As heretofore pointed out, the driving spindle head 47 engages the slot 42b in storage roller 42 for driving the storage roller 42 about the recess 42a and the projecting end of the winding key 46 as illustrated in Fig. 16. The driving spindle head 47 is operated by the driving spindle shaft shown at 48. The driving spindle shaft 48 is mounted in journals 49 and 50 in the triple standard 11. There is a pin 48a in the end of driving spindle shaft 48 which is adapted to be engaged with the socket of a driving crank 52. The socket of the driving crank 52 is slotted as indicated at 53 for engaging the ends of the pin 48a and allowing the driving spindle shaft to be rotated to impart rotary movement to the driving spindle head 47 for correspondingly driving the line storage roller 42.

There is a protective plate 54 supported by means of pedestal members and coacting screws indicated at 55 from the under side of base 1. The plate 54 serves to protect all of the moving parts of the cardioid shaped cam mechanism and cam driven car 23. The driving spindle shaft 48 carries a bevel gear 51 which is keyed to the driving shaft and is adapted to mesh with the bevel gear 15 heretofore described. Rotary motion imparted to crank 52 is accordingly transmitted both to the line storage roller 42 and to the cardioid shaped cam 20 which in turn moves the cam driven car 23 through cam followers 22 for imparting movement to the line guide carriage 33 which in turn feeds the rope or line 56 upon the mandrel or line storage roller 42. The movement of the line guide carriage 33 is originally set so that the line guide carriage reciprocates as the line is fed from one end of the coil to the other end thereof. The coil is built up on the line storage roller 42 in the shape illustrated more particularly in Figs. 21 and 22. The line is rewound rapidly upon the storage roller 42. It may be desirable to remove the coil 57 from the storage roller 42 in which event the storage roller is projected through the aperture 3 in base 1 as illustrated in Fig. 21 with the end of the coil 57 resting against base 1 and the storage roller driven out of the coil 57 and removed therefrom.

I have found the rewinding machine as hereinbefore described highly practical in construction and adapted for rewinding relatively light lines rapidly. There are instances where a much heavier line must be handled and in such cases I provide a larger and heavier construction of rewinding machine. As illustrative of the larger machine, reference is made to Figs. 23–33.

The base of the larger machine is indicated at 60 mounted upon suitable channel beams which greatly strengthen the base structure. The construction of the large size rewinding machine is with two major exceptions substantially the same as that of the smaller rewinding machine. The two machines have different constructions of line guides. In the larger machine, there is a multiplied drive for the line guide carriage. This multiplied drive makes it possible to use the same size cam in the large machine as is used in the smaller machine to obtain the much longer axial length of winding required on the larger size machine. That is to say, the same tools may be employed for constructing the reciprocatory driving mechanism in both machines and yet a sturdier and a longer path drive obtained in the larger size machine by means of the mechanism hereinafter explained.

I provide a standard 61 adjacent one end of the base 60. There is a bearing 62 in the head of the standard 61 through which the winding key 63 extends. The winding key 63 as shown more particularly in Fig. 24 has a flange 63c thereon which limits the distance into which the end of the winding key projects into the recess 64a in the end of the line storage roller 64. The recess 64a is substantially cylindrical in shape and receives the end of the winding key 63.

The driving head 65 which imparts movement to the mandrel or spindle 64 is driven by the driving spindle shaft shown at 71 which is journaled in substantially the same manner as is the driving spindle shaft 48 in the form of my invention heretofore described. In the larger size machine, however, the supporting parts and bearings are substantially larger and more rugged. I have shown at 72 the triple standard which provides bearings 73 and 74 for the driving spindle shaft 71. The shaft 71 is driven through the crank 75 which may be connected with the driving spindle shaft 71 when required. The central portion of the standard 72 provides a bearing for the central shaft which is the equivalent of shaft 14 in the earlier form of my invention and

which I have designated by a similar number in the modified form thereof. The shaft 14 carries the bevel gear 15 which meshes with the bevel gear 51 on the driving spindle shaft 71. The lower end of the shaft 14 connects with the cardioid shaped cam 20 in much the same manner as heretofore described, except in this instance, I provide an end securing means 76 for insuring a substantial connection between shaft 14 and the cardioid shaped cam 20. The reciprocating cam driven car has been shown at 66 mounted in much the same manner as the car 23 in the previous form of my invention. The car 66 is provided with a pair of follower rollers 22 which engage the cam 20 and allow the reciprocatory car 66 to be shifted back and forth. On the upper surface of the car 66, I mount rollers 26 which engage the depending channel shaped members 25 in order to guide the cam driven car in its reciprocatory path. Because of the heavy construction of car 66, I increase the number of guide rollers 26 as indicated in the drawings in this form of my invention. The side walls of the car 66 are bent upwardly and serve to carry the roller members 67 and 68. The roller members 67 and 68 operate in the Z shaped rails 69 and 70 secured to the under side of the base support shown at 60. The cam driven car 66 is thus free to be driven in a reciprocatory path back and forth in order to operate the rope guide means as hereinafter more fully described.

The cam driven car 66 carries a rack member 77 on one side thereof as shown more clearly in Fig. 26. The rack 77 engages a pinion 78 carried on the same hub or shaft as is the larger gear 79 which is driven simultaneously with the movement of the pinion 78. The pinion 78 and gear 79 are mounted on a hub which is journaled or pivoted about a stub shaft 80 which is carried by the frame 81 serving as a journal for the shaft 80. The gear 79 meshes with an extended rack 83 which connects at one end with the drive 82 for the line guide carriage. The rack 83 is maintained in engagement with the gear 79 by the action of roller 88 operating against the rear of rack 83 as the rack 83 reciprocates. The drive 82 for the line guide carriage is operated in a reciprocatory path under control of the guide rails 86 and 87 secured to the frame structure 60. The drive 82 carries a set of rollers 84 and 85 which engage the guide rails 86 and 87 for allowing the guide 82 to be driven in a reciprocatory path. There is a slot 90 in the base structure 60 through which lugs 91 on the drive 82 project. The lugs 91 are apertured at 91*a* to allow a pin 92 to extend therethrough and serve as a connecting means for the lugs 94 on the body of the line guide carriage 93 shown more particularly in Figs. 28 and 29.

The line guide carriage 93 is provided with a tension spring adjusting screw shown at 96. The screw 96 is provided with a swivel head 97 which bears against the roller of the line guide carriage 93 and allows the member 96 to rock to various angular positions in order that the body structure 98 of the line tensioning device may shift to various positions. The member 96 is provided with a tension spring 99 which bears against the body structure 98 of the line tensioning device. An adjusting screw 100 is adapted to be adjusted with respect to spring 99 for predetermining the spring pressure exerted against the body structure 98 and accordingly tensioning the line as it is rewound upon the mandrel or spindle 64. The line guide carriage 93 is provided with outstanding lug members 101 adjacent the top thereof which serve as a hinge for the body structure 98 of the line tensioning device. A pin 102 extends through the body structure 98 and the lugs 101 for hingedly supporting the body structure 98 with respect to the line guide carriage 93. The line guide carriage 93 is also provided with rearwardly extending lugs or projections 104 which serve as a pivot means for the line tracking roller shown at 112. The line tracking roller 112 is secured between the projection members 104 by means of the removable line tracking roller spindle 105.

The line guide carriage 93 carries a line guide member 106 and a pair of line guide members 107 for directing the line 108 under the first of the guide rollers 103. The line extends between the guide rollers shown at 103. That is to say, the line 108 extends under the lower roller 103 and over the upper roller 103 carried by the body structure 98 of the line tensioning device and then extends under the line tracking roller 112 from which the line is distributed to the coil shown at 109. The rope is rewound on the mandrel or spindle 64 into a coil 109 in the same manner as heretofore described. When the rope is rewound on the mandrel or spindle, it may be removed as a complete coil as heretofore described in connection with Fig. 21 and Fig. 22. It will be observed that the line tracking roller 112 is relatively wide. There is no central groove in the line tracking roller 112 so that the rope is permitted to change in its angular position as the rope is supplied to the coil on the mandrel or spindle. That is to say, the rope may assume various angular positions as the rewinding operation proceeds. The rewinding is generally conducted at relatively high speeds and it is possible to restore the mandrel within a very brief interval even when the rope is of very long length such as lengths of 2100 feet. I have accomplished such rewinding of relatively heavy rope of lengths of 2100 feet in such intervals of time as seven minutes which is an accomplishment which greatly facilitates the use of the rewinding apparatus with line throwing equipment in lifesaving operations.

As in the earlier form of my construction, I provide a protective plate beneath the moving mechanism. I have shown the plate at 110 secured by suitable means 111 to the under surface of the supporting frame 60.

The tandem multiplying gears 78—79 are arranged one above the other on a common hub. The smaller of these two gears, that is, 78, engages the short rack 77 attached to the cam driven car 66. The larger gear 79 engages the long rack 83 attached to the line guide carriage 93. The "throw" of the cam is transmitted to the multiplying gears by the short gear rack 77. The "throw" of the cam is multiplied and reversed in these gears as the motion is transmitted to the long gear rack 83 and line-guide carriage 93. The multiplying factor of these gears is equal to the ratio of the larger to the smaller of their pitch diameters.

By virtue of the flat construction of the cardioid shaped cam 20 and the compactness of the parts associated therewith, the base of the machine is of relatively low height. The operation of the reciprocatory mechanism is such that for continuous driving of the storage roller, reciprocation of the line guide is effected, automatically reversing as the end of the coil is reached.

I have found the rewinding equipment of my invention highly practical in its manufacture, production and operation. The line rewinding equipment has been coordinated with various forms of line throwing equipment to provide a complete assembly of apparatus highly convenient in lifesaving operations. I realize, however, that my invention may assume various forms and in illustrating my invention in two of its preferred forms, I have not intended to limit myself to the constructions illustrated. I fully understand that modifications may be made and I intend no limitations upon my invention other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. Rewinding apparatus for projected life lines comprising in combination with a rotatable line storage roller, means for directing a line in wrapped arrangement upon said line storage roller, said means including a supporting member operative in a reciprocatory path parallel to the axis of said rotatable line storage roller, a line tracking roller journaled on one side of said supporting member, a pair of aligned guide rollers journaled on the opposite side of said supporting member in series relation for guiding a projected line under said line tracking roller and upon said rotatable line storage roller, and means including one of said guide rollers for applying tension to said line.

2. In a rewinding apparatus for projected life lines, a base structure, a line storage roller rotatably journaled with respect to said base structure, means for rotatably driving said rotatable line storage roller, a line guide mounted for reciprocatory movement in a path parallel to the axis of said line storage roller, means for imparting reciprocatory movement to said line guide simultaneously with the rotation of said line storage roller, a line tracking roller journaled with respect to one side of said line guide and operative against the line coiled upon said line storage roller, a pair of guide rollers disposed in series relation and in alignment with each other adjacent the other side of said line guide whereby a line may be directed between said guide rollers and under said line tracking roller, and means including one of said guide rollers for applying tension to said line whereby the projected line may be rewound evenly upon said line storage roller.

3. In a rewinding apparatus for projected life lines, a base structure, a line storage roller rotatably journaled with respect to said base structure, means for rotatably driving said rotatable line storage roller, a line guide mounted for reciprocatory movement in a path parallel to the axis of said line storage roller, means for imparting reciprocatory movement to said line guide simultaneously with the rotation of said line storage roller, a line tracking roller journaled with respect to one side of said line guide, a supporting block pivotally mounted from a position adjacent the top of said line guide and on the side thereof opposite said line tracking roller, a pair of line guide rollers journaled in said supporting block and in alignment with each other, and means mounted on said line guide for directing a line between said line guide rollers whereby the projected line may be rewound upon said line storage roller.

4. In a rewinding apparatus for projected life lines, a base structure, a line storage roller rotatably journaled with respect to said base structure, means for rotatably driving said rotatable line storage roller, a line guide mounted for reciprocatory movement in a path parallel to the axis of said line storage roller, means for imparting reciprocatory movement to said line guide simultaneously with the rotation of said line storage roller, a line tracking roller journaled with respect to one side of said line guide, a supporting block pivotally mounted from a position adjacent the top of said line guide and on the side thereof opposite said line tracking roller, a pair of line guide rollers journaled in said supporting block and in alignment with each other, means mounted on said line guide for directing a line between said line guide rollers whereby the projected line may be rewound upon said line storage roller, and adjustable spring means disposed between said supporting block and said line guide for frictionally restraining said line between one of said guide rollers and said line guide.

5. In rewinding apparatus employing a rotatable line storage roller, a support for one end of said roller comprising a standard apertured adjacent the end thereof, a stud shaft member slidably mounted in said aperture and adapted to engage one end of said roller, said standard having a slot therein communicating with and parallel to the axis of the said aperture therein, a pin fixed in said stud shaft member and adapted to enter said slot as said shaft member is retracted for freeing said line storage roller, and a recess in the face of said standard adapted to receive said pin when the said shaft member is in engagement with said roller for maintaining said shaft member in engagement therewith.

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