

H. E. OLSEN & E. A. SCHMIDT.
MACHINE FOR WIRING CORKS IN BOTTLES.
APPLICATION FILED AUG. 6, 1908.

992,240.

Patented May 16, 1911.

3 SHEETS—SHEET 1.

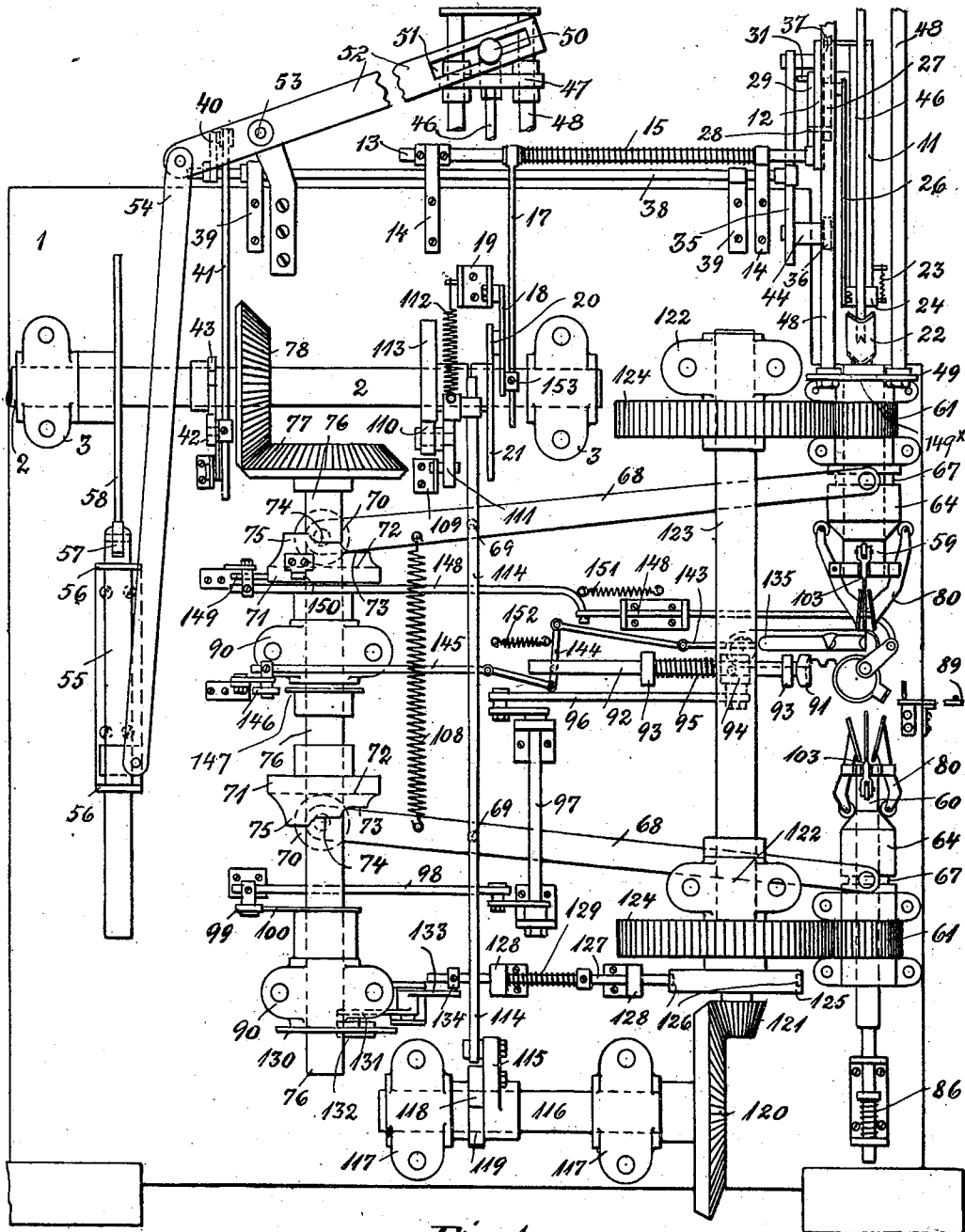


Fig. 1.

Witnesses:

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F. H. Logan

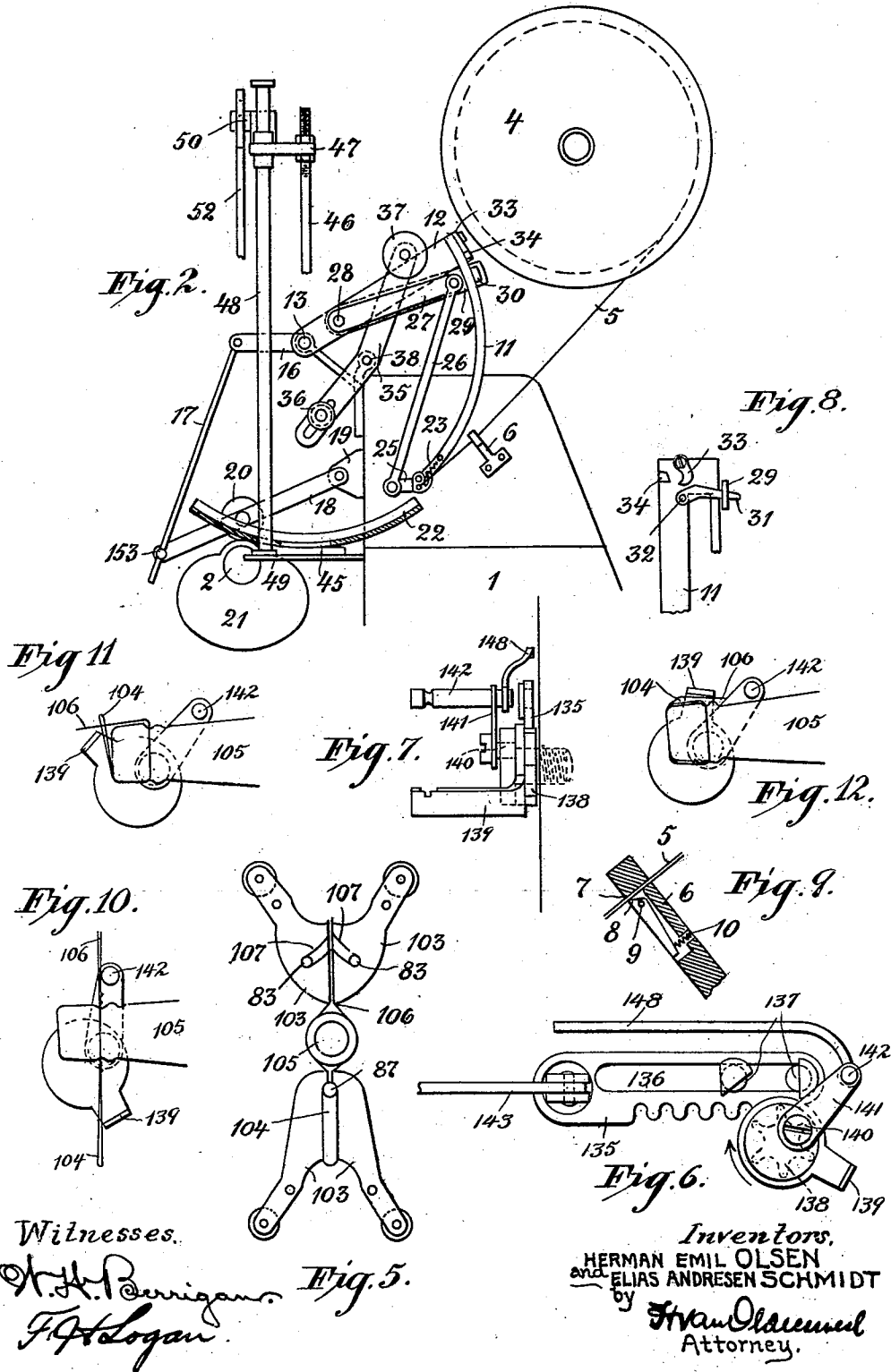
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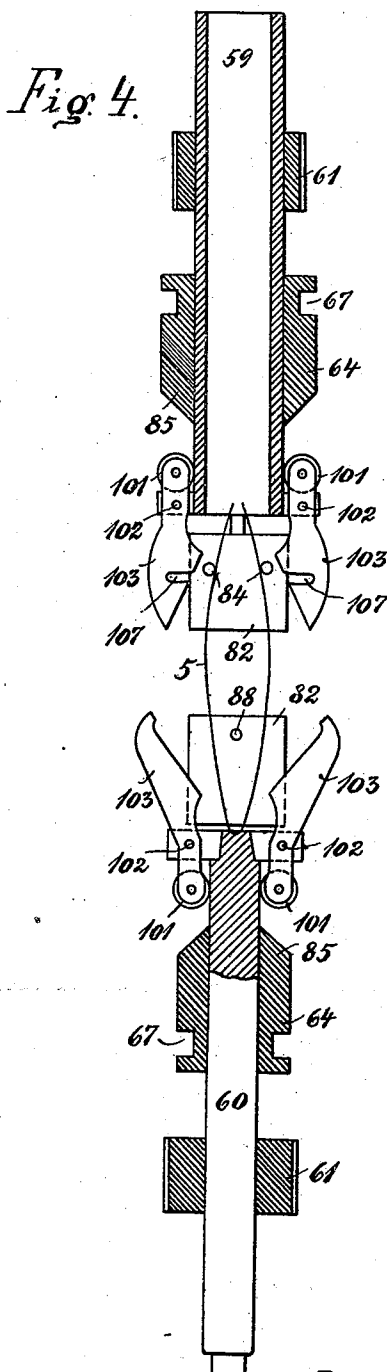
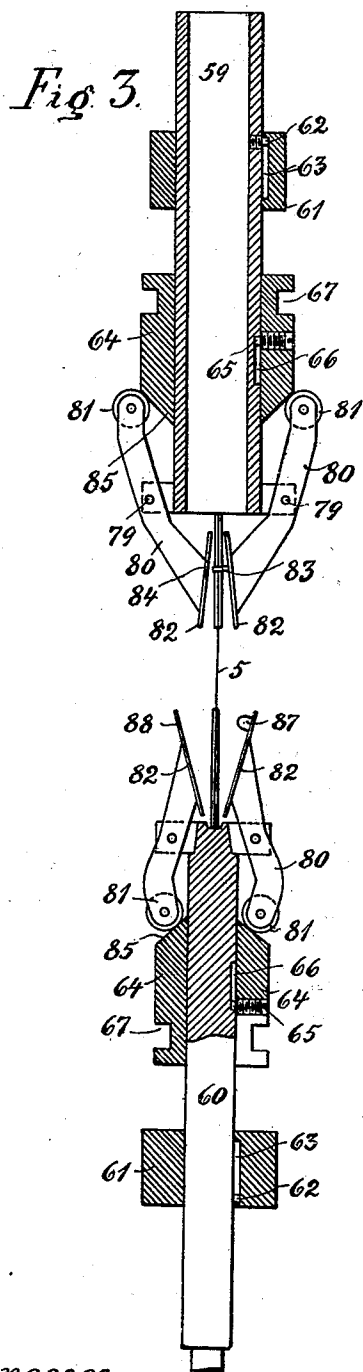
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UNITED STATES PATENT OFFICE.

HERMAN EMIL OLSEN AND ELIAS ANDRESEN SCHMIDT, OF COPENHAGEN, DENMARK.

MACHINE FOR WIRING CORKS IN BOTTLES.

992,240.

Specification of Letters Patent.

Patented May 16, 1911.

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To all whom it may concern:

Be it known that we, HERMAN EMIL OLSEN, clerk, and ELIAS ANDRESEN SCHMIDT, engineer, who are subjects of the Kingdom of Denmark, residing at Gamle Carlsberg, Copenhagen, and Konghøjsgade 5, Copenhagen, Denmark, respectively, have invented a new and useful Machine for Wiring Corks in Bottles; and we do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to a machine for wiring corks in bottles. Such a machine is represented in the drawing where—

Figure 1 shows a side elevation of the machine, Fig. 2 a front view of the device for conveying and cutting the wire, Fig. 3 a partial side section of the device for the shaping of the wire before and after it has been placed on the bottle-neck, Fig. 4 a front view of the same device, Fig. 5 a detail of the same device, by which the wire is pressed around the bottle-neck, Fig. 6 a side elevation of the device carrying the wire-ends into the eye and bending them down along the bottle-neck, Fig. 7 a front view of the same, Fig. 8 a right hand view of the device for cutting the wire, Fig. 9 a partial side section of a device for holding the wire fast, Figs. 10, 11 and 12 the end of a bottle-neck with wire applied to it, at different stages of the strapping.

The best arrangement is to have the machine mounted on the vertical wall of a platform case or block 1, and all the organs of the machine are actuated by the driving shaft 2 arranged in the bearings 3.

On the top of the case (on Fig. 1 to the right, but, for the sake of distinctness, not shown) is arranged a roller 4 (Fig. 2), on which the wire necessary for the binding is rolled up. The wire 5 is carried from the roller down to the conveying and cutting device. (Figs. 1 and 2). On its way to the latter, the wire passes a gripping device which allows the wire to go from the roll downward, but prevents its being pulled the opposite way. It consists (Figs. 2 and 9) of a plate 6 with a groove 7 for the passage of the wire 5; below the groove is arranged a latch 8, edge-shaped at the top, which turns on a pivot 9 and is actuated at its bottom by a spring 10, which endeavors to carry the top part of the latch in a direction contrary to the movement of the wire. When the wire is pulled through the de-

vice by the conveying device, it will carry the edge along with it, thus pressing the spring 10 a little together; if, on the other hand, an attempt is made to pull the wire the other way; the edge will cut into the wire, thus preventing this movement. From this device, the wire as above mentioned, passes on to the conveying and cutting device (Figs. 1, 2 and 8). It consists of an arc-shaped rail 11, the wire-carrier, which is fastened on one end of an arm 12, the other end of which is fixed on a shaft 13 lying in the center of the wire-carrier 11, and journaled in the bearings 14.

Around the shaft 13 is laid a spiral spring 15 which is at one end fastened to one of the bearings 14 and, at its other end, to an arm 16 fastened to the shaft 13. The spring 15 tries to turn the shaft in such way that the wire-carrier 11 occupies the raised position shown in the figures, so that, consequently the arm 16 is kept in the position shown in Fig. 2. The arm is jointed on to the rod 17 which is turnably connected with one end of a rod 18, the other end of which turns in a bearing 19. The rod 18 is provided with a roll 20 which is actuated by an eccentric 21 arranged on the driving shaft 2. When the shaft is turned around, the arm 18 is raised, so that the wire-carrier 11 will swing down and cover the concaved arc-shaped or curved trough 22. The wire 5 will then be carried along in the following manner: Around a bolt at the end of the wire-carrier 11 turns a little two-armed lever, one arm of which, actuated by a spring 23, is shaped like a hook 24, which is pulled in against the wire-carrier 11 by the spring, so that the wire is kept firm between the wire-carrier and the hook 24, the wire thus following the movement of the wire-carrier and laying itself along the outer curved side of the wire-carrier 11. The other arm 25 of the lever is, through the rod 26, in jointed connection with a rod 27, which turns around a bolt 28 journaled in the arm 12, around the other end of which bolt turns a bar 29, the extreme free end of which has a slit 30, through which is carried the free end of a little one-armed lever 31 (Figs. 2 and 8), which turns around a pivot 32 arranged on the wire-carrier 11. The lever 31, when raised by the rod 29, will actuate the movable arm 33 of the wire-cutter, which arm is carried against the firm arm 34, thus cutting the wire. The angle-

lever 35, which carries at its ends the rolls 36 and 37, and which is firmly arranged at the end of the shaft 38, carried in the bearings 39 (Fig. 1), serves the purpose of effecting this cutting and, at the same time, that of making the hook 24 let go the wire-end. This shaft 38 normally tends to keep the lever 35 in the position shown in Fig. 2. The shaft 38 carries at its back end a crank 40, which is connected with a rod 41, the free end of which carries a roll 42 actuated by an eccentric 43 arranged on the driving shaft 2. Now when the wire carrier 11 reaches the end of its downward movement, that is, when it is just above the trough 22, the shaft 38 will, by means of the eccentric 43, be turned a slight distance (Fig. 2); the roll 36 will then raise the rod 27 a little, so that the hook 24 will open itself so as to let go the end of the wire 5, and the hook will proceed to its dead-point position and keep itself open. The shaft 38 and, consequently, the lever 35 as well will immediately return to their previous positions. When the roll 36 touches and raises the rod 27, the bolt 44 (Fig. 1), on which the roll 36 is arranged, will at the same time touch the rod 29 and raise the same a little, so that the lever 31 is raised so much that the cutter 33, 34 cuts off the wire; and the wire will then lay itself in the groove 22. The shaft 13 then turns the wire-carrier 11 with all the organs arranged on the same back into the position shown in Fig. 2; during this movement, the rod 27 will push against the roll 37, so that the rod will actuate the hook 24 so as to shut the same and so as to grasp once more the free end of the wire 5. The whole conveying and cutting device is then ready to recommence the movement described.

The wire is then to be shaped, and this is effected in the following way: In the groove or trough 22 there is a slit 45 (Fig. 2); and above the middle of the same there is a long pin 46 (Figs. 1 and 2) fastened to a plate 47, in which there are holes for the rods 48, which are carried by the plate 49, which has a rather long aperture 149* (Fig. 1) for the passage of the wire 5 and the pin 46. The plate 47 is connected to a gudgeon 50, which glides in a slit 51 on a two-arm lever 52 which turns around the bolt 53, and the short arm of which is, by means of the rod 54, in jointed connection with a rod 55, the upward and downward movement of which is connected in guiding devices 56, and the top end of which carries a roll 57 rolling on the eccentric 58 on the driving-shaft 2. When the eccentric 58 allows it, the long arm of the lever 52 will go downward on account of its own weight, causing at the same time the pin 46 to go downward. The pin 46 then pushes against the middle of the cut-off wire, which lies in the groove

22; the middle of the wire will then be pressed through the slit 45 and be continually carried downward through a hollow cylinder 59, until it is stopped by another and solid cylinder 60, thus obtaining a long U-shape, (see Fig. 4). Presently, the eccentric 58 presses the rod 55 downward, so that the pin 46 is again pressed upward into the position shown in Fig. 1.

The cylinder 59 (Figs. 1, 3 and 4) is carried by a little gear 61, which is turnable, but prevented from moving up and down. The cylinder 59 meshes through a little gudgeon 62 with a longitudinal groove 63 on the gear 61 so that the cylinder can move a certain distance longitudinally in the gear but is forced to turn with the latter. Below the gear 61, the guiding-cone 64 can glide on the cylinder 59, which guiding-cone has a gudgeon 65 meshing with a groove 66 on the cylinder 59, so that, consequently, the cylinder 59 can also move a certain distance longitudinally in proportion to the guiding-cone 64, while the latter is forced to turn with the cylinder. The guiding-cone has at its top a groove 67, in which catches a gudgeon on a two-armed lever 68 (Fig. 1), which turns around the bolt 69, while its short arm carries a roll 70 pressing against a disk 71, the upwardly projecting edge of which has four steps 72, 73, 74 and 75. The disk 71 is arranged on the vertical shaft 76 placed in the bearings 90, which shaft carries, at its top, a beveled gear 77, which meshes with a beveled gear 78 located on the driving shaft 2. For every revolution of the driving shaft 2 the shaft 76 will likewise turn around once. As long as the roll 70 runs on the step 72, the lever 68 will not move; but when the roll runs up on the step 73, the long arm of the lever and likewise the guiding-cone 64 will move downward, and the cylinder 59 will then, on account of its own weight, likewise move, until the gudgeon 62 touches the end of the groove 63. Round bolts 79 placed on the lower end of the cylinder 59, support two two-armed levers 80, the upper ends of which carry rolls 81, and the lower ends of which carry plates 82; one of the plates 82 carries two gudgeons 83, while the other one has corresponding holes 84. When the guiding-cone 64 moves downward in relation to the cylinder 59, the rolls 81 will glide up along the cone 85 and out on the cylinder plate, so that the plates 82 will smack together and squeeze the interjacent upper part of the wire 5 so as to make it flat. Simultaneously, the lower part of the wire will be treated in the same way by a similar device. The cylinder 60, which is pressed upward by a spring 86, has likewise a gudgeon 62 gliding in a groove 63 on a gear 61, and a guiding-cone 64 with a gudgeon 65 gliding in a groove 66 on the cylinder 60. This guiding-cone has

likewise a groove 67 in which catches a gudgeon on the lower two-armed lever 68, which, by a draw-spring 108, is connected with the upper lever 68, and which turns around the pivot 69, and the short arm of which has a roll 70 gliding on a disk 71, with the four steps 72, 73, 74 and 75. This guiding-cone has likewise a conical surface 85, against which the rolls 81 on the levers 80 glide, so that the plates 82 clap together; the lower plates 82 have only one gudgeon 87 and one hole 88 respectively, which are at the top in the middle of the plates. Consequently, the wire has now been squeezed flat, but has otherwise still the shape shown before.

The bottle that is to be bound over, has in the meantime been placed on a table 89 on the front side of the stand, and has been introduced between the cylinders 59 and 60, so that the bottle-neck gets between the two branches of the wire 5. To prevent the bottle-neck getting too far into the machine, there is a cup-shaped counter-bearing 91 placed on a rod 92 conducted in bearings 93. On the rod 92 there is a sleeve 94 and between the latter and one of the hoops 93 there is a spring 95 laid around the rod 92, which spring 95 tries to push the rod 92 onward (in Fig. 1, to the right). The rod 92 is, through the rod 96 and the shaft 97, connected with the rod 98, which, at its free end, carries a roll 99 gliding on an eccentric 100 arranged on the shaft 76. When the roll 99 glides on the narrow part of the eccentric 100, the spring 95 will carry the rod 92 and likewise the counter-bearing 91 to the right, whereby the place of the bottle during the next two stages of the binding is determined.

The next stage is shown in Fig. 5. During the continued rotation of the shaft 76, the rolls 70 on the levers 68 will glide up on the steps 74; the guiding-cones 64 will then be carried downward and upward respectively; and as the downward and upward movement of the cylinders 59 and 60 is now stopped by the gudgeons 62, as mentioned above, the guiding-cones will move along the cylinders. During this movement, the conical surfaces 85 will carry outward the rolls 101 at one end of the levers 103 which are turnable around bolts 102 on the cylinders. These levers are thin plates of a thickness hardly equal to that of the wire, and when the rolls 101 have glided over the conical surface up on the cylindrical surface, the free ends of the plates 103 between the plates 82 will be carried together against each other in the way shown in Fig. 5, so that an eye 104 is formed at the bottom; for the bottom plates 103 only join together at the top above the gudgeon 87; then there comes an eye for the bottle-neck 105, while the wire above the same is joined entirely

together, as shown by 106, the upper plates 103 with their rectilinear edges going quite together, the movement of the plates being conducted by the gudgeons gliding in corresponding slits 107, which gudgeons 83 prevent the wire from spreading its ends out sideward. After the strap has obtained the shape shown in Fig. 5, the wires are twisted twice around over and under the bottle-neck. This is brought about in the following manner: In a bearing in the armature 109, Fig. 1, turns a crank 111 provided with a roll 110, which crank is held up by a spring 112. The roll 110 glides on an eccentric 113 arranged on the driving shaft 2, while the crank 111 is, by means of a rod 114, connected with a crank 115, loosely mounted on a horizontal shaft 116 carried by bearings 117; on the crank 115 is placed a pawl 118, which engages with a six-toothed ratchet 119 firmly fastened to the shaft 116. For every revolution of the driving shaft 2, the shaft 116 is thus turned $\frac{1}{4}$ of a revolution. At the end of the shaft 116 there is a beveled gear 120 which meshes with another beveled gear 121, which is arranged at the lower end of a vertical shaft 123, carried by the bearings 122, which vertical shaft carries two gears 124, which mesh with the gears 61 of the cylinders 59 and 60. The transmission is this, that the gears 61 and likewise the cylinders 59 and 60 will make two revolutions for every time the shaft 123 makes $\frac{1}{2}$ and the shaft 116 $\frac{1}{4}$ of a revolution, consequently for every revolution of the driving-shaft 2. As the wire is held fast by the plates 82 and 103, which are firmly connected with the cylinders 59 and 60, the wire over and under the bottle-neck will thus be twisted twice around. To effect the stopping of the cylinders 59 and 60 exactly after two revolutions, a brake-disk 125 is placed on the shaft 123 at the bottom, which brake disk has two diametrical holes 126 for the end of the brake-rod 127, which is conducted in bearings 128, and which is carried onward by a spring 129 (to the right in Fig. 1). It is only when the shaft 123 is to turn its half revolution, that the rod 127 may be taken out of the hole 126, which is effected by a cam-disk 130 arranged on the shaft 76, which cam-disk actuates a roll 132 placed on the bell crank 131, the upper arm 133 of which has a slit, in which catches a gudgeon 134 arranged on the rod 127, which gudgeon carries the rod 127 to the left. The strap is now in the state shown in Fig. 10.

For forming the two nooses (shown in Fig. 5), movable cylinders 59 and 60 are provided with two pairs of levers, 80 and 103 respectively. Levers 80 carry plates 82, which rest against each other, thereby keeping the bent wire in the same plane. Each of the other pair of levers, 103, consists of plates having their edges normally nearly in

contact, and which are made thin enough to enter between the plates 82, when desired. Between the plates of the levers 103 are fitted the two ends of the wire, and from
 5 these plates these ends are led close together, as shown in the upper part of Fig. 5. The lower set of levers 103, are led close together for a short distance near their tops, but with a space between their edges, in which space
 10 the lower eye is to be formed, the upper eye being formed around the bottle-neck, which is placed between the space between the upper two sets of levers 80 and 103 and the lower sets of levers 80 and 103, the move-
 15 ments of all of these levers being herein described.

The next operation to be executed consists in the lower noose being bent back and upward, while at the same time the joined
 20 free wire-ends are likewise carried backward (in Fig. 10, to the left), the wire ends going at the same time into the noose, which stage is represented on Fig. 11, whereafter the wire-ends are finally bent forward (in
 25 Fig. 11, to the right) and the binding-over is then finished, as is shown in Fig. 12. These movements are brought about by the devices shown in Figs. 6 and 7. A rack 135 guided by two gudgeons 137 gliding in the
 30 slit 136, meshes with a gear 138 carrying a sidewardly projecting arm 139. Around a bolt 140 turns an arm 141 with a side-ward projecting arm 142. The rack 135 is moved by the rod 143, which, through a
 35 lever-connection 144, actuated by a spring 152, is in connection with the rod 145, which, at its back end, carries a roll 146 gliding on a cam-disk 147 Fig. 1. When the cam moves the rod 145 to the left, the lever-connection
 40 144 causes the rod 143 and the rack 135 as well to go to the right; this makes the wheel 138 turn in the direction shown by the arrow in Fig. 6, so that the arm 139 swings the same way, thus carrying the noose 104
 45 along with it to the position shown in Fig. 12, the strap-ends 106 being at the same time stuck into the noose. If this is to take place, however, the arm 142 must swing in a direction toward the arrow. This is effected by the arm 142 being in turnable con-
 50 nection with the rod 148, the other end of which carries the roll 149 gliding on the disk 71, which is provided with a knob 150. This knob will pull the rod 148 to the left. The arm 142 will then swing back so as to move the strap-ends 106 from the position
 55 in Fig. 10 to the position in Fig. 11, whereafter the arm 142, because of the pull of the spring 151 is at once brought back to the position shown in Fig. 6. The arm 139 meanwhile continues its movement so as to carry the strap-ends 106 from the position
 60 shown in Fig. 11 to the position shown in Fig. 12, whereafter the rack 135, by means
 65 of the spring 152, will carry the arm 139

back to the position shown in Fig. 6. Consequently, the proceeding, briefly stated, is as follows: The wire is cut off, is bent at the middle, so that the wire-halves become paral-
 70 lel, whereafter they are pressed flat in the same plane; the wires are then carried together around the bottle-neck so as to form a noose at the middle of the wire, while the ends are conveyed quite together; on both
 75 sides of the bottle-neck, the wire is now turned twice around, whereafter the wire-ends and the noose are bent toward each other, the former is carried into the latter, and finally the wire-ends are bent back along
 80 the bottle-neck. The first part of this scrap- may also be executed in the following manner. By means of the screw 153 the rod 17 is adjusted in such manner that the wire-carrier does not place the wire 5 at its middle
 85 under the pin 46; the latter will then bend the wire so that one part becomes longer than the other. The proceeding is now otherwise the same as the one mentioned above, until the arm 142 is to bend back
 90 the wire-ends 106, one of these is now too long for this, and it will then push against one of the upper plates 82 and thus be bent somewhat upward, so that it will not go into the noose 104. Through the final move-
 95 ment of the arm 139, the strap-ends will then be bent back along the bottle-neck, whereafter they may be twisted together by hand.

The bottles may be conveyed to the machine automatically or by hand, while the
 100 machine is arranged so as to be able to stop automatically after each revolution of the driving-shaft, while the wired bottle is removed and a fresh one is brought on.

Having thus described our invention, we
 105 claim as new and desire to secure by Letters Patent.

1. In a bottle-wiring machine, means for feeding wire to the machine, means for severing said wire into desired lengths,
 110 means for bending each length of the wire, means for placing a bottle-neck in the bend thus formed, shaping devices for forming two nooses in said wire, one around the bot-
 115 tle-neck and one outside the same, means for twisting the ends of the wire together at both sides of the bottle-neck, means for passing a wire-end through the noose bent over the bottle-neck, and means for bending
 120 both ends back along the bottle-neck.

2. In a bottle-wiring machine, an arc-shaped swinging wire-carrier 11, provided, at its respective ends, with a gripping de-
 125 vice and with a cutting device, for conveying a wire over a part having an arc-shaped trough 22 provided with an aperture, a hollow cylinder 59 for receiving wire from said aperture, another cylinder 60 under that first mentioned, both cylinders provided with plate-shaped shaping-devices 82 and
 130

103, downwardly and upwardly converging respectively, for catching the wire, giving the wire the desired shape and twisting its ends together at both sides of the bottle-neck, and swinging-arms 139 and 142, arranged in the interval between the two cylinders 59 and 60, for effecting the binding.

3. In a bottle-wiring machine, an arc-shaped wire-carrier 11, an eccentric arranged on the driving-shaft 2, for imparting a swinging movement to said wire-carrier, a spring-actuated gripping hook 24 at one end of the wire-carrier, a pair of wire-severing knives, one fixed and one movable, at its other end, arms for operating said devices, and a lever 35 for operating said arms.

4. In a bottle-wiring machine, a swinging carrier provided with wire-gripping and cutting devices, and a concaved arc-shaped trough 22 for guiding the carrier and having an aperture for the passage of wire.

5. In a bottle-wiring machine, means for moving two pairs of plates 82 with their flat sides against each other, means for moving two other pairs of plates 103 with their edges against each other, the upper pair of plates 82 having gudgeons 83, which keep

the wire together and guide the other upper pair of plates 103, while the lower pair of plates 82 has a single gudgeon 87, which is caught by the lower pair of plates 103, to form the lower noose of the wire.

6. In a bottle-wiring machine, cylinders 59 and 60, means for imparting two revolutions to the cylinders for every revolution of the driving-shaft, said means comprising gears 61 in which the cylinders are arranged to slide up and down for a limited distance, and which are in mesh with gears firmly connected with a brake-disk, 125, which is stopped for every half revolution.

7. In a bottle-wiring machine, a stopping device 91 indicating the exact placing of the bottle-neck, swinging-arms 139 and 142 for securing a wire to said bottle-neck, and means for removing the stopping device before said swinging-arms are set in motion.

In witness whereof we have hereunto set our hands in presence of two witnesses.

HERMAN EMIL OLSEN.

ELIAS ANDRESEN SCHMIDT.

Witnesses:

F. PETERSEN,

H. S. SUB.