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G. K. GAUMER

2,352,622

COUNTER ASSEMBLY FOR WIRE PRODUCTS MACHINES

Filed Aug. 30, 1940

4 Sheets-Sheet 1

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by Charles H. Hill Attys

July 4, 1944.

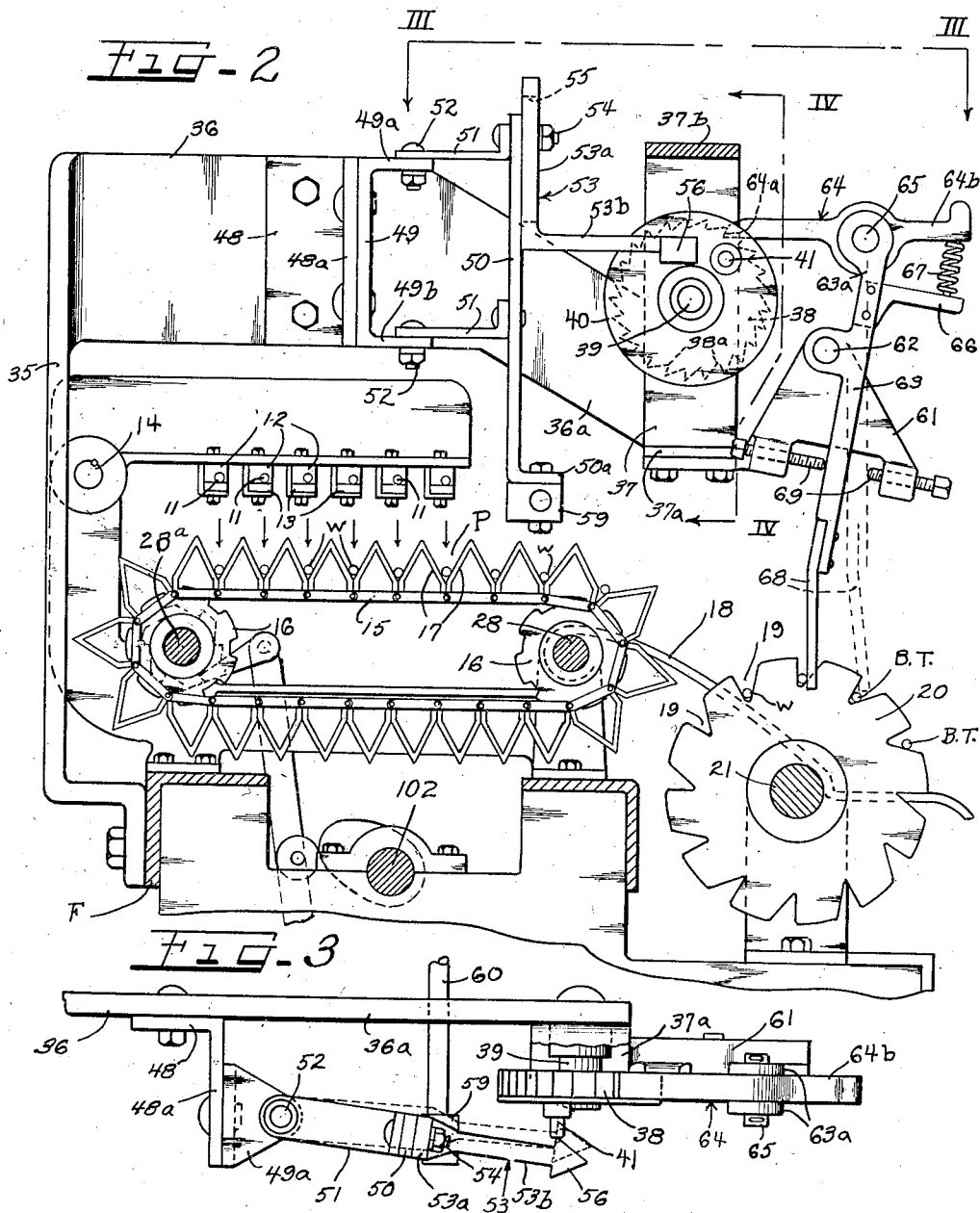
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4 Sheets-Sheet 2



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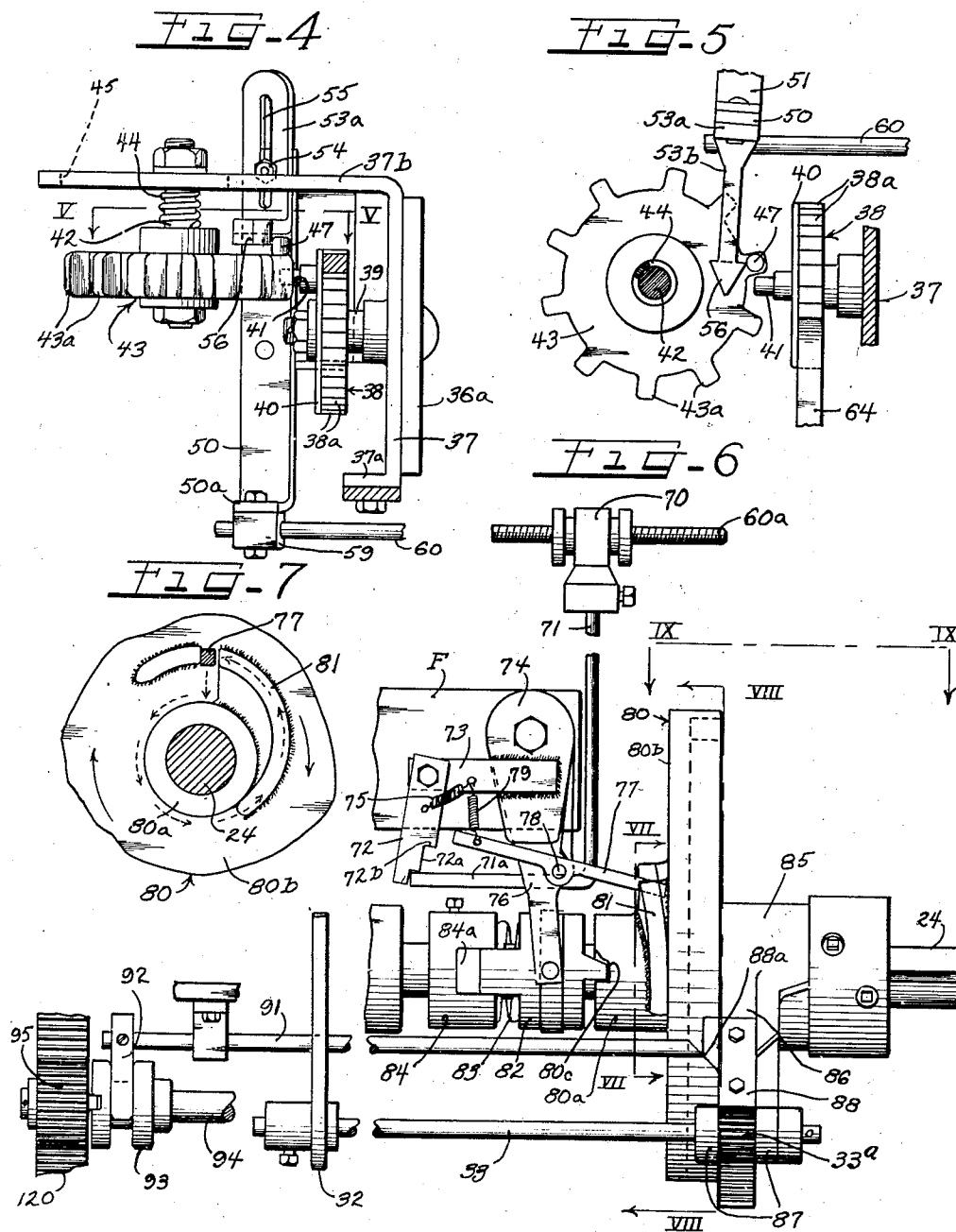
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COUNTER ASSEMBLY FOR WIRE PRODUCTS MACHINES

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4 Sheets-Sheet 3



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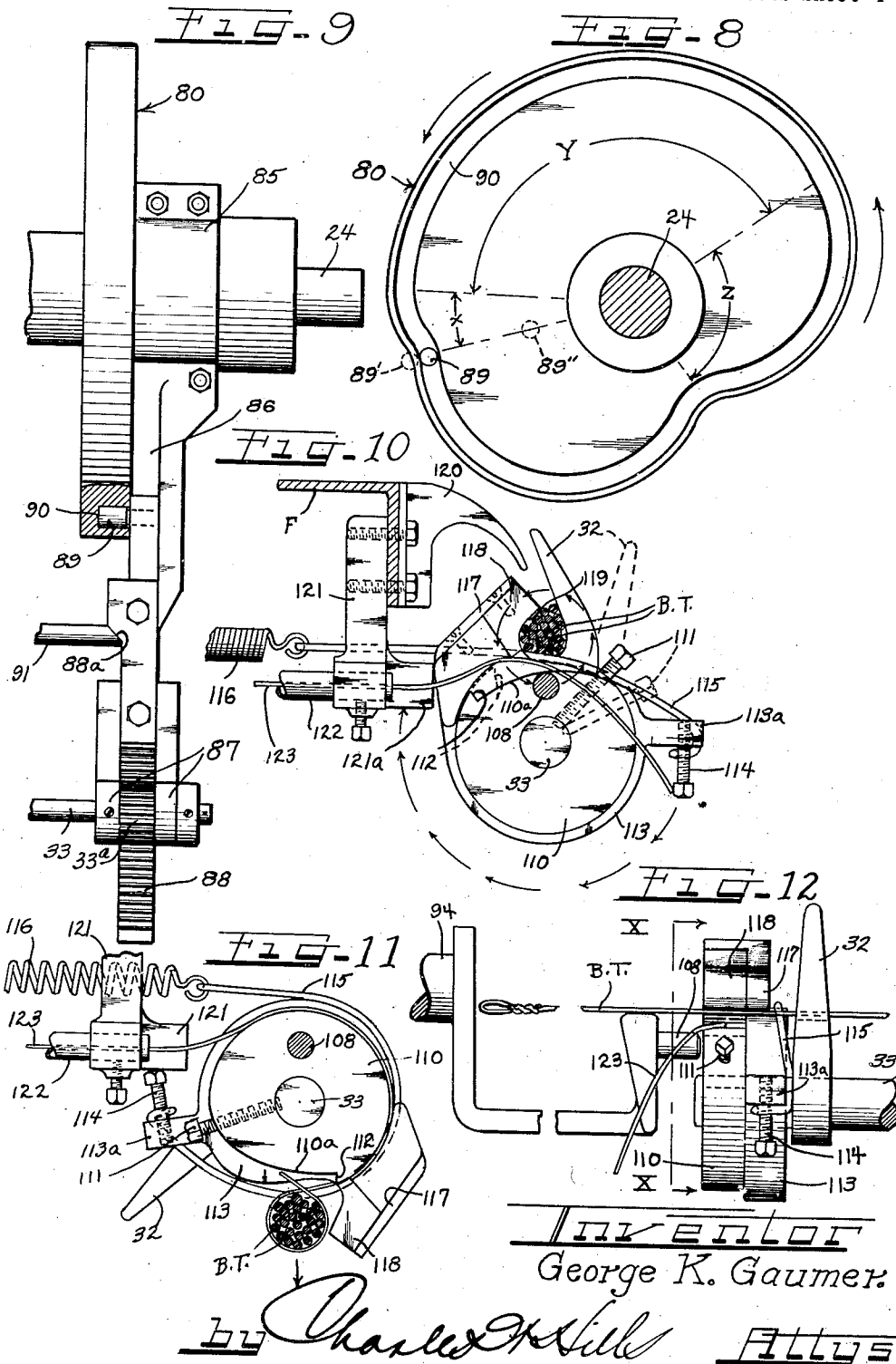
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COUNTER ASSEMBLY FOR WIRE PRODUCTS MACHINES

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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

2,352,622

COUNTER ASSEMBLY FOR WIRE PRODUCTS MACHINES

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5 Claims. (Cl. 235—98)

This invention relates to mechanisms for automatically counting wires or strip products made on a wire fabricating machine.

More specifically this invention relates to improved bale tie machines adapted to discharge tied-together bundles containing any predetermined number of finished bale ties.

While the invention will hereinafter be specifically described in connection with a machine for making bale ties, it should be understood that the invention is, in general, adapted for the automatic counting of a large variety of products, particularly elongated strands or strips such as, for example, wires, ribbons, rods and the like.

In the high-speed fabrication of wire products such as bale ties it is highly desirable that the fabricating machine discharge finished products in bundles containing a known number of the products. It is also desirable that the collecting, bundling-together and discharging be entirely automatic in operation in order that one operator can look after a number of machines.

Heretofore bale tie machines merely discharged the finished bale ties onto a collecting platform and it was necessary to manually count, bundle-together, and move the counted and bundled-together bale ties to another machine which applied a commercial wrapping around a desired number of the bundles. The manual counting, sorting out and bundling of the long bale ties was awkward, time-consuming and expensive.

The present invention now eliminates all of this manual effort, and the bale tie machine discharges already bundled bale ties with each bundle containing a known number of the bale ties. It is then merely necessary to move any desired number of the bundles into the final wrapping machine.

It is, then, an object of this invention to provide apparatus for automatically counting wire products.

A further object of the invention is to provide a device for counting wire products as the same are being made on a machine.

A further object of the invention is to provide a device which collects a predetermined number of fabricated wire products and automatically discharges the collected products immediately upon receiving the last product to make up a batch of predetermined quantity.

A specific object is to provide attachments for a bale tie machine for converting the machine to deliver bundles of bale ties of known quantity instead of single bale ties.

Another specific object is to provide a counter

for a bale tie machine which controls the actuation of the discharge device of the machine.

A further object is to provide a counter for a bale tie machine actuated by movement of the bale ties as they are being conveyed to a collector.

Other and further objects of the invention will be apparent to those skilled in the art from the following detailed descriptions of the annexed sheets of drawings which, by way of example, illustrate a preferred embodiment of the invention.

On the drawings:

Figure 1 is a broken front elevational view of a bale tie machine according to this invention.

Figure 1A is a side elevational view of a bundle of bale ties produced by the machine of Figure 1.

Figure 1B is an end elevational view along the line IB—IB of Figure 1.

Figure 1C is a fragmentary vertical cross section taken along the line IC—IC of Figure 1.

Figure 2 is an enlarged vertical transverse cross-sectional view taken along the line II—II of Figure 1.

Figure 3 is a fragmentary top plan view taken along the line III—III of Figure 2 with parts in shifted position.

Figure 4 is a vertical cross-sectional view taken along the line IV—IV of Figure 2 and illustrating an additional regulating device.

Figure 5 is a horizontal cross-sectional view taken along the line V—V of Figure 4.

Figure 6 is an enlarged broken front elevational view of the right hand end of the machine shown in Figure 1 and also showing connections with the left hand end of the machine.

Figure 7 is a vertical cross-sectional view taken along the line VII—VII of Figure 6.

Figure 8 is a vertical cross-sectional view taken along the line VIII—VIII of Figure 6.

Figure 9 is a top plan view, with a part broken away and shown in horizontal cross-section, taken along the line IX—IX of Figure 6.

Figure 10 is a vertical cross-sectional view of the bundler assembly taken along the line X—X of Figure 12.

Figure 11 is a view similar to Figure 10 illustrating the bundler assembly in a different operating position.

Figure 12 is a fragmentary broken front elevational view of the bundler assembly of this invention.

As shown on the drawings:

In Figure 1 the reference numeral 10 designates generally a bale tie machine mounted on suitable framing F. A feeding mechanism (not shown).

continually supplies six wires such as W through helical coil springs such as S, through a cutter C (more fully described and claimed in my Patent No. 2,278,613 issued April 7, 1942) and into open bottomed recesses 11 of spaced parallel horizontal guide blocks 12 extending along the length of the machine in front of the cutter C as best shown in Figures 1 and 2. The open bottoms of the recesses 11 in the guide blocks 12 are closed by bars 13 which support the wires in the recesses. These bars 13 are mounted from a sliding bar which is actuated through a rock shaft (not shown herein, but fully shown and described in my above referred to patent) controlled by the drive shaft 14 to retract the bars 13 for exposing the open bottoms of the recesses 11. The wires W are cut by the cutter C into the desired lengths after the wires are seated in the blocks 12. The bars 13 are then retracted to allow the cut wires W to drop by gravity into the pockets of endless conveyors 15 trained around sprockets 16 at spaced intervals across the length of the machine. The conveyors 15 are composed of linked-together pointed members 17 having pointed apexes and sloping side walls dividing the pockets P therebetween. These conveyors are moved intermittently to deposit each wire W onto downwardly inclined rods or ways 18 and into the notches 19 of discs 20 mounted at spaced intervals across the length of the machine on a shaft 21. The shaft 21 is driven intermittently in timed relation with the conveyors 15 through a ratchet wheel 22 and pawl 23 from a main cam shaft 24 extending along the length of the machine. The pawl 23 is mounted on a lever 25 which is rotatably carried on a shaft 26 and actuated through a cam device 27 on the cam shaft 24.

The front sprockets 16 of each conveyor 15 are loosely mounted on shaft 28. The rear sprockets 16 are keyed on a shaft 28a (Fig. 2) intermittently driven by a ratchet and pawl connection from a cam on a shaft 102 hereinafter described. Thus the conveyor chains 15 and the discs 20 are driven from separate ratchets and pawls to have different rates of movement, but the chains are moved in timed relation with the discs so that a wire length W will be deposited into the notches of the discs 20 when the discs are stationary.

When the wire W is deposited in the notches 19 of the discs 20 and the discs are moved to carry the wire therewith, the cut end of the wire is moved over an anvil 29 as shown in Figure 1 and under a vise 30. A looping member 31 is then brought into operation to turn the free end of the wire into a loop. The vise is next actuated to clamp the end portions of the wire W on the anvil. The looped end of the wire is then twisted to form the finished bale tie B. T. as best shown in Figure 12.

After the bale tie has been formed, the vise is released from the looped end and the discs 20 are advanced to bring a new wire length into the device and to discharge the bale tie B. T. onto the guide 18 from which it falls by gravity into collector arms 32 mounted on a shaft 33.

It should be understood that the bale tie fabrication can be modified greatly without departing from this invention. For example, a machine such as is disclosed in the Bradley Patent 1,992,286 can be used in connection with this invention to form a bale tie having a bayonet slot at one end and a head at the other end, as disclosed in said patent.

According to this invention, as best shown in Figures 2 and 4, a bracket 35 is secured to the

main frame F at the back end of the machine and extends vertically upwardly to a level above the operating portions of the machine. A leg 36 extends forwardly from the bracket 35 and has a downturned portion 36a disposed above a conveyor 15 aligned with the disc 20. A vertical strap 37 is bolted to the free end of the leg portion 36a and has a short horizontal flange 37a at the bottom thereof and a long horizontal flange 37b at the top thereof. Both flanges project in the same direction as shown in Figure 4.

A ratchet wheel 38 is rotatably mounted on the vertical member 37 between the flanges thereof around a stub-axis 39 carried by the member 37. The ratchet wheel 38 has a predetermined number of ratchet teeth 38a around the periphery thereof. Twenty-five of such teeth are illustrated. A plate 40 is mounted on the outer face of the ratchet wheel 38 and extends beyond the apices of the teeth 38a. This plate 40 is fixed to the ratchet wheel 38 and rotates therewith. A pin 41 projects horizontally outwardly from the plate 40 between the axis and periphery of the ratchet wheel.

The horizontal top leg 37b of the member 37 has a stub-shaft 42 depending therefrom and rotatably supporting a gear or toothed wheel 43. A coil spring 44 is mounted around the stub-shaft 42 to urge the toothed wheel 43 downwardly. This spring imparts resistance to rotation of the roll. The stub-shaft 42 extends through an elongated slot 45 in the flange 37b and is held in this slot by a nut 46. The spring 44 can be compressed for the manual adjustment of the wheel in the slot. Thus the wheel can be moved from one end to the other end of the slot.

As shown in Figures 4 and 5, a predetermined number of teeth 43a are provided on the wheel 43 and ten such teeth are illustrated. One of the teeth 43a carries a pin 47 projecting vertically from the top face of the wheel.

The wheel 43 can be moved in the slot 45 so that the teeth 43a thereof are driven by the pin 41 of the ratchet wheel 38. Likewise, the wheel 43 can be moved out of the path of the pin 41, as shown in Figure 1.

As best shown in Figure 2, the leg 36 of the bracket 35 has an angle 48 bolted thereon with the outturned flange 48a of the angle receiving a bracket 49 having forwardly facing top and bottom horizontal flanges 49a and 49b. A vertical strap 50 has rearwardly extending horizontal arms 51 pivoted on the flanges 49a and 49b by means of bolts 52, supports an L-shaped member 53 by means of a bolt 54 extending through an elongated slot 55 in the vertical leg 53a of the L-shaped member. The L-shaped member 53 is thus vertically adjustable on the strap 50.

The horizontal leg 53b of the L-shaped member 53 extends forwardly and its free end is formed in the shape of a spearhead 56.

When the wheel 43 is mounted in the slot 45 so as to be driven by the pin 41 of the ratchet wheel 38, the L-shaped member 53 is adjusted on the strap 50 so that the spearhead 56 will lie in the path of the pin 47 on the wheel 43 as shown in Figure 4. When the pin strikes a side of the spearhead 56 as illustrated in Figures 4 and 5, the entire strap assembly 50 will be swung about the pivots 52 toward the left-hand end or inlet end of the machine.

When the wheel 43 is moved out of the path 41 as illustrated in Figure 1, the L-shaped bracket can be adjusted so that the spearhead 56 will be in the path of the pin 41 of the ratchet wheel

38. When this pin strikes the side of the spearhead it will swing the strap assembly in the same manner described above.

The strap 50 has a horizontal bottom flange 50a carrying a block 59 in which is secured the end of a rod 60 extending horizontally to the right-hand end of the machine as shown in Figure 1.

As best shown in Figure 2, the bottom flange 37a of the member 37 carries a bracket 61 forwardly of the member 37. This bracket 61 is generally triangular-shaped and has a pivot pin 62 at the apex thereof pivotally supporting a pawl arm 63. The top end 63a of the arm 63 is bifurcated and carries a pawl 64 on a pin 65 mounted in the furcations. The pawl 64 has a free end 64a projecting into the path of the ratchet teeth 38a for driving the ratchet wheel as will be hereinafter described. The pawl 64 also has a tail portion 64b projecting toward the front end of the machine beyond the bifurcated end 63a of the arm 63.

A platform 66 is mounted on the arm 63 beneath the portion 64b of the pawl and a compression spring 67 is interposed between the platform and the tail of the pawl.

The pawl arm 63 has a yoke member 68 secured to the lower end thereof with the yoke arms of the member embracing the periphery of a disc 20 and lying in the path of the bale ties carried by the disc. Rotation of the discs 20 to move the bale ties into the collecting arms 32 causes the arm 63 to tilt about its pivot 62 and thereby move the pawl 64 against a ratchet tooth 38a for advancing the ratchet wheel one step. It will be noted from Figure 2 that the arm 63 is so balanced as to assume the position shown in solid lines and is only driven out of this position by a bale tie as shown in dotted lines. When the bale tie clears the yoke carried by the arm, the arm will swing by gravity and force of the spring 67 back to the position shown in solid lines. The advancement of the arm from the position shown in solid lines to the position shown in dotted lines in Figure 4 causes a driving of the ratchet wheel through the pawl 64 for the distance of one tooth.

The base corners of the bracket 61 carry set screws 69 which limit the amount of travel of the arm 63.

The pivotal connection of the pawl 64 with the arm and the spring 67 permits the pawl to be manually disengaged from the ratchet wheel 38 in the event that a bale tie produced by the machine and causing a driving of the pawl is defective. The advancement of the ratchet wheel can thus be stopped to make up for any number of defective bale ties.

From the above descriptions it therefore should be understood that the bale ties themselves drive the pawl 64 for advancing the ratchet wheel 38. Since this ratchet wheel has twenty-five teeth the pin 41 carried thereby will actuate either the toothed wheel 43 or the spearhead 56 once for every twenty-five bale ties. The pin 41 on the ratchet 38 must actuate the ten teeth of the wheel 43 before the pin 41 actuates the spearhead. Thus the device, without the use of the wheel 43, automatically counts twenty-five bale ties, and with the use of the wheel 43 automatically counts two hundred and fifty bale ties. However, visible indicating means are not provided, since the counting is entirely automatic and foolproof.

As shown in Figure 1, the rod 60 extends to 75

the right hand end of the machine and may, of course, be slidably suspended along its length. As also indicated in Figure 6, the end 60a of the rod 60 is threaded and receives in threaded relation thereon a coupling member 70 which carries a vertical rod 71 having a horizontal offset portion 71a with the free end thereof acting against a locking member 72 pivotally supported from a bar 73 which is welded to a strap member 74 carried in fixed relation to a part of the main frame F. The locking member 72 has a spring 75 secured thereon and anchored to the carrier 73 to urge the locking member against the end of the rod portion 71a.

A clutch arm 76 is swingably mounted from the frame behind the member 74 and pivotally carries a lever 77 on a pivot pin 78 positioned intermediate the ends of the lever. A spring 79 acts between the left hand free end of the lever 77 and the support member 73 to urge the right hand end of the lever downward.

The locking member 72 has a notched portion 72a providing a shoulder 72b adapted to thrust against the left hand free end of the lever and hold the same down, thereby raising the right hand end of the lever. When the spearhead of the counting mechanism is not moved by the pin on either the ratchet 38 or wheel 43 the locking member 72 is in the position shown in Figure 1. However, when the spearhead is moved by a pin to shift the rod 60 toward the left end or inlet end of the machine, the portion 71a of the depending rod 71 is moved to the left to swing the locking member 72 clear of the lever 77, thereby permitting the spring 79 to act on the lever. The lever then assumes the position shown in Figure 6.

A cam member 80 is freely mounted around the cam shaft 24 of the machine. The cam member 80 consists of a hub portion 80a and a large, solid disc portion 80b integral with the hub portion 80a. A cam face 81 is built up on the hub 80a and left-hand face of the disc 80b as best shown in Figure 6. This cam face 81 acts on the lever 77. When the locking member 72 holds the lever against the upward spring pull as in the position shown in Figure 1, the other end of the lever is on the high spot of the cam face as shown in Figure 7. However, when the rod end 71a moves the locking member to free the lever, the spring 79 pulls the lever so that the same will drop to a low spot on the cam face as shown by the arrows in Figure 7.

The shaft 24 has a driven clutch member 82 slidably mounted thereon and urged toward the hub 80a of the cam member 80 by means of a compression spring 83. The compression spring acts against a block 84 rotated with the shaft 24 and providing a recess 84a into which the clutch member 82 can slide. The clutch arm 76 is yoked to the clutch member 82 and, when the lever 77 is dropped to a low spot on the cam, the clutch arm 76 is free to move to the right and the spring 83 will urge the clutch member into recesses such as 80c provided in the hub 80a of the cam 80. The cam will then be driven with the shaft 24 and rotation of the cam face 81 will again move the lever 77 to the high spot on the cam face, thus disengaging the clutch 82 since the lever acts on the clutch arm. In the meantime, the locking member 72 has returned to the position shown in Figure 1 to hold the lever on the high spot.

As shown in Figures 6 and 9 a boss member 85 is freely mounted on the shaft 24 to the right of the cam 80. This boss has a track defining

arm 86 extending forwardly and supported at its forward end in bearings 87 on the end of the collector arm shaft 33. A rack 88 is slidably mounted on the track 86 and meshes with a pinion 33a on the shaft 33. The inner end of the rack member 88 carries a roller pin 89 which rides in a cam groove 90 formed in the right hand face of the cam disc 80b. Rotation of the cam disc by the clutch moves the rack 88 in and out in accordance with the pattern of the cam groove 90.

The in and out movement of the rack 88 will cause rotation of the shaft 33 so that the arms 32 will dump their load and be returned for receiving a new batch of bale ties.

The rack 88 has an inclined shoulder 88a formed on the left hand side thereof for acting on the beveled end of a rod 91. The rod 91 extends along the whole length of the machine to the left-hand end thereof and acts on a clutch arm 92 carried thereby for controlling a clutch 93 slidably mounted on a wrapping shaft 94. The clutch 93 is adapted to engage with a dog carried by a small pinion 95.

As shown in Figure 1B, the machine 10 is driven from a main drive shaft 100 at the left hand end of the machine on the rear thereof. A gear 100a on this shaft 100 meshes with and drives a large gear 101 on a shaft 102. The shaft 102 extends into the machine and connects through a gear train 102a with the main cam shaft 24 to constantly drive the shaft. A cam on the shaft 102 as shown in Figure 2 drives the pawl which drives the ratchet to move the conveyor chains 15 step by step. A large gear 103 is loosely mounted on the left hand end of the shaft 24 and is intermittently advanced through a 120° arc by means of crank arm 103a driven by the gear 101 and driving a ratchet 103b best shown in Figure 1C. The ratchet has three teeth 103c each 120° apart formed on a plate 103d loosely mounted around the shaft 24 but secured directly to the gear 103. A pawl 103e driven by the crank 103a meshes with the teeth.

The gear 103, therefore, is intermittently advanced through arcs of 120° to intermittently drive the pinion 95 and another pinion 104. The pinion 95 drives the clutch 93 and the pinion 104 drives a shaft 105 controlling other parts of the machine. The main cam shaft 24 is constantly driven.

The wrapping shaft 94 is thus rotated when the clutch 93 is engaged by the control rod 91. The right hand end of the shaft 94, as best shown in Figure 12, has a wrapping finger 107. The wrapping finger 107 is substantially U-shaped to clear the looped ends of the bale ties and the right hand end of the finger carries a wrapping pin 108 for acting on a wrapping wire to tie together a plurality of bale ties as will be hereinafter described.

The collector arms shaft 33 has a disc 110 secured thereon by means of a locking pin 111 directly in front of the wrapping pin 108. The disc 110 will therefore rotate with the shaft 33. The disc 110 has a cam surface 110a defining a cutting shoulder 112 on the periphery of the disc.

A disc 113 is loosely mounted on the shaft 33 to the right of the disc 110 and has a leg 113a projecting from the periphery thereof. An adjustable stop bolt 114 is threaded in the leg 113a and serves as an anchor for the end of a rawhide strip or strand of other flexible wear-resisting material 115. The other end of the rawhide strip 115 is anchored to a tension spring 116 which is carried by the frame of the machine and which

serves to pull the floating disc 113 in a counter-clockwise direction to the position shown in Figure 10.

The floating disc 113 has a head portion 117 which overlaps the disc 110 as shown in Figure 12. This head portion 117 carries a cutter block 118 over the periphery of the disc 110. The cutter block 118 and the head 117 define a segmental cylindrical recess 119 adapted to receive the bale ties therethrough.

The main frame of the machine F has a stationary guide 120 bolted thereon (Figure 10) for guiding the ends of the bale ties into the recess 119 and for cooperating with the guiding wires 18 described hereinabove. A bracket 121 is also bolted on the main frame of the machine and depends downwardly therefrom into adjoining relation with the disc 113. An abutment 121a is formed on the bracket 121 for preventing retraction of the head 117 beyond the position shown in Figure 10 and for acting on the stop bolt 114 as shown in Figure 11.

This bracket 121 also carries a tube 122 through which is fed a wrapping wire 123 from a spool or other suitable source (not shown) mounted on the machine. The wrapping wire 123 is initially guided over the cutting portion 112 of the driven disc 110 and thence into the path of the wrapping pin 108 as shown in Figures 10 and 12.

When the cam pin 89 initially acts on the rack 88 it rotates the shaft 33 to move the collector arms 32 from the position shown in dotted lines in Figure 10 to the position shown in solid lines. This causes the collector arms to cooperate with the recess 119 of the cutter head 118 and form the bale ties into a round bundle. The movement of the rack is then reversed by the cam track 90 and the shaft 33 is rotated in the opposite direction to drive the disc 110 in a clockwise direction as shown by the arrows in Figure 10. In the meantime, however, the rod 91 has been actuated by the shoulder 88a of the rack 88 to engage the clutch 93 and cause the rapid rotation of the shaft 94 which spins the wrapping pin 108 through two complete revolutions to wrap the leading end of the wire 123 around the bale ties B. T. During the spinning of the wrapping pin 108 the disc 110 continues to rotate at a slower speed in the clockwise direction, and this causes the cutting shoulder 112 to clamp the wire against the cutting head 117 thus pulling the wire through the tube 122 and moving the floating disc 113 with the disc 110 against the tension of the spring 116. The floating disc 113 continues to rotate with the disc 110 until the stop bolt 114 strikes the abutment 121a as shown in Figure 11. Upon striking the abutment the floating disc 113 is stopped but the disc 110 continues to rotate for shearing off the wire between the cutting head 117 and the cutting shoulder 112 as shown in Figure 11. The wire therefore no longer is clamped between the disc 110 and the cutting head 117, and the spring 116 can therefore pull the disc 113 back into the position shown in Figure 10, with the cutting head 117 abutting the top portion of the abutment 121a. When this happens, however, sufficient wire has been pulled through the tube to leave a leading end in the position shown in Figure 12 for the next wrapping operation. The severed wire has been wrapped around the bale ties as shown in Figure 11 by the wrapping pin 108 for two complete revolutions and the collector arms 32 have been moved to a dump posi-

tion as shown in Figure 11 so that the bale tie bundle can drop by gravity out of the machine, as shown in Figure 1A.

As shown in Figure 8 the cam track 90 moves in a counter-clockwise direction and the pin 89 is initially in the position shown in solid lines. Upon movement of the cam through the arc X, the pin moves to the position shown in dotted lines at 89'. This throws the rack 88 outwardly from the shaft 24 to move the collector arms 32 from the position shown in dotted lines to the position shown in solid lines in Figure 10, thereby tightening and shaping the collected bale ties. The pin 89 then rides through the entire arc Y of the cam track without further moving the rack 88. However, during this arc the rod 91 has caused engagement of the clutch 93 so that the wrapping pin 108 is in operation. The cam track then moves the pin to the position shown in dotted lines at 89'' as the cam track advances through the arc Z. This movement of the pin pulls the rack 88 in toward the shaft thereby rotating the shaft 33 so that the collector arms 32 will be moved to the dump position shown in Figure 11, and so that the cutting disc will be rotated to the position shown in Figure 11. When the pin 89 reaches its innermost position, as shown at 89'', the wire has been sheared and the cutter head 117 is being returned by the spring 116 back to starting position. The wrapped bale tie bundle has also been dumped out of the arms 32. The remaining path of travel on the cam track 90 brings the pin back to the starting position shown in solid lines at 89. Upon reaching this position the lever 77 has also reached the high spot on the cam face 81 to disengage the clutch 82 and stop operation of the cam. The collector arms then remain in their collecting position until the counting device again actuates the clutch 82.

From the above descriptions it should be clearly understood that this invention now provides for the automatic counting of wire products as they are made on a fabricating machine. The counting device can be regulated so as to actuate the bundling of the counted products and the discharge of the bundle from the machine as soon as any predetermined number of products have been made by the machine. In the one embodiment of the invention, a pawl device can act on a ratchet wheel which in turn acts directly on a throw member to initiate the wrapping and discharging operations. In another embodiment of the invention the ratchet wheel can act on another toothed wheel which is readily thrown into operation by mere movement into the path of the ratchet wheel. In the illustrated embodiment the ratchet wheel will count twenty-five bale ties on a bale tie making machine whereupon feeding of the twenty-fifth tie into a collector initiates the wrapping of the twenty-five ties together and the discharge of the wrapped bundle out of the machine. In the other embodiment the ratchet wheel acts on another toothed wheel containing ten teeth, and this wheel must be turned through a complete revolution before initiating the wrapping and discharging operations. In such event, the bundle will contain two hundred and fifty bale ties. It is obvious that the number of bale ties in a bundle is readily controllable by the ratchet teeth or gear teeth on the counting mechanism.

When the predetermined number of bale ties have been made the counter will effect positive movement of the locking member to unlock a

lever which then drops to a low spot on a cam surface and allows engagement of a driving clutch. The clutch will drive another cam track to control a rack and pinion for moving the collector device to shape the collected bale ties into a tight bundle. This movement also causes the engagement of another clutch which throws the wrapping device into operation for wrapping two complete turns of a wire around the collected bale ties. The wrapped wire is then severed and the cam track reverses the movement of the collector and disengages the wrapping device for dumping the finished bundle out of the machine.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. In a wire products fabricating machine including means for conveying wire products in spaced relation, a pawl device arranged to be tripped by each wire product, a ratchet operated by said pawl device, shiftable means adjustably mounted on the machine actuated by said ratchet, and a toothed wheel adjustably mounted on the machine inserted between said ratchet and said shiftable means to be driven by the ratchet for controlling the shiftable means the adjustment of the shiftable means and the toothed wheel being provided so that the shiftable means can be selectively operated once for each revolution of the ratchet or for each revolution of the wheel.

2. A counter for a wire products fabricating machine comprising a toothed ratchet wheel, a pawl device arranged to be tripped by each wire product passing through the machine for advancing the ratchet wheel a distance equivalent to one tooth thereof, a pin projecting from a side face of the ratchet wheel, a toothed wheel adjustably mounted on said machine and having a predetermined number of teeth thereon in the path of said pin on the ratchet wheel, a pin on the toothed wheel, shiftable means adjustably mounted on the machine to be actuated by said pin on the toothed wheel, and the adjustment of said toothed wheel and said shiftable means being effective for direct actuation of the shiftable means by said pin on the ratchet wheel whereby the shiftable means can be selectively operated by a number of wire products equivalent to the number of teeth on the ratchet or by a number of wire products equivalent to the number of teeth on the ratchet multiplied by the number of teeth on the toothed wheel.

3. A counter for a wire product fabricating machine including mechanism for conveying wire products in spaced relation which comprises a device arranged to be tripped by each wire product, a shiftable means adjustably mounted on the machine actuated by said device upon predetermined amount of movement of the device, and means adjustably mounted on the machine inserted between said device and said shiftable means to be driven by the device for controlling the shiftable means, the adjustment on the shiftable means and the means being provided so that the shiftable means can be selectively operated at variable amounts of movement of the device.

4. In a wire products fabricating machine including means for feeding wire products in spaced relation, a pawl device arranged to be

tripped by each wire product, a ratchet operated by said pawl device, shiftable means adjustably mounted on the machine actuated by said ratchet, and an intermediate means adjustably mounted on the machine inserted between said ratchet and said shiftable means to be driven by the ratchet for controlling the shiftable means, the adjustment of the shiftable means and the intermediate means being provided so that the shiftable means can be selectively operated directly from said ratchet or through said intermediate means.

5. A counter for a wire products fabricating

machine comprising a toothed ratchet, a pawl device arranged to be tripped by each wire product passing through the machine for advancing the ratchet, a cam projecting from said ratchet, adjustable shiftable means actuated by said ratchet, and an adjustable intermediate rotatable device disposed between said cam and said shiftable means for controlling said shiftable means, the adjustments of the shiftable means and the intermediate means being provided for varying the operation of the shiftable means relative to the operation of the pawl device.

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