

C. M. SONNEY.
BUNDLE TYING MACHINE.
APPLICATION FILED OCT. 5, 1911.

1,047,456.

Patented Dec. 17, 1912.

4 SHEETS-SHEET 1.

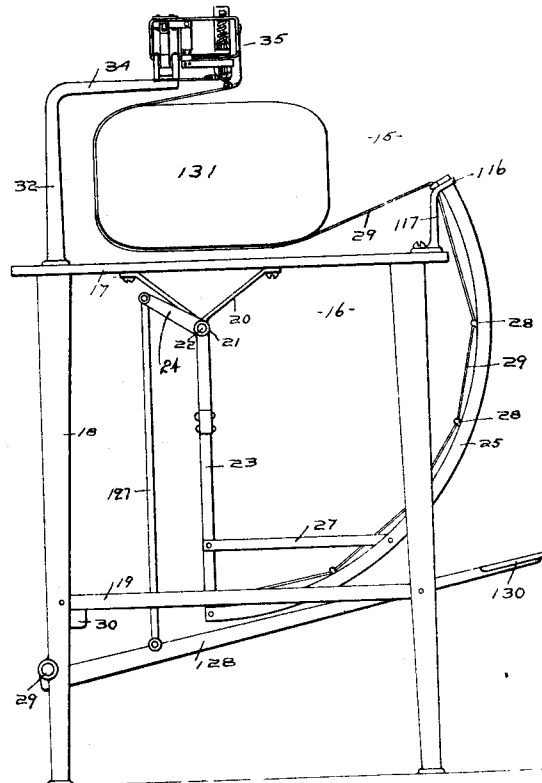


Fig. 1.

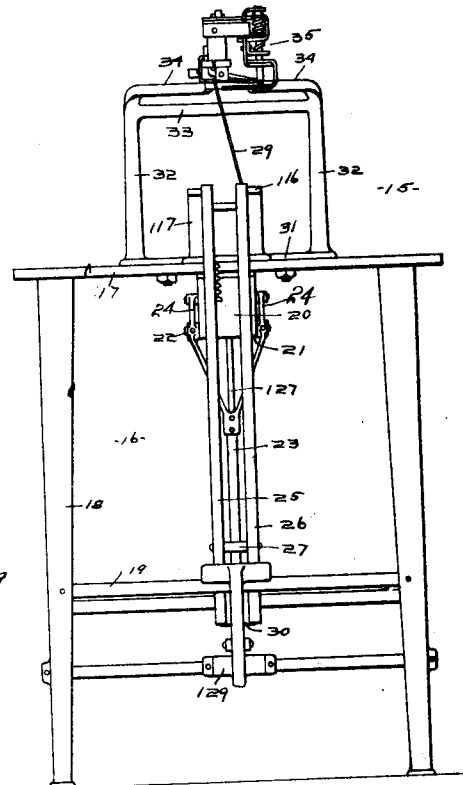


Fig. 2.

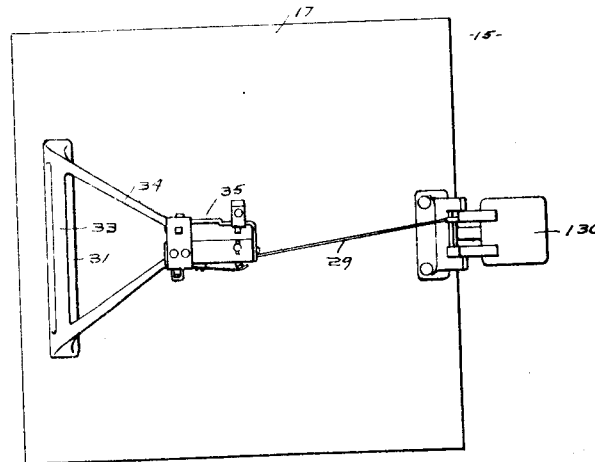


Fig. 3.

Witnesses

J. H. Brown
M. L. Sullivan

Inventor

C. M. Sonney,

By *Charles C. Brown*

Attorneys

C. M. SONNEY.
BUNDLE TYING MACHINE.
APPLICATION FILED OCT. 5, 1911.

Patented Dec. 17, 1912.
4 SHEETS-SHEET 2.

1,047,456.

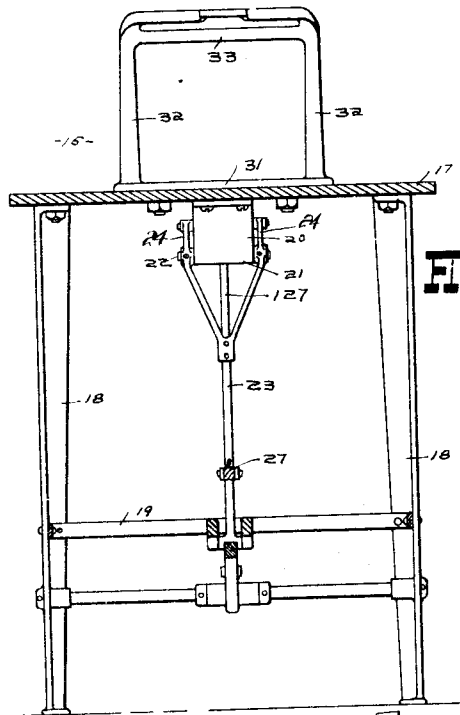


Fig. 4

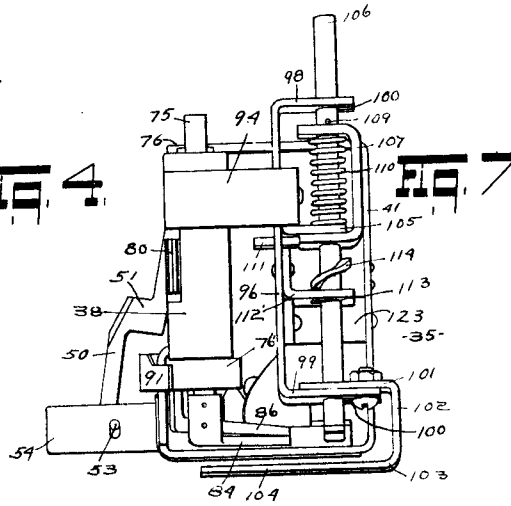


Fig. 7

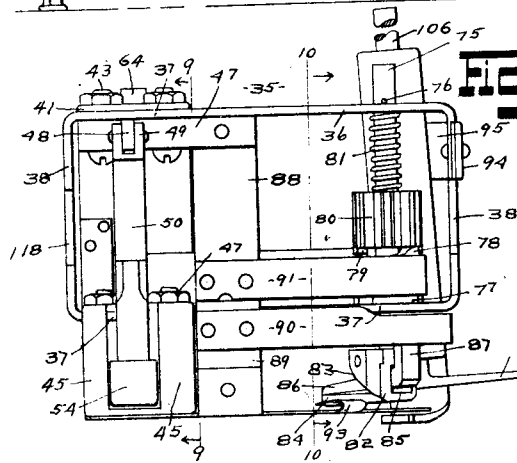


Fig. 5

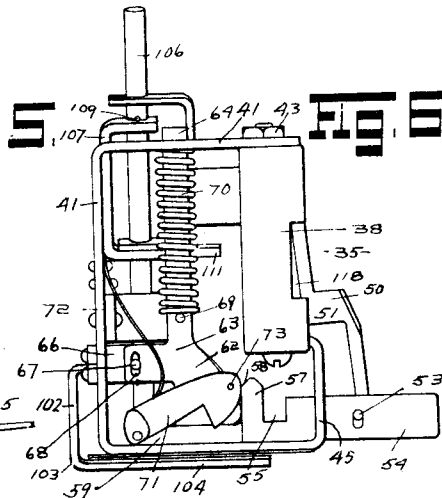


Fig. 6

Witnesses

J. H. Brown
M. L. Sullivan

Inventor
C. M. Sonney,

By *Charles H. Brown*

Attorney

C. M. SONNEY.
BUNDLE TYING MACHINE.
APPLICATION FILED OCT. 5, 1911.

Patented Dec. 17, 1912.

4 SHEETS—SHEET 3.

1,047,456.

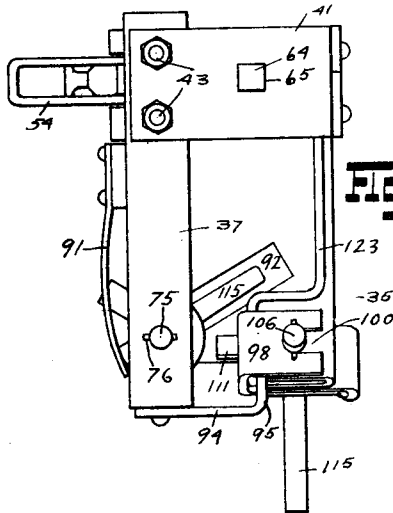


FIG. 8.

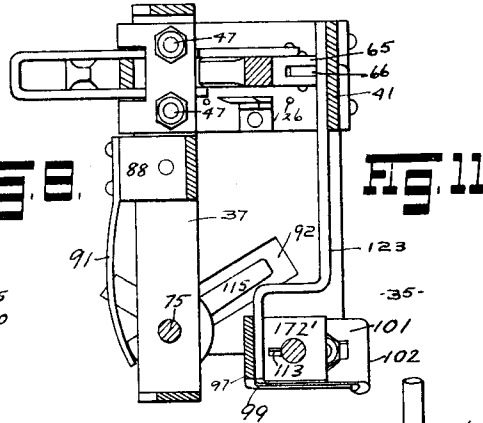


FIG. 11.

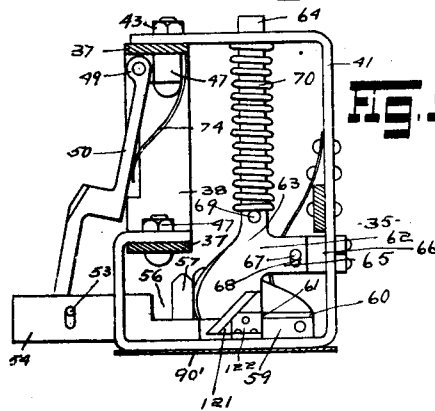


FIG. 9.

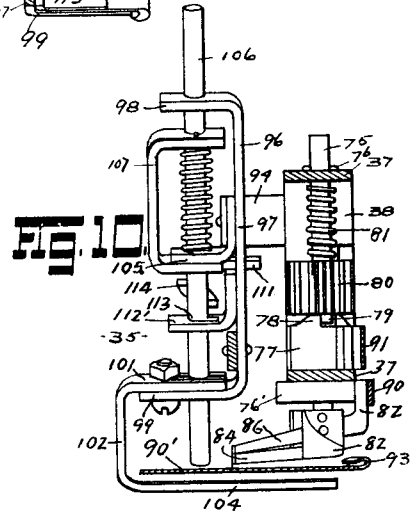


FIG. 10.

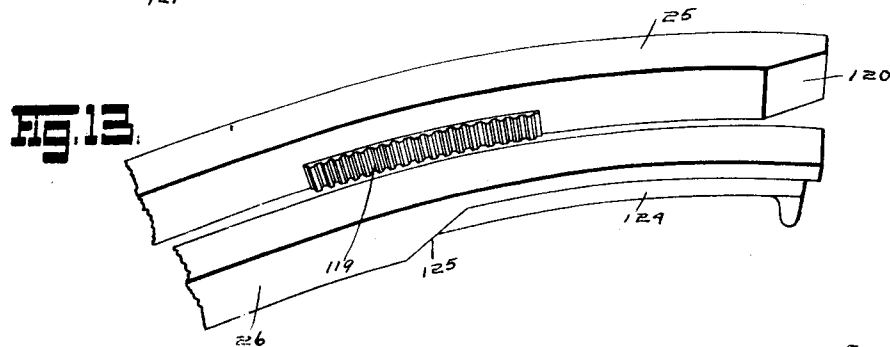


FIG. 13.

Witnesses

J. H. Sonney
M. A. Sullivan

Inventor

C. M. Sonney

By *Charles C. Sonney*

Attorneys

C. M. SONNEY.
BUNDLE TYING MACHINE.
APPLICATION FILED OCT. 5, 1911.

1,047,456.

Patented Dec. 17, 1912

4 SHEETS—SHEET 4.

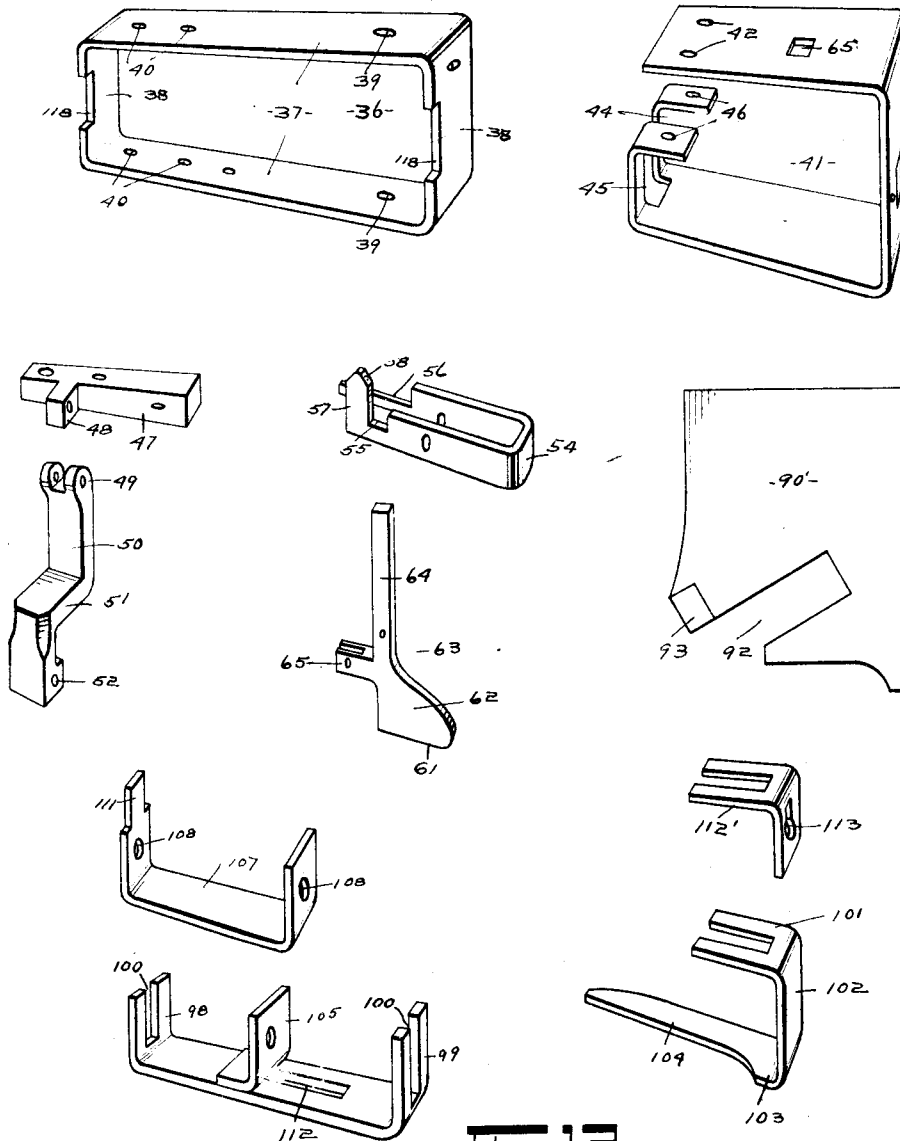


Fig. 12.

Witnesses

H. J. Brown
M. L. Sullivan

Inventor
C. M. Sonney

Charles C. Brown

Attorney's

UNITED STATES PATENT OFFICE.

CHRISTIAN M. SONNEY, OF BUTTE, MONTANA.

BUNDLE-TYING MACHINE.

1,047,456.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed October 5, 1911. Serial No. 652,950.

To all whom it may concern:

Be it known that I, CHRISTIAN M. SONNEY, a citizen of the United States, residing at Butte, in the county of Silverbow, State of Montana, have invented certain new and useful Improvements in Bundle-Tying Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in bundle tying machines.

An object of this invention is the provision of a device of this character which will tightly wrap a strand of thread around a package and securely tie the free ends thereof.

Another object of this invention is the provision of a bundle tying device which comprises a base to which is hingedly secured a pair of arcuate arms, one of which supports a thread and securely winds the same around a bundle, while the other of the said arcuate arms, together with the first mentioned one operates a device which grasps the free ends of the thread and securely ties the same in a knot.

A further object of this invention is the provision of a device of the character described which comprises a base preferably in the form of a table, to which is hingedly secured a pair of arcuate arms operated through the medium of a treadle, one of the said arms being constructed for supporting a thread and moving the same around the package to be tied, both of the said arms being arranged for engagement with a knot tying device which engages the ends of the strand above said package and securely ties the same into a knot, at the same time severing the ends of the thread from the remainder at a point slightly above the knot.

A further object of this invention is to improve and simplify devices of this character rendering them comparatively simple and inexpensive to manufacture, reliable and efficient in use and readily operated.

With the above and other objects in view this invention resides in the novel features of construction, formations, combinations and arrangements of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of my invention. Fig. 2 is an end view thereof. Fig. 3

is a top plan view. Fig. 4 is a transverse sectional view. Fig. 5 is an enlarged side elevation of the knot tying apparatus. Fig. 6 is an end view thereof. Fig. 7 is an end view taken from the opposite side. Fig. 8 is a top plan view of the knot tying device. Fig. 9 is a transverse sectional view taken on the line 9-9 of Fig. 5. Fig. 10 is a transverse sectional view taken on the line 10-10 of Fig. 5. Fig. 11 is a horizontal sectional view. Fig. 12 is a view illustrating several of the parts removed and shown in perspective, and Fig. 13 is a view showing the ends of the arcuate arms in perspective.

Referring to the accompanying drawings by similar characters of reference throughout the several views, the numeral 15 designates generally my improved machine which comprises a base 16 preferably in the form of a table and comprising a top 17 mounted upon suitable legs 18 connected at points throughout their lengths by braces 19. The central portion of the top has secured thereto a depending bracket 20 provided at its lowermost terminal with a pair of spaced bearings 21 in which is journaled a transversely extending shaft 22. This shaft 22 has keyed to its intermediate portion between the bearings 21 a depending lever 23, the upper end of which is extended at an angle, as indicated by the numeral 24, while the opposite end has secured thereto adjacent one terminal a pair of arcuate shaped arms 25 and 26, the said arms being connected to the lever 23 intermediate their ends by braces 27.

The arm 25 has secured thereon upon its inner side a plurality of eyes 28 for the reception of the thread 29 located in a housing 30 mounted on one of the before mentioned braces 19. The top 17 of the table or stand has secured thereon a transversely extending bar 31, to the opposite ends of which are secured a pair of upright bars 32 connected at their upper ends by a cross bar 33 from which project forwardly converging supporting bars 34, to the converged terminals of which is secured my improved knot tying device 35. This knot tying device comprises a substantially rectangular side frame 36 consisting of horizontal rails 37 connected at their opposite ends by vertical rails 38. The rails 37 adjacent one end are provided with single alining openings 39, while the opposite ends thereof are formed with pairs of alining openings 40 to

which are secured the terminals of a supporting frame 41. This frame 41 is preferably U-shaped having its arch arranged in a vertical position and provided in its upper leg with a pair of apertures 42 which are connected by suitable fastening devices 43 which extend through the openings 40 in one end of the side frame 36. The opposite leg is bifurcated as indicated by the numeral 44 and extended in a vertical plane, as at 45, at the terminals of which they are bent in substantially parallel relation to the lower leg of the said frame and are apertured as at 46 to provide a means whereby fastening devices 47 may be used to secure that portion of the frame 41 to the lower rail 37 of the frame 36. A supporting bar 47' is secured to the upper rail 37 of the said frame 36 by the fastening devices 43 and is formed with a laterally extending ear 48 to which is pivoted the forked terminal 49 of a swinging arm 50. This arm is offset intermediate its ends, as at 51, to extend beyond the lower rail 37 and is provided in its lower end with an aperture 52 which extends longitudinally of the frame 36 and receives a bolt or similar fastener 53 which retains thereon a hinged shoe 54. This shoe 54 is U-shaped in plan view and is provided in its parallel legs adjacent their free terminals with alining slots 55 and 56. The forward end of the slot 56 is preferably open, while the similar end of the slot 55 is closed by a vertical extension 57 provided with a cam nose 58 for a purpose to be later disclosed.

A fastener block 59 is secured to the lower leg of the U-shaped frame 41, substantially intermediate its longitudinal edges and is provided with a longitudinally extending rib 60 which receives a groove 61 formed in the lower side of the head 62 of a vertically movable plunger 63. The shank 64 of this plunger 63 is preferably square in formation and extends through a squared opening 65 formed in the upper leg of the frame 41 and provides a means for permitting the vertical movement of the said plunger and at the same time holding it against any undesired rotation. The head of this plunger 63 is provided with a rearwardly extending vertically slotted leg 65 which embraces the opposite sides of a lug 66 formed upon the arch of the frame 41. This lug is provided with a transversely extending pin 67 which extends through a pair of slots 68 cut vertically in the ears 65, thus permitting of the vertical movement of the before mentioned plunger. The shank of this plunger has secured therein a pin 69 which abuts against the lower end of a coil spring 70, the opposite end of which engages the under face of the upper leg of the frame 41 serving to yieldingly retain the plunger head in its lowermost position so that the rib 60 engages the groove 61. A latch 71 is piv-

otally secured to the rear end of the block 59 and is adapted to lie between the outer side of the head 62 and the inner side of one of the legs of the shoe when the said shoe is moved inwardly. This latch 71 is normally forced downward by a suitable spring 72, while extending from the outer face of the latch 71 is a pin 73 which engages the cam nose of the extension 57, thereby forcing the latch member upwardly as the shoe is moved inwardly.

The shoe supporting arm 50 is normally retained in its outermost position by a spring 74 which is secured to the rear of the bar 47 and engages the said arm adjacent its off set portion, thereby normally retaining the same so that the grooves 55 and 56 are held beyond the side of the frame to permit the ready insertion of the thread 29 therethrough. After the thread has been passed through the said grooves the shoe may be pressed inwardly, which causes the lifting of the latch 71 and forces the thread between the head 62 and the block 59 securely holding the same against displacement by its engagement with the rib 60 and groove 61, together with the latch 71, thereby holding the free terminal of the said thread against any undesired displacement during the operation of the machine.

A vertically extending shaft 75 is journaled in the openings 39 located in the rails 37 and is held against displacement at its upper end by a pin 76. The lower end of the shaft has loosely mounted thereon a cam disk 76' which prevents the shaft's upward displacement. This cam disk is secured to the lower end of the shaft 75, upon one side of the rail 37, while keyed upon the opposite side of this rail 37 to the shaft 75 is a cam disk 77 provided in its upper end with a plurality of clutch teeth 78 for engagement with the teeth 79 formed upon the lower side of a gear wheel 80 loosely mounted upon the shaft 75 and held in engagement therewith through the medium of a spring 81 which forces the teeth 78 and 79 into engagement thereby keying the said gear wheel 80 to the shaft 75 so that upon its movement in one direction it will cause the rotation of the shaft, but upon its movement in an opposite direction will pass loosely thereover.

A head 82 is secured in any suitable manner to the lower end of the shaft 75, and is provided with a spirally arranged groove 83 from the lower end of which extends a laterally projecting finger 84. The head 82 is longitudinally slotted as at 85 and has pivotally secured in the said slot a movable finger 86. This finger 86 is formed with an upwardly extending heel 87 which rests upon the cam periphery of the groove 86' and upon the rotation of the same causes the fingers to open and shut. A brace 88

connects the rails 37 of the frame 36 and extends below the lower side thereof, as indicated by the numeral 89. This brace has extending horizontally therefrom a pair of springs 90 and 91 which engage the cam disk 76' and gear 77, the former to hold the heel into contact therewith and the latter to lock the shaft 75 in its normal position.

A base plate 90' is connected to the depending extensions 89 of the brace 88 and to the lower leg of the U-shaped frame 41 and extends parallel to the lower rail 37 of the frame 36. This plate is formed with a curved slot 92, the outer corner of which is provided with a hooked portion 93 for engagement with the thread to be tied. The slot 92 extends substantially parallel to the fingers 84 and 86 when the shaft 75 is in its normal position.

A bracket 94 is secured to the upper end of one of the rails 38 of the frame 36 and is offset at its outer terminal, as indicated by the numeral 95, for engagement with a guide member 96 to which it is rigidly secured. This guide member comprises a vertically arranged plate 97, the opposite ends of which are extended laterally as at 98 and 99 in spaced parallel relation to each other and are provided with slots 100 which extend from the free ends inwardly to equidistant points from the plate 97. The lateral extension 99 of the plate 97 has secured thereto the upper side of a bracket 101 which is extended at right-angles as at 102, and then laterally in parallel relation to the extension 101, as indicated by the numeral 103 providing a curved guide arm 104, to which is secured the adjacent end of the plate 90'. The intermediate portion of the plate 97 has extending in parallel relation to the portions 98 and 99 an apertured lug 105 which supports the intermediate portion of a vertically movable and rotatable shaft 106.

A U-shaped operating clip 107 provided with apertures 108 in its opposite terminals which embrace the shaft 106 is secured thereto as indicated by the numeral 109 and is engaged by a tension spring 110 which bears upon the upper face of the lug 105 and the under side of the upper leg of the said member 107 and normally retains the shaft in its uppermost position. The lower leg of this said member 107 is provided with a reduced extension 111 which extends through a slot 112 formed in the plate 97 for a purpose to be later disclosed.

An L-shaped bracket 112' is secured to the plate 97 between the lug 105 and extension 99 and is provided with a threaded opening 113 which engages a worm 114 formed upon the shaft 106. The lower end of the shaft 106 is provided with a laterally extending arm 115 for a purpose which will later appear. The arcuate arms 25 and 26 pass

between guides 116 provided on a vertically extending plate 117 secured to the forward edge of the table or stand 16. These guides cause the arm 25 to pass through the groove 118 formed in the end rails 38 of the frame 36 for engagement with the gear wheel 80, which gear wheel meshes with a plurality of rack teeth 119 formed in the adjacent side of the said arm 25. This arm 25 is also formed with a wedge shaped cam extension 120 which engages the arm 50 forcing the same inwardly so that the thread 29 will be brought into engagement with a knife 121 supported by a bracket 122 extending vertically from the lower leg of the U-shaped frame 41.

In order to prevent any undesired displacement between the plate 97 and the frame 41 a longitudinally extending brace 123 connects the arch of the said frame and the lower end of the plate, thereby rigidly retaining the same against any undesired displacement with respect to each other. The arm 26 passes between the frame 36 and plate 97 and is formed in one side thereof with a groove 124 which engages the reduced extension 111. This groove is cut at an angle adjacent one end thereof, as indicated by the numeral 125, to cause the depression of the clip 107 and the swinging of the arm 115 upon the upward movement of the said arms 25 and 26.

In order to prevent any undesired lateral movement of the shoe during its inward operation a pair of guides 126 are arranged to engage the one side thereof and cause one leg of said shoe to be extended between the side of the head 62 and the knife 121 and the opposite leg to engage the outer face of the latch 71.

In order to provide a means for manually operating the device and throwing the arms 25 and 26 upwardly, the terminal of the lever 24 is connected by means of a link 127 to the intermediate portion of a treadle 128 which is hinged as indicated by the numeral 129 to one of the braces 19. The forward end of the treadle 128 extends to the forward side of the table or stand 16 and is formed with a foot rest 130 whereby the same may be swung downwardly at will and the arms moved upwardly. Obviously upon the release of this treadle 128 the weight of the arms 25 and 26 causes them to be moved downwardly to their normal positions by gravity and the said treadle to be moved upwardly to its starting position.

The operation of the device is as follows: The tread 29 is drawn from the housing 30 and inserted through the eyes 28 carried by the arm 25, after which it is inserted through the grooves 55 and 56 formed in the shoe, which shoe is then pressed inwardly so that the free end of the thread is engaged by the fastening block 59 and head 62, together

with the latch member 71. The package which is designated by the numeral 131 is then placed upon the thread and moved inwardly until the tying device is located at a point upon the package at which it is desired that the knot be tied. The treadle 128 is then pressed downwardly which causes the upward swinging movement of the arms 25 and 26 which first causes the rotation and downward movement of the shaft 106, which causes the arm 115 to swing forwardly engaging one end of the thread and causing the same to be forced into the slot 92 into which the other end has been previously inserted. Simultaneously with the insertion of the thread 29 in the slot 92 the rack 119 engages the gear wheel 80 causing the rotation of the shaft 75, together with the fingers 84 and 86 which open and close over the ends of the thread above the package and upon their rotation wind the thread securely around the same through the medium of the spiral groove 83. Immediately after this operation the cam extension 120 formed upon the arm 25 engages the arm 50 forcing the same together with the shoe inwardly which forces the thread against the knife 121 and obviously severs the same. The package is then moved outwardly causing the thread to be pulled through the open end of the groove 97, which forces the loop over the free ends of the thread and ends of the fingers and as the said free ends of the thread are obviously grasped between the fingers and the loop slips over the terminals thereof, the same will be securely knotted as the package is removed from the device.

From the foregoing disclosures taken in connection with the accompanying drawings, it will be manifest that a package tying machine of the nature described is provided which will fulfil all the necessary requirements of such a device.

Having thus fully described this invention, what I claim as new and desire to protect by Letters Patent, is:

1. The combination in a package tying device, of a supporting member, a knot tying device, means provided by the supporting member for bringing thread into engagement with the knot tying device, means provided by the knot tying device for engaging one end of the thread, an arm pivoted to the knot tying device, a shoe carried thereby and engaging the thread and a knife located in the path of the shoe whereby upon the inward movement of the arm the thread will be severed and means for operating said arm.

2. The combination in a package tying device, of a supporting member, a knot tying device mounted thereabove and comprising a plurality of frames, means for bringing the thread into engagement with the said

knot tying device, a knotter mounted in the said frame, means for operating the knotter, means for bringing the thread into engagement with the knotter, a thread fastening device, an arm journaled upon one of said frames, a shoe supported thereby for engaging the thread and forcing the same into engagement with the fastening device and a knife located in the path of the shoe whereby the same will be severed, substantially as and for the purposes set forth.

3. The combination in a bundle tying device, of a supporting means, a knot tying device located thereabove, said knot tying device consisting of a base plate and a plurality of frames, a shaft rotatably journaled in one of said frames, spring fingers supported by the shaft, one of said fingers being provided with a head having a spiral groove, a heel provided upon one of said fingers, a cam disk secured to the frame and engaging the heel, whereby the said fingers will be opened and closed upon the rotation of the shaft, means for rotating the shaft, and means for severing the thread.

4. A bundle tying device such as described, comprising a supporting member, a knot tying device located thereabove, said knot tying device comprising a base plate having a slot formed therein and a plurality of frames, a shaft journaled within one of said frames and provided at its lower end with a head and a laterally extending finger arranged to travel above the slot formed in the base plate, a finger hingedly secured to the said head to cooperate with the before mentioned finger, a heel provided upon this movable finger, a cam disk carried by the frame for engaging the heel and forcing the fingers to and from each other, a shaft journaled adjacent the first mentioned shaft, a laterally extending arm projecting therefrom and means for operating said shafts.

5. The combination in a bundle tying device, of a supporting member, thread carrying means secured thereto, a knot tying device located thereabove and comprising a base plate and a plurality of frames, a slot provided in said plate, a pair of shafts journaled in one of said frames, a pair of fingers carried by one shaft, means for opening and closing the fingers upon the rotation of the shaft, an arm extending from the opposite shaft for engaging a strand of thread and forcing the same into a slot formed in said base plate, a fastening block secured to the opposite frame, a head movable for engagement therewith, an arm carried by the first mentioned frame, a shoe provided upon the arm and extending upon opposite sides of the head and fastening block, said shoe being slotted for engagement with one end of the thread for forcing the same between the head and fastening block, a latch secured to the fastening block and engaging the thread,

a knife located adjacent the fastening block and means for operating the shoe to force the thread into engagement with the knife whereby the said thread will be severed.

5 6. The combination in a bundle tying device, of a supporting means, a pair of arcuate arms hingedly secured thereto, means for swinging said arcuate arms, thread support-
 10 ing means provided upon one of the arcuate arms, a knot tying device located above the supporting means, said knot tying device consisting of a slotted base plate and a plu-
 15 rality of frames, a fastening block secured to one of the frames, a head normally engaging the fastening block, an arm pivoted to one of said frames, a shoe carried by the
 20 arm and extending upon opposite sides of the fastening device, said shoe being grooved whereby a thread will be engaged thereby
 25 and inserted between the fastening block and the head for retaining the same against displacement, a latch pivoted to the fasten-
 30 ing block for engagement with the thread and further insuring the same against dis-
 35 placement, a shaft mounted in one of said frames, a laterally extending arm provided
 40 upon the shaft for engagement with the

thread and forcing the same into engage-
 ment with the slot formed in the base plate,
 a clip provided upon the shaft, a worm 30
 formed upon the shaft, a lug extending from
 the frame and engaging the worm for rotat-
 ing the shaft and moving the same down-
 wardly upon the depression of the clip, a
 finger extending from the clip and engaging 35
 a groove formed in one of said arms, a sec-
 ond shaft mounted in one of said frames, a
 gear wheel keyed thereto for engagement
 with a rack provided upon one of said arms,
 fingers extending from the shaft, means for 40
 operating said fingers upon the rotation of
 the shaft, one of said fingers being support-
 ed by a grooved head for engagement with
 the thread and looping the same over the
 fingers, and an extension formed upon one 45
 of said arcuate arms for forcing the shoe in-
 wardly to engagement with the knife and
 severing the thread.

In testimony whereof, I affix my signature,
 in presence of two witnesses.

CHRISTIAN M. SONNEY.

Witnesses:

JOHN NELSON,
 A. S. HOLST.