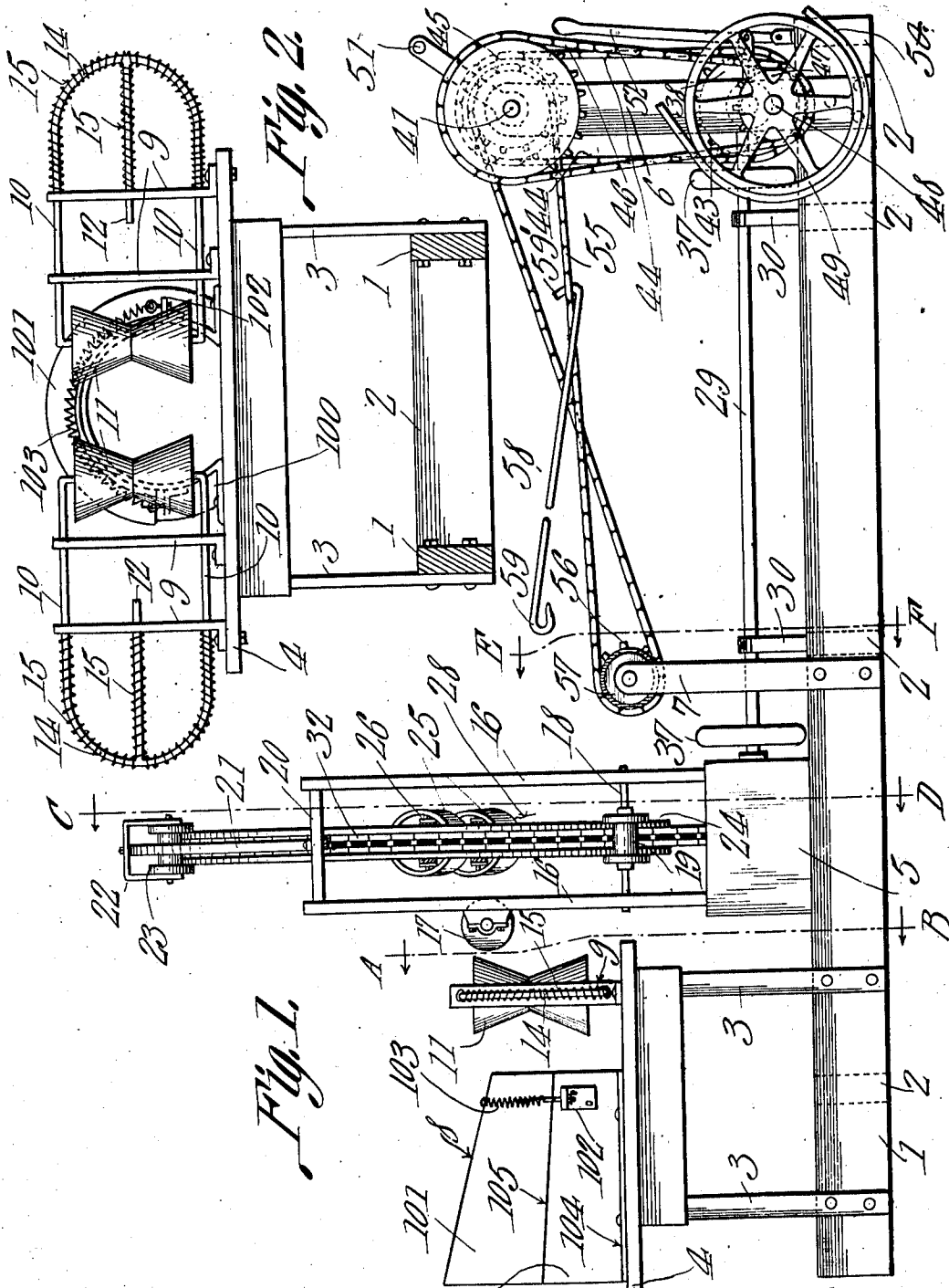


A. N. JOHNSON.
 TREE BUNDLING MACHINE.
 APPLICATION FILED MAY 28, 1910.

Patented Apr. 4, 1911.

2 SHEETS-SHEET 1.

988,347.



Witnesses

J. R. Dornlin
Mason B. Lawton

Andrew N. Johnson, Inventor

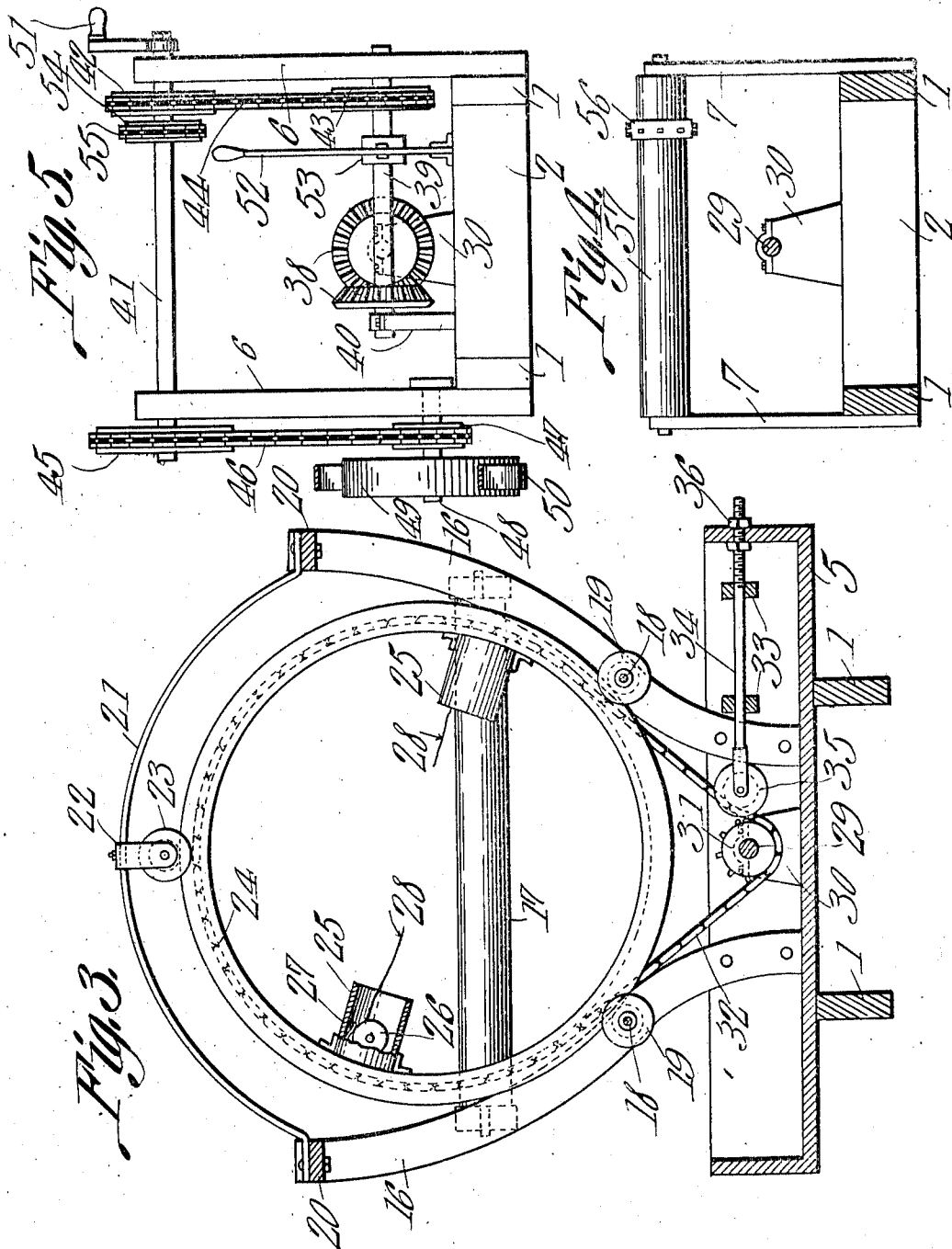
by *Chas. Snow & Co.*
 Attorneys

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UNITED STATES PATENT OFFICE.

ANDREW N. JOHNSON, OF BAGLEY, MINNESOTA.

TREE-BUNDLING MACHINE.

988,347.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed May 26, 1910. Serial No. 563,589.

To all whom it may concern:

Be it known that I, ANDREW N. JOHNSON, a citizen of the United States, residing at Bagley, in the county of Clearwater and State of Minnesota, have invented a new and useful Tree-Bundling Machine, of which the following is a specification.

The device forming the subject matter of this application, is a machine adapted to receive trees, of the sort which are commonly employed for Christmas decorations, to dispose the trees into bundles, and to wrap each bundle about with a securing band, the operation of bundling the trees, and the operation of wrapping them being carried out by co-acting devices preferably operated by a common mechanism.

It is the object of this invention to provide novel means for bunching or bundling trees, to provide novel means for wrapping the trees about spirally, with a securing band, to provide means adapted to receive the bundles after they have been bound up, and to provide novel means for actuating that portion of the mechanism whereby the securing band is applied to the bundle.

Another object of the invention is to provide a means for binding up the bundles of trees, and to provide a means for advancing the bundles, so that the band whereby the bundle is bound up, may be applied spirally to the same, from end to end thereof.

Another object of the invention is to provide a means for binding the bundles about with a securing band, to provide a means for receiving the bundles after they are thus bound, and to provide a device operative at once to actuate the binding means and the means whereby the bound up bundles are received.

The drawings show typical embodiments merely, and it is to be understood that changes, properly falling within the scope of what is claimed, may be made, without departing from the spirit of the invention.

In the drawings,—Figure 1 shows the invention in side elevation; Fig. 2 is a transverse section upon the line A—B of Fig. 1; Fig. 3 is a transverse section upon the line C—D of Fig. 1; Fig. 4 is a transverse section upon the line E—F of Fig. 1; and Fig. 5 is an end elevation, showing that end of the machine upon which the actuating mechanism is located.

Broadly speaking, the invention com-

prises four co-acting mechanisms; a bunching mechanism; a mechanism for applying a band to the bundle; a device adapted to receive the bundle after it is bound up; and an operating mechanism. These four coöperating structures may be supported in any desired or suitable manner. In the present instance, in order to present a compact structure, and in order to connect the parts so that the machine as an entity may readily be moved about, I have shown parallel sills 1, connected by a plurality of cross sills 2. Rising from the sills 1, adjacent one end thereof, are legs 3, upon which the bunching table 4 is supported. A transverse member, in the present instance shown in the form of a box 5, is rested upon the sills 1 and secured thereto, in front of the bunching table 4. Rising from the sills 1 adjacent one end thereof, are end standards 6, intermediate standards 7 rising from the sills 1 between the end standards 6 and the box 5.

Supported upon the bunching table 4 is a hopper 8 which may be of any desired form. This hopper 8 is disposed in a substantially horizontal position upon the bunching table, and is a funnel shaped structure, comprising two yieldable parts 100 and 101, the remote edges of which are secured to the bunching table, as shown at 104, the adjacent edges of the parts 101 and 100 overlapping, as seen at 105. Secured to the parts 100 and 101, are brackets 102. A retractile spring 103 is extended transversely of the hopper 8, the end of the spring being secured to the brackets 102. Obviously, the brackets 102 may be applied to the hopper at any desired points between its ends, the retractile spring 103 being in position to exert its efforts at the desired point between the front and rear ends of the hopper. This hopper 8 is adapted to receive the trees which are to be bundled; and the retractile spring 103 serves to telescope the parts 100 and 101 transversely, thereby compressing the trees into compact form.

Rising from the bunching table 4, in front of the hopper 8, are pairs of supports 9, aligned transversely of the bunching table. In these supports 9, are, as seen most clearly in Fig. 2, U shaped, arcuate members, the parallel arms 10 of which extend through the supports 9. The free ends of the arcuate members are disposed toward each other, adjacent the longitudinal center of the ma-

chine. Rotatably supported between the free ends of the arms 10 of each of the arcuate members, is a roller 11, the same being contracted in its intermediate portion, to give to the roller, roughly speaking, an hour-glass outline. A finger 12 projects from the curved portion 14 of the arcuate member, this finger 12 being slidably mounted in one of the supports 9. Retractable helical springs surround the curved portions 14, and likewise surround the fingers 12, these springs which are denoted by the numeral 15, being connected with the outermost pair of the upright supports 9.

By referring to Figs. 1 and 3, it will be seen that spaced, curved arms 16 are secured, at their lower ends, to the side walls of the box 5. A horizontally disposed roller 17, positioned in front of the rollers 11, is terminally journaled for rotation in one pair of the curved arms 16. Adjacent their lower ends, and slightly above the upper edge of the box 5, the arms 16 carry shafts 18, upon which are placed grooved wheels 19. The upper ends of the arms 16 are connected, longitudinally of the machine, by ties 20. An arcuate bar 21, seen most clearly in Fig. 3, connects the ties 20. Depending from this bar 21 is a hanger 22, in which is journaled for rotation, a wheel 23, similar to the wheels 19, the several wheels being located in a common vertical plane.

The box 5 and the arms 16 constitute a supporting member for a ring 24, the same being mounted for rotation in the wheels 19 and 23. This ring 24 will be referred to hereinafter as the carrying member, for the reason that it supports a plurality of band-holders, each band-holder including a tubular casing 25 secured to the inner surface of the carrying member 24, to project radially toward the center thereof. There may be two of these casings 25, disposed diametrically opposite to each other. In each casing, a reel 26 is journaled for rotation, the reel 26 being held under check by a suitable tension device of any sort; the same being shown conventionally in Fig. 3, and there denoted by the numeral 27. It is upon these reels 26 that the securing bands, whereby the bundles of trees are bound, are located. The securing band is ordinarily a heavy cord 28, shown in Fig. 3 as extending from the reels 26.

Passing now to the mechanism whereby the carrying member 24 is rotated, it will be seen that a drive shaft 29 extends longitudinally of the machine, this drive shaft being held for rotation in bearings 30, placed upon the cross sills 2, or upheld in any other suitable manner. Referring to Fig. 3 it will be seen that a sprocket wheel 31 is secured to the shaft 29 within the contour of the box 5. A sprocket chain 32 is passed about the wheel 31, this chain being

extended around the periphery of the carrying member 24, in a suitable groove fashioned therein. In order that any slack in the sprocket chain 32 may be removed, an idle pulley 35 is brought to bear against the said sprocket chain. This idle pulley 35 may be advanced against the chain in any manner appropriate to the end sought. If desired, transverse guides 33 may be mounted in the box 5, and in these guides 33, a rod 34 may be mounted for longitudinal sliding movement, the pulley 35 being journaled for rotation upon one end of the rod. The rod 34 may be advanced and retracted by means of adjusting nuts 36 or the like, bearing against one end wall of the box 5. The shaft 29 may carry, adjacent its ends, fly wheels 37.

Adjacent that end of the machine which is remote from the hopper 8, a transverse shaft 39, disposed substantially at right angles to the drive shaft 29, is journaled for rotation in a bearing 40 rising from one of the cross sills 2, and in one of the end standards 6; or any other suitable means for mounting the shaft 39 for rotation, may be employed. This shaft 39 is operatively connected with the drive shaft 29, by means of beveled pinions 38. Journaled for rotation in the upper ends of the standards 6, is an auxiliary shaft 41. Upon the auxiliary shaft, is a sprocket wheel 42, aligned vertically with a sprocket wheel 43 upon the shaft 39, a sprocket chain 44 being passed about the wheels 42 and 43. The ends of the auxiliary shaft 41 protrude beyond the standards 6 in which the shaft is mounted. Upon one of the protruding ends of the auxiliary shaft 41, there is a sprocket wheel 45, aligned vertically with a sprocket wheel 47, mounted upon a stub shaft 48 which is held in one of the standards 6. A sprocket chain 46 connects the wheels 45 and 47. Upon the stub shaft 48, beyond the sprocket wheel 47, is mounted a pulley 49, adapted to receive a belt 50, the belt 50 forming an operative connection between the tree bundling machine and a prime mover of any sort. The opposite protruding end of the shaft 41, may be provided with a crank 51; and thus, through the instrumentality of the crank 51 and the pulley 49, the device may be operated either manually, or by a gasoline engine or the like.

A lever 52 is fulcrumed upon one of the cross sills 2, the lever 52 serving to operate a clutch 53 located upon the shaft 39; the lever 52 obviously serving as a means for throwing the machine into and out of gear. The shaft 41 carries a sprocket wheel 54 about which is passed a crossed sprocket chain 55, the sprocket chain 55 being engaged in a sprocket wheel 56 carried by a roller 57 journaled for rotation in the intermediate standards 7. A bar 58 is provided, having hooks 59 and 59' in its ends, and the

hook 59' may be engaged in the links of the sprocket chain 55.

When either the crank 51 or the pulley 49 is put into motion, the auxiliary shaft 41 will be rotated; the sprocket chain 44 securing a rotation of the shaft 39, and the beveled pinions 38 transmitting rotary motion to the drive shaft 29. The drive shaft 29 will rotate the sprocket wheel 31, the sprocket wheel 31 engaging the sprocket chain 32, the chain 32, being passed about the periphery of the carrying member 24, causing the said carrying member to rotate in the wheels 19 and 23.

The rotation of the auxiliary shaft 41 will put into motion the sprocket chain 55, the roller 57 being rotated, through the instrumentality of the chain. It will be seen, moreover, that when the bar 58 is hooked into the chain 55, the bar will be drawn toward the shaft 41, as the latter is rotated.

The trees which are to be disposed in a bundle are placed upon the bunching table 4 and passed into the hopper 8. A suitable lashing is passed about the butts of all of the trees which are to constitute the bundle. The bar 58 is then extended through the center of the carrying member 24 and between the rollers 11, and hooked at one end into the lashing. The other end of the bar 58 is then hooked into one of the links of the sprocket chain 55. The machine is then put into operation, through the instrumentality of the crank 51 or the pulley 49. The trees which are to form the bundle are thus drawn between the rollers 11, which said rollers, being actuated toward each other by means of the springs 15, will serve to dispose the trees into a compact bundle, the rollers 11 constituting yielding co-acting compression members co-operating with the horizontally disposed roller 17 to form what, for convenience, may be denominated the bunching or bundling mechanism.

As the rotation of the auxiliary shaft 41 is continued, the trees, fashioned into a compact bundle, will move between the rollers 11 and beneath the roller 17, the butts of the trees passing within the contour of the carrying member 24. When the butts are well within the contour of the carrying member, the ends of the cords 28 are made fast to the trees adjacent their butts, but between the lashing with which the hook 58 is engaged, and the tips of the trees.

A continued rotation of the auxiliary shaft 41 will serve to draw the bundle of trees through the carrying member 24, and will likewise cause the carrying member 24 to rotate, the band-holding elements, comprising the casings 25 and the reels 26 being revolved about the bundle of trees and it is drawn longitudinally of the machine. Thus, the trees, having been bundled together, will be wrapped about with a pair of

spiral bands extended from a point adjacent the butts of the trees, to a point as near the tips thereof as the operator may desire. When this wrapping has been carried to the desired point, the cords 28 are severed, and their free ends united about the bundle. Obviously, as the bundle of trees is drawn through the carrying member 24 the butts of the trees will be received upon the roller 57, which said roller, being actuated by the sprocket chain 55 will serve to aid the bar 58 in advancing the bundle of trees through the carrying member.

When the bundle has passed over the roller 57, the bar 58 may be disengaged from the lashing which is about the bundle, the process of bundling being completed, and the bundle, securely bound about from end to end, being deposited between the roller 57 and the operating mechanism.

It is to be noted that the hook 59' of the bar 58 is not so pronounced in outline as the hook 59. Moreover, the hook 59' is inserted upwardly through the chain 55. As the chain 55 moves toward and around the sprocket wheel 54, the hook 59' will engage the sprocket wheel 54 and be forced downwardly, and out of engagement with the chain 55. Thus, there is no chance of the hook 59' being bound between the chain 55 and the sprocket wheel 54.

Having thus described the invention, what is claimed is:—

1. In a device of the class described, means for bundling the material transversely; means for advancing the material longitudinally; and means for winding a band spirally about the material as it is advanced.

2. In a device of the class described, means for bundling the material transversely; means for advancing the material longitudinally; means for winding a band spirally about the material as it is advanced; and mechanism for operating simultaneously the advancing means and the band winding means.

3. In a device of the class described, means for compressing the material transversely; means for applying a securing band about the material; and a device for drawing the material lengthwise through the compressing means to fashion the material into a bundle, and for advancing the bundle with respect to the band-applying means to receive successive convolutions of the band.

4. In a device of the class described, bundling mechanism; a band-holder revoluble about the bundle formed in said mechanism; and means for advancing the bundle with respect to the bundling mechanism and the band holder.

5. In a device of the class described, yieldably co-acting compression members; means

for advancing the material between the compression members; and means for winding a securing band about the material subsequent to its passage between the compression members and while the material is moving under the impulse of the advancing means.

6. In a device of the class described, mechanism for advancing the material; means for applying a securing band about the material during its advancement; and movable means operable by the advancing mechanism to receive the material subsequent to the application of the securing band.

7. In a device of the class described, means for applying a securing band about the material; a device for operating the band-applying means; and a member actuated by the operating means to advance the material to receive successive convolutions of the band.

8. In a device of the class described, means for applying a securing band about the material; a device for operating the band-applying means; a roller positioned to receive the material subsequent to the application of the band; means for operatively connecting the roller with the operating device; and a device connecting the roller-operating means with the material to advance the material with respect to the band-applying means.

9. In a device of the class described, means for compressing the material transversely; a device for applying a band to the material; a roller to receive the material subsequent to the application of the band; operating mechanism effective at once to actuate the band-applying device and the roller; and means actuated by the operating mechanism to advance the material with respect to the compression means and the band-applying device.

10. In a device of the class described, yieldably co-acting compression members; means for applying a band to the material subsequent to its passage between the compression members; a roller to receive the material subsequent to the application of the band; means for actuating the band-applying means and the roller; and a device for advancing the material with respect to the compression members and the band-applying means to dispose the material upon the roller.

11. In a device of the class described, a centrally open, rotatably mounted carrying member; a band-holder located upon the carrying member; means for rotating the carrying member; and means for advancing the material through the carrying member.

12. In a device of the class described, a rotatably supporting ring; means upon the ring for applying a band to the material; means for advancing the material through the ring to receive successive convolutions of

the band; and an operative connection between the advancing means and the ring to secure a rotation of the latter.

13. In a device of the class described, a support; a centrally open carrying member disposed within the contour of the support; anti-friction means disposed between the support and the carrying member; a band holder located upon the carrying member; means for rotating the carrying member; and means for drawing the material through the carrying member.

14. In a device of the class described, parallel, yieldably co-acting rollers; a fixed roller disposed substantially at right angles to the first named rollers; means for drawing the material across the rollers; and means for applying a band in a continuous length to the material as it is moved with respect to the rollers.

15. In a device of the class described, a centrally open, rotatably mounted carrying member; a band-holder located upon the carrying member; a drive shaft disposed substantially at right angles to the plane of the band-holder and operatively connected therewith; mechanism remote from the band-holder for operating the shaft; and a device operable by said mechanism for advancing the material through the carrying member and toward the operating mechanism.

16. In a device of the class described, a centrally open, rotatably mounted carrying member; a band-holder located upon the carrying member; a drive shaft disposed substantially at right angles to the plane of the band-holder and operatively connected therewith; an auxiliary shaft supported for rotation substantially at right angles to the drive shaft; a flexible member passed about the auxiliary shaft; means for connecting the flexible member with the material to draw the same through the band-holder; and means for operatively connecting the shafts.

17. In a device of the class described, a drive shaft; an auxiliary shaft supported for rotation substantially at right angles to the drive shaft; a flexible member passed about the auxiliary shaft; means for connecting the material with the flexible member; means for operating the shafts; and revolving means operatively connected with the drive shaft for applying a band in a continuous length to the material as it is advanced by the flexible member.

18. In a device of the class described, a rotatably supported shaft; a roller supported parallel thereto; a band connecting the shaft with the roller; a connecting member having elements for removably engaging the band and the material to advance the material upon the roller; means for applying a band in a continuous length to the ma-

terial during its advancement; and an operative connection between said means and the shaft.

19. In a device of the class described, a
5 bunching table; a hopper thereon; yieldably
coacting vertical rollers supported upon the
bunching table in front of the hopper; a
horizontal roller supported in front of the
vertical rollers; a centrally open, rotatably
10 mounted carrying member disposed in front
of the horizontal roller; a band holder located
upon the carrying member; and means for
advancing the material between the rollers
and through the carrying member, to
15 receive successive convolutions of the band.

20. In a device of the class described, a
bunching table; yieldingly co-acting, vertical
rollers upon the table; a supporting member
located in front of the vertical
20 rollers; a horizontal roller journaled for rotation
upon the supporting member; a centrally open,
carrying member mounted for rotation in the
supporting member; a bandholder mounted upon
the carrying member; and means for rotating the
25 carrying member; and means for advancing the
material between the rollers and through the
carrying member, to receive successive convolutions
of the band.

30 21. In a device of the class described, a
bunching table; supports rising therefrom;
arms slidable in the supports; rollers mounted
upon the adjacent ends of the arms; resilient
means for actuating the arms
35 to move the rollers toward each other; means

for advancing the material between the rollers; and means for applying a band about the material as it is advanced.

22. In a device of the class described, a
bunching table; supports rising therefrom; 40
arcuate members having parallel arms slidable
in the supports; rollers disposed between the
free ends of the arms of each of said members;
retractile springs surrounding the curved portions
45 of the arcuate members and connected with the
supports; means for advancing the material between
the rollers; and means for applying a band about
the material as it is advanced.

23. In a device of the class described, a 50
bunching table; a funnel shaped, horizontally
disposed hopper thereon, and comprising
yieldable parts united at their remote edges
with the table and having their adjacent
55 edges overlapped; a retractile spring extended
transversely of the hopper and having each of
its ends secured to one of the hopper parts;
means for drawing the material through the
hopper; and means for applying a securing band
60 subsequent to its passage through the hopper.

In testimony that I claim the foregoing
as my own, I have hereto affixed my signature
in the presence of two witnesses.

ANDREW N. JOHNSON.

Witnesses:

O. J. NORBY,
E. T. EVENSON.