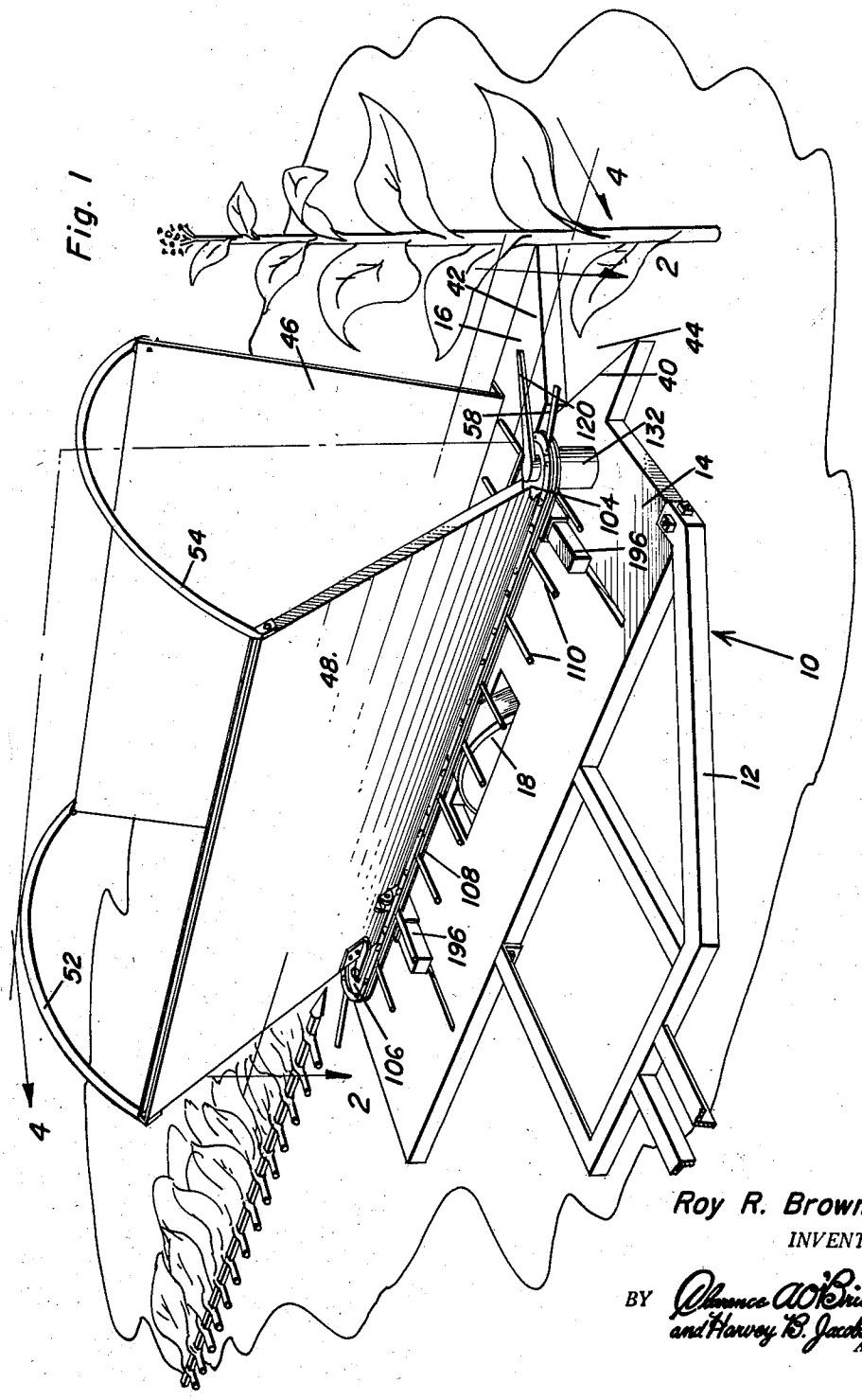
Feb. 2, 1960 R. R. BROWN 2,923,116

TOBACCO HARVESTER

Filed July 22, 1957 5 Sheets-Sheet 1

Fig. 1



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Feb. 2, 1960 R. R. BROWN 2,923,116

TOBACCO HARVESTER

Filed July 22, 1957 5 Sheets-Sheet 2

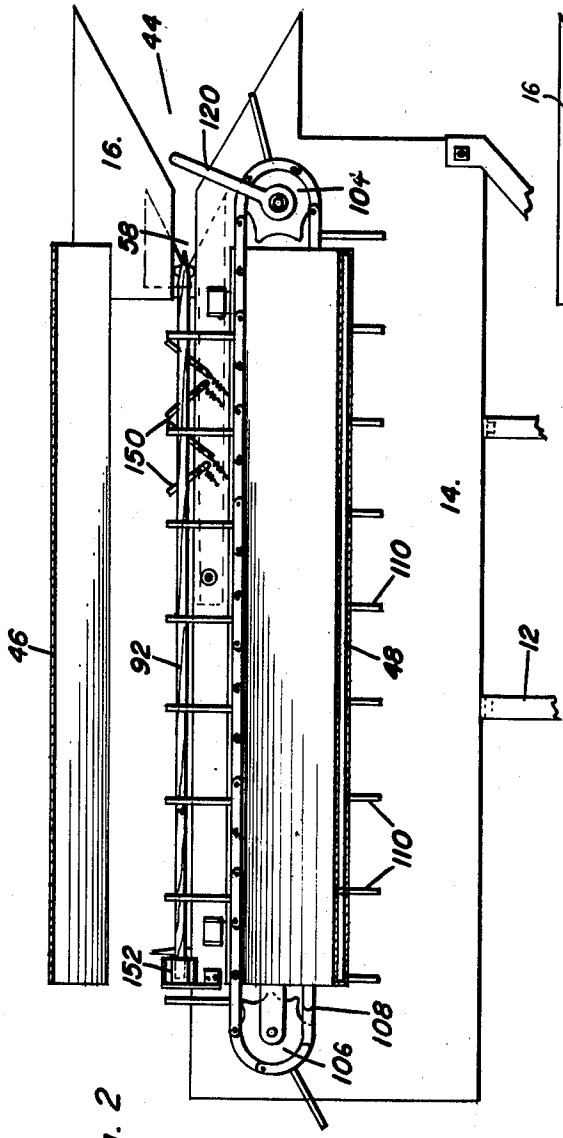


Fig. 2

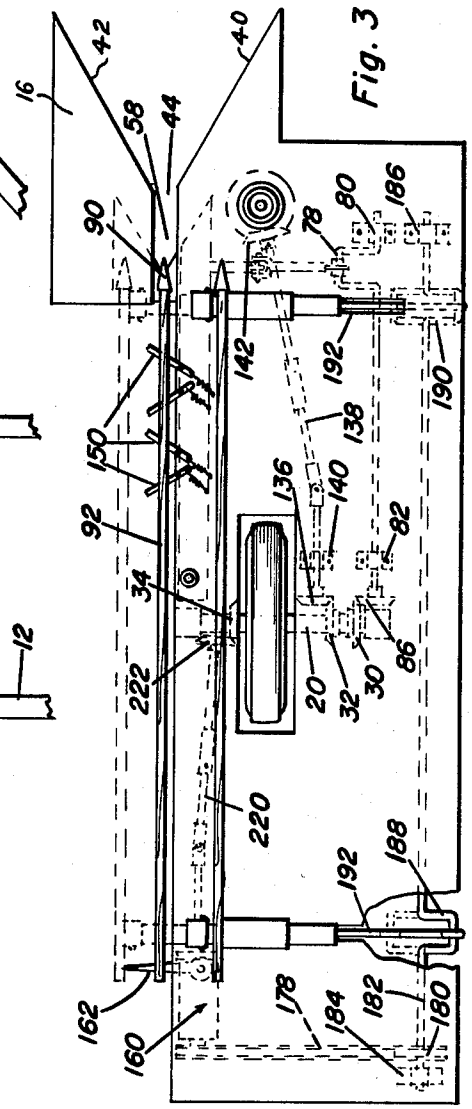


Fig. 3

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Feb. 2, 1960 R. R. BROWN 2,923,116

TOBACCO HARVESTER

Filed July 22, 1957 5 Sheets-Sheet 3

Fig. 4

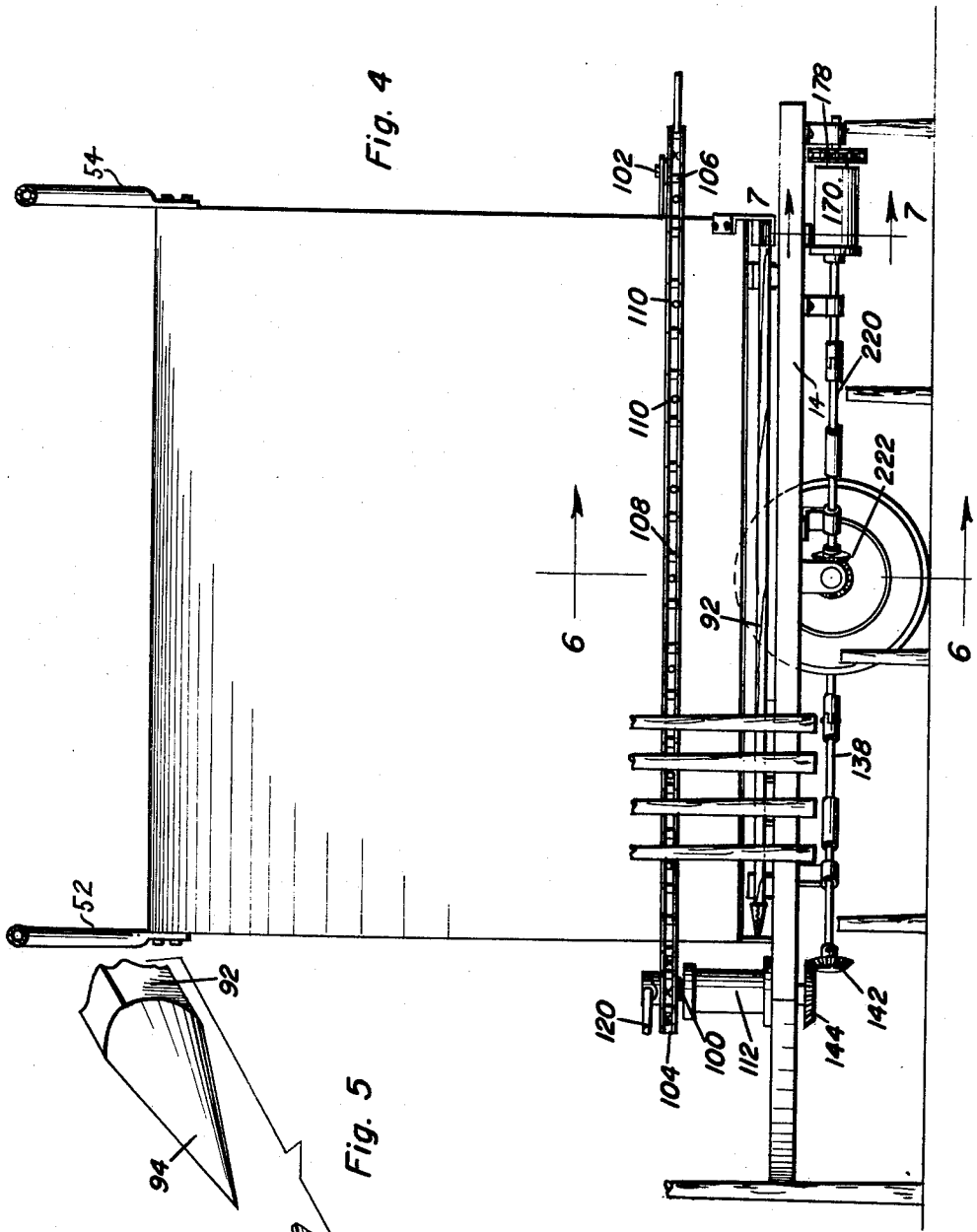


Fig. 5

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Feb. 2, 1960 R. R. BROWN 2,923,116

TOBACCO HARVESTER

Filed July 22, 1957

5 Sheets-Sheet 4

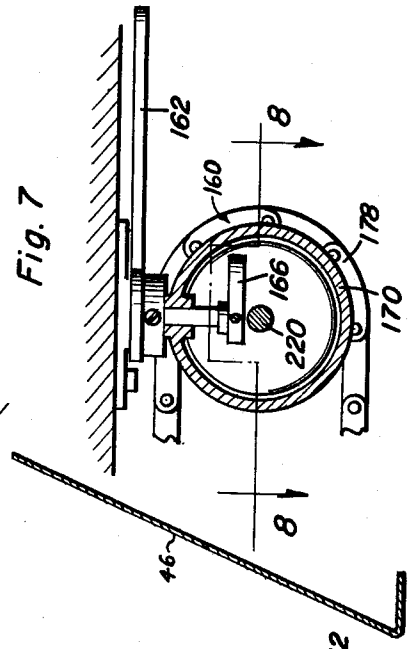


Fig. 7

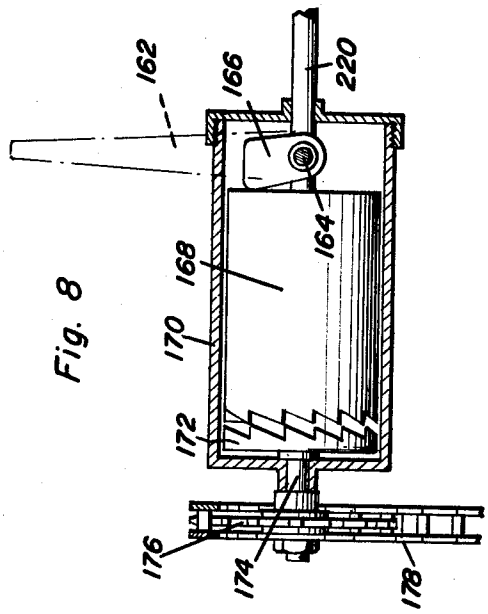


Fig. 8

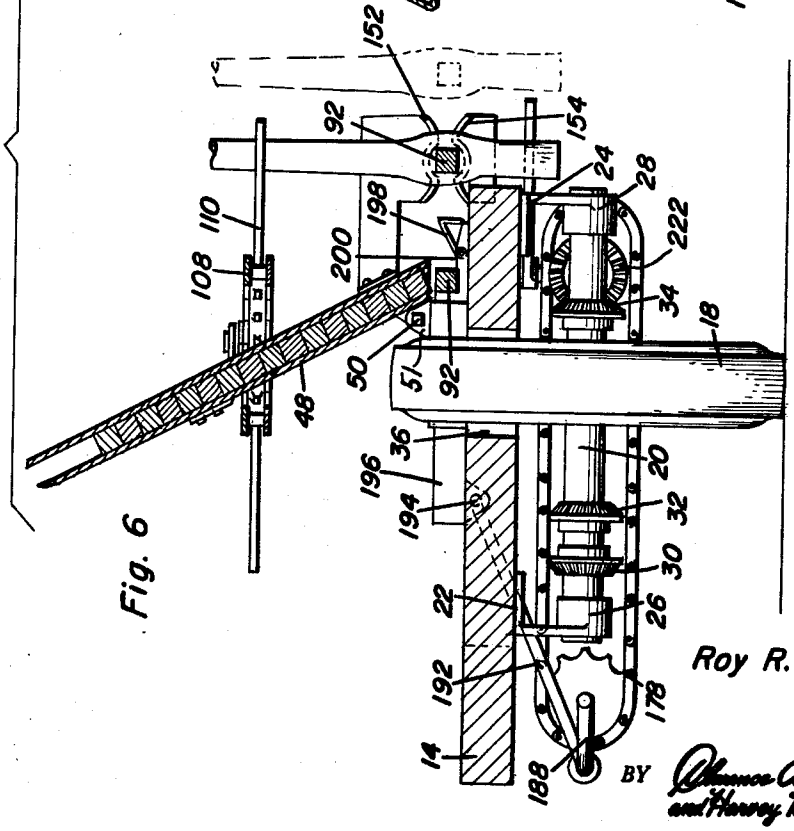


Fig. 6

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Feb. 2, 1960 R. R. BROWN 2,923,116

TOBACCO HARVESTER

Filed July 22, 1957 5 Sheets-Sheet 5

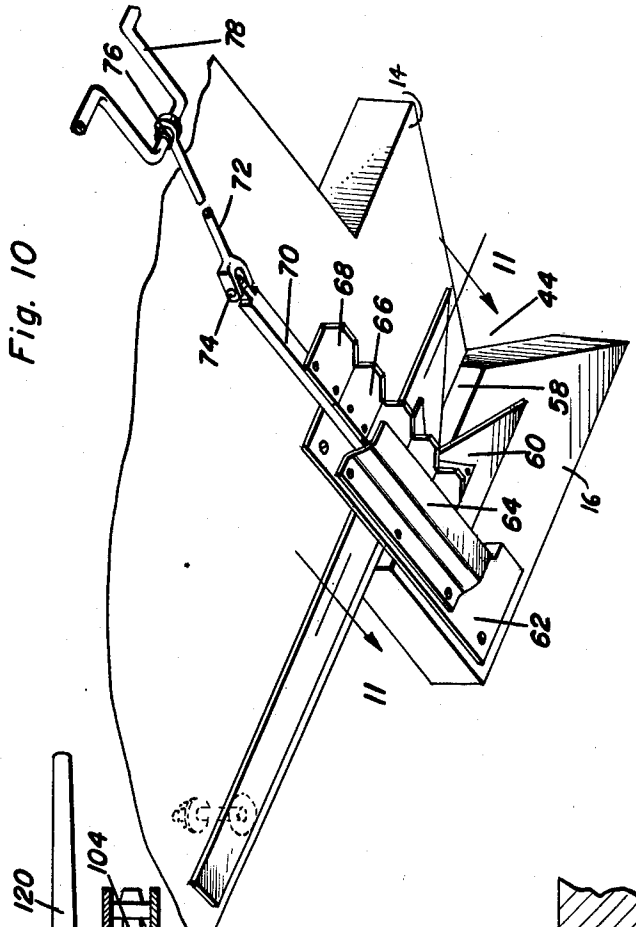


Fig. 10

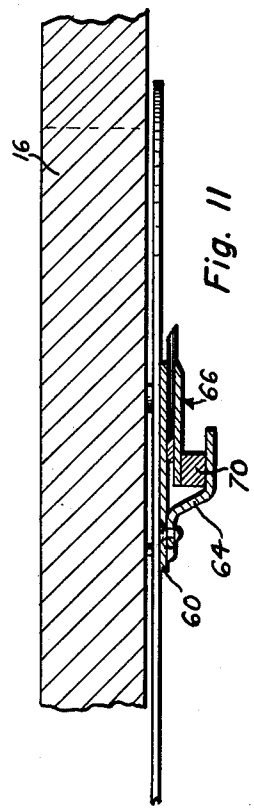


Fig. 11

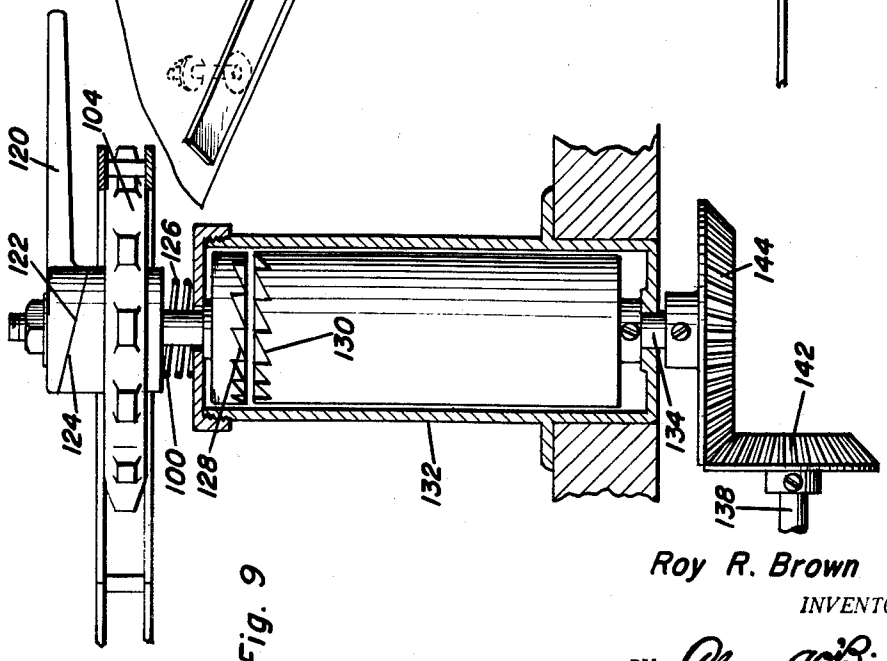


Fig. 9

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2,923,116

TOBACCO HARVESTER

Roy R. Brown, Mosheim, Tenn.

Application July 22, 1957, Serial No. 673,487

9 Claims. (Cl. 56—27.5)

This invention relates to the class of agricultural equipment and more particularly to a novel tobacco harvester.

The primary object of the present invention resides in the provision of a machine adapted to be attached to a tractor or like vehicle and to be propelled through a field of tobacco with the invention functioning to push a tobacco stick through successive tobacco stalks while the tobacco stalks are still standing and also cutting the tobacco stalk which stalk is impaled on the tobacco stick. Further movement of the tobacco harvester along a row of crop will function to load the stick with the tobacco stalks after which the tobacco stick will be ejected onto the ground with the stalks impaled thereon and in erect position. This serves to preserve the crop against harm.

A further object of the present invention resides in the provision of a tobacco harvester that is substantially automatic in its functions and capable of being operated by a single man to harvest a tobacco crop.

One of the special features of the invention lies in the novel clutch arrangement for actuating the cutting means, the tobacco stick feeding and ejecting means, and the conveyor means for moving the tobacco stalks along the stick.

Incorporated in the present invention is a novel tobacco stick magazine with positioning and ejection means associated therewith whereby in the use of the invention it is not necessary to constantly replace the tobacco sticks but such function is carried out automatically.

Still further objects and features of this invention reside in the provision of a tobacco harvester of a type capable of impaling and impelling tobacco stalks on a tobacco stick and employing a tobacco stick having a pointed end for more easily piercing the tobacco stalk.

Still additional objects and features of this invention reside in the provision of a tobacco harvester that is essentially simple in construction, relatively inexpensive to manufacture, and highly efficient in use.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this tobacco harvester, a preferred embodiment of which has been illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is a perspective view of the tobacco harvester comprising the present invention;

Figure 2 is a horizontal sectional view as taken along the plane of section line 2—2 in Figure 1 illustrating in particular the arrangement of the supporting means for the tobacco stick and the conveying means;

Figure 3 is a fragmentary plan view of the device shown in Figure 2 with certain parts omitted and others broken away to illustrate the lower portions of the tobacco harvester in detail and particularly illustrate the drive connections provided;

Figure 4 is a vertical longitudinal sectional view taken along the plane of section line 4—4 in Figure 1 illustrating in particular the relative arrangement of the conveyor chain and its drive means;

Figure 5 is an exploded perspective view of portions of a tobacco stick utilized in the present invention;

Figure 6 is a vertical transverse sectional detail view taken along the plane of section line 6—6 in Figure 4 and showing upon an enlarged scale the construction of the drive means and of the tobacco stick magazine and ejector means therefor;

Figure 7 is a vertical transverse sectional detail view taken along the plane of section line 7—7 in Figure 4 illustrating upon an enlarged scale the construction of the actuation means for the clutch utilized in actuating the ejector.

Figure 8 is a horizontal sectional detail view as taken along the plane of section line 8—8 in Figure 7 further illustrating the construction of the clutch;

Figure 9 is an enlarged elevational view, with parts broken away and shown in section, of the clutch employed in actuating the cutting means;

Figure 10 is a partial perspective view illustrating upon an enlarged scale the construction of the cutting means utilized in the invention; and

Figure 11 is an enlarged vertical sectional detail view taken along the plane of section line 11—11 in Figure 10.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 generally designates the tobacco harvester comprising the present invention. This tobacco harvester 10 includes a frame 12 of any suitable configuration adapting the device to be connected to a tractor or other similar farm vehicle for towing of the tobacco harvester along a row of tobacco. The frame 10 includes plate portions as at 14 and 16 with the plate 14 forming the main support to which most of the elements of the invention are connected. The frame is supported on a wheel 18, see also Figures 3, 6, mounted on an axle 20 carried by brackets 22 and 24 which support the bearings 26 and 28 in which the axle 20 is journaled. The wheel 18 is fixed to the axle 20 whereby the axle is rotatable therewith. Mounted on the axle 20 are drive bevel gears 30, 32 and 34. The wheel may be of any suitable size and a slot 36 is formed in the plate 14 for allowing the upper portion of the wheel to extend therethrough so that the plate 14 may be held at the proper height for optimum operation of the device above the ground.

The plate 14 and the plate 16 have forwardly diverging vertical surface portions as at 40 and 42 forming a mouth as at 44 for the tobacco harvester. Further, a plate 46 extends upwardly and divergingly outwardly from an inclined tobacco stick magazine 48, the plate 46 having its lower front end fixed to the plate 16 while the magazine 48 is secured at its lower portion by fasteners 50 to a bracket 51 or other suitable support member carried by the plate 14. Transverse braces 52 and 54 interconnect the plate 46 and the magazine 48 and extend above the normal height of the tobacco crop. As seen in Figures 2 and 3, the plate 16 is relatively short in comparison with the plate 14 and is supported solely by its attachment to the lower end of the plate 46, which latter is supported entirely from the magazine 48 by the braces 52 and 54, shown in Figure 1.

In alignment with the mouth 44 is a passageway 58 which extends the full length of the plate 16. Positioned in alignment with the mouth 44 at a portion of the passageway 58 immediately adjacent the mouth 44, see also Figures 10 and 11, is a fixed cutting blade 60 of substantially V-shape. By means of a bracket 62 and a substantially S-shaped guide 64, a movable cutting blade 66 having a plurality of readily replaceable segments 68 is mounted for reciprocating motion and cooperates with the fixed blade 60 to sever tobacco stalks passing through the slot 58. The segments 68 are fixed to a bar 70 hav-

ing a link 72 pivotally connected at 74 thereto with the link 72 being pivotally connected at 76 to a crank 78. As can be seen best in Figure 3, the crank 78 which is journaled in bearings 80 and 82 is driven by rotation of the bevel gear 30 upon rotation of the axle 20 due to the movement of the tobacco harvester along the row of tobacco. The bevel gear 30 engages a bevel gear 86 secured to the crank 78.

As can be readily understood, the cutter blade is constantly reciprocating and will cut a stalk of tobacco as soon as it enters the passageway immediately after it has been impaled on the pointed end 90 of a tobacco stick 92 held in alignment with the passageway 58. The tobacco stick 92, whose construction can be best seen in Figure 5, may be formed of wood having a pointed end 94 over which a cap 96 is secured with the cap being provided with suitable means for gripping and holding the pointed cap or tip 96 firmly on the pointed end of the wooden portions of the tobacco stick 92. It is to be realized that the metal utilized may be brass, copper, or preferably some metal not subject to deterioration by the juices of the tobacco plant.

There are mounted on the plate 14, see Figures 1, 2 and 4, a pair of vertical shafts 100 and 102 and carrying sprockets 104 and 106 about which an endless conveyor 108 is entrained. The conveyor 108 carries a plurality of fingers 110 which are adapted to extend parallel to plates 14 and 16 and in overlying relationship relative to the tobacco stick 92 and upon engagement with a tobacco stalk will move the tobacco stalk and impel it further on the tobacco stick and carry it toward the rear end of the latter. There is provided means for intermittently actuating the conveyor so that the conveyor will function to move the tobacco stalk only when the next tobacco stalk has been impaled on the tobacco stick. This drive means and control means for intermittently actuating the conveyor functions through the use of a clutch mechanism 112, see Figures 1, 4 and 9, which clutch mechanism functions when a laterally and horizontally projecting clutch arm 120 is engaged by a tobacco stalk. The clutch arm 120 includes an axial cam 122 and is mounted on the upper end of the vertical shaft 100. The cam 122 engages a corresponding cam surface 124 fixed to the sprocket 104 causing the sprocket to be pushed downwardly depressing the clutch release spring 126. This will serve to cause the toothed wheel 128 to become engaged with the constantly rotating toothed drum 130 mounted within a housing 132. The constantly rotating toothed drum 130 is driven through rotation of the shaft 134. The shaft 134 is driven, see Figures 3 and 6, through rotation of the bevel gear 32 which in turn drives bevel gear 136 and drives a sectional shaft 138 suitably journaled as at 140 which sectional shaft drives a bevel gear 142 engaging the bevel gear 144. Hence, as a stalk enters the mouth 44 and passes into the passageway 58, it will engage the arm 120 causing the operation of the conveyor for the period during which the stalk engages and actuates the arm 120.

The tobacco stick 92 is supported as shown in Figures 2–4, 6 slightly above the plates 14, 16 and in vertical alignment with the passageway 58 at the front end of the stick by resiliently mounted bars 150 of any suitable number and character which as shown in Figure 3 are carried by and extend laterally from the plate 14 and serve to loosely support at the proper elevation the tobacco stick 92. The rear end of the stick is resiliently held as shown in Figure 6 between substantially W-shaped laterally projecting vertically spaced members 152 and 154 carried by the plate 14. After the conveyor belt has successively moved the tobacco stalks along the tobacco stick 92 until the tobacco stick 92 is filled, the tobacco stick is then ejected onto the ground with the tobacco stalks speared upward. This is accomplished by means of ejector mechanisms actuated through the use of a clutch suitably mounted on plate 14 and indicated at 160. The construction of the clutch can be best seen in Figures 3 and 8 it being noted that there is provided a clutch arm 162 which extends laterally into the path of travel of the tobacco stalks. The clutch arm 162 is mounted on a vertical shaft 164 to which there is also fixedly secured a cam 166. The cam 166 is adapted to engage a tooth cylinder 168 which is movable within a housing 170 and adapted to engage a tooth cylinder 172 fixed to a horizontal, longitudinal shaft 174 on which a sprocket is mounted as at 176 about which an endless belt or chain 178 is entrained. The belt or chain 178 is further entrained about a sprocket 180 mounted on a horizontal, longitudinal shaft 182 journaled in bearings 184 and 186. The shaft 182 is provided with two offset or crank portions 188 and 190 to which transversely extending, horizontal ejector rods 192 are attached, the rods 192 forming portions of the tobacco stick ejector and functioning in identical manners. The rods 192, see Figure 6, are pivotally connected as at 194 to ejectors 196 which slide upon the plate 14 transversely thereof and carry substantially inverted V-shaped resilient bumpers 198 in the lower cut-away portions 200 thereof. Upon rotation of the shaft 182, the cranks will cause operation of the rods 192 to cause movement of the ejectors 196 transversely of the plate 14 so that the V-shaped members 198 will engage the tobacco stick 92 to move the tobacco stick off of the resilient supports 150 and from between the resilient supports 152 and 154 thereby dropping the tobacco stick on the ground. At the same time, another tobacco stick 92 carried in the recessed portions 200 will be moved into alignment with the passageway 58 and into engagement with and mounted upon the resilient supports 152 and 154 and onto the resilient supports 150. The magazine 48 will permit another tobacco stick to drop into the portion 200 of the ejectors as soon as the ejector is returned to its initial position. During the movement of the stick 92 by the recesses 200 to the supports, the top surfaces of the ejectors 196 will close the lower end of the magazine.

It is noted that the constantly rotating tooth drum 168 is driven by a shaft 220 which in turn is driven through bevel gear 222 which meshes with the bevel gear 34.

The operation of the device is actually quite simple. The mouth 44 is sufficient to guide a standing tobacco stalk into the passageway 58 where it is impaled on the tobacco stick 92. Further movement of the tobacco harvester will cause the tobacco stalk to be cut and will cause the conveyor to move the tobacco stalk along the tobacco stick. When the tobacco stalks have completely filled the tobacco stick, the rearmost tobacco stick, the clutch arm 120 and the clutch 112 will actuate the operating arm 162 whereupon the clutch 160, shaft 182 and the ejectors 196 will cause the tobacco sticks to be ejected upon the ground. A truck following the tobacco harvester may then have the filled tobacco stick loaded thereon.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A tobacco sticker machine comprising a mobile frame including a pair of elongated laterally spaced plates with their adjacent edges defining a passageway therebetween, said plates having their adjacent edges forwardly divergent and providing a mouth for guiding standing stalks into said passageway, a tobacco stick positioned in said passageway and in alignment with said mouth and having a pointed forward end positioned rearwardly of said mouth, means on said frame releasably supporting said tobacco stick and including resilient supporting elements engaging the forward end of said stick, a conveyor mounted on said frame adjacent said passageway and

including fingers movable longitudinally to first impale standing tobacco stalks on the stick and then move the same rearwardly therealong, severing means on said frame positioned for severing tobacco stalks below said stick and rearwardly and immediately adjacent the forward end of said stick such that the stalks are cut only after being impaled on the stick, said frame at its rearward portion having said passageway laterally enlarged to provide an opening, said frame and opening being so positioned relative to said conveyor and severing means as to leave a free and unobstructed path for lateral ejection of a loaded tobacco stick from said releasable supporting means and ejector means mounted on said frame and selectively operable upon loading of a tobacco stick to disengage said stick from its supporting means and for ejection through said opening from said machine.

2. The combination of claim 1 including drive means on said frame, connecting means for operatively connecting said drive means to said conveyor, a control lever operatively connected to said connecting means and extending laterally across said mouth in the path of movement of standing stalks whereby to effect movement of said conveyor when said control lever is in engagement with a stalk.

3. The combination of claim 1 including drive means on said frame, a control lever pivotally mounted upon the frame at the rear end of said passageway and extending transversely of the latter and in the path of movement of stalks through said passageway, said control lever being operatively connected to said ejector means for actuating the latter when the lever is pivoted by passage of a stalk through the rear portion of said passageway.

4. The combination of claim 1 including a magazine mounted on said frame adjacent said passageway and having an open lower end for dispensing sticks therefrom by gravity, said ejector means being disposed beneath said magazine and supporting a stick released therefrom and having stop means effective upon operating movement of said ejector means to close the lower end of said magazine.

5. The combination of claim 4 wherein said magazine is rigidly mounted upon one of said plates, means supporting and mounting the other of said plates upon said magazine.

6. The combination of claim 1 wherein said stick support means includes a spring clip mounted on the rear portion of said frame and resiliently gripping the rearward end of said stick.

7. The combination of claim 6 wherein said resilient supporting elements are spaced longitudinally of said passageway for successive engagement by stalks moving along said passageway, said elements being yieldably swingable to permit passage of stalks and being resiliently returned into normal stick supporting position after passage of said stalks whereby the forward portion of said stick will be constantly supported.

8. The combination of claim 1 wherein said resilient supporting elements are spaced longitudinally of said passageway for successive engagement by stalks moving along said passageway, said elements being yieldably swingable to permit passage of stalks and being resiliently returned into normal stick supporting position after passage of said stalks whereby the forward portion of said stick will be constantly supported.

9. The combination of claim 8 wherein said ejector means includes pushers mounted on said frame for movement transversely of said passageway whereby to eject said stick from said support means and discharge said stick laterally from the latter and downwardly through said opening and from the machine.

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