March 5, 1929. J. HALL 1,704,190

COILER

Filed Sept. 28, 1927 5 Sheets-Sheet 1

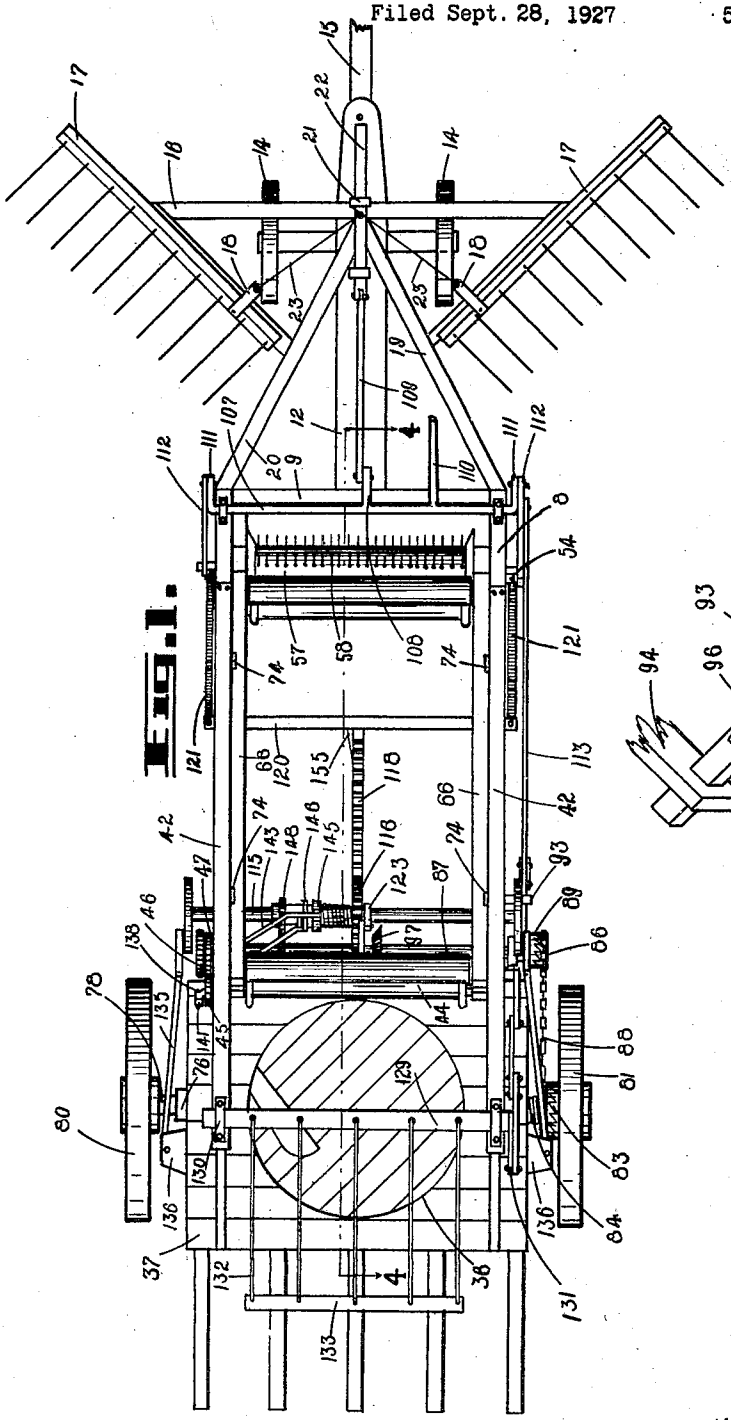


Fig. 1.

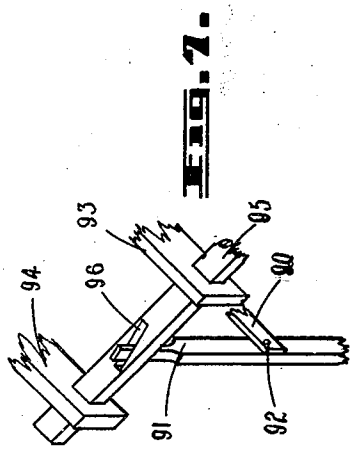


Fig. 7.

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COILER

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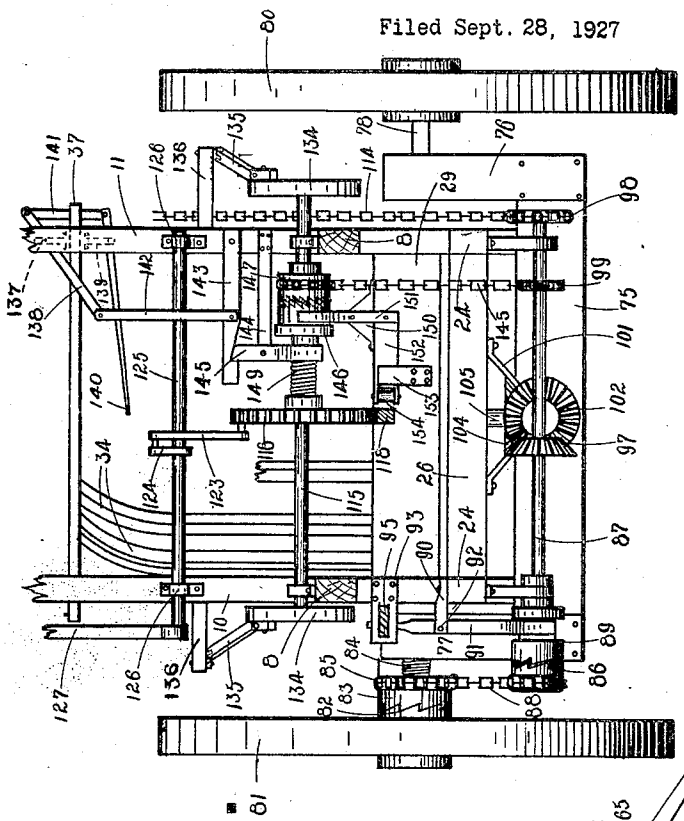


Fig. 6.

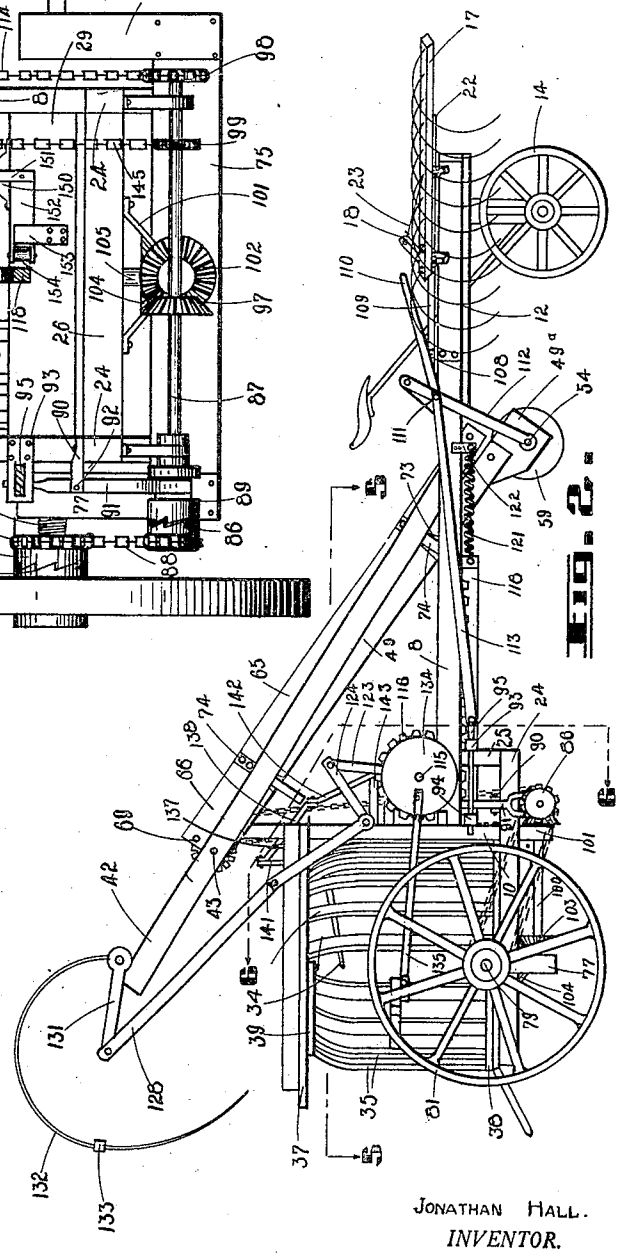


Fig. 5.

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COILER

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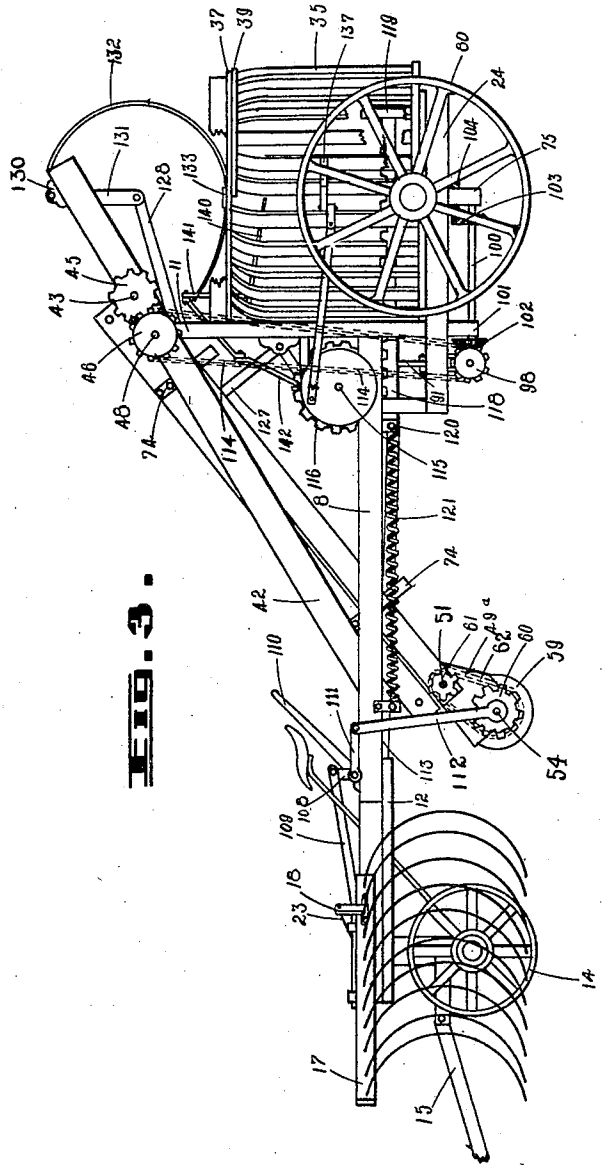


Fig. 3.

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COILER

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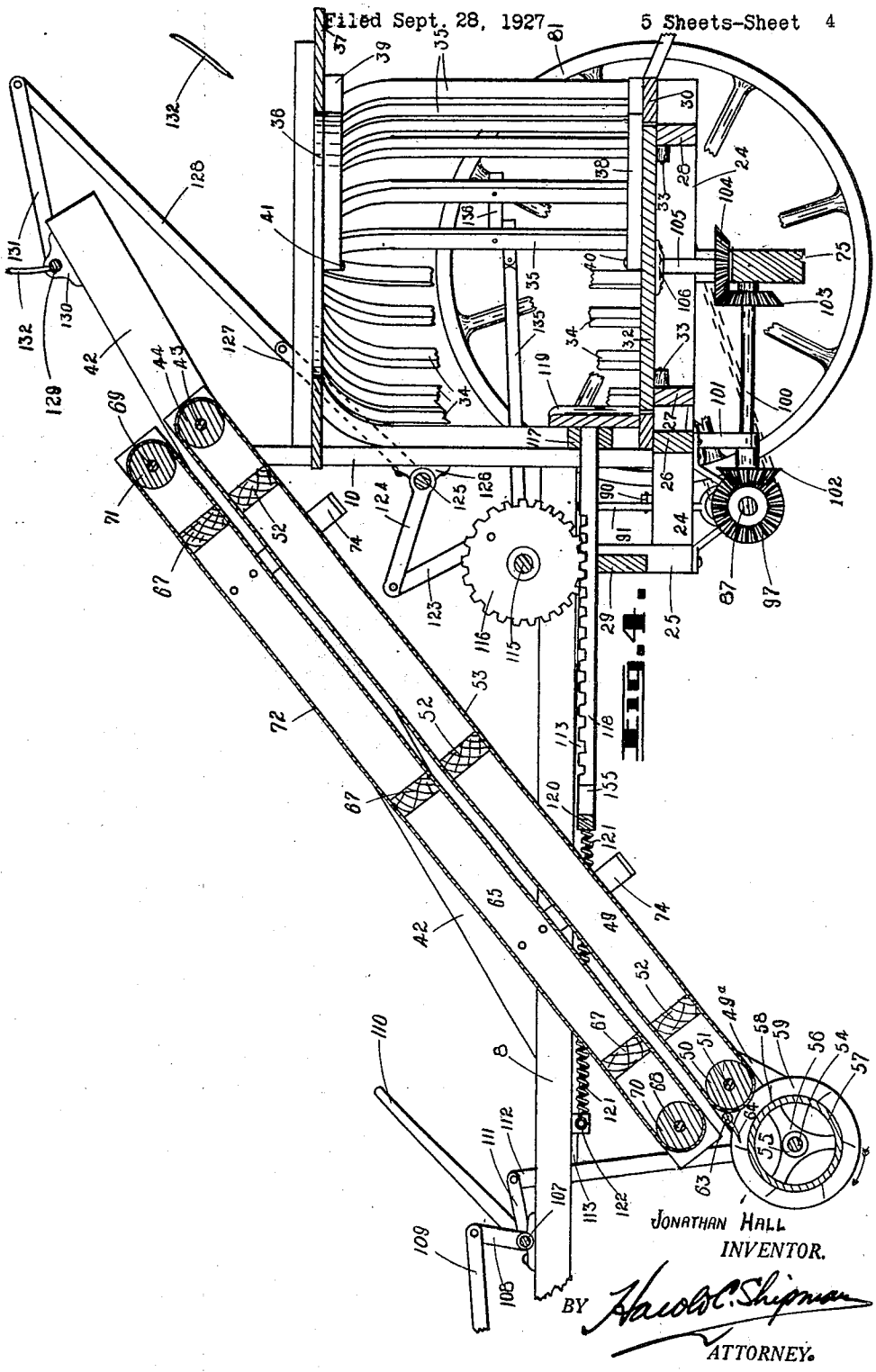


Fig. 4.

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COILER

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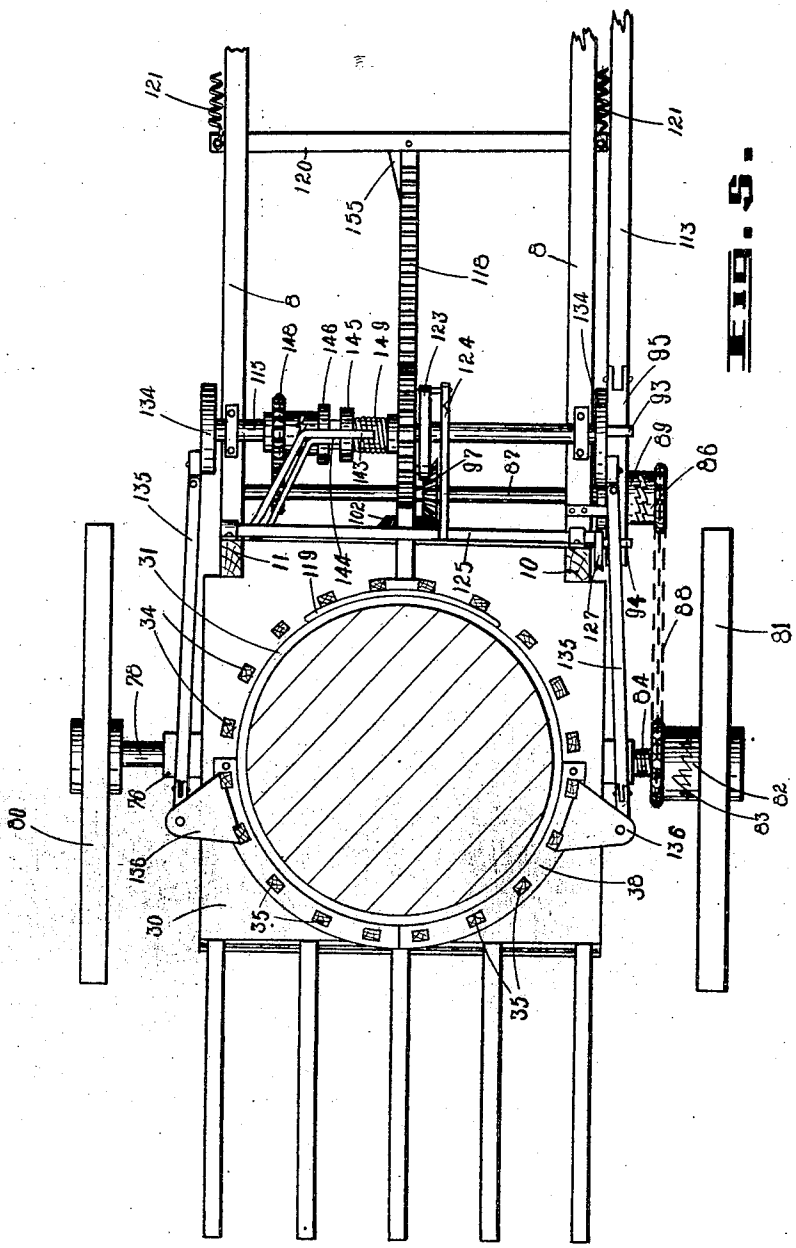


Fig. 5.

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Patented Mar. 5, 1929. 1,704,190

UNITED STATES PATENT OFFICE.

JONATHAN HALL, OF EMO, ONTARIO, CANADA.

COILER.

Application filed September 28, 1927. Serial No. 222,552.

This invention relates to coilers, particularly designed for coiling hay after the same has been cut in the fields.

The principal object of my invention is to provide a means for raking the hay into a windrow, elevating it up into a coiling crate and automatically discharging the contents of said crate when the same is filled to a predetermined capacity.

With the foregoing and other objects in view, as will appear as the description proceeds, the invention consists of the novel construction, combination and arrangement of co-operating elements as hereinafter more specifically set forth, claimed and shown in the accompanying drawings forming a part of the present application, in which:

Fig. 1 is a top plan view of the preferred embodiment of my invention, the elevating belts being removed.

Fig. 2 is a side elevation of the preferred embodiment of my invention, looking as from the right hand side of Fig. 1, the operating parts of the construction being shown in inoperative position.

Fig. 3 is a side elevation of the preferred embodiment of my invention, looking as from the left hand side of Fig. 1, the operating parts of the construction being shown in operative position.

Fig. 4 is a sectional view taken on the plane indicated by the line 4—4 of Fig. 1, looking in the direction of the arrows.

Fig. 5 is a sectional view taken on the plane indicated by the line 5—5 of Fig. 2, the elevator being removed so as to more clearly show the working parts.

Fig. 6 is a sectional view taken on the plane indicated by the line 6—6 of Fig. 2.

Fig. 7 is a detail view of the clutch operating mechanism.

Like numerals of reference designate corresponding parts throughout the different views.

8 indicates the side members of the supporting frame of my construction, the front ends of which are suitably connected together by the cross member 9, the rear ends being suitably engaged with the uprights 10 and 11. 12 is an extension platform, the rear end of which is securely engaged to the cross member 9. Near the front end of this extension platform, I provide a pair of wheels 14 with a suitable axle and rocker construction for supporting the extension platform thereon. The tongue 15 will be used for attaching draught animals or traction power as may be desired. 16 is an extension arm suitably connected intermediate its ends on the extension platform 12. At each end of the arm 16, I provide hingedly mounted rake members having an operating arm 18 protruding upwardly therefrom. 19 and 20 indicate suitable brace members for properly supporting the rake members 17 in their proper position.

On the extension platform 12, I provide brackets 21, which have openings formed therethrough and in which the rod 22 is reciprocally positioned. 23 indicates connecting members between the upper end of the operating arm 18 and the rod 22. When the rod 22 is pressed forwardly as illustrated in Fig. 1, the connecting members 23 will pull the operating arm 18 inwardly, so that the rake members 17 will be hinged upwardly on the extension arm 16. In Fig. 2, the rake members are shown in their raised or inoperative position. When the rod 22 is pulled in the opposite direction, the rake members 17 will be allowed to drop to their operative position as shown in Fig. 3, the lower end of the tines being carried in close proximity to the ground.

I provide a suitable frame work supported from the rear end of the side members of the supporting frame 8 and uprights 10 and 11. This frame work comprises the side members 24 having a suitable connection to the lower end of the uprights 10 and 11 and having connecting posts 25 between the supporting frame 8 and the side members 24. I provide suitable intermediate cross members between the members 24, such as indicated by the numerals 26, 27 and 28. 29 is the cross member between the connecting posts 25, the purpose of which will be hereinafter mentioned. 30 is a platform suitably positioned over the side members 24 and the cross members 26, 27 and 28. This platform 30 is provided with a central annular opening 31 in which an annular platform 32 is positioned. The side members 24 and the cross members 27 and 28 have connected thereto, the supporting rollers 33, which rollers act as bearings against the under face of the platform 32, so that this platform can be easily revolved. Positioned in annular formation around the opening 31, I provide ribs 34 and 35, the

upper ends of which are slightly converged to be normally positioned around the opening 36 formed in the upper platform 37. The ribs 34 are suitably connected to the under face of the upper platform 37. These ribs 34 and 35 form the coiling crate portion of my construction. The ribs 34, forming the front half of this coiling crate, are fixedly held between the lower platform 30 and the upper platform 37, while the ribs 35, forming the back half of the coiling crate are divided into two quarter sections. Each quarter section is provided with base members 38 and cap members 39 to hold the ribs forming this quarter section as a unit. The base members 38 are hingedly connected to the lower platform 30 by the bolts 40 and the cap members are hingedly connected to the upper platform 37 by means of the bolts 41. By these hinge connections, the quarter sections hereinbefore referred to, are adapted to be swung outwardly to provide an opening through which coiled hay in the coiling crate may be discharged.

42 indicates supporting members having their lower ends angularly supported from the supporting frame 8. Intermediate their ends, they engage on the upper ends of the uprights 10 and 11 and are supported thereon. Extended transversely between the supporting members 42, I provide a shaft 43 on which the roller 44 is fixedly carried. The end of the shaft 43 extends slightly beyond the outer face of the supporting member 42 on the left hand side thereof. A gear 45 is fixedly connected to this end of the shaft 43. 46 is a chain driven gear with which is fixedly connected the gear 47, which gear 47 meshes with the gear 45. The gears 46 and 47 are suitably mounted on a stub shaft 48 supported from the supporting members 42. The roller 44 provides the rotatably mounted member for the lower portion of my elevator. This lower portion of my elevator comprises side members 49 intermediate of which is mounted the lower roller 50 on a suitable shaft 51. Intermediate spacing members 52 are positioned between the side members 49, so as to hold the side members 49 at their desired relative position from each other. 53 is an endless canvas belt fitted around the rollers 44 and 50. Any desired means for tightening this belt on the rollers may be used, as my invention does not pertain to the method of tightening the belts. The side members 49 have their lower ends 49ª extended. Intermediate these extended ends, I provide a shaft 54. At spaced intervals along the shaft 54, I provide fixedly connected hubs 55 having radially positioned spokes 56 supporting a cylindrical drum 57, which drum is provided with tines 58 across and around the entire outer surface thereof. At each end of the drum 57, I provide annular flanges 59. On the left hand side of the construction, I provide a sprocket gear 60 keyed to the shaft 54. 61 is a sprocket gear keyed to the outer end of the shaft 51. 62 is a chain drive connection from the gear 61 to the gear 60, the rotation of the gear 60 causing rotation to the shaft 54 on which the drum 57 is fixedly connected. The drum 57 will be turned in the direction of the arrow, so that the hay which is raked into a windrow by the rake members 17, will be picked up by the tines 58 and carried over towards the lower end of the endless canvas belt 53. 63 is a guide rod, the ends of which are engaged in the opposite side members 49. This guide rod 63 has outwardly directed tines 64 in spaced relationship between the tines 58 on the drum 57, so that the hay, being picked up by the tines 58, is guided by the tines 64 from the tines 58 to the canvas belt 53. 65 is the upper portion of the elevator construction, which is provided with side members 66 having spaced transverse members 67. These side members 66 and the transverse members 67 form the frame work for this portion of the elevator. At the opposite ends, I provide transversely positioned shafts 68 and 69 on which are mounted the rollers 70 and 71. Positioned around the rollers 70 and 71 is the endless canvas belt 72. At spaced intervals along the side members 49, I provide side notches 73. Attached to the side members 66, I provide holding members 74, which extend downwardly from the side members 66 and fit into the notches 73. The lower ends of the holding member 74 are bent inwardly at an angle, so that when the upper portion of the elevator expands the full length of the holding members 74, the bent ends will come in contact with the under side of the side members 49 and limit the upward movement of the upper portion of the elevator.

The side members 24, supporting the platform 30, are supported on the cross beam 75, the ends of which are supported in brackets 76 and 77. 78 and 79 are axles extending outwardly from the upper end of the brackets 76 and 77 respectively. The wheel 80 is suitably mounted for rotation on the outer end of the axle 78. The wheel 81 is suitably mounted for rotation on the outer end of the axle 79. The inner face of the hub of this wheel 81, is serrated as at 82 to engage in a serrated clutch member 83. A coil spring 84 around the axle 79, between the inner face of the clutch member 83 and the bracket 77 tensions the serrated outer face of the clutch member 83 into engagement with the inner serrated face 82. This construction permits of backing up without reversing the operation of the moving parts in my construction.

The clutch 83 has provided integral therewith the gear 85, which gear is connected

to the idler portion 86 of the clutch mounted on the outer end of the shaft 87 by means of the chain drive 88. 89 is the other portion of the clutch co-acting with the portion 86. This portion of the clutch 89 is movable longitudinally of the shaft 87 and is in keyed relationship therewith, so that on the rotation of the portion 89, the shaft 87 will be rotated. 90 is a bracket in which the lever 91 is fulcrumed, as at 92. 93 and 94 are brackets supported to one of the connecting posts 25. These brackets 93 and 94 are provided with squared openings adjacent their outer ends through which the adjusting member 95 is adapted to reciprocate. The portion of the adjusting member 95, intermediate the brackets 93 and 94 is provided with an angularly positioned slot 96 through which the upper end of the lever 91 protrudes. On the movement of the adjusting member 95, the portion 89 of the clutch will be thrown in or out of engagement with the portion 86.

Mounted on the shaft 87 is a bevel gear 97. Mounted on the end of the shaft 87, I provide a chain drive 98. Intermediate the gears 97 and 98, I provide a chain drive gear 99. 100 is a shaft having one end mounted in a suitable bearing in the cross beam 75 and the forward end suspended in a bracket 101. 102 is a bevel gear meshing with the bevel gear 97 to turn the shaft 100. 103 is a bevel gear mounted near the inner end of the shaft 100 and meshing with the bevel gear 104 carried on the shaft 105. The upper end of this shaft is fixedly engaged in the cap 106, which cap is attached to the underside of the annular platform 32, preferably by screws or bolts.

By this driving mechanism of shafts and gears, I provide rotation of the annular platform 32 on which the hay falls and is coiled. Across the forward end of the frame, preferably over the cross member 9, I provide a lever shaft 107, provided with a stub lever 108 integral therewith, which lever connects to one end of a connecting rod 109, the other end of which is connected to the rod 22 hereinbefore mentioned. 110 is the lever which is integrally connected at one end to the shaft 107 for turning the same. The ends 111 of the shaft 107 are bent at a right angle, to the main portion, as more clearly shown in Fig. 1. Pivotally connected from the ends 111 are side plates 112. The opposite ends of the side plates 112 are pivotally connected to the outer ends of the shaft 54. Pivotally connected intermediate the ends of one of the side plates 112 is the rod 113, which connects to the end of the adjusting member 95. In Figs. 1 and 2 the lever 110 is pushed forward in inoperative position, while in Fig. 3 it will be noted that the lever 110 is thrown backwardly and the drum 57 is in lowered operative position. The adjusting member 95 will also be moved rearwardly to throw the clutch member 89 into operative position. The ends 111 are thrown forward over centre when the construction is in inoperative position and are thrown backwardly over the centre when the construction is in operative position.

The chain drive 114 extends from the chain gear 98 to the chain gear 46 to drive the lower portion of the elevator. 115 is a shaft suitably supported in bearings on the supporting frame 8. 116 is a gear fixedly connected to the shaft. Reciprocally mounted in the cross member 29 and the brace 117 is the rack 118. The brace 117 is secured intermediate two of the ribs 34. On the rear end of the rack 118, I provide an ejector 119. At the other end of the rack 118, I provide a transverse rod 120 extending to the sides of the frame. The ends of the rod 120 are engaged in the ends of the recoil tension springs 121. The forward ends of these springs are engaged in brackets 122. By means of these recoil springs 121, the rack 118 is normally held in its forward position as shown in Fig. 4. When the shaft 115 is rotated, the gear 116, meshing with the teeth of the rack 118, will move the ejector rearwardly so as to discharge the coiled hay in the coiling crate hereinbefore mentioned.

123 is an arm pivotally connected near the outer contour of the gear 116. Pivotally connected to the outer end of the arm 123, is an outwardly protruding arm 124 integral with the shaft 125, which shaft is suitably mounted in bearings 126 supported on the uprights 10 and 11. At one end of the shaft 125, I provide a lever arm 127 integral with the shaft 125. The free end of this arm 127 is pivotally connected to one end of the connecting rod 128. Supported from the upper ends of the supporting members 42, I provide a rack bar 129 mounted in suitable bearings 130. At one end of the rack bar 129, I provide an arm 131 having one end securely attached thereto, while the other end is pivotally connected with the connecting rod 128. The rack bar 129 is provided with curved tines 132, which through the connection thus described, is turned to the position shown in Fig. 3 when the ejector 119 is discharging the coiled hay from the coiling crate. The hay coming up over the end of the elevator is held in the tines 132 during the operation of the ejector while the recoil springs 121 bring the rack 118 back to its normal position. 133 is a spacing bar in which the tines 132 are held in proper spaced relationship to each other. The gear 116 will be turned back to its normal position and through the mechanism hereinbefore referred to in this paragraph, the tines 132 will return to their normal position as shown

in Fig. 2, so that the hay coming up the elevator will again be discharged into the opening 36. At each end of the shaft 115, I provide angularly positioned arms 134 to which are pivotally connected the forward ends of the connecting rods 135. Suitably secured to the outer side of a certain number of the ribs 35 is the bracket 136. This bracket extends outwardly from the ribs and is connected at its outer end to the rear end of the connecting rod 135. The rear hinged quarter sections of the coiling crate, swinging on the bolts 40 and 41, will be hinged to open position on the rotation of the shaft 115.

137 is a bracket suitably mounted on the top of the upper platform 37 in which the lever arm 138 is fulcrumed. 139 is a bracket suitably mounted on the under side of the upper platform 37 in which the blade 140 is fulcrumed. 141 is a connecting rod between the ends of the lever 138 and the blade 140. 142 is a connecting rod having its upper end connected to the lever arm 138 and its lower end connected to the latch member 143, which latch member is pivotally connected to the upright 11. 144 is a bracket supported from the upright 11 on which the clutch control member 145 is pivotally mounted. 146 is the portion of the clutch which is in keyed relationship to the shaft 115 and is adapted to be moved longitudinally therein by the clutch control member 145. 147 is the other portion of the clutch member which revolves freely on the shaft 115. This portion of the clutch is driven by the chain drive 148 driven by the chain gear 99. 149 is a coil spring positioned around the shaft 115 intermediate the gear 116 and the lower end of the clutch control member 145. When the hay being coiled raises in the coiling crate to contact with the under side of the blade 140, the free end of this blade 140 will be raised, which will disengage the latch member 143 from the upper end of the clutch control member 145. The reciprocal portion 146 of the clutch will now be moved by the tensioning of the coil spring 149 towards the portion 147 and will start the shaft 115 to rotate. Positioned on the cross member 29 is a bracket 150. Pivotally mounted in this bracket is a second clutch control member 151. The lower end of this second clutch control member is pivotally connected to the slide arm 152, the outer end of which slides in the bracket 136. A roller 154 is carried at the end of the slide arm 152. The rack 118 carries a wedge 155 at one side adjacent its outer end. As hereinbefore mentioned, the hay coiled under the blade 140, will operate the hereinbefore described mechanism to throw the clutch portion 146 into operative position. When the discharge of the coiled hay has been completed the ejector will have travelled its full distance with the rack 118 and the wedge 155 will contact with the roller 154 forcing the slide arm 152 in a direction, so that the upper end of the second clutch control member will move the portion 146 of the clutch in the opposite direction into inoperative position. The upper end of the clutch control member 145 will return to its normal engaged position in the latch member 143.

The foregoing specification and annexed drawings disclose the preferred embodiment of my invention, but it is to be understood that minor changes may be resorted to in the commercial adaptation of my invention without departing from the scope of the invention as hereinafter claimed.

What I claim as new is:

1. A hay coiler comprising a supporting frame; an inclined elevator; a coiling crate, the opening into which is positioned under the discharge end of said elevator; a rotary platform for said crate; a means for continuously rotating said platform during operation of said coiler; portions of said crate being hingedly mounted to permit the discharge of coiled hay from said crate and a plunger reciprocally mounted to force coiled hay from said crate.

2. A hay coiler comprising a supporting frame; an inclined elevator; a coiling crate, the opening into which is positioned under the discharge end of said elevator; a rotary platform for said crate; a means for continuously rotating said platform during operation of said coiler; portions of said crate being hingedly mounted to permit the discharge of coiled hay from said crate; a plunger reciprocally mounted to force coiled hay from said crate and a means for raising and lowering the pick-up end of said elevator.

3. A hay coiler comprising a supporting frame; an inclined elevator; a coiling crate, the opening into which is positioned under the discharge end of said elevator; a rotary platform for said crate; a means for continuously rotating said platform during operation of said coiler; portions of said crate being hingedly mounted to permit the discharge of coiled hay from said crate; a plunger reciprocally mounted to force coiled hay from said crate and a means for temporarily holding the hay being discharged from said elevator while the coiled hay is being discharged from said crate.

4. A hay coiler comprising a supporting frame; an inclined elevator; a coiling crate, the opening into which is positioned under the discharge end of said elevator; a rotary platform for said crate; a means for continuously rotating said platform during operation of said coiler; portions of said crate being hingedly mounted to permit the discharge of coiled hay from said crate; a plunger reciprocally mounted to force coiled

hay from said crate and a means for gathering the hay into a windrow in front of the pick-up end of said elevator.

5. A hay coiler comprising a supporting frame; an inclined elevator; a coiling crate, the opening into which is positioned under the discharge end of said elevator; a rotary platform for said crate; a means for continuously rotating said platform during operation of said coiler; portions of said crate being hingedly mounted to permit the discharge of coiled hay from said crate; a plunger reciprocally mounted to force coiled hay from said crate; means for hinging said portions of said crate and a means for simultaneously reciprocating said plunger.

6. A hay coiler comprising a supporting frame; an inclined elevator; a coiling crate, the opening into which is positioned under the discharge end of said elevator; a rotary platform for said crate; a means for continuously rotating said platform during operation of said coiler; portions of said crate being hingedly mounted to permit the discharge of coiled hay from said crate; a plunger reciprocally mounted to force coiled hay from said crate; means for raising and lowering the pick-up end of said elevator; and said means having co-operative parts for throwing the first said means into operation when the pick-up end of said elevator is lowered and out of operation when the pick-up end of said elevator is raised.

In testimony whereof, I affix my signature.

JONATHAN HALL.