

No. 849,580.

PATENTED APR. 9, 1907.

B. SMITH.  
HAY HARVESTING MACHINE.

APPLICATION FILED OCT. 11, 1905.

4 SHEETS—SHEET 1.

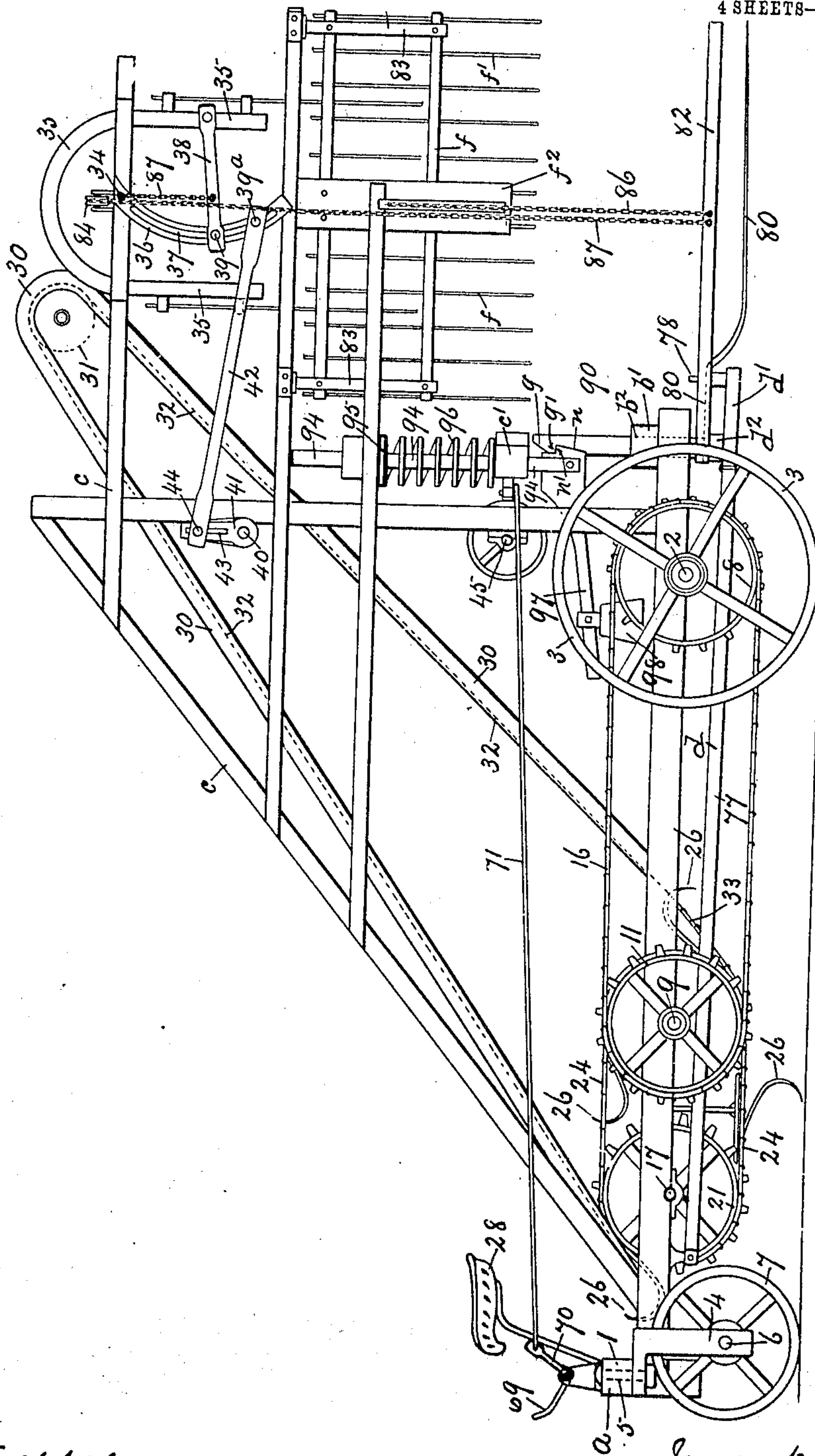


Fig. 1.

Witnesses  
J. S. Edmunds  
A. Byrick

Inventor  
Benjamin Smith  
By P. J. Edmunds  
Attorney

No. 849,580.

PATENTED APR. 9. 1907.

B. SMITH.  
HAY HARVESTING MACHINE.  
APPLICATION FILED OCT. 11, 1905.

4 SHEETS—SHEET 2.

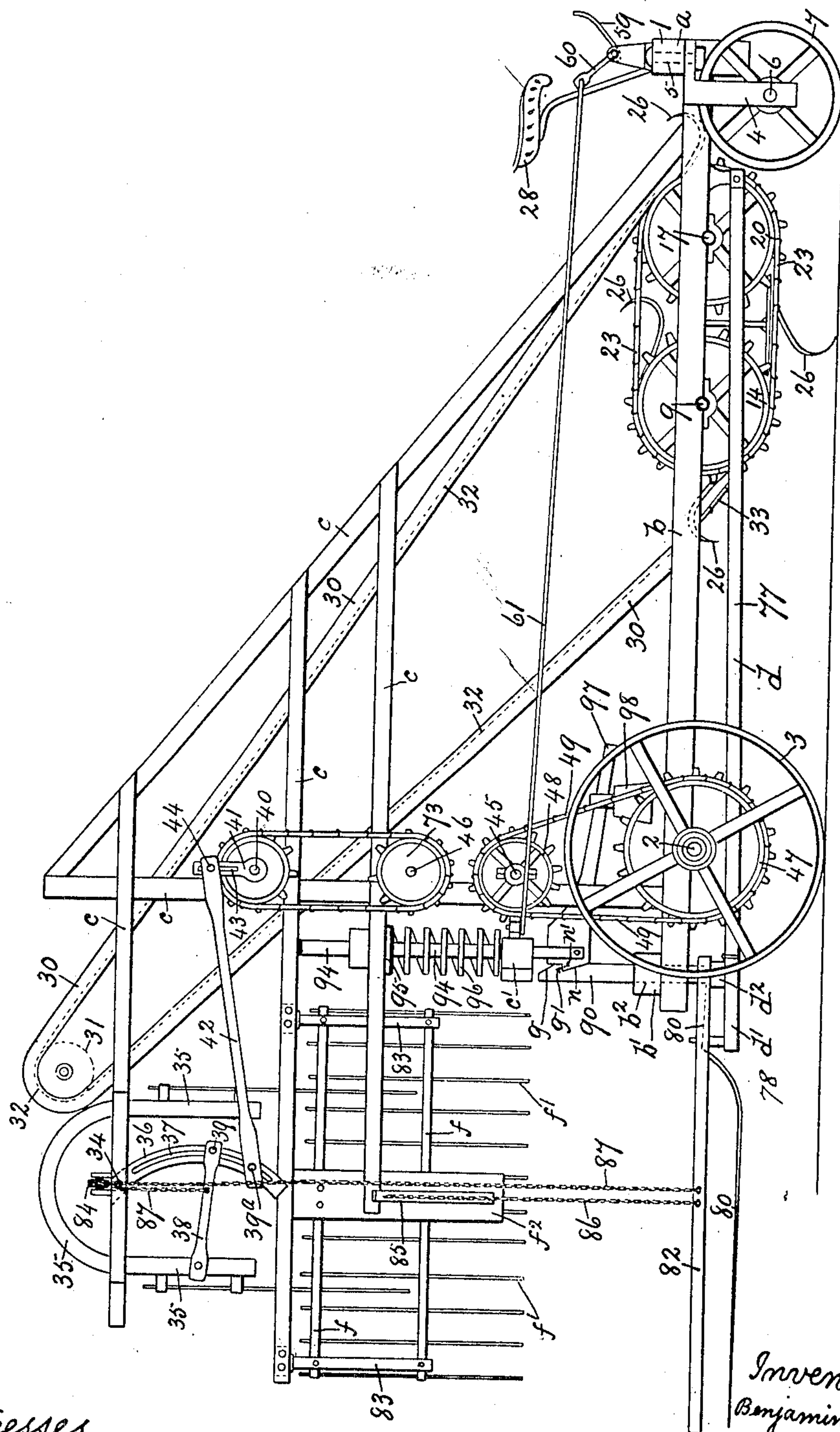


Fig. 2.

Witnesses  
J. S. Edmunds  
A. Brick

Inventor  
Benjamin Smith  
By  
P. J. Edmunds  
Attorney

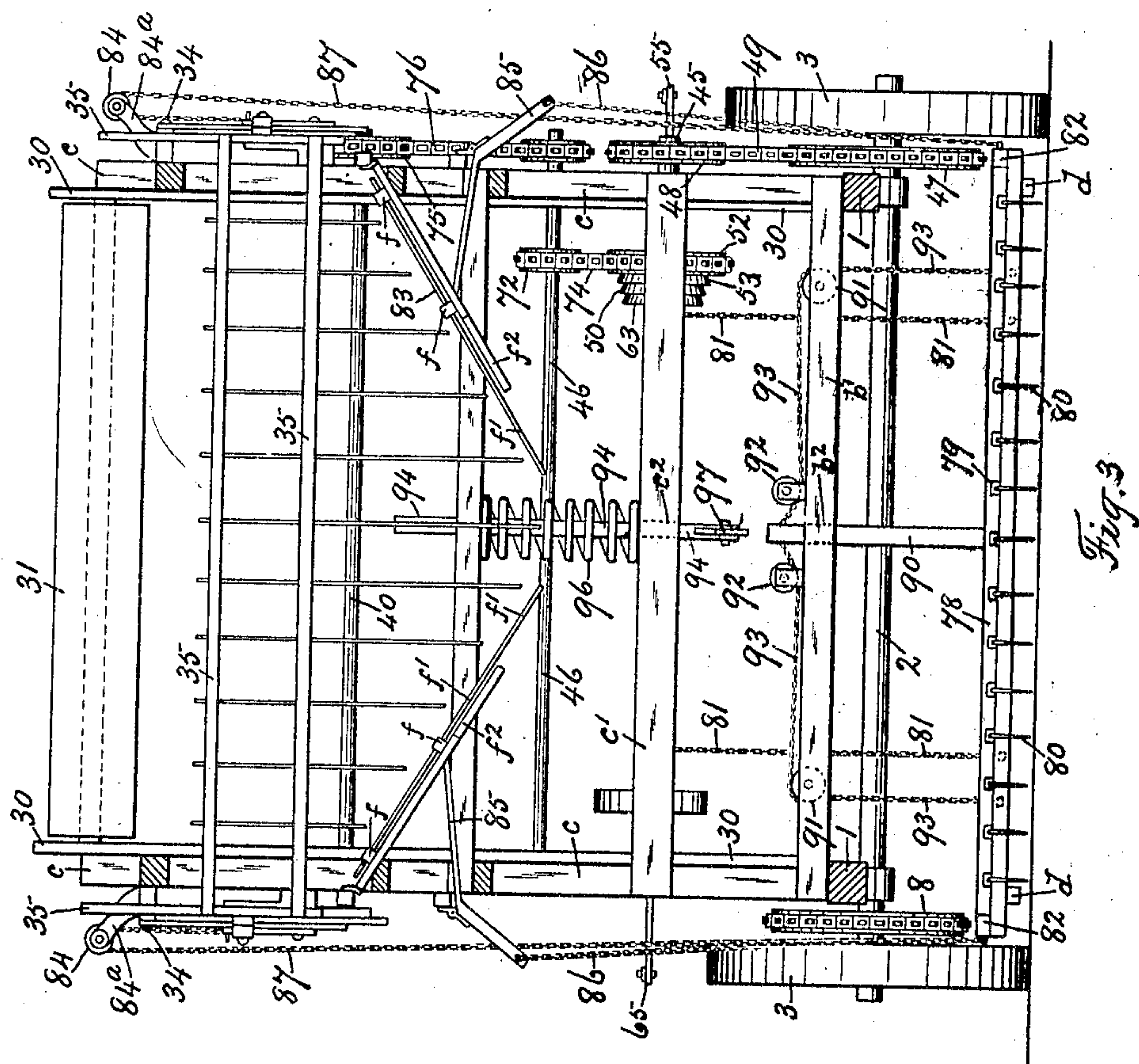


No. 849,580

PATENTED APR. 9, 1907.

B. SMITH.  
HAY HARVESTING MACHINE.  
APPLICATION FILED OCT. 11, 1905.

4 SHEETS—SHEET 3.



Witnesses  
J. S. Edmunds  
A. Byrick

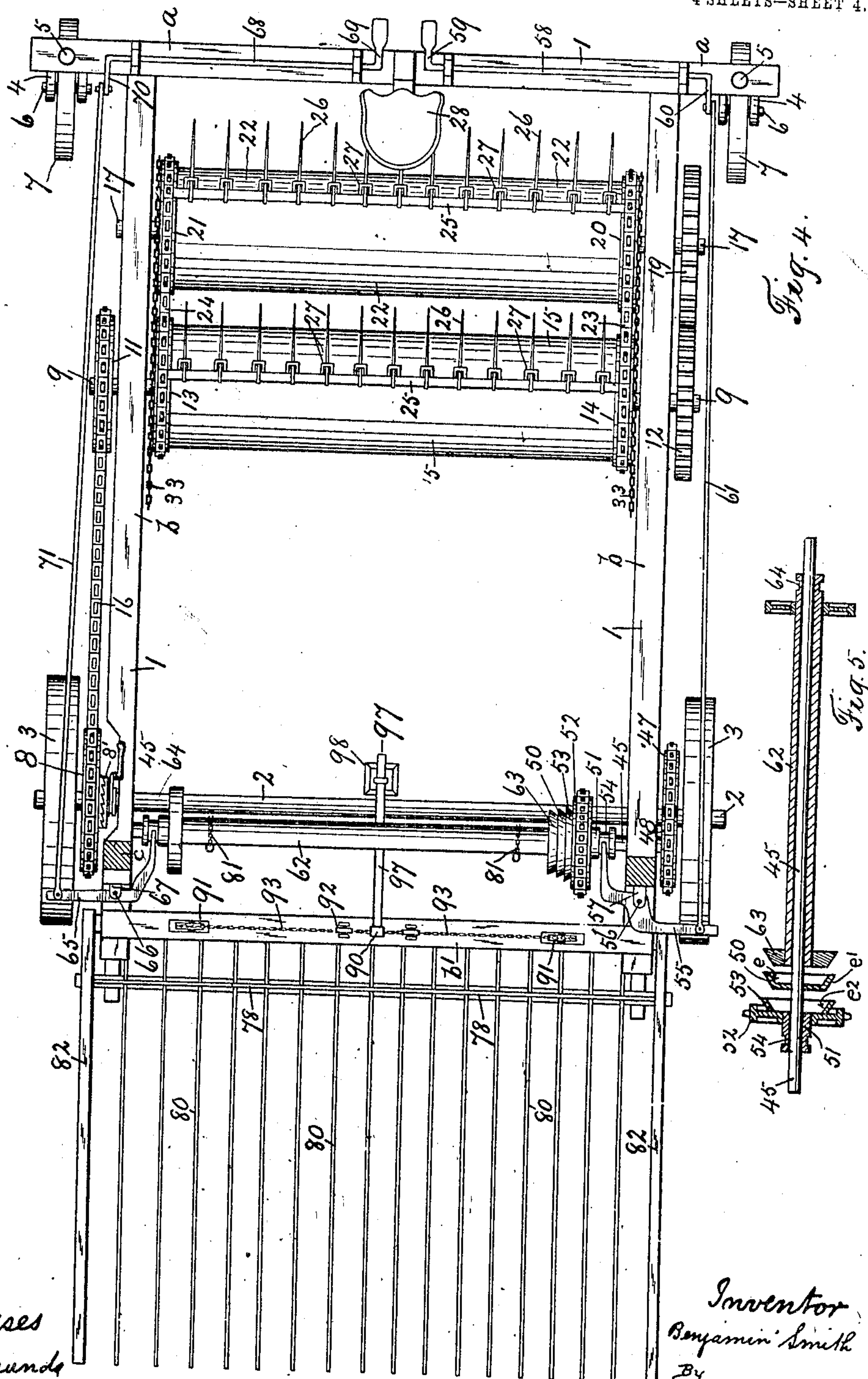
Inventor  
Benjamin Smith  
By P. J. Edmunds  
Attorney

No. 849,580.

PATENTED APR. 9, 1907.

B. SMITH.  
HAY HARVESTING MACHINE.  
APPLICATION FILED OCT. 11, 1905.

4 SHEETS-SHEET 4.



Witnesses  
J. S. Edmunds  
A. Byrick

Inventor  
Benjamin Smith  
By  
P. J. Edmunds  
Attorney



# UNITED STATES PATENT OFFICE.

BENJAMIN SMITH, OF DEREHAM TOWNSHIP, OXFORD COUNTY, ONTARIO,  
CANADA.

## HAY-HARVESTING MACHINE.

No. 849,580.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed October 11, 1906. Serial No. 282,343.

*To all whom it may concern:*

Be it known that I, BENJAMIN SMITH, a subject of the King of Great Britain, and a resident of the township of Dereham, in the county of Oxford, in the Province of Ontario, Canada, have invented a new and useful Hay-Harvesting Machine, of which the following is a specification.

The object of this invention is to provide a machine that will rapidly and easily gather or collect hay, form it into small conical piles or stacks, known as "cocks," and deliver said stacks at intervals in the field; and this invention consists of the improved construction and novel combination of parts of the same, as will be hereinafter first fully set forth and described and then pointed out in the claims.

Reference is had to the accompanying drawings, wherein—

Figure 1 is a side view of a hay-harvesting machine embodying my invention. Fig. 2 is another side view of same looking at it from the opposite side to that shown in Fig. 1. In this view the toothed wheels 12 and 19 shown in Fig. 4 are removed. Fig. 3 is a rear end view of the machine shown in Fig. 1, and Fig. 4 is a detail plan view of same. In this view the endless elevating-carriers are removed in order to illustrate the remaining parts more clearly. Fig. 5 is a detail central sectional view of the conical friction-clutch, sleeves, and their supporting-shaft.

In the accompanying drawings the numeral 1 designates the body or frame of the machine, 2 an axle by which the rear end of said frame 1 is supported, and 3 wheels to which the axle 2 is secured, which wheels rest on and are rotated by traveling over the ground.

4 designates a hanger or bracket, one of which is pivotally secured by the pivot-bolt 5 to and extends downward from the front end *a* of the frame 1 at each side of the machine, 6 a spindle supported in each of said hangers, and 7 a caster-wheel, one of which is mounted on each of said spindles.

8 designates a sprocket-wheel which rotates freely on the axle 2 independent of the wheel 3, and said sprocket-wheel 8 may be adapted to be rotated with the wheel 3 by any suitable clutch mechanism, such as the clutch mechanism 8', (shown in Fig. 4 of the drawings,) so that by throwing said

sprocket-wheel 8 in and out of contact with the wheel 3 the machine may be thrown in or out of gear or operation.

9 designates a shaft mounted and rotating perfectly free in bearings secured to the opposite side sills *b* of the frame 1, and 11 a sprocket-wheel; and 12 a toothed wheel fixed on said shaft 9.

13 and 14 designate sprocket-wheels secured to a cylinder 15, and the latter is mounted and rotates perfectly free on said shaft 9.

16 designates a chain belt passing over the sprocket-wheels 8 and 11, which communicates motion from the sprocket-wheel 8 when the latter is operating to the sprocket-wheel 11, shaft 9, and toothed wheel 12.

17 designates a shaft mounted in bearings secured to the opposite side sills *b* of the frame 1.

19 designates a toothed wheel fixed on the shaft 17, which toothed wheel engages with the toothed wheel 12 on the shaft 9, so that when the latter is operating motion is communicated by these toothed wheels 12 and 19 from the shaft 9 to the shaft 17.

20 and 21 designate sprocket-wheels secured to the cylinder 22, and the latter is fixed on the shaft 17.

23 and 24 designate chain belts which pass over the sprocket-wheels 20 and 14 and 21 and 13, respectively, to communicate motion from the shaft 17 to the sprocket-wheels 13 and 14 and cylinder 15, which are loose on the shaft 9.

25 designate rake heads or bars the opposite ends of which are secured to the chain belts 23 and 24 at suitable intervals, and 26 designate rake-teeth with which said rake-heads 25 are provided and which teeth are adapted to engage with and rake up and thus gather and collect the hay when the machine is in gear and traveling over the ground.

27 designate wire loops secured to the rake-heads 25, through which loops 27 the teeth 26 extend for the purpose of firmly holding the rake-teeth 26 a uniform distance apart.

28 designates the driver's seat, secured to the front end *a* of the frame 1, and to this end of the frame the tongue, doubletree, &c., (not shown,) for attaching the horses thereto is secured.

*c* designates the upright sides of the frame 1, to which the carrier-frame 30 is secured, and 31 designates an antifriction-roller sup-



ported by, held in place, and rotating perfectly free in bearings in the upper end of said carrier-frame 30.

32 designates an endless elevating-carrier provided at opposite sides with chain belts 33, and these endless chain belts 33, secured to the opposite edges of said endless elevating-carrier 32, pass over the sprocket-wheels 20 and 21 and under the sprocket-wheels 20 and 14 and 21 and 13 and up over the antifriction-roller 31, so that when the machine is in gear the rake-teeth 26 gather and collect the hay and deliver it on said endless elevating-carrier 32, and the chain belt 16 from the sprocket-wheel 8, passing over the sprocket-wheel 11 on the shaft 9, and motion being communicated from the shaft 9 to the shaft 17 by means of the toothed gear-wheels 12 and 19 the hay is elevated on the endless elevating-carrier 32 and in the opposite direction to that at which the machine is traveling.

In the rearward portion of the upright sides *c* of the frame 1 and at opposite sides of the machine pivot-bolts 34 are firmly secured, and 35 designates a frame which is pivotally supported on said pivot-bolts 34, and the two opposite sides of said frame 35 are composed of horizontal cross-bars, to which vertical teeth are secured, and said frame extends across the machine below and adjacent to the upper end of the elevating-carrier 32, so that when the carrier, with the hay thereon, turns over the roller 31 the hay will fall down between the opposite side teeth of the frame 35.

36 designates segmental bars, one of which is pivotally mounted on each pivot-bolt 34 at opposite sides of the machine, and in each of said segmental bars 36 an elongated segmental slot or opening 37 is formed, and 38 designates pivotal connecting-bars, one of which is pivotally secured at one end to the frame 35 at opposite sides of the machine, and in the other end of each of said bars 38 one end of a pin 39 is rigidly secured, and the other projecting portion of said pin 39 projects into and through the segmental slot 37 in the adjacent segmental bar 36 and is loose in said slot, and the heads of said pins or bolts 39 are formed larger in cross-section than said slot and extend beyond said bar to prevent said bolts from becoming disengaged from or falling out of said segmental bar 36.

39<sup>a</sup> designates a pivot-bolt, one end of which is adjustable in the segmental slot 37 in said segmental bar 36 and when properly adjusted is rigidly secured to said segmental bar 36.

40 designates a shaft supported by and adapted to revolve perfectly free in suitable bearings secured to the upright sides *c* of the frame 1, 41 crank-arms, one of which is secured to each end of said shaft 40 beyond the upright sides *c* of frame 1, and 42 pitmen, one of which is pivotally secured at one end to

each of said crank-arms 41 and at the other end to the pivot-bolt 39<sup>a</sup>, secured to said segmental bars 36 at opposite sides of the machine, and said crank-arms 41 are each provided with an elongated slot 43, in which the pivot-bolt 44 may be adjusted for the purpose of increasing or reducing the throw or movement of said pitmen 42.

45 and 46 designate shafts which are supported by and adapted to revolve perfectly free in bearings secured to the upright sides *c* of the frame 1.

47 designates a sprocket-wheel fixed on the axle 2, 48 a sprocket-wheel fixed on the shaft 45, and 49 a chain belt passing over the sprocket-wheels 47 and 48, by which motion is communicated from the axle 2 to said shaft 45.

50 designates the cylindrical stationary section of a conical friction-clutch which is fixed on the shaft 45, and this stationary section 50 is formed with an interior tapered face *e* and with an exterior tapered face *e'*.

51 designates a sleeve which encircles and is loose on said shaft 45, and fixed on said sleeve is a sprocket-wheel 52 and the cylindrical adjustable section 53 of a conical friction-clutch formed with the inner tapered face *e''*, which is fitted to and adapted to bind on the exterior tapered face *e'* of the stationary section 50 of said conical friction-clutch, and in said sleeve 51 an annular groove 54 is formed.

55 designates a lever pivoted on the pivot-bolt 56, supported in the bracket 57, and the latter is secured to the upright side *c* of the frame 1, and the end of said lever 55 is inserted in the annular groove 54 in the sleeve 51. This loosely engages said lever with said sleeve.

58 designates an oscillating shaft supported in bearings secured to the front end *a* of the frame 1, and said shaft is provided with an arm 59, the outer end of which arm may be readily and easily pressed downward at the outer end by the foot of the driver from the seat 28, and on the other end of said shaft 58 a crank-arm 60 is secured, and 61 designates a connecting-rod which is pivotally connected at one end to the lever 55 and at the other end to the crank-arm 60, so that when desired by pressing downward on the outer end of the arm 59 the crank-arm 60 may be operated to throw the adjustable section 53 in contact with the stationary section 50 of the conical friction-clutch and cause the sprocket-wheel 52, fixed on the sleeve 51, to rotate with the shaft 45.

62 designates a sleeve which encircles and is loose on the shaft 45.

63 designates the adjustable tapered plug or cone of a conical friction-clutch which is fixed on said sleeve 62, the outer face of which cone 63 is fitted to and adapted to engage with the interior tapered face *e* of the station-



ary section 50 of the conical friction-clutch, and 64 designates an annular groove formed in the sleeve 62.

65 designates a lever pivoted on the pivot-bolt 66, supported on the bracket 67, and the latter is secured to the upright sides *c* of the frame 1.

68 designates an oscillating shaft supported in bearings secured to the front end *a* of the frame 1.

69 designates an arm with which the oscillating shaft 68 is provided adjacent to the seat 28, the outer end of which arm may be readily and easily pressed downward by the foot of the driver from the driver's seat 28, and on the other end of said oscillating shaft a crank-arm 70 is fixed, and 71 designates a connecting-rod which extends from and is pivotally secured at one end to said crank-arm 70 and at the other end to one end of the lever 65, so that by pressing downward on the arm 69 the sleeve 62, together with the conical tapered plug 63, is adjusted toward the stationary section 50 until said plug 63 engages with the interior face *e* of the stationary section 50 of said conical friction-clutch, when the sleeve 62 and the shaft 45 will revolve together.

72 and 73 designate sprocket-wheels fixed on the shaft 46, and 74 a chain belt passing over the sprocket-wheels 52 and 72, by which motion is communicated from the shaft 45 to the shaft 46.

75 designates a sprocket-wheel fixed on the shaft 40, and 76 a chain belt passing over the sprocket-wheels 73 and 75, by which motion is communicated from the shaft 46 to the shaft 40.

77 designates a frame open at the front end, and the front ends of the side bars *d* of this frame 77 are hinged or pivotally secured to the under side of the side sills *b* of the frame 1.

*d'* designates short rear sections of the side bars of the frame 77, which are hinged to the front sections *d*, and *d*<sup>2</sup> designates a cross-bar which connects the hinged sections *d'* at the rear end of the frame 77 together, and

78 designates a guide-bar also secured at its ends to the opposite hinged sections *d'* of the frame 77, and in said guide-bar the slots or openings 79 are formed.

80 designates holding or supporting teeth, each of which are secured at one of their ends to the cross-bar *d*<sup>2</sup> of the pivotal section *d'* of the frame 77. These teeth 80 then extend rearward through the slots or openings 79 in the guide-bar 78, which guide-bar thus holds said teeth 80 uniformly spaced apart.

81 designates chains which are fastened at one end to the cross-bar *d*<sup>2</sup> of the frame 77 and at the other end to the sleeve 62 on the shaft 45.

82 designates bars which are rigidly and firmly secured at one end to the cross-bar *d*<sup>2</sup>

of the pivotal frame 77, and said bars extend rearward of the machine at opposite sides of and slightly above the supporting-teeth 80.

83 designates gates hinged at opposite sides of the machine to the rearward extensions of the upright sides *c* of the frame 1. These gates 83 are composed of bars *f*, to which the teeth *f'* are secured, and *f*<sup>2</sup> designates a plate secured to each of said gates midway between their ends, as shown in Figs. 1 and 2.

84 designates a grooved pulley, mounted in a bracket 84<sup>a</sup>, and the latter is rigidly and firmly secured to a rearward extension of the upright sides *c* of the frame 1, and one of said brackets and pulleys are secured to each side of the machine, as shown in Fig. 3.

85 designates a lever, one of which is pivoted to the rearward extension *c* of the frame 1 at opposite sides of the machine, and the inner end of one of each of said levers abuts against the plate *f*<sup>2</sup> of the gate 83 at the adjacent side of the machine.

86 designates chains, one of which is secured at one end to the outer end of each of the levers 85, and one of said chains extends downward on opposite sides of the machine, and the other end of each chain is secured to a side bar 82 at the corresponding side of the machine.

87 designates chains, one of which is secured at one end to each of the side bars 82. These chains 87 then extend upward, and one of each passes over the pulley 84, and the other end of one of each of said chains is secured to the connecting-bar 38 at the corresponding side of the machine.

*b'* designates a cross-bar sill of the frame 1 at the rear end of the machine, through which sill *b'* a socket or opening *b*<sup>2</sup> is formed, and 90 designates a shouldered bar formed with a beveled face *g* and shoulder *g'*, and said bar 90 is fitted to and extends through said socket or opening *b*<sup>2</sup>. This holds said bar 90 in place and guides it as it is raised and lowered, and the lower end of said bar 90 rests on and is secured to the cross-bar *d*<sup>2</sup> of the pivotal frame 77.

91 designates pulleys mounted in bearings in the sill *b'*, 92 pulleys mounted in brackets or bearings secured to said sill *b'*, and 93 designates chains secured at one end to the cross-bar *d*<sup>2</sup> of the pivotal frame 77, which chains extend upward over the pulleys 91 and under the pulleys 92, and their ends are secured to the opposite sides of the shouldered bar 90, the purpose of this construction being to connect cross-bar *d*<sup>2</sup> with bar 90.

*c* designates a cross-bar secured to the upright sides *c* at the opposite sides of the frame 1.

94 designates a vertical bar which extends through and is guided and held as it moves vertically in a socket or opening *c*<sup>2</sup>, formed in said cross-bar *c*.

95 designates a block formed on or secured



to said bar 94, and 96 a coil-spring encircling said vertical bar 94 and located between said block 95 and the cross-bar *c'*.

97 designates a lever pivoted on the lower end of the vertical bar 94, and said lever 97 is formed with an inclined face *n* and shoulder *n'* and is adapted to engage with the inclined face *g* and the shoulder *g'* on the shouldered bar 90.

98 designates a weight secured to the other inner end of said lever 97.

The operation is as follows: As the wheels 3 travel over the ground they revolve with the axle 2, and when so revolving by adjusting the sprocket-wheel 8 in engagement with the adjacent wheel 3 by any suitable clutch mechanism said sprocket-wheel 8 will also revolve and in the same direction as the wheel 3, and as the sprocket-wheel 8 revolves the shaft 9, sprocket-wheel 11, and toothed wheel 12 are also revolved and in the same direction as said wheels 3, because the chain belt 16 communicates motion from said sprocket-wheel 8 to said sprocket-wheel 11, and the toothed wheel 12 engaging with the toothed wheel 19, fixed on shaft 17, as said toothed wheel 12 revolves the toothed wheel 17 would also be revolved, but in the opposite direction to that at which the shaft 9 is revolving, and the sprocket-wheels 20 and 21 being fixed on the shaft 17 as the latter revolves the sprocket-wheels 13 and 14, being loose on shaft 9, will also be revolved by the chain belts 23 and 24, and motion being transmitted from the sprocket-wheels 20 and 21 to the sprocket-wheels 13 and 14 the latter operate in the same direction as the shaft 17, but in the opposite direction to the shaft 9, and the chain belts 33 at the side edges of the elevating-carriers 32 being operated by passing over the sprocket-wheels 20 and 21, outside of the chain belts 23 and 24, and said sprocket-wheels 13 and 14 and shaft 17 operating in the same direction to the shaft 9 and wheels 3 said carriers move in the opposite direction to that at which the machine is traveling, and the rake-heads 25, to which the rake-teeth 26 are secured, being attached to the chain belts 23 and 24 as said chain belts 23 and 24 travel along the under side of the sprocket-wheels 20 and 14 and 21 and 13, respectively, said rake-teeth 26 travel over the ground in the same direction as that in which the machine is traveling, and as said teeth 26 pass over and close to the ground they gather and collect the hay, and as said rake-teeth travel farther onward they turn upward and deliver it onto the endless carriers 32, on which the hay is carried upward until it comes to the roller 31, and as said carriers 32 pass over said roller 31 the hay falls off said carriers and down between the teeth of the opposite sides of the frame 35. Again, when the sprocket-wheel 47 is revolving motion is transmitted from the sprocket-

wheel 47 to the sprocket-wheel 48 on the shaft 45 by the chain belt 49, and as said shaft 45 revolves the portion 50 of the conical friction-clutch also revolves, being fixed on said shaft 45. When the shaft 45 is revolving and the operator wishes the frame 35 to vibrate or swing backward and forward in order to distribute the hay evenly and lengthwise on the teeth 80, he presses downward on the outer end of the arm 59, and this adjustment through the oscillating shaft 58, connecting-rod 61, and lever 55 adjusts the sleeve 51 lengthwise on the shaft 45 until the interior conical face of the portion 53 of the conical friction-clutch engages with the exterior conical face of the portion 50 of said friction-clutch. This holds the sleeve 51 and sprocket-wheel 52 to rotate with shaft 45. 72 designates a sprocket-wheel on the shaft 46, and motion is communicated from the shaft 45 to the shaft 46 by a chain belt 74 passing over said sprocket-wheels 52 and 72. 73 designates another sprocket-wheel on the shaft 46, and 75 a sprocket-wheel on the shaft 40, and motion is communicated from the shaft 46 to the shaft 40 by a belt passing over said sprocket-wheels 73 and 75, and as said shaft 40 rotates the crank-arms 41 are also rotated, which operate the pitmen 42, and the latter being pivotally connected at one end to said crank-arm 41 and at the other end to the segmental bar 36 and the latter being pivotally connected to the frame 35 by the connecting-bars 38. As said pitmen 42 are operated the segmental bar 36 is swung or vibrated, as well as the frame 35, lengthwise of the machine, and as the hay falls down between the opposite sides of this swinging frame 35 the hay is distributed evenly and lengthwise on the teeth 80. As the hay collects on the teeth 80 its weight compresses the coil-spring 96, as follows: The chains 93 connect the cross-bar *d'*, to which the teeth 80 are rigidly secured, to the shouldered bar 90, and the shoulder *g'* on the shouldered bar 90 engaging with a shoulder *n'* on the lever 97, and said lever 97 being pivotally connected to the vertical bar 94, and a block 95 being secured to the upper end of said bar 94, and the coil-spring 96 being located between said block 95 and the cross-bar *c'*. As the hay collects on the teeth 80 its weight compresses the coil-spring 96. This lowers the vertical bar 94 and teeth 80, together with the side bars 82, connected therewith, and as the spring 96 is compressed by the weight of the hay on the teeth 80 said teeth 80 and side bars 82 thereof gradually lower, and said side bars 82 being connected to the connecting-bars 38 by chains 87 passing over pulleys 84, and one end of each of said connecting-bars being pivotally connected to the frame 35 and the bolts 39, which connect the other end of said connecting-bars 38 to the segmental bars 36 being loose and adapt-



ed to move freely up and down in the segmental slots 37 in said segmental bars 36. As the teeth 80 and side bars 82 are lowered by the weight of the hay the ends of the connecting-bars 38 are raised in the slots 37 of the segmental bars 36, and as said ends of said connecting-bars are raised the swing or vibration of the frame 35 will be less because the ends of the connecting-bars 38 are gradually adjusted toward or closer to the pivot 34 on which said segmental bars 36 are pivoted. The result is that as the hay accumulates on the teeth 80 the swing or vibration of the frame 35 becomes less lengthwise of the machine. Consequently the hay is spread over a smaller space lengthwise of the teeth 80, and the side bars 82, being connected by the chains 86 to the outer ends of the levers 85 and the inner ends of said levers 85 abutting against the plate  $f^2$  of the gates 83, as the teeth 80 and side bar 82 lower they draw down on the outer end of said levers 85, which raise the inner ends of said levers as well as the inner free ends of said gates 83. This gradually brings the inner ends of said gates 83 together as the hay accumulates on the teeth 80, and as the inner ends of these gates gradually close together the hay falls on a smaller area crosswise of the machine, the result of which, together with the lessening of the swing or vibration of the frame 35 lengthwise of the machine, is that a conical pile or cock of hay is formed on said teeth 80, and the weight 98 on the lever 97 is regulated according to the weight or quantity of hay required in the pile or cock when complete, so that when sufficient hay has accumulated on the teeth 80 to overcome the resistance of the weight 98 the weighted end of said lever 97 is raised and the end of said lever on which the shoulder  $n'$  is formed is lowered until the shoulder  $g'$  on the bar 90 disengages therefrom, when the teeth will further lower until they rest on the ground, which action will remove the compression from the spring 96, when it will return to its original or normal position, and the frictional contact of the hay on the ground will permit the teeth 80 to gradually withdraw from under the hay as the machine moves forward, and thus leave the pile or cock of hay in proper position on the ground. After the pile or cock of hay is formed and its weight on the teeth 80 trips the weighted lever 97 as the teeth 80 lower to and rest on the ground the gates 83 are closed together at their inner ends, onto which gates when in this position the hay falls as the machine travels forward after or while the pile or cock of hay is being deposited and until the machine is set or the teeth 80 adjusted in proper position to receive the hay. Just as soon as the conical pile or cock of hay has been delivered on the ground the operator in the seat 28 presses downward on the outer end of the arm 69, and this adjustment,

through the oscillating shaft 68, connecting-rod 71, and lever 65, adjusts the sleeve 62 lengthwise on the shaft 45 until the exterior conical face of the portion 63 of the conical friction-clutch engages with the interior conical face  $e$  of the portion 50 of the conical friction-clutch. This holds the sleeve 62 to rotate with the shaft 45, and as said sleeve 62 rotates the chains 81, which are secured at one end to said sleeve 62 and at the other end to the cross-bar  $d^2$  of the frame 77, are wound around it, which raises the rear end of the frame 77, teeth 80, side bars 82, and bar 90 until the inclined face  $g$  of the bar 90 passes the inclined face  $n$  on the lever 97, until the shoulder  $g'$  of said bar 90 will engage with the shoulder  $n'$  of the lever 97, which operation slackens the chains 86 and 87, and the slackening of the chains 86 permits the inner ends of the levers 85, as well as the inner adjacent edges of the gates 83, to lower and spread apart, when the hay which has collected thereon will fall on the teeth 80, and the slackening of the chains 87 will permit the lowering of the end of the connecting-bar 38 adjacent to the segmental bar 36 to give a wide spread to the hay which forms the lower portion of the hay-cock, the connecting-bar 38 being of sufficient weight to cause it to lift the chain 87, after which the operation hereinbefore described is repeated, and so on.

Having thus described my invention, I claim—

1. In a hay-harvesting machine, a main frame, a jointed frame pivotally secured to said main frame, supporting-teeth secured to said jointed frame, and means for supporting the jointed frame between its joint and its outer end, in combination with a swinging frame pivotally supported on said main frame above said supporting-teeth of said hinged frame, and means for operating said swinging frame to spread the hay on said supporting-teeth, substantially as shown and described and for the purpose specified.

2. In a hay-harvesting machine, a main frame, and a jointed frame pivotally secured thereto, in combination with a swinging frame pivotally secured to said main frame, and means for connecting said jointed frame with said swinging frame to cause the latter to gradually swing less as the hay accumulates on said jointed frame and thus gradually form the pile of hay tapered or smaller at the upper end lengthwise of the machine, substantially as shown and described and for the purpose specified.

3. In a hay-harvesting machine, a main frame, a jointed frame pivotally secured thereto, and a swinging frame pivotally secured to said main frame, in combination with a segmental bar, pivotally secured to said main frame, and in which an elongated segmental slot is formed, a connecting-bar having a sliding connection at one end with



said segmental bar, and pivotally secured at the other end to said swinging frame, a pivot-pin secured to one end of said connecting-bar and extending through and adapted to slide in said segmental slot in said segmental bar, a pulley supported in a bracket secured to said main frame, and a chain passing over said pulley and secured at one end to said jointed frame and at the other end to said connecting-bar, and means for swinging said segmental bar, substantially as shown and described and for the purpose specified.

4. In a hay-harvesting machine, a main frame and a jointed frame pivotally secured thereto, in combination with gates hinged to said main frame, and means for connecting said gates with said jointed frame to cause their inner ends to move gradually toward one another, as the hay accumulates on said jointed frame, and thus gradually form the pile of hay tapered or smaller at the upper end from the sides toward the center of the machine, substantially as shown and described and for the purpose specified.

5. In a hay-harvesting machine, a main frame and a jointed frame pivotally secured thereto, in combination with gates hinged to said main frame and inclined toward the center of the machine, levers pivotally secured to said main frame, the end of one of each of which is adapted to engage with one of said gates, and chains, one of which is connected at one end to the outer end of each lever, and at the other end to said jointed frame, substantially as shown and described and for the purpose specified.

6. In a hay-harvesting machine, a main frame, and a jointed frame pivotally secured thereto, in combination with a swinging frame pivotally secured to said main frame, and gates hinged to said main frame and inclined toward the center of the machine, and means for connecting said swinging frame and said gates with said jointed frame to cause the swinging frame to gradually swing less, and gradually to bring the adjacent ends of the gates together, as the hay accumulates on said jointed frame, and thus gradually form the pile or stack of hay on said jointed frame conically tapered toward and smaller at the upper end, substantially as shown and described and for the purpose specified.

7. In a hay-harvesting machine, a main frame, a jointed frame pivotally secured thereto, supporting-teeth secured to said jointed frame, a shouldered bar resting on said jointed frame, and means for supporting the outer end of said jointed frame and for guiding the shouldered bar as it is raised and lowered, in combination with a vertical bar held in place in a socket in a cross-bar secured to the main frame, a block secured to said vertical bar, a coil-spring encircling said vertical bar and interposed between said

block and said cross-bar, and means for connecting said shouldered bar with said vertical bar that will trip and permit them to separate when the hay on the supporting-teeth is of the weight or quantity required, substantially as shown and described and for the purpose specified.

8. In a hay-harvesting machine, a main frame, a jointed frame pivotally secured thereto, supporting-teeth secured to said jointed frame, a shouldered bar resting on said jointed frame, chains connecting said jointed frame with said shouldered bar, and means for supporting the outer end of said jointed frame and for guiding said shouldered bar as it is raised and lowered, in combination with a vertical bar held in place in a socket in a cross-bar secured to said main frame, a block secured to said vertical bar, a coil-spring encircling said vertical bar and interposed between said block and said cross-bar, a lever pivoted on the lower end of said vertical bar, and provided with a shoulder adapted to engage with a shoulder on said shouldered bar, and a weight suspended from said lever, substantially as shown and described and for the purpose specified.

9. In a hay-harvesting machine, a main frame, a jointed frame pivotally secured thereto, supporting-teeth secured to said jointed frame, and gates hinged to said main frame and connected with said jointed frame, in combination with a shouldered bar resting on said jointed frame, chains connecting said jointed frame with said shouldered bar, means for supporting the outer end of said jointed frame and for guiding said shouldered bar as it is raised and lowered, a vertical bar held in place in a socket in a cross-bar secured to said main frame, a block secured to said vertical bar, a coil-spring encircling said vertical bar and interposed between said block and said cross-bar, a lever pivoted on the lower end of said vertical bar, and provided with a shoulder adapted to engage with a shoulder on said shouldered bar, and a weight suspended from said lever, substantially as shown and described and for the purpose specified.

10. In a hay-harvesting machine, a main frame, a jointed frame pivotally secured thereto, supporting-teeth secured to said jointed frame, and a swinging frame pivotally secured to said main frame and connected with said jointed frame, in combination with a shouldered bar resting on said jointed frame, chains connecting said hinged frame with said shouldered bar, means for supporting the outer end of said jointed frame and for guiding said shouldered bar as it is raised and lowered, a vertical bar held in place in a socket in a cross-bar secured to said main frame, a block secured to said vertical bar, a coil-spring encircling said vertical



bar, and interposed between said block and  
said cross-bar, a lever pivoted on the lower  
end of said vertical bar, and provided with a  
shoulder adapted to engage with a shoulder  
5 on said shouldered bar, and a weight sus-  
pended from said lever, substantially as  
shown and described and for the purpose  
specified.

10 11. In a hay-harvesting machine, a main  
frame, a jointed frame pivotally secured  
thereto, supporting-teeth secured to said  
jointed frame, a swinging frame pivotally se-  
cured to said main frame, and gates hinged  
to said main frame, and both connected with  
15 said jointed frame, in combination with a  
shouldered bar resting on said jointed frame,  
chains connecting said hinged frame with  
said shouldered bar, means for supporting  
the outer end of said jointed frame and for

guiding said shouldered bar as it is raised and 20  
lowered, a vertical bar held in place in a  
socket in a cross-bar secured to said main  
frame, a block secured to said vertical bar,  
a coil-spring encircling said vertical bar and  
interposed between said block and said cross- 25  
bar, a lever pivoted on the lower end of said  
vertical bar and provided with a shoulder  
adapted to engage with a shoulder on said  
shouldered bar, and a weight suspended from  
said lever, substantially as shown and de- 30  
scribed and for the purpose specified.

In testimony whereof I have signed in the  
presence of the two undersigned witnesses.

BENJAMIN SMITH.

Witnesses:

P. J. EDMUNDS,

A. BYRICK.