No. 783,636. PATENTED FEB. 28, 1905.

D. S. HARROLD.

HAY RAKE.

APPLICATION FILED JUNE 1, 1904.

3 SHEETS—SHEET 1.

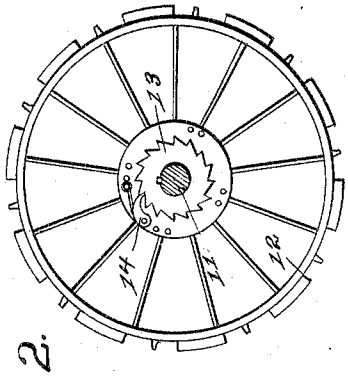


Fig. 2.

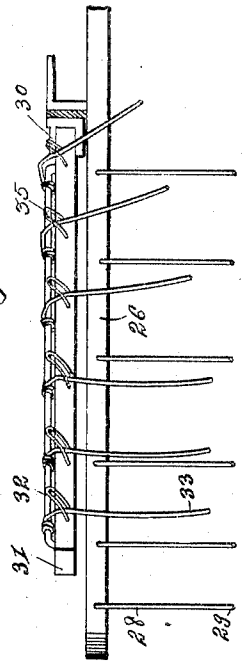


Fig. 3.

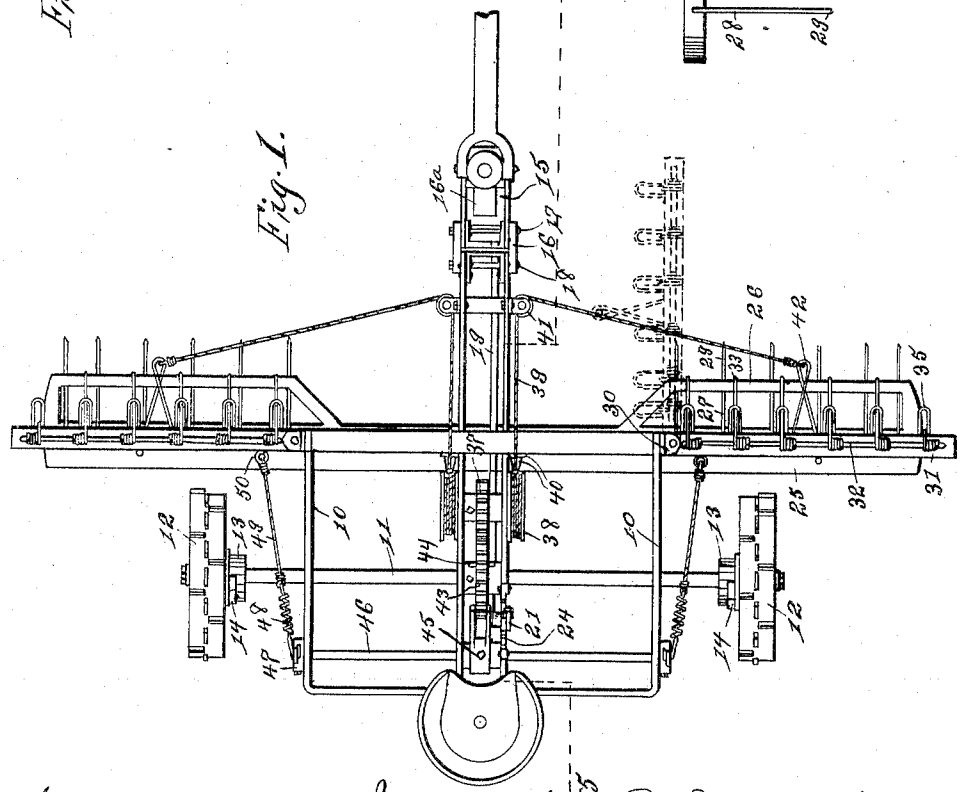


Fig. 1.

Witnesses:
L. L. Holbrook
J. B. Smutney.

Inventor: D. S. Harrold.
by Orwig & Lane
attys

No. 783,636. PATENTED FEB. 28, 1905.

D. S. HARROLD.

HAY RAKE.

APPLICATION FILED JUNE 1, 1904.

3 SHEETS—SHEET 2.

Fig. 4.

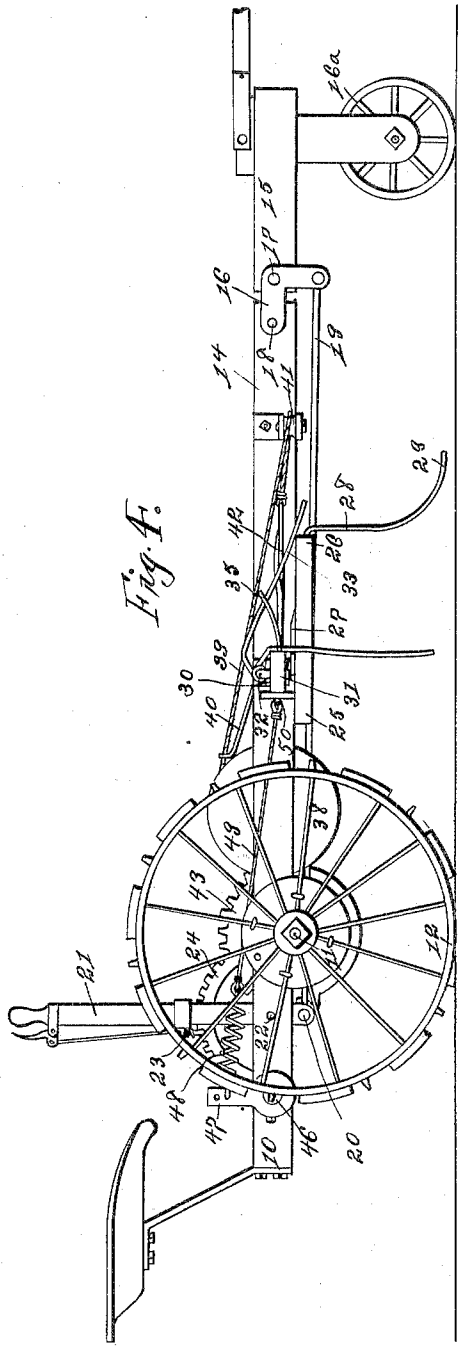
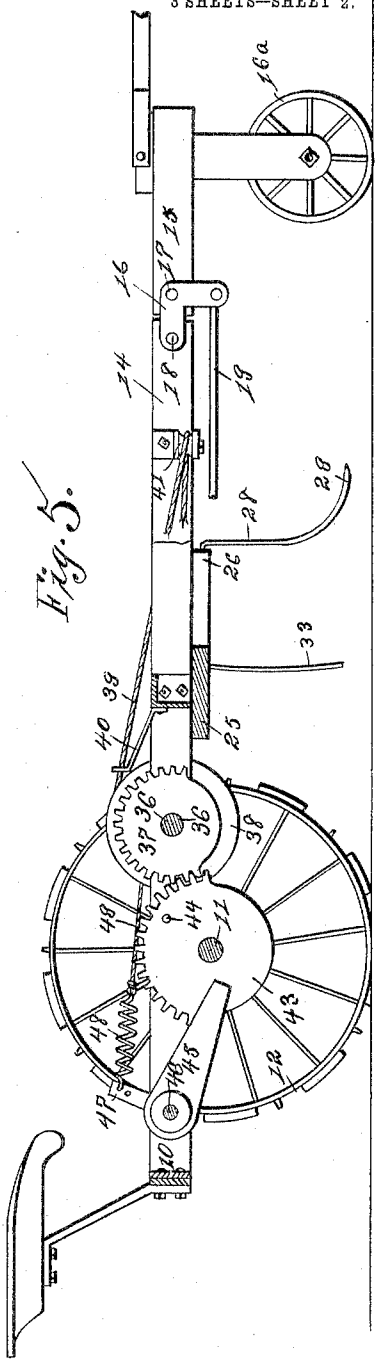


Fig. 5.



Witnesses.
L. L. Heilbrock.
J. B. Smutney.

Inventor: D. S. Harrold
by Orwig & Lane
attys.

No. 783,636. PATENTED FEB. 28, 1905.

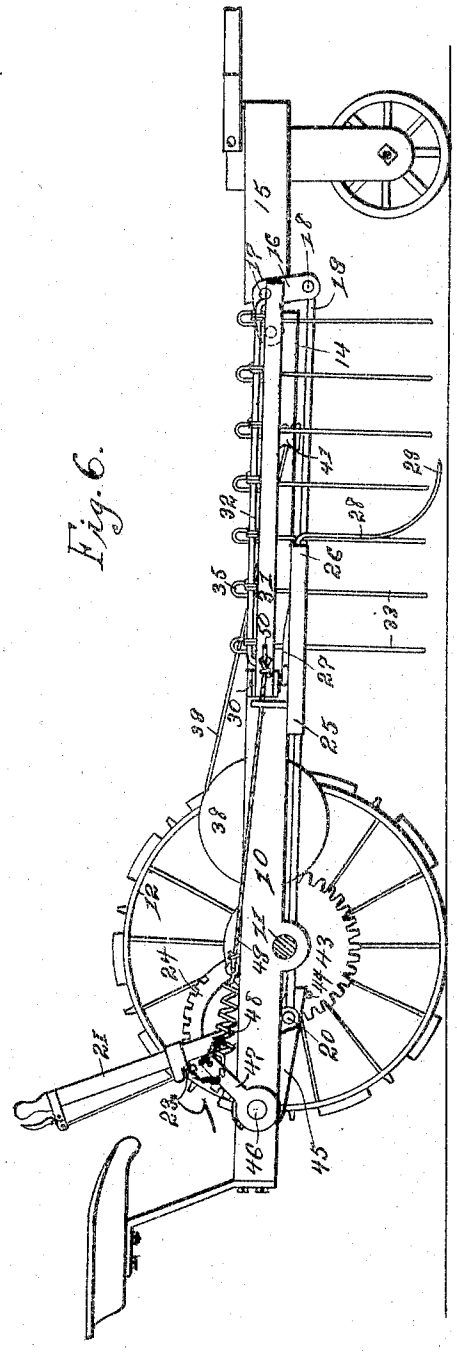
D. S. HARROLD.

HAY RAKE.

APPLICATION FILED JUNE 1, 1904.

3 SHEETS—SHEET 3.

Fig. 6.



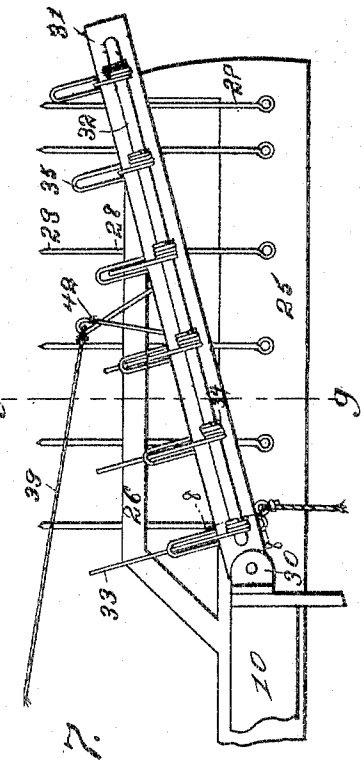


Fig. 8.

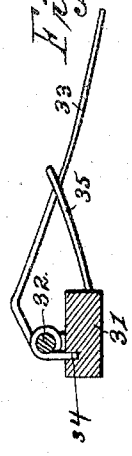
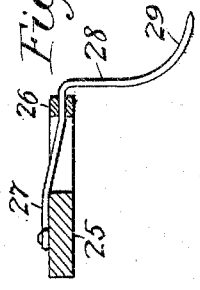


Fig. 9.



Witnesses:-
L. L. Leibrock.
J. B. Smutney.

Inventor: D. S. Harrold.
by Orwig & Lane
Attys.

No. 783,636. Patented February 28, 1905.

UNITED STATES PATENT OFFICE.

DAVID S. HARROLD, OF CLEVELAND, NORTH DAKOTA.

HAY-RAKE.

SPECIFICATION forming part of Letters Patent No. 783,636, dated February 28, 1905.

Application filed June 1, 1904. Serial No. 210,685.

To all whom it may concern:

Be it known that I, DAVID S. HARROLD, a citizen of the United States, residing at Cleveland, in the county of Stutsman, State of North Dakota, have invented certain new and useful Improvements in Hay-Rakes, of which the following is a specification.

The objects of my invention are to provide a hay-rake of simple, durable, and inexpensive construction designed to be advanced over a field by draft-animals and to deposit hay in a row at the center of the machine-frame.

My invention consists in certain details in the construction, arrangement, and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a top or plan view of the complete machine with the pivoted rake-sections in their position at right angles to a fore-and-aft line through the machine. The dotted lines indicate the position of one of the pivoted rake-sections in its position parallel with a fore-and-aft line through the machine. Fig. 2 shows a detail side view of one of the traction-wheels. Fig. 3 shows a detail front view of one of the stationary rake-sections in position at right angles to a fore-and-aft line through the machine. Fig. 4 shows a side elevation of the complete machine. Fig. 5 shows a longitudinal sectional view of the machine on the line 5 5 of Fig. 1. Fig. 6 shows a side elevation of the machine with the pivoted rake-sections in position parallel with a fore-and-aft line through the machine. Fig. 7 shows a top or plan view of one of the rigid rake-sections and one of the pivoted rake-sections adjacent thereto. Fig. 8 shows a transverse sectional view on the line 8 8 of Fig. 7. Fig. 9 shows a transverse sectional view through the stationary arm on the line *g g* of Fig. 7.

Referring to the accompanying drawings, I have used the reference-numeral 10 to indicate the body portion of the machine-frame. In the said machine-frame is a rotatable axle 11, upon which the traction-wheels 12 are rotatably mounted. Adjacent to each traction-wheel 12 is a ratchet-wheel 13, fixed to the axle 11, engaged by spring-actuated pawl 14, mounted on the traction-wheel. In this way the axle 11 is rotated when either traction-wheel is advanced; but the axle is not rotated when either traction-wheel is moved rearwardly.

The numeral 14ª indicates a beam extending forwardly from the body of the machine-frame, and 15 indicates an extension of same, provided with a caster-wheel 16ª, to which a tongue is pivoted to swing in a vertical plane.

I have provided means for raising and lowering the forward end of the beam 14 relative to the extension 15, as follows: The numeral 16 indicates a bell-crank lever fulcrumed at 17 to the extension 15 and having its rear end pivoted at 18 to the beam 14ª and having its other end projecting straight downward. A rod 19 is pivoted to the downwardly-projecting end of the bell-crank lever 16 and is extended rearwardly and pivoted at 20 to the lower end of a lever 21, which is fulcrumed to machine-frame at 22 and is provided with a pawl 23, designed to engage a sector 24, fixed to the machine-frame. By manipulating the lever 21 the forward end of the beam 14 may be raised and lowered.

At the front of the body portion of the machine-frame are two fixed rake-sections extending at right angles to a fore-and-aft line through the machine, with a space between them to permit the hay gathered by the fixed rake-sections to pass between the said sections. Each of the fixed rake-sections comprises the body portion 25, having at its front edge an arm 26, spaced apart from the body portion 25. The rake-teeth are made of metal bars, the upper ends of which are fixed at 27 to the part 25 and the central portions of which are projected through an arm 26, then downward at 28, and the lower ends are extended forwardly at 29. Mounted above the inner end of each fixed rake-section is a bracket 30, to which the arm 31 is pivoted. This arm 31 is provided with a rod 32 at its top, and a number of spring rake-teeth 33 are connected to the arm 31 by being wound upon the rod 32, with one end 34 secured to the arm 31, as shown in Fig. 8. The said ratchet-teeth 33 are then inclined forwardly and downwardly and are passed through the limiting-

guides 35, secured to the front of the arm 31. In this way the said teeth 33 are normally held by the resiliency of the metal of which they are formed in position against the front of the arm 31, and their outer movement relative to the arm 31 is limited by the guides 35. The outer one of the teeth 33 is arranged to pass beyond the outer end of the body portion 25 of the fixed rake-section, as shown in Fig. 7.

I have provided means for automatically operating the pivoted rake-sections upon the advance of the machine, as follows: The numeral 36 indicates a shaft pivoted to the machine-frame in front of the axle 11, and fixed thereto is a mutilated gear-wheel 37 and two drums 38. Wound upon each drum 38 is a cable 39, projecting forwardly through the guides 40 and then outwardly around a direct pulley 41, with its outer end fixed to the bracket 42 at the front of the arm 31. Fixed to the axle 11 is a mutilated gear-wheel 43, designed to mesh with the gear-wheel 37. This gear-wheel 43 is provided with a pin 44, which pin is arranged to engage a slotted arm 45, which arm receives the gear-wheel 43 and is fixed to a rock-shaft 46 in the rear of the axle 11. In this way during each revolution of the gear-wheel 43 the arm 45 is engaged by the pin 44 and elevated and held in its elevated position until the pin 44 passes beyond its end, whereupon it is free to drop.

I have provided means for causing the pivoted rake-arms to return to their position at right angles to a fore-and-aft line, as follows: On the ends of the rock-shaft 46 I have fixed arms 47, and to each of said arms I have attached a contractable coil-spring 48, and a cable 49 is attached to the spring and to an eye 50 at the rear of the arm 31.

In practical use and assuming that the machine is being advanced over the field containing cut hay both of the fixed rake-sections will collect the hay lying in their path. The pivoted rake-sections when at their rearward limit of movement have their teeth yieldingly held against the arm 26 of the fixed rake-sections, and when the pivoted rake-sections begin to move forward the teeth 33 will be yieldingly held against the front of the arm 26, so that the lower ends of the teeth 33 will move downwardly and engage the hay carried by the fixed rake-sections. Then as the fixed rake-sections move forwardly they will carry the accumulated hay to position between the fixed rake-sections, so that as the machine is advanced the hay will be deposited in a row at the center of the machine. The said hinged rake-sections are slowly moved to their inward limit as the machine is advanced, and when this limit is reached they are quickly moved to their rearward limit by the springs 48. This operation is produced as follows: The springs 48 normally hold the hinged rake-sections at their outer limit of movement, and they also hold the arms 45 at their downward limit. When the machine is advanced, the mutilated gear 43 is rotated, and it turns the mutilated gear 37. When the gear 37 is turned, the drums 38 are moved in a direction to wind up the cable 39, and thus slowly draw the hinged rake-sections forwardly and inwardly. Before the hinged rake-sections reach their inward limit of movement the pin 44 has engaged the arm 45 and elevated it, thus applying considerable tension to the spring 48. When the inner limit of movement of the hinged rake-section is reached, that part of the mutilated gear 43 having no teeth is moved to position adjacent to the mutilated gear 37. Hence the latter gear-wheel is free to rotate, and the springs 48 will then operate to quickly swing the hinged rake-sections to their outer limit. Then as the mutilated gear progresses farther the pin 44 passes beyond the arm 45, and the said arm drops, thus relieving the tension on the spring 48. The position of the rake-teeth relative to the ground-surface may be varied by a manipulation of the lever 21.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—

1. The combination of a frame, a fixed rake-section extending across the path of travel of the frame and a hinged rake-section in one position standing in front of and above the fixed rake-section and movable to position substantially at right angles to the fixed rake-section, the teeth of the movable rake-section designed to engage stock gathered by the fixed rake-section and to carry it to a point to one side of the fixed rake-section.

2. The combination of a machine-frame, a fixed rake-section extending across the path of travel of the machine-frame, a hinged rake-section, movable from a position adjacent to the fixed rake-section forwardly and inwardly, and means for moving said pivoted rake-sections forwardly and inwardly, said means actuated by the advance of the machine.

3. The combination of a machine-frame, a fixed rake-section extending across the path of travel of the machine-frame, a hinged rake-section, movable from a position adjacent to the fixed rate-section forwardly and inwardly, means for moving said pivoted rake-sections forwardly and inwardly, said means actuated by the advance of the machine, and spring-actuated means for returning it.

4. The combination of a machine-frame, two fixed rake-sections, spaced apart and extended across the path of travel of the machine-frame, two pivoted rake-sections, each movable from position adjacent to one of the fixed rake-sections forwardly and inwardly to carry stock gathered by the fixed rake-sections and to discharge it between the fixed rake-sections.

5. A machine-frame mounted on wheels, two fixed rake-sections spaced apart and extending across the path of travel of the machine-

frame and attached to a part of the machine-frame, means for vertically adjusting the part of the machine-frame, to which the fixed rake-sections are attached, and two rake-sections pivoted to the inner end portions of the fixed rake-sections and susceptible of movement from position adjacent to the fixed rake-sections forwardly and inwardly.

6. A machine-frame, a rotatable axle mounted in the machine-frame, traction-wheels on the axle, two fixed rake-sections mounted on the machine-frame spaced apart and arranged across the path of travel of the machine-frame, two pivoted rake-sections arranged for movement from positions adjacent to the fixed rake-sections, forwardly and inwardly, two drums rotatably mounted on the machine-frame, cables wound upon said drums and attached to the pivoted rake-sections, and means actuated by the rotatable axle for rotating the drums and for swinging the pivoted rake-sections forwardly and inwardly.

7. A machine-frame, a rotatable axle mounted in the machine-frame, traction-wheels on the axle, two fixed rake-sections mounted on the machine-frame spaced apart and arranged across the path of travel of the machine-frame, two pivoted rake-sections arranged for movement from positions adjacent to the fixed rake-sections forwardly and inwardly, two drums rotatably mounted on the machine-frame, cables wound upon said drums and attached to the pivoted rake-sections, and means actuated by the rotatable axle for rotating the drums and for swinging the pivoted rake-sections forwardly and inwardly, said means automatically releasing the pivoted rake-sections when at their inward limit of movement.

8. A machine-frame, a rotatable axle mounted in the machine-frame, traction-wheels on the axle, two fixed rake-sections mounted on the machine-frame spaced apart and arranged across the path of travel of the machine-frame, two pivoted rake-sections arranged for movement from positions adjacent to the fixed rake-sections forwardly and inwardly, two drums rotatably mounted on the machine-frame, cables wound upon said drums, and attached to the pivoted rake-sections, and means actuated by the rotatable axle for rotating the drums and for swinging the pivoted rake-sections forwardly and inwardly, said means automatically releasing the pivoted rake-sections when at their inward limit of movement, and spring-actuated means for returning the pivoted rake-sections.

9. A machine-frame, a rotatable axle mounted therein, ratchet-wheels fixed to the axle, traction-wheels rotatable on the axle, spring-actuated pawls carried by the traction-wheels to engage the ratchet-wheels, a mutilated gear-wheel fixed to the axle, a shaft mounted in the machine-frame, a mutilated gear-wheel fixed to the shaft to mesh with the other gear-wheel, two drums fixed to the shaft, two fixed rake-sections mounted on the machine-frame, and extended across the path of travel of the machine-frame, two rake-sections pivoted to the inner ends of the fixed rake-sections, and cables fixed to the said drums and to the pivoted rake-sections.

10. A machine-frame, a rotatable axle mounted therein, ratchet-wheels fixed to the axle, traction-wheels rotatable on the axle, spring-actuated pawls carried by the traction-wheels to engage the ratchet-wheels, a mutilated gear-wheel fixed to the axle, a shaft mounted in the machine-frame, a mutilated gear-wheel fixed to the shaft to mesh with the other gear-wheel, two drums fixed to the shaft, two fixed rake-sections mounted on the machine-frame, and extended across the path of travel of the machine-frame, two rake-sections pivoted to the inner ends of the fixed rake-sections, cables fixed to the said drums, and to the pivoted rake-sections, a rock-shaft mounted in the machine-frame, an arm fixed to the rock-shaft, a pin carried by the mutilated gear on the axle to engage said arm, two arms fixed to the end of the rock-shaft, contractible springs fixed to said arms, and connected to the pivoted rake-sections for the purposes stated.

11. In a machine of the class described, a bar supported in position across the path of travel of the machine, an arm parallel with the bar supported in front of it, and rake-teeth fixed at one end on top of the bar projecting forwardly through said arm and then downwardly and forwardly, for the purposes stated.

12. In a machine of the class described, a stationary arm standing across the path of travel of the machine, an arm pivoted above the stationary arm, a rod on top of the pivoted arm, and spring rake-teeth wound upon the rod with one end of each tooth secured to the pivoted arm and the other end normally held in a downwardly-inclined position by its resiliency, the said teeth arranged to be moved vertically, by engagement with the said stationary arm, above the surface on which the machine rests.

13. In a machine of the class described, a fixed bar extending across the path of travel of the machine, an arm in front of the fixed bar, rake-teeth attached to the fixed bar extending through the arm and downwardly, an arm pivotally mounted near one end of the fixed bar, a rod on top of the arm, a number of spring rake-teeth coiled upon the rod, each having one end fixed to the arm and the other end projecting forwardly and downwardly, said teeth on the arm arranged with the outer tooth beyond the end of the fixed bar and the rest of the teeth engaged and elevated by the arm in front of the bar, when the pivoted arm is in position above the fixed bar, said teeth on the pivoted bar moved downwardly in front of the teeth on the fixed bar, when the pivoted arm is swung forwardly.

14. In a machine of the class described the combination of a fixed arm extending across the path of travel of the machine, rake-teeth projecting downwardly from the fixed arm, a pivoted arm mounted for movement a slight distance in the rear of the fixed arm and spring-teeth carried by the pivoted arm, said teeth elevated by the fixed arm when the pivoted arm is at its rearward limit of movement, said spring-teeth moved downward in front of the teeth on the fixed arm when the pivoted arm swings forward.

15. In a machine of the class described, the combination of a fixed arm extending across the path of travel of the machine, rake-teeth projecting downwardly from the fixed arm, a pivoted arm mounted for movement a slight distance in the rear of the fixed arm and spring-teeth carried by the pivoted arm, said teeth elevated by the fixed arm, when the pivoted arm is at its rearward limit of movement, said spring-teeth moved downward in front of the teeth on the fixed arm when the pivoted arm swings forward, and guides on the pivoted arm limiting the movement of the spring-teeth.

DAVID S. HARROLD.

Witnesses:
RICHARD L. SAMUEL,
G. BECKWITH.