

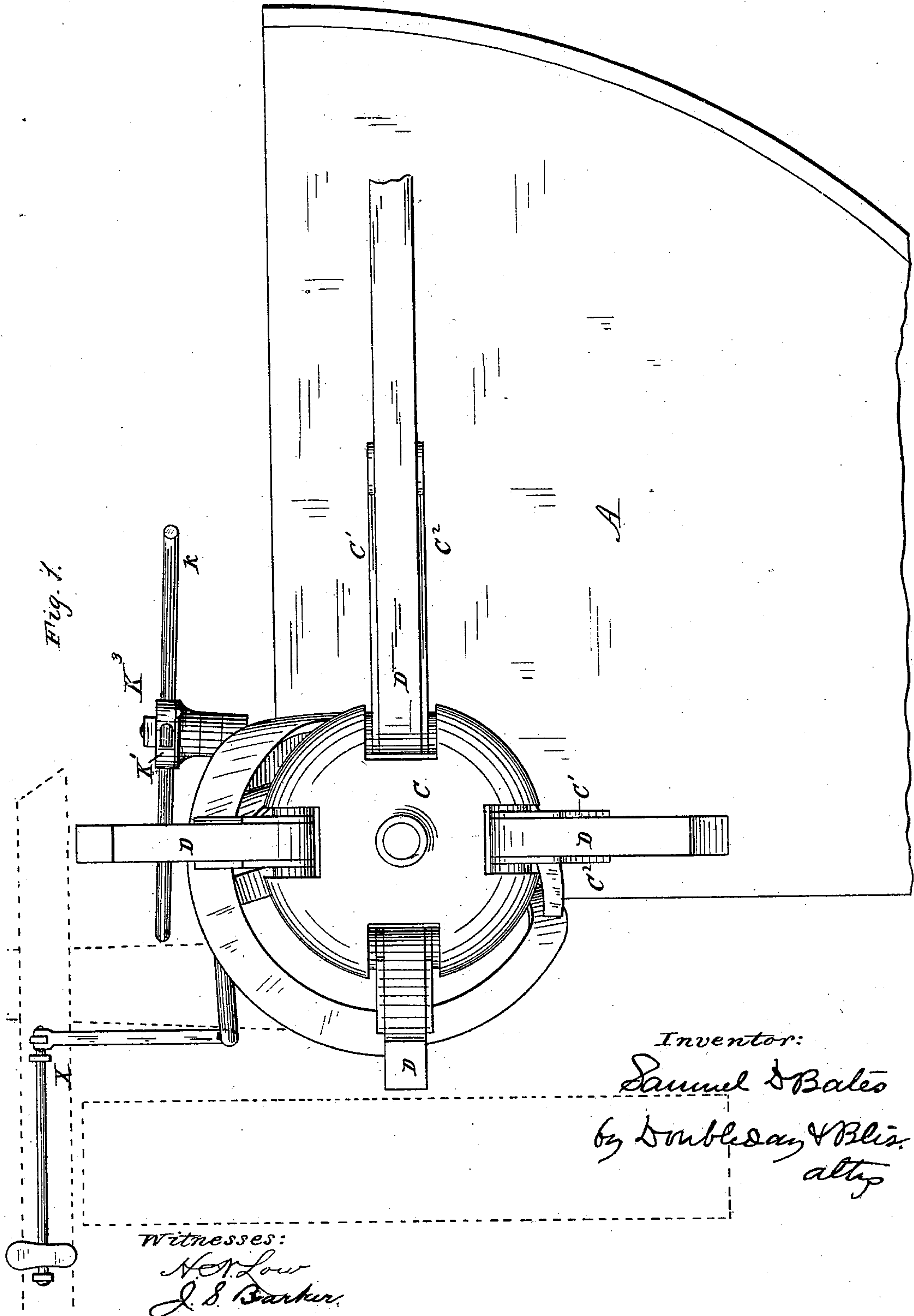
(No Model.)

2 Sheets—Sheet 1.

S. D. BATES.
Harvester Rake.

No. 236,533.

Patented Jan. 11, 1881.



2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

SAMUEL D. BATES, OF LEWISBURG, PENNSYLVANIA.

HARVESTER-RAKE.

SPECIFICATION forming part of Letters Patent No. 236,533, dated January 11, 1881.

Application filed October 19, 1880. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL D. BATES, a citizen of the United States, residing at Lewisburg, in the county of Union and State of Pennsylvania, have invented certain new and useful Improvements in Harvesters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a top-plan view of so much of a harvester as is necessary to illustrate my invention. Fig. 2 is a top plan of the camways. Fig. 3 is a bottom view of the devices for regulating the rake-arms. Fig. 4 is a side elevation of the raking apparatus. Fig. 5 is a side elevation of a three-armed counter-wheel or star-wheel.

The draft devices, the driving-gear, the main frame, the cutting apparatus, and the gearing which operates the rakes may be of any preferred character, they forming no essential part of the improvements to be herein described, and therefore they need not be shown or described in detail.

In the accompanying drawings, A represents a harvester-platform of quadrant shape, and of substantially the ordinary construction. Upon the inner forward corner of the platform, or upon the main frame which connects said platform to the draft devices, is mounted the raking apparatus. Said apparatus is supported upon a tubular standard, B. In this standard is journaled a vertical shaft, B', carrying at its upper end a rake-head, C, and at or near its lower end a gear-wheel, C⁴.

The rake-arms D are respectively hinged to the rotating head C. They are formed of bars pivoted and clamped between plates C' C², which latter are provided with slots at their outer ends for adjusting the bars in proper position. At their inner ends the rake-arms carry stud-shafts c and rollers c'. The plate C² is extended laterally for a purpose to be hereinafter described.

Camways for raising and lowering the rake-arms are supported upon the stationary tubu-

lar standard B. The camway which serves to guide the arms when they are to operate as rakes to sweep the grain from the platform consists of an upper part, E, describing substantially an arc of a circle, and a lower part, E². The way which serves to guide the arms when they operate as reels consists of the part E, a pivoted cam or track, E', a switch or cam-gate, F, and a short stationary cam, F⁴, situated between the pivoted cam E' and the switch F.

The switch is formed in the shape of a bell-crank lever, with the pivot f on its under side mounted within a tubular bearing depending from the camway-support. The pivot e of the cam or track E' is mounted in a tubular bearing, e'. The pivot f of the switch F carries an eye, f', secured directly to the pivot f, or to a plate or collar, f², attached to said pivot. f³ is a coiled spring, one end of which is connected to the pivot f of the switch by means of the eye f'. The other end of the spring is attached to some fixed part of the mechanism. This spring f³ is arranged to always tend to force the forward arm, F', of the switch outwardly, and when said arm is at its outermost position the inner or rear arm, F², of the switch is situated across the inner camway.

G represents a lever pivoted beneath the camway to a hanger or pendent support.

G' is a spring of coiled wire, rubber, or other suitable material, and arranged to tend to force the outer or forward end of the lever G upwardly.

H' is a slotted guide-plate, which prevents lateral strain or displacement of the forward end of the lever G.

g is a latch-arm carried by lever G, and adapted to be pressed upwardly by the spring G' through an aperture in the camway.

If the switch F be situated in the position shown in full lines in Fig. 2—that is to say, with the forward arm, F', turned toward the shaft B'—and the latch-arm g be thrust upwardly, said arm will lock the switch in the position described; and it will be seen that if the arm g be withdrawn below the camway the spring f³ will immediately throw the forward arm, F', of the switch outwardly into the position shown in dotted lines in Fig. 2.

If a roller, c', passes behind the forward part, F', of the switch F, it will take a course nearer

to the central shaft, B', than if it be thrown outward by the switch, and the inner path thus taken by the roller insures that the rake-arm shall pass close to the platform and over the whole surface thereof. Therefore an arm can be caused to rake the platform by simply placing the forward part, F', of the switch so that the roller shall pass behind it. After a roller has passed behind the forward part, F', of the switch, it strikes against the rear part, F², and swings the forward part, F', in again, the last said part depressing the latch-arm *g* of lever G and locking the switch again in a closed position, to be ready for the next arm that is to operate as a reel.

In order to rake the platform at regular intervals of time, I combine with the latch *g* the following devices, whereby the switch is automatically released:

I represents a shaft, journaled at one end in the hanger H' and at or near the other end in the hanger H². K is a sliding switch-cam, supported upon the shaft I and carrying the laterally-projecting lug I'. The shaft I is squared to engage with the sliding cam, though said parts may be engaged by means of a feather or spline. If the shaft I be rotated, it carries with it the switch-cam K and the lug I'. When the lug I' is in its normal position it is so situated that the rotation of the shaft will cause it (the lug) to engage with and depress the outer end of the latch-lever G, such engagement and depression occurring at each revolution of the cam K and shaft I. Therefore this mechanism can be employed to cause the sweeping of a gavel from the platform at each revolution of the shaft I.

Under some circumstances it is necessary to rake the grain from the platform more frequently than under others.

When it is desired that every fourth arm shall rake the platform I employ a counter-wheel or star-wheel, K³, having four radial arms projecting from a central hub, K'. This wheel is mounted upon the shaft I, it being keyed to or clamped against a boss, L, attached to the shaft. The arms *k* project sufficiently far from the center of the wheel to be struck by the plates C² (carried by the rake-arms) when they are traversing the forward part of their path. Each rake-arm imparts one-fourth of a revolution to the shaft I, and therefore one arm of each successive four will cause the lug I' to depress the lever G and permit the spring *f*³ to throw the switch open, so that said rake-arm shall pass behind the switch and operate as a rake. If the conditions are such that the platform should be raked more frequently, the wheel K³ is removed and one similar to that shown at L', Fig. 5, is used, it having a smaller number of radial arms, (the one shown in the drawings having three,) and it will be seen that the passage of three of the rake-arms will cause a revolution of shaft I and the release of the switch, as above described, and consequently one out of each successive three of the arms will operate as a rake

upon the platform. Under conditions requiring a less frequent sweeping of the platform a wheel having five or more radial arms may be used, which will result in causing the switch F to remain closed a longer time.

M is a forked lever engaging with the sliding switch-cam K by means of a groove. The switch-cam is formed with a cylindrical part, *k*³, an inclined or conical part, *k*', and a larger cylindrical portion, *k*². If the cam be shifted along the shaft toward the hanger H', the conical part *k*' bears downwardly upon the end of the lever G and withdraws the latch-arm *g*, and thus can be caused to release the switch; and if it be pushed far enough in the same direction to bring the larger cylindrical portion *k*² of the cam over the end of the lever, the latch-arm *g* will be withheld, although the shaft continues to revolve. The lever G has an arm, *g*², extending upwardly from its outer end, so that an unobstructed space, *g*³, is left on the inside of said upwardly-projecting arm for the free revolution of the lug I'. If the lever be made of a wide piece, a space for such free revolution may be formed by recessing or cutting away the upper side of the lever G. If the switch-cam K be moved along the shaft toward the hanger H², the lug I' can be prevented from engaging with the lever G, and the shaft I will continue to revolve without tripping the latch-arm *g*.

The switch-cam is moved along the shaft I by the following devices:

N represents a sliding rod, arranged to reciprocate in ways provided for it in the down-hanging brackets H' H². The forked lever M is secured to this sliding rod.

n n' are coiled springs around the rod N, arranged to bear one against the forked lever M and the bracket H', and the other against the forked lever and the bracket H². The springs are so adjusted that they shall equilibrate each other when the trip-lug I' is in the plane of the end of lever G, this being the normal position of said lug.

O is a rocking lever, having its axial part mounted in brackets *o o'* attached to the rake-support. One end of this rocking lever is connected to the forked lever M by a link, P, and the other end is attached to an operating mechanism, X, extending to within convenient reach of the driver.

If the end *o'* of the rocking lever O be thrust backward, the switch-cam K will also be moved backward on the shaft I, and it can be moved thus far enough to withdraw the latch-arm *g* and permit the switch F to fly open. In this way any arm can be caused to act as a rake which would otherwise operate as a reel at that revolution. If the end *o'* of the lever O be pulled forward, the switch-cam K can be moved forward on shaft I so that the lug I' shall not engage with the lever G. This prevents the withdrawal of the latch-arm *g* and the release of the switch F. Thus any arm can be caused to act as a reel which would otherwise operate as a rake. So long as the

switch-cam K is held by the lever O out of engagement with the lever G, the counter-wheel or star-wheel and the shaft I will continue to revolve without affecting the switch, and any
 5 number of arms may be compelled to act consecutively as reels. If no counter-wheel or star-wheel be employed, the shaft I will remain stationary, and the switch F can be controlled by means of the lever O, and any arm
 10 can be compelled at will to act as a rake. After the switch-cam K has been thrust forward by the lever O it is returned to its normal position by means of the spring n' , and after it has been pushed backward it is returned by
 15 spring n .

What I claim is—

1. The combination, with the rake-arms and the camways, of the following elements, namely: the switch for determining the path of the
 20 arms, the latch g for said switch, the sliding switch-cam K, which is constructed to open said latch both while rotating and while sliding, and mechanism which moves said cam rectilinearly on lines parallel to its axis of rotation.
 25

2. The combination, with the rake-arms and the camways, of the following elements, viz: a switch which controls the path of said arms, the latch g for holding said switch, the shaft
 30 I, the star-wheel on said shaft, and the trip-cam K, also on said shaft, and arranged to slide independently of the star-wheel, whereby said cam can, while rotating, be moved entirely out of engagement with the latch g without altering the positions of any of the other
 35 parts.

3. The combination, with the rake-arms and the camways, of the following elements, namely: the switch F, the latch g , the tripping-lever G, permanently connected with said latch,
 40 the trip-cam K, disconnected from the lever G and arranged to be moved into and out of engagement with said lever without stopping the rotation of the trip-cam.

4. The combination of the sliding trip-cam K, having the eccentric lug I' , with the latch
 45 g and the lever G, having the upwardly-extending arm g^2 , situated as described, to permit the lug I' to revolve between the arm g^2

and the latch g without engaging with said arm g^2 . 50

5. The combination, with the revolving arms and the camways, of the following elements, namely: the switch F, the latch g , the sliding and rotating trip-cam K, provided with the
 55 eccentric lug I' , and the coiled springs n n' , which hold the trip-cam in position to intermittently operate said latch.

6. The combination of the switch F, the latch g , the lever G, the sliding trip-cam K, 60 having the thinner cylindrical part k^3 , the thicker cylindrical part k^2 , and the intermediate conical part k' , substantially as set forth.

7. The combination of the switch F, the latch g , the shaft I, the sliding trip-cam K, 65 constructed to intermittently open said latch when in one position, and also to hold the latch permanently open when in another position, the levers O and M, whereby the driver can throw the cam into the last said position, and
 70 the spring n , which returns the cam into the first of said positions, substantially as set forth.

8. The combination of the switch F, the latch g , the shaft I, the sliding trip-cam K, 75 constructed to open said latch intermittently while revolving in one position, and arranged to be moved on said shaft into another position, to rotate without engagement with said latch, the lever O, whereby the operator can
 80 throw the cam into the last of said positions, and the spring n' , which returns the cam into the first of said positions, substantially as set forth.

9. The combination, with the rake-arms and 85 the camways, of the following elements, namely: the switch F, the latch g , the shaft I, the trip-cam K, which is rotated by said shaft and slides longitudinally thereon, and mechanism, constructed and arranged as set forth, 90 to slide the trip-cam in both directions alternately along said shaft.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL D. BATES.

Witnesses:

J. W. ZELLER,

GEO. D. WOODS.