2 Sheets—Sheet 1.

O. COOLEY.

HARVESTER-RAKE.

No. 186,413. Patented Jan. 23, 1877.

Fig 1.

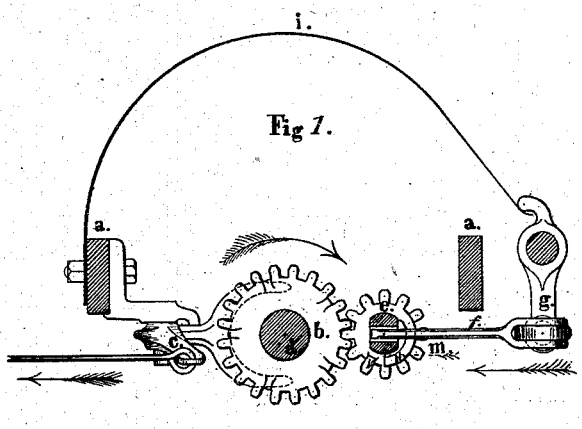


Fig 5.

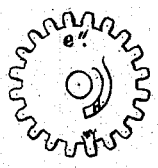


Fig 2.

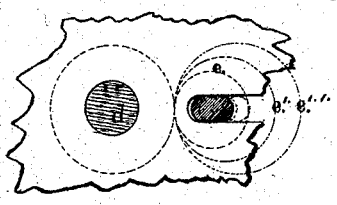


Fig 6.

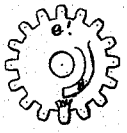


Fig 3.

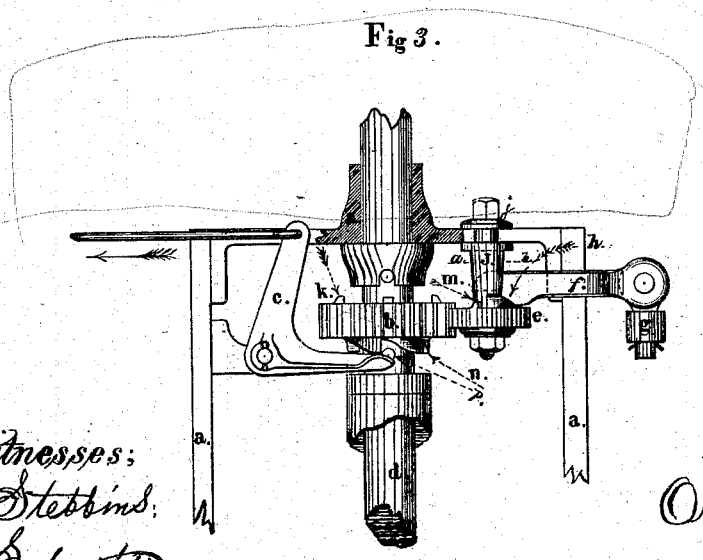
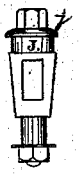


Fig 4.



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2 Sheets—Sheet 2.

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HARVESTER-RAKE.

No. 186,413. Patented Jan. 23, 1877.

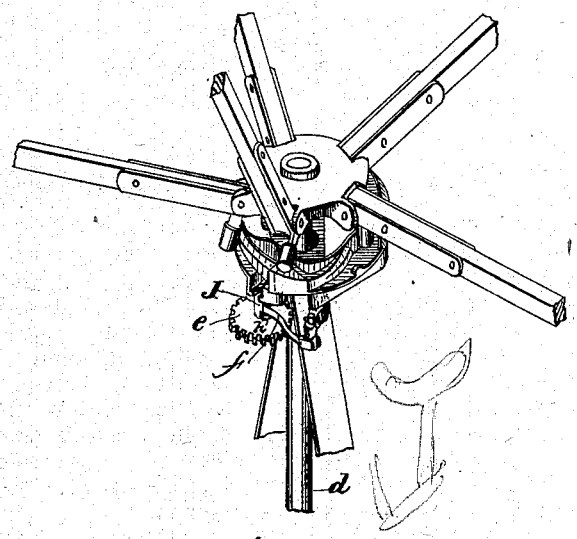

Fig. 7.

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UNITED STATES PATENT OFFICE.

ORVILLE COOLEY, OF BROCKPORT, NEW YORK, ASSIGNOR TO JOHNSTON HARVESTER COMPANY, OF SAME PLACE.

IMPROVEMENT IN HARVESTER-RAKES.

Specification forming part of Letters Patent No. **186,413**, dated January 23, 1877; application filed December 18, 1875.

To all whom it may concern:

Be it known that I, ORVILLE COOLEY, of Brockport, in the county of Monroe and State of New York, have invented a new and Improved Gear-Trip for Harvesters; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top plan view of the gear-wheels, showing also their connected parts in plan and section. Fig. 2 is a diagram, showing the positions of the wheels under their different adjustments. Fig. 3 is a side elevation, showing the general arrangement of the gear-wheels, together with the tripping lever and latch, with the gear-wheel *e* arranged to operate every third rake. Fig. 4 is an elevation of the adjustable gear-wheel standard, which serves also as a latch-guide. Fig. 5 is a plan of the gear-wheel arranged to operate every fifth rake; and Fig. 6 is a plan of the gear-wheel arranged to operate every fourth rake.

Similar letters of reference in the accompanying drawings denote the same parts.

The object of this invention is to obtain an improved automatic adjustable gear-trip for opening and closing the cam-gates of harvester-rakes, and thereby regulating at will the size of the gavel to be formed.

To this end the invention consists in the devices and combinations which I will now proceed to describe.

In the drawings, *a a* represent the standards which support the cam plate or head which guides the movements of the rakes, and *d* represents the vertical revolving rake-shaft. The rakes, cam-plate, gate, and spring for opening the gate are of the usual construction, and need no special description. The spring, however, may be of the form shown at *i*, and arranged to operate upon a gate-lever, *g*, fixed rigidly to the pivot of the gate, below the cam-plate, so as to open the gate whenever the latter is unlatched. On the shaft *d* is placed a loose gear-wheel, *b*, having, say, twenty cog-teeth, more or less, or about four cog-teeth for each rake. This wheel is provided with ratchet-teeth *n* on its under side, which engage with a pin, *p*, projecting out from the shaft, whereby the wheel is carried around with the revolutions of the shaft in the normal direction, but is not rotated when the movement of the shaft is reversed. Two forked arms of a bell-crank lever, *c*, extend under the wheel, and the lever is connected to a hand or foot lever near the driver's seat, by which he can, at will, raise the gear-wheel out of engagement with the driving-pin *p*, and thus prevent the operation of the rakes while turning the machine, or at any other time when desirable.

To prevent any possible movement of the wheel when thus raised, it may, if preferred, be provided with lugs *k* on its upper side, which will catch against any suitable stop when the wheel is raised, and thus hold it from any accidental rotation. At one side of this gear-wheel I arrange a second gear-wheel, *e*, adapted to be driven by it. This second gear-wheel is supported by a slotted stud, J, which, being held in a slot in the supporting-plate above, is capable of being adjusted toward or from the shaft *d*, and of being clamped firmly in any desired position by a clamping-nut, *j*. The slot in the supporting-plate is clearly represented in Fig. 2, and the mode of securing the stud therein will be easily understood from Fig. 3. On the upper side of the wheel *e* is a cam-incline, H, terminating in a square shoulder. A latch-arm, *f*, articulated to the outer end of the gate-lever *g*, extends into the slot in the stud J, the lower side of the latch-arm resting on, or coming nearly down to, the upper face of the wheel, so that, as the latter revolves, the incline H will raise the end of the latch and drop it once during each revolution of the wheel *e*.

The extreme end of the latch is provided with a notch or shoulder, (seen in dotted lines in Fig. 3,) which engages against the lower corner or edge of the slot when the latch is down, and thus holds the gate closed, but which clears said lower edge when the incline H raises the latch, thus leaving the spring *i* free to open the gate.

When the gate is closed by the further movement of the rake-arm, its closing movement draws out the latch from the slot until

the shoulder drops over the lower edge of the slot, when the latch falls and again locks the gate closed, as before. As the latch rests upon the cam or lower edge of the slot, and is held only by its own weight, it is obvious that it may be lifted at any time, by means independent of the gears, and at the will of the driver, as by a simple cord attached thereto.

The operation is entirely automatic, and the parts are extremely simple, and not liable to get out of order.

Assuming the wheel *b* to possess twenty cog-teeth, and the machine to carry five rakes, it is obvious that there are four cogs on the driving-wheel *b* to every rake. If, then, the driven wheel *e* have twelve cogs, as shown in Fig. 1, it will perform an entire revolution while any three rakes are passing a given point, and its incline H will therefore operate every third rake. It will, then, be obvious that, by substituting for the wheel *e* a larger wheel, *e'*, having sixteen cogs, it will operate every fourth rake, and by substituting a still larger wheel, *e''*, having twenty cogs, it will operate every fifth rake, and that the number of rakes that may be operated can thus be varied, as may be desired, according to the condition of the grain. Each machine should be provided with a full set of these wheels, for the purpose of so adjusting the operation of the rakes. As the larger wheels are applied to the stud J, the latter must be adjusted farther away from the driving-shaft *d*, as clearly shown in Fig. 4.

Having thus described my invention, I claim as new—

1. The combination, with the cam-gate of a harvester, the latch *f*, slotted stud J, and wheel *e e'*, or *e''*, having an incline or lifting-cam on its upper face, substantially as and for the purposes set forth.

2. In combination with the lifting-wheel *e*, the driving-wheel *b*, mounted loosely on the rake-shaft, and driven by a ratchet or clutch, substantially as described.

3. The forked lever *c*, in combination with the rake-shaft *d* and driving wheel *b*, clutch and gear *e*, operating the latch of a harvester-rake, substantially as described.

4. The stud J, adjustable toward and from the rock-shaft *d*, in combination with the driving gear-wheel *b*, and adapted to receive any one of the series of different-sized driven wheels *e e' e''*, &c., for the purposes herein set forth.

5. In combination with the cam-gate of a harvester, held open by a spring, and the cam-plate to which it is applied, and rake-arms moving over it, a gate-latch and tripping mechanism, wholly under the control of the driver and independent of the rake-arms, substantially as described.

6. In combination with a spring-gate, cam-plate, and rake-arms, a gate-lever, gate-latch, and adjustable tripping mechanism, the said tripping mechanism being under the control of the driver and independent of the rake-arms, substantially as described.

7. The combination of spring-gate, cam-plate, rake-arms, gate-lever, gate-latch, and tripping mechanism for automatic operation, and the clutch and rod for operation at will by the driver.

8. In a harvester, the combination of a cam-plate, rake-track, a gate, operated by a spring and lever for the purpose of guiding the proper reel-arm into position for raking off, a latch normally holding the lever and gate in position for reeling, but unlatching for the purpose of raking off, said latch being capable of adjustment to any one of a set of wheels, which are provided with a cam for unlatching the gate-lever, and which receive motion from the rake or reel shaft, whereby, by putting the latch in connection with different wheels of the differential series, the gate will be opened at greater or less intervals during the revolution of the rake-shaft, and the raking-off be effected at variable intervals.

9. In a self raking harvester, the combination of the rake arms, cam-track, gate, and gate-lever, with a latch, which positively locks the gate, and is capable of being disengaged both by the rotation of gear-wheels driven from the rake-shaft and independently thereof, substantially as described.

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