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W. N. Whiteley, Jr.

Harvester Rake.

No. 49669 Patented Aug. 29, 1865.

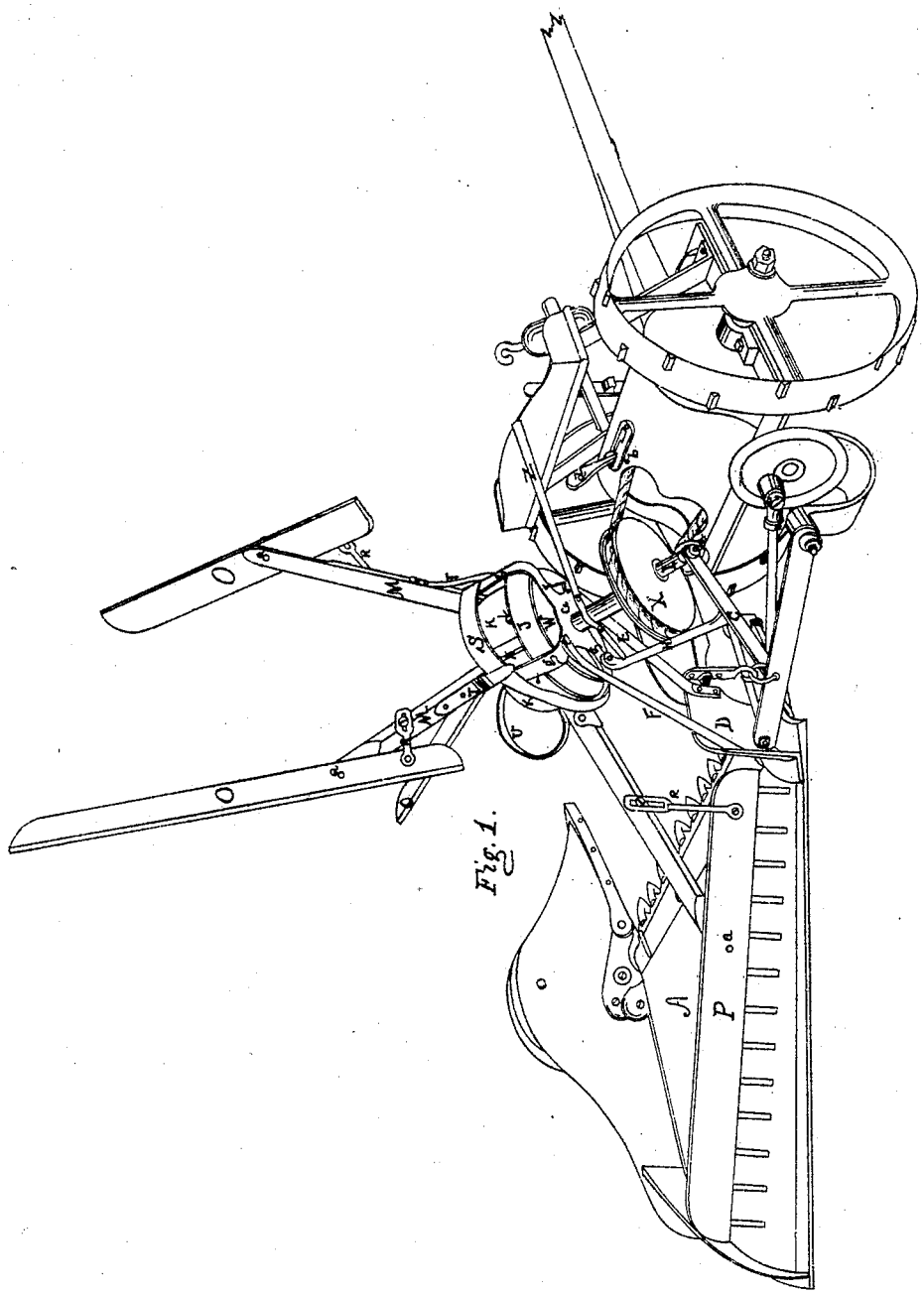

Fig. 1.

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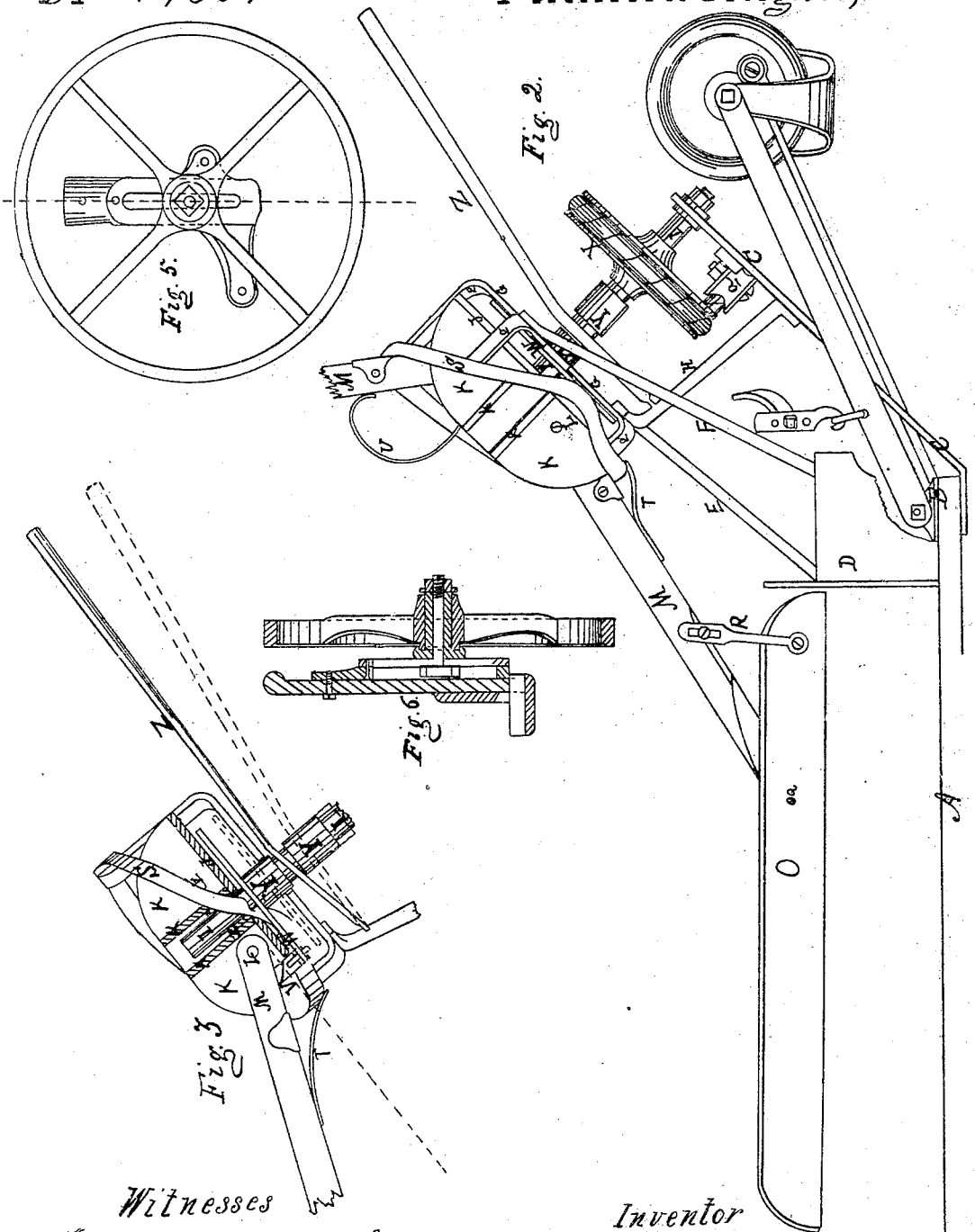

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Fig. 4.

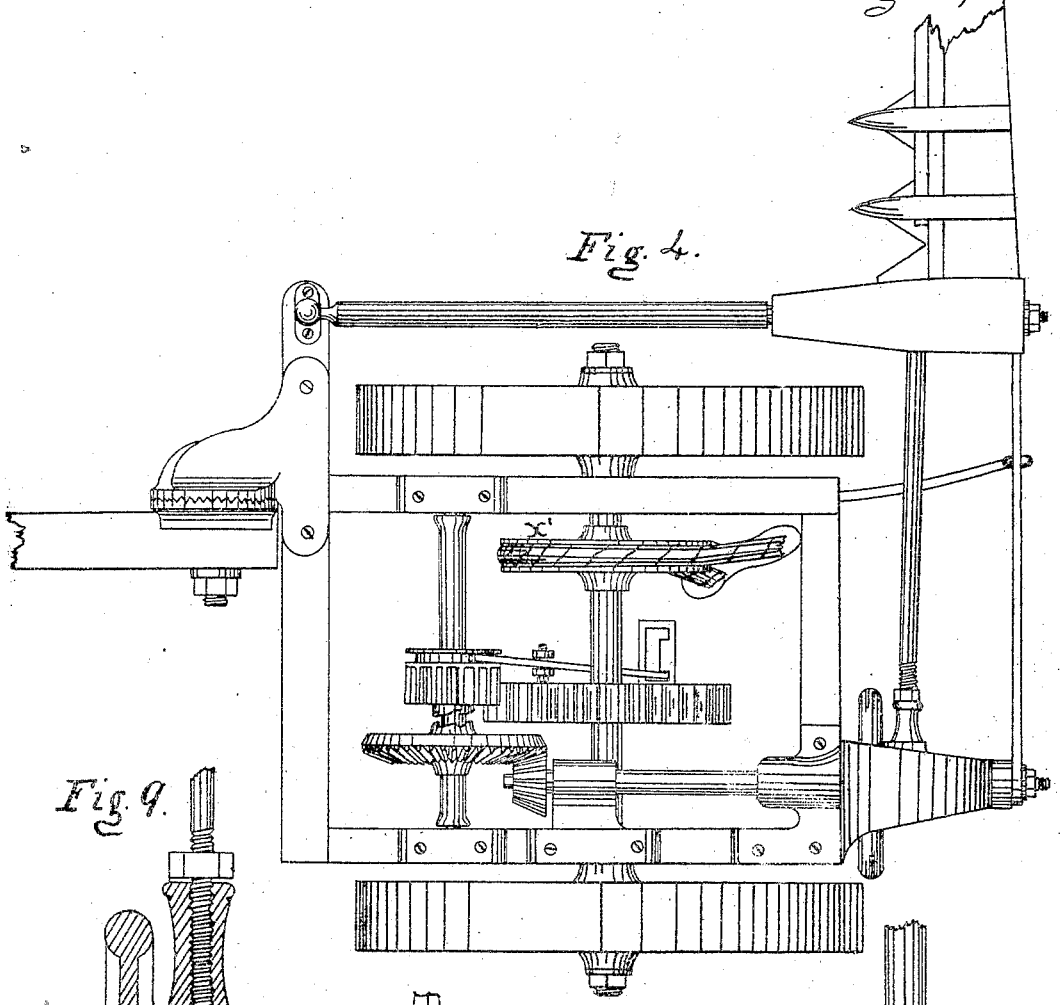


Fig. 9.

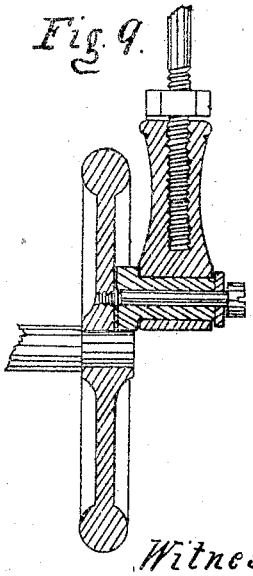


Fig. 8.

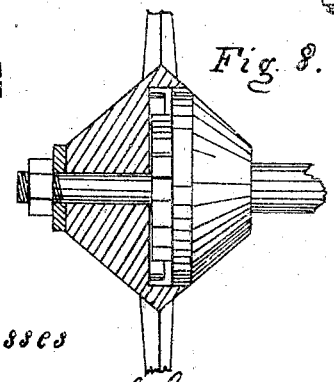
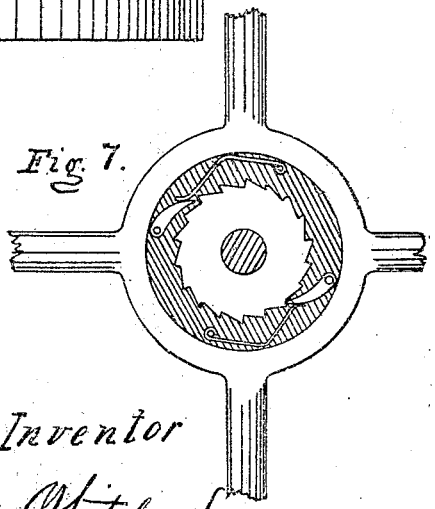


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM N. WHITELEY, JR., OF SPRINGFIELD, OHIO.

IMPROVEMENT IN AUTOMATIC RAKES FOR HARVESTERS.

Specification forming part of Letters Patent No. **49,669**, dated August 29, 1865.

To all whom it may concern:

Be it known that I, WILLIAM N. WHITELEY, Jr., of Springfield, in the county of Clarke and State of Ohio, have invented a new and Improved Automatic Rake for Harvesting-Machines; 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, in which—

Figure 1 is a perspective view of a reaping-machine with my invention attached. Fig. 2 is a rear elevation of my improvement. Fig. 3 is a vertical longitudinal section of the head of the reel-shaft. Fig. 4 is a bottom plan of the mechanism of the machine.

My invention belongs to that class of overhung reels which have a single inclined shaft and a stationary camway to guide the wings of the reels in their revolution; and it consists, mainly, in so constructing the parts composing said reel as to allow one of the wings of the same to be raised and lowered in its orbit so as to sweep near to or far from the platform at pleasure; also, in the manner of bracing and supporting the bearings of the reel-shaft, in the manner of raising and lowering the rake, and in the manner of holding the rake to the platform while removing the gavel therefrom.

That others may understand the construction and operation of my invention, I will describe it particularly.

A is the platform of the machine, for a detailed description of which, exclusive of the reel and rake, reference is made to the specification in my application for Letters Patent (division A) filed at even date herewith.

B is the inner shoe of the cutting apparatus, to the under side of which is firmly secured the arm C, a few inches of the lower end of which is so bent as to lie in contact with the under side of the shoe, as aforesaid, while the arm itself projects laterally from the shoe in a line with the sickle-bar, but inclined upward at an angle of about forty-five degrees to the level of the cutting apparatus.

Around the curved inner edge of the platform is erected a stout metallic flange or side board, D, which is firmly secured to the platform and inner shoe, B. To this flange D the braces E and F are bolted, one at either end. They project upward and inward at about the same angle as the arm C.

To the upper ends of the braces E and F the frame G is secured. Another brace, H, connects the frame G to the arm C, thus increasing the stiffness and strength of the whole. The frame G consists in a central disk with radial arms *g g g g* projecting from its edge. In the center of the said disk is a suitable aperture for a bearing for the upper end of the reel-shaft I, which has its lower bearing at the upper end of the arm C, Figs. 1 and 2.

At the head or upper end of the reel-shaft I is the disk J, which has upon its upper side two sets of vertical parallel flanges or plates, K K, each plate being semi-elliptical in form, the straight side of each being upon the surface of the disk J. The plates of each set, respectively, are a few inches asunder, just far enough to accommodate the thickness of the reel and rake staves between them. The two sets are placed at right angles to each other, and thus when the staves M of the reel-wings and the rake are inserted in their proper places and secured by the pivot-bolts L they project radially from the head J, and may move vertically on their pivots L and between the plates K K. For convenient removal the head J is secured to the top of the reel-shaft I by a pin or key, N, driven through tooth-shaft I and flanges K K. (See Fig. 3.)

That wing of the reel which serves also as a rake has a somewhat longer staff than the other wings, so that it sweeps nearer the platform than they do. While the wings of the reel pass some distance above the platform, as O in Fig. 2, the rake-wing P, Fig. 1, with its rake-teeth, sweeps in actual contact with the platform. The wings of the reel and the rake are not rigidly attached to their staves, but are pivoted to them by a screw, and may be moved nearer to or farther from the end at pleasure, (see Q, Fig. 3,) and an adjustment that secures parallelism between the edges of the wings and the platform is secured to the link R, with its slotted end and set-screw.

If the wings of the reel rotated in a plane at right-angles to the axis of the reel-shaft, so much space would be occupied in their revolution as to render them very inconvenient and objectionable. The cam-rail S is therefore placed upon the upturned ends of the arms *g*. This cam-rail is so depressed on the side which is lowest or toward the platform and is so shaped that as the staff of the reel or rake passes over that part of it it is brought near to the platform and is caused to sweep in a line parallel to the platform. As the reel or rake leaves

the platform the cam suddenly rises, and during that part of the orbit which is opposite to the platform they are nearly vertical, and sweep through the air above the head of the driver or attendant.

In order to keep the staves of the reel-wings always in contact with the cam-rail the springs T T are placed on the under sides of said staves, their lower or free ends pressing upon the lower edge of the cam-rail, which is there rounded and smooth, thus embracing the said rail between the spring and staff and holding them securely in contact. This arrangement, however, is not so applicable to the rake-wing, for it is necessary that the rake be allowed sometimes to rise from the cam-rail during that part of its revolution which is over the platform, as the grain will sometimes be very thin, and not enough be collected during one revolution of the reel to form a sufficient gavel. The attendant will then wish to raise the rake so that it will pass above the cut grain and not sweep it off the platform. In order to allow the rake to be thus raised the spring U is attached to one of the plates K and, curving upward and outward, comes down again upon the upper side of the rake-staff, so that by compressing the said spring the rake may be allowed to rise as high as required.

That the attendant may be enabled thus to raise the rake whenever he desires to do so, the pendent rod V and plate W, with its lever L, are provided. The pendent rod V (see Fig. 3) is pivoted to the lower side of the rake-staff, and has at its lower end a small wheel or roller. It drops through a hole in the plate J, and is so long that when the staff of the reel is at its greatest elevation it still protrudes through and below the lower surface of the plate J. When the rake is sweeping over the lower part of the cam-rail S and over the platform the rod V projects below the plate J farther than at any other time, and it is evident that if now the plate W, Figs. 1, 2, and 3, be brought up close to the under side of the plate J, the rod V, with its small roller, will rest upon it and be pushed up by it, causing the rake to rise from the platform. (See Fig. 3 and the red lines thereon.) The plate W is nearly or quite as large in diameter as the plate J, and is attached to the sleeve Y, which is slipped over the reel-shaft I, and may be raised or lowered by the lever Z, which has its fulcrum-point in the brace H, and thence extends obliquely across the machine to a point within easy reach of the attendant's hand.

The reel and rake are driven by a belt passing over a pulley, X, on the reel-shaft, and thence over the pulley X′ on the main axle. (See Fig. 4.) That a change of respective position between the reel-shaft and pulley X and the main axle and pulley X′, in consequence of undulations of the ground, shall not affect the proper operation of the belt which drives the reel, the adjustable guide-pulley *a* is attached to the arm C and the guide-pin *b* is inserted through the case near the clutch-rod *d*.

Having described the construction of my invention, its operation will be readily understood. When the machine is in motion the reel-shaft I is caused to revolve by the belt over the pulleys X and X′. The reel-wings and the rake-wing necessarily revolve about the axis of I when motion is communicated thereto, but the orbit through which they travel is described on a warped plane, and is not through any considerable portion of it at right angles to the axis of the reel-shaft. The eccentricity of the orbit is such that when the wings are sweeping through that part of their orbit which is farthest from the platform they stand nearly vertical to the ground, while during that part of their orbit which is over the platform they stand parallel to its surface and move in that relation throughout their passage over said platform. When the grain is very thin the time of two or three revolutions of the reel and rake may be required to accumulate a sufficient quantity upon the platform. In that case the attendant will, by means of the lever Z and plate W, cause the rake to sweep over the platform as far removed from it as are the reel-wings, because the plate W, being raised up, receives the rod V, with its wheel, upon its upper surface before the staff of the rake will have reached the lowest point on the cam-rail, and as the plate W has a plane surface the wheel at the bottom of V will run thereon, and the rake be lifted up from the cam-rod during the lowest part of its revolution.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The plate W and lever Z, or an equivalent device, for raising the rake away from the platform, without affecting the height of the wings of the reel, to prevent the removal of the gavel, when desired.

2. The combination of arrangement of the reel-shaft I, plate W, flanges K K, and cam-rail S for the purposes of revolving, guiding, and controlling the action of the combined rake and reel, substantially as set forth and described.

3. In combination with the staves of an upright revolving reel, substantially as described, the spring U, or its equivalent, to hold said staves in contact with the cam rail or guide without causing said contact to be rigid and inflexible, substantially as described.

4. Connecting and sustaining the rake and reel upon the platform A by means of the arm C and the braces E, F, and H, substantially as described.

5. In combination with the rake-staff M, the pendent rod V, substantially as and for the purpose set forth.

6. In combination with the pulley X, the guide-pulley *a* and pin *b*, for the purpose set forth.

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Witnesses:

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GEO. ARTHUR.