M. SMAIL.

Combined Grader and Stalk Cutter.

No. 221,872. Patented Nov. 18, 1879.

Fig. 1.

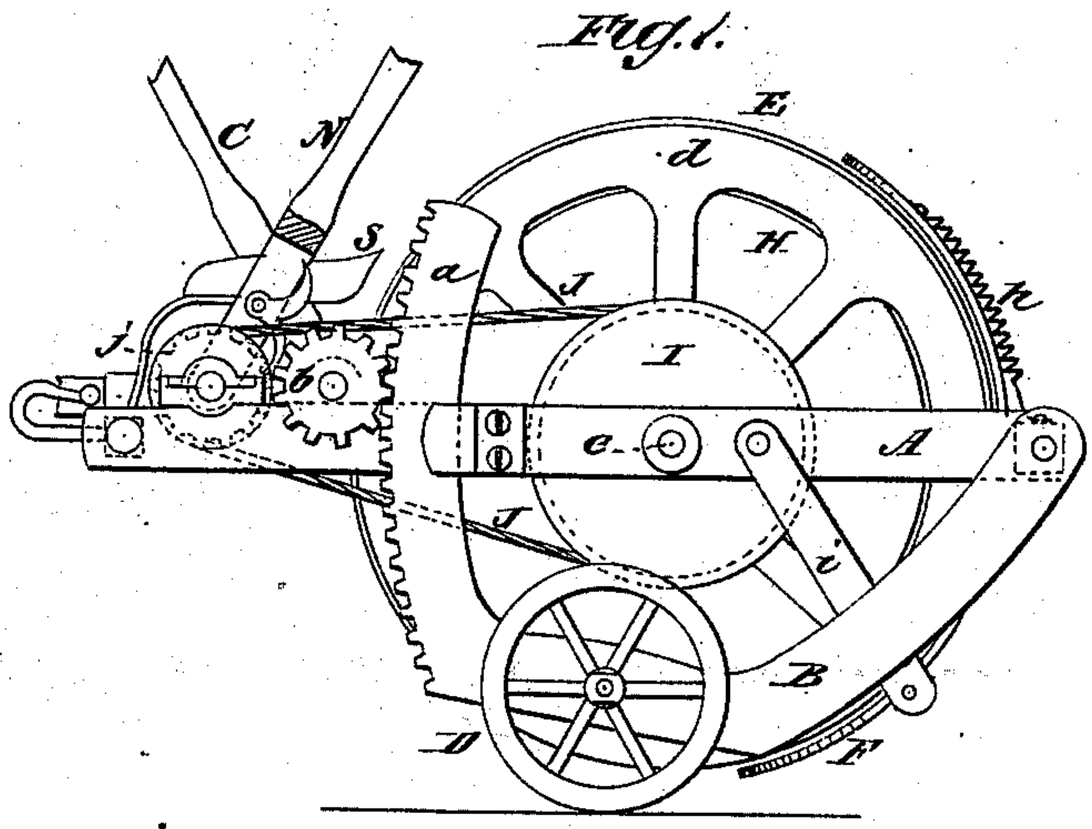


Fig. 2.

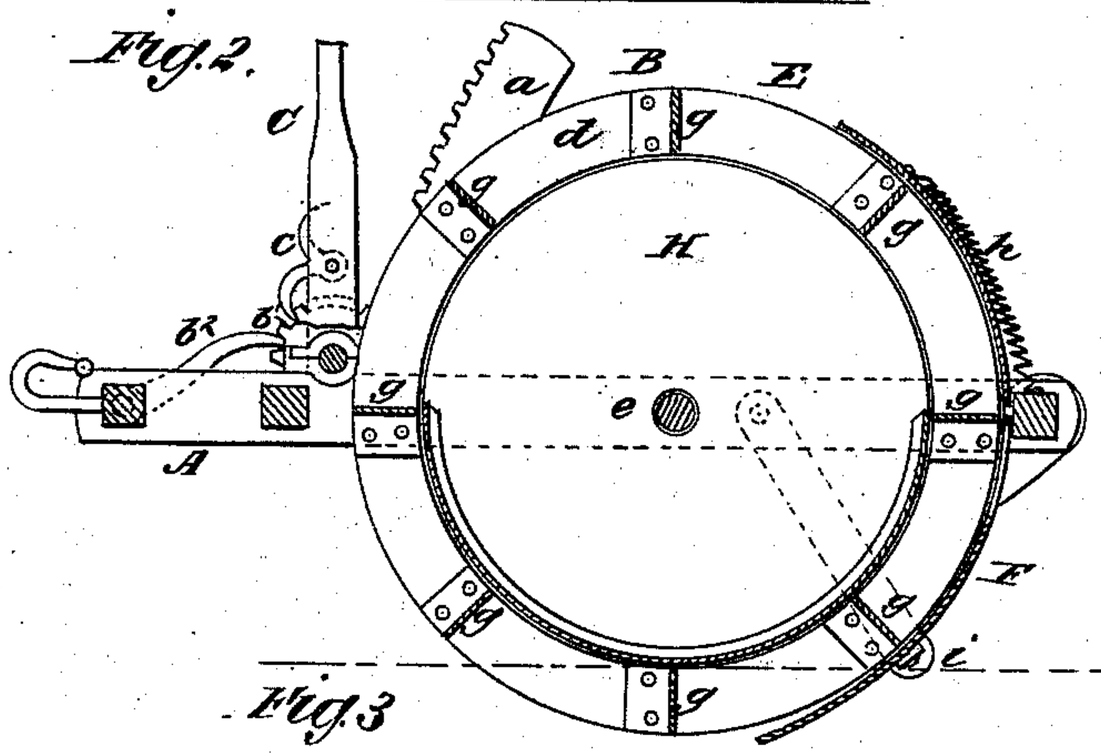


Fig. 3

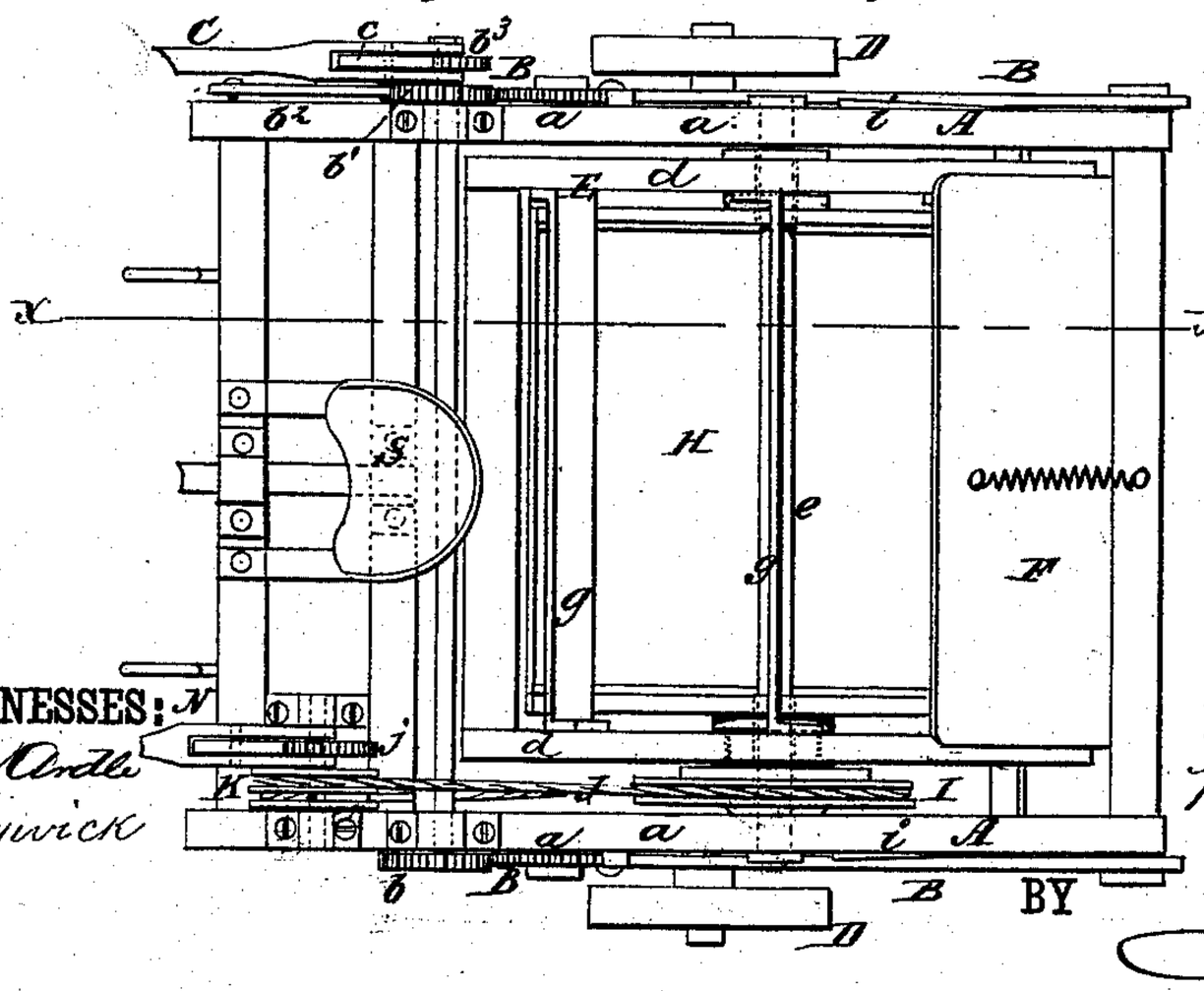
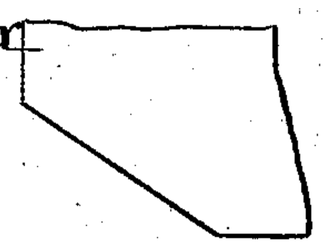


Fig. 4



WITNESSES:

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UNITED STATES PATENT OFFICE.

MARION SMAIL, OF CRAWFORDSVILLE, INDIANA.

IMPROVEMENT IN COMBINED GRADER AND STALK-CUTTER.

Specification forming part of Letters Patent No. **221,872**, dated November 18, 1879; application filed March 24, 1879.

To all whom it may concern:

Be it known that I, MARION SMAIL, of Crawfordsville, in the county of Montgomery and State of Indiana, have invented a new and Improved Combined Grader and Stalk-Cutter, of which the following is a specification.

The invention consists in combining a drum and loose semi-cylinder with mechanism substantially as hereinafter described.

In the annexed drawings, Figure 1 is an elevation of one side of the machine, showing the digging-drum elevated. Fig. 2 is a vertical section taken longitudinally through the machine in the plane indicated by dotted line *x x*, Fig. 3. Fig. 3 is a top view of the machine, parts of which are broken away. Fig. 4 is a portion broken from the yielding scraper.

Similar letters of reference indicate corresponding parts in the several figures.

The letter A designates the rectangular frame of the machine, to the sides of which are pivoted segments B B, the front edges of which are toothed, so as to form two curved racks, *a a*. These racks *a a* engage with the teeth of two pinion spur-wheels, *b b'*, on a shaft which has its bearings on the front part of the frame A. The wheel *b'* is engaged by a pawl, b^2, pivoted to the frame A, and alongside of this wheel *b'* is a ratchet-wheel, b^3, with which a double-acting or reversible pawl, *c*, engages, and as this pawl is pivoted to a hand-lever, C, the driver on his seat S can raise or lower the spading or digging drum.

The frame A is provided with transporting-wheels D D, the short axles of which are fixed to the lower portions of the pivoted segments B B.

The spading or digging drum E is composed of two wheels, *d d*, which turn on a shaft, *e*, having its end bearings in the side bars of frame A, and these wheels have properly secured to them radial blades or spades *g*, which may be detachable and adjustable. These blades are arranged at equal distances apart, and they are designed for cutting into and spading up the ground, delivering the loose earth upon a scraper, F, and elevating the earth. The scraper is constructed with a tapered scraping-edge, and it lies close to the edges of the blades of the drum E, extending about one-half of the diameter thereof. The scraper is acted on by a spring, *h*, and it is connected to the side bars of the frame A by means of jointed arms or links *i i*. The scraper is thus allowed to yield and accommodate itself to inequalities of surface, and also to recede out of the way on meeting with an obstruction which would be liable to derange the machine.

Inside of the drum E is a semi-cylinder, H, the heads of which are free to turn on the shaft *e*. This semi-cylinder H is suitably connected to a grooved pulley, I, on shaft *e*, arranged on the outside of the said drum, and around this pulley a cable, J, passes, which also passes in opposite directions around a double-grooved pulley, K, on the front part of the frame A. On the shaft of the pulley K is keyed a ratchet-wheel, *j*, with which a double or reversible pawl engages, which pawl is pivoted to a hand-lever, N. By vibrating the lever N the driver can turn the semi-cylinder H about its axis. This semi-cylinder H serves as a receiver for the earth elevated by the blades *g*, and when it is filled with earth the driver can upset or dump it by simply moving the hand-lever N.

If the outer edges of the blades *g* are made sharp the machine can be used for chopping corn-stalks or other vegetable products in the field.

To convert the machine into a land-roller I will use a cylinder of suitable construction, which is slipped over the drum E and suitably secured thereto.

In practice I shall arrange the lever C in close relation to the driver's seat, and employ such devices as will allow the driver to operate the pawl b^2 by his foot when he desires to throw the machine into or out of operation.

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

A combined grader and stalk-cutter in which the drum E and the loose semi-cylinder H on shaft *e* are combined with the grooved pulleys I K, the ratchet-wheel *j*, and the reversible pawl pivoted to hand-lever N, as and for the purpose specified.

MARION SMAIL.

Witnesses:

ARCH. BAILEY,

JAMES WRIGHT.