

(No Model.)

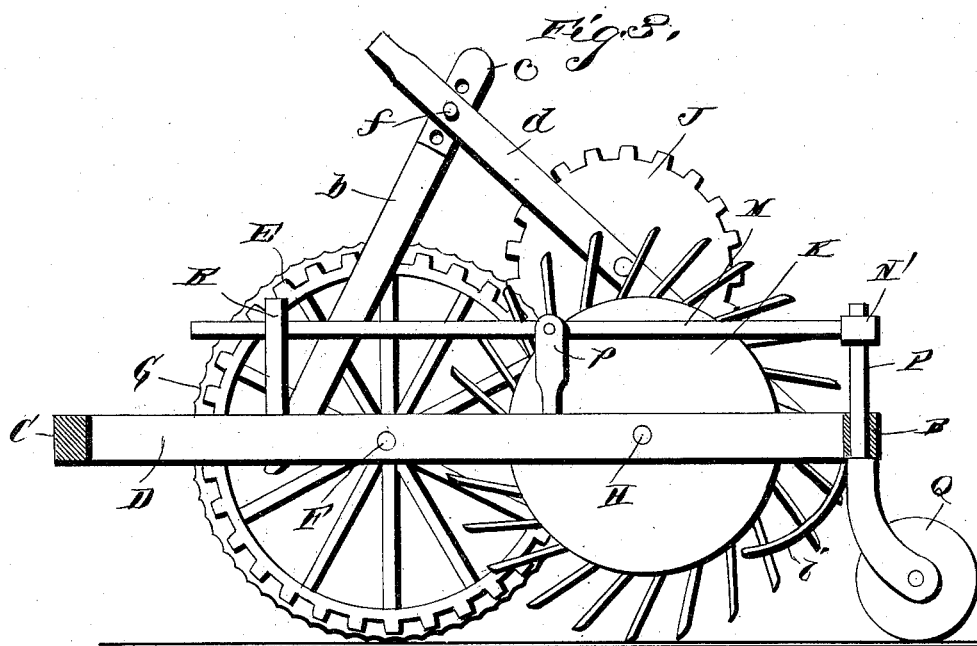
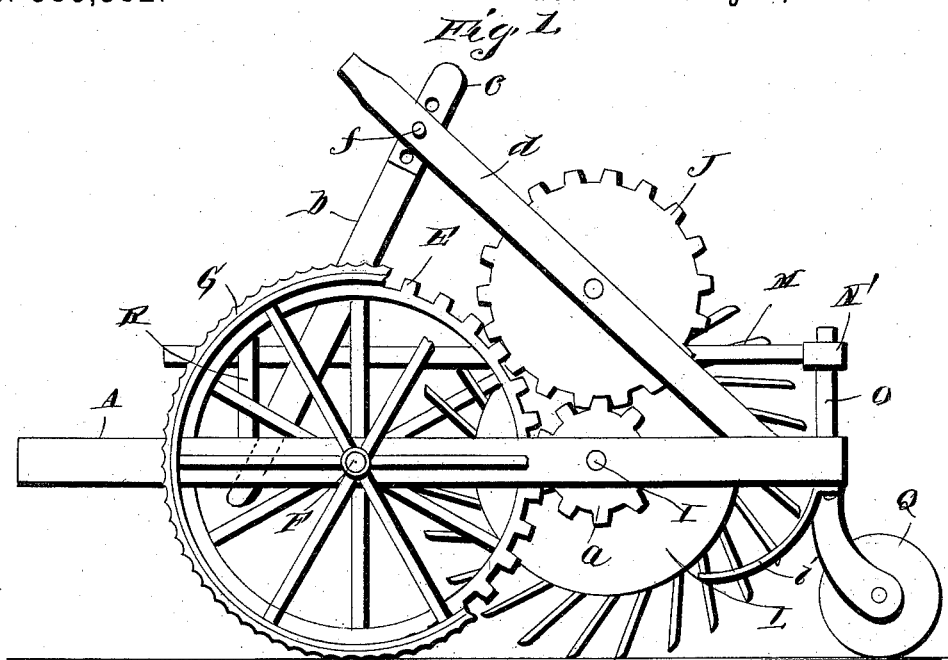
2 Sheets—Sheet 1.

J. F. STARK.

COMBINED HARROW AND PULVERIZER.

No. 385,382.

Patented July 3, 1888.



Witnesses
C. B. Taylor,
R. J. Marshall, Jr.

Inventor.
Jonathan F. Stark.

By *his* Attorneys.
C. A. Snow & Co.

(No Model.)

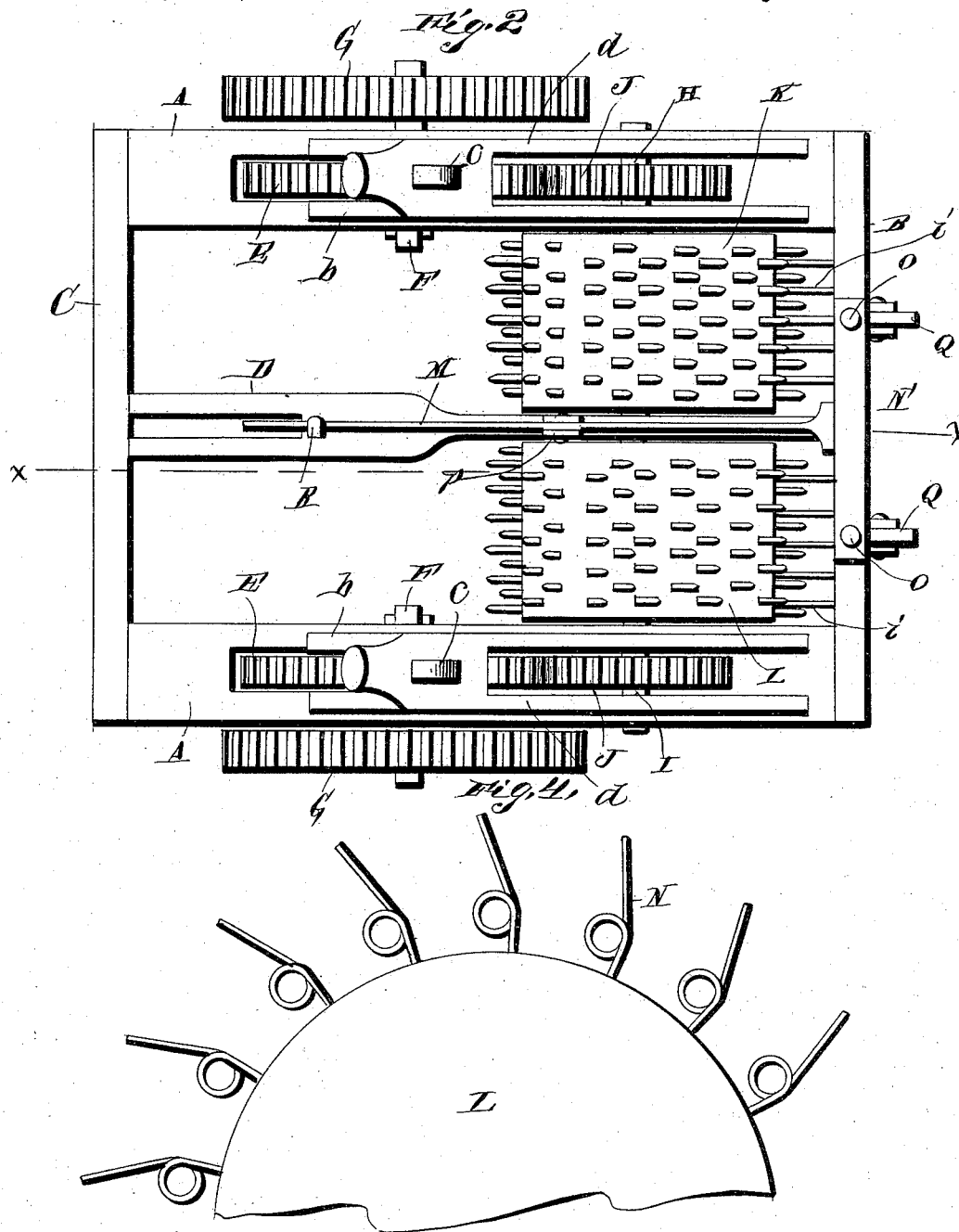
2 Sheets—Sheet 2.

J. F. STARK.

COMBINED HARROW AND PULVERIZER.

No. 385,382.

Patented July 3, 1888.



Witnesses,

C. L. Taylor,
R. J. Marshall, Jr.

Inventor,

Jonathan F. Stark,

By his Attorneys.

C. A. Howells

UNITED STATES PATENT OFFICE.

JONATHAN F. STARK, OF LEOTA, INDIANA.

COMBINED HARROW AND PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 385,382, dated July 3, 1988.

Application filed February 25, 1888. Serial No. 265,244. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN F. STARK, a citizen of the United States, residing at Leota, in the county of Scott and State of Indiana, have invented a new and useful Improvement in Combined Harrow and Pulverizer, of which the following is a specification.

My invention has reference to combined harrows and pulverizers; and it consists in the improvements hereinafter described, whereby a simple and durable machine is provided that will efficiently harrow and pulverize.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a machine embodying my improvements, one of the carrying-wheels being removed to more clearly disclose the relative position of parts. Fig. 2 is a plan view of the machine. Fig. 3 is a longitudinal section on the dotted line *x x*, Fig. 2. Fig. 4 is a detail view of a portion of the cylinder, showing the spring-teeth.

The supporting-frame of the machine comprises the side bars, A, and rear and front bars, B C. A central bar, D, extends longitudinally from the bars B C and is slotted at its front for the attachment of a suitable tongue or draft-plate. Each side bar, A, is slotted longitudinally to receive a large gear-wheel, E, mounted upon a stub axle, F, bearing in the side bar and carrying one of the main carrying-wheels G upon its outer projecting end. The periphery of each carrying-wheel G is ribbed to increase its tractive effect. Two independent shafts, H I, bear in the side and central bars in line with each other, and said shafts are designed to rotate independently of each other. A cylinder, K L, is mounted upon each shaft, and a gear-wheel, *a*, is mounted upon each shaft, so as to rotate in the slot of the side bars.

A standard, *b*, is located on each side bar and is slotted, so that the gear-wheel E can rotate without interference, and the upper end of said standard is provided with a tongue, C, having a perforation or perforations. A yoke, *d*, is pivotally connected to the rear part of each side bar, A, and is inclined, so that the tongue *c* of the standard extends through a slot formed in the upper portion of the yoke. The latter, adjacent to said slot, is perforated to register with the openings in the tongue, and the parts are secured together by means

of a bolt or pin, *f*, which is passed through said registering openings. A gear-wheel, J, is mounted in the yoke-frame, and when the latter is secured, as previously described, the gear-wheel J meshes both with the wheels E and *a*.

The cylinders K L are provided with a series of spring-teeth, N, arranged in line with each other around the drum, and each composed of a wire having one end embedded in the drum and its projecting portion looped, as indicated in Fig. 4. A spring rod or rods, *i*, extend from the rear bar of the frame and extend between the parallel rows of teeth, so as to remove the trash from the teeth and cylinder.

For some purposes the cylinders will be provided with a series of rigid teeth, *n*, which are arranged alternately, and are pointed and beveled at their ends, as shown.

A short standard, *p*, is located in the central bar, and centrally pivoted to this standard is a lever, M, the rear end of which carries a cross-bar, N, perforated at each end for the passage of vertical guide-bars O, located on the end bar. Cylindrical shanks P of casters extend through the rear bar, and are connected at their upper ends to the cross-bar N, so that the casters can be raised or lowered by the corresponding movements of said bar N. A notched standard, R, located on the central bar near the front of the machine, is designed to have the end of the lever engaged by the notches.

In operation the machine is drawn forward, and each carrying-wheel revolves its gear-wheel E to transmit motion through the gear-wheel J to the adjacent wheel *a*. This latter wheel of course revolves its drum in a direction corresponding with the direction of rotation of the main carrying-wheel. The wheels with spring-teeth act as harrows, while the wheels with rigid teeth serve as pulverizers, the spring-teeth serving to harrow and pulverize. The character of the said spring-teeth is such that should they strike an obstruction they will yield, so as to pass the same. The presence of the intermediate gear-wheel insures the revolution of the drums in a manner that will tend to throw the earth rearwardly, thus preventing banking in front of the rollers. The arrangement of gearing is

such that in turning one of the carrying-wheels will remain stationary, so that its parts will not unnecessarily operate. If either of the yokes are disengaged, the corresponding drum 5 will be thrown out of operation. By manipulating the central lever the caster-wheels may be elevated or depressed to raise and lower the frame, so as to regulate the depth the teeth enter the soil.

10 In commercial form it is intended that an attendant's seat will be so located as to be within convenient reaching distance of both the central lever and the yoke-frames in order that they may be properly operated.

15 In some cases I may find it desirable to dispense with the gear-wheel J, and instead gear the wheels G and a direct.

The relative sizes of the transmitting-gears are such that the drums are revolved at a higher 20 rate of speed than the motion of the carrying-wheels, thus having a greater effect upon the clods. By having the drums revolve in the same direction as the carrying-wheels their rotation tends largely to assist in the movement 25 of the machine, and thereby decrease the draft.

I claim—

1. The combination, with the main frame, of the drums mounted therein, the carrying-wheels, the gear-wheels E on the shafts of the 30 carrying-wheels, the gear-wheels a on the shafts of the drums, the yokes d, pivoted to the main frame, and the gear-wheel J, carried by said yokes and adapted to mesh with the gear-wheels E and a, as set forth.

2. The combination of the main frame, 35 the drums mounted therein, the gear-wheels a on the shafts of the drums, the carrying-wheels, the gear-wheels E on the shafts of the carrying-wheels, the standards b on the main frame, the yokes d, pivoted at their lower ends 40 to the main frame and adjustably connected at their upper ends to the standards b, and the gear-wheel J, carried by the yokes and adapted to mesh with the gear-wheels E and a, as set forth.

3. The combination of the main frame hav- 45 ing the slotted side bars, the drums mounted in the said frame, the gear-wheels a on the shafts of the drum projecting through the slotted side bars of the main frame, the stub shafts 50 F, mounted in the said side bars, the carrying-wheels mounted on said shafts, the gear-wheels E, mounted on said shafts and projecting through the slotted side bars, the standards b, erected on the side bars, the yokes d, piv- 55 oted at their lower ends to the side bars and adjustably secured at their upper ends to the standards b, and the gear-wheel J, carried by said yokes and adapted to engage the gear-wheels E and a, as set forth. 60

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JONATHAN F. STARK.

Witnesses:

JAMES M. DAVIS,
MARCUS GRAY.