

(No Model.)

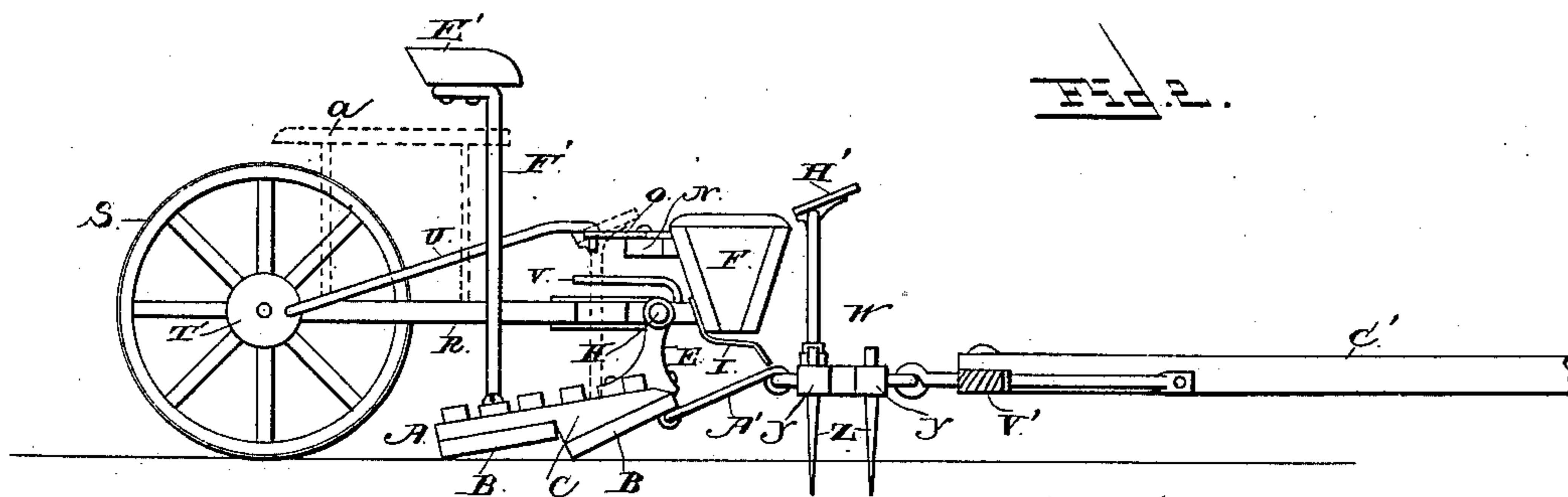
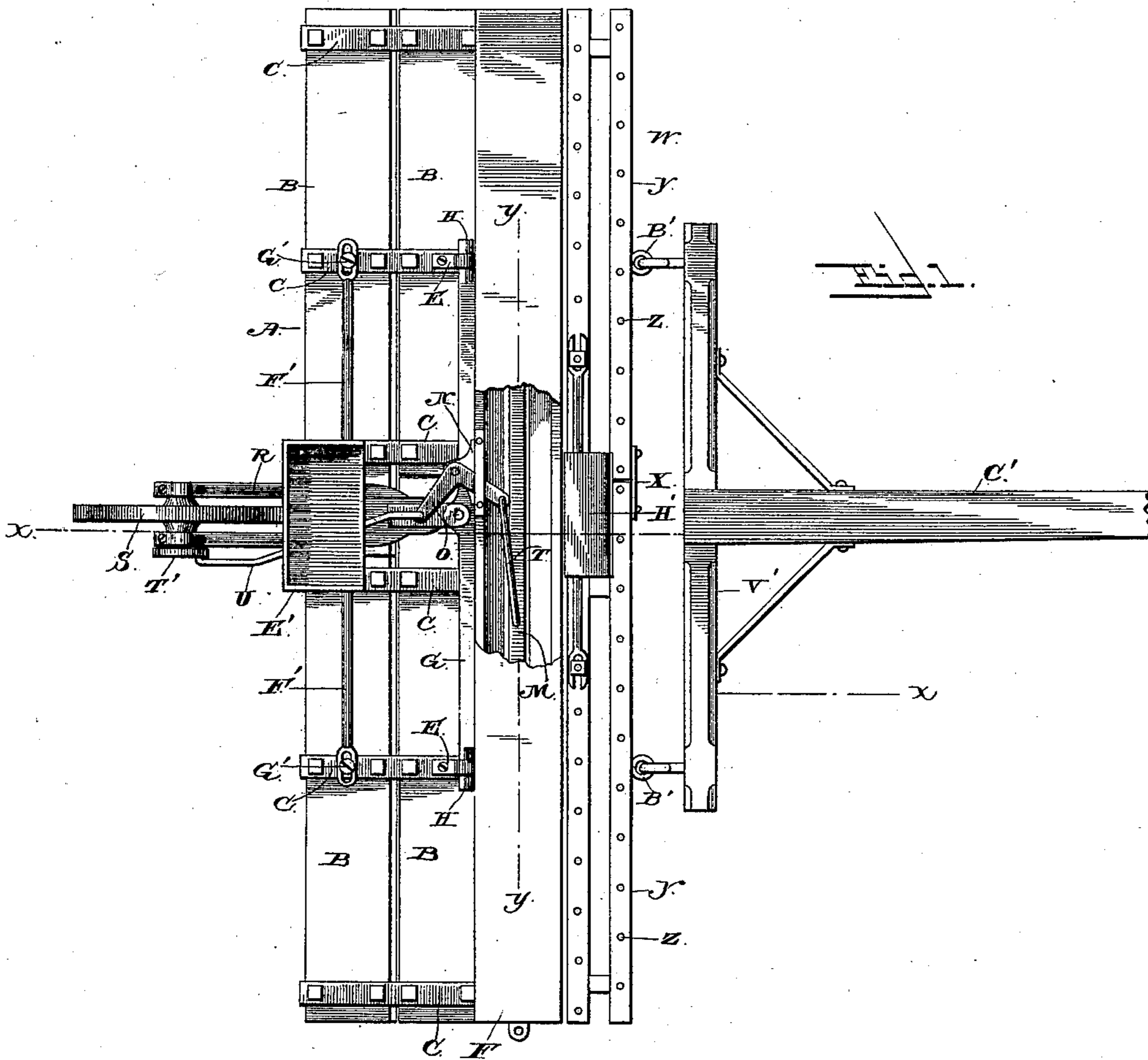
2 Sheets—Sheet 1.

J. M. POORE.

COMBINED HARROW, SMOOTHER, AND SEEDER.

No. 359,363.

Patented Mar. 15, 1887.



Witnesses

M. C. Fowler

J. W. Ganner

Inventor

James M. Poore

By *his* Attorneys

C. A. Snowden

(No Model.)

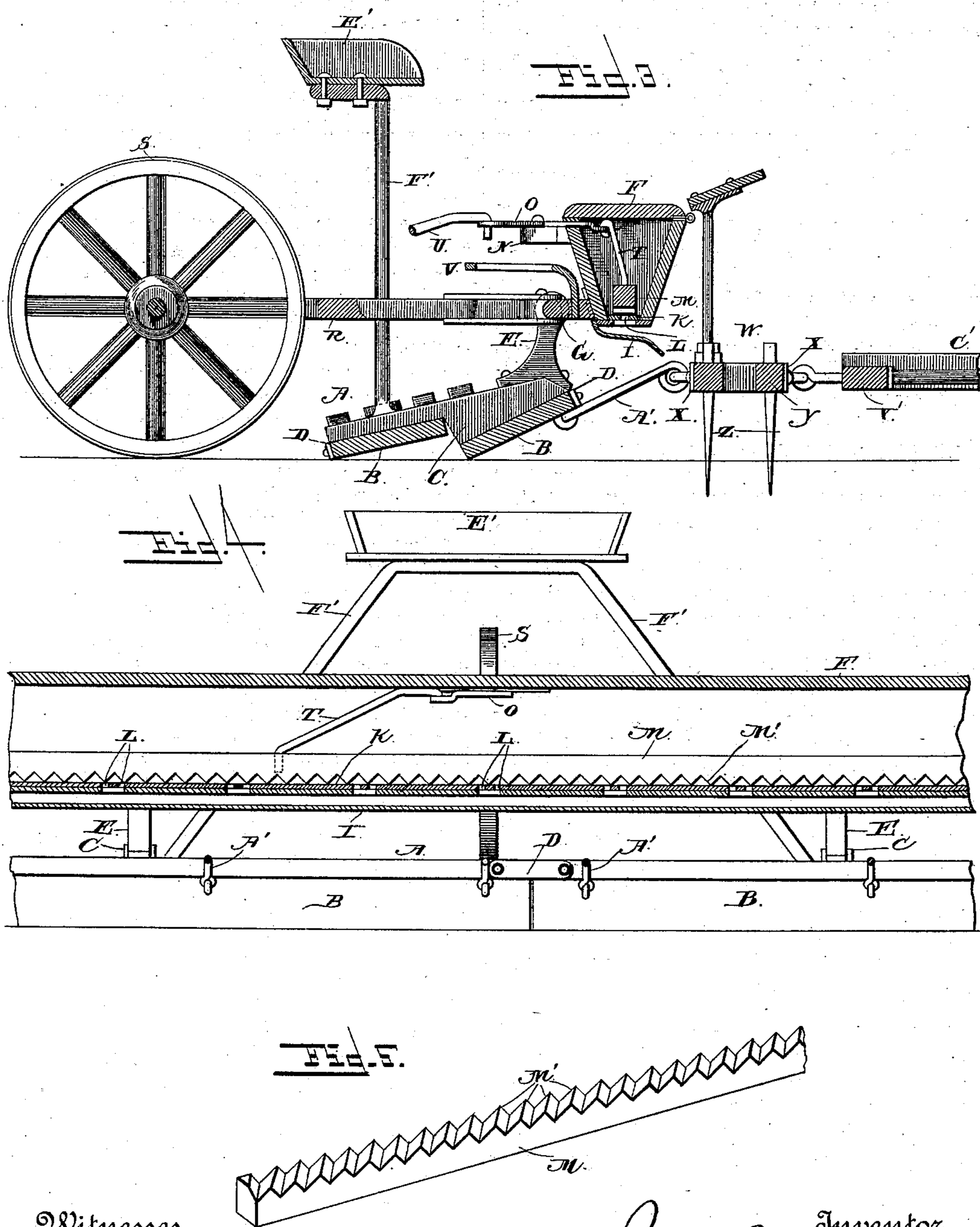
2 Sheets—Sheet 2.

J. M. POORE.

COMBINED HARROW, SMOOTHER, AND SEEDER.

No. 359,363.

Patented Mar. 15, 1887.



Witnesses
M. E. Fowler
J. W. Garner

Inventor
James M. Poore
By his Attorneys
C. A. Snowley

UNITED STATES PATENT OFFICE.

JAMES M. POORE, OF SPRING VALLEY, MINNESOTA.

COMBINED HARROW, SMOOTHER, AND SEEDER.

SPECIFICATION forming part of Letters Patent No. 359,363, dated March 15, 1887.

Application filed December 10, 1886. Serial No. 221,225. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. POORE, a citizen of the United States, residing at Spring Valley, in the county of Fillmore and State of Minnesota, have invented a new and useful Improvement in Combined Harrow, Smoother, and Seeder, of which the following is a specification.

This invention is an improved combined harrow, smoother, and seeder; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the drawings, Figure 1 is a top plan view of my invention. Fig. 2 is an end elevation of the same. Fig. 3 is a vertical longitudinal sectional view taken on line *x x* of Fig. 1. Fig. 4 is a vertical transverse sectional view taken on line *y y* of Fig. 1. Fig. 5 is a detail view of the seed-slide.

A represents a smoother, comprising two sections, each of which is composed of a pair of boards, B, arranged parallel with each other and one behind the other, the said boards being inclined so as to have their front sides higher than their rear sides, and connected together by means of longitudinal bars C. The front board of one section is shorter than the corresponding front board of the other section, and its rear board is longer than that of the corresponding rear board of the other section, so that the meeting ends of the two sections form a lap-joint, as shown in Fig. 1, and the said meeting ends of the two sections of the smoother are connected together by means of links D, which have their extremities pivoted to the front and rear sides of the sections. On the center longitudinal bar, C, of each section of the smoother, at the front end thereof, is secured a bearing-block, E.

F represents a hopper, the width of which corresponds to the extreme width of the two sections of the smoother, and the said hopper is provided on its rear side with a bar, G, that is bolted thereto, the ends of the said bar forming spindles H, to enter the bearing-blocks E, and thereby pivot the hopper on the front upper sides of the smoother. On the under side of the hopper, and extending throughout its entire width, is a forwardly and downwardly

inclined board, I, which is adapted to direct the seeds from the hopper to the ground in advance of the smoother. The lower side of the hopper is provided with the usual openings for the escape of the seed, and above the bottom of the hopper is located a slide, K, which is provided with a series of small openings, L, that are adapted to register with the larger openings in the bottom of the hopper.

M represents a seed-slide, which is located in the bottom of the hopper, and is provided on its under side with a series of oblique corrugations, M'. The rear side of the hopper, near its upper edge and near the center, has a rearwardly-extending arm, N, to which is pivoted a bell-crank lever, O. The inner arm of the said lever, which projects forwardly into the upper side of the hopper, is connected to the seed-slide by a rod, T.

To the center of the bar G, and projecting rearwardly therefrom, is pivotally connected an arm, R, between the bifurcated rear end of which is journaled a trailing wheel, S. To one end of the shaft which turns with the said wheel is attached a crank or eccentric, T', that is connected to the rear arm of the bell-crank lever O by means of a pitman, U, the front end of which is turned downwardly, and is thereby adapted to be readily attached to the rear arm of the bell-crank lever by being inserted in an opening in the said arm, and this downturned end of the pitman enables the same to be readily detached from the bell-crank lever. A slotted arm, V, is pivoted to the bar G below the bell-crank lever, for the purpose to be hereinafter explained.

W represents a harrow, which is made in two sections pivotally connected together by a link, X, that is similar to the links D. The said sections of the harrow are each composed of a pair of parallel bars, Y, and a series of harrow-teeth, Z, which are connected to the said bars. The front and rear bars of the harrow-sections are of unequal lengths, so as to form a lap-joint at the meeting ends of the sections similar to the lap-joint formed by the meeting ends of the sections of the smoother.

A' represents a series of links or arms, which are pivoted to the front side of the smoother and to the rear side of the harrow, so as to connect the former to the latter and

adapt it to be dragged in rear thereof. The front side of each harrow-section is provided at its center with an eye, B'.

C' represents a tongue or draft-pole having a brace cross-bar, V', at its rear end, provided with hooks which are adapted to engage the eyes B', so as to connect the draft-pole or tongue to the front side of the harrow.

E' represents a seat for the driver, which is provided with laterally-diverging spring bars or arms F', having their lower outer ends slotted. Bolts G' extend through the said slots and enter the central bars, C, of the smoother-sections, so as to secure the seat thereupon. A bar, H', forming a foot-rest, has its downturned end provided with slotted openings adapted to fit over the upper ends of some of the harrow-teeth, so as to connect the said foot-rest to the harrow-sections in front of the smoother.

The operation of my invention is as follows: The seeds to be sown are placed in the hopper, the pitman U is connected to the bell-crank lever, and the driver mounts a seat, E', and directs the team, the slide K being previously moved so as to cause its openings L to register with the openings in the bottom of the hopper. As the machine advances, the harrow-teeth stir and pulverize the soil, the smoother breaks up the small lumps and clods, and also compresses the surface soil firmly and compactly, to prevent the loss of its moisture by evaporation in warm weather, and the rotation of the trailing wheel causes the bell-crank lever to oscillate and thereby reciprocate the seed-slide in the bottom of the hopper. The seeds escape from the openings in the bottom of the hopper onto the deflecting board or plate I, and are scattered by the same evenly on the ground in rear of the harrow and in advance of the smoother, so that the seeds are covered by the latter at a suitable depth in the ground.

A machine thus constructed is particularly adapted for sowing grass and small grains—such as wheat, rye, and oats—is very cheap and simple, is easily constructed, and is exceedingly durable.

By making the harrow and the smoother in two sections connected together by links, the said harrow and smoother sections are adapted to play vertically independently of each other and adapt themselves to inequalities of the ground. The lap-joints formed at the meeting ends of the said harrow and smoother sections prevent any portions of the ground from being skipped or left unoperated upon.

In the event that it is desired to discontinue sowing the seeds while the machine is in motion on the field, this may be readily done by the driver by simply disconnecting the front end of the pitman from the bell-crank lever and inserting it in the slot of the pivoted idle-arm V.

Heretofore, so far as I am aware, in the construction of seeders it has been the practice to

connect the seed mechanism to a wheel at one or both ends of the hopper. This construction is disadvantageous, for the reason that when the machine is turning at the end of a row or to avoid an angle or obstruction in the field, if the driving-wheel happens to be at the center of the circle described by the machine, or approximately so, it will run very slowly, and consequently the seeds will not be sown so rapidly or so thickly as when the machine, is traveling in a straight line. I avoid this objection by connecting the seed mechanism to a wheel which is at the center of the machine, and the said wheel is thus caused to rotate at an equal rate of speed, whether the machine is traveling in a straight line or on a curve, and consequently the seeds are scattered with the same rapidity and in the same quantities at all portions of the field.

a (shown in dotted lines in Fig. 2) represents a seat which is adapted to be attached to the arm R, so that the weight of the driver may be imposed on the trailing wheel, to prevent the latter from slipping and cause it to rotate, so as to operate the seed-bar.

Having thus described my invention, I claim—

1. The combination of the smoother, the hopper pivoted on the front side thereof and supported above the smoother, the seeding mechanism in the hopper, the arm R, projecting rearward from the hopper, and the driving-wheel S, journaled to arm R and connected to the seeding mechanism, substantially as described.

2. The combination of the smoother having the blocks E, the hopper having the seeding mechanism and provided on its rear under side with the bar G, journaled in the blocks E, the arm R, pivoted to the center of the bar G and extending rearward therefrom, and the trailing driving-wheel S, journaled to the bar G and connected to the seeding mechanism, substantially as described.

3. The combination of the smoother, the hopper supported above and in front of the smoother and having the seeding mechanism and the rearward-extending arm R, the wheel S, journaled to the said arm and connected to the seeding mechanism to actuate the latter, and the harrow and the links connecting the same to the front side of the smoother, substantially as described.

4. The combination of the smoother, the hopper secured thereto and supported thereby, the seed-slide in the hopper, the arm R, extending rearward from the hopper, the driving-wheel S, journaled to said arm and having the crank-wheel, the bell-crank lever O, fulcrumed to the hopper, the rod T, connecting the said lever to the seed-slide, and the pitman connecting the bell-crank lever to the crank-wheel, substantially as described.

5. The combination of the smoother, the hopper pivoted thereto and adapted to turn in a vertical direction, the arm R, pivotally

connected to the rear side of the hopper and adapted to turn in a horizontal direction, and the wheel S, journaled to the rear end of the arm R, substantially as described.

5 6. The combination, in a seeder, of the hopper having the seeding mechanism, and the bell-crank lever O, connected thereto, the idle slotted arm V, projecting from the hopper, the arm R, extending rearward from the hopper, the
10 wheel S, journaled to said arm and having the crank-wheel, and the pitman connected at its rear end to the crank-wheel, and having its front end adapted to be attached to the bell-crank lever or inserted in the slotted idle-arm
15 V, substantially as described.

7. The combination of the smoother, the hopper attached thereto and having the seed-

ing apparatus, the arm R, extending rearward from the hopper and carrying the trailing wheel S, connected to the seeding apparatus to
20 actuate the same, the harrow, the links connecting the same to the front side of the smoother, the seat for the driver, attached in rear of the hopper, and the foot-rest attached
25 to the harrow in advance of the hopper, substantially as described.

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

JAMES M. POORE.

Witnesses:

W. L. KELLOGG,
Mrs. J. B. VIAL.