

(No Model.)

3 Sheets—Sheet 1.

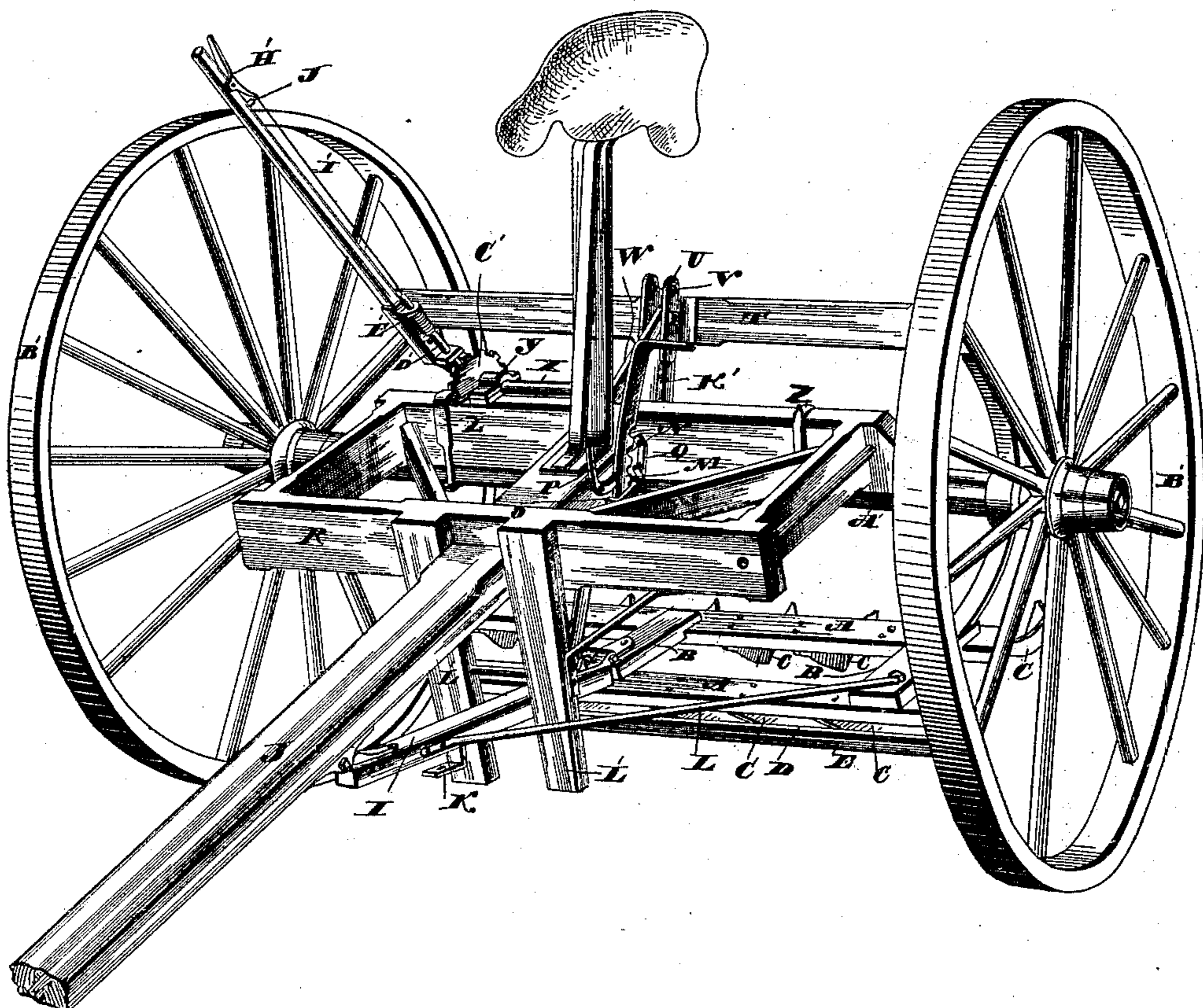
M. S. & W. A. DOOLITTLE.

SULKY HARROW.

No. 378,578.

Patented Feb. 28, 1888.

Fig. 1



Witnesses:

Chas. E. Shumway,
Eugene A. Beecher.

Inventors,

Marcus S. Doolittle & Co.

Wilson A. Doolittle

By Geo. D. Seymour,

(No Model.)

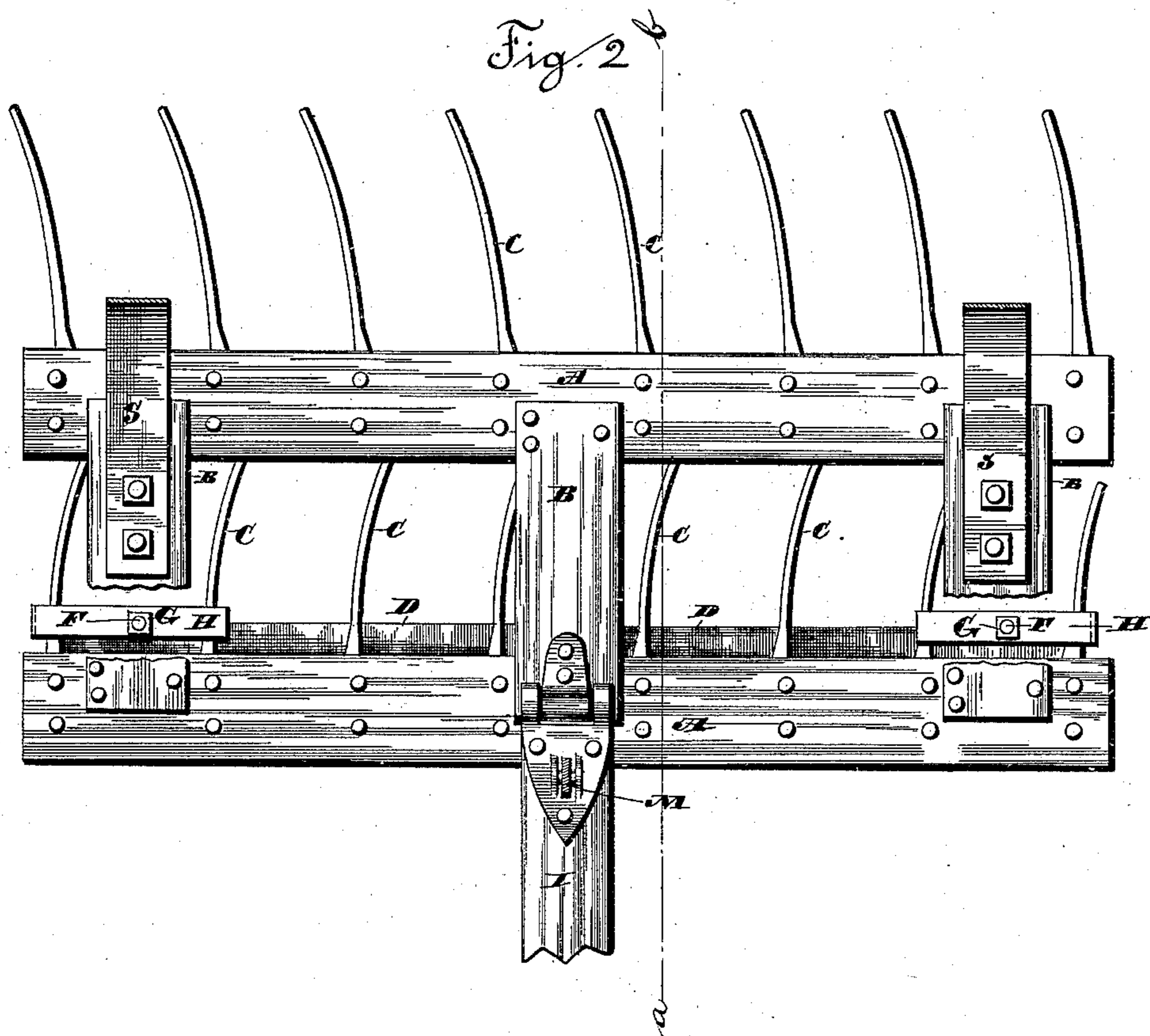
3 Sheets—Sheet 2.

M. S. & W. A. DOOLITTLE.

SULKY HARROW.

No. 378,578.

Patented Feb. 28, 1888.



Witnesses:
Chas. B. Shumway
James G. Clark.

Inventors
Marcus S. Doolittle
Wm. A. Doolittle.
By Geo. B. Seymour.
Atty.

(No Model.)

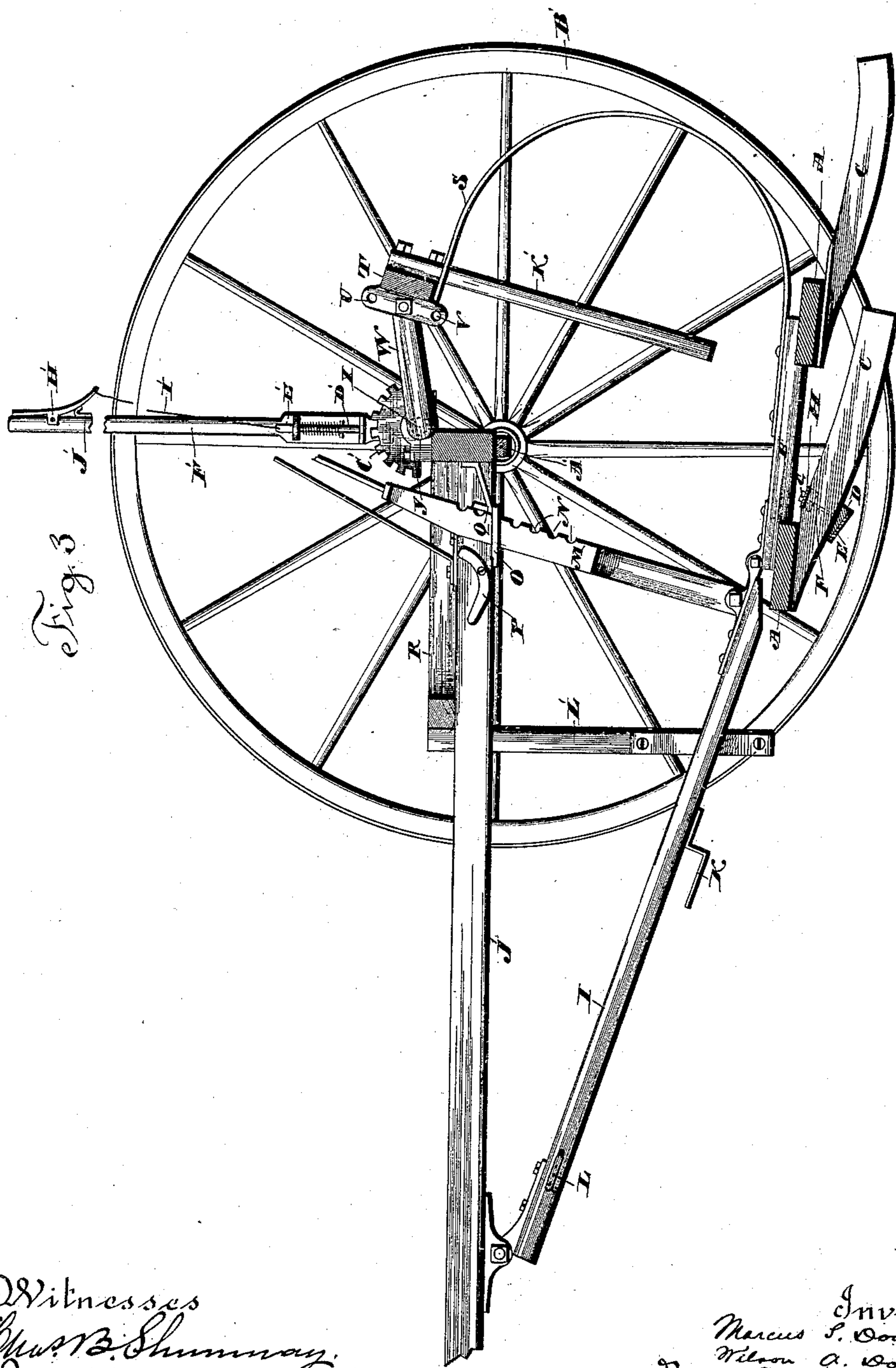
M. S. & W. A. DOOLITTLE.

3 Sheets—Sheet 3.

SULKY HARROW.

No. 378,578.

Patented Feb. 28, 1888.



Witnesses
Chas. B. Shumway.
James G. Clark.

Inventors
Marcus S. Doolittle &
Wilson A. Doolittle.
By Geo. D. Seymour
Atty.

UNITED STATES PATENT OFFICE.

MARCUS S. DOOLITTLE, OF NORTH HAVEN, AND WILSON A. DOOLITTLE, OF
HAMDEN, CONNECTICUT.

SULKY-HARROW.

SPECIFICATION forming part of Letters Patent No. 378,578, dated February 28, 1888.

Application filed June 13, 1887. Serial No. 241,157. (No model.)

To all whom it may concern:

Be it known that we, MARCUS S. DOOLITTLE and WILSON A. DOOLITTLE, respectively residing at North Haven and Hamden, in the
5 county of New Haven and State of Connecticut, have invented a certain new and useful Improvement in Sulky-Harrows; and we do declare the following to be a full, clear, and exact description of the same, reference being
10 had to the accompanying drawings, which form a part of this specification.

Our invention relates to an improvement in sulky-harrows, the object being to produce a machine of simple, durable, and cheap construction, having the harrow suspended by
15 and controlled through one or more springs and virtually independent of the sulky.

With these ends in view our invention consists in a sulky-harrow having certain details
20 of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a harrow embodying our
25 invention. Fig. 2 is a detached broken view in plan of the harrow with its spring-and-pole connections. Fig. 3 is a view thereof in central longitudinal section.

The harrow consists, as herein shown, of
30 two parallel frame-pieces, A A, three parallel cross-pieces, B B B, secured to them at right angles, and two rows of teeth, C, respectively bolted to the under faces of the two frame-pieces, the teeth on one frame-piece curving
35 in one direction and those on the other in an opposite direction. A clod-crusher, D, consisting of a long bar having a beveled lower face shod with a steel plate, E, is held against the lower edges of the forward row of teeth by
40 bolts F, carrying nuts G and suspended from short plates H H, located upon the upper edges of such teeth and having their ends bent to embrace the same. The position of the clod-crusher is adjusted according to the requirements of the work to be done by it and to the
45 elevation of the forward end of the harrow by sliding it and the plates H H forward and back over the edges of the teeth after loosening the nuts G, which are tightened to hold it
50 in place when the desired position for it has

been secured. The said harrow is pivoted at a central point in its forward edge to the rear end of a pole, I, pivoted at its forward end to the under face of the tongue J of the machine, the pivots at each point being confined to vertical action. A draft-iron, K, is secured to
55 the under face of the said pole and midway of its length, whereby the draft of the team is applied directly to the harrow to obvious advantage in many ways. Braces L L, secured
60 to the pole at a point forward of such draft-iron, respectively extend to the opposite ends of the harrow, which they assist in holding in place. The forward end of the harrow is raised and lowered through a lever, M, piv-
65 oted to the rear end of the pole I and provided upon its rear face with a vertical series of notches, N, through which it is engaged with a frame, O, receiving and guiding it and secured to the tongue aforesaid. A cam-lock,
70 P, also pivoted to the said tongue, is arranged to be engaged with the outer face of the lever for holding its notched rear face in engagement with the frame against the vibration of the machine, tending to disengage it therefrom.
75 When not in use, the cam is turned back, as shown by Fig. 2 of the drawings. A detent, Q, pivoted to the rear cross-piece of the sulky-frame R, is provided for engaging with the rear face of the lever and holding it out of en-
80 gagement with the frame and free to play up and down therein, whereby it is virtually disconnected from the sulky. When not in use for this purpose, the said detent is swung upon its pivot and turned out of engagement with
85 the lever.

Two outwardly-bowed springs, SS, are bolted to the rear ends of the outer two cross-bars of the harrow. The upper ends of these springs are secured to the ends of a beam, T, provided
90 at the central point of its inner face with a head, U, having a vertical series of holes, V, through which it is attached to a lever or arm, W, rigidly secured to a shaft, X, mounted in bearings Y, located upon the rear cross-piece
95 of the sulky-frame R, which is secured by clips Z Z to the axle A', carrying the wheels B' B'. The opposite end of said shaft X carries a notched segment, C', engaged by a spring-actuated dog, D', mounted in the lugs of a
100

frame, E', secured to a pivotal operating-lever, F', carrying at its outer end a pivotal hand-piece, H', connected by a wire, I', with the said dog, which is lifted out of engagement with the teeth of the segment by pressure upon the hand-piece and re-engaged with the teeth by its spring. A sliding locking-piece, J', located under the said hand-piece, is provided for holding the same in that position in which it holds the dog away from the segment. The beam T carries a depending stop or guard, K', the lower end of which is normally held over the harrow, with which it engages to prevent a too great flexion of the springs. Arms L' L', secured to the forward cross-piece of the sulky-frame and depending on opposite sides of the tongue, embrace the pole I and hold the same against lateral displacement.

Under the described construction the harrow is suspended from the sulky and supported by the lever M and the springs S S, the latter being connected with the lever F', as set forth. Practically, the harrow is largely handled and controlled by the said lever F', which requires but very little power or effort for its manipulation. By moving the said lever forward and locking it there, the harrow is lifted clear of the ground, permitting the sulky to be drawn or transported from place to place, and as well over rough as smooth surfaces. In his seat the driver may easily move the handle F' back and forth to raise and lower the harrow, as required, for escaping obstructions and for securing its greatest abrasive effect; or the levers, either or both, may be set to the specific work to be done. In this case the springs alone will insure an automatic adjustment or conformation to the constantly-changing demand upon the harrow. By disconnecting both levers the harrow will float virtually independent of the sulky and of the broad base included between its two wheels. It will thus be seen that by supporting and operating the harrow as described the machine is made easy to transport and to handle and widened in its range of usefulness. By placing the draft in the direct line of the load the power is applied to the best advantage and the sulky relieved of much strain.

If desired, the forward operating-lever may be dispensed with. Other changes may also be made in carrying out the principles of our invention. We would have it therefore understood that we do not limit ourselves to the exact construction and arrangement of parts herein shown and described, but hold ourselves at liberty to make such changes and alterations as fairly fall within the spirit and scope of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a sulky-harrow, the combination, with the tongue thereof, of a pole extending parallel with such tongue and pivoted at its forward

end thereto to have vertical but not lateral pivotal action and similarly pivoted at its rear end to the harrow, a draft-iron secured to such pole, and guards depending from the tongue on opposite sides of the pole, which plays up and down between them, substantially as set forth.

2. In a sulky-harrow, the combination, with a harrow consisting of a rigid frame having harrow-teeth secured to its lower face, of an operating-lever secured to a shaft located in bearings attached to the vehicle-frame, an arm rigidly secured to such shaft, a bar pivoted to the outer end of such arm, and one or more springs directly secured to such bar and to the harrow-frame, which is raised, lowered, and pressed downward by it or them, substantially as set forth.

3. In a sulky-harrow, the combination, with a harrow consisting of a rigid frame having harrow-teeth secured to its lower face, of an operating-lever secured to a shaft located in bearings mounted upon the vehicle-frame, an arm rigidly attached to said shaft, a head having a vertical series of holes pivoted to such arm through one of the holes, a bar secured to such head, and one or more bow-shaped springs directly attached to such bar and to the harrow-frame, which is raised, lowered, and pressed downward by it or them, substantially as set forth.

4. In a sulky-harrow, the combination, with a harrow consisting of a rigid frame having harrow-teeth secured to its lower face, of an operating-lever mounted upon the vehicle-frame, a bar connected with such lever, one or more bow-shaped springs attached to such bar and to the harrow-frame, and a stop consisting of a post attached to the bar and extending downward in position to engage with the harrow-frame to limit the flexion of the spring or springs, substantially as set forth.

5. In a sulky-harrow, the combination, with the tongue thereof, of a harrow, a pole pivoted directly to the tongue and pivotally connected with the harrow, an operating-lever mounted upon the vehicle-frame, one or more bow-springs positively connected with such lever and attached to the harrow, which is raised, lowered, and pressed downward by it or them, substantially as set forth.

6. In a sulky-harrow, the combination, with the harrow thereof, of a clod-crusher located upon and sliding forward and back upon the teeth thereof, substantially as set forth.

7. In a sulky-harrow, the combination, with the harrow thereof, of an adjustable clod-crusher consisting of a steel-shod bar clamped against the lower edges of the harrow-teeth by plates supported upon their upper edges, substantially as set forth.

8. In a sulky-harrow, the combination, with the tongue thereof, of a harrow, a pole pivoted directly to the tongue and pivotally connected with the harrow, an operating-lever pivoted

to the forward end of the harrow and extending upward through the vehicle-frame, an operating-lever mounted upon such frame, and one or more bow-springs positively connected
5 with such lever and attached to the harrow, which is raised, lowered, and pressed downward by it or them, substantially as set forth.
In testimony whereof we sign this specifica-

tion in the presence of two subscribing witnesses.

MARCUS S. DOOLITTLE.
WILSON A. DOOLITTLE.

Witnesses:

CHAS. B. SHUMWAY,
GEO. D. SEYMOUR.