(No Model.) 2 Sheets—Sheet 1.

A. & M. RUNSTETLER.

GRAIN DRILL.

No. 287,779. Patented Oct. 30, 1883.

Fig. 1.

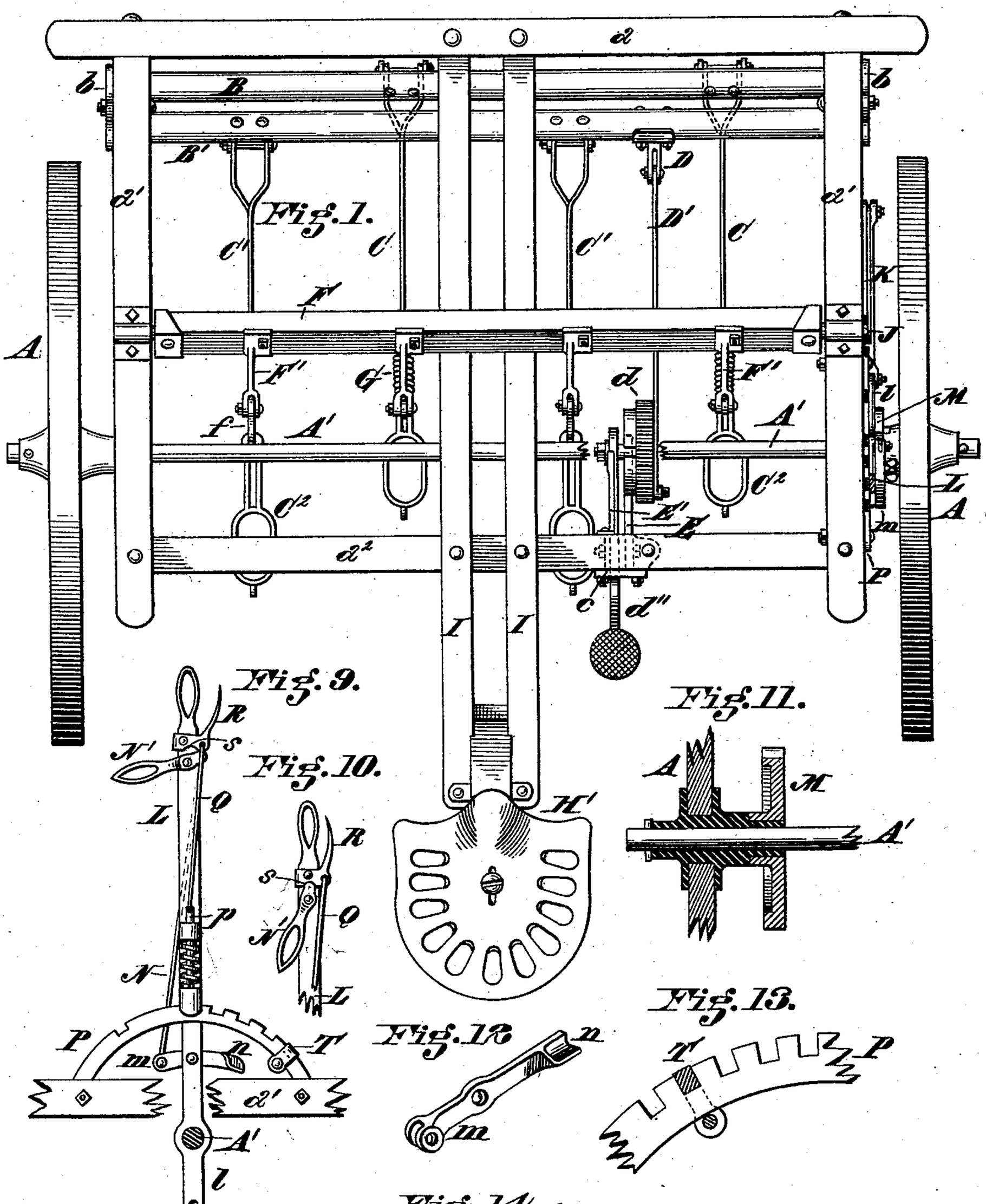


Fig. 9.

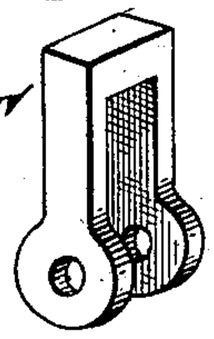
Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.

Fig. 14.



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his attorneys &c.

(No Model.) 2 Sheets—Sheet 2.

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GRAIN DRILL.

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Fig. 2.

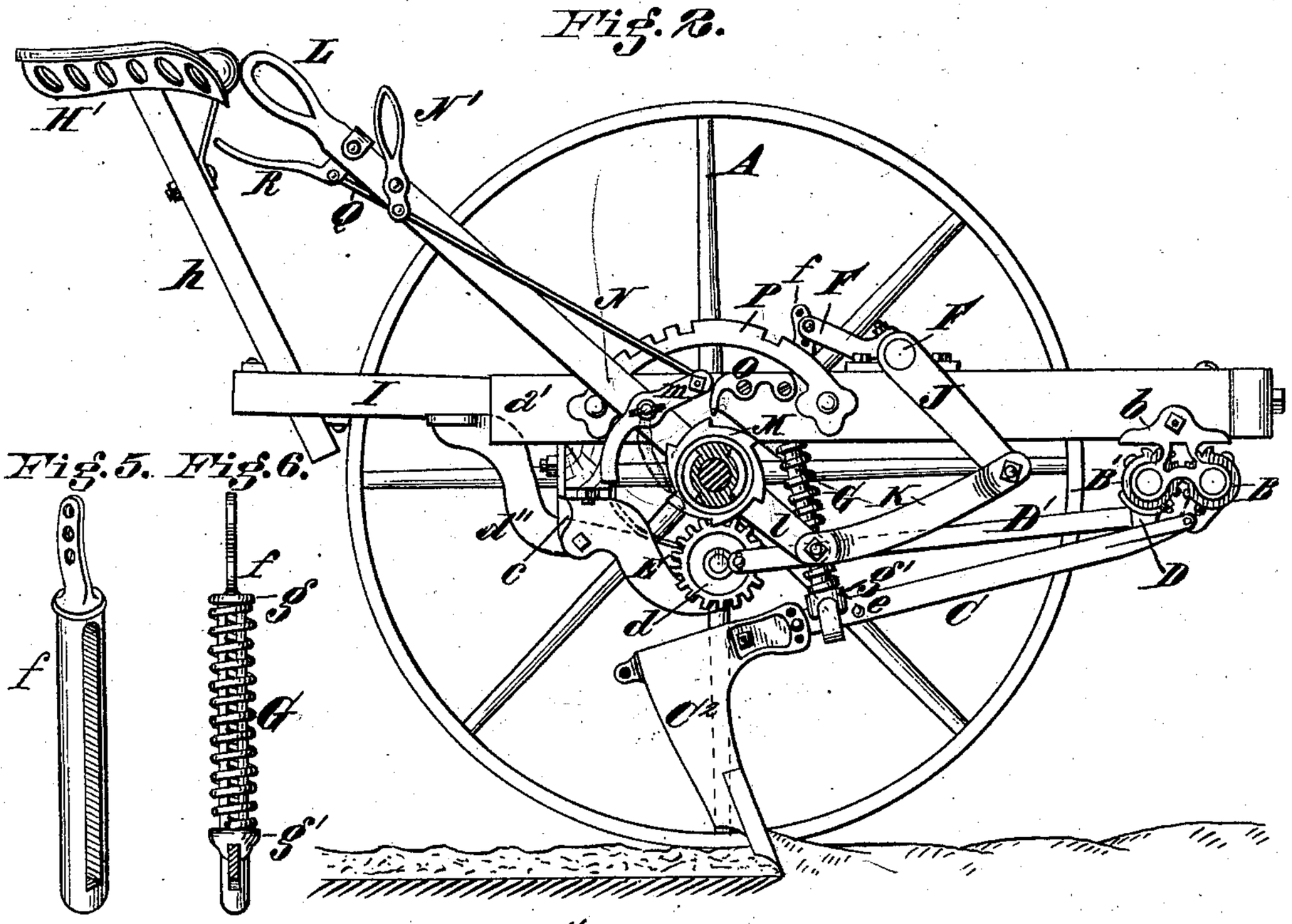


Fig. 5. Fig. 6.

Fig. 3.

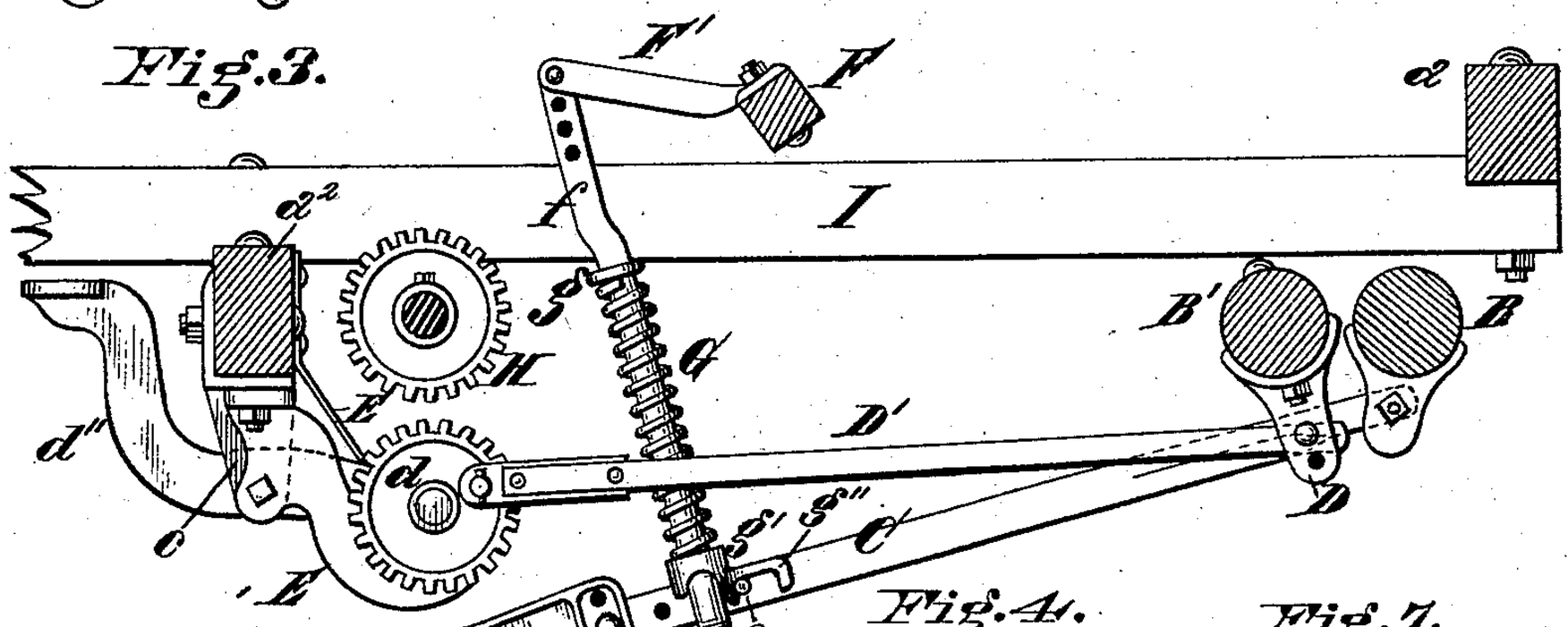


Fig. 4.

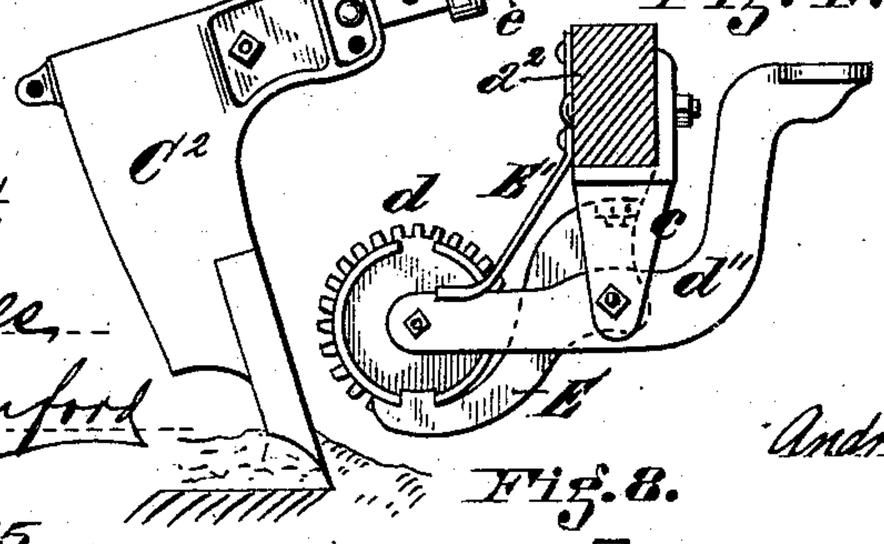
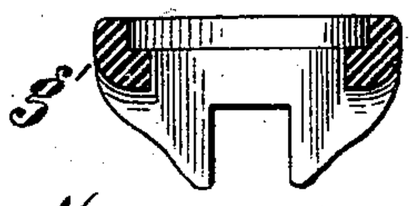


Fig. 7.



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Andrew & Michael Runstetler,
by Wood & Boyd
their Attorneys &c.

Fig. 15.

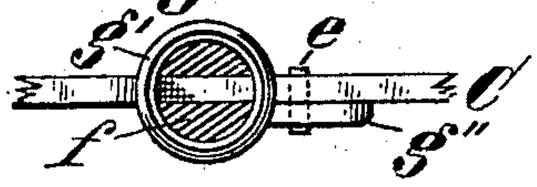

Fig. 8.

UNITED STATES PATENT OFFICE.

ANDREW RUNSTETLER AND MICHAEL RUNSTETLER, OF DAYTON, OHIO, ASSIGNORS TO THE FARMERS FRIEND MANUFACTURING COMPANY, OF SAME PLACE.

GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 287,779, dated October 30, 1883.

Application filed June 18, 1883. (No model.)

To all whom it may concern:

Be it known that we, ANDREW RUNSTETLER and MICHAEL RUNSTETLER, citizens of the United States, and residents of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Grain-Drills, of which the following is a specification.

Our invention relates to improvements in grain-drills, broadcast-seeders, and other machines which employ hoe or cultivator-teeth attached to drag-bars that are pivoted to the main frame of the machine.

One of the objects of our invention is to provide mechanism for automatically raising the hoes by the draft of the team, through the medium of a lever which can be locked to the driving-axle and made to revolve therewith.

Another object of our invention is to so construct the oscillating lifting-lever that the operator can by means of said lever raise or lower the drag-bars without the intervention of the power of the team, and at the same time readily lock said lever in any desired position, so as to hold the hoes in or out of the ground, as occasion may require.

Another object of our invention is to combine the devices for lifting the drag-bars with automatic hoe-shifting devices which are operated by the power of the team, by means of a gear upon the driving-axle, so that the hoes may be lifted or shifted in unison, or independently of each other, by the draft of the team.

Another object of our invention is to arrange these automatic lifting and shifting devices in such relation to each other that the operator, sitting upon the seat attached to the main frame of the machine, may operate these several devices without seriously interfering with his guiding the team and managing the machine in its working operation in the field. The preferred form of constructing and arranging these devices will be fully described in connection with the accompanying drawings, in which—

Figure 1 is a top plan view of our improvement attached to the grain-drill. Fig. 2 is a side elevation of the same with one wheel removed. Fig. 3 is a detail view, partly in section, showing the connection of the drag-bars to the frame of the machine and to the lifting and shifting devices. Fig. 4 is a side elevation of the foot-lever and shifting-gear mounted thereon on the reverse side of the same parts shown in Fig. 3. Fig. 5 is a perspective view of the lifting-link with the spring removed. Fig. 6 is a transverse elevation of the same, showing the spring in position. Fig. 7 is a transverse sectional elevation of the lower spring-socket on the slotted link. Fig. 8 is a plan view of the lifting-clutch gear. Fig. 9 is a detailed view of the lifting and lock lever. Fig. 10 is a detail view, showing the lever locked out of engagement. Fig. 11 is a central horizontal section, showing the preferred form of mounting the clutch-rack on the driving-wheel and axle. Fig. 12 is a perspective view of the driving-pawl. Fig. 13 is a broken elevation of the notched segmental lock-bar. Fig. 14 is a perspective view of the stop on the segmental-bar block. Fig. 15 is a broken sectional plan of the drag-bar and slotted supension-link, showing the spring-socket in position.

A represents the supporting ground-wheels, one of which is locked or pinned fast to axle A′, the other wheel running loose thereon.

a a′ a″ represent the main frame of the machine, which is supported upon the axle by means of journaled boxes in the ordinary way.

B B′ represent oscillating shifting-bars, which are journaled to the forward end of the main frame by means of bracket-standard *b*, rigidly secured to the side rails, *a′*. They are shown as provided with segmental gear meshing with each other, so that the said oscillation of one bar will transmit motion to the other.

C C′ represent drag-bars, which are hinged alternately to the bars B B′, so that each alternate drag-bar will be operated by the bar B and the remaining series of drag-bars by the oscillating bar B′, for shifting the hoes C^2 from one to two ranks in the usual manner.

D represents a crank-arm attached to bar B′.

D′ represents a pitman pivoted at one end to arm D and at the other end to a crank-pin

on gear-wheel *d*, which revolves on a shaft mounted on foot-lever *d''*, which is pivoted to a bracket, *c*, which is rigidly secured to the rear rail, a^2, of the main frame.

E represents a rigid arm carrying a clutch-lug adapted to engage and stop the motion of gear *d*.

E′ represents a spring for forcing gear *d* into engagement with the clutch-arm E.

The above parts have been fully shown in a previous application of ours filed May 26, 1883.

F represents the oscillating bar journaled upon the main frame.

F′ represents crank-arms rigidly connected thereto.

f represents slotted links pivoted to crank-arm F′. The drag-bars C pass through the slots in these links *f*.

G represents springs coiled around said links or standards *f*, the upper ends of which springs are held in place by means of the flanged collar *g*, and the lower ends are supported in a sliding socket-collar *g′*.

e represents pins passing through drag-bars C to prevent the links or standards *f* from moving forward of the desired point when the drag-bars C are raised. This socket-collar *g′* holds the spring in proper position, and assists in compressing the spring G when the drag-bars C are raised by means of obstructions striking the hoes C^2. This collar *g′* is provided with a gain-arm, *g''*, having downwardly-projecting lugs or forks which straddle pin *e*, and are sufficiently far apart to allow the necessary lateral movement of the pin in the act of raising the hoes. A series of holes may be pierced in the drag-bar to allow of the stems *f* being adjusted backward or forward of drag-bar C, as may be desired.

H represents a driving-gear keyed to the shaft A′ for shifting the hoes of drill, as before described, when gear *d* is brought into mesh therewith.

H′ represents a driver's seat, which is attached to the standard *h*, which is adjustably secured to parallel rails I, which are rigidly secured to the main frame of the machine.

L represents a lifting-lever pivoted upon the axle A′, and adapted to oscillate freely thereon. Its lower end projects below said axle a sufficient distance to form a lifting-arm, *l*, to which is pivoted link K, the forward end of which link is pivoted to the crank-arm J, rigidly secured to the outer end of rock-shaft F. As lever L is moved forward from the operator, sitting on seat H′, the arm *l* draws link K and crank-arm J backward, oscillating the rock-bar F, and through the medium of crank-arm F′ and standards or links *f* elevates the series of drag-bars C C′.

It may be desirable in some instances to connect the drag-bars C C′ to the crank-arm F′ by means of chains, so as to allow the hoes C″ to be lifted independently and raised freely to pass over obstacles, and when so connected they can be operated by lever L, either with or without the power of the team, in the same manner as when spring drag-bars are employed, except that the hoes C″ cannot be locked in the ground by means of said lever, and when thus used they embody the features of our invention herein set forth as far as they relate to the elevating and depressing of said drag-bars, as specified in the first three clauses of claims herein. It is also obvious that a single oscillating or sliding shifting-bar, B, might be employed, in lieu of bars here shown, for shifting the position of the hoes, and such a modification would not affect the features of invention herein shown and described.

In order to lift the hoes by means of the draft of the team, the following instrumentalities are employed in connection with the lever L, oscillating upon the axle A′.

M represents a ratchet-wheel hinged upon the axle A′ between the ground-wheel and the side rails, *a a*, and in close proximity with lever L.

m represents a pawl or dog pivoted to lever L.

N represents a connecting-rod, one end of which is pivoted to the dog *m* and the other to a lever, N′, which is in turn pivoted to the lever L. When lever N′ is turned forward from the operator, dog *m* is brought into engagement with one of the teeth of ratchet M, when lever L is locked to axle A′, and moves with it in the same direction as if pushed forward by the operator, thereby raising the hoes out of the ground in the same manner. In order to automatically lock the lever from the axle A′, a trip, O, is provided, which is rigidly secured to the side rail, *a′*, above the ratchet M, and a lip or lug, *n*, upon the inner face of the end of dog *m*, so as the dog travels forward with the lifting-lever L the lip *n* will strike the trip O, when lever L is moved to a vertical position, or nearly so, and throws the dog out of contact with the tooth of ratchet M, releasing the lever L, which drops back into position, as shown in Fig. 2. It is sometimes desired, however, to lock the hoes out of the ground and maintain lever L in a forward position. This can be accomplished by the following means:

P represents a segmental notched bar secured to the frame O′, and upon the inside of said lever L, vertically above segment P, a lock-bolt is secured and operated by means of connected rod Q and hand-lever R, pivoted upon lever L, in convenient reach of the hand of the operator. It is sometimes desirable to hold the lock-bolt *p* out of contact with the notches in the segment P. For this purpose lock-lever N′ is made with a projection forward of its pivot-point, so that said projection will engage in a notch, *s*, cut in the shank of lever R, as shown in Fig. 10, which represents the bolt *p* withdrawn and lever L free to oscillate. Fig. 9 represents lever L locked to the segment P, in which condition the drag-bars C C′ and the hoes C″ are rigidly held in

position by the lock-lever L. When it is desired to raise the hoes by the draft of the team, lock-bolt *p* should be held out of engagement with the segment P, which may be done by the hand of the operator, as well as by the locking devices above described. T represents an adjustable stop, of U shape, bolted to segment P, for sustaining the lever L in its backward position.

It is obvious that the lock-lever and the device for operating it or locking it to the shaft might be variously modified without changing the features of invention herein set forth.

We do not wish to limit ourselves to the specific devices herein set forth; but

What we do claim as our invention is—

1. In a grain-drill, a lifting-lever oscillating upon a driving-axle, in combination with link and crank devices connecting said lever to the oscillating bar journaled upon the main frame, to which the drag-bars are connected in such manner that the hoes may be raised or lowered by the oscillation of the lifting-lever, substantially as herein set forth.

2. In a grain-drill having a lifting-lever oscillating upon a driving-axle, and adapted to raise and lower the hoes by link and crank connection to the oscillating bar journaled on the main frame, in combination with the ratchet-and-pawl devices for locking the lifting-lever to the axle, substantially as herein set forth.

3. In combination with a lifting-lever, L, oscillating upon a driving-axle, and the means for locking it thereto, an automatic trip arranged upon the main frame and adapted to automatically disengage the locking devices as the lever is moving forward with the axle, substantially as herein set forth.

4. In combination with the lifting-lever L, oscillating upon the main axle, and having locking devices for connecting the lever to the axle, a bolt-lock attached to the free end of the lifting-lever, whereby it may be locked in any desired fixed position for holding the hoes in or out of the ground, substantially as herein set forth.

5. In combination with the lifting-lever L, journaled upon the driving-axle, and lock devices R Q, the secondary lock-lever N′, adapted to hold the lock-rod *p* from engagement with the segment P, substantially as herein set forth.

6. In a grain-drill, the combination of the automatic shifting devices operated by the power of the team by a driving-gear keyed to the driving-axle, a lifting-lever journaled upon said axle, with clutch devices for locking said lever to said axle, whereby the power of the team may be employed to shift and raise the hoes, substantially as herein set forth.

7. In a grain-drill, a lifting-lever oscillating upon the driving-axle, with locking devices for connecting the movements of the lever with the movements of the axle, attached to said lever and under control of the operator, whereby the hoes may be raised, either by draft of the team or by the operator himself moving said lever, disconnected from the movements of the axle, substantially as herein set forth.

8. In combination with standard *f*, the socket *g′*, provided with the forked arm *g″*, adapted to engage over the pin *e* of the drag-bar, so as to hold it in proper relative position thereon, substantially as herein set forth.

In testimony whereof we have hereunto set our hands.

ANDREW RUNSTETLER.
MICHAEL RUNSTETLER.

Witnesses:
J. F. CAMPBELL,
GEORGE O. WARRINGTON.