3 Sheets—Sheet 1.

A. P. STEELE.
Seeding-Machine.

No. 205,312. **Patented June 25, 1878.**

Fig 1.

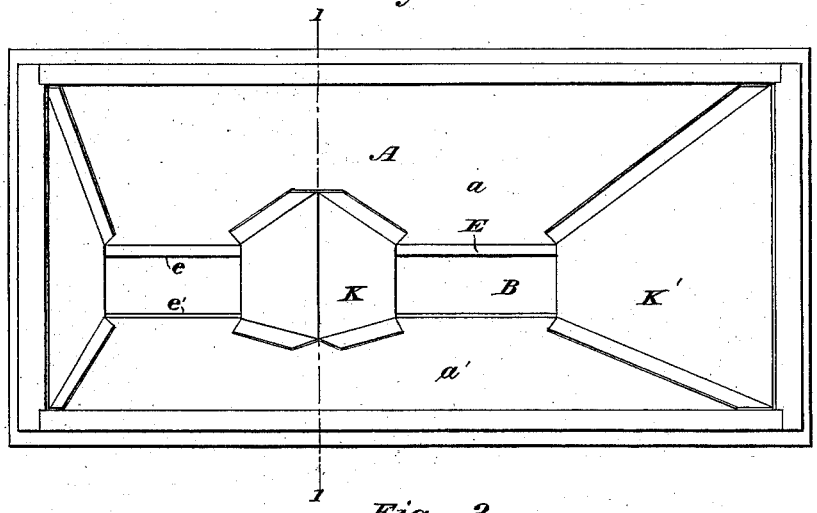
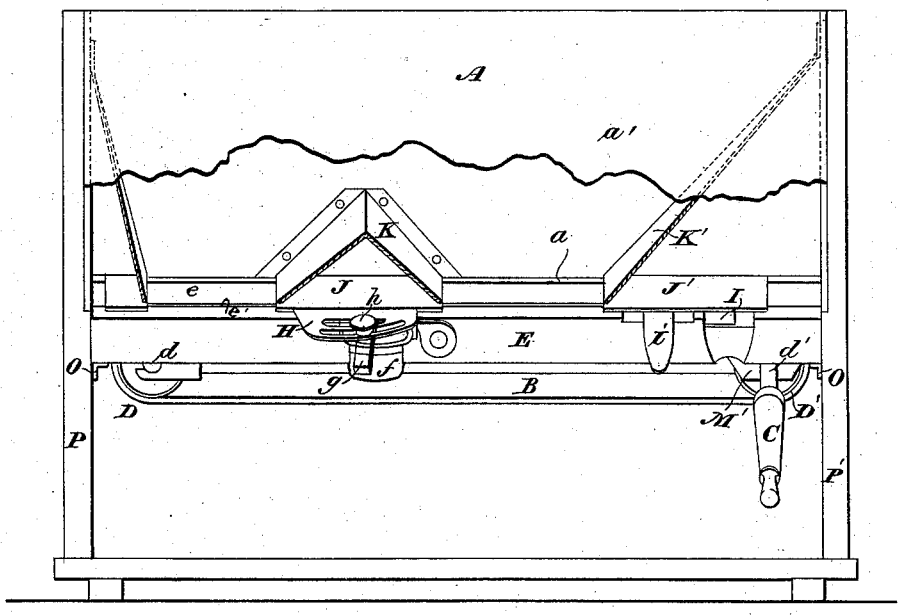


Fig 2.



WITNESSES

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F. Stich

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Fig 3.

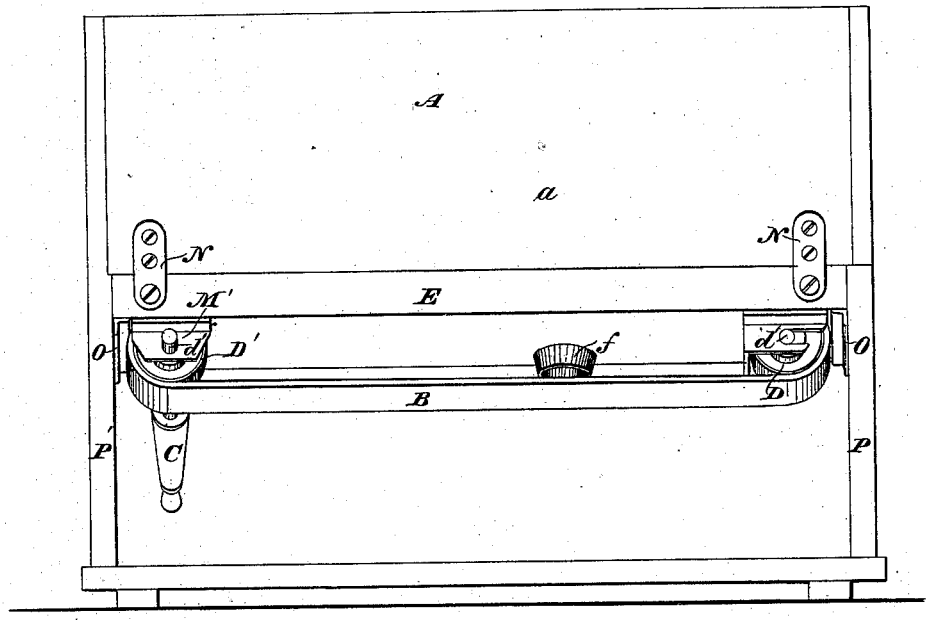

Fig 4.

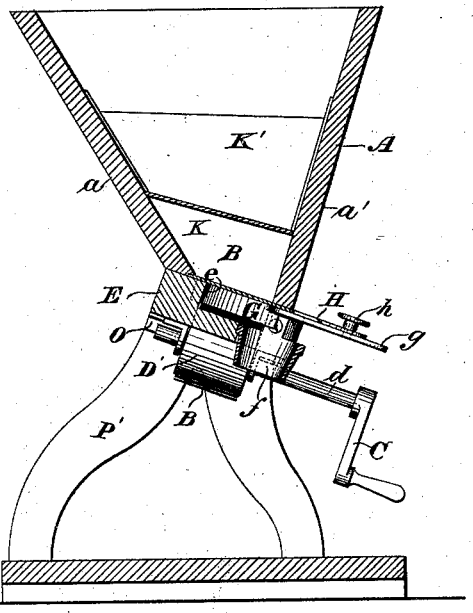

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Fig 5.

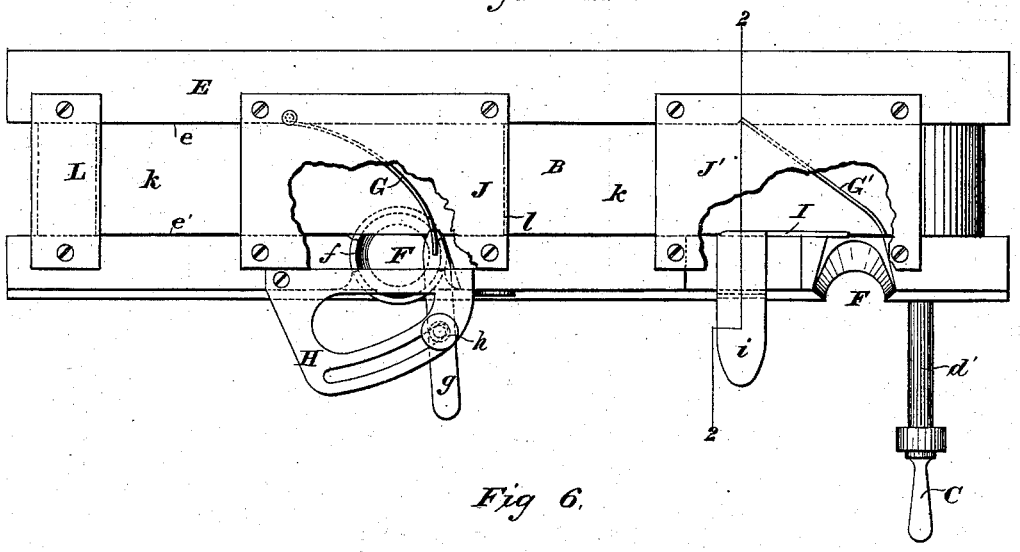


Fig 6.

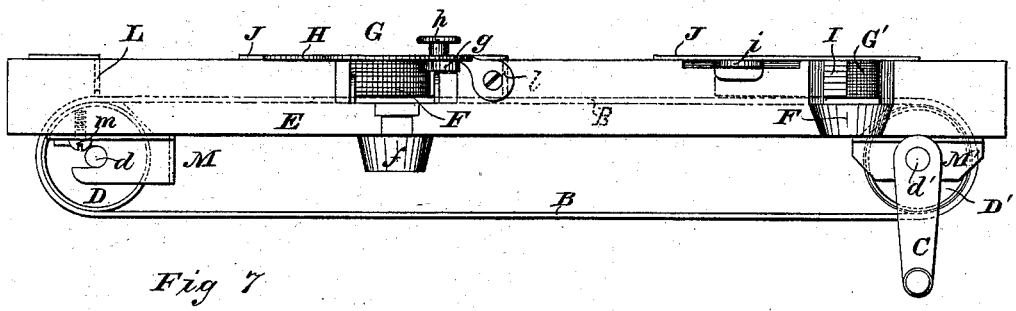


Fig 7

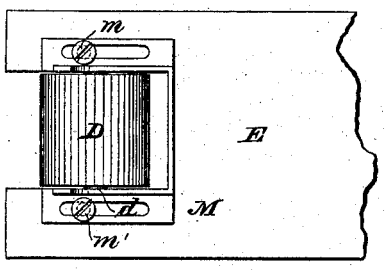
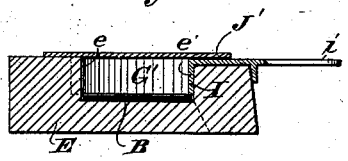


Fig 8.



WITNESSES

Wm A Skinkle

F. Stidl

INVENTOR

Alden. P. Steele.

By his Attorneys.

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UNITED STATES PATENT OFFICE.

ALDEN P. STEELE, OF SPRINGFIELD, OHIO, ASSIGNOR OF ONE-HALF HIS RIGHT TO ROBBINS & MYERS, OF SAME PLACE.

IMPROVEMENT IN SEEDING-MACHINES.

Specification forming part of Letters Patent No. **205,312**, dated June 25, 1878; application filed March 23, 1878.

To all whom it may concern:

Be it known that I, ALDEN P. STEELE, of Springfield, in the county of Clarke and State of Ohio, have invented certain new and useful Improvements in Seeding-Machines, of which the following is a specification:

My invention relates to machines of that class which are provided with endless feeding-belts or carriers.

My objects are to discharge the grain from the seed-box or hopper in steady streams and in regulated quantities; to prevent injury to the grain-carrier or feeding-belt and its attachments or co-operating parts by the warping, straining, or shrinking of the hopper; to facilitate the repairing and adjusting of the moving or working parts of the mechanism, and to improve the details of the machine. These ends I attain by the novel organization of mechanism hereinafter fully described.

The subject-matter claimed will hereinafter specifically be designated.

The accompanying drawings represent so much only of a portion of a fully-organized seeding-machine embodying all my improvements as is necessary to illustrate the subject-matter claimed. The invention will, of course, however, be used on a fully-organized seeder of approved well-known construction, which needs no description here. Some of my improvements obviously, however, may be used without the others, and in machines differing somewhat in their details of construction from that therein shown and herein described.

The drawings represent two grain-accumulating chambers and discharge-openings only of the seeder-hopper, with my improvements adapted thereto; but, in practice, a complete hopper will be, of course, employed, and is ordinarily provided with from three to twelve accumulating-compartments, each having the various parts for feeding, discharging, &c., adapted thereto in a manner similar to those shown; but as such parts would be mere duplications of those shown their representation is unnecessary to an understanding of the invention.

Figure 1 is a plan or top view. Fig. 2 is a rear elevation, with the hopper partly broken away to show the interior construction. Fig. 3 is a front elevation. Fig. 4 is a transverse vertical section on the line 1 1 of Fig. 1, showing the inclined feeding-belt or carrier, the deflector and regulator, and the seed-tube, into which the grain falls over the edge of the belt. Fig. 5 is a plan or top view of the removable hopper-bottom and the belt and other working parts carried thereby, detached from the hopper, with the plates covering the deflectors partly broken away. Fig. 6 is a view, in elevation, of the parts shown in Fig. 5. Fig. 7 is an inverted plan or under-side view of a portion of the detachable bottom, showing the means for securing in place and adjusting one of the belt-rollers to take up slack in the belt; and Fig. 8 is a section on the line 2 2 of Fig. 5, showing a fixed or permanent deflector and an independent regulator or seed-discharge-controlling slide.

A seed box or hopper, A, is constructed with sides *a a'*, preferably inclined, as usual. The rear side *a'* of the hopper projects below the front side *a*, (see Fig. 4,) thus giving an inclination or downward slope to the bottom from front to rear throughout the length of the hopper.

An inclined endless belt or apron, B, of a width corresponding to the distance apart of the sides of the hopper at the bottom, or of a width sufficient to close the space between the inner bottom edges of the sides, passes around pulleys or rollers D D' at the ends of and beneath the hopper. To give the desired inclination to the belt, these pulleys are mounted on inclined axles *d d'*, and one of them is rotated in any suitable manner to give motion to the belt. In the drawings, the shaft *d'* is shown, for the sake of illustration merely, as driven by a hand-crank, C.

As the feeding-belt or grain-carrier B is traversed longitudinally of the hopper, the tendency of the seed supported thereon is to pass down its sloping surface to the side of the hopper, and thus the current is concentrated at the lower edge of the belt, which in this instance is the rear edge. The discharge of the seed over the edge of the belt, as will presently be explained, is thus greatly facilitated.

To prevent injury to the feeding, regulating, and discharging mechanism from the warping, straining, or shrinkage of the hopper, they are

mounted upon a bottom, E, separate from the hopper, and capable of being readily secured thereto and removed therefrom. The belt-rollers are mounted upon this bottom, which is transversely inclined to correspond to the inclination of the belt, the upper portion of which moves in contact with it and is thereby prevented from sagging. The belt works in a longitudinal groove or recess in the bottom, the walls or uncut portions *e e'* of which form, when in place, continuations of the sides *a a'* of the hopper.

Seed-discharge openings F are provided in the bottom E, at the rear lower edge of the feeding-belt or seed-carrier B, through which openings the grain falls from the belt. These discharge-openings may conduct the grain directly into the upper ends of seed-tubes, which may be secured to the hopper-bottoms in proper positions in usual well-known ways, or the grain may fall directly from short tubes *f*, or upon a scatterer, as may be preferred.

To insure the proper delivery of the grain to the discharge openings or tubes, each opening is provided with a grain guide or deflector, G G', crossing the belt diagonally and touching, or nearly touching, its surface from side to side at their lower edges. The grain, as it is carried along by the belt, strikes the deflectors and is directed into the openings at the edge of the belt. These deflectors may be either curved or straight, and be either movable, to regulate the discharge, or stationary. Of the examples shown, one deflector, G, is curved, and hinged at one end to the bottom on one side of the central groove therein, and provided at its opposite end with an arm, *g*, by which it may be adjusted by means of a slotted bracket, H, and suitable retaining device *h*, to regulate or shut off the flow of grain. Both the bracket H and arm *g* project in rear of the hopper to facilitate adjustment, and the former is also secured to the detachable bottom E. The other deflector, G', is stationary, and is secured at its opposite ends to the front and rear walls *e e'* of the bottom. This deflector is straight throughout, except at its discharge or rear end, where it is slightly curved, to more readily guide the grain over the edge of the belt to the opening. In connection with the stationary deflector, an independent slide, I, operated by an arm, *i*, is employed to regulate the flow of the grain or cut off the discharge entirely.

To cover the deflectors and protect them from the mass of grain in the hopper, as well as to prevent the tendency of the grain to clog at the discharge edge of the apron by downward pressure, and thereby prevent an accurate side delivery of the grain to the discharge-openings or seed-tubes, plates J J' are secured upon the walls *e e'* of the bottom, or to the opposite sides of the hopper, over the deflectors. Inclines *k k'*, terminating at bottom at these covering-plates, serve to direct the grain to the belt at the accumulating spaces or chambers *k* between the protecting-plates, as well as to insure the perfect operation of the feeding devices when the hopper is partially empty, as is well understood. A sufficient space is left between the bottoms of the plates and the belt's surface to admit the grain freely beneath the plates at one end, and admit of its being readily carried against the deflector, and directed to the discharge-openings. Guards or stop-plates *l* prevent the grain entering beneath the opposite ends of the plates to the backs of the deflectors. Guards or cut-off plates L are secured between the walls *e e'* of the bottom, at the ends, so as to fill up the channel therein above the belt, and prevent the escape of grain at the ends of the hopper where the belt passes around the pulley. To compensate for wear and take up slack in the belt, the driven pulley D is journaled in a suitable sliding bearing, shown as consisting of an adjustable bracket, M, through slots in which set-screws *m m'* pass to secure the bracket in the desired position. The driving-pulley D' is mounted in a bracket, M', secured in suitable manner to the bottom. This pulley D' is preferably covered with leather, to prevent the belt slipping thereon. The removable bottom is secured in place by screws and clips N and end-supporting brackets O, or in any other suitable well-known way which will admit of the ready removal and attachment of the bottom. The brackets O are shown as secured in an inclined position upon the inner sides of the downwardly-projecting end pieces P P' of the hopper-frame, so that the bottom may be slid in and out in attaching or removing it.

From the foregoing description the operation of the machine will be readily understood. The feeding-belt is driven by power applied by means of suitable gearing connecting with the driving-pulley. The belt is preferably made of leather, and as the rough or flesh side acts upon the grain a regular feed is insured.

Obviously my improvements may be modified in some respects without departing from the spirit of my invention, as, for instance, by transversely corrugating the belt, or indenting or crimping it diagonally across its upper surface, to increase the friction or hold of the belt upon the grain; or any suitable flexible belt may be employed by enlarging vertically or increasing the depth of the space between the belt and covering-plate at and near the deflectors, thus making the area of the inlet for the grain less than the area of the central portion of the chamber formed between the bottom of the plate and upper surface of the belt, so as to prevent any possibility of carrying the grain to the deflectors in quantities too great to be readily deflected and discharged laterally into the openings.

It is also obvious that, instead of hinging or securing the deflectors upon the removable bottom, they may be secured to the sides of the hopper, as may also the covering-plates. A permanent bottom might be used; and it

is also manifest that a belt with a horizontal or level surface, instead of one transversely inclined, might be employed, in which event the lateral delivery of the grain would be due to the action of the deflectors; but I prefer the construction shown by the drawings and heretofore described.

I claim as my invention—

1. A continuous feed, consisting of an endless traversing belt, adapted to deliver the grain laterally over its edge, substantially as hereinbefore set forth.

2. An endless feeding-belt or grain-carrier, working longitudinally at the bottom of a seed-hopper, and transversely inclined, substantially as hereinbefore set forth.

3. The combination, substantially as hereinbefore set forth, of a seed box or hopper, an endless feeding-belt or carrier traversing the hopper-bottom longitudinally, and inclined driving and driven pulleys, around which the belt passes, outside of the hopper.

4. The combination, substantially as hereinbefore set forth, of a seed box or hopper, a transversely-inclined feeding-belt or grain-carrier working therein beneath the grain, and the hopper-bottom having a discharge-opening therein beneath the discharge edge of the belt.

5. The combination, substantially as hereinbefore set forth, of a seed box or hopper, an endless feeding-belt or grain-carrier working therethrough, and a deflector, to which the grain is fed, and by which it is directed to the edge of the belt.

6. The combination, substantially as hereinbefore set forth, of a seed box or hopper, an endless transversely-inclined feeding-belt or grain-carrier working therethrough, and a deflector to which the grain is fed and by which it is directed to the edge of the belt.

7. The combination, substantially as hereinbefore set forth, of a seed box or hopper, an endless transversely-inclined feeding-belt or grain-carrier working therethrough, a deflector crossing said belt, and a side-discharge tube or opening, to which the grain is directed and through which it passes from the lower edge of the belt.

8. The combination, substantially as hereinbefore set forth, of a seed box or hopper, an endless feeding-belt or grain-carrier working beneath the grain and between the opposite sides or walls of the hopper, a deflector which directs the grain crosswise of the belt, and a regulator for controlling the discharge of the grain.

9. The combination, substantially as hereinbefore set forth, of a seed box or hopper, a transversely-inclined endless feeding-belt or grain-carrier working endwise of the hopper, the hopper-bottom having grain-discharge openings at the lower edge of the belt or carrier, a deflector crossing said belt diagonally, and a seed-discharge regulator and cut-off.

10. The combination, substantially as hereinbefore set forth, of a seed box or hopper, a laterally-discharging endless feeding-belt or grain-carrier working at the bottom thereof, a deflector for directing the grain crosswise of the belt, and a covering-plate to separate the deflector from the mass of grain in the hopper.

11. The combination, substantially as hereinbefore set forth, of a seed box or hopper, a transversely-inclined laterally-discharging endless feeding-belt or grain-carrier working longitudinally and at the bottom of the hopper, the hopper-bottom having a discharge-opening at the lower edge of the belt, and a protecting-plate spanning the hopper above the deflector and discharge-opening.

12. The combination, substantially as hereinbefore set forth, of a seed box or hopper having front and rear sides terminating at their lower edges in different horizontal planes, an inclined detachable hopper-bottom, and an endless feeding-belt carried thereby.

In testimony whereof I have hereunto subscribed my name.

ALDEN P. STEELE.

Witnesses:
WALTER L. WEAVER,
OSCAR T. MARTIN,
DAVID MOFFATT.