(No Model.) 2 Sheets—Sheet 1.

H. E. DODSON.

SEEDING MACHINE.

No. 558,363. Patented Apr. 14, 1896.

Fig. 2.

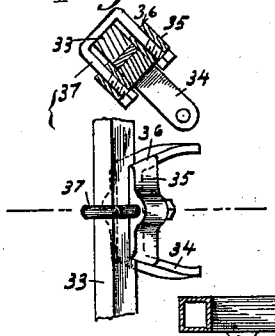


Fig. 1.

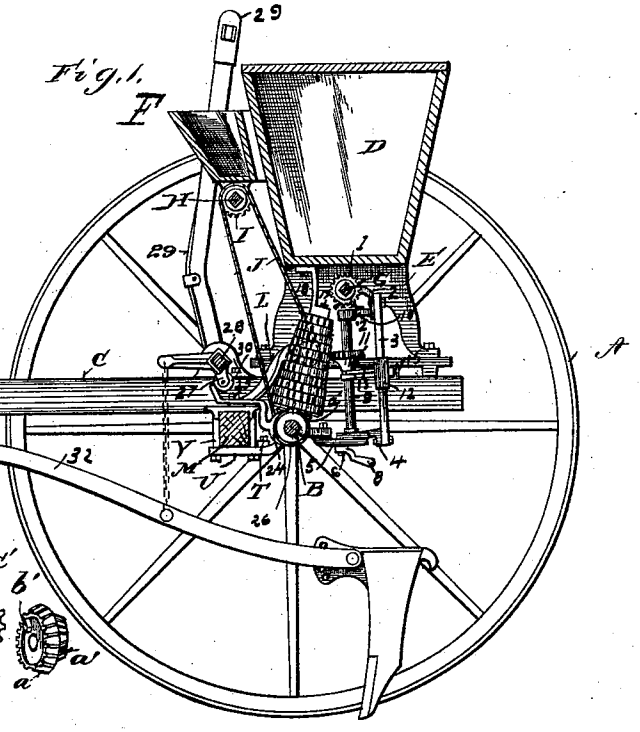
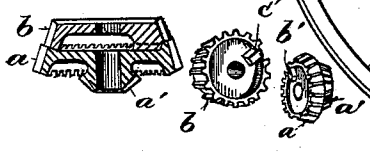


Fig. 3.



Witnesses
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 7.

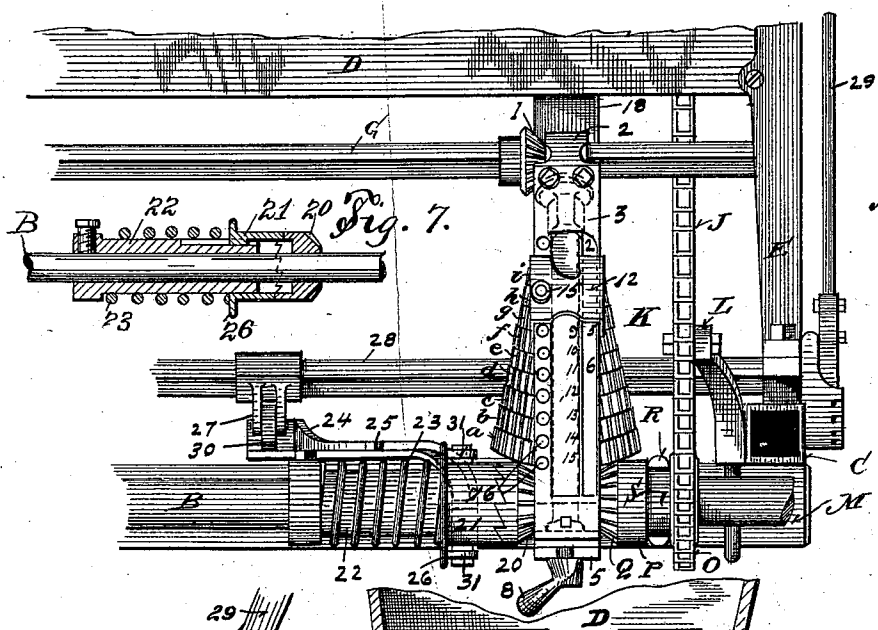

Fig. 4.

Fig. 5

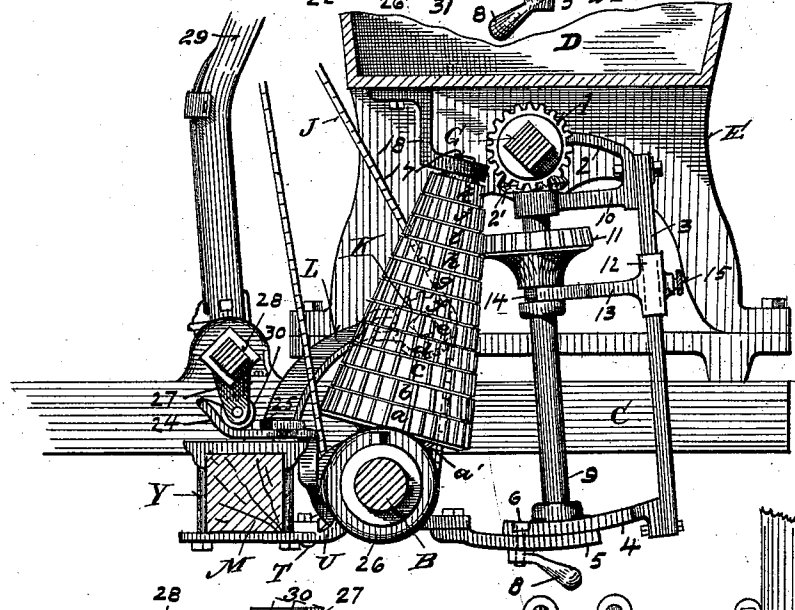

Fig. 6.

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UNITED STATES PATENT OFFICE.

HARRY E. DODSON, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE P. P. MAST & COMPANY, OF SAME PLACE.

SEEDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 558,363, dated April 14, 1896.

Application filed July 18, 1895. Serial No. 556,309. (No model.)

To all whom it may concern:

Be it known that I, HARRY E. DODSON, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Seeding-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in seeding-machines, especially machines for drilling wheat, oats, and barley and sowing grass-seed.

The object of the present invention is to provide a speed changing or varying mechanism by which the rotary motion is conducted from the axle of the machine to the driving-shaft of the seeding mechanism, whereby the speed of the latter shaft may be varied according to the kind of grain to be sown or drilled and according to the quantity that it is desired to plant per acre. This speed-changing mechanism consists, essentially, of a series of gear-wheels, each of a different diameter from every other and arranged in a nest or cone, all of which are so interconnected that rotary motion received by one from the main axle is transmitted to the others, and of a shaft geared to the feed-shaft of the machine and carrying a gear-wheel adapted to be adjusted to mesh with either of said cone or nest gears to receive rotary motion therefrom at a degree of speed varying with the diameter of the nest or cone gear with which it is in mesh.

The invention further consists of details hereinafter fully described.

In the accompanying drawings, on which like reference letters and numerals indicate corresponding parts, Figure 1 is a partial sectional view and side elevation of a grain-drill embodying my invention; Fig. 2, detail sectional and plan views of the coupling for the hoe-beams; Fig. 3, a sectional and perspective view of several of the nest or cone gears; Fig. 4, a rear elevation of the machine and speed-changing mechanism; Fig. 5, a side elevation of such mechanism and the adjacent parts of the machine, on a larger scale; Fig. 6, a plan view of parts of the devices entering into said mechanism and of a part of the frame, and Fig. 7 a detail view of the main axle and clutch mechanism in section.

There is nothing peculiar about the machine generally, and the drawings show so much of an ordinary grain-drill as is necessary to illustrate my several improvements. In the usual ground-wheels, one of which is shown at A, is mounted the axle B and adapted to be rotated by the wheels in the usual manner. A frame C is mounted on the axle, and a grain-hopper D is carried by the frame on standards E, while a grass-seed hopper F is supported by the hopper D. Each of these hoppers in practice has any approved type of feed mechanism operated by the respective shafts G and H. The shaft H has a sprocket-pinion I, driven by a sprocket-chain J, running over a tightening-pulley K, adjustably secured in an arm L, fixed to the cross-beam M of the main frame. The chain J thence passes around a driving sprocket-wheel O, loosely mounted on the axle B and having an elongated hub P formed into a bevel-pinion Q, which receives motion from the lower of the nest or cone gears. An arm R is bifurcated to fit into a groove S of the hub P and is adjustably secured, as shown at T, to a bracket U, fastened by a clip V to the cross-beam M. By adjusting the arm R the beveled pinion Q is thrown in and out of engagement with the gear-wheel from which it receives motion, so that the grass-seeder may be operated or not, as desired.

Referring now to the change-gear mechanism for imparting the variable speed to the feed-shaft G, it will be seen that I mount on said shaft G an arm 2, to which I attach a plate 3, carrying an arm 4 at its lower end, overlapping an arm 5 attached to the rear end of the bracket U. The arms 4 and 5 are clamped together by a bolt 6, carried by the arm 4 and passing through a slot 7 in the arm 5 and provided with a hand-nut 8. Thus the lower end of the plate 3 is adjustable back and forth, the arm 2 swinging on the shaft G for this purpose. A driving-shaft 9 is mounted in the arm 4 and in an arm 10, secured to the plate 3, and on this shaft is a bevel-pinion 2′, meshing with a pinion 1, and a bevel driving-pinion 11, adjustable up and

down on the shaft and held by a slide 12 on the plate 3, having a projection 13, bifurcated to fit a groove 14 in this pinion-hub, and provided with a screw 15, adapted to enter either of the series of holes 16 in the plate 3. This plate has three scales indicated thereon, one for barley, one for oats, and one for wheat, and the slide 12 is set by one or the other of these scales, according to whether barley or oats or wheat is being planted, to regulate the quantity which the feed mechanism will feed, such adjustment of the slide 12 also adjusting the pinion 11 to a larger or smaller gear-wheel of the cone or nest of gears, whereby the speed is varied.

A shaft 17 is mounted in a bracket 18 at one end and at the other end in a step 19 in the bracket U. On this shaft I fix the lower gear-wheel *a* of the nest or cone of gears, having formed with it a beveled pinion *a'*, which imparts motion to the bevel-pinion Q, before referred to, and which receives motion from a bevel clutch-pinion 20, loosely mounted on the axle B. The remainder of the cone or nest consists of gears *b c d e f g h i j k*, gradually lessening in size, and each provided with a lug *b' c'*, so that rotary motion is imparted from one to the other, the lower gear *a* being fixed to the shaft 17, and the motion is thus transferred from one gear to the other by the engagement of the lug *b'* of each gear with a lug *c'* of each gear. The teeth of the respective gears are not always in the same line, because this is not necessary in practice, nor do the peripheries of the several gears all taper to the same degree, as it is found in practice that the pinion 11 will mesh with the gears more satisfactorily when the gears form steps on their periphery, as shown in the drawings. These last two considerations are matters of detail, however. Thus it will be understood that by swinging the shaft 9 to and from the nest of gears and adjusting the pinion 11 up or down it may be made to mesh with one or the other of the gears and to receive a speed agreeing with the size of gear with which it meshes, thus varying the speed imparted to the feed-shaft G. The means for driving these gears consists of the beveled pinion 20, before referred to, and the clutch 21, keyed to rotate with a fixed sleeve 22, but capable of sliding thereon to engage or disengage with the clutch of the pinion 20. A spring 23 maintains the clutch connection, and a lever 24, pivoted to the beam M at 25, engages the flange 26 of the clutch 21 when operated by the projection 27 on the rock-shaft 28, which is controlled by a hand-lever 29. An antifriction-roller 30 is carried by the projection 27, and antifriction-rollers 31 are carried by the lever 24. Thus the clutch 21 may be disengaged from the pinion-clutch 20, so that the shaft B may or may not rotate the pinion 20 and hence the nest of gears.

It will be seen that the axis of the series of cone of gears and the axis of the driving-shaft are oblique to each other. It will be remembered also that this shaft is adjustable to and from the gears. By placing these axes in an oblique relation as distinguished from a right angle or parallel position additional pinions and an additional shaft are avoided, and the pinion on this driving-shaft is made adjustable to mesh with any of the gear-wheels. Thus directness and simplicity of construction are gained by this relation of said axes, with the resulting economy in cost, reduction in friction, and lessening in the number of the parts subject to wear and breakage.

I will now refer to an improved coupling for connecting the hoe-beams 32 to the draft-bar 33. This coupling consists of a yoke 34, fitted against the bar 33, and of a block 35, fitted within the yoke and having edges 36 extending over the yoke at both sides and lapping over the beam 33 and held by a clip 37, whereby a strong but simple coupling is constituted. The hoe-beam is bifurcated at its forward end and pivoted to the yoke 34. By loosening up the clip 37 the coupling with the beam can be adjusted laterally to any desired point on the bar 33.

While I have shown the lugs *b'* and *c'* as the means for interconnecting or interlocking the several gear-wheels *a b c*, it will be understood that any means for transferring the rotary motion from that one of these gear-wheels which is operated from the main axle to the others will answer the purpose and be included in the terms "interconnecting" or "interlocking."

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a grain-drill, the combination with the main axle and the feed-shaft, of a cone of gears receiving motion from the said axle, and a driving-shaft transmitting motion to said feed-shaft, the axes of the cone and driving-shaft being oblique to each other, the driving-shaft being also adjustable to and from the cone, and a slidable pinion meshing with the cone and mounted on the driving-shaft.

2. In a grain-drill, the combination with the main axle and the feed-shaft, of intermediate speed mechanism consisting of a series of interconnected gear-wheels graduated in diameter, and receiving motion from the main axle, of a driving-shaft geared to the feed-shaft, and a pinion on the driving-shaft, the axes of the interconnecting gears and the driving-shaft being oblique to each other, the driving-shaft adjustable to and from the gears and the pinion slidable on the shaft, whereby the pinion may mesh with either of said gear-wheels.

3. In a grain-drill, the combination with a feed-shaft and the main axle, a pinion on said axle, a clutch on said axle adapted to clutch said pinion, of intermediate speed mechanism consisting of a nest or series of interconnected graduated gear-wheels, one of which meshes with said pinion, a driving-shaft geared to the feed-shaft and having a swinging adjust-

ment to and from the gear-wheels, a slidable pinion on the driving-shaft, and means to adjust it into mesh with either of said gear-wheels.

4. In a grain-drill, the combination with a feed-shaft and the main axle, a pinion thereon, and a clutch to clutch the pinion to the axle, of intermediate speed mechanism consisting of a series of interconnected graduated gear-wheels, a pinion on one of them meshing with a pinion on the axle, a driving-shaft hung on an arm at one end and adjustable to and from the axle, and geared to the feed-shaft, a slidable pinion on the driving-shaft, and means to adjust and hold it in mesh with either of said gear-wheels.

5. In a grain-drill, the combination with two feed-shafts and the main axle, two pinions on said axle and a clutch to clutch one of them thereto, of a nest or series of interconnected graduated gear-wheels, a pinion on one of them meshing with the pinions on said axle, a sprocket-chain connecting one of the latter pinions and one of the feed-shafts, a driving-shaft geared to the other feed-shaft and a slidable pinion on the driving-shaft adapted to mesh with either of said gear-wheels.

6. In a grain-drill, a speed-changing mechanism consisting of a series of graduated interconnected gear-wheels, and a driving-shaft adjustable to and from said gear-wheels, the axes of the gear-wheels and the driving-shaft being oblique to each other, and a pinion on said shaft adapted to mesh with either of said gear-wheels, such adaptability being effected by the double adjustment of the shaft-axis relatively to the gear-wheels' axis and the longitudinal adjustment of the pinion on the driving-shaft.

7. In a grain-drill, the combination with a feed-shaft and the main axle, of a series of interconnected graduated gear-wheels, a pinion on one of them and a pinion on said axle which pinions intermesh, a plate hung from said feed-shaft and secured by overlapping adjustable arms, a plurality of scales on said plate, a slide fitted to the plate and adapted to be adjusted to the respective scales, the driving-shaft geared to the feed-shaft and supported by said plate, a slidable pinion on said shaft connected to the slide on the plate and adapted to mesh with either of said gear-wheels.

8. In a grain-drill, the combination with a feed-shaft having a pinion, a plate hung from said shaft and having adjustable securing-arms, a slide on said plate, a driving-shaft supported by said plate and having a pinion meshing with the feed-shaft pinion, and a slidable pinion connected with said slide, the main axle having a clutch and pinion thereon, a bracket on said axle, a shaft stepped in said bracket and supported at its other end, a series of graduated interconnected gear-wheels on said latter shaft with either of which the slidable pinion may mesh.

9. In a grain-drill, the combination with a shaft, of a series or nest of graduated gear-wheels mounted thereon, and lugs on said wheels each arranged so that all of the gears are thereby interconnected so that rotary motion applied to the first of the series will be transmitted to any of the others.

10. In a grain-drill the combination with the drag-bar and hoe-beam, of a coupling consisting of a yoke fitted to the bar and a block fitted to the yoke, and a clip connecting the block to the bar, the beam being pivoted to the yoke.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY E. DODSON.

Witnesses:
C. C. KIRKPATRICK,
J. W. SPAHR.