

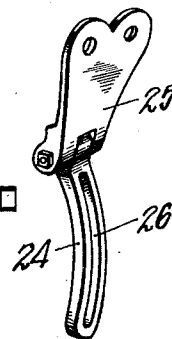
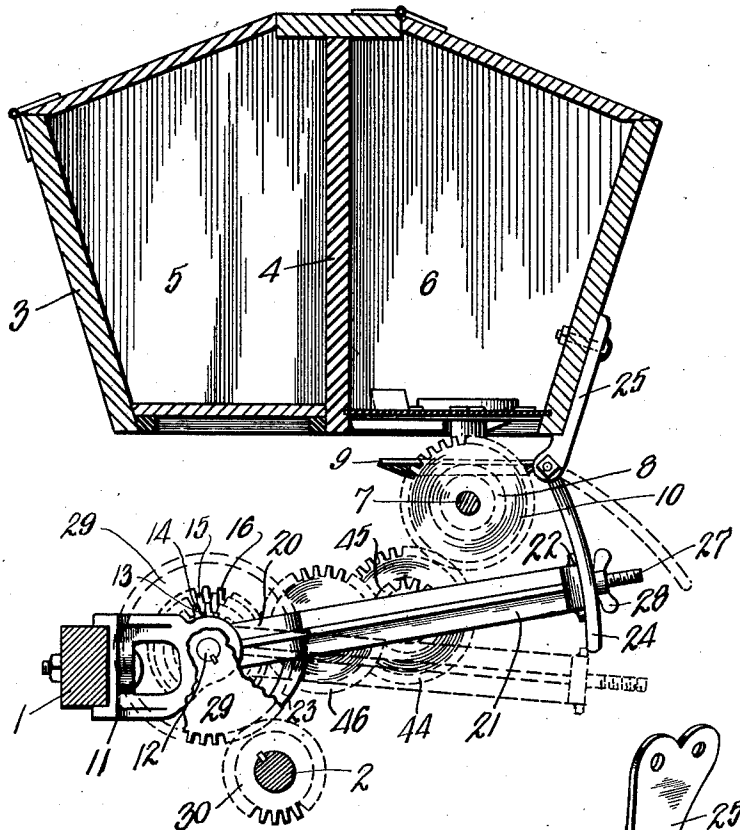
L. E. ROBY.
GEARING.

APPLICATION FILED OCT. 7, 1907.

1,002,868.

Patented Sept. 12, 1911.

4 SHEETS—SHEET 1.



Witnesses:
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Lavin L. Fuller

Inventor:
Luther E. Roby
By Chas. H. LaPointe Att'y

L. E. ROBY.

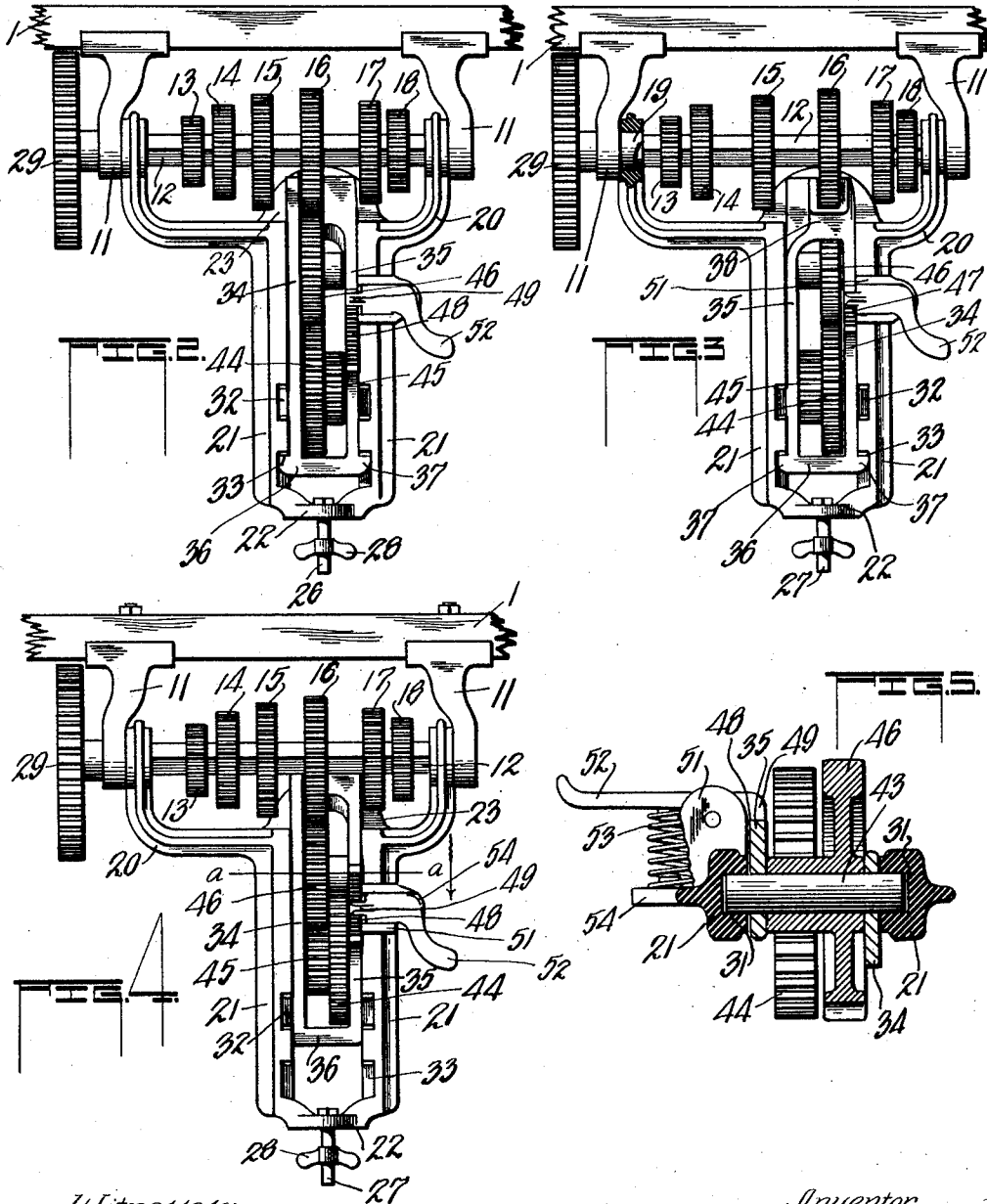
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4 SHEETS-SHEET 2.



Witnesses:

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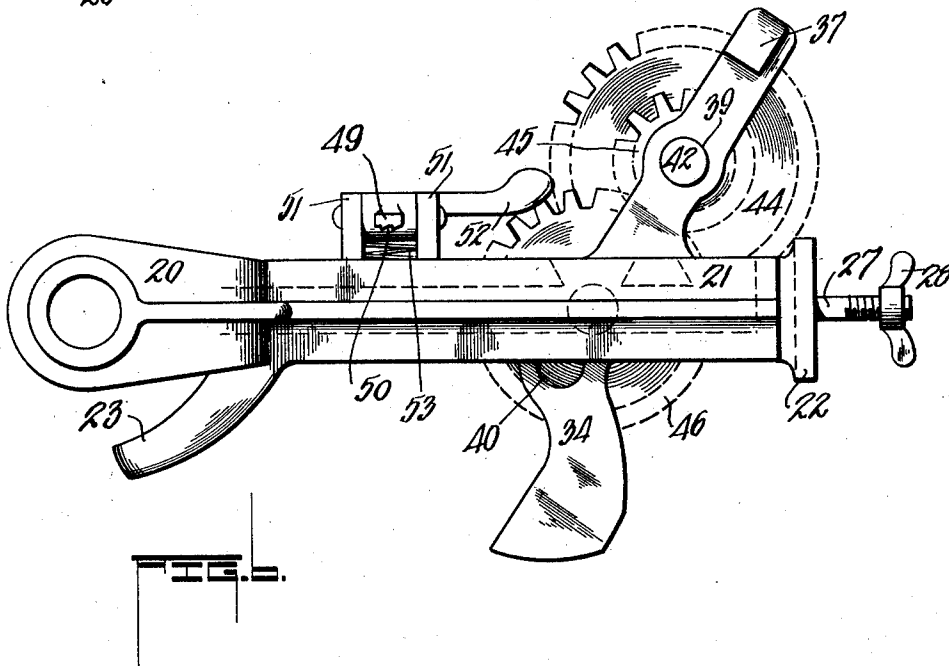
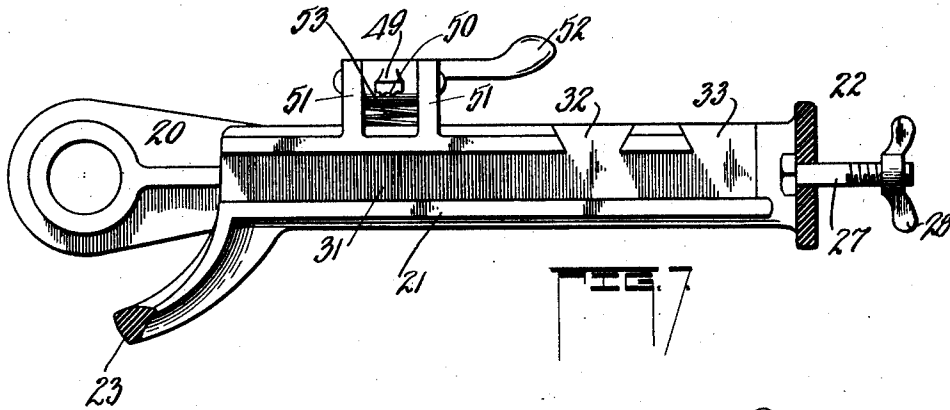
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4 SHEETS—SHEET 3.

1,002,868.



Witnesses:
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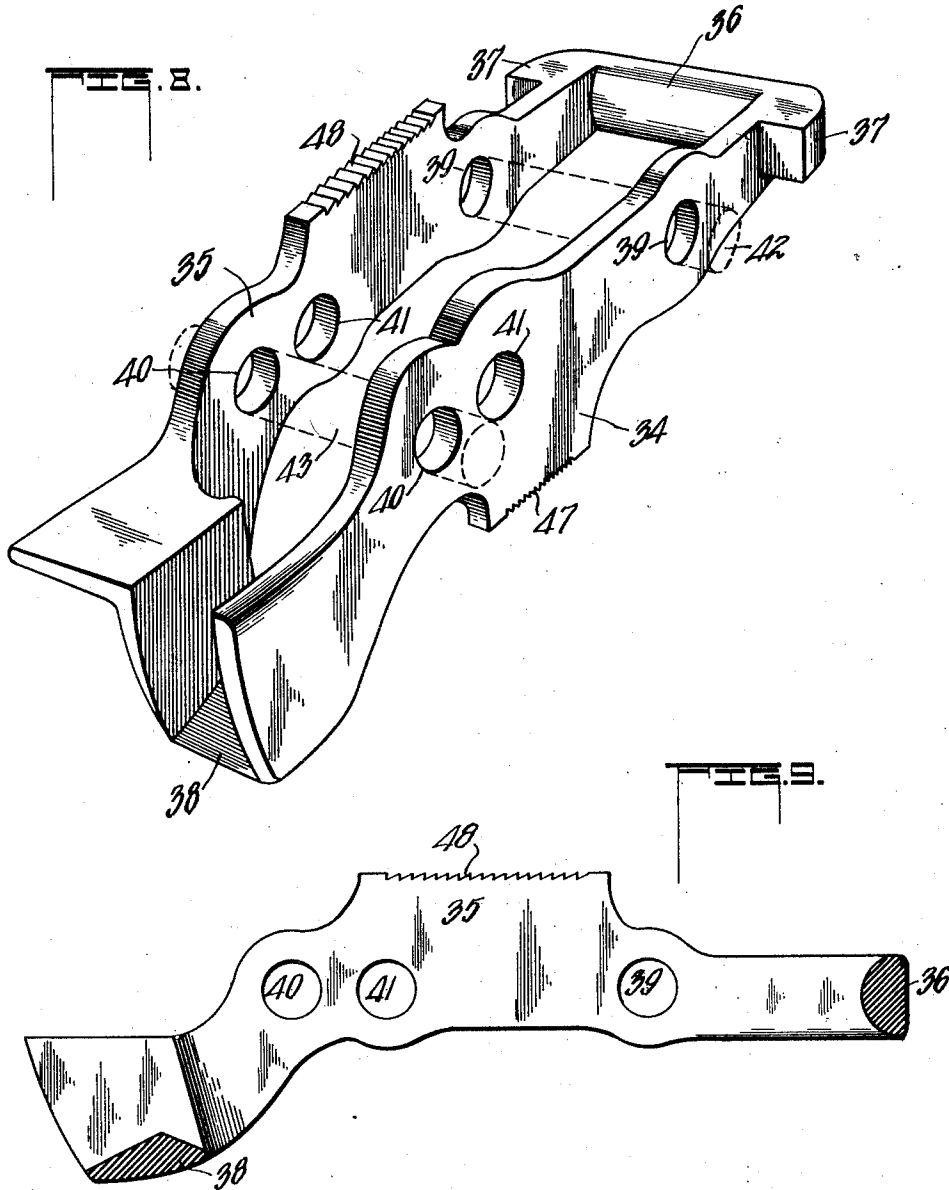
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1,002.868.

L. E. ROBY.
GEARING.
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Patented Sept. 12, 1911.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

LUTHER E. ROBY, OF PEORIA, ILLINOIS.

GEARING.

1,002,868.

Specification of Letters Patent.

Patented Sept. 12, 1911.

Application filed October 7, 1907. Serial No. 396,206.

To all whom it may concern:

Be it known that I, LUTHER E. ROBY, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Gearing; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference to certain new and useful improvements in changeable speed gearing capable of being connected up with the driving shaft or axle of a grain drill for transmitting motion from said shaft or axle to the feeding devices of the hopper of the drill, but more particularly to the fertilizer distributing devices, whereby the relative speed of said devices may be varied.

For a further and full description of the invention herein and the merits thereof, and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which:—

Figure 1 is an elevation in cross section of the hopper of a grain drill and showing the application of the devices embodying my invention applied thereto, for the purpose of transmitting motion from the driving shaft or axle to the fertilizer distributing devices; Fig. 2 is a plan view of two groups of gearing and an interposed idler, one group of which is carried by a counter-shaft, the other group and idler interchangeably and detachably carried in a slide supported by a bracket or hanger; the position of the gearing is such as to transmit a slow speed from the driving shaft or axle through the countershaft to the fertilizer distributing devices; Fig. 3 is a plan of substantially the same elements as are shown in Fig. 2, with the exception that the slide has been reversed, which imparts a medium speed from the driving shaft or axle through the countershaft to the fertilizer distributing

devices; Fig. 4 is a plan of substantially the same elements as are shown in Figs. 2 and 3, with the exception that the slide is in the position shown in Fig. 2, and the gears journaled therein, have been transposed for the purpose of imparting fast speed from the driving shaft or axle through the countershaft to the fertilizer distributing devices; Fig. 5 is an enlarged cross section as the same would appear if taken on the line *a—*a**, of Fig. 4, and looking in the direction of the arrow shown on said figure; Fig. 6 is a side elevation of the bracket or hanger supporting the slide, in which is journaled certain of the gearing, and the slide is shown in the position it should assume when the same is in the act of being placed in the bracket or hanger; Fig. 7 is a vertical longitudinal section through the bracket or hanger, with the slide removed; Fig. 8 is a perspective of the slide, the spindles which support the gearing therein, being shown in dotted lines in said slide; Fig. 9 is a vertical longitudinal section through the slide, and Fig. 10 is a perspective of a bracket and swinging arm, to the latter may be adjustably secured the bracket or hanger, as shown in Fig. 1.

Like numerals of reference indicate corresponding parts throughout the figures.

In the drawings, 1 denotes a cross bar, which, in a grain drill, is that bar which is disposed directly in front and above the axle or shaft which is indicated as 2, and which, at its opposite ends, is connected to the side frames, from which is supported the means for sustaining the combination grain and fertilizer hopper, which is indicated as 3; the hopper being divided by a central partition 4 forming the chambers 5 and 6, the former to receive the grain, and the latter, the fertilizer.

I have omitted in the main figure, all features which I consider not essential to show the application of my improvements to a drill, such as the entire frame, the means for supporting the hopper, the ground wheels, disk, shoes or other parts, as they form no part of the invention, except as they are associated with a complete drill to coöperate with the invention herein shown, to complete and make a perfect drill.

Extending longitudinally beneath the hopper, is a feed shaft 7, which may be

journaled in suitable supports depending from the hopper or in the means for sustaining the same, and on said shaft is carried a plurality of beveled wheels 8, although only one is shown, and such wheels are in mesh with beveled wheels 9 for transmitting motion from the shaft 7 to suitable feeding devices in the bottom of that portion of the hopper containing the fertilizer.

And at a suitable point on the shaft 7, I attach or secure, preferably, a spur gear wheel 10, which receives power in a manner to be described, through a train of gearing interposed between said shaft and the drive-shaft or axle 2, for imparting motion to the distributing devices in that portion of the hopper containing the fertilizer, through the beveled wheels 8 and 9.

Secured to the rear face of the bar 1 and projecting rearwardly therefrom, are brackets 11 which are suitably spaced apart, and in these brackets are journaled the opposite ends of a countershaft 12, that portion of the shaft intermediate the brackets 11, being squared as shown in Figs. 2, 3 and 4, on which is slidably carried a plurality of spur gears 13, 14, 15, 16, 17 and 18. The brackets 11 have the extended hub portions 19, best seen in Fig. 3, which form a bearing, on which are journaled or hung the bifurcated ends 20 of a bracket consisting of the parallel frame parts 21, which are suitably spaced apart, connected at their outer ends by the cross head 22, and at their inner ends by the yoke 23. The outer end of this bracket or hanger is adjustably supported in connection with a swinging arm 24, which is pivotally connected at its upper end, with a bracket 25, suitably secured to the hopper 3, and said swinging arm is provided with a longitudinal slot 26, through which may be inserted a threaded stem or bolt 27, connected with the cross head 22 of the bracket or hanger, and a winged nut 28, which has a threaded connection with the stem or bolt 27, is employed for locking the bracket or hanger in adjustable relation with the swinging arm 24, and when said winged nut is removed from said stem or bolt, the swinging arm may be swung up into a position substantially as shown in dotted lines in Fig. 1, which will allow the bracket or hanger to be dropped into the position shown in dotted lines in Fig. 1, or down upon the axle or shaft 2, for purposes to be described.

For transmitting motion from the shaft or axle 2, to the countershaft 12, there is secured on one end of said countershaft, outside of one of the brackets 11, a spur gear wheel 29 which is in constant mesh with a spur pinion 30, suitably carried on the shaft or axle 2, best seen in Fig. 1.

From an examination of Figs. 5 and 7, it will be observed that the parallel frame parts

21 of the bracket or hanger, are each provided with a longitudinal channel 31, extending approximately their full length, and communicating with said channels, are the open ways or cut-out portions 32 and 33, in the upper faces or overlying portions of the channels of said parallel frame parts, for a purpose to be described. Having a slidable, as well as a detachable and interchangeable connection with said bracket or hanger, is a slide composed of the parallel frame parts 34 and 35, connected at one end by the cross head 36, which projects beyond the opposite sides of the frame parts 34 and 35, to form the lugs 37, while the opposite ends of said side frame parts are connected by what I shall term a fork 38. Said side frames 34 and 35 of the slide, are each provided with the openings 39, near the ends thereof, which are connected by the cross head 36, and with the openings 40 and 41 in proximity to each other, near their opposite ends. In the openings 39, is adapted to be journaled the opposite ends of a cross shaft or spindle 42, which projects through said openings on the opposite sides of said side frames, and a shaft or spindle 43, which is similar to the shaft or spindle 42, is adapted to be journaled in either of the openings 40 or 41, and to project through the same. On the shaft or spindle 42, is carried a compound gear consisting of the spur gear wheel 44 and the spur pinion 45, which are preferably cast integral, and on the shaft or spindle 43, is carried the spur gear wheel or idler 46, which, when the shaft or spindle 43 is journaled in the openings 40 of the side frame of the slide, is adapted to intermesh with the spur gear 44, but when said shaft or spindle 43 is journaled in the openings 41 of the side frames of said slide, the spur gear 46 is adapted to intermesh with the spur pinion 45. Thus the position of the shaft or spindle 43 in the slide, is governed by the connection desired between the spur gear 46 and the spur gear and pinion 44 and 45. The slide is adapted to be inserted into and between the parallel frame parts 21 of the bracket or hanger, somewhat in the manner seen in Fig. 6, by passing the projecting ends of the shaft or spindle 43 down through the open ways 32, and then into the channel ways 31, and sliding the slide longitudinally in the bracket or hanger between the side frame parts thereof, will bring the projecting ends of the shaft or spindle 42, into position to be also inserted through the open ways 32 in the side frame parts 21, and then into the channels 31 thereof, and the lugs 37 of said slide, will pass down through the open ways 33 and into the channel ways formed in the side frame parts 21, or into that position shown in either Figs. 2, 3 or 4. The side frame 34 on its lower edge, and for a portion of

its length, is serrated or notched as at 47, and the side frame 35 on its upper edge and for a portion of its length, is serrated or notched as at 48. After the slide has been placed in the bracket or hanger, in the manner above described, and properly adjusted therein, it may be locked by a pawl 49, having a serrated or notched engaging portion 50, and which is pivotally mounted between a pair of ears 51, attached to or forming a part of one of the parallel frame parts 21 of the bracket or hanger. This pawl is provided with a finger hold 52, by means of which the pawl may be released from the serrations or notches of the slide to allow the same to be removed from the bracket or hanger, and a spring 53 interposed between the finger hold and an ear extension 54 of the bracket or hanger, yieldingly holds the pawl in engagement with the serrations or notches of the slide. Providing the side frames of the slide, with serrations or notches above and below, permits the reversal of the slide from the position shown in Fig. 2, to that position shown in Fig. 3, and when so reversed, may be locked in the manner shown. The position of the slide in the hanger or bracket is governed largely by the connection desired between the counter-shaft 12 and the shaft or spindle 43, and between the shaft or spindle 43 and the shaft or spindle 42. In other words, with the mechanism which I have shown, I am enabled to make approximately eighteen different changes in the drive between the axle or shaft 2 and the fertilizer operating shaft 7, and through such changes, approximately eighteen different gradually increasing quantities of fertilizer may be sown.

In Fig. 2, the shaft or spindle 43 supporting the spur gear 46, is journaled in the openings 40 in the side frames of the slide, and when so arranged, said spur gear is in mesh with the spur gear 44 on the shaft or spindle 42; the spur gear 44 with its spur pinion 45, being disposed with the spur pinion adjacent to the side frame 35 of the slide. With this arrangement, the spur pinion 45, is in mesh with the spur gear 10 on the fertilizer shaft 7, and several variations of speed may be imparted through said spur pinion to the spur gear on the fertilizer shaft, by connecting up any one of the spur gears 13, 14, 15, 16, 17 and 18, with the spur gear 46. In Fig. 2, the spur gear 16 is shown in mesh with the spur gear 46, and it is positioned to intermesh with said spur gear by withdrawing the slide in the bracket or hanger, and sliding the gears on the countershaft 12 until said spur gear 16 is in alinement with the spur gears 44 and 46 of the slide, when the slide is shoved forward until the spur gear 16 is within the yoke 38 of the slide, and in mesh with the spur gear 46, as shown; the yoke serving to

retain the spur gear on the counter-shaft, in position thereon, to intermesh with the gear in the slide. Thus it will be understood that with the arrangement of the gears of the slide, as they are shown in Fig. 2, six different changes may be made in the drive between the shaft or axle 2 and said fertilizer shaft 7, and is considered as the slow speed.

In Fig. 3, the gears in the slide, are positioned substantially as they are in Fig. 2, with the exception that the slide has been removed, and its position in the bracket or hanger, is reversed, or in other words, has been put in the bracket or hanger up side down, which places the spur gear 44, which is adjacent to the side frame 34 of the slide, in mesh with the spur gear 10 of the fertilizer shaft 7, and in mesh with the spur gear 46 of the shaft or spindle 43, which remains journaled in the openings 40 of the slide, is seen the spur gear 16 of the countershaft 12. With this arrangement, I impart what I term a medium speed from the shaft or axle 2, to the fertilizer shaft 7, or in other words, by the arrangement as shown in Fig. 3, I can obtain six additional changes or variations in the speed, from the arrangement shown in Fig. 2.

In Fig. 4, while the slide is right side up, or in that position in which it is shown in Fig. 2, the spur gears 44 and 45 have been reversed from the position in which they are shown in Fig. 2, and are in that position shown in Fig. 3, except that the spur gear 44 is adjacent to the side frame 35 of the slide, and the shaft or spindle 43 carrying the spur gear 46, has been removed and is shown journaled in the openings 41 of the side frames of the slide, which causes the gear 46 to intermesh with the spur pinion 45, on the shaft or spindle 42. With this arrangement, I aim to impart a fast speed from the shaft or axle 2 to the fertilizer shaft 7, as the spur gear 44 is intended to mesh with the spur gear 10, on the fertilizer shaft 7, and six further changes may be made in the speed between the shaft or axle 2 and the fertilizer shaft 7, than is accomplished in the arrangement of the gearing, as the same is shown in Fig. 3; the adjustment of the spur gears on the countershaft, is the same in Figs. 3 and 4, as was described in connection with Fig. 2.

To make a change of speed in any one of the two groups of gears or the idler gear, as the same are shown in either Figs. 2, 3 or 4, when the bracket or hanger is connected up with the swinging arm 24, in the manner seen in Fig. 1, the winged nut 28 is released sufficiently to allow the bracket or hanger to drop to the bottom of the slot in said swinging arm, when the slide may be pulled toward the operator, and the desired spur gear on the counter-shaft set into position

so that it will come in the fork in the end of the slide and be brought into mesh with the idler gear 46, when the slide has been moved forwardly into position to cause the inter-

5 meshing of such gears.

To change the compound gear or the idler in the slide, the winged nut should be removed from the threaded stem or bolt 27, to allow the swinging arm to be disconnected from said threaded stem or bolt, so that the
10 bracket or hanger may be lowered sufficiently to permit of the slide being taken out of the bracket; the preferred position is to drop the bracket or hanger so that it will rest on the bracket or shaft 2. The slide is removed from the bracket by reversing the operation above described, for inserting the same therein, when the shafts or spindles 42 and 43 may be removed and properly reset
20 with the spur gears adjusted to accommodate the changes desired.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent of the United States, is:—

25 1. In combination, a hanger, a slide reciprocally mounted in the hanger, locking means between the hanger and the slide, a pair of spindles journaled in the slide, one of which is adjustable, and gears mounted
30 on said spindles.

2. In combination, a pivotally mounted hanger, means for adjusting the free end of the hanger, a slide reciprocally mounted in the hanger, locking means between the
35 hanger and the slide, a pair of spindles journaled in the slide, one of which is adjustable, and gears mounted on said spindles.

3. In combination, a hanger, a slide reversibly mounted in the hanger, means supported by the hanger, adapted to have locking engagement with the opposite sides
40 of the slide, a pair of spindles journaled in the slide, one of which is adjustable, and gears mounted on said spindles.

4. In combination, a hanger pivotally mounted at one end, means for holding said hanger in adjusted positions, a slide reciprocally and reversibly mounted in said
45 hanger, means connected with the hanger for locking the slide adjustably therein, a pair of spindles journaled in the slide, one of which is adjustable, a compound gear on one spindle, and an idler wheel on the other spindle, in mesh with one of said gears.
50

5. In combination, a hanger, a slide having a detachable connection with said hanger and having a serrated face, a pawl supported by the hanger for engagement with the serrations of the slide, and gears
60 mounted in said slide.

6. In combination, a hanger, a slide having a detachable connection with said hanger and having a serrated face, a pawl supported by the hanger for engagement
65 with the serrations of the slide, gearing hav-

ing an interchangeable connection with said slide, and an idler also mounted in said slide and capable of intermeshing with said gearing.

7. In combination, a hanger including 70 parallel spaced frame parts, each having longitudinal channels, a slide, spindles detachably mounted in the slide with projecting ends capable of moving in the channels of the hanger, gearing mounted on the spin- 75 dles of the slide, and locking means between the hanger and the slide.

8. In combination, a shaft, a hanger swingably connected with said shaft, a plurality of gears on said shaft, a slide having 80 a detachable relation with the hanger, locking means between the hanger and the slide, a pair of shafts journaled in said slide, one of which is adjustable, and gears carried by the shafts of the slide and in mesh, either of 85 said gears of said first mentioned shaft being capable of connection with one of gears of said slide.

9. In combination, a hanger, a slide having a detachable relation with said hanger, 90 and provided with three sets of openings forming bearings for shafts, a shaft journaled in one pair of openings in said slide, and projecting beyond the opposite sides thereof, a gear and a pinion mounted on said 95 shaft, a second shaft having an adjustable relation with the slide and adapted to be journaled in either of the two remaining pairs of openings in the slide, and projecting beyond the opposite sides thereof, and 100 an idler gear carried on said shaft and capable of intermeshing with the gear or the pinion of the first mentioned shaft.

10. In combination, a hanger pivotally mounted at one end, means for holding said 105 hanger in adjusted positions, a slide having a detachable relation with said hanger, and provided with three sets of openings forming bearings for shafts, a shaft journaled in one pair of openings in said slide, and projecting beyond the opposite sides thereof, a gear and a pinion mounted on said shaft, a second shaft having an adjustable relation with the slide and adapted to be journaled in either of the two remaining pairs of open- 115 ings thereof, and projecting beyond the opposite sides thereof, an idler gear carried on said shaft and capable of intermeshing with the gear or the pinion of the first mentioned shaft, and means for locking the slide adjustably in the hanger. 120

11. In a grain drill, the combination of an axle, a feed shaft, a counter-shaft, connections between the counter-shaft and the axle, a plurality of slidably gears on the counter- 125 shaft, a hanger having a pivotal relation with the counter-shaft, means for holding the hanger in adjusted positions, a pair of associated gears and an idler mounted in said hanger, connections between one of said 130

gears of the hanger and the feed shaft, the idler being capable of intermeshing with any one of the gears of the counter-shaft.

12. In a grain drill, the combination of
5 an axle, a feed shaft, a counter-shaft, gearing connecting the axle and the counter-shaft, a plurality of gears slidably carried on the counter-shaft, a hanger having a pivotal relation with the counter-shaft, a support, a swinging arm carried by said support, means for adjustably securing one end of the hanger to said swinging arm, a pair of associated gears and an idler having an adjustable relation with said hanger, said
10 gears being in operative connection with the feed shaft, and the idler being capable of having an operative connection with any one of the said sliding gears of the counter-shaft.

13. In a grain drill, the combination with
20 a support, of an axle, a counter-shaft, supports for the counter-shaft from the frame, gearing connecting the axle and the counter-shaft, a plurality of gears slidably carried
25 on the counter-shaft, a hanger having a pivotal connection with the supports of the counter-shaft, means for adjustably connecting the opposite end of the hanger with said first mentioned support, a pair of gears
30 and an idler having an adjustable and slidable relation with said hanger, a feeding shaft, gearing connecting said feeding shaft with one of said gears of the hanger, the idler being capable of cooperating with any
35 one of the sliding gears of the counter-shaft.

14. In combination, a shaft, a plurality of gears slidable on said shaft, a support, a group of gears and a cooperating idler mounted in said support, said idler being
40 capable of having connection with any one of said first mentioned gears, and means for changing the relation of the gears of the group aforesaid and said idler, and thereby provide for a plurality of changes of speed
45 with each change of said gears and idler.

15. In combination, a shaft, a plurality of gears slidable on said shaft, means for operating said shaft, a support having a swinging relation with said shaft, a group of gears
50 and a cooperating idler mounted in said support, said idler being capable of having connection with any one of said first mentioned gears, and means for changing the relation of the gears of the group aforesaid and said idler, and thereby provide for a plurality of changes of speed with each
55 change of said gears and idler.

16. In combination, a shaft, a plurality of gears slidable on said shaft, means for operating said shaft, a support having a swinging relation with said shaft, a group of gears and a cooperating idler slidably mounted in said support, said idler being capable of having connection with any one of said first mentioned
60 gears, and means for changing the

relation of the gears of the group aforesaid and said idler, and thereby provide for a plurality of changes of speed with each change of said gears and idler.

17. In a grain drill, the combination with
70 a feed shaft, of a counter-shaft, means for operating the counter-shaft, a plurality of different size gears slidably carried on the counter-shaft, a hanger having a swinging relation with the counter-shaft, a slide detachably mounted in said hanger and capable of being reversed, a group of gears mounted in said slide, either of which may have operative connection with the said
75 shaft, and an idler also mounted in said slide capable of transmitting motion from any one of the gears on the counter-shaft to the group of gears of said slide.

18. In a grain drill, the combination with
80 a feed shaft, of a counter-shaft, means for operating the counter-shaft, a plurality of different size gears slidably carried on the counter-shaft, a hanger having swinging relation with the counter-shaft, a slide detachably mounted in said hanger and capable of being reversed, means for locking the slide in adjusted positions in said hanger, a group of gears mounted in said slide, either of which may have operative connection
85 with the said shaft, and an idler also mounted in said slide capable of transmitting motion from any one of the gears on the counter-shaft to the group of gears on said slide.

19. In a grain drill, the combination with
100 a feed shaft, of a counter-shaft, a plurality of different size gears slidably mounted on said counter-shaft, means for operating the counter-shaft, a hanger having a swinging relation with said counter-shaft, means for locking the hanger in adjusted positions, a slide having an adjustable relation with the hanger and capable of being inserted therein in reverse positions, said slide having a forked inner end for receiving a gear of the counter-shaft and holding it against lateral
105 movement, a pair of spindles journaled in said slide, one of which is adjustable therein, a gear and a pinion mounted on one spindle each of which is capable of being operatively connected with the feed shaft, and an idler on the adjustable spindle capable of having connection with any one of the gears on the counter-shaft and with either the gear or the pinion on the spindle aforesaid.
110 120

20. In a grain drill, the combination with
a feed shaft, of a counter-shaft, means for operating the counter shaft, a plurality of different size gears slidably mounted on said counter-shaft, a hanger having a swingable
125 relation with said counter-shaft, and comprising parallel channeled side frames, means for sustaining said hanger in adjusted positions, a slide detachably connected with said hanger and capable of being
130

placed therein, in reverse positions, means
for locking the slide in adjusted positions
in the hanger, a pair of spindles journaled
in the slide, one of which is adjustable, and
5 the outer ends of said spindles having con-
nection with the channels of the side frames
of said hanger, a gear and a pinion on one
spindle, each of which is capable of being
operatively connected with the feed shaft,
10 and an idler on the adjustable spindle,

capable of imparting motion from any one
of the gears on the counter-shaft, to the gear
and the pinion on the spindle aforesaid.

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

LUTHER E. ROBY.

Witnesses:

CHAS. W. LA PORTE,

ROBERT N. McCORMICK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
