

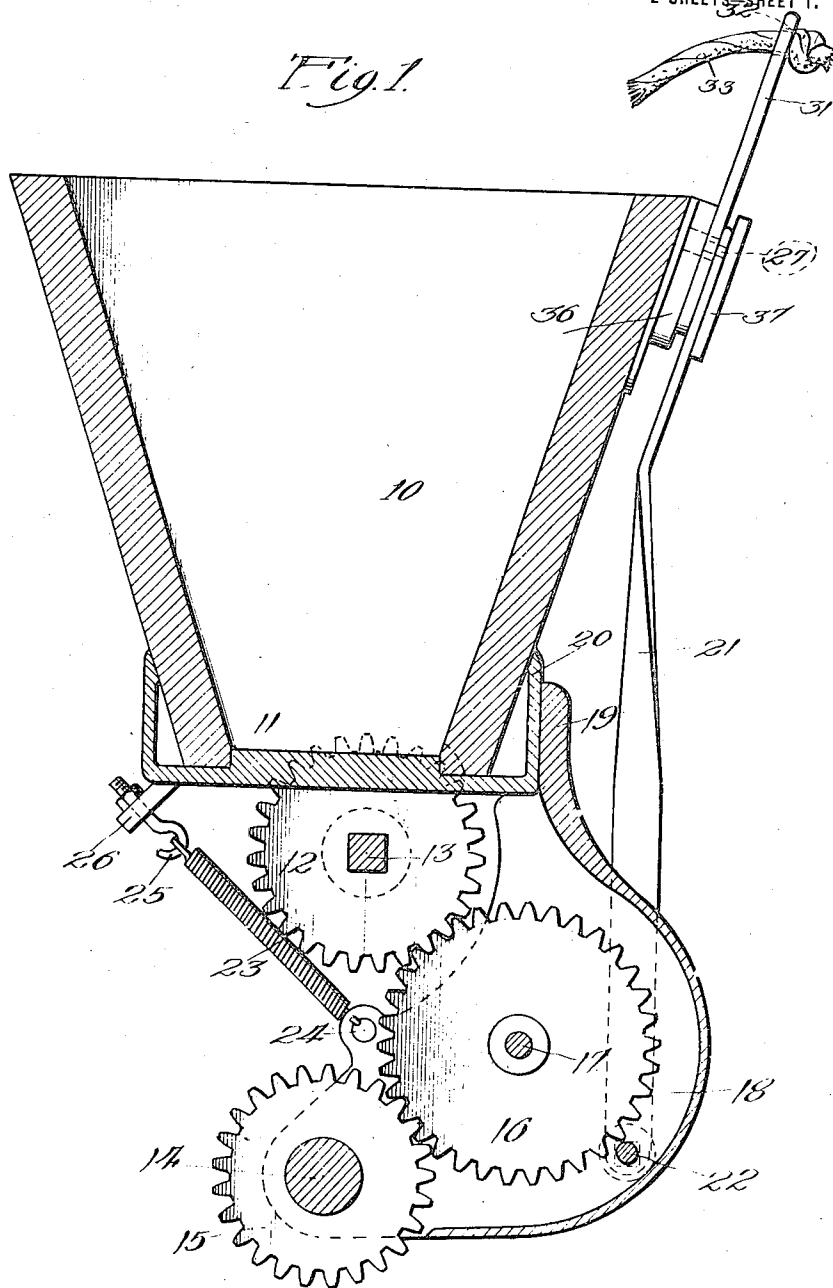
T. BRENNAN, JR.
 AUTOMATIC GEAR THROW-OUT MECHANISM FOR GRAIN DRILLS OR THE LIKE.
 APPLICATION FILED SEPT. 22, 1919.

1,394,663.

Patented Oct. 25, 1921.

2 SHEETS-SHEET 1.

Fig. 1.



Witness:

Harry S. Gauthier

Inventor

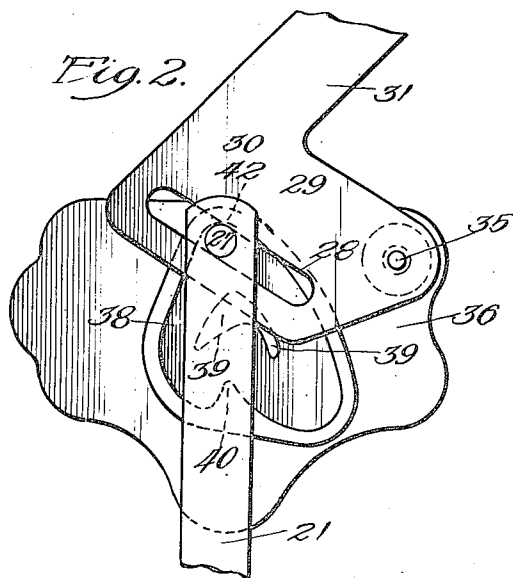
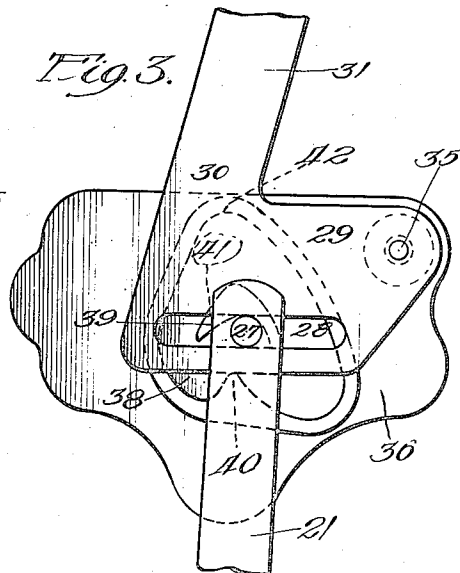
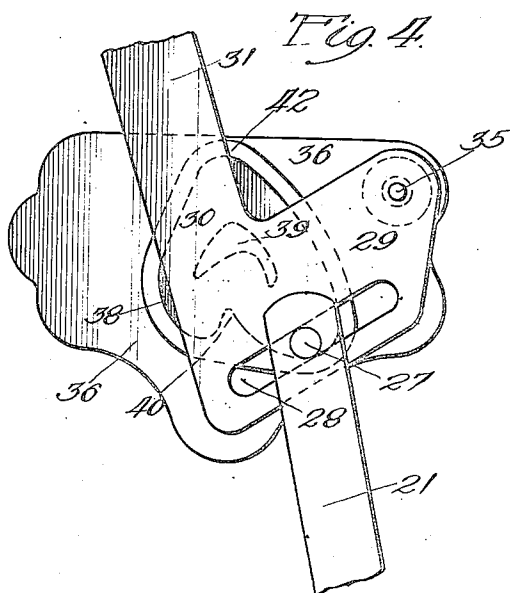
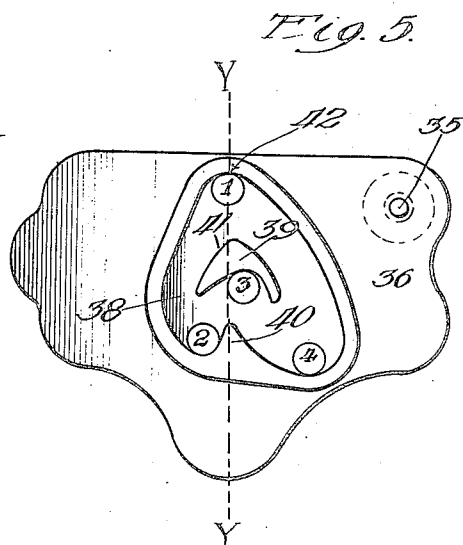
Thomas Brennan, Jr.

By *Samuel D. Smith* Att'y

T. BRENNAN, JR.
 AUTOMATIC GEAR THROW-OUT MECHANISM FOR GRAIN DRILLS OR THE LIKE.
 APPLICATION FILED SEPT. 22, 1919.

1,394,663.

Patented Oct. 25, 1921.
 2 SHEETS—SHEET 2.



Witness:
Harry S. Gaither

Inventor:
 Thomas Brennan Jr.
 By *Barning & Barning, Attys.*

UNITED STATES PATENT OFFICE.

THOMAS BRENNAN, JR., OF MOLINE, ILLINOIS, ASSIGNOR TO MOLINE PLOW COMPANY, OF MOLINE, ILLINOIS, A CORPORATION OF ILLINOIS.

AUTOMATIC GEAR-THROW-OUT MECHANISM FOR GRAIN-DRILLS OR THE LIKE.

1,394,663.

Specification of Letters Patent.

Patented Oct. 25, 1921.

Application filed September 22, 1919. Serial No. 325,435.

To all whom it may concern:

in the position of being switched into train; 55 and

Fig. 5 is a diagrammatic view showing the progress of the parts from one position to another.

The invention is applied to a grain drill 60 employing a hopper 10 of ordinary construction, through the floor 11 of which projects the edge of a feed shaft gear 12 mounted on a feed shaft 13 in the usual way. The details of the feed mechanism need not be 65 described, since they are of any usual and well known construction commonly employed in grain drills.

The power for operating the feed shaft gear is derived from the main axle 14 of 70 the drill, which is provided with a driving gear 15 which meshes with an intermediate gear 16, which in turn meshes with the gear 12 on the feed shaft. The gear 16 is journaled to a stub shaft 17 carried within 75 a bracket 18 of generally triangular shape, which at its forward lower corner is pivoted upon the main axle in such a way as to permit the bracket with the intermediate gear to be swung upon the main axle as a 80 center in order to throw the intermediate gear into and out of mesh with the feed shaft gear 12. The bracket 18, at its upper angle, is provided with a stop lug 19 which, with the parts in train, is adapted to bear against 85 the face of a plate 20, which forms a portion of the shield which houses the feeding gear 12. The swinging bracket, however, might be otherwise stopped by contact with any suitable portion of the hopper structure. 90

The making and breaking of the train is effected by swinging the bracket on the axle 14 as a center, and the present invention is concerned mainly with the means provided for adjusting and locking the position of 95 this bracket. These adjustments are effected through the action of a connecting rod 21, which is pivoted by means of a pin 22 to the lower outer edge of the bracket, and a thrust on the rod 21 will act in opposition 100 to the pull of a spring 23 which is connected to a lug 24 on the forward edge of the bracket and extends to a hook 25 suitably supported by means of a tongue 26 projecting from the forward portion of the 105 hopper structure. The action of this spring is such that it will maintain the gears in meshed relation, and at the same time im-

Be it known that I, THOMAS BRENNAN, JR., a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Automatic Gear-Throw-Out Mechanism for Grain-Drills or the like, of which the following is a specification.

10 This invention is directed to the provision of easily adjustable mechanism designed for the purpose of throwing into and out of train the gears which control the operation of the seed feeding mechanism of a grain 15 drill; and the object of the present invention is to so construct the mechanism that it can be quickly and readily operated by the driver of a tractor in advance of the grain drill by the simple expedient of pulling on a rope 20 or cable, either to throw the mechanism into or out of train as the case may be. With this end in view the invention is directed to suitable means which will maintain the parts in locked relation whether in train 25 or out of train, until a subsequent pull of the rope or cable serves to unlock the parts and change the relationship of the gears.

Although the invention is designed particularly with reference to its relation to the 30 gears employed in connection with the grain feed, it is not the intention to limit the invention to this particular use, since the adjusting devices are equally adapted for use in connection with gears designed for other 35 purposes, and particularly to gear trains on agricultural implements which it is desirable to control from a position on the tractor.

Further objects and uses of the invention will appear from a detailed description 40 thereof, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings:

45 Figure 1 is a cross sectional view through the hopper of a grain drill, showing the gear mechanism employed for feeding the grain;

Fig. 2 is an interior face view of the switch and lock mechanism with the parts in the relation maintained in holding the gears in 50 train;

Fig. 3 is a similar view showing the parts in the relation maintained in holding the gears out of train;

Fig. 4 is a similar view showing the parts

part an upward thrust on the connecting rod 21, which holds the rod under spring tension in elevated relation with respect to the locking switch mechanism now to be described.

The upper end of the connecting rod is provided with an inwardly projecting stud 27 which rides within an elongated slot 28 in the lower arm 29 of an L-shaped throw-out lever 30, the upper arm 31 of which is provided with a hole 32 through which is entered a rope or cable 33 extended inwardly to the center of the hopper, at which point it is turned through a guide loop or eye (not shown) and forwardly to a point within convenient reach of the driver on the tractor not shown. In the implement shown, the inventions herein described are arranged in duplicate on opposite sides of the seeding machine, so that two of the ropes or cables are employed, both of which extend to the center of the machine and forwardly in the manner stated.

The L-shaped throwout lever is pivoted at the outer end of the lower arm 29 to a pin or stud 35 supported between inner and outer spaced plates 36 and 37, which in conjunction form a housing and guide for the operation of the L-lever and its associated connecting rod. The stud 27 is of a length to project inwardly through the slot 28 and into a switch guideway 38 in the form of peculiarly configured flanges outstanding from the outer surface of the inner plate 36. This switch guideway is of a generally heart shape formation, and the outer flange is associated with a centrally disposed switch flange 39 of inverted crescent shape, the concave face of which is in overlying spaced relationship to the lower apex 40 on the outer flange and in slightly eccentric relation thereto. The convex face 41 of the inner switch flange underlies the inner apex 42 of the outer flange and is in slightly eccentric relation thereto, the general relation of the parts being such that the inner switch flange occupies a position slightly to one side of the dotted line Y—Y drawn from the apices 40 and 42 of the outer flange, for the purpose to be now described.

The relationship of the guide flanges is such that when the parts are in the normal relation shown in Fig. 2, the tension of the spring 23 will force the stud 27 to its highest position and bring it to rest in contact with the upper apex 42 of the outer flange and slightly to the left or toward the machine center with respect to the position occupied by the apex 41 of the inner crescent shaped flange. This action of the spring will also throw the arm 31 of the lever 30 to its outermost position. With the parts in meshing relation, when the driver desires to unmesh the gears, he will pull the rope or cable 33, which draws the arm 31 inwardly,

and this movement, through the engagement of the stud 27 with the slot 28, will impart a downward thrust movement to the connecting rod 21, the stud 27 riding freely within the slot 28 to accommodate itself to the movements imposed upon it by the configuration of the guideway. As the connecting rod is thus thrust down, the stud 27 will engage the convex surface of the inner crescent shaped flange to the left of the apex thereof and will thus be drawn or guided through the inner or left hand guideway until it has reached its lowermost position, indicated diagrammatically by the numeral 2 in Fig. 5, which position marks the limit of inward movement of the throwout lever 30, and imparts a sufficient thrust to the connecting rod 21 to unmesh the intermediate gear and stop the grain feeding operation. After the driver of the grain drill has thus thrown the lever he releases his pull on the rope or cable, and the tension of the spring 23 will impart an upward thrust to the connecting rod, causing the stud to assume the locked position diagrammatically indicated by the numeral 3 in Fig. 5. The relation of the inner or left hand point of the crescent shaped inner switch flange to the curved bottom of the outer flange is such that it will intercept the stud when the pull on the cable is released and prevent it from riding back to its initial position, and maintain the parts in locked relation until a further pull of the controlling cable will force down the connecting rod and with it the stud, which on this movement will engage the right or outermost face of the lower apex 40 of the outer guide flange and be switched over into the position diagrammatically indicated by the numeral 4 in Fig. 5, from which position, upon a release of the controlling rope or cable, it will ride back to the initial position 1, the parts being relationed in such a way that on this terminal movement it will clear the crescent shape switch flange and assume the highest position allowed by the configuration of the flanges.

By proportioning and relationing the parts in the manner specified, the operator, by a mere pull of the controlling cable to its extreme position, and an immediate release thereof, can throw the parts either into or out of gear as occasion requires, and the position of the arm 30 will indicate to the operator whether the gears are in or out of mesh. The construction is one which enables the employment of flexible ropes or cables of any suitable length, which is important, in that it enables the implement to be associated with any kind of a tractor without the necessity of providing connecting mechanism especially designed or proportioned with regard to the construction of the respective implements.

The use of a cable control is also desirable,

in that the cable being flexible need not be jointed or otherwise fitted to permit the tractor to be turned, steered or manipulated in the field. The construction is an extremely simple one and is capable of being readily applied to grain drills or other implements in which it is desired to control the meshing and unmeshing of gears from a distant point.

10 I claim:

1. In an automatic gear throwout, the combination of a driven gear, a second gear adjustably mounted to be thrown into and out of mesh with the driven gear, a connection for adjusting the second gear to meshed or unmeshed position, controlling means for imparting movements to the adjusting connection and a guide for directing the path of said movements, said guide being configured to lock the adjusting connection out of normal on its first actuation by the controlling means, and to release the adjusting connection from locked position and allow it to return to normal position on the second operation of the controlling means, substantially as described.

2. In an automatic gear throwout, the combination of a driven gear, a second gear adjustably mounted to be thrown into and out of mesh with the driven gear, a connection for adjusting the second gear to meshed or unmeshed position, controlling means for imparting movements to the adjusting connection, a guide for directing the path of said movements, said guide being configured to lock the adjusting connection out of normal on its first actuation by the controlling means, and to release the adjusting connection from locked position and allow it to return to normal position on the second operation of the controlling means, and a spring adapted to be tensioned by a movement of the parts from normal position and adapted to return the parts when unlocked to normal position, substantially as described.

3. In an automatic gear throwout, the combination of a driven gear, a second gear adjustably mounted to be thrown into and out of mesh with the driven gear, a connection for adjusting the second gear to meshed or unmeshed position, controlling means for imparting movements to the adjusting connection, a guide for directing the path of said movements, said guide being configured to lock the adjusting connection out of normal on its first actuation by the controlling means, and to release the adjusting connection from locked position and allow it to return to normal position on the second operation of the controlling means, and a driving gear constantly in train with the second mentioned gear, substantially as described.

4. In an automatic gear throwout, the combination of a driven gear, a second gear adjustably mounted to be thrown into and

out of mesh with the driven gear, a connection for adjusting the second gear to meshed or unmeshed position, controlling means for imparting movements to the adjusting connection, a guide for directing the path of said movements, said guide being configured to lock the adjusting connection out of normal on its first actuation by the controlling means, and to release the adjusting connection from locked position and allow it to return to normal position on the second operation of the controlling means, a spring adapted to be tensioned by a movement of the parts from normal position and adapted to return the parts when unlocked to normal position, and a driving gear constantly in train with the second mentioned gear, substantially as described.

5. In an automatic gear throwout, the combination of a driven gear, a second gear adapted to be brought into and out of mesh with the driven gear, an adjusting connection for shifting the second mentioned gear, said adjusting connection being adapted for endwise movement, a controlling device connected to the adjusting connection and adapted to impart endwise movements thereto, a guide for directing the movements of the adjusting connection, and configured on the first operation and release of the controlling means to guide the parts from normal position to locked position, and on the second operation and release to guide the parts from locked position to normal position, and means for insuring the return of the parts when unlocked to normal position, substantially as described.

6. In an automatic gear throwout, the combination of a driven gear, a second gear adapted to be brought into and out of mesh with the driven gear, an adjusting connection for shifting the second mentioned gear, said adjusting connection being adapted for endwise movement, a controlling device connected to the adjusting connection and adapted to impart endwise movements thereto, and a guide, comprising an outer flange having a substantially heart-shaped configuration, and an inner switch flange of substantially crescent-shaped configuration, the parts being related to permit the adjusting means to be actuated by the controlling means from normal position in engagement with the apex of the outer flange to a locked position in engagement with the concave surface of the inner flange through a guideway on one side of the inner flange, and upon a second actuation of the controlling means to be unlocked and switched into a return guideway on the opposite side of the inner flange, substantially as described.

7. In an automatic gear throwout, the combination of a driven gear, a second gear adapted to be brought into and out of mesh

with the driven gear, an adjusting connection for shifting the second mentioned gear, said adjusting connection being adapted for endwise movement, a controlling device connected to the adjusting connection and adapted to impart endwise movements thereto, a guide, comprising an outer flange having a substantially heart-shaped configuration and an inner switch flange of substantially crescent-shaped configuration, the parts being relationed to permit the adjusting means to be actuated by the controlling means from normal position in engagement with the apex of the outer flange to a locked position in engagement with the concave surface of the inner flange through a guideway on one side of the inner flange, and upon a second actuation of the controlling means to be unlocked and switched into a return guideway on the opposite side of the inner flange, and a spring for normally holding the adjusting means in contact with the apex of the outer flange and for holding the adjusting means in locked relation to the inner flange on the first adjustment, and for returning the parts to normal position on the second adjustment, substantially as described.

8. In an automatic gear throwout, the combination of a driven gear, a second gear, an adjustable mounting for the second gear adapted to throw said gear into and out of train with the driven gear, an endwise movable adjusting connection for said mounting, a controlling lever having a pin and slot connection with the adjusting connection, a guideway into which said pin is entered, said guideway comprising an outer flange of substantially heart-shape, with an upper apex and a lower apex, and an inner switch flange of substantially crescent-shape off center with respect to a line drawn between the apices, the relationing of the parts being such that a first actuation and release of the controlling lever will carry the pin from a point in contact with the upper apex of the outer flange to a locking position in contact with the concave face of the inner flange and beyond the lower apex, and a second actuation and release of the controlling means will carry the pin out of locked position and switch it past the lower apex of the outer flange and permit its return to initial position, substantially as described.

9. In an automatic gear throwout, the combination of a driven gear, a second gear, an adjustable mounting for the second gear adapted to throw said gear into and out of train with the driven gear, an endwise movable adjusting connection for said mounting, a controlling lever having a pin and slot connection with the adjusting connection, a guideway into which said pin is entered, said guideway comprising an outer flange of substantially heart-shape, with an upper apex

and a lower apex, an inner switch flange of substantially crescent-shape off center with respect to a line drawn between the apices, the relationing of the parts being such that a first actuation and release of the controlling lever will carry the pin from a point in contact with the upper apex of the outer flange to a locking position in contact with the concave face of the inner flange and beyond the lower apex, and a second actuation and release of the controlling means will carry the pin out of locked position and switch it past the lower apex of the outer flange and permit its return to initial position, and a driving gear constantly in train with the second mentioned gear and mounted concentrically with the axis of movement of the gear mounting for the second gear, substantially as described.

10. In a device of the class described, the combination of an adjusting rod fitted for endwise movement, a pin at the upper end of the adjusting rod, a controlling lever provided with a slot through which the pin is entered, a guide-way comprising an outer flange provided with upper and lower apices, and an inner flange of substantially crescent-shape and presenting its concave face in opposition to the lower apex of the outer flange, the relationing of the parts being such that upon a first actuation and release of the controlling lever the pin will be moved from normal position in contact with the upper apex and guided past one side of the inner flange and into locking contact with the under face of the inner flange, and upon a second actuation and release of the controlling lever will be switched past the lower apex and guided past the opposite side of the inner flange and returned to normal position, substantially as described.

11. In a device of the class described, the combination of an adjusting rod fitted for endwise movement, a pin at the upper end of the adjusting rod, a controlling lever provided with a slot through which the pin is entered, a guideway comprising an outer flange provided with upper and lower apices, and an inner flange of substantially crescent-shape and presenting its concave face in opposition to the lower apex of the outer flange, the relationing of the parts being such that upon a first actuation and release of the controlling lever the pin will be moved from normal position in contact with the upper apex and guided past one side of the inner flange and into locking contact with the under face of the inner flange, and upon a second actuation and release of the controlling lever will be switched past the lower apex and guided past the opposite side of the inner flange and returned to normal position, and a spring for imparting a thrust to the connecting rod to hold the pin normally in contact with the upper

apex of the outer flange, and when adjusted to hold the pin in locking contact with the inner flange, and for insuring the return of the parts to normal position on the second adjustment, substantially as described.

12. In a device of the class described, the combination of an adjusting rod fitted for endwise movement, a pin at the upper end of the adjusting rod, an L-shaped controlling lever pivoted to one side of the upper end of the connecting rod, and provided with a slot through which the pin is entered, a guideway comprising an outer flange provided with upper and lower apices, and an inner flange of substantially crescent-shape and presenting its concave face in opposition to the lower apex of the outer flange, the relationing of the parts being such that upon a first actuation and release of the controlling lever the pin will be moved from normal position in contact with the upper apex and guided past one side of the inner flange and into locking contact with the under face of the inner flange, and upon a second actuation and release of the controlling lever will be switched past the lower apex and guided past the opposite side of the inner flange and returned to normal position, substantially as described.

13. In a device of the class described, the combination of an adjusting rod fitted for endwise movement, a pin at the upper end of the adjusting rod, an L-shaped controlling lever pivoted to one side of the upper end of the connecting rod, and provided with a slot through which the pin is entered, a guideway comprising an outer flange provided with upper and lower apices, and an inner flange of substantially crescent shape and presenting its concave face in opposition to the lower apex of the outer flange, the relationing of the parts being such that upon a first actuation and release of the controlling lever the pin will be moved from normal position in contact with the upper apex and guided past one side of the inner

flange and into locking contact with the under face of the inner flange, and upon a second actuation and release of the controlling lever will be switched past the lower apex and guided past the opposite side of the inner flange and returned to normal position, and a spring for imparting a thrust to the connecting rod to hold the pin normally in contact with the upper apex of the outer flange, and when adjusted to hold the pin in locking contact with the inner flange, and for insuring the return of the parts to normal position on the second adjustment, substantially as described.

14. An automatic gear throwout having, in combination, a driven gear, a driving gear, a third gear meshing with the driving gear and adapted to be moved into and out of engagement with the driven gear, and controlling means for the third gear including a movable member, said controlling means being arranged so that upon movement of the movable member in one direction the third gear will be moved into mesh with the driven gear and upon the next movement of the movable member in the same direction, the third gear will be moved out of mesh with the driven gear.

15. An automatic gear throwout having, in combination, a driven gear, a driving gear, a third gear meshing with the driving gear and arranged to be moved into and out of mesh with the driven gear, and controlling means for the third gear including a movable member, said controlling means being arranged so that, upon movement of the movable member in one direction and release thereof, the third gear will be moved into and locked in mesh with the driven gear and, upon the next movement of the movable member in the same direction and release thereof, the third gear will be moved out of mesh with the driven gear and locked in such position.

THOMAS BRENNAN, JR.