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R. E. WILSON

FEED MECHANISM FOR COTTON CLEANER FEEDERS

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Fig. 2

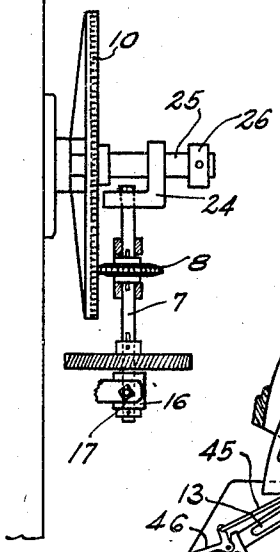
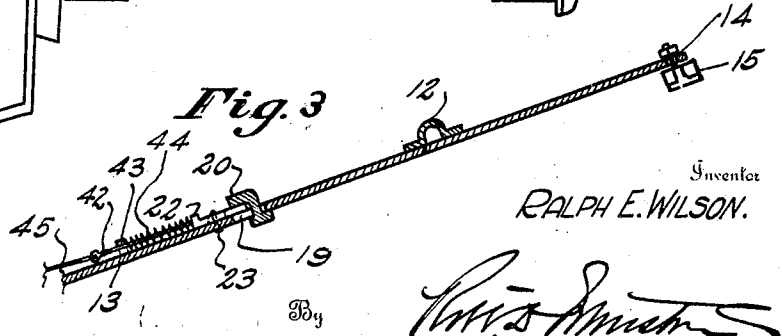


Fig. 1

Fig. 3



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Fig.5

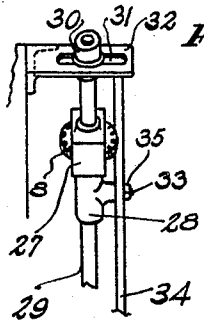
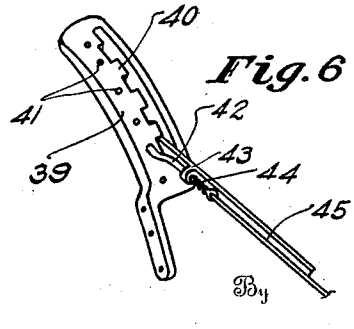


Fig.4

Fig.6



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UNITED STATES PATENT OFFICE.

RALPH E. WILSON, OF DALLAS, TEXAS, ASSIGNOR TO CONTINENTAL GIN COMPANY, A CORPORATION OF DELAWARE.

FEED MECHANISM FOR COTTON-CLEANER FEEDERS.

Application filed May 8, 1924. Serial No. 711,939.

My invention relates to an improvement in the feed mechanism for cotton cleaner feeders, and more particularly for a speed change for a disk gear and pinion drive for such a feed mechanism.

The disk gear and pinion drive which has been in general use for many years, comprises a disk gear having a plurality of circumferential rows of teeth or pins at different radial distances from its center and the pinion, which is driven thereby, is slidable on a rocking drive shaft and controlled by a handle and a latch mechanism so that it required two operations to set and lock the pinion in mesh with any desired set of teeth on the disk gear. The drive from the pinion was transmitted to the cotton cleaner feeder and the latter driven at a speed proportionate to a ratio of the meshing gear teeth and pinion. The handle and latch mechanism to shift and lock the pinion in a set position, were mounted high up on the feeder adjacent to the gear and to effect a change of speed in the cleaner feed the operator must climb up to the disk gear and use both hands to unlatch the gear and set it. This was not easy to do, and as a result this renders objectionable the disk gear and pinion feed, though in many respects it is very desirable for its simplicity and reliability.

The prime object of my present invention is to design a gear shift and latch mechanism for a disk gear and pinion drive which can be operated from the floor and by means of which the pinion can be both released, shifted and relatched in operating position by one hand, thus leaving the operator's other hand free for control of other parts of the mechanism.

My invention comprises the novel details of construction and arrangements of parts, which in their preferred embodiments only are illustrated in the accompanying drawings, in which:—

Fig. 1 presents in side elevation a cotton cleaner feeder with a disk gear and pinion drive, the pinion being shifted and latched by one embodiment of my invention.

Fig. 2 is an end view of the disk gear and pinion drive with the lever shown in cross section.

Fig. 3 is a detail view of the pinion control lever and its latch means.

Fig. 4 is a view corresponding to Fig. 1, showing a modified arrangement of pinion housing and latch mechanism for the pinion shifting lever.

Fig. 5 is a detail view showing the upper sliding bearing for the pinion shaft; and

Fig. 6 is a detail sectional view through the lever latch.

Similar reference numerals refer to similar parts throughout the drawings.

In the embodiment of my invention illustrated in Fig. 1, the cleaner drum, not shown, is mounted on a shaft 1 mounted in end bearings 2 attached to the end wall 3 of the cotton cleaner feeder. Fast on the shaft 1, which is driven by a pulley 4, is a worm 5 which drives a worm gear 6 mounted on a shaft 7 which has a key seat cut therein and a pinion 8 mounted on the shaft so that it can slide along a loose key 9 in the key seat so as to shift it into position to mesh the desired set of gear teeth on the disk gear 10. The teeth or pins 11 in this gear are arranged in annular rows and formed by holes in the disk, each set being concentric with the disk and having an increasing number of teeth as its radial distance from the disk center increases. There may be any desired number of sets of gear teeth in the disk according to the number of speed changes desired. In sliding the pinion 8 along the shaft 7, it is necessary to disengage the pinion from the disk gear or pin plate 10. To permit this the pinion is mounted between the sides of a yoke 12 disposed at an intermediate point in the control lever 13. This yoke has aligning openings to receive and slide on the shaft 7, and it is adapted to receive snugly between its sides the hub of the pinion 8, which, however, is free to rotate in the yoke with the shaft 7. The yoke at its upper end is mounted loosely on a fulcrum 14 carried by a bracket 15 and on this fulcrum the lever is free to swing in a vertical plane and to have a limited rocking movement laterally. The shaft 7 at its lower end is mounted on a swivelled bearing 16 adapted to rock about a swivel pin 17 in a plane at right angles to the plane of the disk gear 10.

Between the yoke 12 and the handle 18 on the lever I provide an opening 19 which is adapted to permit one of a series of hook lugs 20, mounted on a quadrant 21, to project therethrough with its overhanging lip sufficiently spaced from the lever to permit

a lock plate or latch 22 mounted on the lever by a stud 23 engaging through a slot in the plate to catch under the lug lip and thus lock the lever against disengagement from the lug until the lock plate has been drawn by its control mechanism, hereafter described, to clear the lug lip. The lugs are all equi-distant from the fulcrum 14 and the lever can be caused to engage any desired one. Also the lugs are so spaced that each one will set and lock the lever with the pinion 8 meshing a different set of teeth 11 on the disk gear 10. A rod 45 connects the end of the lock plate with a spring-pressed grip element 46 pivoted on the lever at its handle end so that when the lever is grasped to shift it the latch plate will be disengaged.

In effecting a change of speed in the drive it is necessary first to disengage the pinion 8 from the disk gear and this is done by shifting the lock plate 22 to disengage the lug 20 and then moving the lever laterally outwardly from the cleaner until it clears the lugs 20 and the pinion 8 becomes disengaged from the gear 10. The lever is then free to be rocked in a vertical plane about its fulcrum so as to bring the pinion opposite the desired set of teeth 11 and thereupon it is shifted laterally inwardly, causing the corresponding lug 20 to project through the lever slot 19 and to be engaged by the lock plate 22 when the grip element is released. I provide a bearing for the upper end of the shaft 7, this being in the form of an angled bracket 24 in one leg of which the upper end of the shaft 7 has a slip fit, and the other leg of which has a sliding bearing on the feed roller shaft 25 upon which the disk gear 10 is mounted fast and which shaft projects substantially beyond the disk gear and carries on its outer end a fast collar 26. This sliding bearing affords ample play to enable the shaft 7 to rock and disengage the pinion from the disk gear 10. It will be noted that the lever is quite long and that its handle and grip element 46 are disposed in position in which they can be readily manipulated from the floor so that all the setting of the pinion and the latching of its lever can be accomplished with one hand, which is very necessary when a ginner is in a hurry to make a change. The quadrant 21 is formed by a casting attached in any suitable manner to the end cleaner wall 3.

In Figs. 4 to 6 I show a modified arrangement of the drive. Here the pinion 8 is mounted in a yoke 27 formed at the upper end of a sleeve 28 which is slidable on the drive shaft 29 corresponding to 7. The pinion is keyed to the shaft in the manner described and is adapted to be slipped along the shaft to mesh the desired teeth 11 in the disk gear 10 by the shifting of the sleeve 28. It will be observed that the gear is disposed on the far side of the disk center from the driven worm wheel 6 and that this necessitates the elimination of the overhung end of the feed roller shaft 25. The upper end of the shaft 29 is mounted in a bearing 30 which is free to slide in an elongated slot 31 in a bracket 32 overhung from the top of the cleaner, the slot being elongated in a direction substantially parallel with the axis of the feed roller shaft 25. The sleeve 28 has a stud bolt 33 thereon which is connected to an operating lever 34 by a nut 35, which leaves the lever free to rock about the stud. At its upper end the lever has an elongated slot 36 which leaves it free to rock both vertically and laterally about a fulcrum 37 in a bracket 38 attached to the top of the feeder. The lever passes through an arcuate guide plate 39 having spaced teeth 40 at one side leaving notches, each of which is adapted to receive the lever and set it in position with the pinion meshing one of the sets of disk gear teeth 11. Opposite each of the notches is a pin hole 41 adapted to receive a latch pin 42 slidable in a guide 43 on the lever and normally pressed by a spring 44 into engagement with the guide plate 39. A rod 45 connects the latch pin with a spring-pressed grip element 46 mounted adjacent to the handle 47 of the lever. By pressing the grip element 46 the pin can be disengaged, the lever shifted laterally out of the notch so as to clear the teeth 40, and then rocked about its fulcrum 37 to bring the pinion into mesh with the desired set of teeth 11, after which the lever can be shifted laterally into the notch standing opposite to it and the grip released to lock it in this position. In this design, the shaft 29 is held yieldingly in position with the worm wheel 6 meshing the worm 5 by means of a rod 48 engaging a collar 49 on the shaft at its upper end, and at its lower end passing through a guide 50 and engaged by a coil spring 51 which presses against a seat formed by a nut 52 at the end of the rod. A nut 53 limits the rocking movements of the shaft 29 counter-clockwise.

It will be apparent that in both forms of my invention illustrated the gear speed change can be effected very rapidly and easily by the operator with one hand and from the floor.

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

1. In a disk gear and pinion drive for cotton cleaner feeders, a driving shaft loosely mounted to rock, a pinion keyed to and slidable on said shaft, a disk gear having a plurality of annular series of teeth with which its pinion is adapted to mesh, a feed roller shaft on which said disk gear is mounted, and means to shift and lock the pinion in different operating positions, comprising a lever having a handle projecting into posi-

tion to be operated from the floor, a latch means on said handle to lock it in different operating positions, and a bearing for the handle about which it is free to rock both vertically and laterally.

2. A gear shift mechanism according to claim 1, in which the lever bearing is at the upper end of the lever on the far side of the disk gear from the lever handle.

3. A gear shifting mechanism in accordance with claim 1, in which the latch means comprises elements to positively hold the lever against movement in a plane parallel with the plane of the disk gear, and lock means to lock the lever in engagement with said latch elements, said lever being releasable from said latch elements when unlocked, as and for the purposes described.

4. In a disk gear and pinion drive for cotton cleaner feeders, a disk gear having a plurality of circumferential series of teeth at different distances from its center, a feed roll shaft upon which said gear is mounted, a drive shaft disposed radially in front of the disk gear, a drive means for said latter shaft at its lower end, a rocking bearing for said drive shaft, a lever having movable therewith at an intermediate point, a yoke, a pinion mounted on the radially disposed shaft and splined thereto and shiftable by said yoke, a loose bearing for the upper end of the said lever, the handle at the lower end of said lever being disposed within reach of the operator on the floor, and latch means, to lock the lever in any one of its series of operating positions, controllable by a grip element on the lever handle.

In testimony whereof I affix my signature.

RALPH E. WILSON.