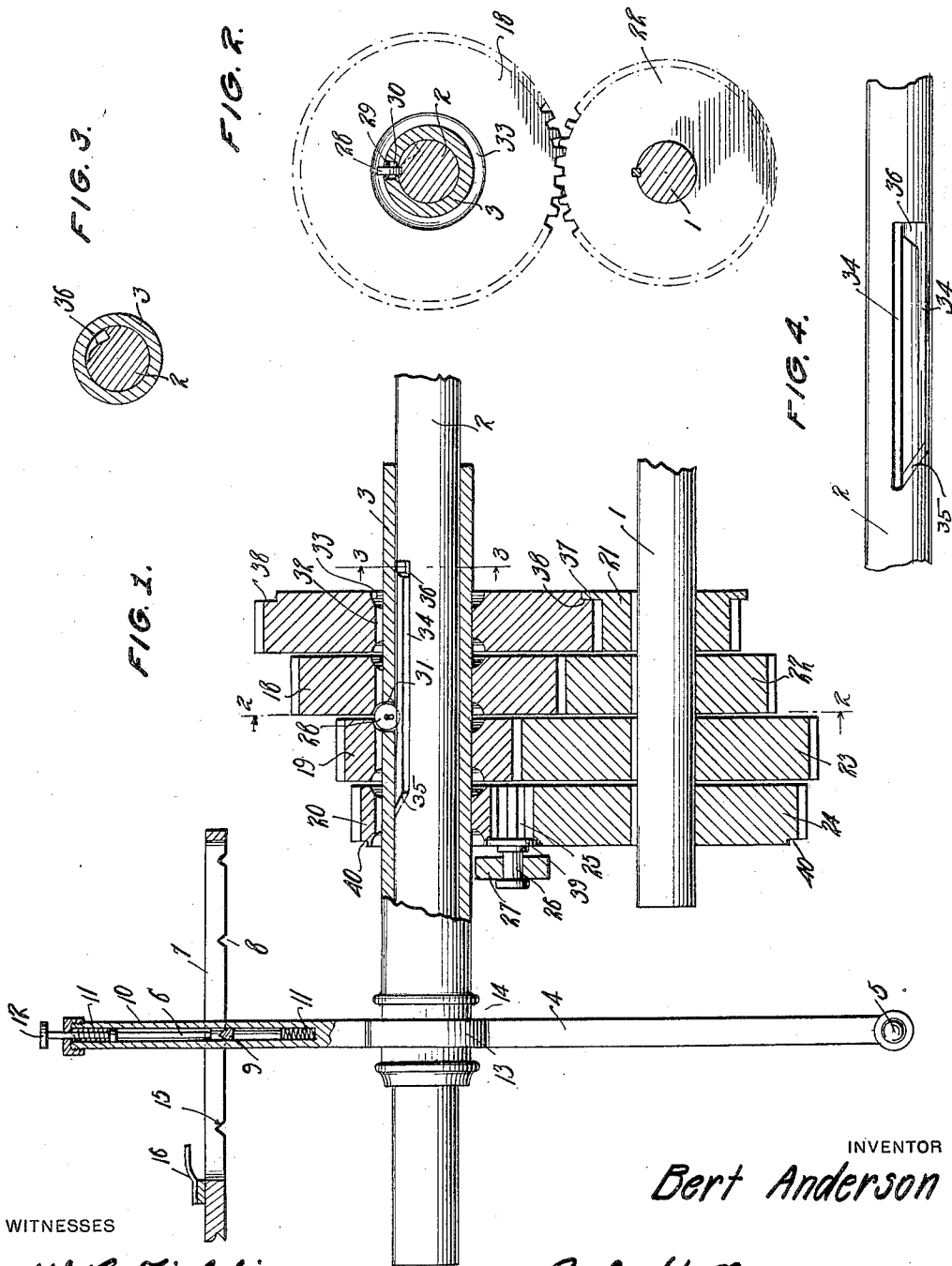


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GEARING.

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WITNESSES

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GEARING.

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To all whom it may concern:

Be it known that I, BERT ANDERSON, a citizen of the United States, residing at Granger, in the county of Williamson and State of Texas, have invented certain new and useful Improvements in Gearings, of which the following is a specification.

This invention relates to a variable speed transmission device and has for its object the production of a simple and efficient means for shifting the driving mechanism for the purpose of driving a vehicle at varied speed.

Another object of this invention is the production of a simple and efficient speed changing device especially adapted for use in connection with automobiles and motor vehicles wherein the different speed or driving gears are thrown into and out of operation by means of a sliding key, the gears at all times remaining in mesh.

With these and other objects in view, this invention consists of certain novel constructions, combinations and arrangements of parts as will be hereinafter fully described and claimed.

In the drawings:

Figure 1 is a longitudinal section through the speed changing device,

Fig. 2 is a section taken on line 2—2 thereof,

Fig. 3 is a section taken on line 3—3 of Fig. 1,

Fig. 4 is a top plan view of the driving shaft upon which the speed supporting sleeve is adapted to move.

By referring to the drawings, it will be seen that 1 designates the driven shaft and a driving shaft 2 is arranged in parallel relation thereto. A supporting sleeve 3 is slidably mounted upon the driving shaft 2 and this sleeve 3 is engaged by means of an operating lever 4. This operating lever 4 is pivotally mounted upon a pivot pin 5 and carries a vertically slidably spring catch 6, the spring catch 6 being adapted to cooperate with the locking frame 7 supported adjacent said lever 4. This locking frame 7 is provided with a plurality of locking notches 8 upon the under face thereof, which notches are adapted to be engaged by means of the laterally extending locking lugs 9 carried by the spring catch 6. This spring catch 6 is slidably mounted within the socket 10 formed in the upper end of the lever 4 and carries a plurality of springs

11 which normally hold the lugs 9 in engagement with the under face of the frame 7. It should be understood that as the push button 12 is forced downwardly, the lugs 9 may be disengaged from the notches 8 and the lever 4 may be easily swung forwardly or rearwardly for the purpose of shifting the sleeve 3. The lever 4 is provided with a yoke portion 13, the yoke portion fitting over a reduced neck 14 formed upon the sleeve 3 for the purpose of permitting the sleeve 3 to be moved longitudinally upon the driving shaft 2 as the lever 4 is swung. Of course it should be understood that a suitable number of notches 8 may be formed in the frame 7 for the purpose of permitting the desired gears to be thrown into action at different periods of time and by considering Fig. 1 it will be seen that a reverse notch 15 is formed in the under face of the frame 7 near the forward end thereof and an abutment spring 16 is carried by the frame 7 against which the lever 4 is adapted to be forced prior to permitting the lug 9 to engage the notch 15. The spring 16 is so placed to cause considerable pressure to be forced against the lever 4 in order to have the lugs 9 engage the notch 15, in this way preventing the reverse gear from being thrown into action inadvertently. As soon as the operator feels that the lever 4 is forced in engagement with the spring 16, he will be advised that the next movement or further pressure upon the lever 4 will throw the gears into engagement with the reverse gear.

By considering Fig. 1, it will be seen that the sleeve 3 extends through the high speed gear 17, the intermediate speed gear 18, the low speed gear 19 and the reverse gear 20. These gears 17, 18, 19 and 20, are supported in any suitable or desired manner and the sleeve 3 is adapted to slidably move through the gears, these gears being held against shifting movement with respect to each other or with respect to the gears carried by the driven shaft 1. The driven shaft 1 carries a high speed gear 21 and an intermediate gear 22 and a low speed gear 23 as well as a reverse gear 24. These gears 21, 22 and 23, mesh respectively with the gears 17, 18 and 19, a reversing pinion 25 being interposed between the gears 20 and 24 for the purpose of causing the reverse action when the gears 20 and 24 are thrown into cooperating relation. The reversing pinion

25 is supported upon a suitable supporting shaft 26 carried by the frame member 27.

A locking key 28 in the nature of a wheel is carried by the sleeve 3 and is capable of moving vertically therethrough. The wheel or key 28 is provided with journals 29 which operate in vertically extending grooves 30 formed in the side of the key receiving aperture 31. This key 28 is mounted upon the sleeve 3 so as to move through the same and engage the key ways 32 formed in the gears 17, 18, 19 and 20. Each of the gears 17, 18, 19 and 20 is provided with a concaved channel 33 upon the sides thereof these channels being formed around the center thereof for the purpose of permitting the key wheel 28 to fit between the concaved channel portions 33 of the respective gears and render these gears neutral or inactive. The key wheel 28 is shown in a neutral position in Fig. 1 of the drawings.

The driving shaft 2 is provided with a pair of longitudinally extending parallel channels 34 formed in one side thereof, one of the channels 34 being considerably deeper than the other channel and of sufficient depth to permit the key wheel 28 to drop therein and to be thrown out of engagement with the key ways 32 formed in the gears 17 to 20 inclusive. This structure is shown in Fig. 3 of the drawings. The channels 34 are connected at one end by an inclined channel 35 and at the opposite end by a widened channel 36. The wheel 28 is adapted to travel within these channels 34, 35 and 36 and when the sleeve 3 is moved longitudinally, the wheel 28 will travel in the comparatively shallow channel 34, in this way holding the wheel 28 in proper position for engagement with the key ways 32 formed in the respective gears 17 to 20 inclusive. After the key wheel 28 has reached the channel 36 reverse movement of the sleeve 3 will cause the sleeve 3 to slightly rotate and the key wheel 28 will travel laterally through the widened channel 36 and into the comparatively deep channel 34. The reverse movement of the sleeve 3 will permit it to move forwardly without interfering with the key ways 32 for the reason that the key wheel 28 will drop down below the outer face of the sleeve 3. By continuing the forward movement of the sleeve the key wheel 28 will ride up through the inclined channel 35 and will engage the key ways 32 formed in the low speed gear 19. When it is desired to throw the reverse gear 20 into operation, the sleeve 3 is forced still farther in the reverse direction and the key wheel 28 will engage the key ways 32 formed in the reverse gear 20 and cause the same to operate in conjunction with the gear, through the medium of the reversed pinion 25.

It should be further understood that after the key wheel 28 has engaged one of the

gears 17 to 20 inclusive, the same will be rendered neutral as soon as the key wheel is moved to a position between the wheels or gears 17 to 20 inclusive as shown in Fig. 1 of the drawings.

As shown in Fig. 1 the lower high speed gear 21 is provided with an overhanging flange 37 which fits in a circular channel 38 formed in the gear 17. The reverse pinion 25 is also provided with an overhanging flange 39 which overhanging flange 39 fits within the cutaway portions 40 formed in the respective gears 20 and 24. In this way the gears 17 to 20 will be assisted in being held against lateral shifting movement or longitudinal movement upon the sleeve 3, as the sleeve 3 is shifted.

It should be of course understood that certain obvious detail mechanical changes may be made in the present device without departing from the spirit of the invention, so long as these changes fall within the scope of the appended claims.

It will be necessary to allow the wheel 28 to return to the neutral position between the gears 20 and 19 so as to allow the same to advance in low, intermediate and high or to the reverse from a neutral starting point. If desired the gears 19 and 23 may be provided with a larger hub on the reverse side to permit more latitude in rising to a neutral position without engaging gear 19. The lower slot 34 may be placed upon either side of the shaft to suit the requirements caused by the direction of rotation of the shafts.

What is claimed is:

1. A variable speed transmission device comprising a driving shaft recessed longitudinally and transversely thereof, a plurality of driving gears mounted on the shaft and provided with key-ways cooperating with the said recesses, a plurality of driven gears in mesh with the driving gears, a key-wheel movable longitudinally of the shaft and within the recesses and key-ways of the said gears and shaft for establishing a driving relation between the two, and means for shifting the said key wheel in progressive engagement with the driving gears.
2. A variable transmission device comprising a driving shaft having a channeled portion, a plurality of driving gears loosely supported on the shaft and about the channeled portion, a driven shaft, gears on the driven shaft and in mesh with the driving gears, a sleeve slidably mounted upon the driving shaft and extending through the driving gears, a key-wheel carried by the sleeve and traveling in the channeled portion of the drive shaft for movement into and out of engagement with the said driving gears for establishing or breaking driving relation between the same and the said drive shaft, and means for shifting the

sleeve longitudinally of the drive shaft for progressively establishing driving relation between the driven and driving gears.

3. A variable speed transmission device comprising a plurality of driving gears provided with key-ways, a sleeve adapted to slide through the gears longitudinally, a key-wheel carried by the sleeve and adjustable cross-wise thereof for engagement or disengagement with the key-ways of the said gears, and a drive shaft supporting the said sleeve and gears loosely thereon said shaft having means for driving and automatically effecting the cross-wise adjustment of the said key-wheel as the sleeve is reciprocated longitudinally of the shaft.

4. A variable speed transmission device comprising a driving shaft having connected channels of unequal depth, a plurality of driving gears mounted on the shaft and having key-ways opening out upon and parallel to the channeled portion of the shaft, a sleeve movable on the shaft and slidable through the gears longitudinally, and a key-wheel carried by the sleeve and traveling in the path of the connected channels of the shaft, said key-wheel being adjustable cross-wise of the sleeve whereby it may be alternately guided into and out of engagement with the key-ways of the said driving gears as the depth of the channels correspondingly vary.

5. A variable speed transmission device comprising a shaft having an endless key seat formed of connected deep and shallow channels, a sleeve slidable on the shaft, a key movable with the sleeve and guided in its movements by the said key seat, said key being adjustable cross-wise of the sleeve for movement inwardly and outwardly thereof in correspondence with the adjustment of the key-seat, and a plurality of gears loosely mounted on the said shaft and provided each with a channeled bearing portion and a key-way opening thereinto, said key-ways adapted when in registry with the key-seat of the shaft to be penetrated by the said key when adjusted outwardly whereby the gear is locked to the shaft, the said channeled portion of the gear providing means for disengaging the key from the key-way and consequently releasing the gear.

6. A variable speed transmission device comprising a plurality of driving gears having key-ways, a plurality of driven gears meshing therewith, a sleeve slidable through the driving gears and provided with key means shiftable therethrough for engaging or disengaging a key way of a driving gear, a driving shaft supporting the said sleeve and provided with means for automatically effecting a shift of the said key means whereby driving relation between the shaft and a gear may be established or broken, one of the gear wheels at each end of the gearing having a flange to engage the outer face of a companion gear to hold all of the gears against relatively longitudinal shifting or disintegrating movement with respect to one another during the shifting of the sleeve and means for sliding the sleeve through the gears.

7. A variable speed transmission device comprising a clutch sleeve, a lever for operating said sleeve, a locking frame adapted to cooperate with the lever, a spring plunger provided with means for engaging the frame and holding the lever in a set position relative thereto, and a retarding spring at one end of the frame, said spring adapted to engage the lever for yieldably resisting the shifting movement thereof to a reverse-gear position.

8. A variable speed transmission device comprising a plurality of cooperating gear wheels, one of which constitutes a reverse-gear, a longitudinally movable sleeve passing through a group of axially aligned gear wheels, clutch means movable with the said sleeve and adapted to progressively engage the gear wheels through which the sleeve is axially movable, an operating lever, a frame engaged by the operating lever, a retarding spring cooperating with the lever for resisting movement thereof, and means for locking said lever in the required adjusted position.

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

BERT ANDERSON.

Witnesses:

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