May 8, 1934. I. G. BRENNEMAN 1,957,428

REVERSE LOCK FOR DRIVING SHAFTS

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Fig. 1.

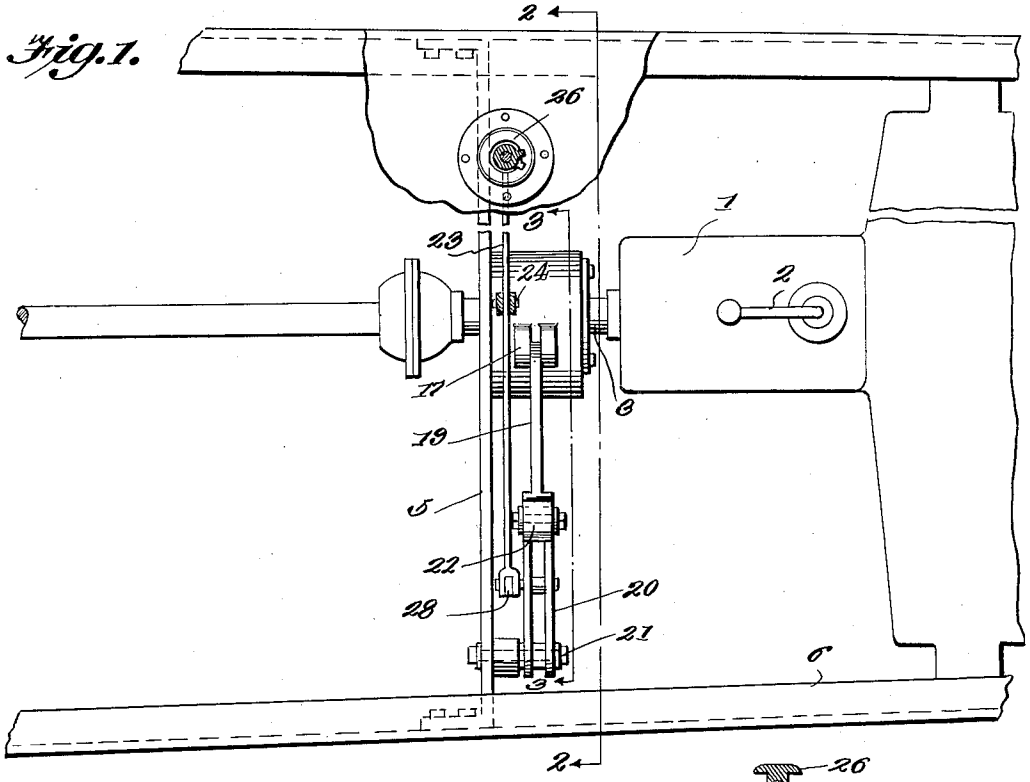


Fig. 2.

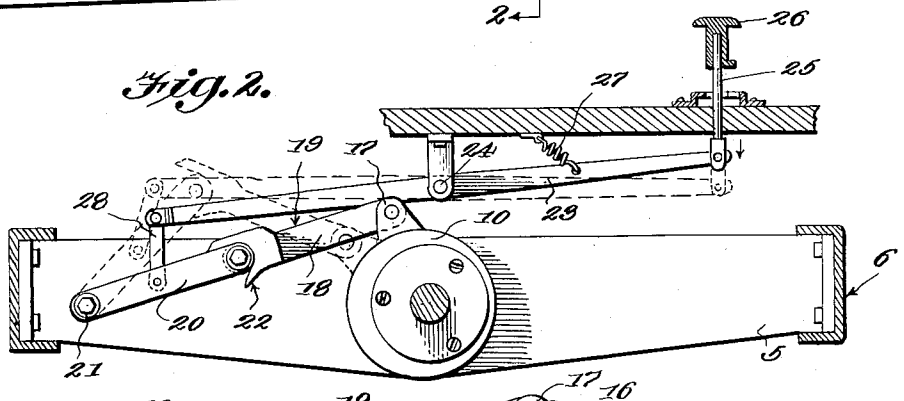
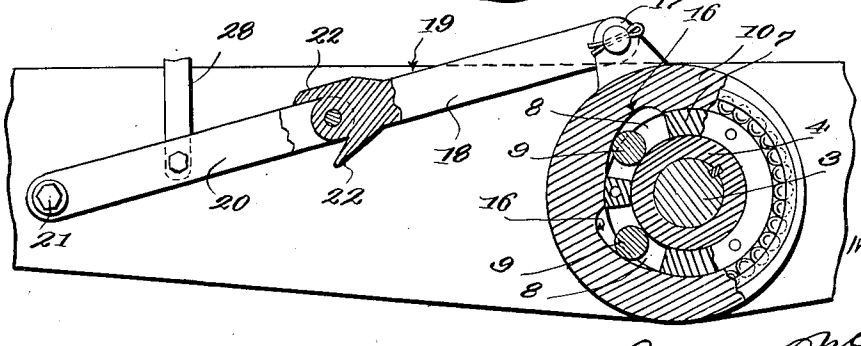


Fig. 3.



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Fig. 4.

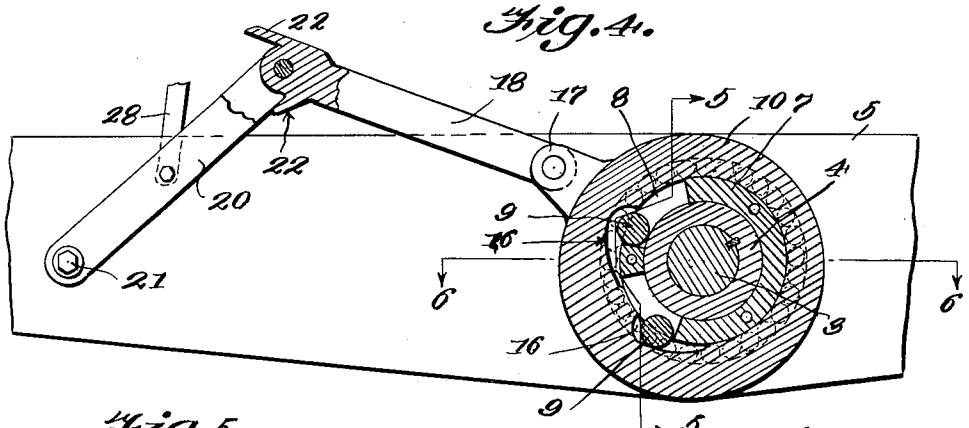


Fig. 5.

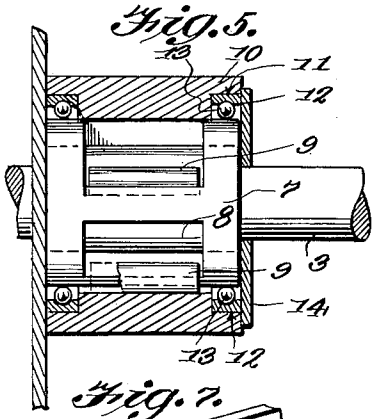


Fig. 6.

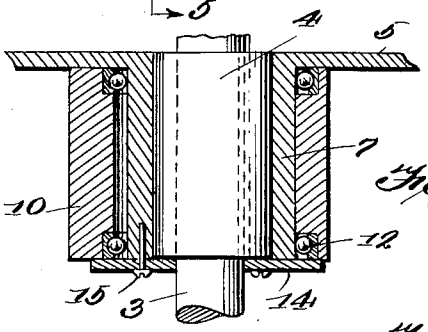


Fig. 9.

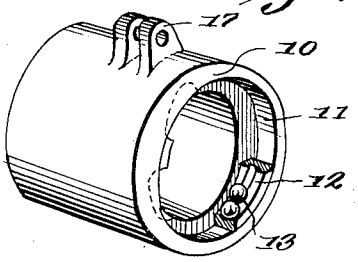


Fig. 7.

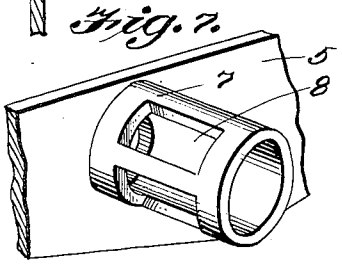


Fig. 8.

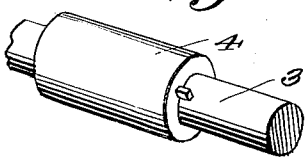


Fig. 11.

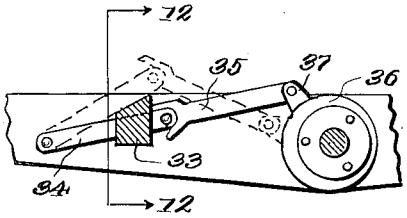
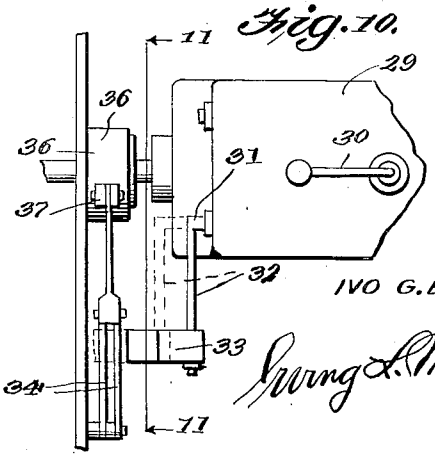


Fig. 12.



Fig. 10.



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1,957,428

REVERSE LOCK FOR DRIVING SHAFTS

Ivo George Brenneman, Blue Hall, Pa.

Application December 4, 1931, Serial No. 579,097

6 Claims. (Cl. 192—4)

This invention relates to means for preventing a motor vehicle from going into reverse and moving rearwardly, for instance, where the vehicle is standing on an incline and where the tendency is to slip backwardly at the time power is supplied to the engine in a pick-up on starting after the vehicle has once come to a stop.

Another object of this invention is the production of a simple and efficient means for automatically gripping the driving shaft so as to hold the same against reverse rotation, but at the same time to permit the driving shaft to rotate so as to drive the vehicle forwardly.

Another object of this invention is the production of a simple and efficient friction cranking mechanism in association with the drive shaft of a motor vehicle which is so constructed as to prevent the reverse rotation of the drive shaft and at the same time permit the release of the shaft so as to allow the shaft to be driven in a reverse motion at the will of the operator.

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 top plan view of my improved mechanism;

Figure 2 is a section taken on line 2—2 of Figure 1;

Figure 3 is a section taken on line 3—3 of Figure 1;

Figure 4 is a transverse sectional view similar to Figure 3, showing the reverse locking mechanism in a released position;

Figure 5 is a section taken on line 5—5 of Figure 4;

Figure 6 is a section taken on line 6—6 of Figure 4;

Figure 7 is a detailed perspective view of the roller supporting thimble;

Figure 8 is a detail perspective view of a portion of a driving shaft showing the locking sleeve carried thereby;

Figure 9 is a detail perspective view of the eccentric cylinder;

Figure 10 is a top plan view of a modified form of the invention for releasing the driving shaft locking mechanism;

Figure 11 is a section taken on line 11—11 of Figure 10; and

Figure 12 is a section taken on line 12—12 of Figure 11.

By referring to the drawings it will be seen that 1 designates the usual gear shift casing which supports the usual gear shift lever 2. The driving shaft 3 is associated with the gear shift casing in the usual manner and this driving shaft 3 has keyed thereon a cylindrical locking sleeve 4, as shown in detail in Figure 8. The driving shaft 3 passes through a transversely extending bracing plate 5 which bracing plate 5 is preferably anchored along the side of the chassis of the machine, and this plate 5 is provided with a laterally extending thimble 7, which thimble is preferably formed integral with the plate 5 and is adapted to snugly fit over the sleeve 4. The thimble 7 is provided with a plurality of longitudinally extending slots 8 formed in one side thereof, within which slots 8 are adapted to be loosely mounted the elongated wedging rollers 9. The elongated wedging rollers 9 are of approximately one-third the diameter of the width of the slot 8 as clearly shown in Figure 3 of the drawings.

An eccentric sleeve 10 is mounted upon the thimble 7 and this eccentric sleeve 10 has notches 11 formed near each end within which the ball-bearing races 12 are mounted for supporting the ball-bearings 13. The ball-bearings 13 are preferably mounted so as to extend substantially flush with the inner face of the eccentric sleeve 10, but at the same time efficiently engage the outer face of the thimble 7 near the respective ends thereof to constitute an efficient bearing for the eccentric sleeve 10 and the thimble 7. The eccentric sleeve 10 is held upon the thimble 7 and against accidental removal therefrom by means of a closure plate 14, which closure plate 14 is secured to the end of the thimble 7 by means of suitable screws 15, shown in Figure 6. The eccentric sleeve 10 is provided with a plurality of wedging notches 16 formed upon the inner face thereof and arranged in close relation with respect to each other, these wedging notches 16 tapering from the top toward the bottom of the eccentric sleeve 10, as shown in Figure 3. The wedging notches 16 of the eccentric sleeve 10 are adapted to register with the notches 8 of the thimble 7, and the wedging rollers 9 which are carried within the notches 8 of the thimble 7 are adapted to work within the wedging notches 16, as clearly shown in Figures 3 and 4 of the drawings.

The eccentric sleeve 10 is provided with integral ears 17 which are connected to a link 18 of the extension sectional link 19. The link 18 of the extension sectional link 19 is connected to the anchor link 20 of the extension sectional link 19, which anchored link 20 is pivotally se-

cured to the plate 5, as at 21. The link 18 of the extension sectional link 19 is provided with a pair of radiating fingers 22, which are adapted to engage the opposite sides of the link 20 at alternate times to limit the upward and downward swing of the link 20.

In order to rotate the eccentric sleeve 10, there is provided a lever 23 which is pivotally mounted as at 24, one end supporting a vertically extending rod 25 which supports a foot-piece 26. A coil spring 27 is employed for normally holding the treadle end of the lever 23 upwardly in the position shown in Figure 2. The opposite end of the lever 23 is connected to the link 20 by means of a link 28 and it will therefore be seen that as the treadle member 25 is depressed, the lever 23 will be moved to the position shown in dotted lines in Figure 2, thereby lifting upwardly upon the link 28 and also upon the link 20, and moving the link 20 and the link 18 to the position shown in dotted lines, or to a "braked position". This will cause the eccentric sleeve 10 to rotate to the position shown in dotted lines and as also shown in Figure 4, thereby permitting the brake rollers 9 to freely rotate without wedging within the slots 16 due to the fact that the wedging slots have been moved to a position to hold the rollers out of binding contact with the sides of the wedging notches 16 and the sleeve 4. The lower finger 22 will limit the upward swing of the levers 20 and 18 as clearly shown in Figure 4.

As soon as pressure is released from the foot-piece 26 of the treadle member 25, the spring 27 will return the parts to their normal position and the eccentric sleeve 10 will then move to the position shown in Figure 3. Consequently, when power is applied to the shaft 3 for driving the shaft in a forward driving direction, the shaft 3 and sleeve 4 may freely rotate in a clockwise direction, or in the direction shown by the arrow in Figure 3. If, however, the shaft 3 should attempt to rotate in a counterclockwise direction, the frictional contact of the sleeve 4 with the wedging rollers 9 will cause the rollers to be wedged in contact with the walls of the wedging notches 16 and in this way firmly lock the shaft 3 against counterclockwise rotation. This will prevent the usual rearward slipping of the automobile when starting on an incline and will prevent the automobile from rolling rearwardly as soon as the clutch-pedal is released, as now very often happens under the usual type of clutch and gear mechanism employed upon motor vehicles.

From the foregoing description, it will be seen that a very simple and efficient means has been produced for frictionally gripping the driving shaft of a motor vehicle and holding the same against reverse rotation except when it is desired to drive the machine in a reverse direction. The mounting of the friction rollers 9 will constitute an efficient automatic frictional grip for locking the driving shaft against reverse rotation, and at the same time permitting the driving shaft to freely rotate in a forward direction. This operation is accomplished by simply pressing downwardly upon the foot-piece 26 as shown, which will fold the extension link 19 and cause the sleeve 10 to be pulled to the left, as shown in Figure 2, thereby causing the parts to assume the position as shown in Figure 4, and allow the braking rollers 9 to freely rotate without frictionally gripping and wedging the driving shaft against counter-clockwise rotation.

In Figures 10, 11 and 12 there is shown a modified form of the invention wherein the usual gear shift casing 29 is employed having a gear shift lever 30 and the usual reverse rod 31 mounted within the housing or casing 29. This reverse rod 31 is provided with a laterally projecting arm 32 which carries a wedge 33 which wedge 33 is adapted to slide under the links 34 of the brake lever 35, which brake lever 35 is connected to the eccentric sleeve 36 by means of an ear 37, the eccentric sleeve 36 being similarly constructed to the sleeve 10 and the other parts being of similar structure. In this type of embodiment, the release is obtained simultaneously with the throwing of the gear shift lever 30 to a reverse position, and when this lever 30 is moved to reverse position, the arm 32 will assume the position shown in dotted lines in Figure 10, thereby forcing the wedge 33 under the links 34 of the brake lever 35 and moving the same to the dotted position for rotating the sleeve 36, as shown in Figure 11.

It should be understood that certain detail changes in the mechanical construction may be employed without departing from the spirit of the invention so long as these changes fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:—

1. A reverse lock for a driving shaft comprising a wedging sleeve, a thimble supported upon said sleeve, rollers carried by said thimble and contacting with said sleeve, an eccentric sleeve cooperating with said rollers for binding said rollers and frictionally holding said driving shaft against reverse rotation, said eccentric sleeve being mounted for rotary motion upon said thimble a plurality of pivotally connected links, means for pivotally supporting one end of one link, means for connecting the remaining link to said eccentric sleeve at its other end, and means for engaging said links for swinging the same and rotating said eccentric sleeve upon said thimble.

2. A reverse lock for a driving shaft comprising a wedging sleeve, a thimble supported upon said sleeve, rollers carried by said thimble and contacting with said sleeve, an eccentric sleeve cooperating with said rollers for binding said rollers and frictionally holding said driving shaft against reverse rotation, said eccentric sleeve being mounted for rotary motion upon said thimble, a plurality of pivotally connected links one of which is pivotally supported at one end and the other engaging said eccentric sleeve at its outer end, and means for engaging one of said links for swinging the same and rotating said eccentric sleeve upon said thimble, said last mentioned means comprising a pivoted lever engaging one of said links at one end and a foot-controlled pedal-piece engaging the opposite end of the lever for moving said links to a collapsed position.

3. A reverse lock for a driving shaft comprising a wedging sleeve, a thimble supported upon said sleeve, rollers carried by said thimble and contacting with said sleeve, an eccentric sleeve cooperating with said rollers for binding said rollers and frictionally holding said driving shaft against reverse rotation, said eccentric sleeve being mounted for rotary motion upon said thimble, a pair of pivotally connected links one of which is pivotally supported at one end and the other engaging said eccentric sleeve at its other end, and means for engaging said links for folding the same and rotating said eccentric sleeve

upon said thimble, said last mentioned means comprising a pivoted lever engaging said links at one end and a foot-controlled pedal-piece engaging the opposite end of the lever for moving said links to a collapsed position, said links being provided with means for limiting the swing of said links in both an upward and a downward position.

4. A reverse lock for a driving shaft comprising a locking sleeve, wedging rollers engaging said locking sleeve, an eccentric sleeve engaging said wedging rollers adapted to normally hold said first mentioned sleeve against reverse rotation, a supporting ear carried by said eccentric sleeve, a pair of links pivotally connected together, one link being secured to said ear at one end, means for anchoring the opposite end of the other link, means for limiting the swing of said links, an operating lever pivotally connected to one of said links and adapted to swing the same upwardly whereby said eccentric sleeve will be rotated, and a pedal member adapted to control the said last mentioned lever.

5. In combination with a gear shift provided with a reverse rod having a laterally extending arm, a driving shaft, a wedging sleeve for locking said driving shaft normally against reverse motion, a wedge carried by said arm, and means associated with said wedge for rotating said wedging sleeve and rendering the same inactive for allowing the reverse rotation of said drive shaft.

6. In combination with a drive shaft, a frictional sleeve, an eccentric sleeve, a roller supporting thimble interposed between said friction sleeve and said eccentric sleeve, said thimble being provided with longitudinally extending comparatively wide slots terminating short of the ends of said sleeve, rollers freely mounted within said slots and having transverse movement thereacross, said eccentric sleeve having wedging notches formed therein for registration with said slots in said thimble and adapted to receive said rollers, said thimble constituting a retaining frame for said rollers, bearings engaging said thimble near the ends, and means for shifting said eccentric sleeve.

IVO GEORGE BRENNEMAN.

CERTIFICATE OF CORRECTION.

Patent No. 1,957,428. May 8, 1934.

IVO GEORGE BRENNEMAN.

It is hereby certified that the residence of the patentee in the above numbered patent was erroneously described and specified as "Blue Hall, Pennsylvania," whereas said residence should have been described and specified as Blue Ball, Pennsylvania, as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of June, A. D. 1934.

Bryan M. Battey

(Seal) Acting Commissioner of Patents.