

A. P. BRUSH.
 SELECTIVE MECHANISM FOR SHIFTING GEARS.
 APPLICATION FILED JAN. 12, 1910.

1,041,734.

Patented Oct. 22, 1912.

Fig. 1.

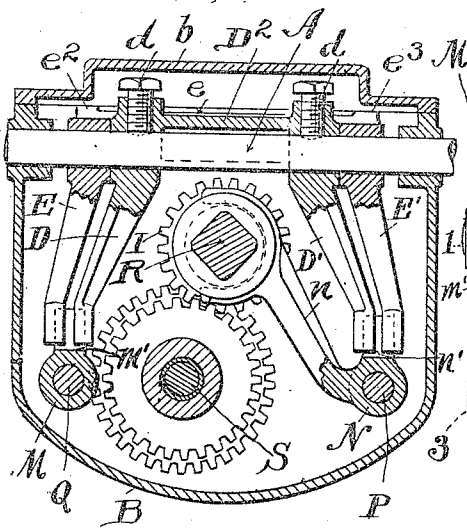


Fig. 2.

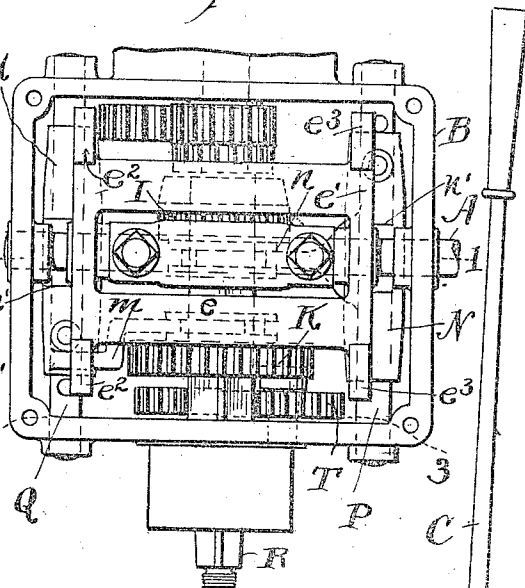


Fig. 3.

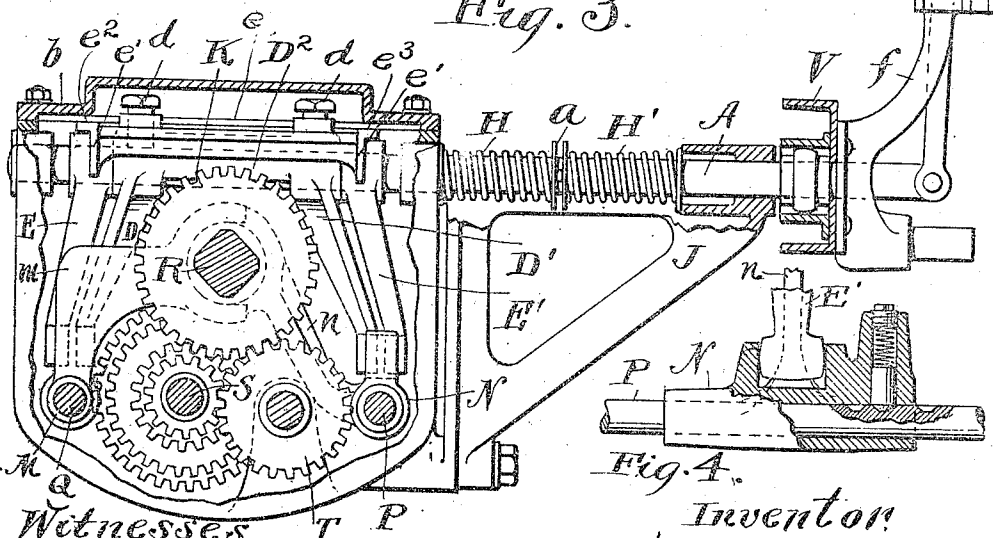


Fig. 4.

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SELECTIVE MECHANISM FOR SHIFTING GEARS.

1,041,734.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed January 12, 1910. Serial No. 537,625.

To all whom it may concern:

Be it known that I, ALANSON P. BRUSH, a citizen of the United States, residing at Flint, in the county of Genesee and State of Michigan, have invented a certain new and useful Improvement in Selective Mechanism for Shifting Gears, of which the following is a full, clear, and exact description.

The invention relates to means for selectively moving any of a plurality of gear shifters in either direction, and for locking other shifters against movement; and more specifically the invention relates to the special adaptation of such mechanism for use in connection with the speed changing mechanism of an automobile.

The essential characteristics of the invention, broadly considered, are that the shifting arms and the locking arms are both hung on a longitudinally movable rock shaft; that the shifting arms are fixed to the shaft so as to partake of both of its movements; that the locking arms are compelled to move longitudinally with said rock shaft, but are prevented from rocking with the rock shaft and shifter arms.

The invention consists in the combinations of parts hereinafter described and pointed out definitely in the claims.

In the drawing, Figure 1 is a sectional end view of the preferred embodiment of the invention, the section being in the plane indicated by line 1—1 on Fig. 2. Fig. 2 is a plan view of the mechanism when the cover plate of the inclosing and supporting casing has been removed. Fig. 3 is a sectional end view in the plane indicated by line 3—3 on Fig. 2. Fig. 4 is a side view of one of the shifters and the engaging part of the associated shifter arms.

Referring to the parts by letters, A represents a rock shaft which is mounted in bearings in which it cannot only rock, but can also move longitudinally. In the specific embodiment of the invention shown these bearings are in the sides of a case B, and also in the outer end of a bracket J which is secured to the side of said case. A lever C is pivoted to the outer end of this shaft on a substantially horizontal pivot, and it passes up between two parallel guide bars

F placed at such distance apart that they guide the lever as it is swung forward or backward to rock the shaft A. When, as with the embodiment of the invention shown, it is intended for use as a part of an automobile, the shaft A will pass somewhat loosely through one of the side members V of the automobile frame; and the bars F will be fixed to a bracket f attached to this frame member. In order to move the shaft A longitudinally, the lever C is rocked to right or left, turning upon one or the other of the bars F, F, as a fulcrum.

The shaft is automatically returned to its intermediate position, relative to longitudinal movement, by two springs H, H' both embracing the shaft, and the former lying between a collar a fixed to the shaft, and the side of the case B, and the other lying between the same collar and the bracket J.

Within the case B two shifter arms D, D' are fixed to the shaft A. In the construction shown these are rigidly connected with the sleeve D², which embraces said shaft and is fixed thereto by set screws d.

E, E' represent two locking arms which are loosely hung upon the shaft A. In the specific construction shown these two arms contact respectively with the shoulders formed by the end faces of the sleeve D², and these two locking arms are rigidly connected together by frame members e, e' so as to form a rigid structure of which the locking arms are parts. This structure has surfaces e², e³ which lie on opposite sides of the shaft A; and when the cover plate b is fixed upon the case B these surfaces slidingly engage with the under face of this cover.

When the shaft A is in its intermediate position, both with respect to longitudinal and with rocking movement, the locking arms E, E' are alined with the shifting arms D, D' in respect to their operative lower ends. These locking arms and shifter arms are, in the construction shown, provided and adapted for the purpose of moving endwise or locking, as required, the two shifters M and N, which are movable longitudinally and in parallel paths. In the construction shown these shifters are respectively sup-

ported by and movable upon two rods P and Q which are fixed to the case B. The shifter M has a forked arm *m* which engages in an annular groove, indicated by dotted lines on Fig. 3, in a sliding gear sleeve K. The shifter N carries a forked arm *n* which engages with an annular groove in a sliding gear sleeve I, as shown in Fig. 1. The shifter M has a transversely extended notch *m'* in its upper surface for the reception of the lower ends of the shifter arm D and locking arm E. A similar transverse notch *n'* is formed in the top face of the shifter N for the reception of the lower ends of the shifter arm D' and the locking arm E'. In fact, in the specific construction shown, when the shaft A is in its normal intermediate position, the lower ends of both of the arms D and E project into the notch *m'* in the shifter M, and both of the arms D', E' project into the notch *n'* in the shifter N.

If, now, it is desired to move the shifter N in one direction or the other, shaft A is, by the actuation of lever C, first moved to the right, as shown in Fig. 3. By this movement the locking arm E' is moved out of engagement with the shifter N, leaving the shifter arm D' in operative engagement therewith. At the same time the shifter arm D is moved out of engagement with the shifter M, leaving the locking arm E in operative engagement therewith. The shaft A may now be rocked in one direction or the other, and, as a result, the shifter N will be moved in one direction or the other by the shifter arm D'; but the shifter M will be prevented from movement by the engagement therewith of the locking arm E. If, instead of moving the shaft A to the right as shown in Fig. 3, it be moved to the left, the shifter M will be freed from the restraint of the locking arm E, and the shifter arm D' will be moved out of engagement with the shifter N. Therefore, when the shaft A is rocked, the shifter M may move in either direction, as required. During the longitudinal movement of the rock shaft the surfaces *e*², *e*³ will slide in contact with the case cover, and during the rocking movement of said shaft they will, by their engagement with this case cover, prevent any rocking movement of the locking arms.

Among the advantages of this described construction, it may be mentioned that it is exceedingly simple and cheap. It is moreover very easily assembled or disassembled when occasion requires. It is only necessary in the latter instance to remove the cover *b*; to free shaft A from the restraining influence of the lever C, to loosen the collar *a*, and then to withdraw said shaft endwise to free it from the locking arms and the shifting arms. They may then be easily re-

moved. To reassemble the parts the locking arm structure and the shifting arm structure are put in place with their holes in alinement, and the shaft again pushed through them.

Although only two shifters are shown, and although a locking arm and a shifter arm is associated with each of them, it is quite apparent that the invention is not limited to the use of two shifters, the essence of the invention lies in the use of a plurality of shifters, cooperating with suitable locking arms and suitable shifter arms and arranged, so that by the endwise movement of the supporting shaft A one or more of the shifters, which is or are to be moved, shall be engaged by a shifter arm or arms, while all the other shifters are free from engagement with the shifter arms and are engaged by locking arms.

Generally speaking, it is not of any importance what specific results are brought about by the movement of the shifters. As shown, however, they respectively move the two gear sleeves K and I, which sleeves are slidably mounted on a squared part of a shaft R, which is the shaft of automobile change speed mechanism, which is to be driven either backward or forward at various speeds. The shaft S is a shaft which serves as the driving shaft of the change speed mechanism, and it has secured to it various gears adapted to be engaged, by gears carried by the gear sleeves K and I, according as said sleeves are moved in one direction or the other. One gear, however, carried by the gear sleeve K, is intended to engage with an idler gear T, which, in turn, engages with a gear fixed to shaft S, whereby the shaft R is driven in the reverse direction.

Having described my invention, I claim:

1. In a selective mechanism, the combination with a pair of shifters, a longitudinally movable rock shaft, shifting arms fixed on the shaft and each engaging a shifter; a pair of locking arms, means for moving said shaft longitudinally, such movement causing one of said shifting arms to be disengaged from its shifter and the locking arm adjacent the last mentioned shifting arm to be retained in contact with said shifter, the other of said shifter arms remaining in contact with its shifter while its adjacent locking arm is disengaged from the said shifter, and means for preventing the turning of the locking arms as the shaft rocks.

2. In selective mechanism, the combination of a plurality of shifters, a case having a removable cover, longitudinally movable rock shaft, mounted in said case, shifting arms fixed to said rock shaft and adapted to respectively engage with said shifters and to

be moved into and out of engagement there-
with by the longitudinal movement of said
rock shaft, locking arms which loosely em-
brace said rock shaft, said rock shaft being
5 provided with shoulders engaging said lock-
ing arms and compelling them to move end-
wise with the rock shaft, members having
surfaces which slidably engage the inner

face of the case cover, said members being
rigidly connected to the locking arms. 10

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

ALANSON P. BRUSH.

Witnesses:

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