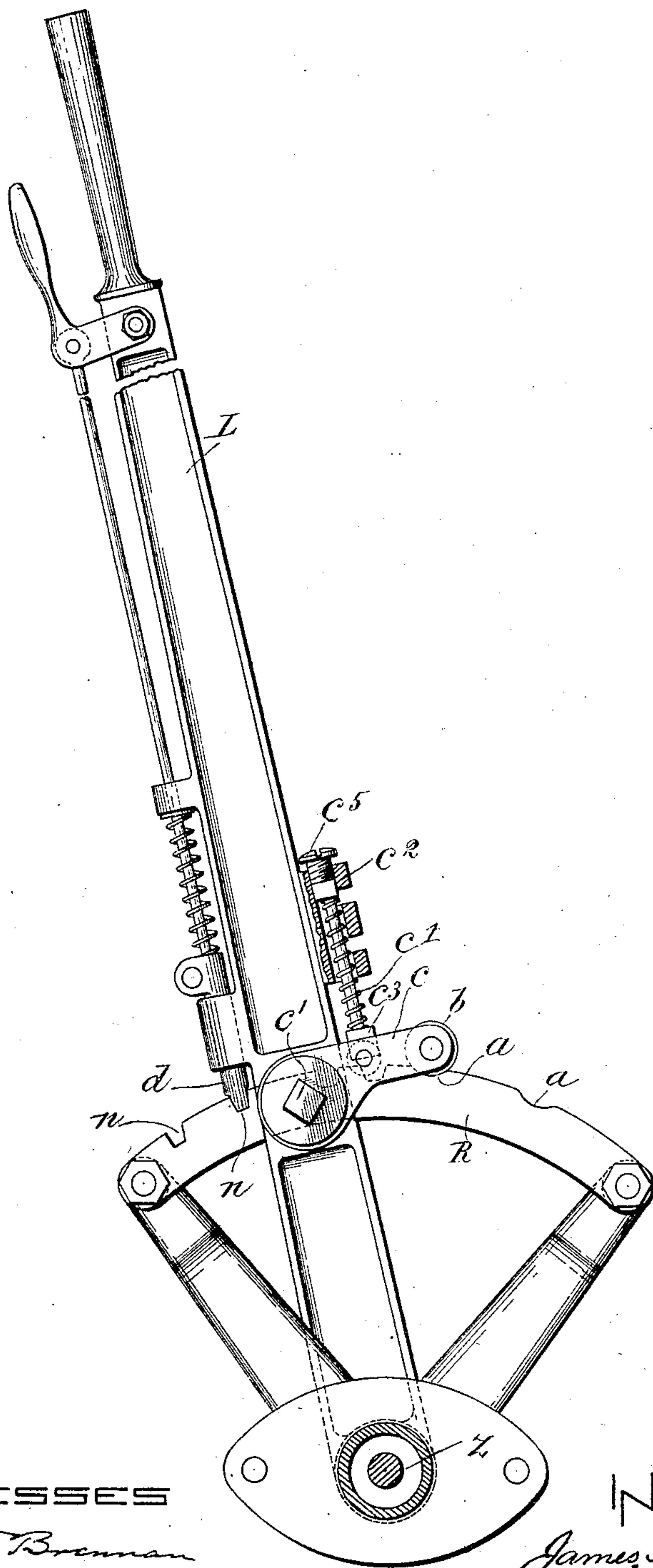


No. 865,569.

PATENTED SEPT. 10, 1907.

J. M. CRAFTS.
GEAR SHIFTING DEVICE.
APPLICATION FILED FEB. 13, 1907.



WITNESSES

Joseph T. Brennan
C. J. Winkery

INVENTOR

James M. Crafts
by *Roberts & Mitchell*
Attorneys

UNITED STATES PATENT OFFICE.

JAMES M. CRAFTS, OF BOSTON, MASSACHUSETTS.

GEAR-SHIFTING DEVICE.

No. 865,569.

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed February 13, 1907. Serial No. 357,224.

To all whom it may concern:

Be it known that I, JAMES M. CRAFTS, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Gear-Shifting Devices, of which the following is a specification.

My invention relates to devices for controlling the position and operation of machinery and is particularly applicable to the speed controlling levers used in operating motor vehicles; it consists in improvements and appliances by which the determination of the several positions of the controlling mechanism may be facilitated and rendered more certain than it is at present with some types of speed controlling mechanism in vogue.

In the drawings hereto annexed which illustrates an embodiment of my invention, there is shown in elevation a typical speed changing lever with my improvements incorporated therewith.

L is the operating lever pivoted at Z, and the segmental rack R, which is concentric with the lever-pivot Z is provided with the usual rack notches *n* with which the hand operated locking bolt *d* engages in the usual manner to stop and hold the lever L in any one of its several determinable positions. A difficulty often encountered by persons operating machinery with such contrivances, especially when quick action is required, lies in the liability of the lever to overthrow and even when the spring controlled lock bolt as *d* is released after it has been lifted from one of the rack notches and before it comes into register with another notch, conditions may arise which prevent the automatic reengagement of the locking bolt with the proper notch. For instance, in driving motor vehicles in wet and especially in wet and freezing weather, the notches *n* which are usually located in a segment rack which is exposed, become clogged with mud and water and sometimes with ice, so that the bolt is even more than usually liable to ride over and pass the notch for which it is intended. Also inexperienced drivers have encountered the difficulty in the correct manipulation of such speed controlling levers, especially at night, when they are unable to see the position of the mechanism which they have not yet learned to control accurately by the sense of feeling and position. In order to obviate these difficulties and prevent the accidents which sometimes result therefrom, I provide the shifting lever L with an arm marked *c* and which, in the distance shown in the drawing, is pivoted at *c'* to the lever L and is furnished at the end which coöperates with the segment bar R, with a rider as the stud or roller *b*. I secure also to the lever L a block *c²* which serves as an abutment for the spring *c⁴* the other end of which bears upon the lug *c³* which is attached to or forms a part of the arm *c*. A pin *c⁵* is screwed into the top of the block *c²* and extends down through the interior of the spring *c⁴* and

into and through a hole in the lug *c³*. This pin *c⁵* serves to hold the spring *c⁴* in place and is easily removable if removal is desired.

On the edge of the rack bar R, I form contour variations such as the depressions *a* which are spaced to correspond exactly with the spacing between the rack notches *n* and are so located that when the rider roller *b* is detained or arrested by one of these contour variations *a*, the locking bolt *d* will then be in register with one of the notches *n*. That is to say, the distance measured along the segment rack, or angularly from the pivotal center at *z*, from the rearmost contour variation *a* to the rearmost rack notch *n* is equal to the distance between the rider *b* and the locking bolt *d*, all measurements being between centers. Similarly, the distance between the second contour variation *a* to the second notch *n* is the same, and equal to the distance between the rider-roller *b* and bolt *d*, and so on. The rider-engaging contour variations correspond in their spacing to the bolt engaging notches, and the distance from any one contour-variation to the corresponding notch is the same as that between the rider-roller and bolt. The contour variations shown in this case as the depressions *a*, are so formed that the rider will pass with comparative ease into and out of engagement with the contour variations but are sufficiently pronounced and abrupt to detain the rider and consequently the lever L with considerable emphasis, so that the liability of the operator overriding the point where he wishes to secure the lever L will be practically eliminated. If, on such occasions as are mentioned above, the notches *n* have become seriously clogged with adhering material, the detention of the lever by the coöperation of the rider *b* and one of the contour variations *a*, will be sufficiently secure to hold the lever L in the desired position under any except the most extraordinary conditions, and while the lever L is so held, the operator may easily, by manipulating the locking bolt, dislodge the adhering material from the notch *n* with which the locking bolt then registers, so that the bolt may enter into effective engagement with the appropriate notch in the rack.

The above described contrivance, while not indispensable to the skilled operator of machinery to which it is an adjunct, will, nevertheless, prove a practical check upon his movements and will assist him in the accurate operation of his machinery. In the case of the less experienced operator such a contrivance as above described will be of more marked practical value.

What I claim and desire to secure by Letters Patent is:

1. The combination of a pivoted lever, a notched segment rack, a hand controlled locking bolt on the lever to engage the rack-notches, the segment rack provided with depressions, a spring controlled rider, shaped to fit said depressions, the distance between each of said depressions and a corresponding notch being equal to the distance between the rider and the bolt, measured along the seg-

ment rack, whereby the rider is detained as the bolt registers with a notch.

2. In combination with two relatively movable members, namely a pivoted lever and segment, a locking bolt on one member, the other member provided with notches to engage the locking bolt, a rider on one of said members the other member provided with contour variations which fit the rider, means to constrain the rider against said contour variations, the distance between each of said rider-fitting contour variations and a corresponding notch being equal to the distance between the rider and the bolt, measured along the segment, whereby the rider is detained as the bolt registers with a notch.

3. The combination of a pivoted lever, a notched segment rack, a hand-controlled locking bolt on the lever to engage the rack notches, a spring controlled rider pivoted to the lever, the segment rack provided with depressions shaped to fit the rider, the distance between each of the rider-fitting depressions and a corresponding notch being

equal to the distance between the rider and the bolt, measured along the segment rack, whereby the rider is detained as the bolt registers with a notch.

4. The combination of a pivoted lever, a notched segment rack, a hand controlled locking bolt on the lever to engage the rack notches, a spring controlled rider pivoted to the lever and bearing on the rack on the side of the lever opposite to the locking bolt, said segment rack provided with depressions shaped to fit the rider, the distance between each of the rider-fitting depressions and a corresponding notch being equal to the distance between the rider and the bolt, measured along the segment, whereby the rider is detained as the bolt registers with a notch.

Signed by me at Boston, Suffolk county, Massachusetts this seventh day of February 1907.

JAMES M. CRAFTS.

Witnesses:

ODEN ROBERTS,

CHARLES D. WOODBERRY.