J. T. ALLMAND AND J. D. LAWRENCE.

WINDOW REGULATOR.

APPLICATION FILED APR. 17, 1919.

1,317,150. Patented Sept. 30, 1919.

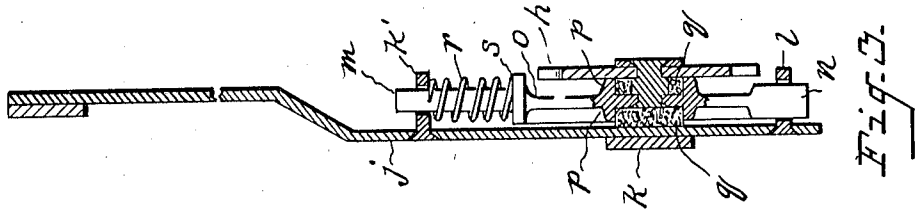


Fig. 3.

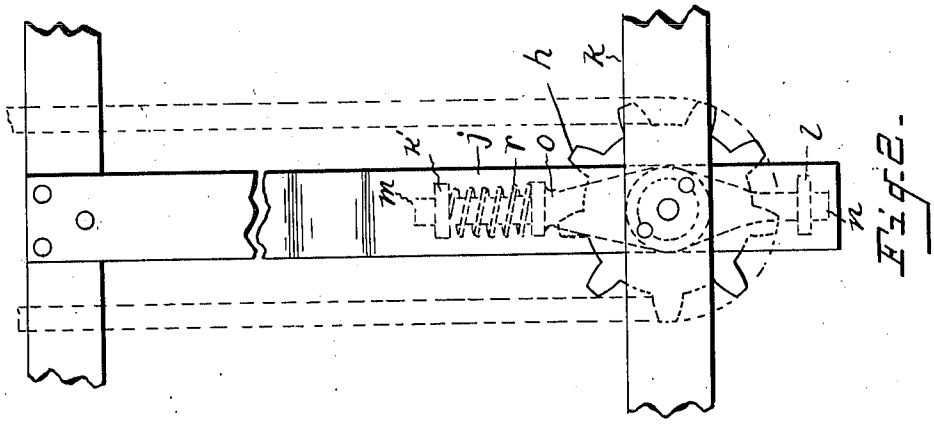


Fig. 2.

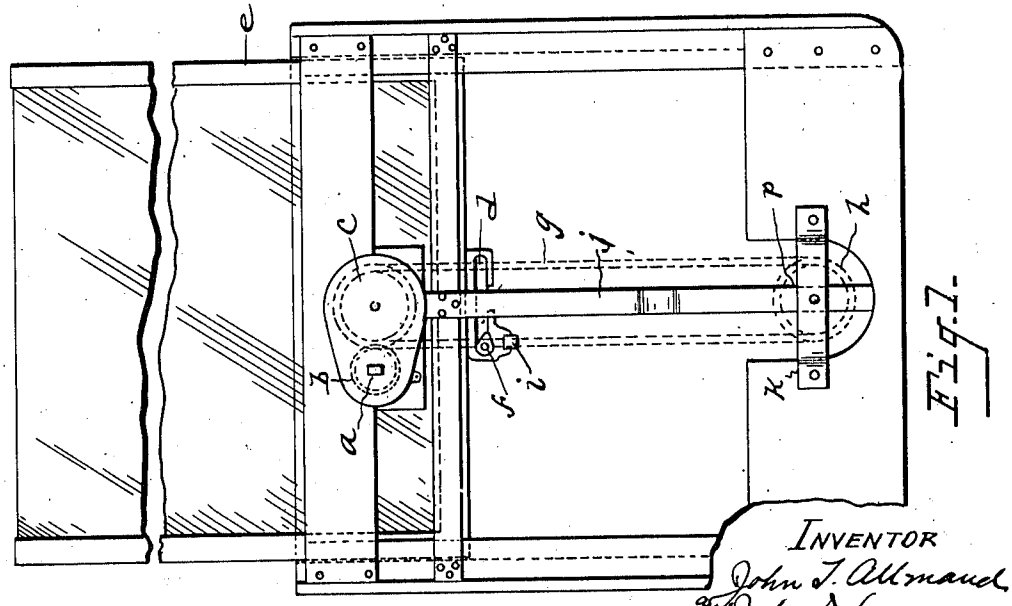


Fig. 1.

INVENTOR

John T. Allmand

BY John D. Lawrence

Stuart O. Bruce

ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN T. ALLMAND AND JOHN D. LAWRENCE, OF DETROIT, MICHIGAN, ASSIGNORS TO TERNSTEDT MANUFACTURING COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

WINDOW-REGULATOR.

1,317,150. Specification of Letters Patent. Patented Sept. 30, 1919.

Application filed April 17, 1919. Serial No. 290,815.

To all whom it may concern:

Be it known that we, JOHN T. ALLMAND and JOHN D. LAWRENCE, citizens of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a new and useful Improvement in Window-Regulators, of which the following is a specification.

This invention relates to window regulators, and has for its object a special form of bearing for the bottom sprocket of a device of this character. Most window lifts comprise an upper and lower sprocket over which runs a chain. A great deal of difficulty has been experienced in the past in the chain running off from the sprockets due to the improper setting of the sprockets by the workmen. This is a very grave annoyance as the apparatus is not very easily accessible, requiring the removal of the trimming and some of the door structure to get at it. It is the object of this invention to provide a bearing which is semi-floating and which is also equipped to tension the chain so as to keep that member taut without the requirement of adjustments. Most window lifts that have been heretofore designed have adjustments to keep the window regulator chain taut. This, of course, in case of a readjustment requires the side of the door to be torn down to effect this object. The present invention accomplishes this automatically.

In the drawings,—

Figure 1 is an inside elevation of an automobile door with part of the door covering removed to show the apparatus.

Fig. 2 is an enlarged rear elevation of the lower structure of the regulator.

Fig. 3 is a vertical cross section of the same.

a designates a crankshaft end connected with the pinion *b*, which is adapted to drive the upper sprocket *c* through the gear (not shown). *e* designates a window which is provided at its bottom with a slotted plate *d* in which engages a pin *f* fast to the chain *g* which runs over the lower sprocket *h*. This much of the construction is old and serves to lift the window or lower the window and in conjunction with the cam *i* push the window over the fence or lift it off from the fence at the top of the window-well.

The improvement resides in the lower sprocket which is ordinarily rotatably supported on a fixed pivot at the juncture of the vertical strap *j* and the cross strap *k*. The vertical strap connects the top and bottom rotatable supports for the sprockets and makes the regulator a unitary device.

It has been customary heretofore to provide some adjustment so that the lower rotatable support for the lower sprocket could be moved slightly to tension the chain to take up any slack and avoid the chain running off the sprockets or becoming noisy. It has also been proposed to secure this tension by having a take-up spring included between some of the links in the chain itself. These objects, however, are accomplished in the present window regulator by a peculiar form of bearing that has the additional feature of allowing the lower sprocket to swing on a vertical axis within a limited arc.

This construction will be best understood by referring to Fig. 3, where it will be seen that a pair of slide brackets *k'* and *l* are fastened on the rear of the vertical strap *j*. These are perforated to receive the cylindrical or trunnion-like ends *m* and *n* of the slide *o*, which centrally and at either side has a boss *p* to form seats for the felt washers *q*. *r* is a spring that engages around the cylindrical upper end *m* of the slide *o* between the slide bracket *k'* and the shoulder *s*. This serves to keep the lower sprocket projected downwardly and the chain taut.

Now obviously if there is a slight clearance between the vertical strap and the rigid parts of the slide, the sprocket wheel and the slide may turn as a unit on the cylindrical ends *m* and *n* in the brackets *k'* and *l*. This is a limited turning movement, perhaps of about ten degrees, but it will be found in practice amply sufficient to allow the lower sprocket to swing around for the purpose of correcting any mislocation or to respond to any tendency of the chain to take a side draft which might otherwise cause the chain to pull off from the sprocket if the sprocket is rigid. This pulling off is what so often occurs in actual experience to the annoyance of owners of automobiles. It will readily be understood that the above described construction corrects these faults. The felt washer *q* keeps the slide normally centralized.

What we claim is:

1. In a window regulator, a vertical-strap provided with a pair of perforated brackets,

a slide slidable through said brackets, a wheel rotatably mounted on the slide, a linear member running over the wheel for transmitting motion, and a spring between one of the brackets and a portion of the slide for tensioning the linear member.

2. In a window regulator, the combination of a pair of rotatable members, a linear member running over the same and operating to lift the window, and a bearing for one of the rotatable members which is both slidable and rotatable through a given arc, means for yieldingly pressing the bearing toward the end of its sliding movement to tension the linear member, the rotatable feature of the bearing serving to avoid the chain running off from the rotatable members by allowing one of the same to swing.

3. In a window regulator, the combination of a strap, a pair of brackets protruding laterally from the strap, a member provided with trunnion-like ends adapted to be rotatably supported in said brackets, a wheel rotatably mounted on said member, and a linear transmission member running over said wheel.

4. In a window regulator, the combination of a sprocket, a chain running over the sprocket, a slide provided with a bearing upon which the sprocket is rotatable, said slide being rockingly mounted to allow the sprocket to swing from side to side within given limits, and a spring for pressing the slide to tension the said chain.

5. In a window regulator, the combination of a support, a sprocket, a chain running over the sprocket, a slide slidable on the support and having a trunnion-like rocking movement on the said support, and a spring pressing against the slide, said slide being provided with a bearing to support the sprocket rotatably.

6. In a window regulator, the combination of a support provided with a pair of brackets forming slide and trunnion bearings, a slide provided with a pair of cylindrical ends to form trunnions that engage in the said brackets, a sprocket rotatably supported on the slide, a spring engaging between one bracket and the slide, and a chain running over the sprocket to tension said spring, the said sprocket being capable of swinging from side to side within given limits.

7. In a window regulator, the combination of an upper sprocket and a lower sprocket, a support for connecting the same, a slide for the lower sprocket both slidably and rockably mounted upon the said support, a chain running over the sprockets, and a spring engaging against the slide to slide the same and tension the said chain.

8. In a window regulator, the combination of an upper and lower sprocket, a support connecting the same, a slide for mounting the lower sprocket which is provided with trunnion-like ends both rockable and slidable with respect to the said support, and a spring bearing against the support and against the slide for moving the lower sprocket and tensioning the chain.

9. In a window regulator, the combination of an upper and a lower sprocket, a support for connecting the same, a chain running over the sprockets, a slide for rotatably mounting the lower sprocket which is both rockingly and slidingly mounted on the support, a felt washer carried by the slide, and a spring between the support and the slide for projecting the slide to tension the chain.

In witness whereof we have hereunto set our hands on the 10th day of April, 1919.

JOHN T. ALLMAND.
JOHN D. LAWRENCE.