March 25, 1930. B. J. GOLDSMITH ET AL 1,751,993

WINDOW REGULATOR

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Fig. 1

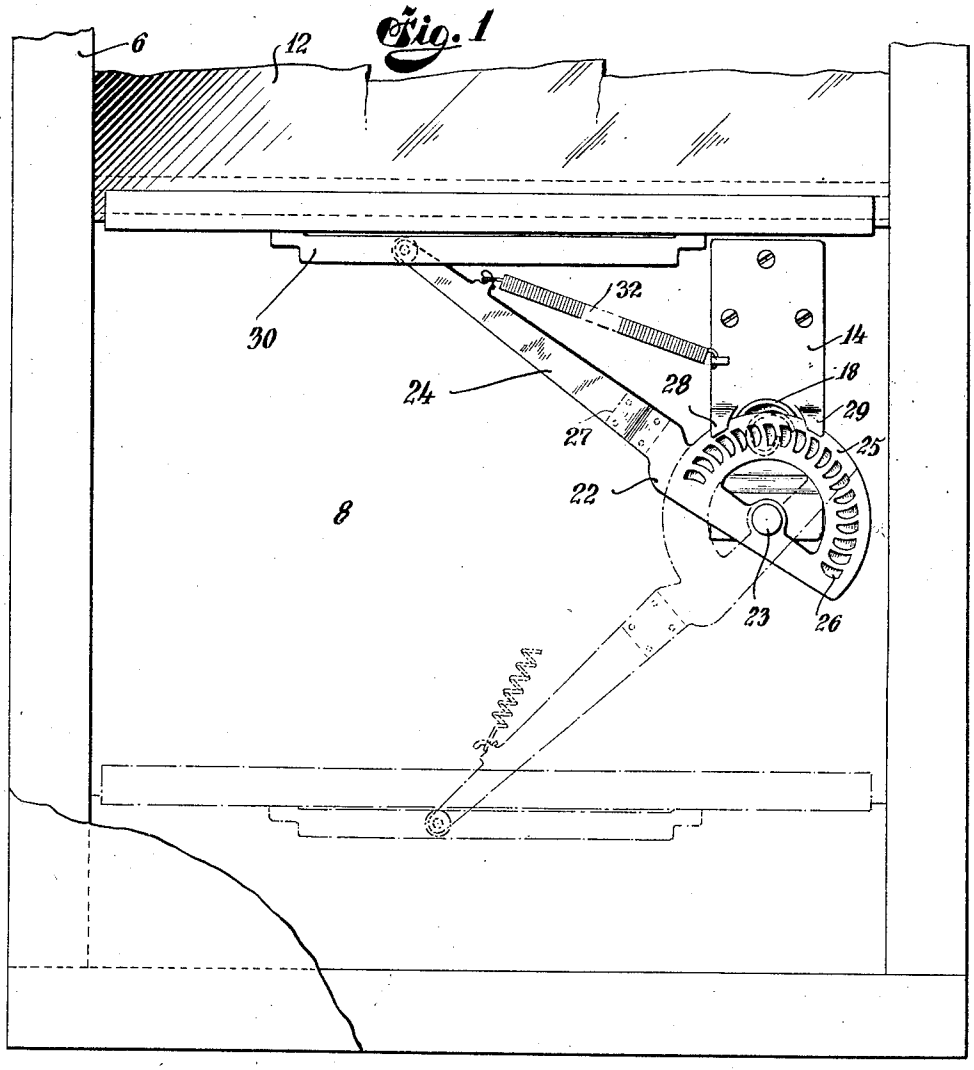
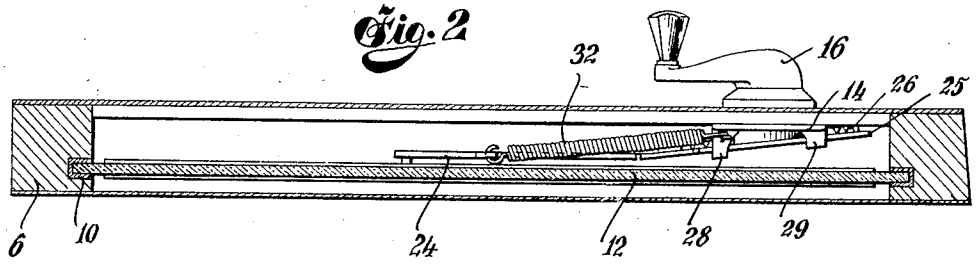


Fig. 2



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Fig. 3

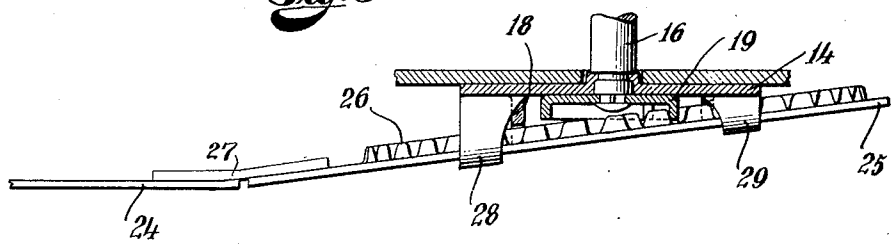


Fig. 4

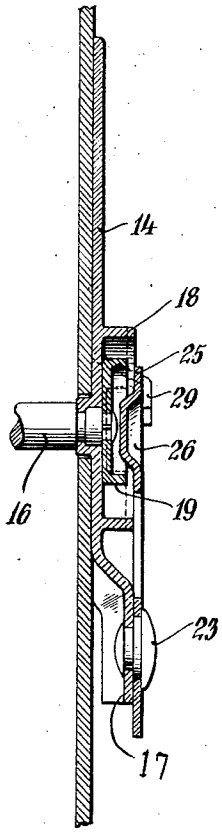
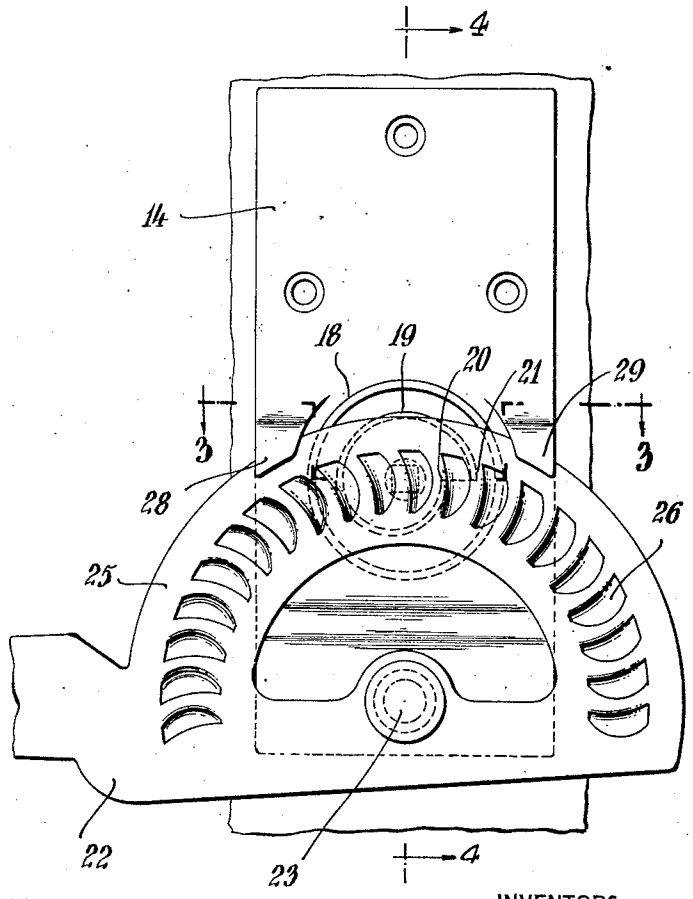


Fig. 5



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UNITED STATES PATENT OFFICE

BERTRAM J. GOLDSMITH AND EMIL KOEB, OF NEW YORK, AND AMBROSIUS BRIECHLE, OF BROOKLYN, NEW YORK, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE ENGLISH & MERSICK COMPANY, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF CONNECTICUT

WINDOW REGULATOR

Application filed May 28, 1925. Serial No. 33,376.

This invention relates in general to improvements in window regulators.

It is one of the principal objects of the invention to provide an improved regulator constructed of a minimum number of moving parts which can be quickly and easily formed and assembled in position.

It is another object to provide a compact construction not likely to become out of order and which will uniformly move and hold the window in its various positions.

Other and more specific objects will appear from the accompanying specification considered in connection with the drawings in which:

Fig. 1 represents a broken elevational view of an automobile frame member showing our invention applied thereto.

Fig. 2 is a horizontal section of the same from above.

Fig. 3 is a similar section taken substantially on the line 3—3 of Fig. 5.

Fig. 4 is a vertical section thereof on the line 4—4 of Fig. 5.

Fig. 5 is an enlarged elevational view of the operating mechanism.

We have shown in the drawings certain portions of an automobile frame member which include the side sills 6, the window well 8, and the window opening thereabove, the side members of the frame being provided with any preferred form of window guide 10. The window pane or other closure 12 is designed to close the window opening or to be lowered into position within the window well 8. The above described parts may be constructed in any preferred manner, the details thereof forming no part of our present invention.

For the purpose of conveniently controlling the position of the window 12 we have provided the following construction. A supporting plate 14 is mounted upon some rigid portion of the frame member within the window well and is designed to support the entire mechanism for positioning the window. The plate 14 may have a housing member 18 projecting in position to shield the window regulator mechanism hereinafter described. The regulator mechanism includes the manual operating member 16 rotatably supported on the plate 14, the handle portion thereof projecting within the interior of the vehicle. The operator shaft 16 has rigidly secured thereto the disk 19 which has formed on the outer face thereof a projecting spiral cam or gear operator 19′, the disk 19 and gear 19′ being positioned within the housing 18 on the supporting plate 14. The gear as shown is continued about the axis of the operator 16 approximately 360°, the same gradually approaching the axis of the operator so as to provide the offset ends 20 and 21 which receive a toothed operating member described below. The disk 19 and spiral cam gear 19′ may be stamped from sheet metal or cast or formed in any other manner as desired.

The operating member 22 is pivotally supported preferably on an offset extension 17 of the plate 14 as indicated at 23 and includes the operating arm 24 and controlling plate 25. The plate 25 has formed thereon a series of projecting teeth 26 which are preferably stamped or drawn therefrom, these teeth being spaced to receive the spiral cam or gear member 19′ and of a width to pass between the spaced ends 20 and 21 thereof. The teeth 26 have both engaging edges thereof arcuately formed as shown in order to accurately interfit with the cam gear 19′ and to provide a substantial surface thereon for engagement by the said gear. The controlling plate 25 is supported by its pivotal connection 23 and by means of projecting arms 28 and 29 preferably punched from the plate 14 at points spaced from the pivotal point of said plate so as to hold the plate in such position that the teeth thereof will be successively engaged by the spiral cam 19′. This engagement should be at one side of the rotating axis of the operator 16 only and for this reason the plate 25 is shown as inclined with respect to the disk 19 as clearly indicated in Fig. 3. The guide 28 accordingly projects further from the supporting plate 14 than the corresponding supporting guide 29.

The arm 24 is preferably provided with a flexible section 27 so that the same may bend to adapt itself to its different operative positions without binding. The arm in the con-

struction shown carries at the extended end thereof a roller or other anti-friction member operating in the guide 30 carried by the lower edge of the window. The weight of the window is counterbalanced by means of the spring 32 extending from a point adjacent the free end of the arm 24 to the plate 14 as will be readily understood by those skilled in the art.

The operation of the device is believed clear from the above description. It will be seen that as the manual operator 16 is rotated in either direction the teeth 26 on the controlling member 25 are caused to be successively engaged by the spiral gear 19 so as to move the arm 24 and consequently the window 12 in a direction dependent upon direction of rotation of the operator. As one complete revolution of the operator moves the window the distance between two successive teeth of the operating member, very little effort is required to move the window to any desired position. The width of the teeth 26 can be made larger or smaller and the spiral gear 19′ constructed accordingly so as to give any desired leverage between the operator 16 and arm 24. The operating cam is shown as extending 360° about its axis so that the same can readily be stamped from sheet metal if desired by bending the edges thereof upwardly to form the spiral cam gear 19′. It is obvious that if desired this cam may be cast and may have any desired number of turns.

While we have shown and described herein certain specific constructions it will be understood that these are merely illustrative of the basic idea of the invention and that we are limited only as set forth in the appended claims.

We claim as our invention:—

1. In a window-regulator, the combination with a reciprocating window and a guide-structure therefor; of a rotatable operator mounted for rotation in a plane substantially parallel with the said window; and driving-connections interposed between the said window and the said operator for effecting the movement of the former by the latter, and including a laterally-yielding arm mounted for rotation about an axis obliquely disposed with respect to the axis of the said operator and with respect to the plane of the said window.

2. In a window-regulator, the combination with a reciprocating window and a guide-structure therefor; of a rotatable operator mounted for rotation in a plane substantially parallel with the said window; and driving-connections interposed between the said window and the said operator for effecting the movement of the former by the latter, and including a member movable in a plane oblique with respect to the plane of rotation of the said operator and with respect to the plane of the said window, the said member being constructed and arranged to yield transversely with respect to its plane of movement.

3. In a window-regulator, the combination with a reciprocating window and a guide-structure therefor; of a rotatable operator mounted for rotation in a plane substantially parallel with the said window; and driving-connections interposed between the said window and the said operator for effecting the movement of the former by the latter, and including a two-part arm mounted for rotation about an axis obliquely disposed with respect to the axis of the said operator and with respect to the plane of the said window, and having its outer part hinged to its inner part so as to yield in a plane transverse to the plane of its movement.

Signed at New York in the county of New York and State of New York this 27th day of May A. D. 1925.

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