July 8, 1952 C. A. BAYES ET AL 2,602,178

WINDSCREEN WIPER

Filed July 23, 1947

FIG. 1.

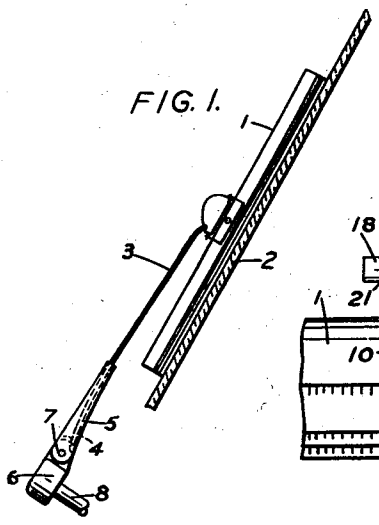


FIG. 2.

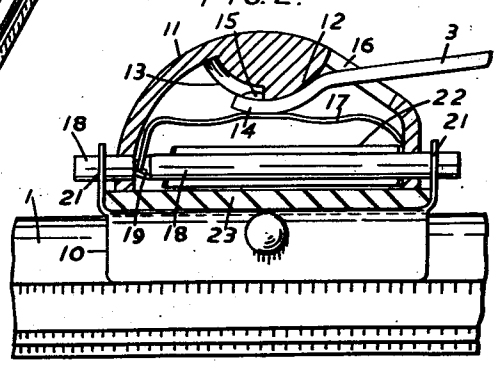


FIG. 3.

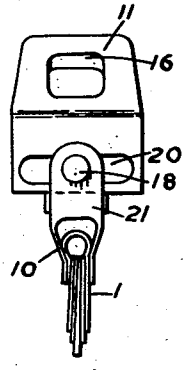


FIG. 4.

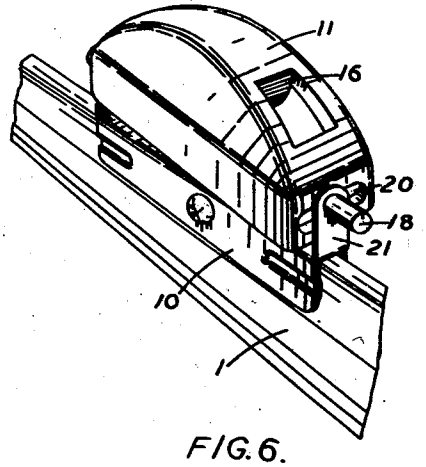


FIG. 5.

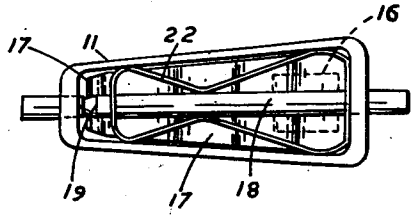
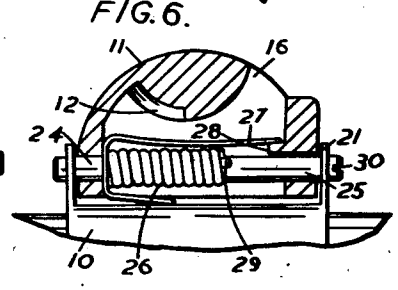


FIG. 6.



Inventors

Charles Arthur Bayes and John Boddy

By

Beau, Brooks, Buckley & Beau.

Attorneys

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WINDSCREEN WIPER

Charles Arthur Bayes, Pettswood, and John Boddy, Hayes, England, assignors to Trico Products Corporation, Buffalo, N. Y., a corporation of New York

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18 Claims. (Cl. 15—250)

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This invention relates to windscreen wipers and, more particularly, to the attachment of the wiper blade to the oscillatable actuating arm by which it is carried.

An object of the invention is to provide improved means for attaching the blade to its arm which allows the blade to assume a trailing position with respect to the arm, that is to say, at the end of each stroke when the direction of movement changes, the blade may rotate through a small angle with respect to the arm in such a manner that the inner end of the blade (i. e. the end nearest to the oscillating shaft to which the arm is attached) trails behind the arm, instead of remaining in line therewith as usual. Further, by a slight modification, the attachment means may be such as to allow the blade, which for the greater part of its movement moves parallel to the arm, to turn through an angle with respect to the arm when one end of the blade meets an obstruction, for example the edge of the windscreen, towards one end of the stroke and thereafter to return the blade into a position in which it is again parallel to and in line with the arm when the said end is again clear of the obstruction on the reverse stroke of the blade.

According to the invention the attachment means comprises bearing means attached to the blade, a cover or housing having an entranceway through which the end of the actuating arm may be introduced, means whereby the end of the actuating arm may be detachably connected to the cover and a spindle which is carried in said bearing means on the blade and passes through apertures in the cover, at least one of the said apertures in the cover being elongated in a direction transversely of the blade so that the wiper blade, in addition to being able to rock about the spindle as axis as each end of its stroke, is also able to swing sideways out of alignment with the arm. The bearing means on the blade may suitably consist of a U-shaped clip which engages around and is attached to the wiper blade and is provided at each end with upstanding gears in which the spindle is carried. In order to urge the blade into a central position, if this is desired, a spring which bears against the sides of the cover and against the spindle may be disposed in the cover.

According to a modified form of construction, the spindle, instead of being in one piece is made in two parts and a coiled spring surrounds the adjacent ends of the two parts of the spindle. One of the parts may then be fixed to the cover

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while the other part, which may screw into the coiled spring, is movable in the elongated apertures in the cover. By this arrangement, one end of the spindle is able to move in the elongated apertures in the cover relatively to the other end in such a manner that the blade, when it meets an obstruction such as the edge of the windscreen, may assume a position in which it is out of alignment with the actuating arm, being returned by the spring to its central position in line with the actuating arm when the obstruction is removed or the blade moves away from the obstruction.

The means for detachably connecting the arm to the cover may consist of a spring whereby a projection on the end of the arm is normally held in engagement with a track in a ramp or the like in the cover and can be released therefrom by depressing the end of the arm against the spring. The spring may be forked at one end which engages in a groove in the spindle so as to hold the spindle in place while the other end may rest freely on the spindle. Alternatively the spring may be provided with an aperture through which the spindle passes and one end may rest upon an abutment provided in the cover.

In order to prevent metal to metal contact between the blade clip and the cover as the blade tilts, a pad of non-metallic material such as rubber or felt may be fitted around the fixed part of the spindle adjacent the spring in such a manner that when the blade tilts, the pad engages the edge of the blade clip.

In order that the invention may be easily understood and readily carried into effect, two forms of attachment means in accordance with the invention are illustrated, by way of example, in the accompanying drawings, in which:

Figure 1 is a side elevational view showing the windscreen wiper and windscreen;

Figure 2 is a fragmentary sectional view through the blade attachment means;

Figure 3 is an end elevation of Figure 2;

Figure 4 is a perspective view of the housing or cover;

Figure 5 is an under plan view showing a blade centralizing spring; and

Figure 6 is a sectional view similar to Figure 2 but showing a modified form of construction.

Referring to the drawings, the numeral 1 designates a windscreen wiper blade which can be oscillated across the surface of the windshield 2 by an actuating arm comprising an outer part 3 and an inner channel-shaped part 5 which is

pivotally connected by a pivot pin 7 to a mounting socket 6 which is fixer on the oscillating shaft 8, the arm 3 being urged towards the windscreen by a spring 4.

The means for attaching the blade 1 to the arm 3 comprises a clip 10 of U-shape which is attached to the back of the blade and a cover or housing 11 to which the outer end of the arm 3 may be detachably connected.

The cover 11 is of approximately the shape of a segment of a circle in side elevation and, in plan, tapers from front to back, its internal width at the narrowest part being slightly greater than the width of the end of the arm 3. The cover 11 is hollow and open at its under side and is provided on the inside with a curved ramp 12 which projects towards the open side of the cover. The ramp is cut away on one side so as to form a curved track 13 which is bounded at one end by the inside of the cover and at the opposite end by the edge of the cutaway portion of the ramp.

The end of the actuating arm 3 is curved as shown at 14 to conform to the curvature of the ramp and the track therein and is provided with a projection 15 which can be engaged with the track 13 by passing the end of the arm through a slot 16 which is formed in the curved side of the cover until the projection engages in the track. The slot 16 is of a sufficient depth to allow the arm to swing up and down, i. e. towards and away from the underside of the cover, whereby the projection 15 moves along the track 13 in one direction or the other.

The projection 15 is normally held in engagement with the track by means of a spring 17 which extends across the inside of the cover. The ends of the spring are bent downwardly and are supported on a spindle 18 which extends across the cover in proximity to its open side and passes through two apertures in the cover and projects a short distance from the cover at each end. The spindle is provided near one end at a point inside the cover at its narrower end with a groove 19 with which one of the downwardly bent ends of the spring engages, this end being forked for the purpose, while the other downwardly bent end of the spring rests freely on the opposite end of the spindle.

At the narrower end of the cover which adjoins the grooved end of the spindle, the aperture through which the spindle passes is of approximately the same diameter as the spindle with sufficient clearance to permit lateral swinging of the blade therebeneath, while at the opposite wider end of the cover the aperture is in the form of an elongated slot 20 which extends across the width of the cover. The projecting ends of the spindle 18 are carried in ears 21 which project at each end from the clip 10 on the blade.

It will thus be seen that the actuating arm can readily be attached by inserting its curved end through the slot in the cover and depressing the spring until the projection engages in the track and can be easily detached by a reverse operation. The angle (when viewed from the side) between the edge of the blade and the actuating arm can vary since the projection on the arm can move along the track to permit such movement. The blade is also able to rock sideways about the spindle as axis. Further, if, as will be usual, the cover and clap are fitted centrally on the blade, with the narrower end of the cover on the outside, the blade, owing to friction with the windscreen, will swing about this end at each change in its direction of movement and take up a trailing position with respect to the arm, since the inner end of the spindle can move from side to side in the slot in the cover.

If such trailing of the blade is not desired, a spring 22 of the form shown in Figure 5 may be fitted around the inside of the cover so as to urge the blade into a central position in which it is in line with the actuating arm but to allow the blade to pivot if it should encounter an obstruction. This spring may be apertured to receive the spindle.

The sideways tilt of the blade is limited by the distance between the top of the blade clip and the lower edge of the cover and may be varied as desired.

A piece of rubber 23 or like material may be interposed between the blade clip and the cover, so as to prevent metal to metal contact and consequent noise as the blade tilts from side to side on changes in its direction of movement.

Referring now to the form of construction illustrated in Figure 6, the spindle, instead of being in one piece is made in two parts 24 and 25 and a coiled spring 26 surrounds the adjacent ends of the two parts of the spindle. The part 24 may be fixed to the cover while the part 25 is movable in the elongated slot as in the form shown in Figures 1 and 2. The part 25 is provided at its inner end with a screw thread 29 which screws into the coiled spring 26 and is provided at its outer end with a notch 30 so that it can be unscrewed for the purpose of assembling and disassembling. By this arrangement the end 25 of the spindle is able to move in the elongated slot in the cover relatively to the outer end in such a manner that the blade assumes a position in which it is inclined to the actuating arm while the spring tends to return the blade to its central position in which it is in line with the actuating arm.

In Figure 6, the spring 27 which corresponds to the spring 17 of Figures 1 and 2, instead of being supported on the spindle in the manner indicated in these figures, is provided with an aperture through which the spindle passes and one end rests on an abutment 28 provided in the cover while the other end lies below the spring.

We claim:

1. Means for attaching a windscreen wiper blade to its actuating arm, comprising a hollow cover having an entranceway to receive the end of the actuating arm, means for detachably connecting the end of the actuating arm to said cover, bearing means attached to the blade extending lengthwise thereof, and a spindle engaged in said bearing means and passing through the end walls of the cover to hingedly connect the cover to the blade for relative rocking movement, said cover having a transversely elongated aperture in one end wall through which one end of said spindle passes for permitting said blade to swing out of alignment with said actuating arm, the opposite end of the spindle having sufficient clearance where it passes through the opposite end wall of the cover to enable such swinging movement of the blade.

2. Means for attaching a windscreen wiper blade to its actuating arm comprising a cover, an entranceway in said cover to receive the end of the actuating arm, means for detachably connecting the end of the actuating arm to said cover, bearing means attached to the blade, a spindle engaged in said bearing means to hingedly connect the cover to the blade for permitting the

blade to rock about said spindle, a transversely elongated aperture in said cover through which one end of said spindle passes for permitting said blade to swing out of alignment with said actuating arm, the opposite end of the spindle having sufficient clearance where it passes through the opposite end wall of the cover to enable such swinging movement of the blade, and a spring disposed in said cover for urging said blade into a centralised position in alignment with said actuating arm.

3. Means for attaching a windscreen wiper blade to its actuating arm comprising a cover, an entranceway in said cover to receive the end of the actuating arm, means for detachably connecting the end of the actuating arm to said cover, bearing means attached to the blade, normally aligned pivot pins engaged in said bearing means and extending into said cover to hingedly connect the cover to the blade for permitting the blade to rock about said pivot pins, a transversely elongated aperture in said cover through which one of said pivot pins passes for permitting the blade to swing out of alignment with the actuating arm and a coiled spring surrounding the adjacent ends of said pins inside the cover for urging the blade into a centralised position in alignment with the actuating arm.

4. Means for attaching a windscreen wiper blade to its actuating arm comprising a cover, an entranceway in said cover to receive the end of the actuating arm, means for detachably connecting the end of the actuating arm to said cover, bearing means attached to the blade, a pivot pin fixed to and extending within said cover and engaged in one of said bearing means, a second pivot pin engaged in the other of said bearing means, both of said pins being in substantial alignment with each other, a transversely elongated aperture in said cover through which said second pivot pin passes and a coil spring surrounding adjacent ends of said pins.

5. Attachment means as claimed in claim 4, in which said second pivot pin is screw-threaded and screws into said coil spring.

6. Means for attaching a windscreen wiper blade to its actuating arm, comprising a hollow cover having an entranceway to receive the end of the actuating arm, means for detachably connecting the end of said arm to said cover having upstanding a clip attached to said blade apertured ears spaced longitudinally of the blade and disposed adjacent the opposite ends of said cover, a spindle engaged in said ears and passing through apertures in the end walls of said cover with one aperture elongated to receive one end of said spindle transversely to enable the blade swinging laterally from beneath the cover, and the opposite end of said spindle being loosely mounted to its respective ear to permit said swinging.

7. Means for attaching a windscreen wiper blade to its actuating arm comprising a cover, an entranceway in said cover to receive the end of the actuating arm, means for detachably connecting the end of said arm to said cover, a clip attached to said blade, apertured ears upstanding from said clip, aligned pivot pins engaged in said ears and extending into said cover, a transversely elongated aperture in said cover, through which one of said pins passes and a coil spring surrounding the adjacent ends of said pins inside said cover.

8. Means for attaching a windscreen wiper blade to its actuating arm, comprising a hollow

cover having an entranceway to receive the end of the actuating arm, bearing means attached to the blade, a spindle engaged in said bearing means and passing longitudinally of the blade through apertures in the end walls of said cover for permitting the blade to rock about said spindle, one wall aperture being transversely elongated for permitting said blade to swing out of alignment with said actuating arm, and the other wall apertured to loosely mount the opposite end of said spindle, and a pad of resilient material interposed between said blade and said cover to prevent metal to metal contact when the blade rocks about said spindle.

9. Means for attaching a windscreen wiper blade to its actuating arm comprising a cover, an entranceway in said cover to receive the end of the actuating arm, means for detachably connecting the end of said arm to said cover, bearing means attached to said blade, pivot pins longitudinally aligned and engaged in said bearing means and extending into said cover, a transversely elongated aperture in said cover through which one of said pivot pins extends, a coil spring surrounding the adjacent ends of said pivot pins inside said cover and a pad of resilient material interposed between said blade and said cover to prevent metal to metal contact when the blade rocks.

10. Means for attaching a windscreen wiper blade to its actuating arm comprising a cover, an entranceway in said cover to receive the end of said actuating arm, means for detachably connecting the end of said arm to said cover, bearing means attached to said blade, pivot pins longitudinally aligned and engaged in said bearing means and extending into said cover, a transversely elongated aperture in said cover through which one of said pivot pins passes, a coil spring surrounding the adjacent ends of said pins, and a pad of resilient material disposed around one of said pins.

11. Means for attaching a windscreen wiper blade to its actuating arm, comprising a hollow cover having an entranceway to receive the end of said actuating arm, a projection on the end of said arm, a recess in said cover in which said projection may engage, bearing means attached to said blade, a spindle engaged in said bearing means and passing longitudinally of the blade through apertures in the end walls of said cover, one wall aperture being transversely elongated to enable the blade swinging laterally from beneath the cover, and a flat spring anchored to said spindle at one end and resiliently supported at its other end and adapted to hold said arm projection in said recess.

12. Means for attaching a windscreen wiper blade to its actuating arm comprising a cover, an entranceway in said cover to receive the end of said actuating arm, a projection on the end of said arm, a recess in said cover in which said projection may engage, bearing means attached to said blade, aligned pivot pins engaged in said bearing means and extending into said cover, a coil spring in said cover surrounding the adjacent ends of said pins, a transversely elongated aperture in said cover through which one of said pins passes, and a spring adapted to hold said arm projection in said recess.

13. Attachment means as claimed in claim 11, in which said spring is forked at one end, and the spindle is provided with a groove with which said forked end of the spring engages.

14. Attachment means as claimed in claim 12,

in which said spring is provided with an aperture through which one of said pivot pins passes.

15. Attachment means as claimed in claim 12, in which said spring is provided with an aperture through which one of said pivot pins passes, a spring extending substantially parallel to and engaging said spindle, and an abutment in said cover on which one end of said spring is supported.

16. Means for attaching a windscreen wiper blade to its actuating arm, comprising a cover, an entranceway in said cover to receive the end of the actuating arm, bearing means attached to the blade, and a spindle extending lengthwise of the blade and engaged with said bearing means, said cover having spaced bearings through which the spindle passes to hingedly connect the cover to the blade for rocking laterally about an axis longitudinal of the blade, one cover bearing being extended transversely to enable pivotal movement of the blade about an axis normal to the surface being wiped for permitting said blade to swing out of alignment with said actuating arm, and the opposite cover bearing being apertured to loosely mount its respective end of said spindle to permit said swinging.

17. A windscreen wiping blade having longitudinally spaced bearings on its back, and an arm attaching member having spaced bearings cooperating with the first bearings to provide a rockable support for the blade beneath the arm attaching member, one of the first bearings being

transversely elongated to enable its cooperating bearing to shift laterally therein and the other of the first bearings loosely mounting its cooperating bearing to permit the blade to swing out of alignment with an attached actuating arm.

18. A windscreen wiping blade having longitudinally spaced bearings on its back, a spindle mounted in the bearings, and an arm attaching member having spaced bearing portions through which the spindle extends to provide a rockable support for the blade, one of the bearing portions being transversely elongated to enable the blade swinging laterally of and beneath the arm attaching member, while the other of said bearing portions has sufficient clearance to permit such swinging.

CHARLES ARTHUR BAYES.
JOHN BODDY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,017,078	Buth	Feb. 13, 1912
1,112,793	Heineman	Oct. 6, 1914
2,264,167	Paulus	Nov. 25, 1941
2,270,589	Hansen	Jan. 20, 1942
2,286,004	O'Shei	June 9, 1942
2,418,559	Scinta	Apr. 8, 1947