March 26, 1935. H. HUEBER 1,996,018

WINDSHIELD CLEANER

Filed March 2, 1931

Fig. 1

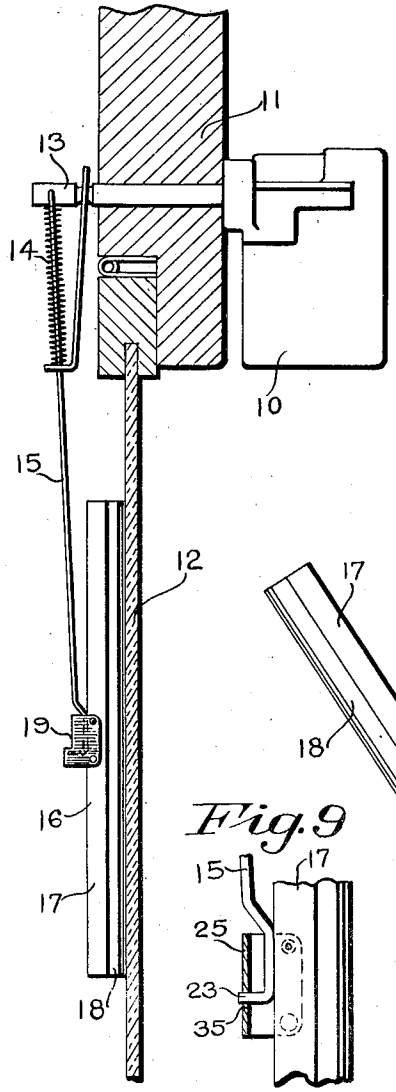



Fig. 3

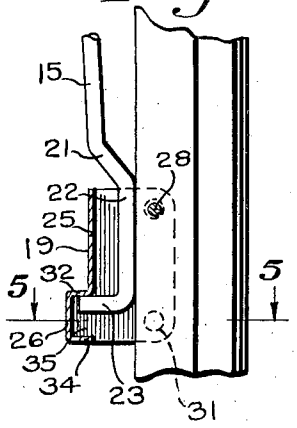



Fig. 2

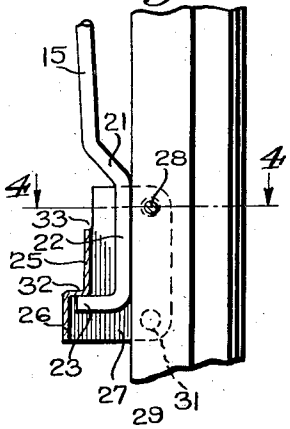



Fig. 4

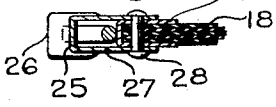



Fig. 5

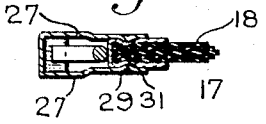



Fig. 6

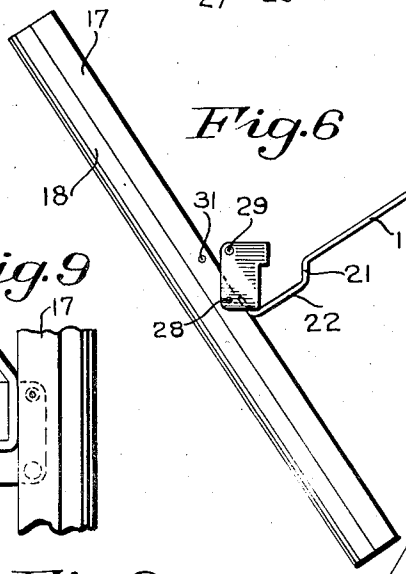



Fig. 7

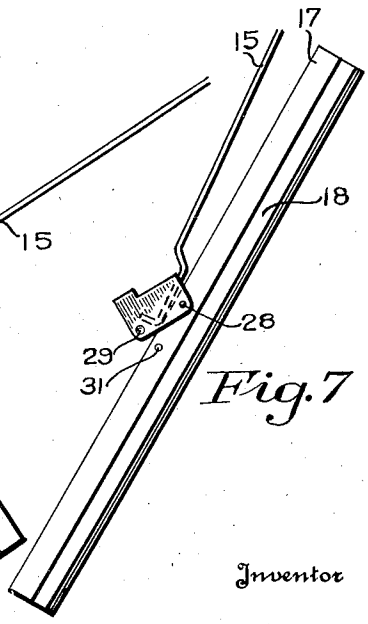
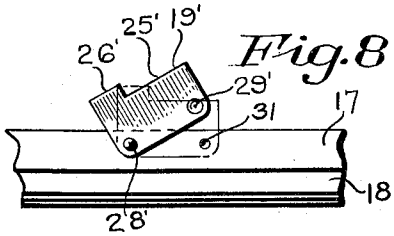



Fig. 9




Fig. 8




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# UNITED STATES PATENT OFFICE

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## WINDSHIELD CLEANER

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Application March 2, 1931, Serial No. 519,592

9 Claims. (Cl. 15—250)

This invention relates to windshield cleaners and particularly to an improved means for attaching the wiping blades to the supporting and actuating arms thereof.

Windshield cleaners conventionally comprise a motor actuated arm which reciprocates in a plane parallel to the windshield to carry the wiping blade in contact with a surface of the windshield. It has been found desirable to provide a play connection between the arm and the supported wiping blade which will allow the blade to trail the arm at an acute angle to the glass to provide better wiping contact and to flop or shift relative to the arm when the direction of arm movement is reversed in order to continue these trailing and angular relationships. It is also desirable to provide a means of connection between the arm and blade which may be effected without the use of tools or attaching bolts or rivets, in order that the blade may be quickly and easily installed or replaced.

Means for attaching cleaning blades having these desirable characteristics have heretofore been invented, as exemplified in my Patent No. 1,778,256, granted October 14, 1930, in which is disclosed a wiper blade provided with a notched and aperture clip for receiving a hooked end portion of a wiper carrying arm, the blade being attachable or detachable from the arm when the latter is moved or lifted outwardly from the plane of the windshield and the blade is moved into a particular angular relationship with the arm, the connection between the blade attaching clip and the hooked arm portion having sufficient play to permit the blade to flop during operation of the cleaner.

It becomes necessary at times, as while washing the windshield, to lift the blade and arm outwardly from the windshield to a position wherein the blade is readily detachable and may fall from the wiper arm. This invention comprehends a blade mounting means which will prevent accidental or unauthorized displacement or disconnection of the cleaner blade when the arm is moved from the windshield, and which will also permit of flopping movement of the blade and of ready attachment or detachament from the arm without the use of bolts, rivets, or special tools. This has been accomplished by employing an attaching clip, for receiving a portion of the blade supporting arm, which is pivotally connected to the blade and has detent means for retaining it in one locked position relative to the blade when the wiper is in use, the arm and blade being connectible or detachable only when the clip is moved about its pivot out of the hooked position. The attaching clip, being at all times connected to the blade cannot become lost, and by angular movement relative to the blade can render the blade positively locked to the arm or render it detachable therefrom.

These and other objects and advantages will become apparent from the following description of several typical embodiments of the invention, reference being made to the accompanying drawing, wherein:—

Fig. 1 is a vertical cross-sectional view through the windshield of a vehicle, showing a windshield cleaner, employing the principles of this invention, mounted thereon;

Figs. 2 and 3 are fragmentary side elevational views of wiping blades, each provided with a different form of the attaching clip of this invention applied thereto, the clips being cut away and shown in cross-section.

Figs. 4 and 5 are transverse sectional views taken along line 4—4 of Fig. 2 and 5—5 of Fig. 3, respectively.

Fig. 6 is a side elevational view depicting the blade and supporting arm in a position at the beginning of an attaching movement.

Fig. 7 is a view similar to Fig. 6 showing the parts in the positions in which they reside in a latter part of an attachng movement.

Fig. 8 is a fragmentary side elevational view of a wiping blade having a modified form of attaching clip mounted thereon.

Fig. 9 is a view similar to Figs. 2 and 3 depicting another modified form of clip.

As shown in Fig. 1, the windshield cleaner comprises a motor 10, which may be mounted to a header bar 11 disposed above the windshield 12. The motor has an actuating rock shaft 13 connected by spring means 14 to a wiping blade carrying arm 15, the spring means urging the arm inwardly or toward the windshield. A wiper blade 16 which may comprise a channeled holder 17 and blade wiping element 18 is attached to the arm by a clip member 19, in such a manner that the blade may be reciprocated or moved back and forth by the motor and rock shaft in a plane parallel to the windshield and in wiping contact with a surface of the latter for removing water, sleet, snow or the like therefrom.

As illustrated the free end of the arm 15 may be provided with an angular portion 21 for spacing the medial portion of the arm from the back edge of the blade 16, while permitting the portion 22 of the arm to seat upon the blade. The extreme end portion 23 of the arm extends outwardly to

interlock with the attaching clip 19. The latter, in the form shown in Fig. 2, may comprise a substantially U-shaped body, the back or central portion 25 of which has a raised or offset portion 26 for providing a socket for receiving the projected portion 23 of the arm. The sides 27 of the clip overlie the sides of the blade and may be attached thereto by a rivet or other fastener 28 which passes through the blade and clip sides 27 at the end of the clip opposite to that having the offset portion 26. Locking teats or depressions 29 may be formed in the sides of the clip to engage interfitting depressions 31 formed in the channel 17, for resiliently and releasably holding the clip in the position relative to the blade shown in Fig. 2, against rotation about the fastener 28.

In this position of the parts, as shown in Fig. 2, it will be impossible to remove the blade from the arm since the clearance between the back portion 25 of the clip and the back of the blade is insufficient to pass the projection 23 of the arm, the latter engaging the back portion 32 of the clip between the back portions 25 and 26. Pressed against the windshield by the arm 15 urged by the spring means 14, the blade 16 will be free to trail the arm, bearing an angular relationship to the windshield, and being permitted to flop about the contacting portion 22 of the arm upon reversal of direction of arm movement since the space between the clip sides 27 adjacent the offset 26 is of width considerably greater than the diameter of the arm projection 23. The blade may be attached to the arm by swinging the clip about the axis of the fastener 28, the resilient clip sides 27 spreading to permit the teats 29 to be disengaged from the depressions 31, to the positions shown in Figs. 6 and 7. The arm may be swung or lifted outwardly from the windshield about its point of connection to the rock shaft 13 to the position shown in Fig. 6 and the end portion 23 of the arm inserted between the clip and blade. The parts may then be lowered or swung inwardly to the position shown in Fig. 7 and the arm portion 23 may be passed into engagement with the offset portion 26 of the clip, and the latter moved relatively to the blade to snap the locking teats 29 into engagement with the depressions 31. The blade may be removed by a reversal of these steps, including moving the clip about the axis of the fastener 28 to increase the distance between the clip portion 25 and the back of the blade sufficiently to pass the projections 23 of the arm. As indicated at 33, the portion 25 of the clip, on the end opposite the offset portion 26, may be notched or cut away in order that the arm and blade may be engaged or disengaged upon minimum outward movement of the arm from the windshield.

It will be observed that the clip and blade coact or act conjointly to secure the shoulder or angular end 23 in interlocked relationship with its pocket, or shoulder 32, when the clip is in its operative or closed position indicated in Figs. 2 and 3. When it is desired to detach the blade the clip is swung to its inoperative or opened position indicated in Figs. 6 and 7, in which position the pocket is exposed or rendered accessible for making or breaking the interlock between parts 32 and 23. The pocket is rendered inaccessible when the clip is in its operative position.

In the form of clip illustrated in Fig. 3, which is particularly adapted for inverted cleaner mountings, that is, where the cleaner motor is mounted at the bottom edge of the windshield and the wiper carrying arm extends upwardly therefrom, the offset portion 26 is provided with a depending portion 34 which forms with the portions 26, 32 and the side portions 27 a socket in the form of a closed pocket or well 35 for receiving the end portion 23 of the arm. When this clip is used in a mounting of the type shown in Fig. 1, the blade will be supported by the contact of the arm portion 23 with the clip portion 32 as in the clip depicted in Fig. 2, and when used in an inverted mounting may be supported by contact of the arm portion 23 with the depending lip 34. The blade is free to flop and may be removed or attached in the same manner as set forth in the description of the clip of Fig. 2.

The modified clip 19', depicted in Fig. 8, may assume the general formation of the clips shown either in Fig. 2 or Fig. 3. It is pivoted to the blade channel 17 by a rivet or other fastener 28' which is disposed at the end of the clip having the offset arm extension receiving portion 26', the locking means 29' being formed on the opposite end for engagement with the blade locking depression 31. The clip may be moved to the position shown in full lines in Fig. 8 in which the angular relationship that the back wall 25' of the clip bears to the back of the blade will permit of entry of an arm portion 23 into the pocket provided by the offset 26'. The clip may, after such entry, be closed or moved to the broken line position of Fig. 8, in which the arm and blade will be held positively engaged.

Fig. 9 illustrates another modified form of clip in which the socket for receiving the projecting arm portion 23 comprises an opening or slot 35 formed in the back portion 25 of the clip.

It will now be understood that this invention provides a positive connection between a wiping blade and a wiping arm which affords the desirable flopping movement and angular trailing of the blade relative to the wiper carrying arm. The blade and arm may be lifted from the windshield for washing the latter or for other reasons, without any possibility of the blade becoming accidentally detached. The blade may be readily removed or replaced by moving the clip relative to the blade, releasing the resilient engagement of the detent teats with the locking or detent depressions.

It will further be understood that the devices described are merely exemplary of the principles of the invention which may be embodied in devices of other structural formation.

What is claimed is:

1. In a windshield cleaner, a wiper, a U-shaped clip extending over and pivoted to the wiper, the central portion of the clip having an outwardly extending part terminating in an offset part substantially parallel to the central portion, said outwardly extending part and said offset part cooperating with the sides of the clip to define a socket for receiving an angular extension of a wiper arm received between the clip and the wiper.

2. In a windshield cleaner, a wiper, a U-shaped clip extending over and pivoted to the wiper, the central portion of the clip having an outwardly extending part terminating in an offset part substantially parallel to the central portion and said offset part having an inwardly extending lip, said parts cooperating with the sides of the clip to define a well with continuous sides for receiving an angular extension of a wiper arm.

3. In a windshield cleaner, a wiper, a U-shaped clip disposed in inverted relation over the back thereof, the back portion of the clip being spaced

from the back of the wiper and having a socket adjacent one end of the clip for receiving an angular extension of a wiper carrying arm, and pivot means extending through the wiper and the sides of the clip adjacent the end of the latter opposite the end thereof having the socket.

4. In a windshield cleaner, a wiper, a U-shaped clip disposed in inverted relation over the back thereof, the back portion of the clip being spaced from the back of the wiper and having a socket adjacent one end of the clip for receiving an angular extension of a wiper carrying arm, and pivot means extending through and connecting the wiper and the sides of the clip adjacent the end of the latter having the socket.

5. In a windshield cleaner, a wiper, a U-shaped clip disposed in inverted relation over the back thereof, the back portion of the clip being spaced from the back of the wiper and having a socket adjacent one end of the clip for receiving an angular extension of a wiper carrying arm, pivot means extending through and connecting the wiper and the sides of the clip adjacent one end of the latter, and detent means on the opposite end of the clip for engaging cooperating detent means on the wiper.

6. In a windshield cleaner, a wiper element, a U-shaped clip element pivotally movable to and from an operative position upon said wiper element and straddling the back thereof, said clip element having a pivotal connection at one extremity to the wiper element to provide for the pivotal movement to and from said operative position, means for releasably securing the clip element in said operative position, and a wiper carrying arm engageable between the clip element and the wiper element, said arm having a part interlocking with a part on one of said first two named elements while said means is maintaining said clip element in its operative position, said parts being disengageable from one another only when the clip element is pivoted away from its operative position.

7. In a windshield cleaner, a wiper element, an attaching element movably mounted on the wiper element, one of said elements having an interlocking part, means for releasably securing the attaching element and wiper element against relative movement, and a wiper arm having a connecting part normally interlocked with said interlocking part and held against removal therefrom by said other element while said elements are releasably secured against relative movement, said connecting part and interlocking part being freely detachable from each other while said means is released and while said elements are relatively movable.

8. In a windshield cleaner, a wiper element, a clip element pivotally mounted on the wiper element and having its body pivotally movable toward and away from said wiper element, one of said elements having an interlocking part, means for releasably securing said elements against relative movement, and a wiper arm having a connecting part normally interlocked against disassembly with respect to said interlocking part by said clip and wiper elements while said elements are secured against relative movement and regardless of the position of the assembled windshield cleaner structure, said connecting part and interlocking part being freely detachable from each other while the body of the clip element is pivoted away from said wiper element.

9. In a windshield wiping structure, a wiper blade element, an attaching clip element movably attached to said wiper blade element and having its body portion movable toward and away from said blade element, means for releasably securing said elements against relative movement when the body portion of the clip is moved toward the blade element, one of said elements being formed with a pocket open toward the other of said elements, a wiper carrying arm having a blade attaching shoulder detachably engageable in the pocket when the body of the clip element is moved away from said blade element and normally held against displacement from said pocket by said other element when the clip is secured against relative movement.

HENRY HUEBER.