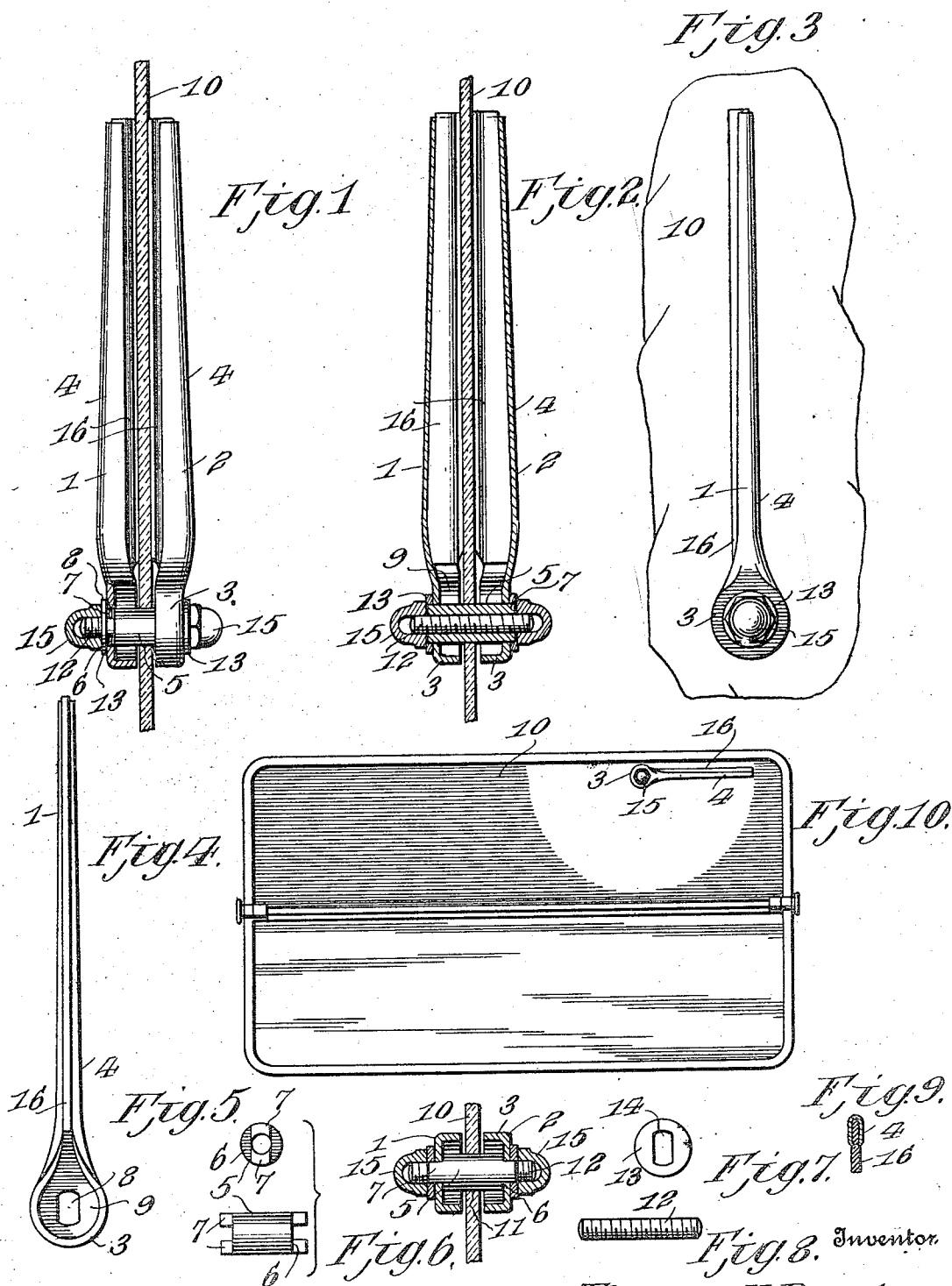


T. K. BERNTSON.
WINDOW CLEANER.
APPLICATION FILED JUNE 21, 1912.

1,060,310.

Patented Apr. 29, 1913.



Witnesses
Frank Hough
D. W. Gould.

Fig. 9. Inventor.
Thomas K. Berntson,
By Victor J. Evans.
Attorney

UNITED STATES PATENT OFFICE.

THOMAS K. BERNTSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

WINDOW-CLEANER.

1,060,310.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed June 21, 1912. Serial No. 705,044.

To all whom it may concern:

Be it known that I, THOMAS K. BERNTSON, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Window-Cleaners, of which the following is a specification.

The invention relates to an improvement in window cleaners of the type designed more particularly for use with windows of vehicles, and adapted for more or less permanent connection with the window.

The general object of the invention is the provision of a window cleaner which, when in place, may, by a simple and convenient operation, be caused to effectively clean both sides of a window pane throughout a prescribed area, the construction providing for such operation from either side of the window.

The particular object of the invention is the provision of a window cleaner containing few parts, with such parts constructed for the most effective application of the cleaning elements directly to the window pane, whereby to permit the convenient assemblage of the parts of the device in operative position, in a manner to at all times protect the glass against damage in the use of the device.

Generally stated, the invention comprises duplicate cleaning arms, so constructed and arranged that their inherent resiliency is utilized to assist in maintaining effective co-operation between the rubbing or cleaning element and the window glass, a sleeve interlocking said arms for simultaneous movement, and in turn adapted for free rotation through an opening in the glass, and means for independently securing said arms to the sleeve in a manner to avoid direct pressure of said arms on the glass at the point of connection.

The invention, in its preferred form of detail, will be described in the following specification, reference being had particularly to the accompanying drawings, in which:

Figure 1 is a view in elevation, illustrating the application of the device, a portion of the latter and the glass being in section. Fig. 2 is a similar view with all parts in longitudinal section. Fig. 3 is a view in elevation, illustrating the application of the device. Fig. 4 is a bottom plan view of one of the arms. Fig. 5 is a view illustrating the pivot sleeve in plan and in end elevation.

Fig. 6 is a longitudinal sectional view through the device in position, with the connecting sleeve and tie bolt in elevation, illustrating particularly the bearing coöperation of the locking washers. Fig. 7 is a plan of one of the locking washers. Fig. 8 is a plan of the tie bolt. Fig. 9 is a transverse section through one of the arms, with connected rubbing element. Fig. 10 is an elevation of an automobile shield, showing the application of the device thereto, and illustrating the cleaning area of the device in use.

Referring particularly to the accompanying drawings, my improved window cleaner includes cleaning arms 1 and 2. As these arms are of duplicate construction, a detailed description of one will suffice for both. The arms are constructed of sheet metal, pressed into proper form, and the use of sheet metal is particularly important in the present invention, in that while providing for a reduced cost of manufacture, the inherent resiliency of the metal is utilized to increase the efficiency of the structure.

Each arm comprises, in completed form, which as previously stated is obtained by pressing or the like, an approximately circular cup-shaped head 3, and a rubber carrying section 4 radiating from the head. The section 4 is of U-form, as shown more particularly in Fig. 9, and immediately adjacent the head 3, the free edges of such section are offset outwardly from the similar point incline gradually inward, until at the free end of the section, the free edges thereof are on a plane inwardly beyond the free edge of the head.

As thus constructed, each arm presents a cup-shaped head having the free edge of the flange thereof at right angles to the axis of the head, and a section radiating from the head of U-form, with its free edge inclining from a point outwardly of the free edge of the head flange, as the device is assembled, to a point inwardly beyond such free edge of the head flange.

A pivot sleeve 5 is used to connect the heads of the respective arms, and to interlock said heads one with the other to insure simultaneous movement of the arms. The pivot sleeve is a cylindrical body, having a length exceeding the combined thickness of both heads 3, and also of the glass with which the device is to be used. The ends of

the sleeve are cut away on opposite sides, as at 6, to leave diametrically opposed projections 7, which projections are of a size and shape to snugly fit an approximately rectangular opening 8, centrally formed in the head of each arm, and are of a length exceeding the thickness of the base or bottom wall 9 of the head.

As the respective ends of the pivot sleeve are identically formed, it is obvious that when both arms are in place on such sleeve, the arms, through the connection described, are interlocked for simultaneous movement with each other and with the sleeve.

The glass 10 is formed at an appropriate point with an opening 11 of a size to receive the sleeve, and at the same time permit of a free rotary movement of said sleeve, without undue play, it being understood that after application of the sleeve, the arms are connected with the sleeve as described, one on each side of the glass.

A tie bolt 12, preferably threaded throughout its length, is passed through the sleeve, projecting therebeyond at each end. A washer 13 is applied on each end of the sleeve, and these washers play a more or less important part in the structure. They are each centrally formed with an opening 14 to snugly fit over the projections 7 of the pivot sleeve, and each washer has a thickness slightly exceeding the length of the projections 7 beyond the outer surface of the bottom of the head of the arm. By this arrangement, the outer surface of the washer projects slightly beyond the free ends of the projection 7 with which said washer is connected, so that upon the application of cap nuts 15 to the projecting ends of the tie bolt 12, said nuts will exert a pressure directly upon the washer, and through the washer bind the heads of the arms upon the sleeve. Through this arrangement, the arms may be interlocked with the sleeve, and the desired rigidity of connection maintained at this point, without in any way increasing the pressure upon the glass, as will be clear from Fig. 6 of the drawing.

A rubbing element, such as an appropriate length of rubber strip 16, is secured in the section 4 of each arm, being preferably applied between the side plates of the sections, and the latter pressed inwardly to grip the strip. A suitable section of the rubber strip will project inwardly beyond the free edges of the arm to bear upon the glass. In the use of a strip of rubber or other flexible cleaning strip, the inherent resiliency of the sections 4 of each arm is important, in that in the manipulation of the device, as hereinafter described, the rubber strip will be bent laterally and follow the arm, in order to provide the most effective cleaning action. It being obvious from Fig. 10 that in use the arms are swept over an area limited by their

lengths beyond their pivot support, and then returned, it will be apparent that having reached one limit of movement, the rubber strip must be reversed for the return movement. The resiliency of the arms permits the reversal, as under the pressure induced, the arms will move away from the glass, to permit a reversal of the rubber, and then return to normal position. Furthermore, the resiliency of the arms provides for maintaining an effective contact between the glass surface and the rubbing element, so that the effective cleaning operation is insured throughout the full length of the rubbing element.

I am aware that it is not new with me to provide arms on opposite sides of a window to be cleaned and to connect said arms for simultaneous movement in the cleaning operation, but in all such inventions with which I am familiar, the arms are essentially rigid, and no provision is made for securing a proper degree of pressure upon said arms, while at the same time avoiding injurious contact between the arms and glass. It is in the specific details looking to carrying out these advantages that my invention resides.

It may be stated that while preferring a flexible element as 16, as a rubber, my device would be effective with a rigid or scraping element, in the use of which the resiliency of the arms would maintain effective coöperation of said rigid element and the glass.

From Fig. 10, it will be seen that in the use of the device with an automobile shield, a prescribed area can be effectively cleaned by a simple operation by the driver, without necessity of leaving his seat, thereby permitting a clear view under any and all weather conditions. Furthermore, as the projection of the device beyond the surface of the glass is comparatively slight, no interference or possible contact with the other section of the shield could result in the usual folding of the shield.

It is, of course, to be understood that the device is applicable to any and all windows, though more particularly designed for use with automobiles, locomotive windows and the like, wherein the necessity for a clear view is imperative, and that the operation of the device may be effected at any time desired, and the device with equal efficiency applied to any desired part of the window.

What is claimed is:

1. A window cleaning device, including inherently resilient arms, a pivot sleeve rotatably mounted in the element to be cleaned and formed beyond each surface of the element for interlocking connection with one of the arms, and means for securing each arm against separation from the sleeve, the arms and sleeve interlocking connection

maintaining a fixed spacing of the arms and surface of the element independently of the pressure of the securing means.

2. A window cleaning device, including
5 inherently resilient arms, a pivot sleeve, the
respective ends of the sleeve being formed
to interlock with the arms and maintain said
arms in fixed spaced relation, a tie bolt
passed through the sleeve, washers engaging
10 with the interlocking connection of the

sleeve and projecting beyond the adjacent
ends of the sleeve, and means engaging the
tie bolt and bearing upon the washers.

In testimony whereof I affix my signature
in presence of two witnesses.

THOMAS K. BERNTSON.

Witnesses:

E. EDMONSTON, Jr.,

K. I. DELABAR.