May 17, 1966 S. L. LARSON ET AL 3,251,084

CAR WASH APPARATUS

Filed Oct. 5, 1964 3 Sheets-Sheet 1

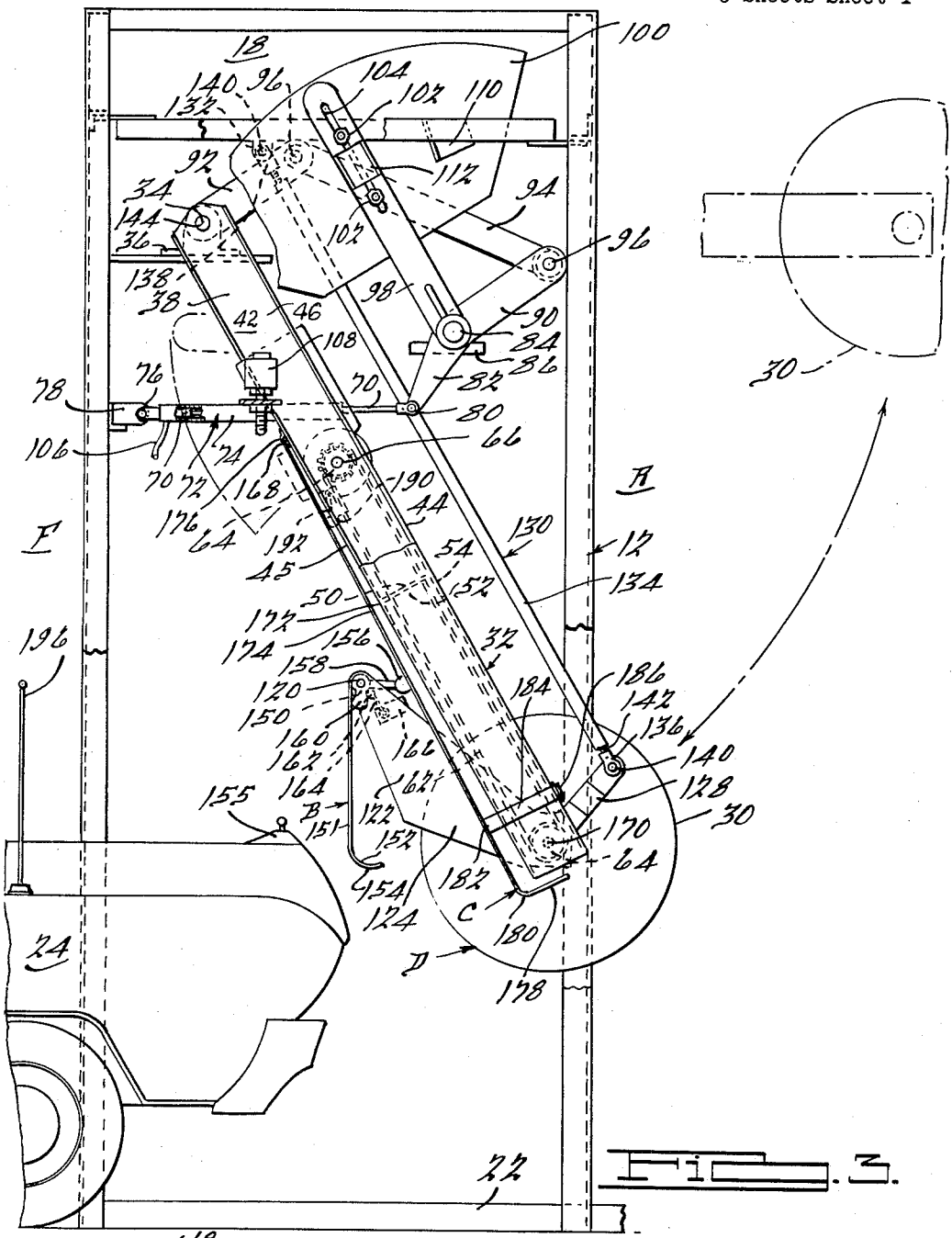

FIG. 3.

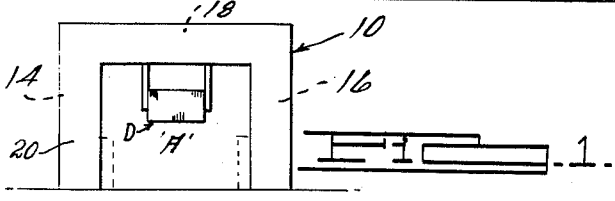

FIG. 1.

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CAR WASH APPARATUS

Filed Oct. 5, 1964 3 Sheets-Sheet 2

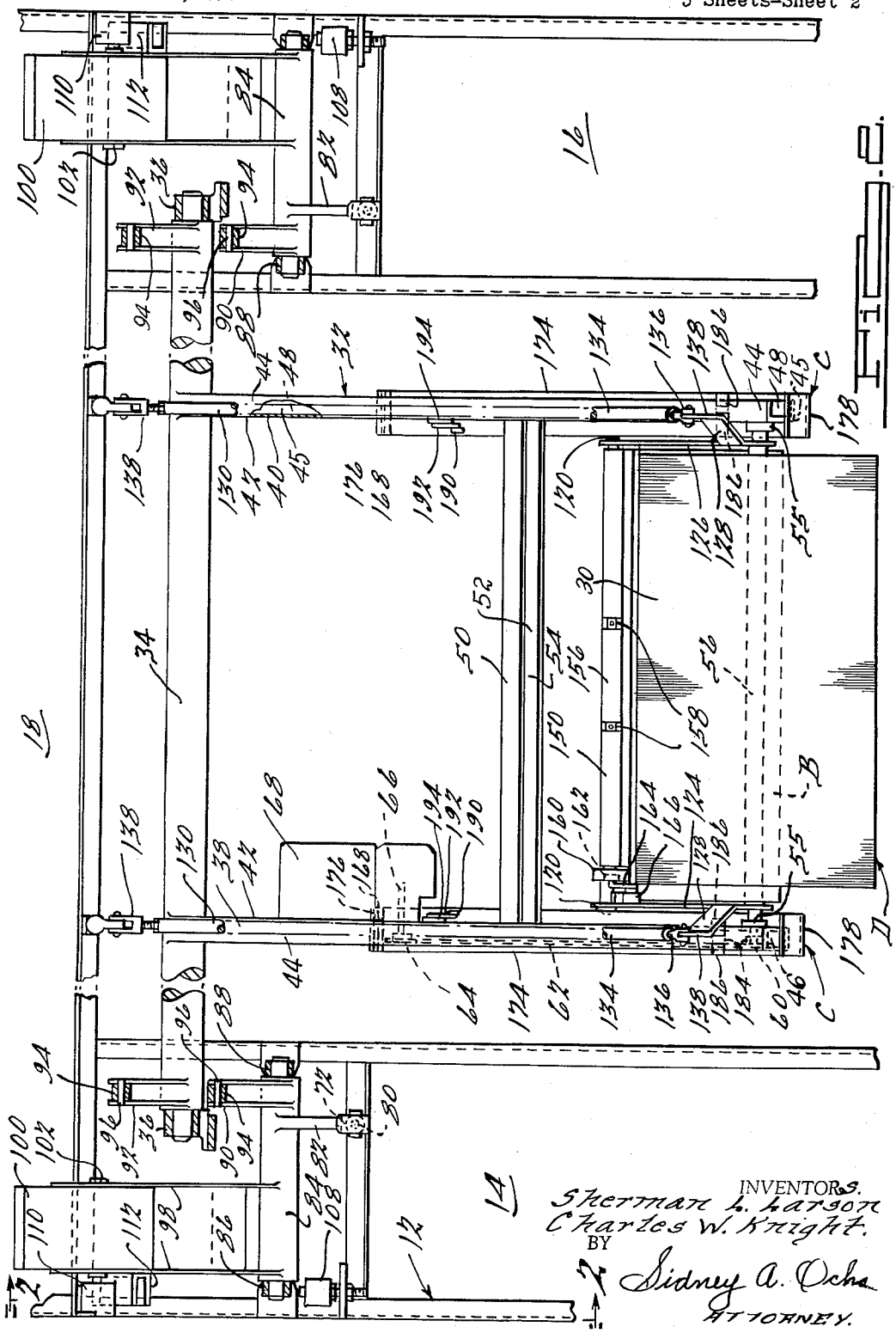

Fig. 2

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CAR WASH APPARATUS

Filed Oct. 5, 1964 3 Sheets-Sheet 3

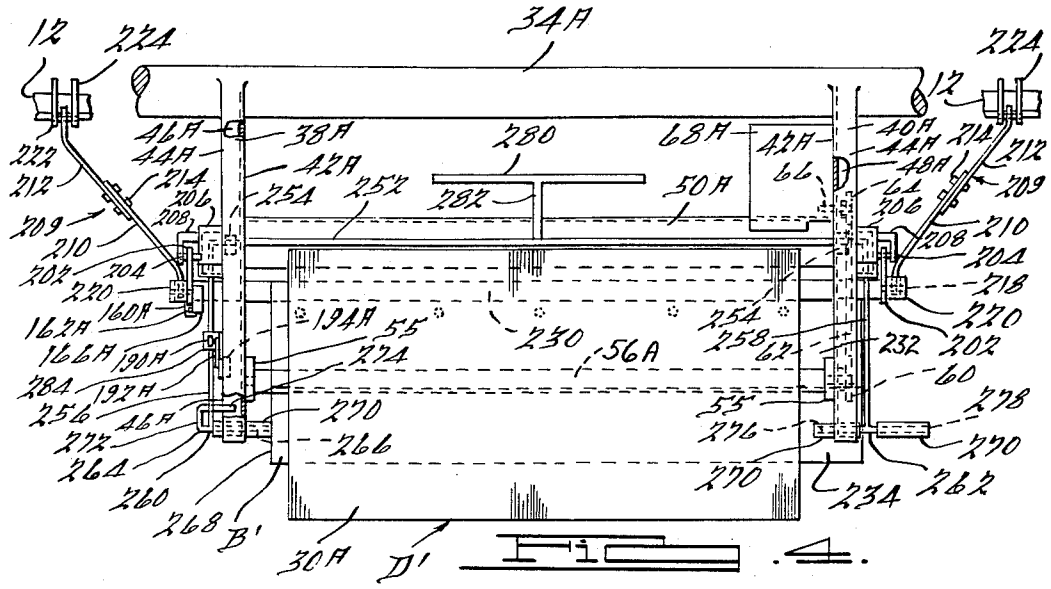

FIG. 4.

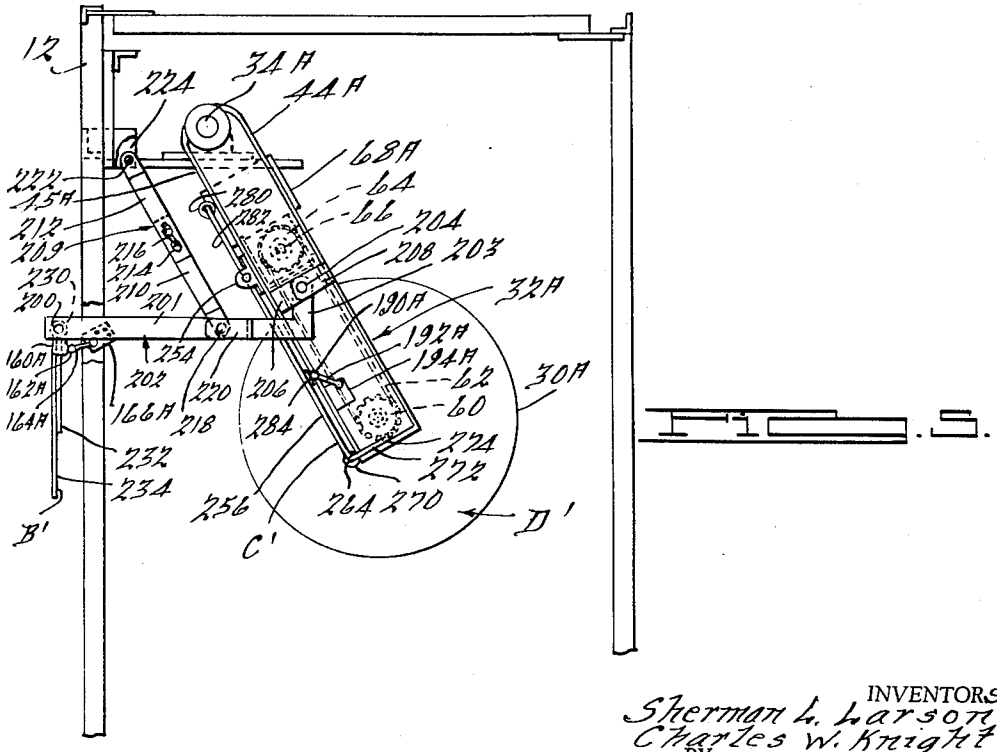

FIG. 5.

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United States Patent Office 3,251,084 Patented May 17, 1966

3,251,084

CAR WASH APPARATUS

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Filed Oct. 5, 1964, Ser. No. 401,431
17 Claims. (Cl. 15—21)

This invention relates to a follower top body brush structure for automatic car wash laundries and in particular to an automatic detector system associated therewith for swiftly raising the brush and its carrying means over any unusual obstacles including aerials, mirrors, visors, luggage racks and ornaments which may be encountered in the area covered by the brush or adjacent said area by the carrying means.

An object of the invention is to provide a top body follower brush structure whose brush is capable of following all the car contours to clean the hard to reach parts of the hood, roof and rear deck, and which is wide enough to thoroughly clean these surfaces but narrow enough to avoid normally positioned side aerials and mirrors, and which structure includes a detector system enabling it to avoid damage to or by unusual objects including ornaments, visors, luggage racks and specially positioned or bent aerials that may be encountered by the structure as the brush travels from a point just below the car grille back over the hood, up the windshield, across the roof, down the rear window and trunk area as far down as the rear bumper on most modern cars, and wherein the brush is swiftly raised over such objects in response to the detector system.

A specific object is to provide a detector system for a brush structure as in the preceding object that includes a detector suspended in front of and lengthwise of the brush and auxiliary detectors suspended in front of or adjacent the supporting arms of the brush for encountering an oncoming car so as to intercept any obstruction in the path of the brush structure likely to cause damage.

A further object is to provide a detector system as in the preceding object applicable to a brush structure having a wide brush for cleaning only the roof portion of a vehicle.

Another specific object is to provide a precision balanced top brush structure that is raised by power means, which may be pneumatic, and lowered by gravity and wherein the up operation of the brush structure is under control of each of a plurality of detectors, each controlling operation of a control means for the pneumatic means.

Other objects and advantages of the invention will be apparent from the following description and from the drawings wherein:

FIGURE 1 is an elevational view showing a body brush unit for automatic car wash lines looking at the exit side and providing side body brushes and a top body brush structure as in the present invention and wherein the housing supports these structures;

FIGURE 2 is a frontal elevational view partly in section looking at the brush carrying structure and detector system from the exit side of the housing of a unit applicable particularly for cleaning the entire lengthwise top contour of a vehicle, and the cover panels of which unit are omitted from the framing of the housing to show the balancing structure for the brush mechanism and the means for lifting and lowering such mechanism;

FIGURE 3 is a side elevational view, partly in section, of the structure of the invention looking in the direction of the arrows 2, 2 in FIGURE 2;

FIGURE 4 is a view taken similarly to that of FIGURE 1 showing a modified detector system applicable to the structure of FIGURE 1 in place of that there shown and which arrangement is particularly applicable to a unit

having a wide top brush principally intended for cleaning the roof portion of a vehicle; and

FIGURE 5 is a side elevational view partly in section, of the structure of FIGURE 4 looking in the direction of the arrows 5, 5 in FIGURE 4.

In the drawings wherein similar numerals represent corresponding parts of the structure, the numeral **10**, generally designates an enclosure or housing of inverted U-shape for supporting and in part enclosing the brush structure of the invention. The housing **10**, is preferably comprised of suitable rigid angle iron framework generally designated by the numeral **12** arranged to form opposite vertical hollow columns **14, 16** and a hollow connecting header **18** providing an archway A through which a vehicle to be cleaned may pass. The frame work **12** is suitably reinforced and closed at the outer ends, top and sides by suitable sheet metal walls **20**.

The housing is arranged, for example, to straddle a suitable rail type guideway **22** such as shown in Patent No. 3,035,293, for guiding a vehicle **24**, in operative position through the archway A, the vehicle being moved by and conventional means such as a conveyor chain or pusher mechanism, not shown. The vehicle **24** enters the front or entrance side F of the housing **10** where it may, for example as shown in said patent, be subjected to prerinsing with water, brushing by top and side brushes and soaping, in that order and pass out of the enclosure at the rear or exit side R.

Since the present invention is primarily concerned with the top brush and its detector control system, only this mechanism is shown but it will be understood that any of the undisclosed features shown in said Patent No. 3,035,293 may be combined therewith and are incorporated herein by this cross reference thereto.

Thus FIGURES 2 and 3 show a horizontal top body brush unit generally designated by the letter D mounted by suitable supports in the housing **10**. Such unit includes a horizontally rotatable brush **30** normally arranged to be in its down position shown in FIGURE 3, by any suitable means, here by gravity, and adapted to be raised to an up positon shown in phantom in FIGURE 3, clear of the top side of the vehicle body.

The unit D further comprises a pivotally mounted carrier frame generally designated by the numeral **32** comprised of a shaft **34** the ends of which are journalled in suitable block bearings **36** carried in the columns **14** and **16** respectively of the housing and to which shaft is secured as by welding a pair of spaced apart arms **38, 40** extending radially outwardly therefrom intermediate the columns **14, 16**. The arms **38, 40** are preferably of channel section with the base walls **42** thereof facing each other at the inner side of the frame and the legs **44, 45** of these sections extending laterally outwardly from the base walls **42** to form elongated depressed pockets **46, 48** at the outer sides of the arms **38, 40** respectively of the frame **32** and extending the length of these arms. A reinforcing tie member or channel bar **50** connects the arms **38, 40** and is welded thereto at a point intermediate the axes of rotation of the frame and brush. The tie member is oriented such that the space **52** between the leg portions **54** thereof faces the brush **30**.

Journalled to the frame arms **38, 40** in bearings **55** adjacent the outer ends of the frame arms is a shaft **56** carrying the rotary brush **30**. The end of the shaft journalled on the arm **38** extends into the pocket **46** of this arm where it carries a sprocket **60** fixed thereto that drivingly connects through a chain belt **62** with the output sprocket **64** and shaft **66** of a geared electric motor **68** suitably mounted on the base face **42** of the arm **38** so as to be movable with the brush carrier **32**. Energization of the motor **68** is controlled by switch means

not shown but which may be similar to that shown and described in the co-pending application of Sherman L. Larson, Serial No. 220,606 filed August 31, 1962, operable by the vehicle as it enters the unit. The motor **68** drives the brush D through the chain and sprockets **62, 64, 60** respectively to provide a peripheral movement of the brush at the line of contact with the vehicle surface which is opposite in direction to that of the vehicle upon which it is operative.

The brush unit D is movable between its operable (down) position and its retracted (up) position by power means which may be the pistons **70** (see FIGURE 3) of a pair of pressure fluid motors **72**, which may be air cylinders one located in each of the column legs **14, 16**. A single motor **72** may be used if desired for operating the brush unit D. The casing **74** of the fluid motor **72** are pivotally anchored as at **76** to a bracket **78** attached to the columns **14, 16** respectively. The piston **70** of the fluid motor **72** in the column **14** is pivotally connected by pin and clevis means **80** to a short operating arm or lever **82** rigidly connected to a counter weight carrying counter shaft **84** journalled in bearing brackets **86, 88** attached to the column **14**. Laterally offset from the lever **82** and rigidly connected to the shaft **84** is a second arm or lever **90** angularly offset from the lever **82** by an angle of about 150 degrees, so as to form a crank arm arrangement. A similar arm or lever **92** is rigidly secured to the shaft **34** of the brush carrying frame **32** at substantially right angles to the frame arm **38** and generally parallels the lever **90** in the down position of the brush frame. A rigid link **94** pivotally connects the levers **90, 92** by pins **96**. Also secured to the counter shaft **84** are a pair of radially extending spaced apart arms **98**, which between them adjustably support a sector shaped cement block counter weight **100**. The counter weight **100** is suitably clamped to the arms **98** by bolts **102**. The arms **98** are slotted at **104** to permit radial adjustment of the weights to effect a substantial dynamic balance of the brush mechanism yet facilitate normal downward movement of the brush frame and brush by gravity when a single acting air cylinder is used to raise the brush.

Suitable means such as a flexible hose **106** connects the cylinders **74** of the air motors **72** with a suitable source of pressure air of predetermined pressure value through solenoid valve means (not shown) in turn controlled by switch means carried by the brush frame and related mechanism to be described. When air is admitted to the left hand side of the piston **70** through hose **106** the crank arms **82, 90** are rotated counter clockwise in FIGURE 3 and this motion is transmitted through the link **94** to lever **92** which thereupon rotates the frame **32** counter clockwise to its up position for the brush unit D shown in phantom in FIGURE 3 about 60 degrees above the down position. Resilient limit stops **108, 110** are provided on the column **14** to be abutted by a lateral bracket **112** projecting from the counter weight arm **98** to limit the up and down movement of the brush. When the air in cylinder **74** is vented there is sufficient unbalance in the mechanism to permit the brush to be lowered by gravity action.

It will be understood that while only the air cylinder and associated linkage and counter weight structure in column **14** have been described for operating the brush frame **32**, that a duplicate set of this mechanism is preferably provided in the column **16** for the same purpose and to facilitate the use of smaller counter weights. It will also be understood that the power motor means **72** may be of the double acting type as described in said Patent No. 3,035,293 aforesaid.

A feature of the invention is the provision of a double or multiple element detector system for facilitating raising of the rotating top brush over an obstruction to the brush detected by such system. One element of the detector system comprises a main rectangular shaped vane-like detector or touch member B extending lengthwise of the brush between the brush frame arms **38, 40** and

pivotally journalled as at **120** in the outer ends of arm or lever portions **122** of a pair of opposite multiple arm brackets or plates **124, 126** which brackets are pivotally journalled on the brush shaft **56**. Each bracket has a further arm or lever portion **128** substantially at right angles to the arm portions **122**. The arms **128** are connected through link members generally designated by the numeral **130** with fixed brackets **132** on the frame **12**. The link members **130** each comprise a rod **134** and a pair of clevis members **136, 138**, one pivotally connected with the arm portion **128** and the other pivotally connected with the fixed bracket **132** on the frame **12** each through suitable pin pivots **140**. The clevises are threadedly adjustable at **142** in the rod **134** to alter the distance between the pivots **140** so as to facilitate a parallelogram movement of the detector mechanism in which the distance between the pivot **140** of bracket **132** and the axis **144** of the brush frame is preferably substantially equal to the length of the arm **128** between its pivotal axes, and the link member **130** has a length substantially that of the distance between the brush frame swing axis **144** and the axis of rotation of the brush **30**. Thus the vane B maintains a relatively fixed relationship to the frame **32** and brush **30** during all up and down movements of the latter.

The detector member B preferably comprises a shaft **150** freely journalled as described above at **120** in the lever arms **122** and to which is secured the vane or apron-like member **151** which hangs downwardly from the shaft **150** to a point just below the brush axis. The lower edge portion of the vane **151** is bent rearwardly as at **152** on a radius to provide a cam-like surface **154** for engaging an obstruction such as the ornament **155** on a vehicle **24** passing through the brush unit. In order to maintain the vane **151** in substantially vertical position and make it very sensitive to a force supplied to it, it is substantially dynamically balanced by a counter weight **156** secured to its shaft **150** by a pair of arms **158**. Also secured to the shaft **150** is a switch actuating cam **160** of generally figure eight shape which as shown engages the roller **162** of a switch operating arm **164** of a two position control trip or limit switch **166** mounted on the crank plate or bracket **124**. The switch **166** as seen in FIGURE 3 is in its normally "off" position with its arm in substantial engagement with the cam **160**.

In operation of the device B, a car entering the brush unit and travelling toward the brush will have any obstruction thereon make contact with the detector vane **151** and cause it to rotate the shaft **150**. This action also rotates the cam **160** which in turn transfers motion to the switch arm **164** causing it to effect closing of the switch contacts (not shown) controlling the solenoid of a normally closed electro-magnetically operable air valve which solenoid becomes energized to open the valve and admit compressed air to the air cylinder **74** through the inlet **106**, the piston **70** of the cylinder actuating the arm **82** and linkage **90, 94, 92** to rotate the brush frame shaft **34** counter clockwise in FIGURE 3 to raise the brush unit D and entire detector system B through a 60 degree arc or as much as is required to break contact of the vane **151** with the vehicle. Throughout this movement the relative position of the brush **30** and vane **151** remains substantially the same irrespective of the position of the brush arms **38, 40**. The detector linkage **130** is adjustable in length to provide a variation in the height of the detector B relative to the brush D.

The brush D continues to rise as long as contact is maintained between the vehicle and the vane **151**. When such contact is broken the detector B including the vane **151** and cam **160** return to their normal position shown in FIGURE 3 and the electric circuit through the limit switch **166** is broken. The solenoid valve then closes stopping air flow to the air cylinder **74** that rotates the frame shaft **34**. The force of gravity then causes the brush frame arm to return to the starting position shown in FIGURE 3. The counter weights **100** connected to

the shaft 34 through the mechanical linkage 98, 90, 94, and 92 are so adjusted to nearly balance the rotating moment of the weight of the brush frame arms 38, 40 and attached components to insure that the downward motion of the brush frame arms will not be too rapid.

The second element of the detector system comprises a pair of auxiliary detector or touch members C, one each hingedly secured as at 168 intermediate the axis 144 of the brush frame and axis 170 of the brush 30 to the outer face 172 of the legs 45 of the channel frame arms 38, 40. As seen the members C may be of stiff sheet metal and comprise an elongated arm portion 174 somewhat wider than the frame arms 38, 40 secured to the legs 45 as by a piano type hinge 176 and extending downwardly therefrom along the leg 45 and in face to face relation therewith to adjacent the lower end of the frame arms, terminating in a laterally directed short leg portion 178 extending around the lower ends of the frame arms 38, 40 and forming an L shape with the arm portion 174. The portions 178 and 174 are connected by a rounded corner 180 adapted to ride over obstructions engaged by the arm 174 without causing damage. Each arm 174 of the detector members C has secured adjacent the lower end thereof as at 182 to its edge portion, a strap 184 the outer end 186 of which hooks over the leg 44 of the frame arms 38, 40 to provide a limit stop for movement of the arm 174 away from the frame arms 38, 40 by gravity action or suitable resilient spring means (not shown). If desired there may be a pair of straps 184 secured to each arm 174 one at each side of each frame arm 38, 40.

Normally preferably engaged with each of the touch members C in the position shown in FIGURE 3 is the roller 190 of a switch operating arm 192 of a two position control trip or limit switch 194 which is suitably mounted on the base walls 42 of the brush frame arms 38, 40 adjacent the hinge 176 of the members C. The switches 194 as seen in FIGURE 3 are in their normal off position with their rollers resiliently biased against the under side of the arm portions 174 of the detector members C.

In operation of the second element of the detector system a vehicle having an obstruction, such as a bent antenna 196 in the line of the detector members C but not in the path of the detector system B will in approaching the brush 30 have the outer end of the obstruction 196 contact the member C at a favorable angle causing the detector C to have its arm portion 174 swing about its hinge 176 toward the brush frame arm to which it is connected and actuate the switch arm 192 to effect closing of the switch contacts controlling the solenoid of an air valve all as described in connection with the switch 166 of the detector B and controlling the brush mechanism D in a similar manner. By reason of the high pivotal axis of the detectors C there is little likelihood of damage to an extended antenna or any other high obstruction since it contacts the detectors C in a much more favorable relationship than the detector B. As seen in FIGURE 3 the detector C has an obstacle intercepting length, vertically speaking, greater than that of the detector B and, vertically speaking extends downwardly past the upper end of the detector B and below its lower end.

FIGURES 4 and 5 show a modification of the invention illustrated in FIGURES 2 and 3. It has particular application to a brush unit utilizing a wide brush and intended to act principally on the roof of a vehicle. The changes in structure are in the brush unit and detector system. The operating mechanism and balancing means for the modification in FIGURES 4 and 5 is not shown but is the same as that in FIGURES 2 and 3.

As seen in FIGURES 4 and 5 the brush unit D' which includes a brush 30A, shown in its normal down position in FIGURE 5, is suitably supported in the housing 10 and adapted to be raised to an up, generally horizontal position, by the power operating means described relative to the unit D of FIGURES 2 and 3.

The unit D' comprises a pivotally mounted brush carrying frame generally designated by the numeral 32A and comprised of a shaft 34A journalled in a manner similar to that of the shaft 34 of the unit D and to which is secured as by welding a pair of spaced apart arms 38A, 40A extending radially outwardly therefrom in a position intermediate the columns 14, 16 of the housing 10. Since the brush of this unit is primarily intended for cleaning car roofs the arms need not be as long as the arms 38, 40 of the unit D. The arms 38A, 40A are preferably of channel section with the base walls 42A of the sections confronting each other at the inner side of the frame and the legs 44A, 45A of the sections extending laterally of the base walls 42A to form elongated depressed pockets 46A, 48A extending the length of the arms 38A, 40A at the outer sides thereof. A reinforcing channel 50A connects the arms 38A, 40A at a position substantially midway the axes of the shaft 34A and brush 30A.

Journalled to the arms 38A, 40A of the frame in bearings 55 adjacent the outer ends of the arms is a shaft 56A that carries the rotary brush 30A. The end of the shaft journalled in the arm 40A extends into the pocket 48A of the arm 40A where it carries a sprocket 60 fixed thereto that drivingly connects through a chain belt 62 with a drive sprocket 64 secured to the output shaft 66 of a geared electric motor 68A suitably mounted on the base wall 42A of the arm 40A so as to be movable with the brush carrier 32A. The motor 68A is controlled in a manner similar to that described with respect to the motor 68 of FIGURE 2 and drives the brush 30A in a similar manner through the described chain drive. It should be understood that in certain instances it may be preferred to have the motor 68A directly drive the brush shaft 56A in which case it will be arranged as shown in said prior patent aforesaid.

The brush unit D' is movable between its operable down position and its retracted up position (substantially horizontal) by means such as described with respect to the unit D of FIGURE 2 and in a similar manner. It is also balanced as shown in FIGURES 2 and 3. The brush unit D' as in the case of the brush unit D employs a double or multiple element detector system which while similar in principle to the system of FIGURES 2 and 3 is somewhat different in specific construction and better adapted to the shorter arm structure of the brush unit D'.

As seen in FIGURES 4 and 5 one element of the detector system for the unit D' comprises a main rectangular shaped vane like detector or touch member B' extending lengthwise of the brush and beyond the ends thereof as seen in FIGURE 4. It is pivotally journalled as at 200 in the outer ends of the long section 201 of a pair of L-shaped arms or levers 202 the latter pivotally mounted through a short section 203 on the arms 38A, 40A of the brush frame midmay their length by pins 204 fixed in each section 203. One end of each pin is journalled in a U-shaped bearing bracket 206 secured as by welding to the frame arms and the other end thereof is journalled in an L-shaped bearing bracket 208 secured as by welding to the bracket 206. An adjustable link 209 comprised of bent sections 210, 212 secured together by bolts 214 extending through slots 216 of elongated shape in these sections pivotally connects through the section 210 with each arm 202 through a pivot pin 218 journalled in the arm 202 and a bearing bracket 220 secured as by welding to the arm 202 and through the section 212 and a pin 222 with a bearing bracket 224 mounted to the frame 12 of the housing 10.

It will be observed that the link 209 which corresponds to the link 130 in FIGURE 3 is below the frame 32A. Moreover it will be seen that the distances between the shaft 34A and pin 204, and between pins 218 and 222 are substantially alike as are the distances between the shaft 34A and pin 222 and between the pins 204 and 218, such that a parallelogram motion is secured assuring a fixed relationship of the arms 202 and vane B' rela-

tive to the brush frame 32A and brush 30A at all times during the up and down movement of the brush unit D'.

The detector B' preferably comprises a shaft 230 journalled at 200 in the arms 202 and to which shaft is secured a rectangular shaped metal plate 232 which in turn carries a relatively stiff but flexible rubber touch member 234 also of rectangular shape for confronting and encountering any obstacles presented by a vehicle. The metal plate 232 is in a plane substantially passing through the axis of the shaft 230 such that the weight of the plate normally maintains the detector B' in a vertical position during all movements of the brush frame 32A. Also secured to the shaft 230 adjacent one of the arms 202 (the left arm in FIGURE 4) is a switch actuating cam 160A of generally figure eight shape similar to the cam 160 of FIGURE 3 and which as shown engages the roller 162A of a switch operating arm 164A of a two position control trip or limit switch 166A mounted on the long section 201 of the arm 202. The switch as seen in FIGURE 5 is in its normally "off" position. The operation of this switch 166A and the detector B' is similar to that of the corresponding elements 166 and B of FIGURE 3.

The second element of the detector system in the FIGURE 4 and 5 arrangement is a U-shaped pivotally mounted member generally designated by the letter C'. It is comprised of a horizontal rod-like section 252 extending across the brush frame and to points in juxtaposition to the outer sides of the arms 38A, 40A of the brush frame 32A and journalled on these arms through bearing blocks 254 secured to these frame arms. Rigidly connecting with each end of the section 252 are T-shaped co-planar legs or arms 256, 258 also of rod-like form and of substantially equal length which extend substantially normal to the horizontal section 252 in juxtaposition to and paralleling the bottom legs of the frame arms 38A, 40A, terminating adjacent the outer ends of these arms. The heads 260, 262 respectively of the T legs 256, 258 respectively are also preferably of rod-like character and are arranged coaxial with each other and parallel the axis of the brush 30A. As seen in FIGURE 4 the head 260 of the leg 256 is unbalanced and straddles the arm 38A. It consists of a short outer portion 264 and a longer inner portion 266 extending to a point in juxtaposition to the lateral edge 268 of the detector B', the latter portion 266 being preferably covered by a sleeve 270 of elastomeric material such as rubber or plastic. The portion 264 includes an L-shaped connecting section, one leg 272 of which connects with the outer end of the portion 264 and the second leg 274 of which extends into the pocket 46A of the frame leg 38A to provide a limit stop for the detector C' limiting the extent to which this element may be displaced from the arms of the brush frame. The head portion 262 of the T-leg 258 is made up of two long sections 276, 278 which are in axial alignment and each of which is covered by a sleeve 270 of elastomeric material. One section 276 overlaps the vane B' in FIGURE 4. The element C' is generally dynamically balanced by a weight 280 secured to an arm 282 connecting with the section 252 of this member so as to make it sensitive to touching action and to have a slight overbalance tending to move the legs 256, 258 toward the frame arms 38A, 40A respectively.

As seen the T-leg 256 is provided with a flat tab or cam plate 284 which normally is in contact with the roller 190A of a switch operating arm 192A of a two position control trip or limit switch 194A which is suitably mounted on the leg 45A of the brush frame arm 38A. The switch 194A as seen in FIGURE 5 is in its normal "off" position with the roller 190A resiliently biased against the cam plate 284 to maintain contact therewith. The detector element C' operates similar to the elements C of the FIGURE 2 construction. They differ in that the operating arms 256, 258 in FIGURES 4 and 5 are connected so that either will operate the same switch 194A on the frame arm 38A, whereas the elements C in FIGURES 2 and 3 operate separate switches.

From the foregoing description of the invention it will be evident that a novel follower top body brush structure and automatic detector system therefor has been provided which will perform safely and efficiently in a line car wash system.

It will be understood that various modifications will suggest themselves to those skilled in the art without departing from the spirit and intent of the invention. Accordingly all modifications, changes and equivalent constructions coming within the purview of the appended claims are contemplated.

We claim:

1. A body brush unit for a vehicle washing line comprising a top body brush, carrying means for said brush mounted for accommodating swinging movement of said brush between a normally down operable position engageable with the top surface of a vehicle and an inoperable position clear of said surface, means for actuating said brush carrying means to said inoperable position, control means for said actuating means and a plurality of independently operable detector means operable upon said control means, said detector means being operable by means constituting an objectionable obstruction for said brush unit and being arranged transversely of said wash line and supported by said carrying means, one of said detector means comprising a pivotally mounted, generally vertically suspended member arranged ahead of said brush and exteriorly of the periphery of said brush and a second detector means comprising a member pivotally mounted vertically speaking above said first member and in closer proximity to said carrying means than said first member, said second member having an obstacle intercepting length vertically speaking, greater than said first member and which vertically speaking extends downwardly past the upper end of said first member.

2. A body brush unit as claimed in claim 1, wherein each of said detector means actuates a separate control means for said actuating means.

3. A body brush unit as claimed in claim 1, wherein said first detector means is arranged centrally of said brush for encountering objectionable obstructions adjacent the vehicle hood, windshield, roof and rear deck of a vehicle and said second detector means is arranged to one side of said brush for encountering objectionable obstructions in the area sidewise of said hood, windshield, roof and rear deck.

4. A body brush unit for a vehicle washing line comprising a top body brush, carrying means including a pair of spaced apart elongated arms journalling said brush, mounted for accommodating swinging movement of said brush between a normally down operable position engageable with the top surface of a vehicle and an inoperable position clear of said surface, means for actuating said brush carrying means to said inoperable position, control means for said actuating means and a plurality of detector means for encountering objectionable obstructions on said vehicle, each said detector means being operable upon said control means and thereby said actuating means for effecting movement of said carrying means to said inoperable position of said brush, one of said detector means comprising a pendulum-like member pivotally mounted on means in turn pivotally mounted on said carrying means, said member being normally located ahead of said brush and exteriorly of the periphery of said brush and a pair of additional detector means independent of said one detector means pivotally mounted on said arms, each of said pair having an operable portion in juxtaposition to one of said arms and within the periphery of said brush.

5. A body brush unit for a vehicle washing line comprising a top body brush, carrying means for said brush including a pair of spaced apart arms rotatably supporting said brush adjacent one end of said arms, a shaft

in spaced relationship to said brush rigidly connecting said arms, means including a stationary support journalling said shaft, a pair of generally L-shaped levers, means on said arms pivotally mounting said levers, one adjacent each arm, separate tie links, one each pivotally connecting with one of said levers and extending generally parallel to said arms and pivotally journalled to said stationary support at a position adjacent the axis of said shaft, a detector member extending lengthwise of said brush outwardly therefrom for encountering objectionable obstructions on said vehicle and operative on control means for raising said brush clear of said obstruction, and means on said levers at a position more remote from the pivotal axes of said levers than the pivotal connection of said links are therefrom swingably supporting said detector member.

6. A body brush unit as claimed in claim 5 including a pair of auxiliary detectors pivotally mounted on said arms at positions nearer said shaft axis than the pivotal axes of said levers, each of said further detectors extending lengthwise of said arms and having portions at least adjacent the ends of said detectors most remote from their pivotal axes extending across said arms in generally parallel relationship to said brush.

7. A body brush unit as claimed in claim 5 wherein said levers are bell cranks whose pivotal axes are coincident with the brush axis.

8. A body brush unit as claimed in claim 6, wherein said auxiliary detectors extend across said arms for substantially their full length and wherein the ends of all said detectors most remote from their pivotal axes are curved to provide a camming face.

9. A body brush unit as claimed in claim 6 including stop means carried by at least one of said auxiliary detectors for limiting pivotal movement of said detectors away from said arms.

10. A body brush unit as claimed in claim 6 wherein said auxiliary detectors are operatively connected.

11. A body brush unit as claimed in claim 5 wherein said tie links are positioned above the top side of said arms and said detector is positioned below the under side of said arms.

12. A body brush unit as claimed in claim 5 wherein said tie links are positioned below the underside of said arms and said detector is swingably supported from the same legs of said levers as those to which said tie links are connected but at a position more remote from the pivotal axes of said levers than said tie links.

13. A body brush unit for a vehicle washing line comprising a top body brush, carrying means for said brush including a pair of spaced apart arms, a stationary support pivotally mounting said arms for accommodating swinging movement of said brush between a normally down operable position engageable with the top surface of a vehicle and an inoperable position clear of said surface, means for actuating said brush carrying means to said inoperable position, a brush shaft, means rotatably journalling said shaft on said arms, a pair of bell cranks freely mounted on said shaft, one in juxtaposition to each of said arms, a first detector member for encountering objectionable obstruction on said vehicle, said member extending between and being pivotally supported in one of the legs of each of said bell cranks, separate tie bars extending generally parallel to each of said arms of said brush carrying means and in adjacency thereto, one end of each tie bar being pivotally secured to the other leg of a bell crank which bell crank is in juxtaposition to the arm to which such tie bar is adjacent and the other ends of said tie bars being pivotally mounted to said stationary support adjacent the pivotal axes of said arms, a pair of auxiliary detectors, one each pivotally mounted on one of said arms and extending across a face of said arms, control means for said actuating means mounted on one of said bell cranks in operable relationship to said first detector, and further control means for said actuating means mounted on said arms in operable relationship to said pair of detectors, each of said detectors being independently operable upon its associated control means and thereby said actuating means for effecting movement of said brush carrying means to said inoperable position of said brush.

14. A body brush unit for a vehicle washing line comprising a top body brush, carrying means for said brush including a pair of spaced apart arms, a stationary support pivotally mounting said arms for accommodating swinging movement of said brush between a normally down operable position engageable with the top surface of a vehicle end and inoperable position clear of said surface, means for actuating said brush carrying means to said inoperable position, a brush shaft, means rotatably journalling said shaft on said arms, a pair of levers pivotally mounted on said arms, one on each arm and extending forwardly in the direction of the vehicle entrance side of said unit, a detector swingably mounted adjacent the outer ends of said levers, separate tie links, one each pivotally connecting with one of said levers at a position inwardly of said detector and extending generally parallel to said arms and pivotally journalled to said stationary support at a position adjacent the pivotal axes of said arms, a pair of auxiliary detectors comprising a cross element journalled on each of said arms and a pair of T-shaped elements rigidly connecting with said cross element, the head portions of said T-shaped elements extending across the underside of said arms and one of said head portions including stop means for hooking engagement with one of said arms, control means for said actuating means mounted on one of said levers in operable relationship to said first mentioned detector and a further control means for said auxiliary detectors mounted on one of said arms in operable relationship to the leg of one of said T elements, each of said detectors being independently operable upon its associated control means and thereby said actuating means for effecting movement of said brush carrying means to said inoperable position of said brush.

15. A body brush unit for a vehicle washing line comprising a top body brush, carrying means for said brush including a pair of spaced apart arms rotatably supporting said brush adjacent one end of said arms, a shaft in spaced relationship to said brush rigidly connecting said arms, means including a stationary support journalling said shaft, power means on one of said arms for driving said brush, balancing means for said brush supporting arms comprising a weight adjustably mounted on lever means secured to a counter shaft generally paralleling said first mentioned shaft and which latter shaft is drivingly connected with said first mentioned shaft through levers secured to each of said shafts and a connecting link between said levers and a plurality of detectors for intercepting objectionable obstructions on said vehicle for said brush unit and operable for effecting movement of said brush to a position clear of said obstruction, one of said detectors extending across said unit in front of said brush and being swingably mounted by means adapted to maintain a substantially constant position of this one detector relative to the axis of said brush and there being a further pair of detectors one each mounted on said arms and having operable portions extending across said arms and beyond the longitudinal outer ends of said one detector.

16. A body brush unit as claimed in claim 15 wherein there is a chain and sprocket drive means drivingly interconnecting said power means and said brush, and said one arm has a channel section and said chain and sprocket drive means are located within said channel.

17. A body brush unit for a vehicle washing line comprising a top body brush, carrying means including a pair of spaced apart elongated arms journalling said brush, mounted for accommodating swinging movement of said brush between a normally down operable position en-

gageable with the top surface of a vehicle and an inoperable position clear of said surface, means for actuating said brush carrying means to said inoperable position, control means for said actuating means and a plurality of detector means for encountering objectionable obstructions on said vehicle, each said detector means being operable upon said control means and thereby said actuating means for effecting movement of said carrying means to said inoperable position of said brush, one of said detector means comprising a pendulum-like member pivotally mounted on means in turn pivotally mounted on said carrying means, said member being normally located ahead of said brush and exteriorly of the periphery

of said brush and an additional detector means independent of said one detector means pivotally mounted on one of said arms, and having an operable portion in juxtaposition to one of said arms and within the periphery of said brush.

References Cited by the Examiner

UNITED STATES PATENTS

1,035,293 5/1962 Larson ---------- 15—21

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