Aug. 7, 1934. J. R. BLACKHALL ET AL 1,968,986

CAR WASHER

Filed July 20, 1931 3 Sheets-Sheet 1

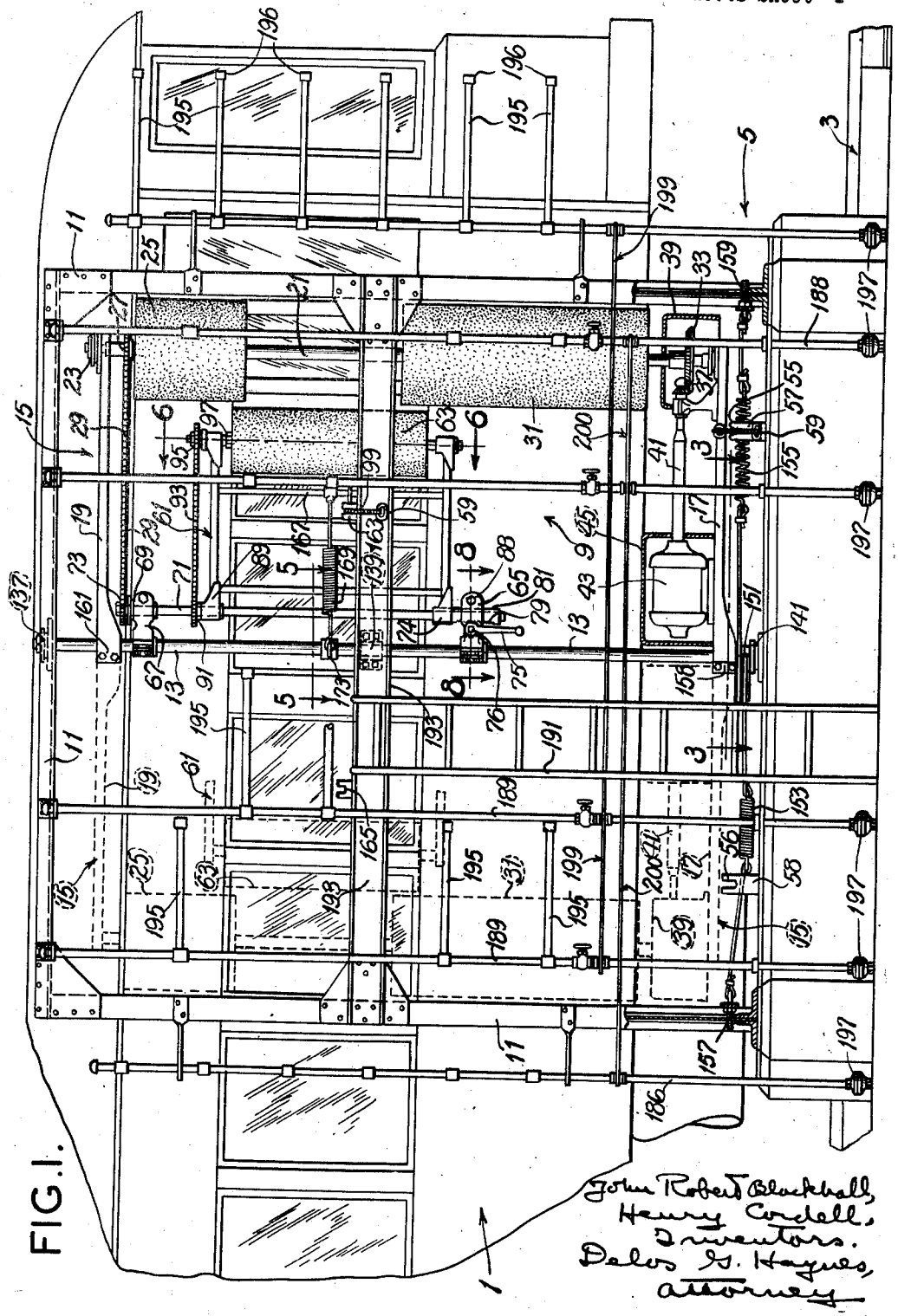


FIG. 1.

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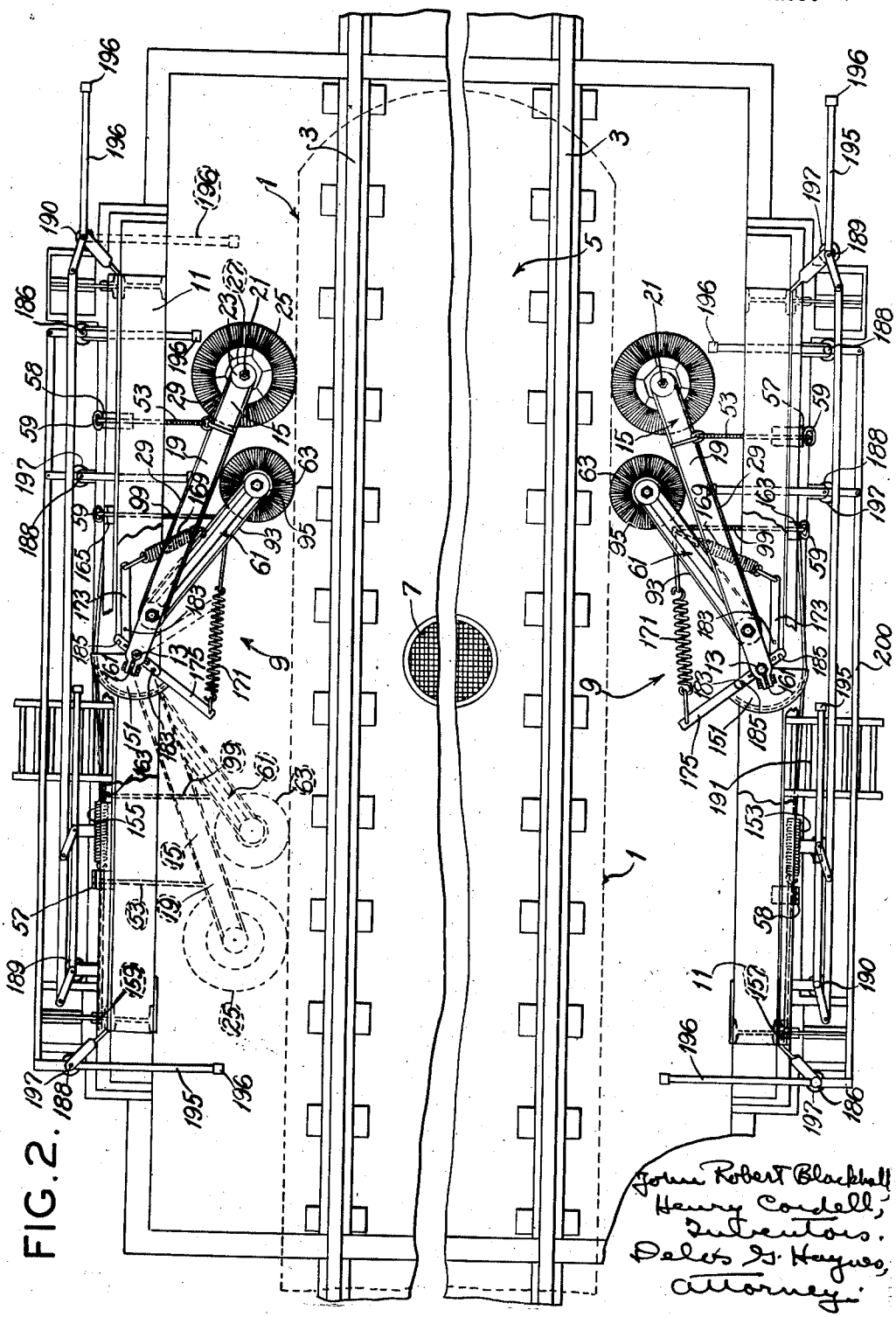


FIG. 2.

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CAR WASHER

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FIG. 3.

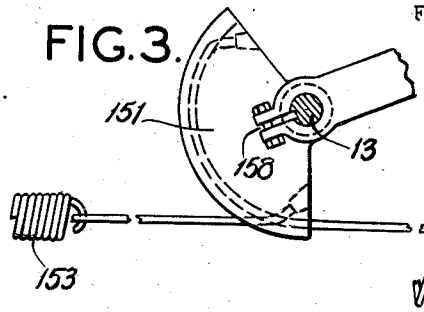


FIG. 4.

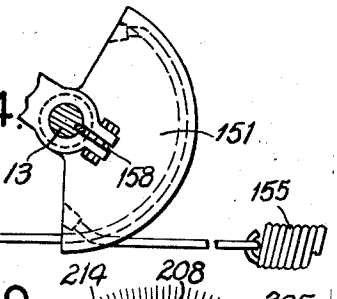


FIG. 9.

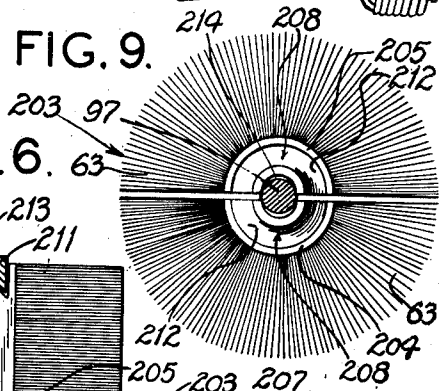


FIG. 5.

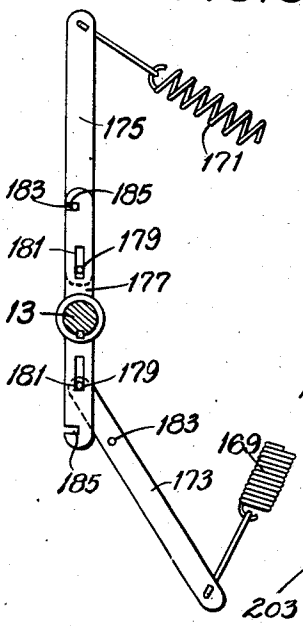


FIG. 6.

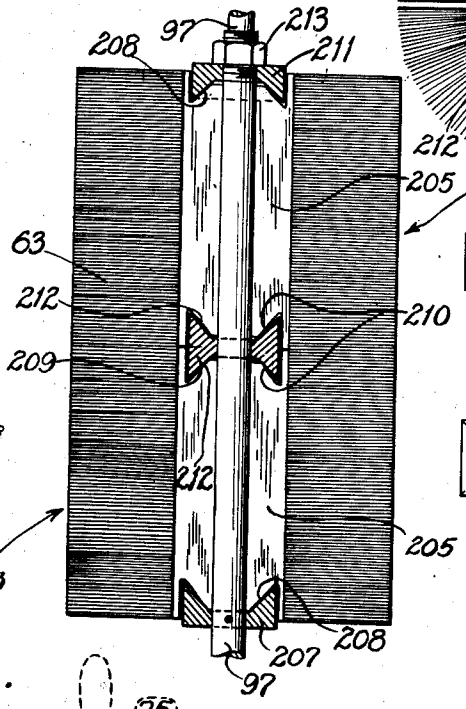


FIG. 7.

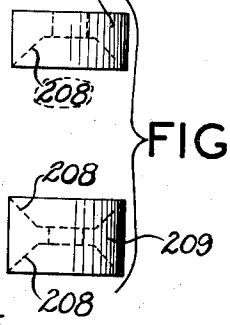
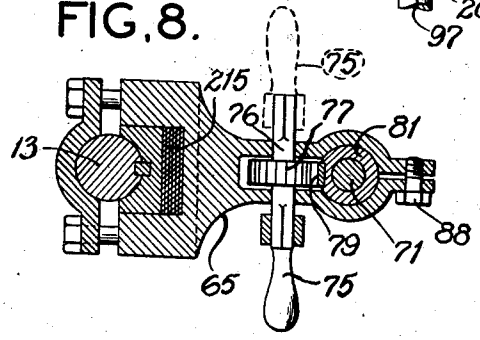


FIG. 8.



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UNITED STATES PATENT OFFICE

1,968,986

CAR WASHER

John Robert Blackhall, Highland Park, and Henry Cordell, Wilmette, Ill.; said Cordell assignor to said Blackhall

Application July 20, 1931, Serial No. 551,938

3 Claims. (Cl. 15—53)

This invention relates to washing machines, and with regard to certain more specific features, to car-washing machines for railways and the like.

Among the several objects of the invention may be noted the provision of an improvement in the car-washing machine described in the patent to H. Cordell et al., No. 1,783,074, issued November 25, 1930; the provision of a car-washing machine of the class described which is readily adjustable to equipment to be cleaned, and which is adapted to wash cars passing through the machine from either of two directions; and, the provision of a car washer of the class described which is provided with improved brush assembly features, and which is simple, rugged in mechanical design. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structure hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is illustrated one of various possible embodiments of the invention,

Fig. 1 is a side elevation, showing the invention in use on a railway car and showing in dotted lines an alternative position of part of the invention;

Fig. 2 is a plan view of the washer showing in dotted lines an alternative position of part of the invention and also showing in dotted lines a position which a railway car assumes as it is being washed;

Figs. 3 and 4 are sectional views taken on line 3—3 of Fig. 1, and showing alternative positions of a spring operated drum segment;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 1 showing certain adjustable arms;

Fig. 6 is a section taken on line 6—6 of Fig. 1, showing the mounting of a brush on a shaft;

Fig. 7 is a detail view of certain collars adapted to secure said brush;

Fig. 8 is an enlarged section taken on line 8—8 of Fig. 1; and,

Fig. 9 is a top plan view of Fig. 6 showing a nut and collar removed.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring now more particularly to Fig. 1, there is illustrated at numeral 1 a railway car adapted to be washed. It is to be understood that the type of car is not important, and that the features of this invention may be adapted to other types of vehicles.

The track 3 along which the vehicle 1 may move crosses a suitable rack 5, said rack including a drain 7 for carrying off waste water and the like. Mounted on each side of the rack 5 is a washing unit 9. These units 9 are identical in structure and the details of a description of one of them will suffice for both, the numerals used in describing either being applied to both in the drawings. As shown in Fig. 2 the machine at the one side of the rack 5 is in the alternative position which the machine on the other side of the rack may assume and vice versa.

Each washing unit 9 comprises a stationary frame 11. Supported vertically and rotatably within said stationary frame is a supporting shaft 13 which forms part of a movable primary framework 15. This primary framework 15 comprises said shaft 13 and lower and upper brackets 17 and 19, respectively, said brackets reaching outwardly to, and supporting a main brush shaft 21, the latter being also vertically located. At the upper end of the brush shaft 21 are located a bearing 23, a short brush 25 for washing an upper panel of the car 1 and a sprocket 27 for a chain 29, the use of which will be set out.

At the lower end of the main brush shaft 21 is located a brush 31 for washing the lower panel of the car 1, and below this brush 31, near the supporting bearing of the brush shaft is carried a bevel gear 33. A beveled pinion 37 meshes with the bevel gear 33. The pinion 37 and the gear 33 are located in a suitable protecting house 39. The pinion 37 is connected with the drive shaft 41 of a motor 43, also located on said secondary framework 15, the motor 43 being also located in a suitable protecting housing 45. The shaft 13, brackets 17 and 19, main brush shaft 21 with its sprockets and the motor 43 with its drive are all adapted to swing as a unit about the center line of said shaft 13. The shaft 13, as shown in Fig. 1 is supported by the bearings 137, 139 and 141, the bearing 139 being supported by a channel piece 193. A drum segment 151 is keyed to the lower end of the shaft 13 and springs 153 and 155 (Figs. 3 and 4), connected with the segment 151 by means of cables, and connected with the frame 11, as shown at numerals 157 and 159 respectively, are adapted

to normally tend to keep the segment 151 in a position which will hold the frame 15 at right angles to the plane of the frame 11. As indicated at numerals 157 and 159 the tension of the springs 153 and 155 is adjustable. As shown at numerals 158 and 161 (Figs. 1 and 4) the braces 17 and 19 are adjustable on the shaft 13 in either an axial or rotational direction.

The brushes 25 and 31 are resiliently pressed against the sides of the car 1 by the reaction of either the spring 153 or 155 as the case may be. The primary frame 15 may be swung either to the right or to the left end of the frame 11, and accordingly the brushes may scrub a car coming from either direction if so properly swung. If the car 1 is entering the car washing machine from the left hand end of the frame 11, Fig. 1, the primary frame 15 will be swung to the right, and the spring 155 placed in tension to resiliently hold the brushes 25 and 31 against the car frame, and at the same time the spring 153 will be relaxed. If the car 1 enters from the right hand end of the frame 11, dotted line position Fig. 1, the primary frame 15 is swung to the left or counterclockwise and the spring 153 is put in tension to resiliently hold the brushes 25 and 31 against the side of the car.

By this arrangement the motor is adapted to rotate the brushes 25 and 31 and said brushes are at the same time swingable either to the right or to the left around the center line of the shaft 13, and in either position are resiliently pressed against the sides of the car.

In order that the primary framework 15 may be withdrawn from the car into a position permitting free movement of the car without washing, there is provided a chain 53 fastened to said primary framework 15 and adapted to be fastened at either notch 55 or 56 associated with parts 57 and 58 respectively on the framework 11. A hand grip 59 permits the manipulation of this chain in said notches 55 and 56. Inasmuch as the chain may be hooked in at any relative position with respect to the notches, it provides a means for setting the brushes 25, 31 in any one of their angular positions with respect to the frame 11.

Another, secondary, framework 61 is swingably supported on said primary framework 15, for swingably mounting a window brush 63. The window brush 63 is adapted to wash the usually depressed windows of the car 1. The frame 61 is arranged as follows:

Lower and upper brackets 65 and 67 respectively are rigidly fastened to the supporting shaft 13 and swing therewith.

The upper bracket carries a thrust bearing 69 rotatably supporting a swing shaft 71, the latter carrying a sprocket 73 at the upper end thereof for meshing with said chain 29 leading from the sprocket 27 on the main brush shaft 21. Thus the chain 29 transmits rotary motion from the brush shaft 21 to the swing shaft 71.

As shown in Fig. 8 the brackets 65 and 67 are provided with takeup shims 215 whereby the distance between the two shafts 71 and 21 may be adjusted and thus the tension in the chain 29 may be varied.

The secondary framework 61 is adjustable on said shaft 71, vertically in order to adapt the window brush 63 to the various window heights on the various types of rolling stock to which it may be applied. In order to accomplish this, there is provided the lower swing shaft bracket 65 (Fig. 8). This bracket 65 rotatably supports a hand crank 75 the latter being connected for rotation with a pinion 77 mounted on a shaft 76. The crank 75 is mountable on either end of the shaft 76 and, as shown in the dotted line position of Fig. 8, it is mounted on the reverse side of the shaft 76 in the event that the frame 61 is turned to its alternative position. The pinion 77 meshes with a rack 79 fastened to a movable sleeve 81. The sleeve 81 is slidable vertically in the bracket 65. It is also slidably mounted over the swing shaft 71.

The sleeve 81 supports a lower bracket 74 of the frame 61 through a suitable bearing (not shown). The member 74 is relatively rotatable with respect to the sleeve 81 and shaft 71, and is adapted to be adjusted in elevation by manipulation of the hand crank 75. The bracket 65 is split so that the sleeve 81 may be clamped by screwing up on a cap screw 88, that is, after an adjustment has been made.

The secondary framework 61 includes said member 74 and upper member 89 corresponding thereto for aiding and supporting said secondary and swingable frame 61. Associated with the member 89 is a sprocket 91 which is splined to the swing shaft 71 for rotation therewith and slidable motion therealong. A chain 93 meshes with this sprocket 91. The chain 93 reaches outwardly to a second sprocket 95 located on the shaft 97 of said brush 63. The shaft 97 of the brush 63 is located with a suitable upper and lower bearing on said secondary frame 61.

A chain 99, similar to the chain 53, is adapted to be secured in notches 163 and 165 to control the movement of the secondary frame 61, in its alternative positions. The chain 99 also has a handle 59.

The brush 63 is resiliently held against the windows of the car 1 as the car passes through the machine from either its left or right end respectively by springs 171 and 169, which are commonly secured at a shaft 167 of the secondary frame 61 (Figs. 2 and 5). The other ends of the springs 171 and 169 are respectively joined to extension arms 175 and 173 which in turn are respectively joined to opposite ends of a bar 177 which is keyed to the shaft 13 and turns therewith. The extension pieces 175 and 173 are joined to the bar 177 by pins 179 which are adapted to slide in but are not removable from slots 181. Pins 183 on the two extension arms 175 and 173 are adapted to be seated in notches 185 in the bar 177, and when the pins 183 are so positioned the extension arms 173 and 175 are firmly secured to the bar 177, but when the pins 183 are not so seated in the slots or notches 185, the extension arms 173 and 175 are collapsible in the plane of said bar 177.

When the frame 61 is swung to its right hand position, the bar 175 is rigidly connected with the bar 177 by seating its pin 183 in the respective slot 185, whereby the spring 171 under tension resiliently holds the brush 63 against the windows of the car 1. At this time the extension arm 173 is preferably collapsed by unseating its pin 183, which unseating is effected by rotating the arm 173 about the pin 179, until the pin 183 is free from its slot 185, and then pulling the arm 173 away from the shaft 13, whereby the pin 179 slides along the slot 181 and as the pin 183 is pulled out beyond the bar 177 the arm 173 is free to rotate about its pin 179 as a center. In this way the tension on the spring 169 is released while the tension in the spring 171 is maintained.

If however, the primary frame, swinging on the shaft 71 is swung to its alternative position as shown in dotted lines in Figs. 1 and 2 the alternative position of the bars 173 and 175 and of the springs 171 and 169 is effected.

The operation of the mechanism is as follows:

Assuming that the car 1 is being run into position between the frameworks 11 from the left, the motor 43 is turned on. It drives the main brushes 25 and 31 on the main brush shaft 21 by way of the bevel gear train 37, 33. The main brush shaft 21 in turn drives the swing shaft 71. The swing shaft 71 has a fixed relationship with respect to the brush shaft 21 and the shaft 13. The reason for this is that all of the shafts 13, 71 and 21 form part of a rigid structure providing the same angular movement of shafts 13, 71 and 21.

The shaft 71 being driven from shaft 21 by said chain 29 in turn drives the secondary brush shaft 97 by way of the chain 93. This drive may be effected at any of the angular positions of the brush 63 with respect to the secondary frame 15, because the brush shaft 97 swings around the center line of the swing shaft 71. To contact the brushes 25, 31 and 63 with the surface of the car, the chains 53 and 99 are fed out so that the normal reactions of the springs 155 and 171 cause the brushes to be resiliently pressed against the sides and windows of the car 1.

In order to effect the proper adjustment of the window brush 63, the screw 88 is loosened and by means of the hand crank 75, the proper elevation is obtained. The screw 88 is then again re-tightened.

If now it is desirable to change the operation so that the car may enter from the right hand side, it is only necessary to rotate the primary frame 15 about the shaft 13 as a center. At the same time the arm 175 is collapsed and the arm 173 is rigidly secured to the arm 177 by seating the pin 183 in the notch 185. Thus the springs 153 and 169 are adapted to effect the resilient pressure of the brushes on the sides of the car. At this time the crank 75 is shifted to its alternative position on the shaft 76.

After the car has been cleaned, all of the brushes may be retracted, by drawing in the chains 99 and 53. Or, either of said chains may be drawn so that either set of brushes 25 and 31, or 63 may be made to operate alone as the car 1 passes.

In order to facilitate rapid and simplified replacement of the brushes of the machine they are removably mounted on their shafts. Thus the window portion 63 is formed into two sections 203, and each section is axially split into identical halves 204 and 205, (Fig. 9) and the halves are mounted on the shaft 97 by means of collars or washers 207, 209 and 211 and the nut 213 (Figs. 6 and 7). The end collars 207 and 211 each have a conically shaped bore 208 in one end and the collar 209 has such a bore at each end. The ends of the halves 204 and 205 have semi-circular grooves 210 which are shaped similarly to the bores 208 but are the inverse thereof. Furthermore, the slope of the sides 212 of the grooves 210 is of a slightly different degree than that of the corresponding sides of the bores 208. Each half also has a semi-circular axial groove 214 extending longitudinally therein which is adapted to receive one-half of the shaft 97. Thus when two halves 204 and 205 are juxtapositioned, (Fig. 9), the grooves 208 form a bore and the grooves 214 form an axial passage for the shaft 97. The bottom collar 207 is pinned to the shaft 97.

To assemble or replace the brush 63, it is only necessary to loosen the nut 213 and lift collar 211. The upper halves 204 and 205 of top section 203 can then be removed and then the collar 209 is lifted which releases the lower halves 204 and 205 of lower section 203 of brush 63. The new halves may then be assembled in place of the old halves. Thus it is not necessary to remove the shaft 97 to replace the brush 63.

An advantage of the car washing machine hereindescribed, rises in the cooperation of the scrubbing action of the brushes and the cleaning action of liquid from spraying devices which are vertically arranged in sets of spray nozzles which are shown at numerals 195 and 196. Inasmuch as the spraying action of the nozzles and cleaning action of the brushes in combination with the spray is completely described in the aforementioned patent to H. Cordell et al., is not deemed necessary to describe it in this invention.

The manipulation of the spraying apparatus has been improved. Two sets of nozzles 196 and 195 are extended from pipes 186 and 188 and 189 and 190 respectively. The nozzles 196 are used when the frame 15 is swung to its right hand position and the nozzles 195 when the frame 15 is swung to its left hand position. The pipes 188 and 186 are connected to their respective main supplies through swivel joints 197, and are all connected together by a leverage mechanism 200 in such a way that the signal movement of the mechanism 200 is adapted to swing all of the nozzles 196 back out of the line of clearance of the cars and/or to adjust the direction of the nozzle for most effective work. Thus as the car 1 runs through the apparatus from the left (Fig. 2), it first receives a high pressure spray of dirt removing liquid on its sides and windows from the nozzles 196 of the pipe 186. This area then runs through the brushes where more water is added from supplementary spraying nozzles 196 connected with pipes 188. This latter spray also serves for rinsing purposes.

The pipes 189 and 190, having nozzles 195, and operable by the mechanism 199 are adapted to supply the spray when the car 1 goes by the washer from the right.

The ease with which the nozzles 195 and 196 may thus be directed by the respective mechanisms 199 and 200 is effective in speeding up the operation of the machine and in increasing the efficiency of the nozzles themselves.

A ladder 191, joined to the channel piece 193 is adapted to facilitate greasing and adjustment of the mechanism. The cross piece 193 serves to provide a stronger stationary frame 11 as well as serving as an additional support for the shaft 13.

An advantage of the car washing machine of the invention is the double end operation which is achieved. Such operation is distinctly valuable from a manufacturing stand point in that it is no longer necessary to manufacture separate machines for the right hand and left hand sides of the car 1. Furthermore, if a car is not properly washed with one passage through the machine, it can be run back directly without first switching it back to again enter the same end of the machine. In this way the whole car washing operation has been greatly simplified

by the variation of operation which has been effected.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. A washer for cars which move along a path in either of two directions, comprising a brush-carrying frame pivoted substantially alongside of the path of the cars, said brush-carrying frame being substantially perpendicular to and having a neutral position extending into the path of the cars, said frame being swingable to both sides of the neutral position, means urging said frame towards said neutral position when said frame is moved from said neutral position by the cars, and a rotary brush positioned substantially at the end of said frame.

2. A washer for cars which move along a path in either of two directions, comprising a stationary frame alongside the path of the cars, a primary brush-carrying frame pivoted substantially vertically in said stationary frame and also alongside the path of said cars, said primary brush-carrying frame having a neutral position extending into the path of the cars, said primary frame being swingable to both sides of a neutral position, means urging said frame towards said neutral position when said frame is moved from said neutral position by the cars, a rotary brush positioned substantially at the end of said frame, and a secondary brush-carrying frame pivoted substantially vertically to said primary frame, a brush on said secondary frame the arc of swing of the end of which is inside of said brush on said primary frame but which intersects the line of travel of the cars, and means yieldingly urging the secondary frame to a position wherein the brush thereon will contact the cars.

3. A washer for cars which move along a path in either of two directions, comprising a stationary frame alongside the path of the cars, a primary brush-carrying frame pivoted substantially vertically in said stationary frame and also alongside the path of said cars, said primary brush-carrying frame having a neutral position extending into the path of the cars, said primary frame being swingable to both sides of a neutral position, means urging said frame towards said neutral position when said frame is moved from said neutral position by the cars, a rotary brush positioned substantially at the end of said frame, and a secondary brush-carrying frame pivoted substantially vertically to said primary frame, a brush on said secondary frame the arc of swing of the end of which is inside of said brush on said primary frame but which intersects the line of travel of the cars, and means yieldingly urging the secondary frame to a position wherein the brush thereon will contact the cars, said last-named means being manually operable to effect independent urges adapted to effect contact with cars passing in either direction.

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