G. A. ROBERTS.

RAILWAY CAR WASHING APPARATUS.

APPLICATION FILED OCT. 23, 1917.

1,298,096.

Patented Mar. 25, 1919.

4 SHEETS—SHEET 1.

Fig. 7.

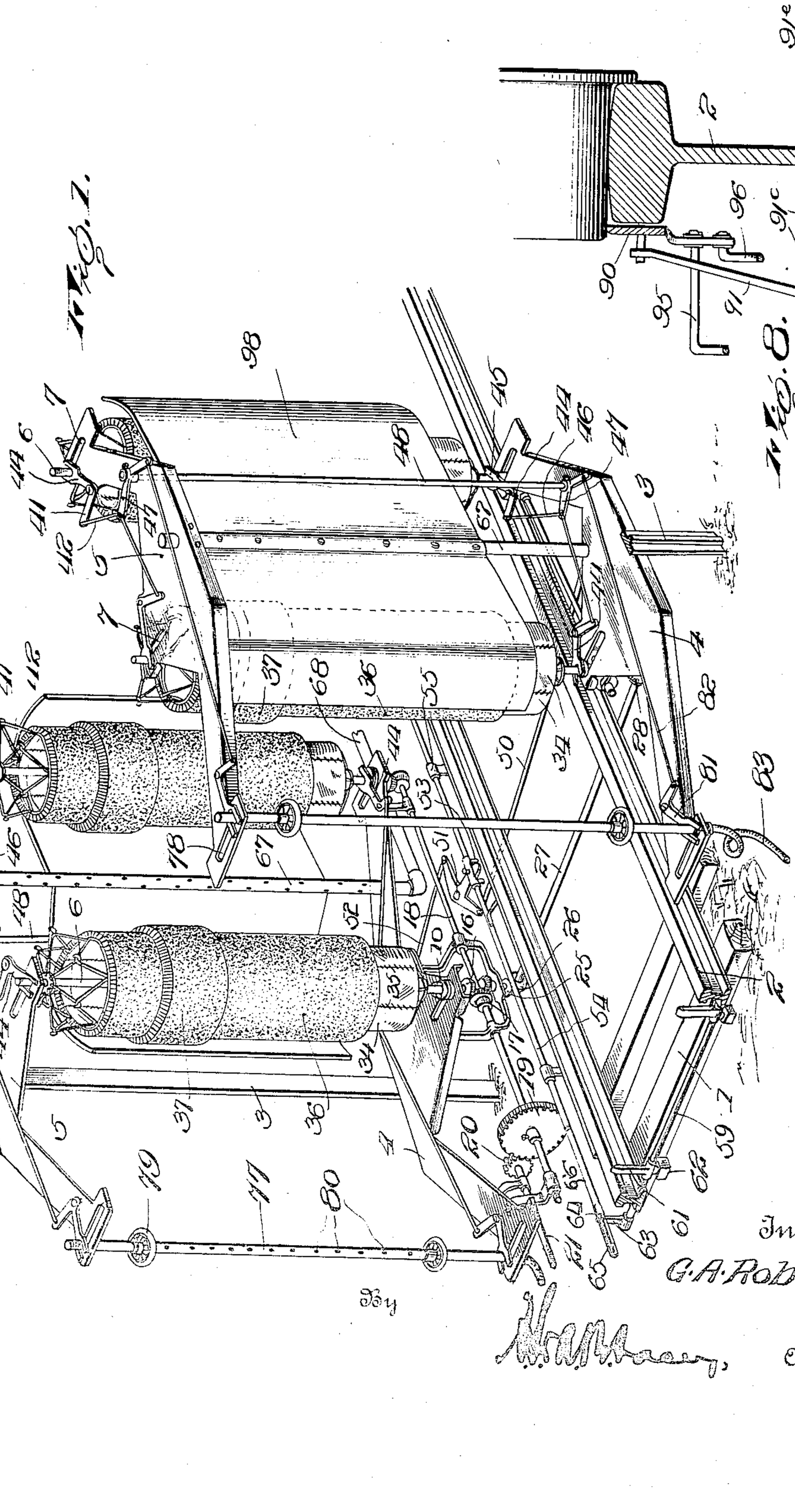
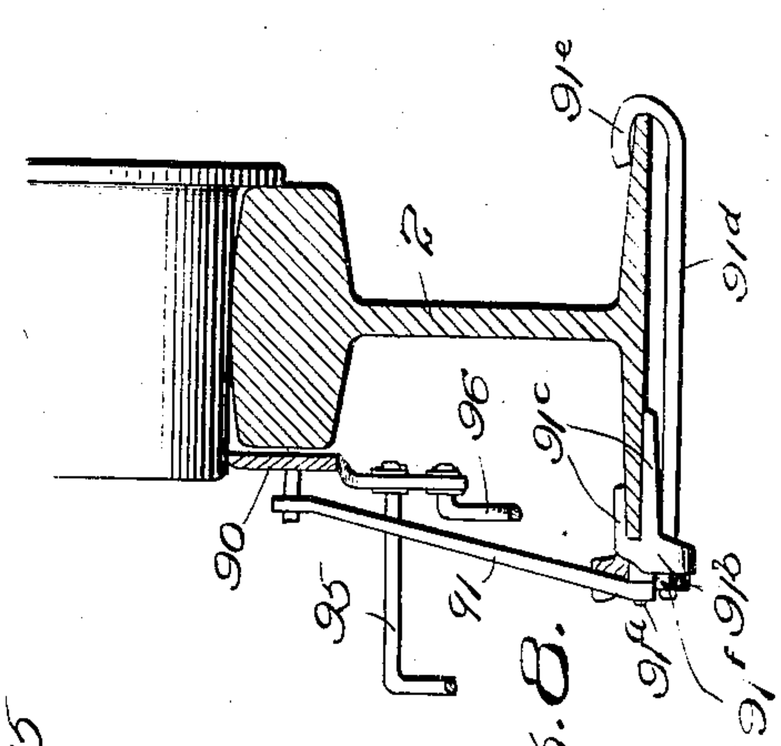


Fig. 8.



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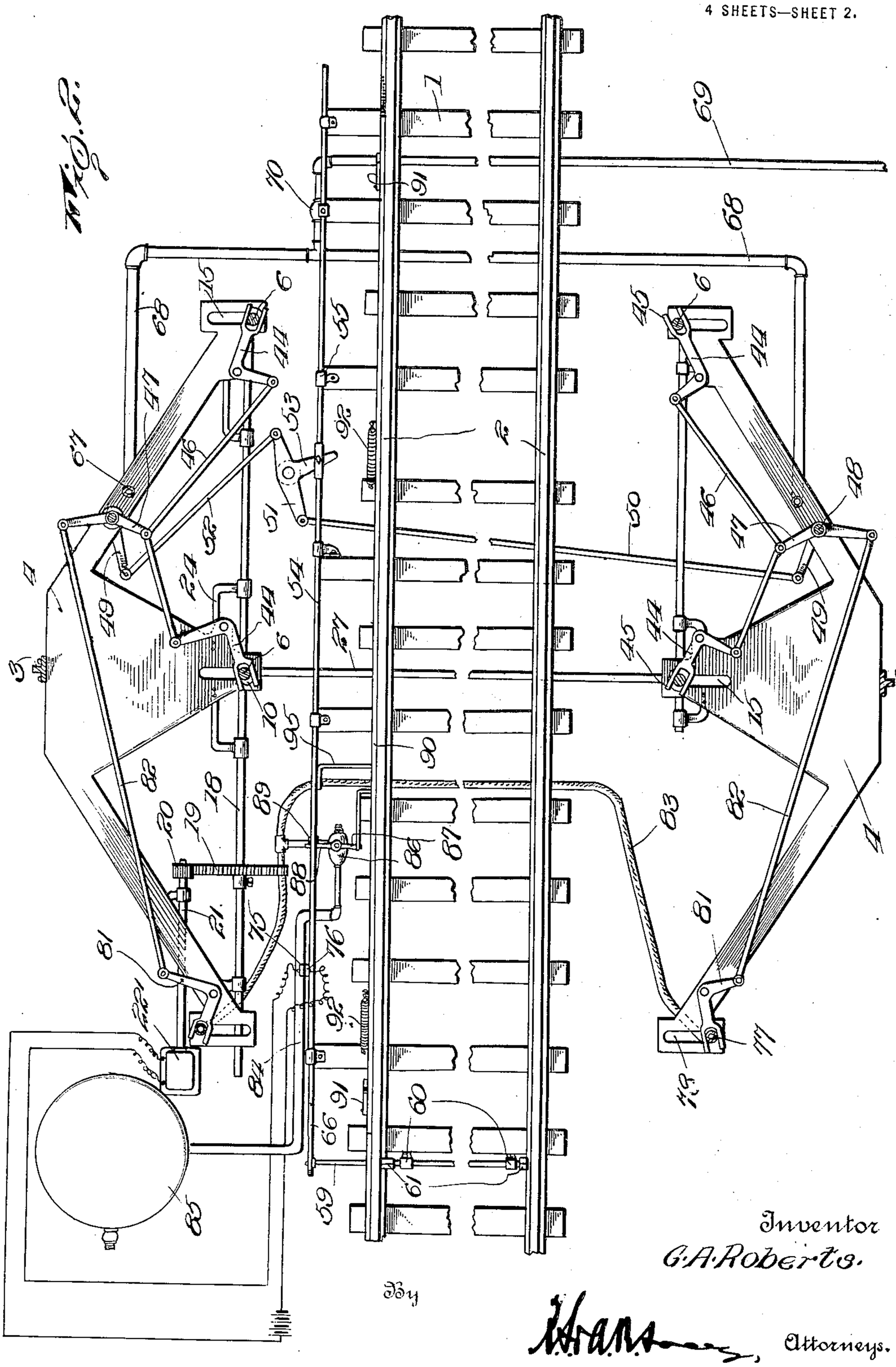

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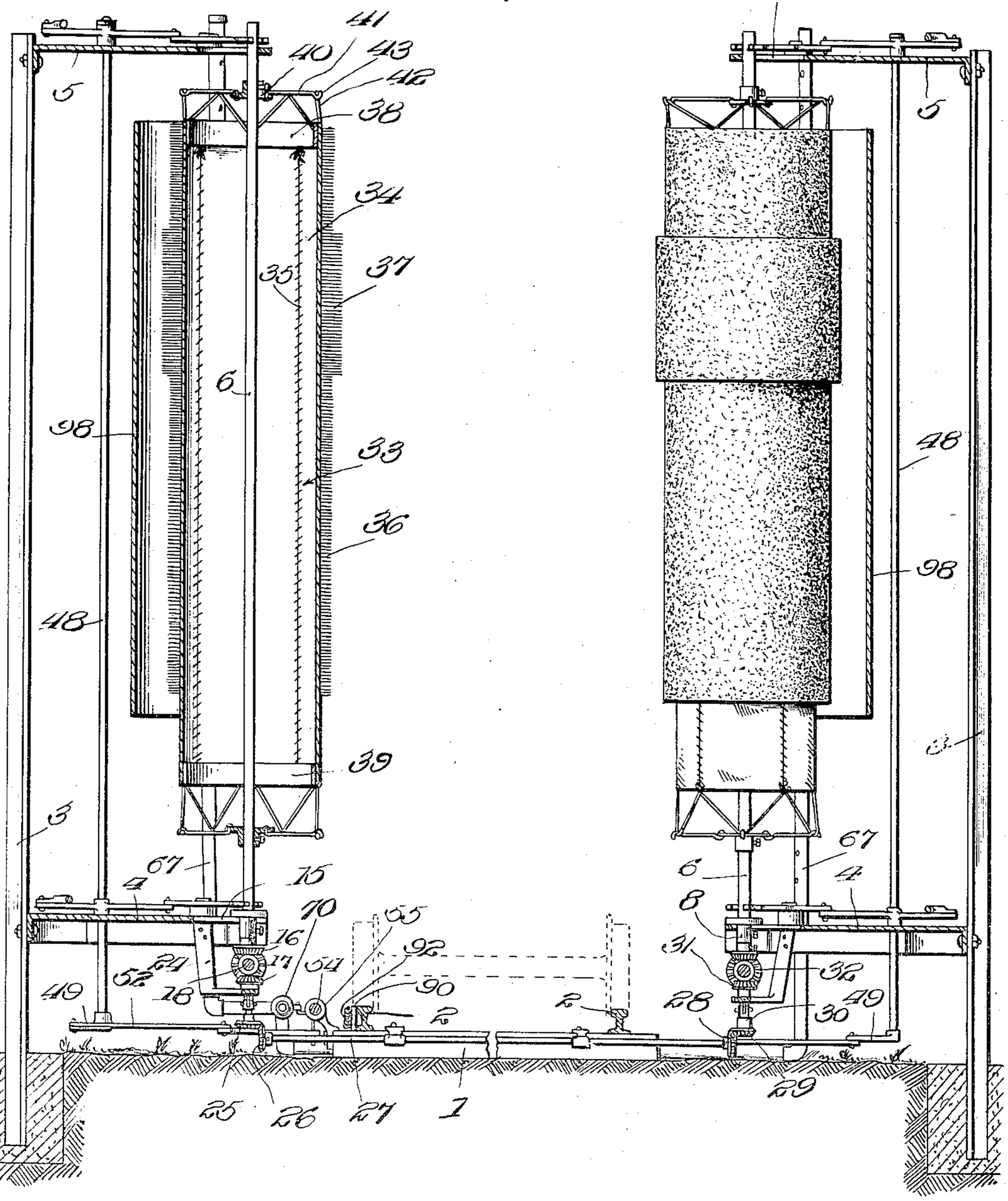
4 SHEETS—SHEET 3.

FIG. 3.



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4 SHEETS—SHEET 4.

Fig. 4.

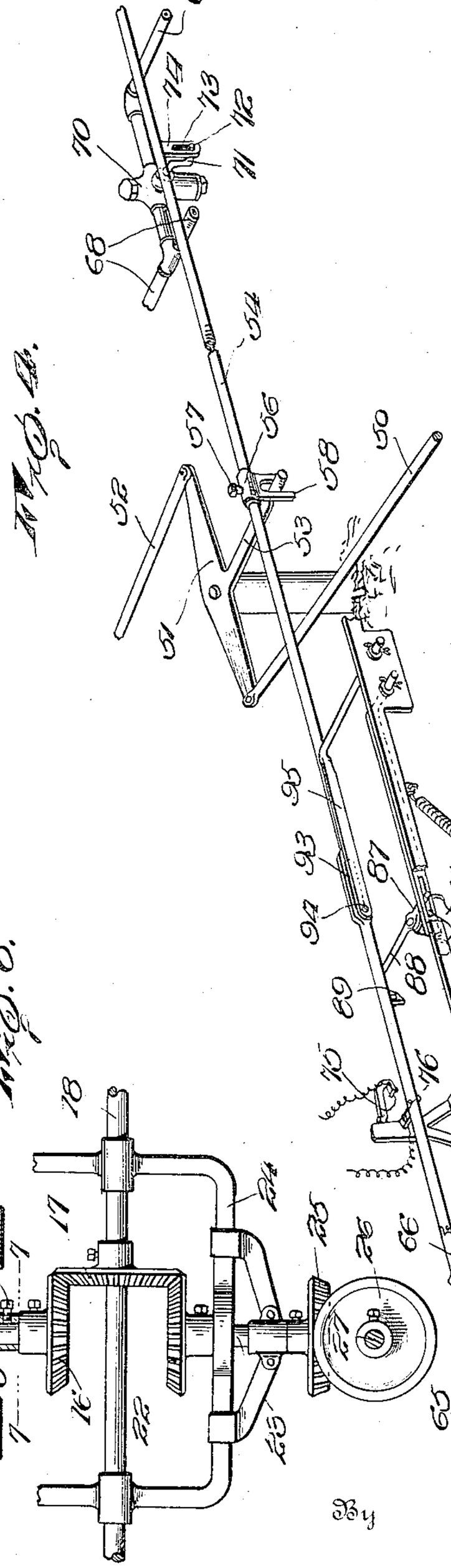

Fig. 5.

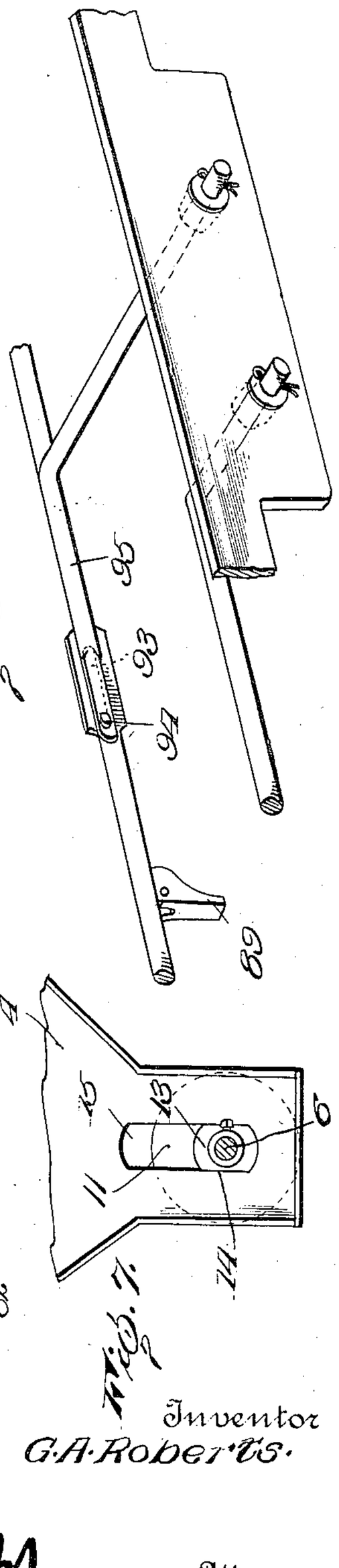

Fig. 6.

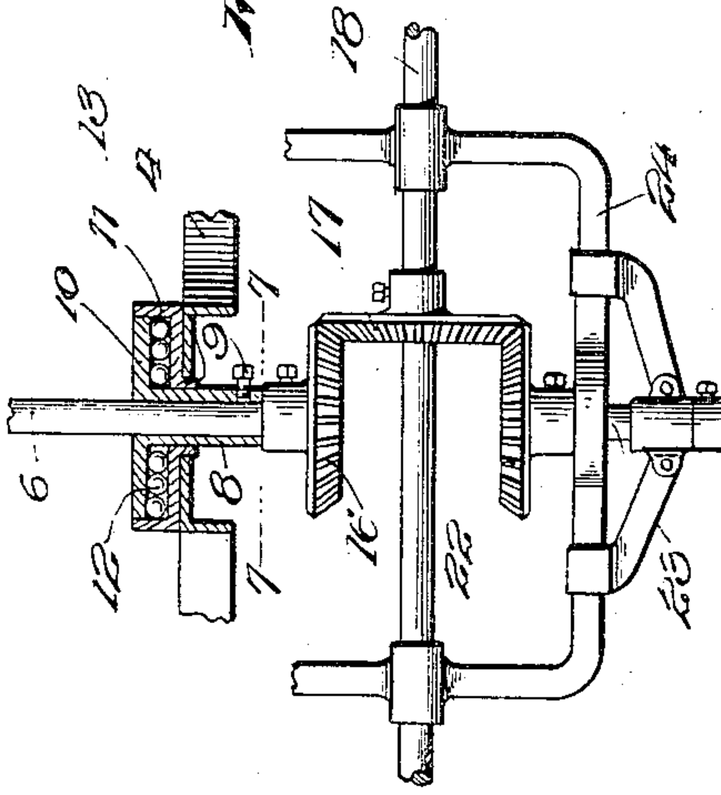

Fig. 7.

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UNITED STATES PATENT OFFICE.

GEORGE A. ROBERTS, OF CHICAGO, ILLINOIS.

RAILWAY-CAR-WASHING APPARATUS.

1,298,096. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed October 23, 1917. Serial No. 198,161.

To all whom it may concern:

Be it known that I, GEORGE A. ROBERTS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Railway-Car-Washing Apparatus, of which the following is a specification.

This invention relates to apparatus for washing, scrubbing, and drying the exteriors of railway passenger, mail, and baggage coaches, and it is one aim of the invention to provide apparatus for the purpose stated which will be entirely automatic in its operation, it being necessary only to move the coaches to be washed past the apparatus in one direction for the purpose of having the apparatus operate to wash and scrub the exteriors thereof, and to move the coaches past the apparatus in the opposite direction in order to have the apparatus dry the exteriors of the coaches.

Another aim of the invention is to provide apparatus for the purpose stated so constructed that it will operate in a highly efficient manner to quickly wash and dry as many coaches as it may be desired to couple in a train, the services of the engine crew alone being required as the apparatus is automatic in its operation and is controlled by the passage of the car wheels past a track located abutment or trip device.

Another aim of the invention is to provide in an apparatus of this class, rotary brushes supported at the opposite sides of a track along which track the coaches to be washed are moved, and in conjunction with the brushes, means for spraying water on to the brushes and also if desired on to the sides of the coaches, the brushes being, when in operation, so positioned as to thoroughly scrub the sides of the coaches and also the windows thereof.

Another aim of the invention is to provide in apparatus of this class, a novel form of rotary brush so constructed as to present a yielding brushing surface to the sides of the coaches during the washing and scrubbing operation so that the brushes may accommodate themselves to inequalities in the surfaces being washed, such, for example, as window frames, moldings, etc., and also in order that the sides of the coaches may be thoroughly scrubbed even though the coaches are slightly canted or tilted toward one side or the other which is not infrequently the case.

Another aim of the invention is to so construct the brushes that they will be adapted to scrub the windows of coaches without, however, having their portions which are to scrub the sides of the coaches, bear with any undue force thereagainst.

Another aim of the invention is to provide means for automatically moving the brushes into position against the sides of the coaches to be washed when the brushes are set in operation and for automatically moving the brushes out of such engagement, or in other words, away from the sides of the coaches when the apparatus is operated to discontinue the rotary motion of the brushes.

Another aim of the invention is to provide in connection with the automatic brush controlling means above referred to, water pipes designed to spray on to the brushes and if desired on to the sides of the coaches, and a valve for controlling the supply of water to the pipes which valve is automatically opened and closed when the brushes are respectively moved into and out of position to scrub the sides of the coaches.

The invention aims further to provide, as a means for drying the coaches, air pipes located at the opposite sides of the track and arranged to discharge blasts of air against the sides of the coaches so as to cause quick evaporation of the water supplied to the said sides of the coaches during the washing operation.

In conjunction with the air pipes above referred to, the invention aims to provide means for automatically moving these pipes into close proximity to the sides of the coaches simultaneously with the movement of the brushes away from the said sides of the coaches and with the cutting off of the water and also to simultaneously open the valve which controls the supply of air to the pipes.

A further aim of the invention is to provide means for automatically cutting off the supply of air to the drying pipes immediately after the last coach has been moved past the pipes so that manual closing of the supply controlling valve for the air will be rendered unnecessary and the apparatus as a whole is so constructed that after the last coach has left the apparatus all parts of the apparatus will be in the same positions

which they initially assume, the power for the brushes being cut off, the water supply controlling valve being closed and the air supply controlling valve being closed.

The invention also has as its object to provide, generally, an apparatus for the purpose stated which may be readily installed beside a length of ordinary track and which may be operated and maintained with but little expense.

In the accompanying drawings:

Figure 1 is a perspective view of the apparatus embodying the present invention;

Fig. 2 is a horizontal sectional view taken in a plane immediately below the lower ends of the brushes;

Fig. 3 is a view, partly in elevation, and partly in section substantially in the plane of the supporting posts, one of the brushes being shown in elevation and another brush being shown in vertical section;

Fig. 4 is a perspective view illustrating a portion of the operating mechanism of the apparatus;

Fig. 5 is a similar view in detail of a portion of the structure shown in Fig. 4;

Fig. 6 is a detail vertical sectional view through the lower bearing for one of the brush shafts;

Fig. 7 is a horizontal sectional view on the line 7—7 of Fig. 6, looking in an upward direction.

Fig. 8 is a detail elevation of the means for closing the air valve, the track rail being shown in section.

The apparatus embodying the present invention is arranged beside a railway track consisting of the usual ties 1 and rails 2 and along which track the coaches to be cleaned are to be moved with relation to the said apparatus. The apparatus consists, generally speaking, of two sets of rotary brushes which are located at opposite sides of the track, a water spray pipe located between the brushes and arranged to supply water thereto, one of the said pipes being located at each side of the track, and air blast pipes being located also one at each side of the track and designed to direct blasts of air against the sides of the coach or coaches after the washing operation. In order to support the brushes and the water and air pipes there are provided frame structures one located at each side of the track and in the drawings each of these structures comprises an upright or post 3 supporting a base or lower plate 4 and an upper plate 5. The plates 4 and 5 may be of any suitable shape and reinforced in any suitable manner and instead of the plates, frames may be employed if desired. The plates are supported upon the posts 3 relatively close to the respective sides of the track and yet in such manner as not to be likely to be engaged by any part of a moving coach. Each brush is mounted upon a shaft 6 which at its upper end is rotatably and slidably fitted through a slot 7 formed in the top plate 5, there being two brushes arranged at each side of the track and the brushes of each set being suitably spaced. The lower end of each shaft 6 has fixed upon it a sleeve 8 held in place by means of a set screw 9 and at its upper end the sleeve is provided with a head 10 which seats within a ball-race 11 disposed slidably upon the upper face of the respective plate 4, bearing balls 12 being arranged between the head 10 and the bottom of the ball-race. The ball-race 10 is provided with a relatively shallow neck 13 flattened upon its opposite sides, as at 14, so as to fit slidably and yet not rotatably in slots 15 formed in the bottom plate 4 immediately below the slots 7 in the respective top plate 5. The sleeve 8, of course, rotatably fits through an opening in the bottom of the ball-race 11 surrounded by the neck 13 and thus sliding adjustment of the shaft in the slots 7 and 15 will not in any way interfere with rotation of the said shaft. At its lower end each shaft carries a bevel pinion 16 designed to mesh with a similar pinion 17 fixed upon a shaft 18. The shaft 18 is provided at some convenient point in its length with a gear 19 with which meshes a pinion 20 upon the shaft 21 of an electric or other suitable motor, as indicated in general by the numeral 22′. This motor is located at one side of the track and it will be understood that the brush shafts at the other side of the track are driven from a shaft corresponding to the shaft 18 and indicated by the same numeral. In order that power may be transmitted from that one of the shafts which is driven directly from the motor, to the other one of the said shafts, the pinion 17 meshes with a pinion 22 fixed upon the upper end of a stub shaft 23 mounted in a suitable bearing bracket 24 supported from the under side of that one of the bottom plates 4 located at that side of the track at which the motor is located. Upon the lower end of the shaft 23, there is fixed a pinion 25 which meshes with a pinion 26 upon one end of a transverse shaft 27 which extends beneath the track rails and which at its other end is provided with a pinion 28 which meshes with a pinion 29 upon a stub shaft 30 corresponding to the shaft 23. A pinion 31 upon this shaft 30 meshes with a pinion 32 which corresponds to the pinion 17 and which, in turn, meshes with the pinion 16 at the lower end of the respective one of the shafts 6. The brushes themselves are of a peculiar construction which will now be described. Each brush includes a cylindrical body 33 which may be made up of a number of strips or sections 34 of leather or other suitable flexible ma-

terial in which bristles may be fixed, the vertical edges of these strips being united by lacing or otherwise, as indicated by the numeral 35, so that if any one particular section becomes worn or for other reasons requires changing it may be removed and a new section substituted therefor. Each section 34 of the body 33 carries upon its outer face a number of bristles 36 of the required stiffness and for a short distance below the upper end of the brush body these bristles are relatively short and of uniform length and they are then increased in length for a suitable distance, as indicated at 37, so as to permit this portion of the brush to come into scrubbing contact with the car windows, and then below the long bristles 37 the bristles are again formed relatively short in length. Thus the brush as a whole is of slightly greater diameter throughout that portion of the length which will be located opposite the windows of the car as the cars are moved past the apparatus and it will be apparent that the shorter bristles at the upper and lower portions of the brush may be brought into scrubbing engagement with the exterior surface of the car walls above and below the windows and that the bristles 37 will at such time be in scrubbing engagement with the window panes. In order to maintain the cylindrical form of the body, it is preferable that annular bands 38 and 39 be arranged within the upper and lower ends of the body 33 and while these bands are sufficiently rigid to hold the body to its shape it is preferable that they be resilient to such degree as to in no way interfere with the yieldability of the sections 34 comprising the body of the brush so that the brushes may conform or adapt themselves to the window frames and other uneven portions of the surface of the coach sides as the coach or coaches are moved past the brushes. In order to mount the brushes upon their respective shafts, there are fixed upon each shaft near the upper and lower ends thereof, but respectively below and above the top and bottom plates 5 and 4 of the supporting frame structure, collars 40 from each of which radiate a number of spider arms 41 which are more or less resilient and which may be of any desired number. Flexible elements 42 are passed diagonally back and forth between the arms and the respective bands 38 and 39, as the case may be, being connected to the said bands and engaged with hooks 43 formed at the terminals of the spider arms. When the elements 42 are tightened or drawn taut the flexible strips or sections 34 comprising the body 33 will, of course, be stretched longitudinally and yet they may yield to the desired degree both because of their inherent flexibility and the resiliency of the spider arms 41.

As before stated, it is contemplated that the brushes shall be moved into scrubbing engagement with the exterior of the coaches to be washed during the washing or scrubbing operation and when not in operation the brushes are to be moved out of such engagement. In order that this may be accomplished there is pivotally mounted upon the upper surface of each plate 4 and 5 in proximity to the shaft of each brush an angle lever 44, one arm of which has a forked end 45 straddling the adjacent brush shaft 6. Pivotally connected to the other arm of each angle lever is a rod 46 and the rods of each set of angle levers are pivotally connected at their other ends to one arm of an angle lever 47. The angle levers 47 are mounted above the plates 4 and 5 upon a shaft 48 which is mounted for rocking movement in suitable bearing openings in the said plates, it being understood that one of such shafts is located at each side of the track-way. Secured to the lower end of each shaft 48 is a crank arm 49 and connected to the arm 49 upon one shaft is a rod 50 which is pivotally connected with one end of a rock arm 51 mounted at one side of the track. A rod 52 is connected to the crank arm of the other shaft 48 and to the other end of the said arm 51 and extending from the intermediate portion of the arm 51 radially with relation to the pivot for the arm is a finger 53 designed to be engaged by spaced abutments upon a shifting rod, as will be presently explained. It will be understood at this point that when the arm 51 is rocked to one position the several sets of crank arms 44 will be rocked so as to move the respective brush shafts in a direction away from the track-way and that when the arm 51 is rocked to the other position the brush shafts will be moved toward the said track-way.

The shifting rod above mentioned is indicated by the numeral 54 and is slidably mounted in suitable bearings 55 arranged beside one of the track rails 2. A sleeve 56 is secured by means of a set screw, or the like, 57 upon the said rod 54 and is provided with spaced abutment fingers 58 which depend therefrom and which straddle the finger 53 so that when the rod is shifted back and forth the arm 51 will be rocked in order to shift the brushes as above explained. The numeral 59 indicates a shaft which is mounted in suitable bearings 60 and which extends transversely beneath the track-rails and this shaft has fixed upon it adjacent the inner side of each rail, a trip arm 61, the arms being so positioned as to be engaged by the wheels of coaches passing along the track. One or both of the arms is provided with a weight 62 which serves to normally hold the shaft in position with the trip arms extending vertically above the

shaft, as shown in Fig. 4 of the drawings. Fixed upon one end of the shaft 59 is an upstanding crank arm 63 carrying a pin 64 fitting a slot 65 formed in a pivoted section 66 of the rod 54. The operation of this portion of the mechanism will presently be more fully explained.

As before stated, means is provided for spraying the brushes and if desired the sides of the coaches to be washed with water, and this means includes perforated water pipes 67 which are arranged vertically between the brushes 33 and which are supplied with water through branch pipes 68 connected with their lower ends and leading from a main supply pipe 69. Any suitable type of cut-off valve 70 is located in the pipe 69 and has a rocking stem 71, the laterally turned end 72 of which works in a slot 73 formed in a depending arm 74 carried by the rod 54. It will be understood that when the rod 54 is shifted in one direction the valve stem 71 will be rocked so as to open the valve and admit water to the spray pipes 67 and that when the rod 54 is shifted in the opposite direction the valve will be closed, thereby cutting off the supply of water to the said spray pipes. At this point it may be stated that the abutment 58 and valve 70 and its stem 71 are so relatively arranged that when the abutment fingers rock the arm 51 to move the brushes toward the track and into working position, the valve stem 71 will be rocked so as to open the valve and admit water to the supply pipes. On the other hand, when the rod 54 is shifted in the opposite direction so as to rock the arm 51 and move the brushes out of position to have scrubbing contact with the sides of the coach or coaches being washed, the valve stem 71 will be rocked so as to close the valve.

The numeral 75 indicates an electric contact which is arranged at one side of the track, and the numeral 76 indicates another contact which is carried by the rod 54, these contacts being located in circuit with the motor 22'. The contacts are so arranged that when the rod 54 is shifted to move the brushes into working position and to open the water valve 70, the circuit will be closed through the motor, thereby setting the brushes in motion. On the other hand, when the rod 54 is shifted so as to cut off the water supply and move the brushes out of operative position, the contacts will be separated and the motor circuit will be opened.

In order that the sides of the coaches may be dried after the scrubbing operation, the apparatus embodies air spray pipes 77 which are mounted at their ends in slots 78 formed in the plates 4 and 5. One of these pipes is mounted at each side of the track and the pipes are located relatively close to the shaft 59. Rotatably mounted upon each of the pipes 77 near the upper and lower ends thereof are rubber-tired wheels 79 which are designed to engage the sides of the coaches as the coaches are moved along the track and which serve to suitably space the pipes 77 from the said sides of the coaches, each pipe being formed with perforations 80 through which air under pressure issues in jets and is directed against the surfaces of the coaches for the purpose of drying the same. Mounted upon the plates 4 and 5 adjacent the pipes 77 are angle levers 81 corresponding to the angle levers 44 heretofore described. Pivotally connected to each angle lever 81 is a rod 82 and these rods are pivotally connected at their other ends to the corresponding angle levers 47. The arrangement of the angle levers 81 is such that when the angle levers 47 are rocked to move the brushes out of operative position, the levers 81 will be rocked in a manner to move the air pipes 77 toward the track and, consequently, into position with their wheels 79 contacting the opposite sides of the coaches to be dried. Air is supplied to the pipes 77 through flexible hose 83 which connect to an air supply main 84 leading from an air tank 85 in which the air under pressure is stored. Interposed in the pipe 84 is a cut-off valve 86 from the stem of which extend arms 87 and 88. The arm 88 is located in the path of movement of a pivoted abutment 89 mounted upon the under side of the rod 54, the abutment being designed to swing in one direction and being held against swinging movement in the opposite direction. Thus when the rod 54 is moved toward the right in Fig. 4 of the drawings, the abutment 89 will ride over the end of the arm 88 without affecting the valve, but when the rod 54 is moved in the opposite direction and subsequent to movement of the abutment past the arm 88, the abutment will engage the said arm and the valve stem will be turned to open the valve and admit air to the pipes 77. The arm 88 is of such length that when the rod 54 is moved in the direction last mentioned or, in other words, toward the left in Fig. 4, to open the valve 86, the abutment 89 will sweep past the end of the arm 88 when the arm has been turned to position to completely open the valve. The means provided for closing the air valve after the sides of the coaches have been dried, will now be described. Supported for oscillatory or shifting movement beside that one of the rails 2 adjacent which the rod 54 is located, is a rail 90, the said rail being supported by means of suitable swinging links 91. At their lower ends the links 91 are pivoted as at 91^a to one member of a rail base engaging clamp, which member is indicated by the numeral 91^b and is provided with spaced upper and lower lips 91^c designed to respectively engage above and beneath one side of

the base flange of the rail. The other member of the clamp comprises a shank 91[d] having at one end a hook 91[e] which engages the other side of the rail base, and the end of the said shank remote from the hook is threaded and is fitted through the clamp member 91[b], a nut 91[f] being threaded upon the last mentioned end of the said shank whereby to cause the clamp members to firmly bind the base of the rail. A spring 92 is connected to the rail 90 and to any suitable fixed element such, for example, as one of the ties 1, and this spring tends to hold the rail 90 in the position shown in Figs. 2 and 4 of the drawings. At an intermediate point in its length the rod 54 is broadened and is formed in its broadened portion with a slot 93 in which works a pin 94 carried at one end by a connecting bar 95. The other end of this bar is connected with the rail 90 and in the normal position of the parts, as shown in Fig. 4 of the drawings, the pin 94 engages in that end of the slot 93 which is nearer the trip arm 61 so that when this arm is swung toward the right in Fig. 4 and the rod 54 is shifted in the corresponding direction, the bar 95 will likewise be shifted and the rail 90 will be moved to the right upon the links 91 and against the tension of the spring 92 in which position it will be held by the wheels of the coaches so long as there is a portion of any coach in position to be acted upon by the apparatus. An arm 96 is pivoted to the rail 90 and this arm is formed at its free end with a slot 97 receiving the arm 87 of the stem for the valve 86. In the normal positions of the parts the end of the arm 87 seats in the right hand end of the slot 97 in Fig. 4 and likewise the pin 64 seats in the right hand end of the slot 65 in the said figure. At this point it may be stated that that end of the rail 90 which is nearer the shaft 59 is so positioned that when a car wheel strikes the trip arm 61 and swings the same downwardly toward the right in Fig. 4, and the rail 90 is shifted so that its supporting links 91 will be inclined in the opposite direction to that shown in the said figure, the said end of the rail 90 will be so located that the first wheel of the first coach advancing over the track will ride on to the rail 90 and prevent the spring 92 returning the rail to its normal position and as the rail is of a length greater than the distance between the wheels of the trucks of any standard coach, the rail will be maintained in its shifted position while any coach is upon the track in position to be acted upon by the apparatus.

The operation of the apparatus is as follows: The train of coaches to be cleaned is caused to approach the apparatus from that end at which the air blast pipes are located. As the wheels of the first coach of the train strike the trip arms 61, these arms will be swung downwardly toward the right in Fig. 4 of the drawings, or, in other words, in a forward direction. This movement of the trip arms is imparted to the shaft 59 and, consequently, to the crank arm 63 and the rod 54 is shifted forwardly causing rocking of the arm 51 in a direction to move the brushes 33 toward the sides of the advancing coach. At the same time the contacts 75 and 76 will be brought into mutual engagement and the current being closed through the motor, rotary motion will be imparted to the brushes. Also at this time the valve stem 71 will be rocked so as to move the valve 70 to open position, thereby establishing a flow of water to the spray pipes 67 so that jets of water will be directed on to the brushes and also if desired on to the sides of the coach. The forward movement of the rod 54 will also result in the connecting bar 95 being carried forwardly with the said rod, thereby shifting the rail 90 upon its links 91 and against the tension of the spring 92 to a position the reverse of that shown in Fig. 4. Then as the car wheels pass on to this rail 90, the rail will be held by the wheels against return to its normal position through the influence of the spring 92. This forward shifting of the rail 90 does not in any way affect the air valve 86, however, due to the provision of the slot 97 in the arm 96 into which slot the arm 87 upon the valve stem projects. When the rail 90 has been shifted to the position stated the arm 87 of the valve 86 will seat within the rear end of the slot 97. As the wheels pass over the trip arms 61 the weights 62 will return these trip arms to vertical or normal position and at the same time the pin 64 will move in the slot 65 until it seats in the rear end of the said slot. As the rod 54 is shifted forwardly the abutment 89 will ride over the arm 88 upon the stem of the valve 86 and the said abutment will drop to active position behind the said arm. The movement of the train of coaches in the direction above stated is continued until all of the coaches have been subjected to the scrubbing action of the rotary brushes. After the last coach has been washed the train of coaches is drawn in the opposite direction and as the first wheels engage the trip arms 61 these arms will be swung rearwardly. As the pin 64 is at such time engaged in the rear end of the slot 65, the rod 54 will be shifted rearwardly and as a result the arm 51 will be rocked so as to move the brushes away from the sides of the coaches, the contacts 75 and 76 will be separated so as to open the motor circuit and thereby stop the rotation of the brushes, and the water valve 70 will be closed. Also upon such movement of the rod 54 the abutment 89 will engage and swing the arm 88 so as to open the air valve 86, the abutment sweeping past the end of the

arm as previously described. The rail 90, of course, remains stationary under these conditions and as the air valve 86 has been opened by the movement of the abutment 89 against the arm 88 of the said valve, a blast of air will be directed against each side of each coach as it passes the air blast pipes 77 and the sides of the coaches will in this manner be dried. Simultaneously with the turning on of the air valve the air pipes 77 will be moved toward the respective sides of the coaches and until the wheels 79 contact the said side walls of the coach. As the last coach of the train leaves the rail 90 the spring 92 will shift this rail rearwardly to its normal position shown in Fig. 4 of the drawings and the arm 96 will coact with the arm 87 upon the stem of the valve 86, thereby moving this valve to closed position. At such time the parts will all reassume their normal positions and the apparatus is then in condition for a repetition of the operation above described.

It is preferable that the shields 98 be mounted at the outer sides of the brushes 36, as for example, by securing to the outer sides of the water pipes 67, so as to prevent water being thrown to all sides during the washing operation.

Having thus described the invention, what is claimed as new is:

1. In car-washing apparatus, the combination of a washing means, drying means, a shifting rod arranged to be actuated by a passing car, and means whereby when said rod is shifted in one direction the washing means will be rendered operative and the drying means inoperative and when the rod is shifted in the opposite direction the washing means will be rendered inoperative and the drying means operative.

2. In car-washing apparatus, the combination of a track over which the car to be washed may travel, washing mechanism mounted at the side of the track and movable toward and from the same, a drying mechanism also mounted at the side of the track and movable toward and from the same, connections between said mechanisms whereby they will simultaneously move in opposite directions relative to the track, a shifting rod, means whereby said rod may be actuated by the travel of the car, and means connected with said rod for rendering the washing and drying mechanisms operative or inoperative.

3. In car-washing apparatus, the combination of a track over which the car to be washed may travel, a washing mechanism adjacent the track, a normally inactive drying mechanism adjacent the track, a shifting rod adjacent the track, means whereby travel of the car over the track will actuate said rod in the direction of travel of the car, means whereby the washing mechanism will be rendered operative when the rod is moved in one direction and will be rendered inoperative when the rod is moved in the opposite direction, means whereby the drying mechanism will be rendered operative upon movement of the rod in the last-mentioned direction, means whereby the drying mechanism will be maintained operative during the travel of the car in said last-named direction, and means for rendering the drying mechanism inoperative when the car is moved past the same.

4. In car-washing apparatus, a brush, means for operating the brush, a water spray, a valve for controlling the water spray, an air blast, a normally closed valve controlling the air blast, a shifting rod arranged for actuation by the movement of a car past the apparatus, means carried by said rod to render active the brush operating means and to open the water valve upon movement of the rod in one direction and upon movement in the opposite direction to render the brush operating means inactive and to close the water valve, and means connected with the rod to open the air blast valve upon the last-mentioned movement.

5. In car-washing apparatus, a washing mechanism, an air blast, a valve for controlling the air blast, car-actuated means for rendering the washing mechanism active upon movement of the car in one direction past the apparatus and inactive upon movement in the opposite direction, means to open the air blast valve upon the last named movement, and means for closing the said valve when the car passes beyond the air blast.

6. In car-washing apparatus, the combination of a washing mechanism, an air blast, a shifting rod, means connected with said rod whereby the washing mechanism will be made active upon movement of the rod in one direction and inactive upon movement of the rod in the opposite direction, a valve for controlling the air blast, means for holding said valve normally closed, said valve having a stem disposed adjacent the shifting rod, an abutment carried by said rod arranged upon movement of the same in the direction to render active the washing mechanism to ride over the stem of the said valve and upon movement of the rod in the opposite direction to engage said stem and move beyond the same, means whereby upon the first-mentioned movement of the shifting rod the means for holding said valve closed will be rendered inoperative; and means for automatically restoring the last-mentioned means to normal position and closing the valve when a car is moved beyond the same.

7. In a car-washing apparatus, the combination of a washing mechanism, a shifting rod, operative connections between the

shifting rod and the washing mechanism whereby upon movement of the rod in one direction the washing mechanism will be rendered operative and upon movement in the opposite direction the washing mechanism will be rendered inoperative, means whereby said rod will be actuated by the travel of a car past the apparatus, an air blast, a valve controlling the air blast, arms extending in opposite directions from the valve, one of said arms being disposed adjacent the shifting rod, an abutment hung upon said rod and adapted to ride over said arm upon the initial movement of the rod and to engage and actuate said arm upon the opposite movement of the rod, a rail arranged to be actuated by the wheels of a car moving past the apparatus, a connection between said rail and the shifting rod, an arm connected to the said rail and engaging one arm extending from the valve, and means connected with the rail whereby, when the car wheels leave the rail, the rail and the arm connected thereto will return to normal position and will close the air valve.

8. In a car washing apparatus, the combination of a washing mechanism, an air blast, a shifting rod, means whereby said rod may be actuated by a car traveling past the apparatus, connections between the said rod and the washing mechanism whereby upon movement of the rod in one direction, the washing mechanism will be rendered active and upon movement of the rod in the opposite direction said mechanism will be rendered inactive, a valve controlling the air blast, arms secured to the stem of said valve and projecting in opposite directions therefrom, one of said arms being disposed adjacent the shifting rod, an abutment hung upon said rod to ride over said arm upon the initial movement of the rod and to engage against said arm and open the valve upon movement of the rod in the opposite direction, a rail arranged to be depressed by the wheels of a car moving past the apparatus, means for normally supporting said rail in an elevated position, an arm pivoted to the said rail and provided at its free end with a slot engaging the end of that arm on the valve stem which is more remote from the shifting rod, and a coupling arm secured to said rail and having a pin and slot connection with the shifting rod whereby upon the initial movement of the shifting rod the rail and the arm connected therewith will be moved to permit opening of the air blast valve and after the car has cleared the valve said rail will be returned to normal position and close the said valve.

9. In a car-washing apparatus, the combination of a supporting structure disposed at the side of a track and provided with slots arranged transversely to the track, a brush provided at its ends with members engaging certain of said slots, an air blast pipe mounted in other slots of the supporting structure, a shifting rod disposed adjacent the track, means whereby the said rod will be actuated by a car moving over the track, and operative connections between the said rod and the brush and the air blast pipe whereby upon movement of the rod in one direction, the brush will be moved toward the track and the air blast pipe moved from the track and upon movement of the rod in the opposite direction the air blast pipe will be moved toward the track and the brush moved from the track.

10. In a car-washing apparatus, the combination of a supporting structure, an air blast pipe mounted in said structure for movement laterally thereof, a brush mounted on the structure for lateral movement, angle levers mounted on the supporting structure adjacent the brush and the air blast pipe respectively, a rock shaft mounted in the supporting structure, an angle lever on said rock shaft, connections between the angle lever on said shaft and the angle lever arranged adjacent the brush, a connection between the angle lever on the shaft and the angle lever adjacent the air blast pipe whereby the brush and the air blast pipe will move simultaneously in opposite directions, a shifting rod, means whereby said rod will be actuated by a car moving past the apparatus, an oscillatory member arranged to be actuated by the shifting rod, and a connection between said member and the rock shaft.

In testimony whereof I affix my signature.

GEORGE A. ROBERTS. [L. S.]