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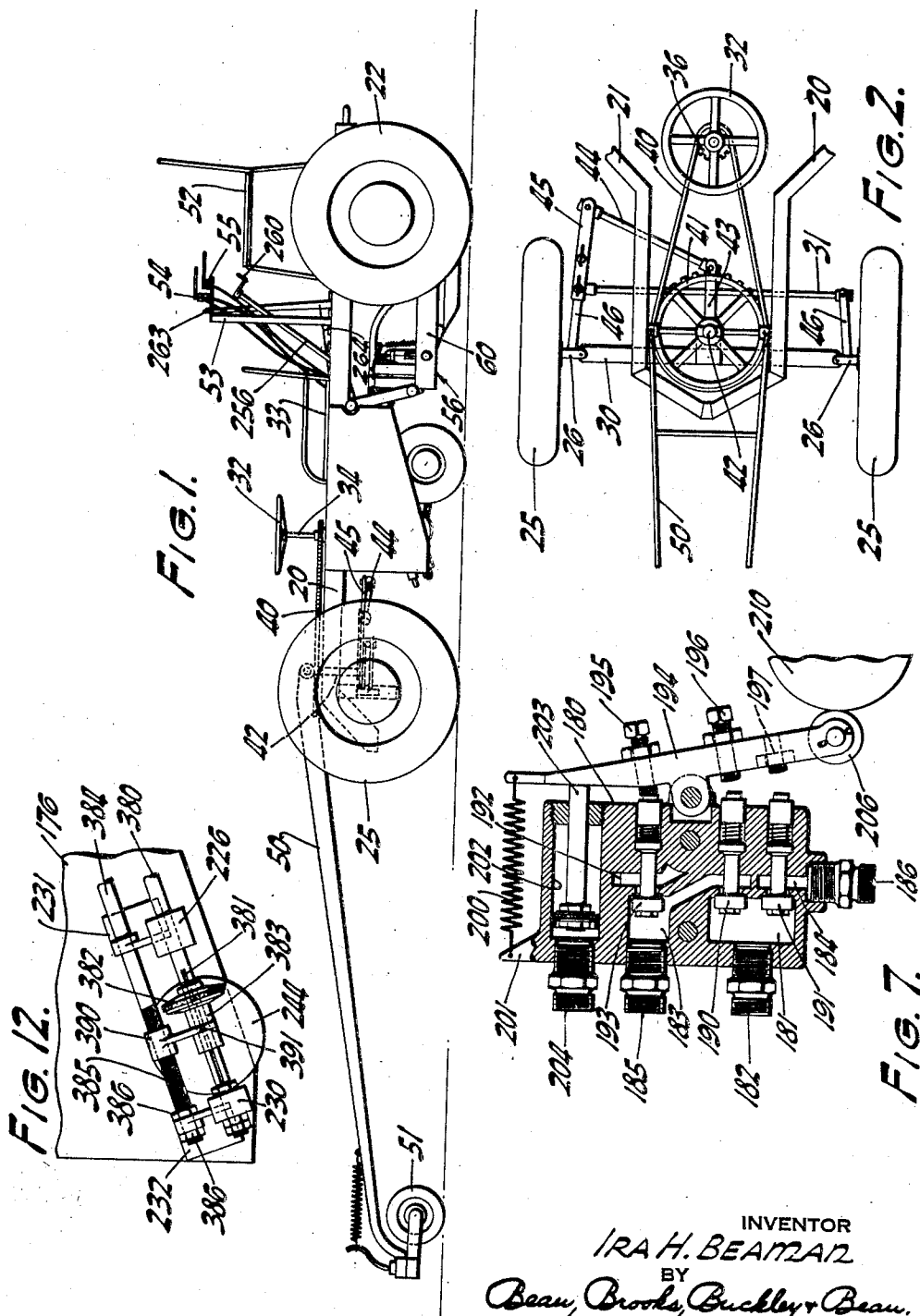
I. H. BEAMAN

2,301,848

PAINT STRIPING MACHINE

Filed April 16, 1940

5 Sheets-Sheet 1



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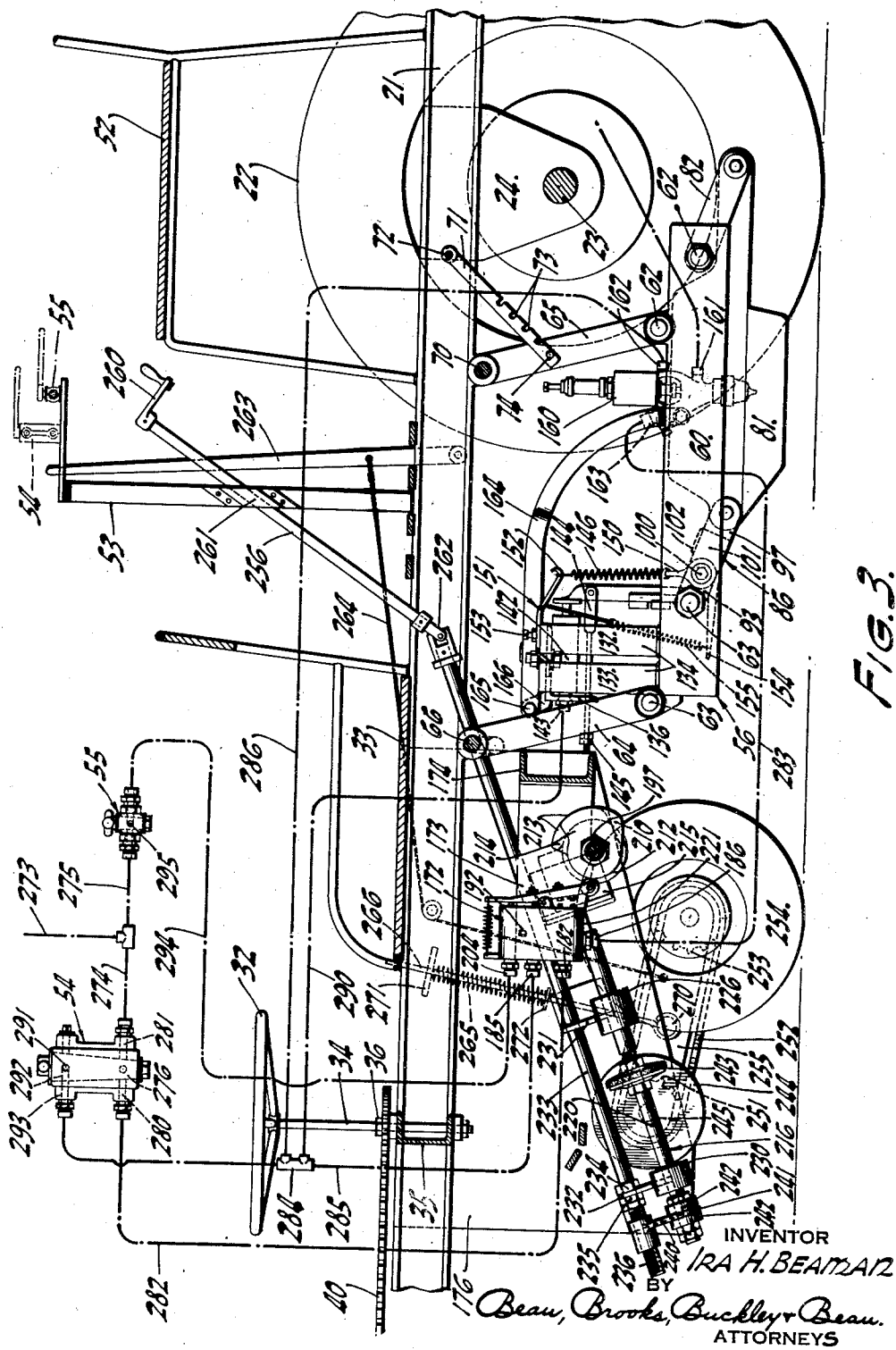
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5 Sheets-Sheet 3

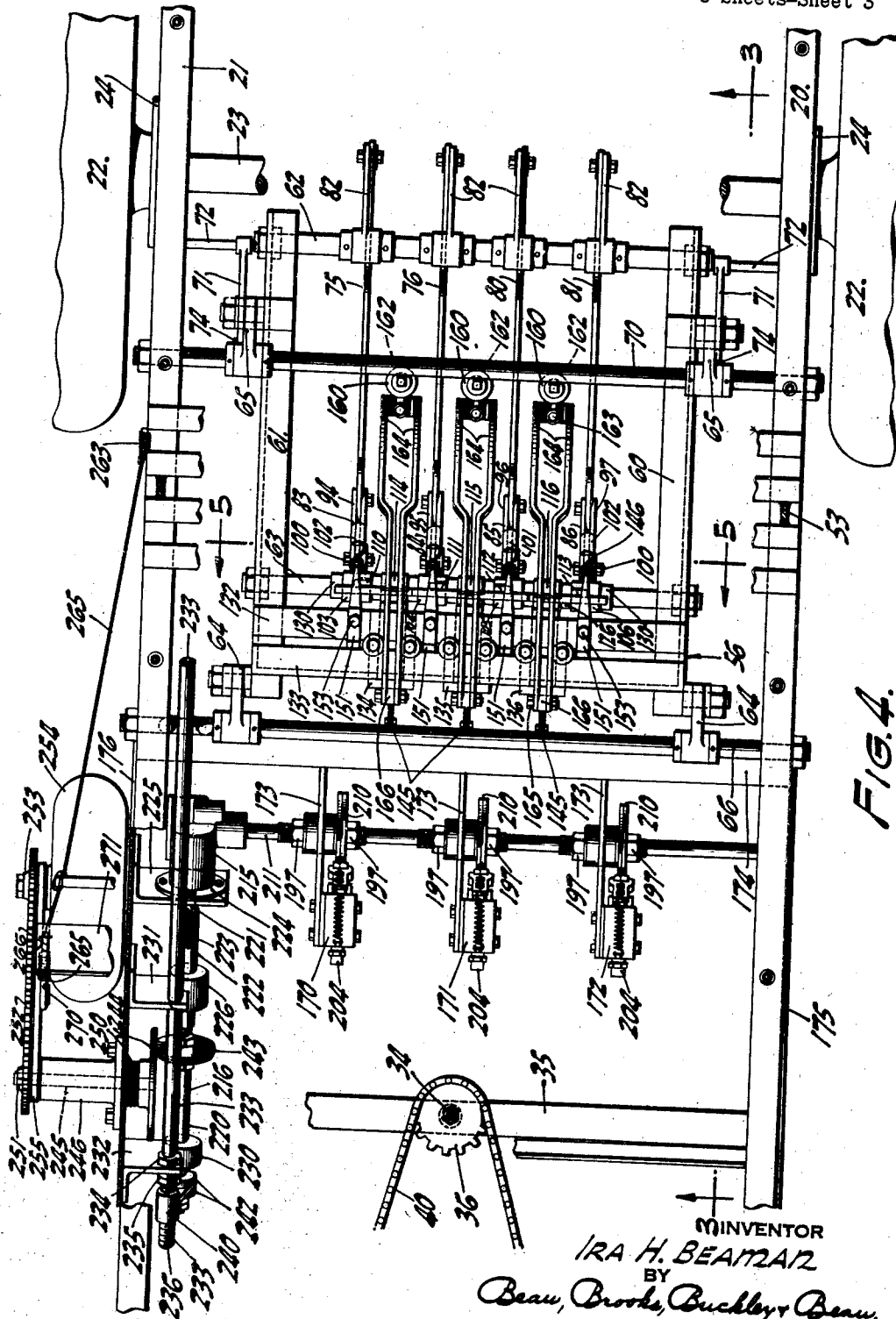


FIG. 4.

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5 Sheets-Sheet 4

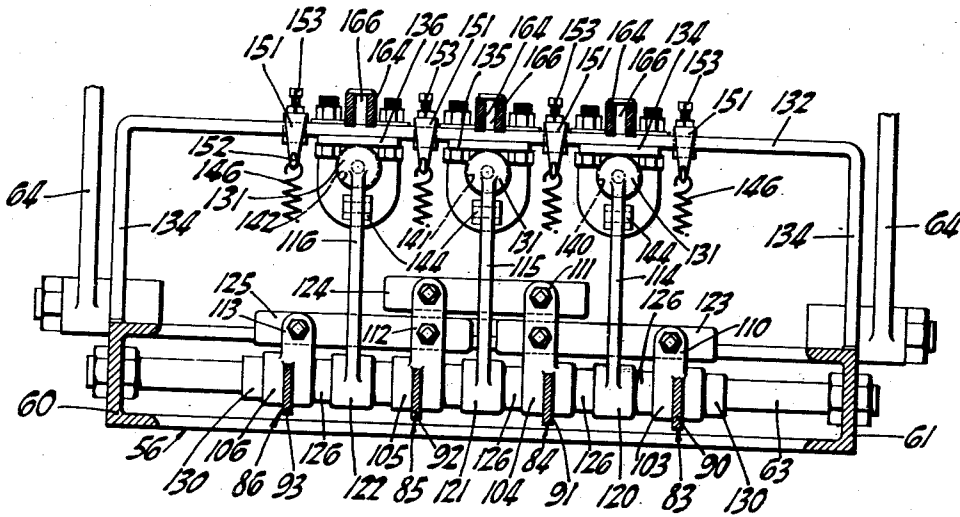


FIG. 5.

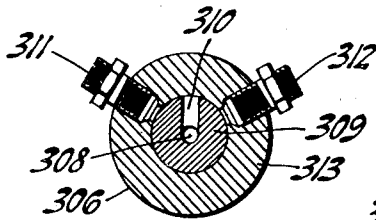


FIG. 9.

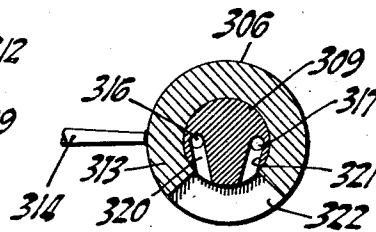


FIG. 10.

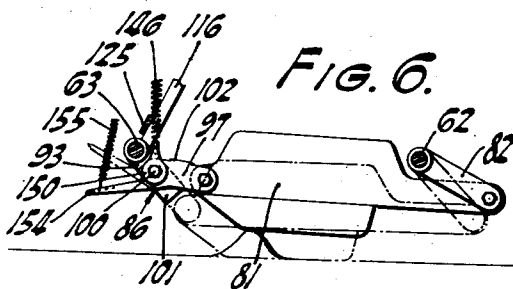


FIG. 6.

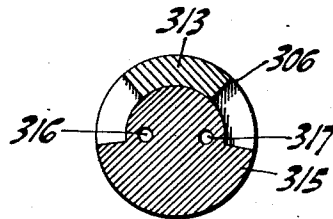


FIG. 11.

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5 Sheets-Sheet 5

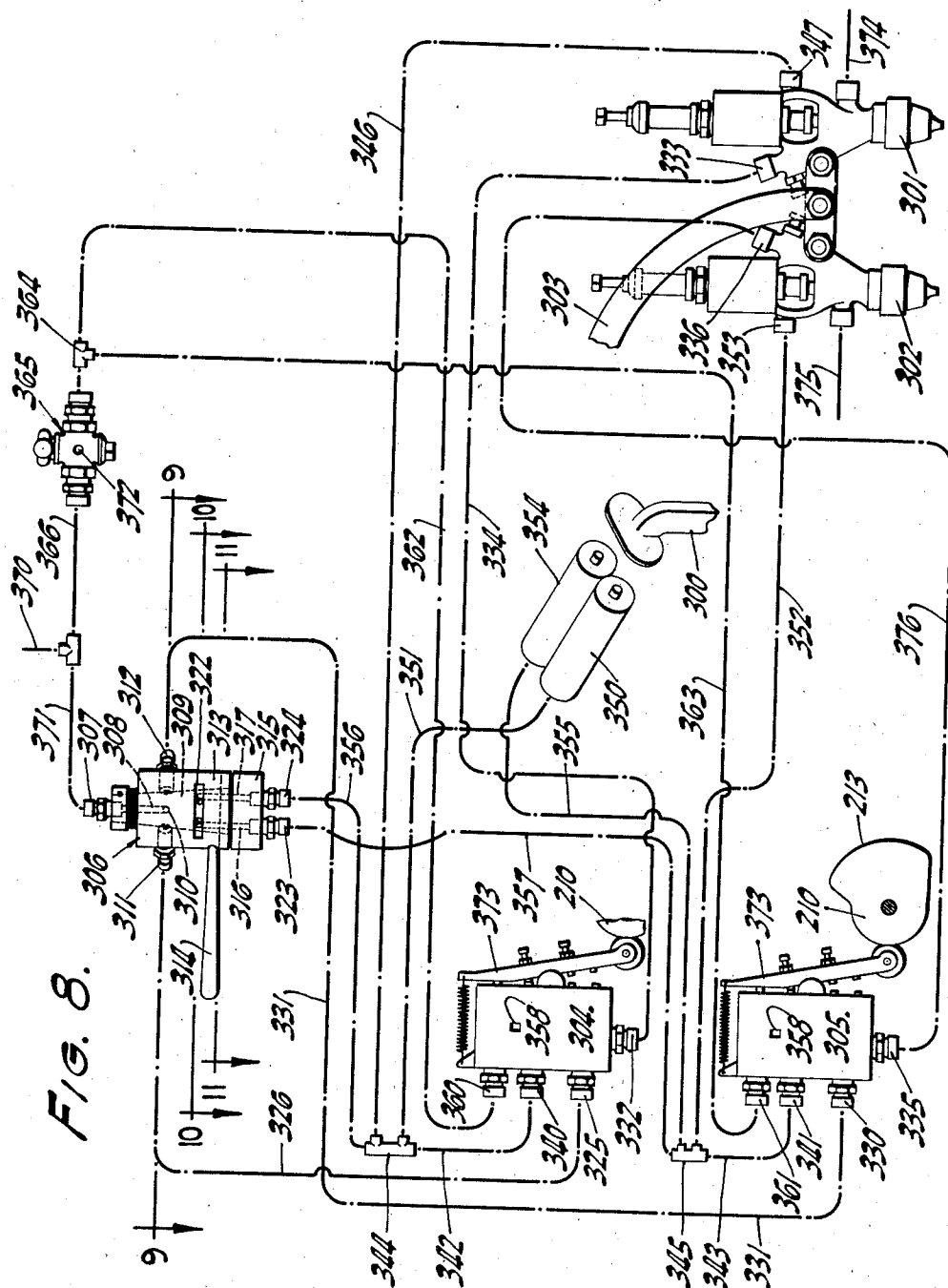


FIG. 8.

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UNITED STATES PATENT OFFICE

2,301,848

PAINT STRIPING MACHINE

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Application April 16, 1940, Serial No. 329,930

5 Claims. (Cl. 91—12)

My invention relates in general to paint striping machines used for marking the pavement of state and county highways, and in particular to that type of machine known as a pushmobile.

It is well known to those skilled in the art that traffic lanes and the safe path for traffic to follow is now quite universally indicated on the pavements of state and county highways. It is customary to divide the traffic lanes by marking the pavement either with a solid line or with a broken line of predetermined cycle. In some places in the highway it is desirable to paint a broken line on either side of a solid line, and under some circumstances it is desirable to paint two solid lines or two broken lines in parallel relation with one another. Furthermore, in some instances it is desirable to have a machine equipped for painting two or more different colors.

The principal object of my invention has been to provide a machine of this type having suitable paint nozzles disposed within paint defining channels, so arranged that any of the above mentioned line combinations may be made.

Another object has been to provide a device by which an intermittent or broken line of predetermined cycle may be automatically applied to the road.

Another object has been to provide a paint striping machine having manually controlled means for conveniently changing the cycle, whereby it may be made to accurately register with dimensional markings or previously painted lines.

Another object has been to provide a machine having movable walls for defining paint channels of predetermined width.

Another object has been to provide means for mounting the walls in such manner that only those walls which are being used are moved to operative positions.

Another object has been to provide means for rendering inoperative the automatic broken line cam action when it is desired to paint a solid line.

Moreover, in my device means are provided for individually mounting each wall so that it will be easily moved out of contact with the road when any foreign object is encountered.

Furthermore, my device is provided with means whereby it is very convenient to change from one of the colors of paint handled by the device to the other.

The above objects and advantages have been

accomplished by the device shown in the accompanying drawings, of which:

Fig. 1 is a side elevation of my complete device.

Fig. 2 is a fragmentary, plan view showing the steering mechanism thereof.

Fig. 3 is an enlarged, fragmentary, side elevation of the device.

Fig. 4 is a plan view with the upper portions of the device removed.

Fig. 5 is a sectional elevation taken on line 5—5 of Fig. 4.

Fig. 6 is a fragmentary view showing the action of one of the paint walls when an obstacle is met in the road.

Fig. 7 is an enlarged, sectional view of one of the distributing units used on my device.

Fig. 8 is a somewhat diagrammatic view showing an arrangement of parts for handling two different colored paints.

Fig. 9 is a transverse, sectional view of the air control valve used in the form of invention shown in Fig. 8 and is taken on line 9—9 of that figure.

Figs. 10 and 11 are similar sectional views taken, respectively, on line 10—10 and line 11—11 of Fig. 8.

Fig. 12 is a fragmentary, side elevation of a modified form of speed changing device.

My device, which is of the pushmobile type and designed, when in operation, to be pushed by a truck, comprises a chassis having side members 20 and 21, preferably in the form of channel-iron and extending substantially the full length of the machine.

Rear supporting wheels 22 are suitably mounted upon an axle 23 supported at the rear of the pushmobile preferably by means of bearing plates 24.

At the forward end of the chassis there are arranged two front supporting wheels 25. These supporting wheels are mounted upon steering knuckles 26 carried by an axle 30, each of the approved automotive type. The wheels are tied together by means of a connecting rod 31 in well-known manner. A steering wheel 32 is provided for my device and is within easy reach of an operator who may occupy the seat 33. The steering wheel is mounted upon a wheel shaft 34 which is rotatably supported by a cross member 35 extending across between the side members 20 and 21 of the chassis. The steering shaft 34 carries a sprocket 36 which is connected by means of a sprocket chain 40 to a steering sprocket 41. The steering sprocket is carried by a steering shaft 42 which is rotatably mounted in suitable bearings carried by the chassis and the axle. At

the lower end of the steering shaft there is provided a steering lever 43 which is connected by means of a drag link 44 to an adjustable steering arm 45 secured to the steering knuckle arm 46. Carried at the upper end of the steering shaft 42 is the steering boom 59 of my device which has a spring-actuated guide wheel 51 at its forward end for following a previously painted line or suitable markings indicating the place where the device is to paint a stripe. In the operation of the device, the steering is accomplished by maintaining the guide wheel 51 upon the guiding line or markings, as just above indicated. Since the steering action of the wheels 25 is magnified in the movement of the guide wheel 51, very accurate steering of the pushmobile may be accomplished. The adjustment between arms 45 and 46 is provided for altering the amount of magnification and relative movement between the front supporting wheels 25 and the guide wheel 51.

Arranged at the rear of the machine is a seat 52 for the accommodation of a second operator. In front of this seat there is provided a control standard 53 upon which is mounted the valve controls 54 and 55, to be hereinafter described.

The painting device 56 of my invention comprises a frame having side members 60 and 61 made preferably of channel-iron which are tied together by means of a rear link shaft 62 and a front link shaft 63. The painting device 56 is suspended from the chassis of the pushmobile by means of supporting links 64 and 65, two at each side of each end of the painting device and pivotally carried, respectively, by supporting shafts 66 and 70. The painting device is shown in its normal operating position in Figs. 1 and 3, but when the pushmobile is being transported from one place of use to another it is preferable that the painting device be raised up out of all possible contact with anything in the road. To accomplish this, I provide one or more latch arms 71, carried preferably by a latch shaft 72 extending across the chassis, and formed in its lower surface with a plurality of notches 73, either one of which being engageable with a latch pin 74 carried by one of the supporting arms 65.

The painting device of my pushmobile preferably comprises a plurality of walls 75, 76, 80 and 81 pivotally supported at their rear ends by means of rear wall links 82 and at their forward ends by means of front wall links 83, 84, 85 and 86, respectively. The rear links 82 are pivotally mounted upon the rear link shaft 62 and the front wall links 83, 84, 85 and 86 are mounted upon the front link shaft 63.

Each of the front links 83, 84, 85 and 86 comprises an actuating part 90, 91, 92 and 93, respectively, and a free part 94, 95, 96 and 97, respectively. The actuating part and the free part of each of the front links are pivotally connected together by means of the pivot bolt 100, and an arm 101 carried by each of the actuating parts contacts with a stop 102 carried by the free part of each of the links when the parts of the link are in alignment. The front wall links are each provided, respectively, with a hub 103, 104, 105 and 106, each of which carries, respectively, an upstanding arm 110, 111, 112 and 113. Mounted between each pair of front wall links 83 and 84, 84 and 85, and 85 and 86 is an actuating lever 114, 115 and 116, respectively, and each of these actuating levers is provided, respectively, with

a hub 120, 121 and 122. These hubs are pivotally mounted upon the front link shaft 63, and each of the respective levers 114, 115 and 116 carries a cross bar 123, 124 and 125, respectively. The cross bars 123 and 125 are arranged so as to engage the upstanding arms 110 and 111, and 112 and 113, respectively. The cross bar 124 is in such position as to engage only the upstanding arms 111 and 112. A spacer 126 is arranged between each adjacent hub on the front link shaft 63 and these spacers provide means for regulating the space between the walls and therefore the width of the paint channel and resulting paint stripe. The entire nested group of hubs is maintained in spaced positions by means of end collars 130. Each of the actuating levers 114, 115 and 116 is provided with a pad 131 at its upper end, to be hereinafter described.

Carried at the forward end of the painting device 56 are two interspaced ways 132 and 133 for the support of various parts of the device. These ways are preferably carried by the framework of the painting device and have their ends 134 extended down to the side pieces 60 and 61 of the framework where they are secured in place preferably by welding.

Supporting brackets 134, 135 and 136 are adjustably carried by ways 132 and 133 and arranged in front of the pads 131 of the actuating links 114, 115 and 116, respectively. Each of the actuating links is controlled respectively by a wall actuating cylinder 140, 141 and 142. Each of these actuating cylinders is suitably supported by the respective bracket and each is provided with an inlet connection 143 (see Fig. 3) whereby each cylinder may be supplied with air under pressure from a suitable source to be hereinafter described. Each of the actuating levers 114, 115 and 116 is provided with a suitable stop 144 which is connected at its forward end to the lever and has its rear end passed through the vertical leg of the supporting bracket where it is provided with a suitable stop nut 145 which contacts with such vertical leg to limit the forward movement of the actuating lever, whereby the lower edges of the walls may be accurately adjusted with respect to the surface of the road.

Means in the form of a helical spring 146 are provided for returning and holding the walls in their inactive positions. Each of these springs is attached at its lower end to a spring clip 150 attached to the front wall links preferably by means of the pivot bolt 100 and secured at its upper end to a spring arm 151. Each of these spring arms is carried by the ways 132 and 133, being disposed on top of the way 132 and having its rear end 152 bent downwardly so as to pass between the ways and be disposed under the way 133. An adjusting screw 153 is provided for each spring arm for adjusting the tension of the springs 146. The free parts 94, 95, 96 and 97 of the front wall links 83, 84, 85 and 86, respectively, are each provided with a centralizing arm 154 which extends forwardly of the pivotal connection 100. A centralizing spring 155 is attached to the outer end of each of these arms. This arrangement permits the walls to easily pass over any obstacle in the road, as shown in Fig. 6. By means of this centralizing arm and centralizing spring the arm 101 of the actuating part of the link is kept in contact with the stop 102, thereby keeping the parts in alignment.

Arranged between each pair of walls is a spray nozzle 160. Each of these spray nozzles is a standard article of manufacture and therefore is not described in detail except to state that each is provided with the usual paint connection 161, the air cylinder connection 162 and air supply connection 163. Each of the nozzles is pivotally mounted between two interspaced nozzle arms 164, the rear ends of which are pivotally secured to the brackets 134, 135 and 136 by means of a pivot bolt 165 which passes through a lug 166 carried by each of said brackets. By thus mounting the nozzles it is possible to conveniently elevate them for adjustment or inspection. The rear ends of the nozzle arms adjacent the pivotal points rest upon the ways 132 and 133 which act as stops for the downward movement of the nozzles.

In order that the paint walls and spray nozzles may be actuated to paint lines of the desired conformation upon the pavement of the road, I provide distributing units 170, 171 and 172, one for each pair of paint walls 75, 76; 76, 80; and 80, 81, respectively, and for each associated spray nozzle 160. Each of these distributing units is mounted preferably upon a supporting plate 173 which is carried by a cross member 174 extending from one side of the chassis of the other and supported preferably by means of plates 175 and 176. As shown in Fig. 7, each of the distributing units comprises a casing 180 formed in its lower end with a manifold chamber 181 which is supplied with air under pressure through the inlet connection 182 and from a suitable source of air supply which is controlled by means of the control valve 54, described later in detail. Opening into the manifold chamber 181 is an outlet chamber 183 and a nozzle outlet chamber 184 in communication with which are connections 185 and 186, respectively. The communication between the manifold chamber 181 and the chambers 183 and 184 is controlled, respectively, by means of a wall outlet valve 190 and a nozzle outlet valve 191. Each of these valves is slidably mounted in the casing and designed to be pressed inwardly to open positions against spring pressure by means to be hereinafter described. An exhaust passageway 192 is provided in the casing which is in communication with the atmosphere and this passageway serves to open the outlet chamber 183 through an exhaust valve 193. This valve is slidably mounted upon a suitable stem and is designed to be operated in timed relation with the two valves just above described by means of an operating arm 194. This operating arm is pivotally carried by the casing of the unit and is provided with set screws 195, 196 and 197 which engage, respectively, with the valves 193, 190 and 191. The operating arm 194 is held normally in the position shown in Fig. 7 by means of a spring 200, one end of which is attached to the upper end of the arm, the other end being secured to a bracket 201 carried by the casing. In the upper end of the casing there is formed a stripe control cylinder 202 which controls a piston rod 203. This piston rod when actuated bears against the upper end of the operating arm 194 for controlling the kind of line to be painted. A connection 204 is carried by the casing of the unit and serves to conduct air under pressure from the stripe control valve 55 to the cylinder 202 to cause the operation of the piston rod 203 thereof.

The lower end of the operating arm 194 is provided with a roller 206 which bears against an

operating cam 210. Such an operating cam is provided for each of the units and is adjustably mounted upon a cam shaft 211. Each of the cams preferably comprises two companion parts 214, each formed with a dwell surface 212 and with an actuating surface 213. The parts of the cam may be relatively rotated so as to alter the length of the effective actuating surface 213 to change the length of the painted line when a broken line is being applied to the road by the device. The cam parts after adjustment are locked in place by means of lock nuts 197 screw-threaded onto the cam shaft.

One end of the cam shaft 211 is suitably supported by the plate 175 and the other end thereof is supported in a worm gear casing 215. A worm wheel (not shown) is mounted within the casing 215 and is secured to the end of the shaft which extends within the casing. This worm wheel meshes with a worm (not shown) carried by a drive shaft 216. This worm and worm wheel construction is of standard arrangement and serves to connect the drive shaft 216 to the cam shaft 211 at the desired reduced speed. The drive shaft 216 is preferably made in two parts 220 and 221 connected together by means of a telescoped splined joint shown in Fig. 4, the part 220 being provided with a slot 222 and the part 221 with a pin 223 which slides in the slot, thus serving to tie the two parts together for unison rotation, but in such manner as to permit relative axial movement thereof. The worm gear casing 215 is provided preferably with a flange 224 which is mounted upon a supporting bracket 225. This supporting bracket is secured to the plate 176 and serves to maintain the part 221 of the drive shaft in proper alignment. The part 220 of the drive shaft is rotatably and slidably mounted in bearings 226 and 230. Each of these bearings is preferably secured, respectively, to a bracket 231 and 232, each of which is secured to the plate 176 in such position as to hold the part 220 of the shaft in alignment with the part 221. The brackets 232 and 231 extend upwardly above their respective bearings 230 and 226 and provide bearing support for an adjusting shaft 233. This adjusting shaft is held against axial movement preferably by means of a limiting nut 234 screw-threaded thereon and disposed on the upper side of the bracket 232, and limiting nuts 235 arranged on the shaft on the opposite side of the bracket 232. These nuts are so adjusted as to permit free rotation of the adjusting shaft but prevent axial movement thereof. The lower end 236 of the adjusting shaft is screwthreaded for a considerable distance and mounted upon this end is an adjusting bracket 240. The outer end 241 of this adjusting bracket is rotatably mounted between thrust washers 242 carried at the lower end of the part 220 of the drive shaft 216. The washers are held in place axially by suitable stop nuts and, therefore, the axial movement of the adjusting bracket along the adjusting shaft causes the part 220 of the drive shaft to be moved axially therewith. Rigidly mounted upon the part 220 of the drive shaft is a friction wheel 243 which has bearing contact with a friction disc 244. This friction disc is mounted upon a shaft 245 which has its axis at substantially right angles to the axis of the driving shaft 216 and which is rotatably mounted in a bearing 246 carried by the plate 176. A helical spring 250 is mounted upon the shaft between the plate and the disc and serves to press the disc outwardly in frictional contact with the friction wheel 243.

The shaft 245 has a sprocket 251 on its outer end which is connected by means of a chain 252 to a sprocket 253 carried by a cam actuating wheel 254. The cam actuating wheel is supported in suitable bearings carried by a wheel plate 255, the other end of such plate being rotatably mounted upon the shaft 245 or the bearing 246 thereof.

When the pushmobile is propelled by suitable means and the cam actuating wheel is drawn along the pavement, the friction disc 244 will be rotated through the medium of the sprockets 253 and 251 and the chain 252. Rotation of this disc will cause the friction wheel 243 to be rotated which, in turn, will cause the rotation of the driving shaft 215. This motion will be transmitted through the worm gearing in the casing 215 to the cam shaft 211, thereby causing the cams 210 to be rotated. If it is desired to change the relative rate of rotation of the cam actuating wheel and the cams, the adjusting shaft 233 is rotated which will cause the bracket 240 to move the friction wheel 243 either toward or away from the center of the friction disc 244 and thereby change the rate of rotation of the friction wheel and, therefore, of the cams. The adjusting shaft is provided with an extension 256 which extends upwardly to within easy reach of the operator occupying the seat 52 where it is provided with an operating handle 260. This shaft extension is preferably mounted in a bearing 261 carried by the standard 53, and is connected to the adjusting shaft 233 by means of a universal joint 262.

When it is desired to bring about a registration of the cam means with a previously painted line or with indicating marks upon the pavement, the cam actuating wheel may be elevated from the road and either rotated by hand until the cam has reached the proper position or the pushmobile may be moved forwardly until in proper place. This is brought about by means of a lift lever 263 carried by the chassis and within reach of the operator occupying the seat 52. This lever is connected by means of a cable 264 to the wheel plate 255, whereby when the lever is drawn backwardly the plate will oscillate about the axis of the shaft 245, thus causing the wheel to be elevated from the pavement. In order that the actuating wheel may be firmly pressed in contact with the pavement, a presser spring 265 is provided. This spring is mounted upon a pusher rod 266 which has its lower end pivotally attached to the wheel plate 255 by means of a pin 270 and its upper end slidably mounted in a bearing plate 271 carried by the chassis. A washer 272 fixed to the presser rod 266 engages the lower end of the spring, whereas the upper end of the spring bears against the plate 271, whereby when the spring is placed under tension, it serves to urge the pusher rod downwardly and thus press the actuating wheel into firm driving contact with the pavement. The control valves 54 and 55 of my device, as hereinbefore stated, are supported by the standard 53 and are shown in Fig. 3 by dot-and-dash lines in the positions occupied on the standard. However, for clearness of illustration, in this figure I have repeated the showing of these valves in full lines and have also shown in diagrammatic manner the valves connected to one of the distributing units and its associated parts by heavy dot-and-dash lines. I have shown but one valve 54 and one valve 55 in this figure, it being obvious that one of each of these valves is provided for each of the distributing units. Air from a suitable source of supply is connected to

both valves 54 and 55 coming through the hose line 273 and branch lines 274 and 275. The valve 54 is of the tapered plug type having a passageway 276 formed in the plug and registerable when the valve is open with passageways 280 and 281 formed in the valve casing. The passageway 281 is connected to the hose line 274, and the passageway 280 is connected by means of a hose line 282 to the inlet connection 182 of the distributing unit 172 and to the manifold chamber 181 thereof. When this unit is operated, air will be conducted past the valve 191 to the nozzle outlet connection 186 from whence a hose line 283 will conduct it to the connection 163 of the nozzle to furnish air to spray the paint. Air will also be conducted from the manifold chamber past the valve 190 and through connection 185 to a branch fitting 284 through a hose line 285. The branch fitting 284 is connected to the cylinder connection 162 of the nozzle by means of a hose line 286, and this fitting is also connected to the connection 143 of the wall actuating cylinder 142 by means of a hose line 290.

The valve 54 is also provided with an exhaust port 291 which is connected to a registering passageway 292 in the plug of the valve and a passageway 293 in the body of the valve when the plug of the valve is rotated to its closed position, as shown in Fig. 3. The air within the paint nozzle cylinder, the wall actuating cylinder, in the connecting hose lines, and in some of the ports of the distributing unit will thus be exhausted to the atmosphere.

When my device is being used to paint a broken line, the cam 210 will cause the associated distributing unit to be periodically operated and air will be conducted through the control valve 54 and hose line 282 to the inlet connection 182 of the distributing unit, thereby placing the manifold chamber 181 under pressure. As the cam 210 is now rotated, the operating arm 194 of the unit will operate the wall outlet valve 190 and the nozzle outlet valve 191 substantially in unison and alternately with the exhaust valve 193. As the two first-mentioned valves are operated air is thereby conducted from the manifold chamber through outlet connection 186 and hose line 283 to the nozzle air connection 163. Air will also pass through outlet connection 185 of the unit, hose line 285 to fitting 284 and thence through hose line 286 to the cylinder of the nozzle, and also through hose line 290 to the wall actuating cylinder 142.

In the above description I have outlined the operation of but one control valve 54 and one distributing unit, it being obvious that there is a complete set of valves 54 and 55 and connections therefrom to each of the separate distributing units and associated nozzle for each pair of walls provided. As hereinbefore pointed out, one stripe may be painted at a time or two or more stripes may be painted. Either stripe, where two or more are painted, may be continuous or broken as the circumstance indicates, or any combination of broken and continuous lines may be brought about by the individual operation of each of the control valves 54 and 55. When, for instance, the paint nozzle between the walls 75 and 76 is to be actuated, the control valve 54 governing the distributing unit 170 and the wall cylinder 140 is actuated. This will cause the operation of the wall actuating lever 114 and, through its cross bar 123 and upstanding arms 110 and 111, will cause the front wall links 83 and 84 to be actuated to lower the walls 75 and

76. If the walls 76 and 80 are to define the channel, then the valve which controls the cylinder 141 will be actuated. This will cause the wall actuating lever 115 to be operated, and through its cross bar 124 and upstanding arms 111 and 112 to cause the front wall links 84 and 85 to lower the walls just above mentioned. In like manner, when the walls 80 and 81 are to be lowered, then the wall actuating lever 116 will be operated by the actuation of the valve 54 which controls the cylinder 142 associated with this lever. The cross bar 125 carried by this lever and coacting upstanding arms 112 and 113 will cause the front wall links 85 and 86 to lower the walls last mentioned. From the foregoing description it will be clear that each time the painting is interrupted during the application of a broken line, the air to the spray nozzle will be shut off as well as the air conducted to the wall actuating cylinder and the cylinder of the spray nozzle, and the air contained in these parts will be exhausted through the exhaust port 192 of the unit and the exhaust valve 193 thereof.

When it is desired to paint a solid or continuous line in either of the channels, the stripe control valve 55 of that particular channel is actuated as, for instance, the channel between the walls 80 and 81 and the actuation of this stripe control valve will cause air to pass from the supply line 273 to the valve through hose line 275 and from it through hose line 294 to the stripe control cylinder connection 204. As hereinbefore pointed out, this will cause the actuating arm 194 of the selected distributing unit to be held in such position as to allow continuous painting until the valve 55 is shut off. When the valve 55 is closed, its exhaust port 295 is opened to the atmosphere and brought in communication with registering ports formed in the plug and casing of this valve, thus bringing this exhaust port in communication with the hose line 294 and permitting air to be exhausted from the stripe control cylinder. Should such stripe control cylinder be rendered inoperative by the valve 55 at such time that the actuating surface 213 of the cam is opposite the roller of the actuating arm 194 and it is desired to discontinue the continuous line before the cam has reached the dwell surface 212, the air control valve 54 will be actuated to close off the supply of air to the distributing unit and thus cause the painting to immediately cease and the active walls to be raised.

Where it is desired to apply paint of two or more different colors between each pair of walls, the forms of apparatus shown in Fig. 8 is employed. Since this figure is largely diagrammatic, no walls are shown and only a fragmentary portion of a wall actuating lever 300 is illustrated. Two spray nozzles 301 and 302 are provided for each paint channel, each nozzle handling a different color paint and being supported as a unit by nozzle arms 303. Each nozzle must be provided with a separate control and, therefore, two distributing units 304 and 305 are provided, respectively, for the nozzles 301 and 302. A two-color air control valve 306 must be employed when two-color nozzles are used, one of such valves being provided for each group of paint nozzles between each pair of associated walls. Each of these valves comprises an inlet fitting 307 which communicates with an inlet port 308 formed in the stator part 309. This inlet port is in communication with a transverse inlet port 310 which is registerable with ports extending from outlet fittings 311 and 312. The outlet fittings are

carried by the rotor part 313 of the valve and are brought in communication with the lateral port 310 of the stator part by rotation of the rotor part which is brought about by means of a handle 314 attached thereto. The stator part is provided with a base 315 which is formed with two upwardly extending exhaust passageways 316 and 317. These exhaust passageways terminate in lateral ports 320 and 321, respectively. As shown in Figs. 8 and 10, the rotor part is provided with an arcuate slot 322 which extends across the outer ends of the ports 320 and 321 when the parts are in their neutral positions as shown in these two figures, thus exposing the ports 320 and 321 and connected passageways 316 and 317 to the atmosphere. The passageways 316 and 317 have connectors 323 and 324, respectively, connected thereto.

The distributing unit 304 controlling nozzle 301 handling one color has its inlet connection 325 connected to the outlet connection 311 of the valve by means of a hose line 326. In similar manner the distributing unit 305 controlling nozzle 302 and handling a different color has its inlet connection 330 connected to the outlet connection 312 of the valve by means of a hose line 331. The nozzle outlet connection 332 of the distributing unit 304 is connected to the nozzle air inlet connection 333 by means of a hose line 334. Likewise, the nozzle outlet connection 335 of the distributing unit 305 is connected to the air inlet connection 336 of the nozzle 302 by means of a hose line 337. The inlet connection 340 and 341 of the units 304 and 305, respectively, are each connected, respectively, by means of hose lines 342 and 343, respectively to a branch fitting 344 and 345. The branch fitting 344 is connected to the connection 347 of the cylinder of the nozzle 301 by means of a hose line 346, and this fitting is also connected to a wall cylinder 350 by means of a hose line 351. The branch fitting 345 is connected by means of a hose line 352 to the connection 353 of the cylinder of the nozzle 302. The branch fitting 345 is connected to a wall cylinder 354 by means of a hose line 355. The branch connection 344 is connected by means of a hose line 356 to the exhaust connection 324 of the valve 306, and the fitting 345 is likewise connected to the exhaust connection 323 of this valve by means of a hose line 357. Each of the distributing units 304 and 305 is provided with an exhaust port 358 like in the unit 172, hereinbefore described.

Each of the air supply connections 360 and 361, respectively, of the units 304 and 305 is connected, respectively, by means of hose lines 362 and 363 to a branch fitting 364. This branch fitting is connected to one side of a stripe control valve 365. The other side of this valve is connected to a branch 366 of an air supply line 370. The supply hose line 370 is also connected to the two-color air control valve 306 by means of the hose line 371. By means of the stripe control valve 365 air may be conducted through the hose lines 362 and 363 to both of the stripe control cylinders of either unit 304 and 305 whereby the cam of both units will be rendered inactive and the distributing unit being used will paint an unbroken line, as hereinbefore described in connection with the other form of the invention. When the stripe control cylinder is moved to its closed position, the parts connected thereto will be vented through the exhaust port 372, also in a manner described in connection with the other form of invention.

When the device shown in Fig. 8 is to be used, and the color handled by the nozzle 301 is to be applied, the rotor part 313 of the two-color control valve 306 is operated so as to bring the outlet connection 311 in communication with the inlet ports 310 and 308 of the stator part, whereby air will be supplied through the hose line 326 to the inlet connection 325 of the distributing unit 304. This distributing unit, through its operating arm 373, will cause air to be conducted to the wall actuating cylinder 350 through the wall outlet connection 340, and hose lines 342 and 351. Air will also be distributed by this unit from connection 332 through hose line 334 to the air spray connection 333 of nozzle 301. The cylinder connection 347 of this nozzle will be supplied with air through the hose line 346 from the fitting 344. Paint of one color is conducted to this nozzle by suitable means through the paint line 374, and paint of a different color is connected to the nozzle 302 through the paint line 375.

When the nozzle 301 is being used, it is of course necessary that the exhaust connection 324 of the two-color valve be closed to the atmosphere so that air may not be exhausted through the hose line 356. This is brought about by the fact that when the rotor part 313 of the valve is rotated to allow air to flow to the distributing unit 304, the exhaust passageway 321 and port 317 are closed off by the rotor part. While in this position, the passageway 320 and port 316 which are connected to the exhaust fitting 323 of the valve are opened to the atmosphere so that air contained in the fitting 345, distributing unit 305, and all of the associated parts will be exhausted.

When it is now desired to discontinue painting the color handled by nozzle 301 and to paint with the color handled by nozzle 302, the rotor part 313 of the two-color control valve is operated in the direction to bring the outlet connection 312 opposite the inlet passageways 310 and 308. During this movement, the arcuate slot 322 of the rotor part will close the exhaust passageways 316 and port 320 and will open the opposite exhaust passageway 317 and port 321, thereby allowing air to be exhausted through hose line 356 which will allow all the air previously contained in the various cylinders and hose lines connected therewith to be exhausted. With the control valve operated to the position just above indicated, air will pass through the hose line 331 to the distributing unit 305 where it will be distributed by the actuation of the operating arm 373 thereof. Air will pass from connection 341 of this unit to the branch fitting 345, thence to the wall actuating cylinder 354 through hose line 355 and through hose lines 352 to the cylinder connection 353 of the spray nozzle 302. Air to spray the paint through nozzle 302 will likewise be supplied through nozzle outlet connection 335 of said unit and hose line 376.

When it is desired to discontinue painting with nozzle 302 and to change to the color paint handled by nozzle 301, or when it is desired to stop the painting, the two-color control valve 306 is operated to either position to bring about the desired result.

The description of operation just above given is when an intermittent or broken line is being painted. However, when it is desired to paint a solid or continuous line, the stripe control valve 365 is operated which causes air to flow from the fitting 364 to hose lines 362 and 363.

Air will thus be conducted to the connection 360 of the distributing unit 304 and the connection 361 of the distributing unit 305, thus causing the stripe control cylinder of each of these units to be operated, thereby forcing the arm 373 of each unit to such position as to hold the wall and nozzle valves thereof open. The unit which is being supplied with air from the two-color control valve 306 will thereby control its associated parts, thus holding the active walls in their operative positions while paint is being continuously sprayed from the associated nozzle.

The parts of either form of my device are so proportioned and adjusted that air at much higher pressure is required to operate the cylinders of the paint nozzles than that which is required to operate the wall actuating cylinders, whereby the walls will first be actuated to their operative positions on the pavement before paint is applied to the pavement through the cooperating nozzle, whereby a paint channel is always initially formed by the selected paint walls.

In Fig. 12 I have shown a modified form of frictional speed changing device for connecting the cam shaft 211 with the friction disc 244. The drive shaft 380 in this form of device is made in one piece and is rotatably supported by bearings 226 and 230 which, as hereinbefore described, are formed as a part of the bracket 231 and 232, respectively. The upper end of this drive shaft, omitted in this figure, is suitably supported by the gear casing 215 and is connected to the worm gearing (not shown) contained in the casing. The portion of this shaft between the bearings 226 and 230 is provided with a spline 391, and the friction wheel 382 of the device is carried by a sleeve 383. The sleeve is mounted upon the shaft 380 and is provided with a suitable keyway whereby it is rotatably fixed to the shaft, but may be slid axially thereon to adjust the friction wheel. Rotatably supported by the brackets 231 and 232 is an adjusting shaft 384 which is held against axial movement by means of stop nuts 386 which engage the bracket 232. This shaft is provided with a screwthreaded portion 385 upon which is mounted an adjusting bracket 390. This bracket extends toward the sleeve 383 and is engageable with a groove 391 formed therein, whereby movement of the bracket axially will cause the movement of the sleeve and friction wheel.

While I have shown and described but one stripe control valve 365 common to each group of distributing units, it is obvious that two separate valves may be employed and each connected directly to its cooperating unit. These and other modifications of the details herein shown and described may be made without departing from the spirit of my invention or the scope of the appended claims, and I do not, therefore, wish to be limited to the exact embodiment herein shown and described, the form shown being merely a preferred embodiment thereof.

Having thus described my invention, what I claim is:

1. A paint striping pushmobile, comprising a chassis, a painting device supported by said chassis, said device including a plurality of selectively movable paint-confining walls capable of movement in pairs and an associated paint nozzle for supplying paint between each pair of walls, means for intermittently moving said walls to road engaging position and for opening the associated paint nozzle in timed relation to the forward movement of said pushmobile, an ac-

tuating wheel carried by said pushmobile and held in yieldable contact with the pavement, and adjustable frictional drive means carried by said pushmobile and connecting said actuating wheel with the wall moving means for changing the cycle of the intermittent line being applied.

2. A paint striping pushmobile, comprising a chassis, a painting device supported by said chassis, said device including a plurality of selectively movable paint-confining walls capable of movement in pairs and an associated paint nozzle for supplying paint between each pair of walls, means for intermittently moving said walls to road engaging position and for opening the associated paint nozzle in timed relation to the forward movement of said pushmobile, an actuating wheel carried by said pushmobile and held in yieldable contact with the pavement, a friction disc actuated by the rotation of said wheel, a drive shaft rotatably carried by said chassis and including an axially movable part, a friction wheel carried by said shaft part, means for moving said friction wheel across the face of said disc to change the speed of rotation thereof, and means connecting said drive shaft to said intermittent moving means.

3. A paint striping pushmobile, comprising a chassis, a painting device supported by said chassis, said device including a plurality of selectively movable paint-confining walls capable of movement in pairs and an associated paint nozzle for supplying paint between each pair of walls, means for intermittently moving said walls to road engaging position and for opening the associated paint nozzle in timed relation to the forward movement of said pushmobile, an actuating wheel carried by said pushmobile and held in yieldable contact with the pavement, a friction disc actuated by the rotation of said wheel, a drive shaft rotatably carried by said chassis and including an axially movable part, a friction wheel carried by said shaft part, an adjusting

shaft rotatably supported by said chassis, means for preventing axial movement of said adjusting shaft, an adjusting bracket carried by said adjusting shaft and movable axially upon rotation of said adjusting shaft, said bracket being connected to said drive shaft to cause axial movement of said friction wheel, and means connecting said drive shaft to said intermittent moving means.

4. A paint striping pushmobile, comprising a chassis, a pivotally suspended painting device carried by said chassis and capable of vertical movement therewith in substantially parallel relation, said device including a plurality of selectively movable paint-confining walls capable of movement in pairs and an associated paint nozzle for supplying paint between each pair of walls, cam means for moving said walls to road engaging positions and for opening the associated paint nozzle in timed relation to the forward movement of said pushmobile, a cam actuating wheel in yieldable contact with the road, and adjustable friction drive means for connecting said actuating wheel with said cam whereby the relative rate of rotation of said wheel and cam can be varied at will.

5. A paint striping pushmobile, comprising a chassis, a painting device supported by said chassis, said device including a plurality of selectively movable paint-confining walls capable of movement in pairs and an associated paint nozzle for supplying paint between each pair of walls, supporting links at each end of said device for pivotally connecting the same to said chassis, thereby permitting vertical movement of said device with its walls and paint nozzles to its road engaging and elevated positions, and latch arms carried by said chassis and engageable with said links for temporarily holding said device in its elevated position.

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