Nov. 3, 1931. W. T. BEATTY ET AL 1,829,728

ROAD SCARIFIER AND SCRAPER

Filed Oct. 12, 1925 4 Sheets-Sheet 1

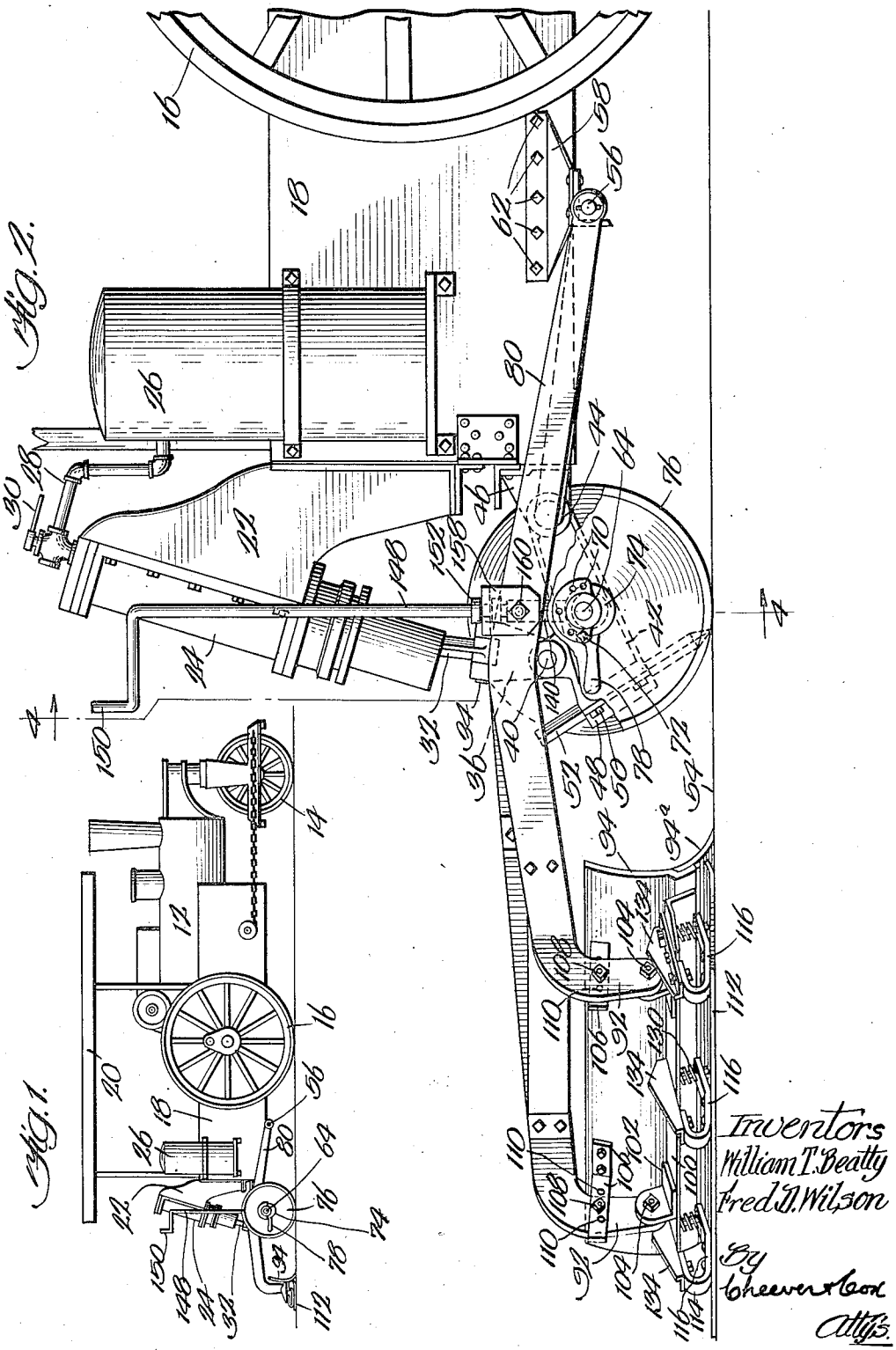


Fig. 1.

Fig. 2.

Inventors
William T. Beatty
Fred D. Wilson
By Cheever & Cox
Attys.

Nov. 3, 1931. W. T. BEATTY ET AL 1,829,728

ROAD SCARIFIER AND SCRAPER

Filed Oct. 12, 1925 4 Sheets-Sheet 2

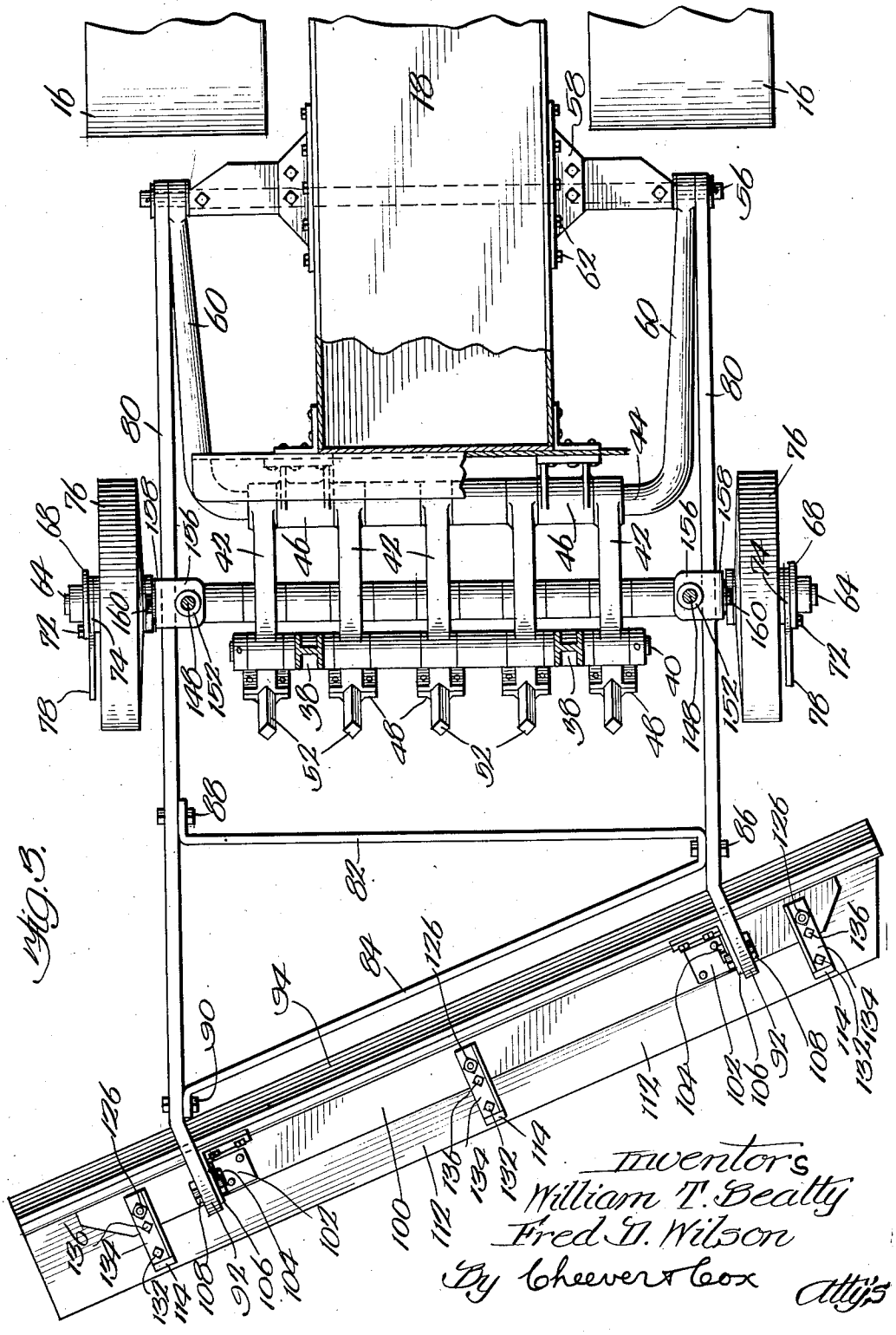


Fig. 3.

Inventors
William T. Beatty
Fred H. Wilson
By Cheever & Cox Attys

Nov. 3, 1931. W. T. BEATTY ET AL 1,829,728

ROAD SCARIFIER AND SCRAPER

Filed Oct. 12, 1925 4 Sheets-Sheet 3

Fig. 4.

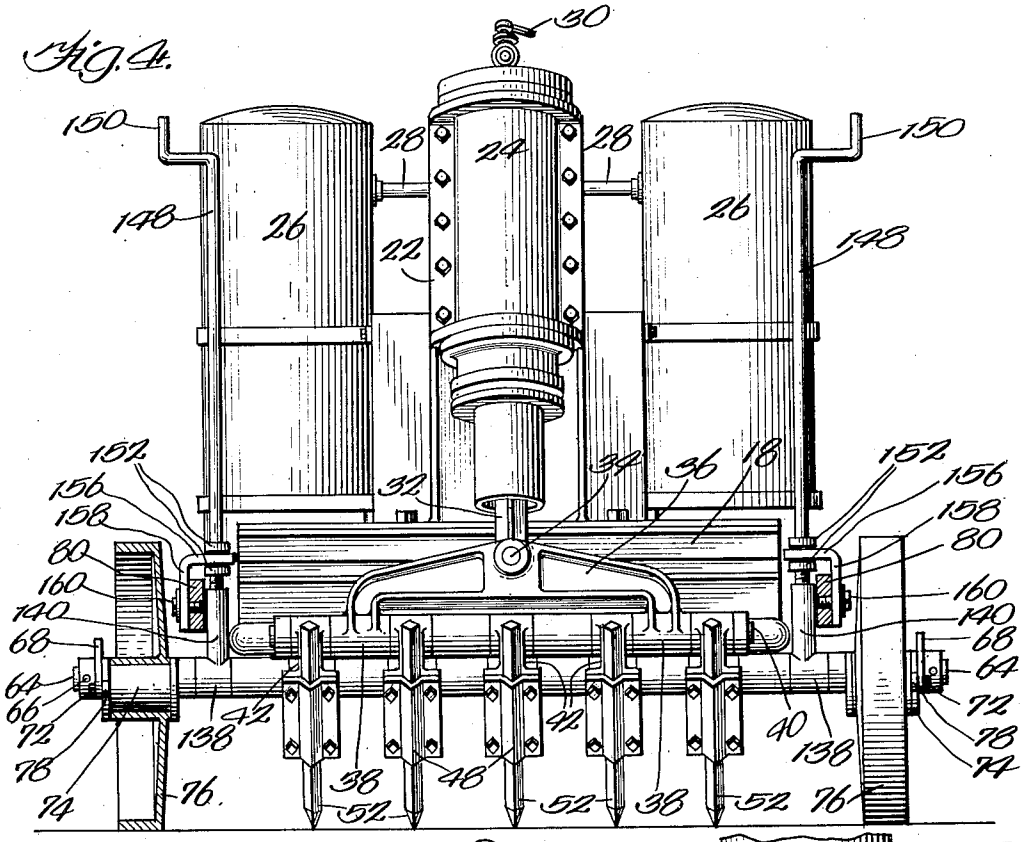
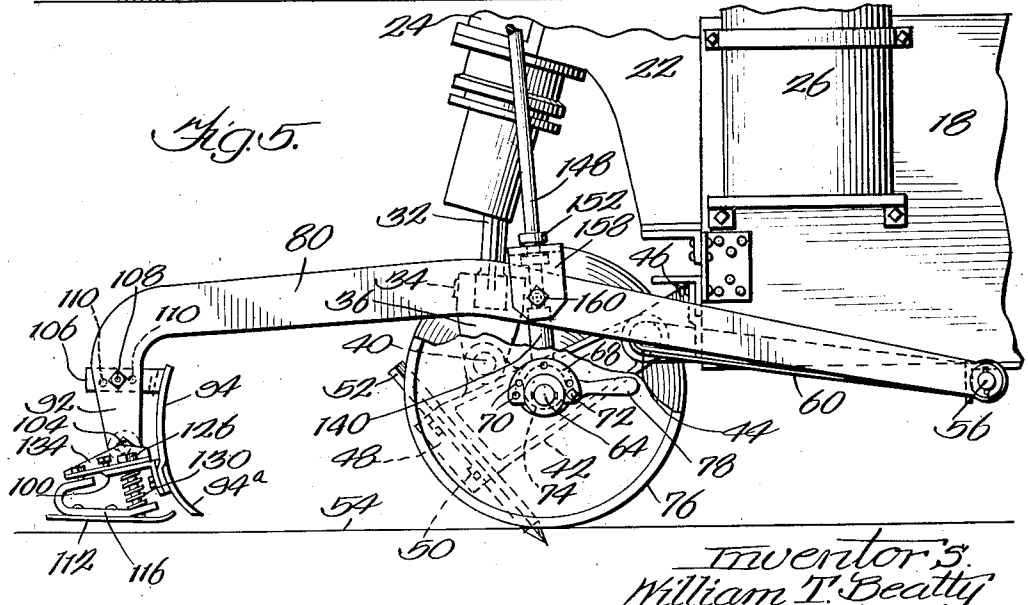


Fig. 5.



Inventors.
William T. Beatty
Fred D. Wilson
By Cheever & Cox Attys

Nov. 3, 1931. W. T. BEATTY ET AL 1,829,728

ROAD SCARIFIER AND SCRAPER

Filed Oct. 12, 1925 4 Sheets-Sheet 4

Fig. 6.

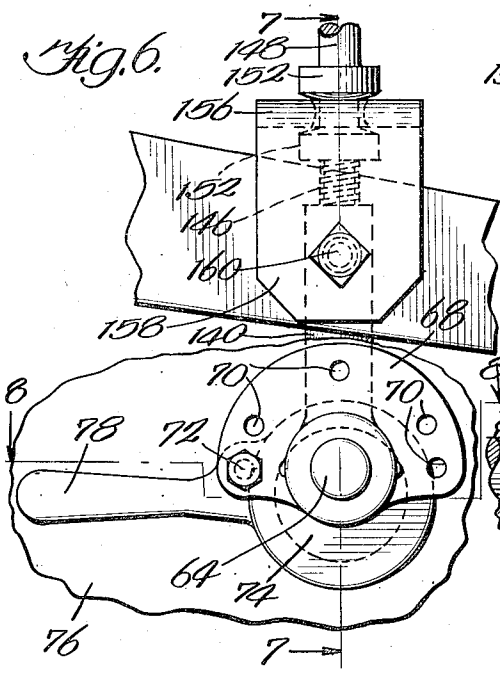


Fig. 7.

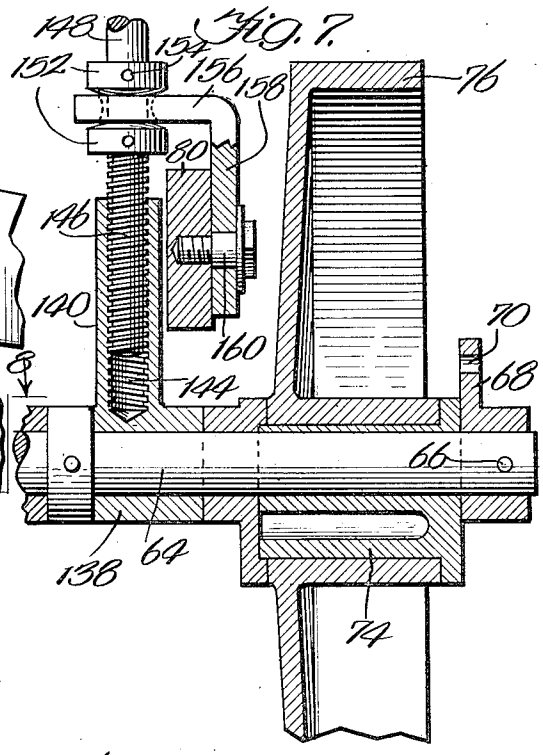


Fig. 8.

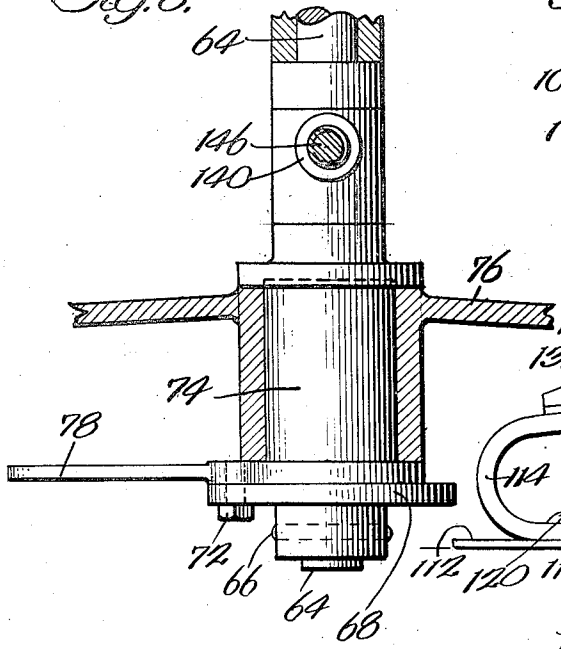
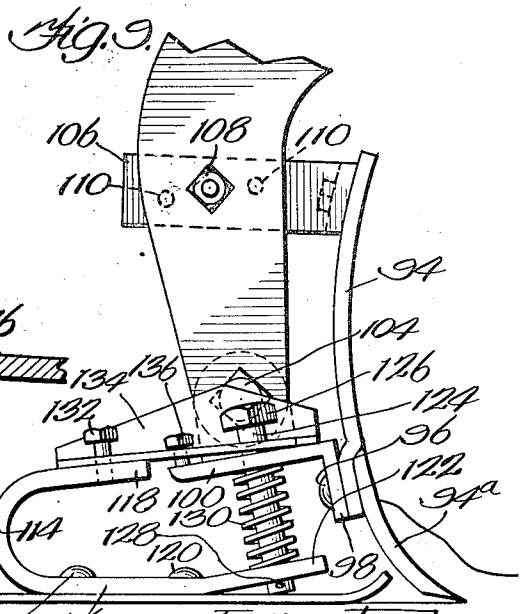


Fig. 9.



Inventors
William T. Beatty
Fred D. Wilson
By Cheever & Cox Attys.

Patented Nov. 3, 1931

1,829,728

UNITED STATES PATENT OFFICE

WILLIAM T. BEATTY, OF FLOSSMOOR, AND FRED D. WILSON, OF HARVEY, ILLINOIS, ASSIGNORS TO AUSTIN MANUFACTURING CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

ROAD SCARIFIER AND SCRAPER

Application filed October 12, 1925. Serial No. 61,920.

This invention relates to road maintenance devices—particularly of the automotive vehicle type.

The object of the invention is to provide such a vehicle specifically a road roller of conventional construction with a combined scarifying and scraping or smoothing mechanism so adjustable with reference to each other and with reference to the road surface that loose road material dug up by the scarifying mechanism is left by the scraping mechanism in predetermined condition of smooth distribution over the road surface.

The invention consists in mechanism capable of attaining the foregoing and other objects; which can be comparatively easily and cheaply made, and applied at the rear of a conventional road roller, which mechanism is efficient in operation and not readily liable to get out of order.

More particularly the invention consists in the mechanisms for effecting the adjustments of the scarifier and scraping mechanisms with reference to each other and with reference to the road surface worked upon.

Still more particularly the invention consists in numerous features and details of construction which will be more fully set forth in the specification and claims.

Referring to the drawings in which like numerals represent the same parts throughout the several views:

Figure 1 is a side elevation of a complete road roller equipped with mechanism of this invention in its preferred form.

Figure 2 is an enlarged detail view of the left hand one-third of Figure 1, showing in considerable detail the mechanism of this invention.

Figure 3 is a plan view of the parts shown in Figure 2.

Figure 4 is a rear view taken on the irregular line 4—4 of Figure 2.

Figure 5 is a changed position view of the scarifier and scraped showing the latter elevated to clear the ground.

Figure 6 is a front detail view of the eccentric cam mechanism and other adjacent parts appearing at approximately the lower central portion of Figure 2.

Figure 7 is a central, detail view on the line 7—7 of Figure 6.

Figure 8 is a plan detail view on the irregular line 8—8 of Figure 6.

Figure 9 is a detail view of the scraper supporting mechanism in changed position from that shown in Figure 5, the scraper in Figure 9 resting upon the ground.

The mechanism of this invention is preferably but not necessarily used in connection with a conventional, automotive vehicle, specifically as shown in the drawings, a conventional form of road roller, having an engine mechanism 12 supported on front roller 14 and rear rollers 16, there being at the rear an operator's platform or station 18, protected by a shade or roof 20. Rigidly secured to the rear of the operator's station 18 is a conventional supporting casting 22 for a diagonally disposed, downwardly inclined conventional scarifier cylinder 24, conventionally supplied with compressed air from storage tank 26 located at the rear of the operator's station 18. The air from tanks 26 passes to cylinder 24 through pipes 28 under the control of valve mechanism 30.

Reciprocally mounted in cylinder 24 through the agency of a conventional piston therein, not shown, is a piston rod 32 pivotally connected at its lower end through a pin 34 to a horizontally disposed yoke 36 extending cross-wise of the road roller and terminating in bearings 38, carrying a horizontally disposed shaft 40. Supported on shaft 40 at points intermediate of their lengths are a multiplicity of scarifier tool supporting arms 42. The ends of these arms 42 nearest the road roller are pivotally mounted on a shaft 44 carried by brackets 46 at the extreme rear of the engine frame (the operator's station). Arms 42 are rockable about the axis of shaft 40, it making no difference so far as the invention is concerned whether the arms are journaled upon shaft 40 or are rigid on said shaft and the shaft is journaled in bearings 38.

The free ends of the arms 42 are provided with clamps 48 adapted through the proper manipulation of screws or bolts 50 to detachably, rigidly hold the scarifier tool or tine 52

in position for working upon road surface 54.

Cylinder 24, the piston (not shown) which reciprocates in it, and valve 30 are conventionally so constructed that valve 30 may be manipulated to selectively admit air from tanks 26 above or below said piston as may be required for ultimate depression or elevation of scarifier tines 52. When the air is admitted above the piston in the cylinder 24, the piston rod 32 is forced downward with consequent forcing of the tines 52 to the position of Figure 5 where they enter the road surface 54. Correspondingly, admission of air below the piston causes upward movement of piston rod 32 and elevation of the tines through the position of Figure 2 to a higher position in which the tines entirely clear the road surface. The strain upon tines 52, arms 42 and shaft 44 when scarifying road work is being done is very severe. Shaft 44 is accordingly braced from a shaft 56 sustained on brackets 58 attached to the under side of the operator's station 18, portion of the frame of the machine, at some distance forward of shaft 40 by slightly, downwardly extending arms or brace rods 60. In the particular case here illustrated, shaft 44 and these arms 60 are made in one U-shaped piece. The brackets 58 are secured to the frame of the machine in any conventional manner, as, for instance, by the bolt 62.

Extending through and rigidly secured to scarifier supporting arms 42 is a shaft 64 having rigidly secured to its outer ends by any suitable means, as, for instance, pins 66, segments 68 provided with a multiplicity of spaced perforations 70. Each one of these perforations 70 in a given segment 68 is selectively engageable by a bolt 72 carried by an eccentric cam 74, itself rotatably mounted on shaft 64 immediately adjacent to said segment 68 and having journaled on its eccentric surface a depth gauge member, specifically a wheel 76, adapted on contacting the ground 54 to prevent further perforation of the road surface by adjacent tine 52. The eccentric is manually rotatable by manipulation of a handle 78 provided for the purpose. Figure 2 shows an eccentric 74 and securing bolt 72 in the position assumed when tines 52 are held at the road surface 54 and Figure 5 shows the opposite extreme position of the cam handle 78, etc., when the eccentric is in position to permit the tines 52 to substantially enter the road surface 54. Intermediate positions of the eccentric between those of Figures 2 and 5, of course, place the tines 52 at different intermediate positions with reference to the road surface 54. If occasion requires, the operator is at perfect liberty to adjust the eccentrics at opposite ends of shaft 64, independently one of the other, to vary the position of the tines at opposite sides of the road roller as may be required by road conditions.

Pivotally mounted on opposite outer ends of shaft 56 are two lever arms 80 constituting, as shown in Figure 3, parallel side members of a generally rectangular frame, cross-connected by members 82 and 84, rigidly secured in place by any suitable means, such, for instance, as bolts 86 and 88 and 90. These lever arms 80 extend, as shown, rearwardly of the road roller; are arched slightly at their centers, as shown in Figure 2, to clear shaft 64 and at their rear or free swinging ends have downwardly turned hooks 92 to which road surface engaging blade 94 is secured.

Blade 94 is, as shown, preferably but not necessarily slightly curved. The blade proper is in the particular case here illustrated made up of an upper permanent portion 94 and a detachable, renewable, cutting portion 94*a*, secured in place by bolts or rivets 96 passing through the two parts of the blade, and the vertical flange 98 of an angle iron having a horizontally disposed flange 100 located immediately under the ends of hooks 92. This flange 100 and consequently the blade is secured to the hooks 92 of lever arms 80 through the agency of angle members 102 and bolts 104. (See Fig. 2). Blade 94 rocks about the horizontal axis of the two bolts 104, as shown and is selectively detachably securable in different angular positions through the agency of a pair of bars 106—one adjacent to each hook 92, each selectively positioned on the adjacent hook by a bolt 108 carried by a given bar and selectively insertable in different ones of special perforations 110 in the adjacent hook (see Fig. 5).

In order to prevent the scraping portion 94*a* of blade 94 entering road surface 54 too deeply, a shoe 112 of substantial width and extending substantially across the machine as shown in Figure 3 is so mounted as to rest on the ground 54 immediately behind the cutting edge of the blade and is loosely spring connected to the blade 94 and frame hooks 92 by the mechanism as shown in Figures 2, 5 and 9. The connecting mechanism referred to includes three U-shaped members 114, having side arms 116 and 118. Arm 116 is rigidly connected to the shoe 112 by any suitable means, as rivets 120, the outer ends of said side arms, however, being bent away from the shoe at 122 to permit the insertion through the arm of pin 124. Each one of these pins 124 passes loosely through angle 100; has a head 126 substantially above and clear of horizontal angle flange 100, and has a cotter pin 128 or the like inserted in the opposite end of the pin between the shoe 112 and part 122 of side member 116. Intermediate between members 122 and 100, enclosing pin 124, is a compression spring 130. Loosely connected to side arm 118 of U-member 114, by a screw 132, is an angular member 134 perforated to receive pin 124 and lie on angle flange 100 under pin-head 126. Members 134 and

100 are loosely connected together by bolts 136 so constructed and arranged as shown in Figure 9 to allow substantial play of member 134 up and down with reference to member 100.

The result of the construction just described is that within the limits of movement of spring 130 and the give and take of members 134 over bolts 132 and 136, the shoe 112 is free to move independently of blade 94, the result being that the blade 94 is guided by the shoe along the road surface 54 in accordance with the general contour of the road surface, this as distinguished from being allowed to bite into the road surface at every minor soft spot encountered by said blade 94. Actual experience has demonstrated that this shoe 112 and its mounting in connection with blade 94 produces a remarkably fine finished road surface made from and upon material just scarified by tines 52.

Rigidly mounted on shaft 64, inside of and immediately adjacent to each eccentric 74, is the hub 138 of a vertically extending post 140. Entering the upper end of this post is a screw threaded recess 144 operatively receiving the screw threaded lower end 146 of a vertically extending shaft 148, equipped at its upper end with a hand-crank 150 graspable by an operator at the operator's station 18 of the machine. Rotatably embracing each shaft 148 and held against longitudinal movement by detachable collars 152, positioned by pins 154 or the like, is the horizontal branch 156 of an angular member whose vertical branch 158 is detachably secured to an adjacent lever arm 80 by any suitable means, as for instance, the screw 160.

The result of the connection just described between each lever arm 80 and the adjacent end of shaft 64 is that the operator can by rotating adjacent handle 150 in one direction separate the named parts 80 and 64, and, by rotating said handle in the opposite direction, he can bring them closer together. As each lever arm 80 is thus adjustable to and from its end of the shaft 64 and, as the adjacent depth gauge member, specifically wheel 76, is adjustable vertically by means of the eccentric 74 on which it is mounted, it is quite obvious that a large number of combinations of adjustments between the scarifying tines, the depth gauge device 76 and the blade 94 may be made by the operator—these, each and all, to accommodate the machine to road conditions as the work of the machine progresses.

In the complete operation of the machine, the road roller travels from left to right, as viewed in Figure 1, pulling the scarifier tines and the scraping blade 94 over the road surface 54. During this movement of the machine, the operator, after first adjusting eccentrics 74 as may be thought necessary, manipulates valve 30 to lower or raise, as the case may be, the tines 52 of the scarifier, and manipulates handles 150, as occasion requires, to vary the position of a scraper or cutting blade 94 or either end thereof to meet the conditions of the road over which the machine is passing. During this operation, the shoe 112 and its supporting mechanism causes the blade 94 to properly function as heretofore described.

Through the connection 138—140—158, the pressure of air on piston rod 32 is transmitted to lever arms 80 and consequently to blade 94.

Attention is called to the fact that by properly using the adjustments shown and heretofore described, the scarifier mechanism may be operated in the usual manner while the blade is raised and entirely clear of the road, and that conversely the scarifier may be raised to such an extent with reference to the blade that the blade may be used while the scarifier is entirely clear of the ground. In the latter adjustment of the parts, the scraping blade is a pneumatically operated instrument just as though no scarifier were present.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In combination with an automotive vehicle, a scarifier device and adjacent scraper, a single means simultaneously moving the entire scarifier and scraper to and from the ground, and means adapted to vary the relationship between the scarifier and scraper while moving over the ground.

2. In combination with an automotive vehicle, a scarifier device and adjacent scraper, a single means simultaneously moving the entire scarifier and scraper to and from the ground and means adapted to vary the relationship between predetermined parts of the scarifier and scraper while moving over the ground.

3. In combination with an automotive vehicle, a scarifier device and adjacent scraper, a single means simultaneously moving the entire scarifier and scraper to and from the ground, and means adapted to vary the relationship between the scarifier and an adjacent end of the scraper while moving over the ground.

4. In combination with an automotive vehicle, a scarifier device and adjacent scraper, a single means simultaneously moving the entire scarifier and scraper to and from the ground, an operator's station on the vehicle, and means operable from said station varying the relationship between the scarifier and scraper while moving over the ground.

5. In combination with an automotive vehicle, a scarifier device and adjacent scraper, a single means simultaneously moving the entire scarifier and scraper to and from the

ground, an operator's station on the vehicle, and manually actuated means, operable from said station, varying the relationship between predetermined parts of the scarifier and scraper while moving over the ground.

6. In combination with an automotive vehicle, a scarifier device and adjacent scraper, a single means simultaneously moving the entire scarifier and scraper to and from the ground, an operator's station on the vehicle, and manually actuated means, operable from said station, varying the relationship between the scarifier and an adjacent end of the scraper while moving over the ground.

7. In combination with an automotive vehicle, a scarifier device and adjacent scraper, a single means simultaneously moving the scarifier and scraper to and from the ground, and means adjustable while in operation varying the relationship between the scarifier and scraper, a depth gauge for the scarifier attached thereto and means varying the position of the depth gauge to control the depth of work done by the scarifier.

8. In combination with an automotive vehicle, a scarifier device and adjacent scraper, a single means simultaneously moving the scarifier and scraper to and from the ground, means varying the relationship between predetermined parts of the scarifier and scraper, while moving over the ground, a depth gauge for the scarifier, and means varying the position of the depth gauge to control the depth of work done by the scarifier.

9. In combination with an automotive vehicle, a scarifier device and adjacent scraper, a single means simultaneously moving the scarifier and scraper to and from the ground, means varying the relationship between the scarifier and an adjacent end of the scraper, a depth gauge for the scarifier, and means carried by the scarifier, varying the position of the depth gauge to control the depth of work done by the scarifier.

10. In combination with an automotive vehicle, a scarifier device and adjacent scraper, a single means simultaneously moving the entire scarifier and scraper to and from the ground, an operator's station on the vehicle, means operable from said station varying the relationship between the scarifier and scraper, a depth gauge for and carried by the scarifier, and means varying the position of the depth gauge to control the depth of work done by the scarifier.

11. In combination with an automotive vehicle, a scarifier device and adjacent scraper, means simultaneously moving the scarifier and scraper to and from the ground, an operator's station on the vehicle, means, operable from said station, varying the relationship between predetermined parts of the scarifier and scraper, a depth gauge for the scarifier, movable vertically with the scarifier, and means varying the position of the depth gauge to control the depth of work done by the scarifier.

12. In combination with an automotive vehicle, a scarifier device and adjacent scraper, means simultaneously moving the scarifier and scraper to and from the ground, an operator's station on the vehicle, means operable from said station varying the relationship between the scarifier and an adjacent end of the scraper, a depth gauge for the scarifier, movable with the scarifier, and means inside the depth gauge varying the position of the depth gauge to control the depth of work done by the scarifier.

13. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power means on the vehicle for lowering and raising the scarifier, a lever mechanism, supported by the scarifier, pivoted to the vehicle and extending past the scarifier and beyond the scarifier carrying a scraper, and means adjustably connecting the lever mechanism to the scarifier mechanism for the purposes set forth.

14. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power means on the vehicle for lowering and raising the scarifier, a lever mechanism, supported by the scarifier, pivoted to the vehicle and extending past the scarifier and beyond the scarifier carrying a scraper, and means adjustably connecting the lever mechanism to the scarifier mechanism at opposite sides of the vehicle for the purposes set forth.

15. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power means on the vehicle for lowering and raising the scarifier, a lever mechanism pivoted to the vehicle and extending past the scarifier and beyond the scarifier carrying a scraper, and means operable, while the machine is in motion, by a person on the automotive vehicle adjustably connecting the lever mechanism to the scarifier mechanism for the purposes set forth.

16. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power means on the vehicle for lowering and raising the scarifier, a lever mechanism pivoted to the vehicle and extending past the scarifier and beyond the scarifier carrying a scraper, and means operable, while the machine is in motion, by a person on the automotive vehicle adjustably connecting the lever mechanism to the scarifier mechanism at opposite sides of the vehicle for the purposes set forth.

17. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement,

power means on the vehicle for lowering and raising the scarifier, a lever mechanism pivoted to the vehicle and extending rearward and beyond the scarifier carrying a scraper, and means manually rotatable by a person on the automotive vehicle adjustably connecting the lever mechanism to the scarifier mechanism for the purposes set forth.

18. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power actuated means on the vehicle for lowering and raising the scarifier, a lever mechanism pivoted to the vehicle and extending beyond the scarifier, carrying a scraper, and means manually rotatable by a person on the automotive vehicle adjustably connecting for independent actuation the lever mechanism to the scarifier mechanism at opposite sides of the vehicle for the purposes set forth.

19. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power means on the vehicle for lowering and raising the scarifier, a lever mechanism pivoted to the vehicle and extending past the scarifier and beyond the scarifier carrying a scraper, and means adjustably connecting the lever mechanism to the scarifier mechanism, a shoe across the machine adjacent to the scraper, and a spring cushion mechanism between the scraper and shoe, for the purposes set forth.

20. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power means on the vehicle for lowering and raising the scarifier, a lever mechanism pivoted to the vehicle and extending past the scarifier and beyond the scarifier carrying a scraper, means adjustably connecting the lever mechanism to the scarifier mechanism, a shoe across the machine adjacent to the scraper, and a spring cushion mechanism between the scraper and shoe, for the purposes set forth.

21. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power means on the vehicle for lowering and raising the scarifier, a lever mechanism pivoted to the vehicle and extending past the scarifier and beyond the scarifier carrying a scraper, means adjustably connecting the lever mechanism to the scarifier mechanism, a depth gauge for the scarifier and scraper at each side of the machine, and means independently adjusting each depth gauge, for the purposes set forth.

22. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power means on the vehicle for lowering and raising the scarifier, a lever mechanism pivoted to the vehicle and extending past the scarifier and beyond the scarifier carrying a scraper, means adjustably connecting the lever mechanism to the scarifier mechanism, a depth gauge for the scarifier and scraper at each side of the machine, and means independently adjusting each depth gauge, for the purposes set forth.

23. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power means on the vehicle for lowering and raising the scarifier, a lever mechanism pivoted to the vehicle and extending past the scarifier and beyond the scarifier carrying a scraper, means operable by a person on the automotive vehicle adjustably connecting the lever mechanism to the scarifier mechanism, a depth gauge for the scarifier and scraper at each side of the machine, and means independently adjusting each depth gauge, for the purposes set forth.

24. In combination with an automotive vehicle, a scarifier mechanism operatively connected to the vehicle for vertical movement, power means on the vehicle for lowering and raising the scarifier, a lever mechanism pivoted to the vehicle and extending past the scarifier and beyond the scarifier carrying a scraper, means operable by a person on the automotive vehicle adjustably connecting the lever mechanism to the scarifier mechanism at opposite sides of the vehicle, a depth gauge for the scarifier and scraper at each side of the machine, and means independently adjusting each depth gauge, for the purposes set forth.

25. In combination with a vehicle, a scarifier mechanism hingedly connected to the vehicle and trailing in the rear thereof, a scraper blade operable while trailed in the rear of the scarifier and means operable from the vehicle for supporting the scraper blade upon the scarifier mechanism.

26. In combination, a tractor; a scarifier; a grader; means for raising and lowering the scarifier; and means on the scarifier adapted to engage the grader to raise and lower the grader with the scarifier, said means permitting the grader and scarifier to be operated independently.

27. In combination with an automotive vehicle, ground working implements therefor, means for raising and lowering said implements, and means on one of said implements operable from the operator's station adapted to engage the other of said implements for raising and lowering the same, said means permitting said implements to be operated independently.

28. In combination with an automotive vehicle, a pair of ground working implements, means for raising and lowering one of said implements, and means on said one implement operable from the operator's station adapted to engage the other of said im-

plements to raise and lower both said implements, said means permitting said implements to be operated independently.

29. In combination with an automotive vehicle, ground working implements therefor including a scarifier, means for raising and lowering said implements, and means on said scarifier adapted to engage the other of said implements for raising and lowering the same, said means permitting said implements to be operated independently.

In witness whereof, we have hereunto subscribed our names.

WILLIAM T. BEATTY.
FRED D. WILSON.