H. D. JONES.

ROAD SCARIFYING DEVICE.

APPLICATION FILED OCT. 12, 1921.

1,429,144.

Patented Sept. 12, 1922.

2 SHEETS—SHEET 2.

Fig. 2.

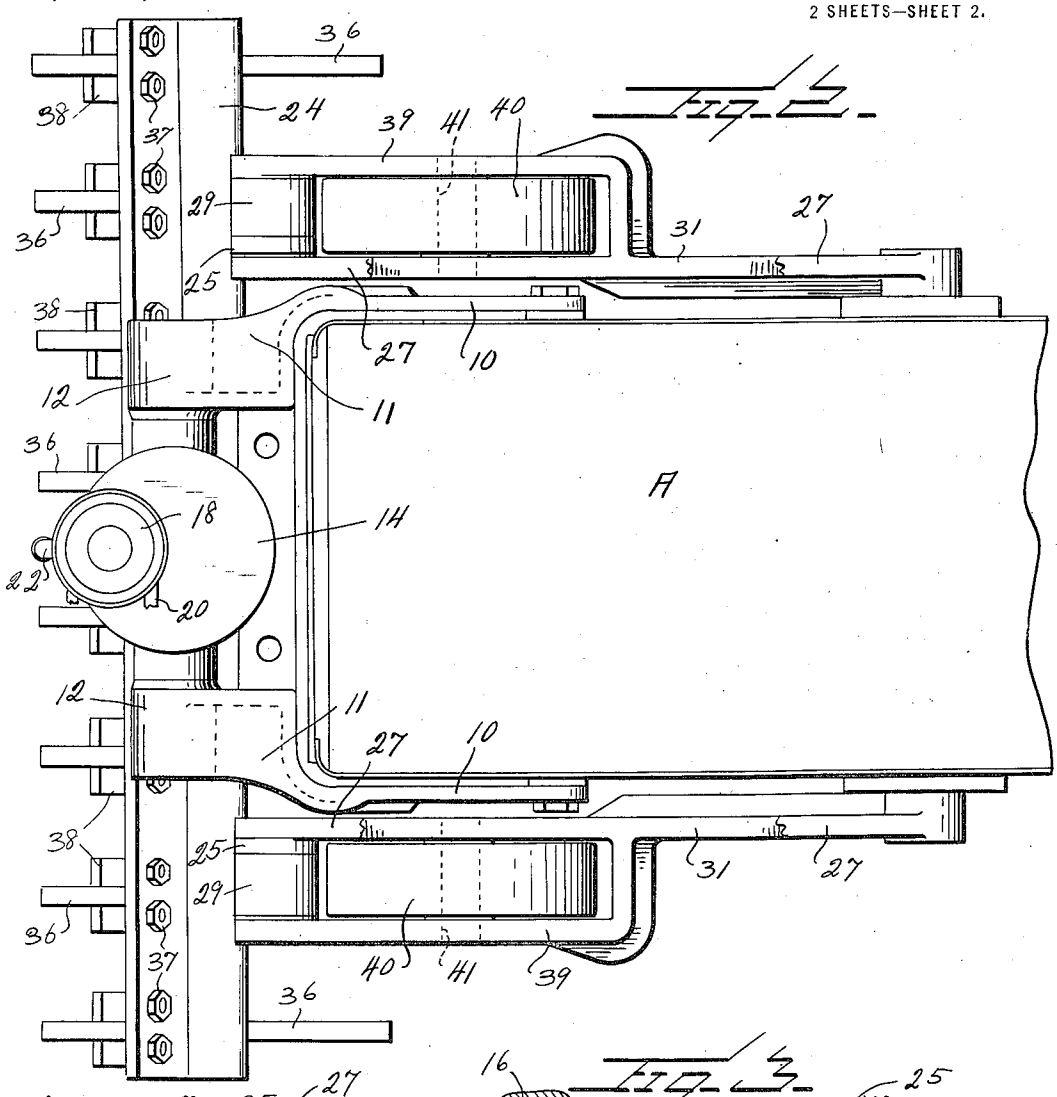


Fig. 3.

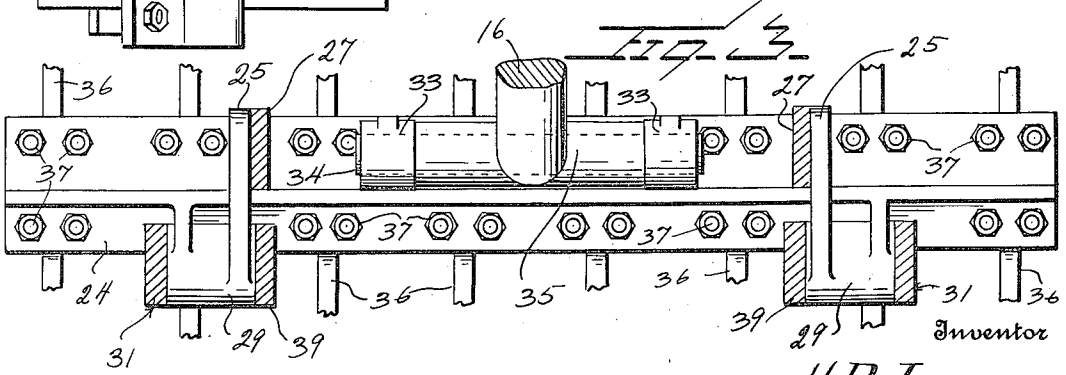
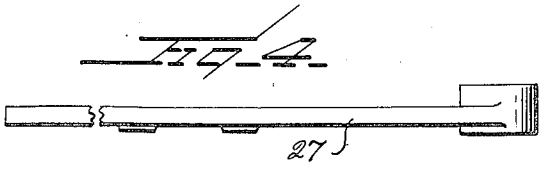


Fig. 4.



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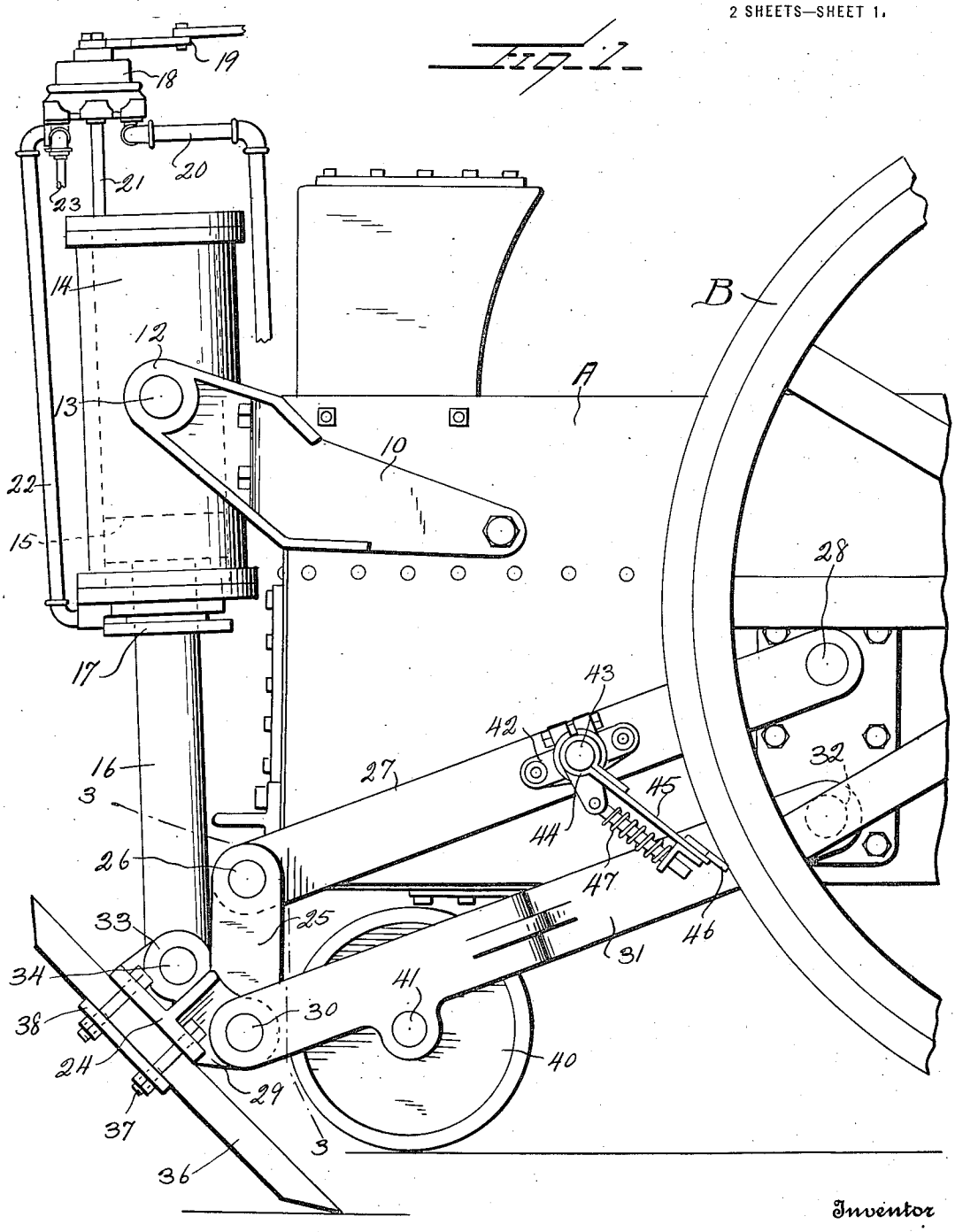
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2 SHEETS—SHEET 1.

Fig. 1.



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UNITED STATES PATENT OFFICE.

HENRY D. JONES, OF GALION, OHIO, ASSIGNOR TO THE GALION IRON WORKS & MFG. CO., OF GALION, OHIO, A CORPORATION OF OHIO.

ROAD-SCARIFYING DEVICE.

Application filed October 12, 1921. Serial No. 507,276.

To all whom it may concern:

Be it known that I, HENRY D. JONES, a citizen of the United States, residing at Galion, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Road-Scarifying Devices, of which the following is a specification.

This invention relates to improvements in scarifying attachments for road engines, particularly to devices of this character employing fluid pressure operated means for raising and lowering a plurality of picks which dig up the surface of a roadway and for yieldingly holding the picks in scarifying engagement with the roadway, and has for an object the provision of a device of this character which is so constructed that the scarifying elements and operating means therefor will be located very close to the rear end of the road engine whereby to lessen the strain on these parts and render them more effective in operation while greatly increasing the strength and durability.

A very important object is the provision of a device of this character in which a novel mounting is provided for the movable member which carries the ground engaging elements, this mounting being in the nature of a parallel ruler which will have the effect of maintaining the picks or ground engaging elements always at the same inclination with respect to the surface being scarified, the exact inclination being of course previously determined by experimentation or otherwise.

Another object is the provision of a device of this character having gauge wheels which travel along the surface of the ground and which operate to limit the degree of penetration of the picks, these gauge wheels being furthermore mounted in a novel bearing structure whereby the axles of the gauge wheels will be supported at both ends, this arrangement having the effect of greatly increasing the strength and resistance of these parts to breakage under heavy strain.

A further object is the provision of a scarifying device of this character in which the gauge wheels are located inwardly of the endmost picks whereby the edge of a road may be dug up, that is whereby digging may be effected along a strip of road wider than the distance between the gauge wheels.

Still another object is the provision of a device of this character embodying certain improved details of construction and arrangement whereby the parts will co-operate more efficiently with one another for producing the desired action, it being moreover a feature that the entire mechanism is comparatively simple and inexpensive in manufacture and installation, as well as efficient in use, durable in service and a general improvement in the art.

To the attainment of the foregoing my invention consists in the details of construction to be hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of my device;

Figure 2 is a plan view;

Figure 3 is a sectional view taken substantially on the line 3—3 of Figure 1; and

Figure 4 is a detail view of one of the supporting links.

Referring more particularly to the drawings the latter A designates a portion of the frame of a road engine which may be gasoline driven or steam driven and which may be of any ordinary type commonly used, it being understood that the engine itself forms no part of the present invention. In carrying out my invention I provide a pair of brackets 10 suitably mounted upon opposite sides of the frame A and having their rear ends inwardly offset, as indicated at 11, and formed with bearings 12 within which are rotatably mounted trunnions 13 which extend from the opposite sides of a substantially vertically disposed cylinder 14 within which operates a piston 15 mounted on a piston rod 16 passing through a suitable packing gland 17 and which is for the purpose of operating the digging mechanism to be hereinafter described. Associated with the cylinder is a four-way valve 18 having an operating handle 19 adapted to be moved by any suitable means under control of the operator of the machine or engine. Connected with the valve 18 is a supply pipe 20 for the purpose of conducting compressed air to the valve and thence to the cylinder from any suitable supply tank, not shown, mounted upon the engine and filled with compressed air by means of any conventional compressed air pump, likewise not shown, which may be driven from the road engine by any preferred means. Leading from the valve 18 are pipes 21 and 22 leading

respectively to the upper and lower ends of the cylinder so that compressed air, or steam if such be preferred, may be supplied to and exhausted from either end of the cylinder by proper manipulation of the valve, the steam being exhausted through an exhaust pipe 23. Any desired form of flexible connections may be associated with the pipe fittings to permit the necessary swinging movement of the cylinder which occurs during the operation of the device, as will be hereinafter made apparent.

The scarifying mechanism proper comprises a T beam 24 which extends entirely across and projects beyond the sides of the road engine frame and this T beam is formed or otherwise provided at points spaced inwardly from its ends with upstanding lugs 25 with which are pivotally connected, as shown at 26, links 27 which are inclined forwardly and upwardly and which are pivoted upon the sides of the frame A, as indicated at 28. Also formed upon the T beam are forwardly extending lugs 29 with which are pivotally connected, as shown at 30, frames 31 which are arranged in spaced parallel relation to the links 27 and below the latter and which have their forward ends pivotally connected with the frame A, as indicated at 32. Extending upwardly from the T beam is a third pair of lugs 33 connected by a shaft 34 upon which is journally engaged a bearing 35 carried by the lower end of the piston rod 16.

The T beam 24 carries a plurality of picks 36 which are adjustable transversely thereof and which are held in inclined position, as clearly indicated in Figure 1, the exact degree of inclination being of course determined by actual experiment. The picks are held in clamped engagement with the T beam by means of bolts 37 which pass through the beam at the sides of the picks and which also pass through clamping bolts 38. By loosening the bolts 37 it will be apparent that the picks may be adjusted longitudinally, that is transversely with respect to the bar for varying the depth of their penetration into the ground. Any desired number of picks may of course be used and they may be located at any suitable distance from one another.

The frames 31 have their intermediate portions open, as indicated at 39, and located within these openings are gauge wheels 40 mounted upon axles 41 which extend through both sides of the frames, as clearly shown.

In the operation of the device it will be seen that when the piston rod 16 is reciprocated by alternately admitting pressure into the cylinder 14 above and below the piston therein, the bar 24 will be moved up and down, the links 27 and frames 31 moving upon their pivots 28 and 32 respectively and having a parallel ruler motion which will maintain the picks 36 at the same angular inclination regardless of their elevation so that the direction in which they pass into the ground will be uniform at all times. It is, of course, apparent that the cylinder 14 will have a certain amount of rocking movement but this is permitted by the mounting of the trunnions 13 within the bearings 12 so that there will be no binding of any of the parts. Assuming that the bar 24 has been moved upwardly, when it is given a down stroke the picks 36 will enter the ground in an inclined direction and owing to the fact that the whole mechanism is traveling along the ground, these picks will operate to tear up the surface. The gauge wheels 40 of course engage the surface of the ground and operate to control the depth of the digging action of the picks so that a layer of uniform thickness will be torn up. There is of course considerable strain upon the axles of these gauge wheels but owing to the fact that both ends pass through the sides of the frames, the structure will have sufficient rigidity to withstand any strain to which the mechanism is likely to be subjected. It is to be noted that the bar which carries the picks extends outwardly beyond the path of travel of the gauge wheels so as to facilitate the digging up of the extreme edge of a road.

It is advisable to provide means for scraping the periphery of the main wheels B of the road engine and in order to effect this I provide plates 42 which are secured upon the outer sides of the links 27 and which carry trunnions 43 upon each of which is engaged a split collar 44 formed with an elongated plate 45 upon the free end of which is mounted a scraper blade 46 resiliently urged into engagement with the periphery of the adjacent wheel B by a coil spring 47. In case the use of the scraper is not desired, it may be swung upon the trunnion 43 and be disposed in inoperative position, that is away from the periphery of the wheel B.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a simply constructed and easily installed road scarifying device which will have a very efficient tearing up action owing mainly to the peculiar mounting of the pick carrying bar whereby the picks will always be maintained at the same angular inclination with respect to the surface worked upon. It is also to be noted that various details of construction have been developed to such an extent as to insure maximum strength so that the entire mechanism should have a long life and satisfactorily perform all the functions for which it is intended.

While I have shown and described the

preferred embodiment of the invention, it is of course to be readily understood that I reserve the right to make such changes in the form, construction and arrangement of parts as will not depart from the spirit of the invention or the scope of the sub-joined claims.

Having thus described my invention, I claim:

1. In combination with a motor driven road engine, a scarifying attachment comprising two pairs of spaced parallel members pivoted upon the sides of the engine frame, a transversely disposed bar pivotally connected with the rear ends of said members and carrying a series of picks arranged in inclined relation to the surface travelled over, and fluid pressure operated means connected with said bar for moving the same vertically.

2. In a scarifying apparatus, and in combination with a motor driven road engine, a scarifying attachment embodying a pair of spaced parallel members pivoted upon opposite sides of the engine frame, a transversely disposed bar carrying a plurality of picks arranged in inclined relation to the surface travelled over, forwardly extending lugs on the bar pivotally connected with the rear ends of the lower ones of said members, upwardly extending lugs on the bar pivotally connected with the rear ends of the upper ones of said members, other upwardly extending lugs carried by the bar near the central portion thereof and connected by a shaft, a fluid pressure cylinder rockably mounted at the rear end of the engine frame, a piston operating within the cylinder and having a rod provided with a bearing journally engaging said shaft, and means for supplying and exhausting fluid pressure within the cylinder alternately above and below the piston therein.

3. In a scarifying apparatus, and in combination with a motor driven road engine, a scarifying attachment embodying a pair of spaced parallel members pivoted upon opposite sides of the engine frame, a transversely disposed bar carrying a plurality of picks arranged in inclined relation to the surface travelled over, forwardly extending lugs on the bar pivotally connected with the rear ends of the lower ones of said members, upwardly extending lugs on the bar pivotally connected with the rear ends of the upper ones of said members, other upwardly extending lugs carried by the bar near the central portion thereof and connected by a shaft, and means connected with said shaft for imparting up and down movement to said bar.

4. In a scarifying attachment for road engines including a rockably mounted fluid pressure cylinder having control means for supplying and exhausting fluid pressure thereinto and therefrom respectively and further including a piston operating within the cylinder and carrying a piston rod; a pair of vertically spaced parallel members pivoted upon each side of the engine frame, a transversely extending bar carrying a plurality of ground engaging picks, lugs on said bar near the center thereof and connected by a shaft pivotally connected with said piston rod, and two pairs of other lugs carried by the bar and connected with the respective rear ends of said bars.

5. In a scarifying attachment for road engines including a rockably mounted fluid pressure cylinder having control means for supplying and exhausting fluid pressure thereinto and therefrom respectively and further including a piston operating within the cylinder and carrying a piston rod; a pair of vertically spaced parallel members pivoted upon each side of the engine frame, a transversely extending bar carrying a plurality of ground, engaging picks, lugs on said bar near the center thereof and connected by a shaft pivotally connected with said piston rod, two pairs of other lugs carried by the bar and connected with the respective rear ends of said bars, said lowermost members being formed as open frames, and gauge wheels located within the frames and having their axles passing through both sides thereof.

6. In a scarifying attachment for road engines including a rockably mounted fluid pressure cylinder having control means for supplying and exhausting fluid pressure thereinto and therefrom respectively and further including a piston operating within the cylinder and carrying a piston rod; a pair of vertically spaced parallel members pivoted upon each side of the engine frame, a transversely extending bar carrying a plurality of ground engaging picks, lugs on said bar near the center thereof and connected by a shaft pivotally connected with said piston rod, two pairs of other lugs carried by the bar and connected with the respective rear ends of said bars, said lowermost members being formed as open frames, and gauge wheels located within the frames and having their axles passing through both sides thereof, said gauge wheels being located considerably inwardly of the ends of the bars and the outermost picks thereon.

7. In a scarifying attachment for road engines including a rockably mounted fluid pressure cylinder having control means for supplying and exhausting fluid pressure thereinto and therefrom respectively and further including a piston operating within the cylinder and carrying a piston rod; a pair of vertically spaced parallel members pivoted upon each side of the engine frame, a transversely extending bar carrying a plurality of ground engaging picks, lugs on said

bar near the center thereof and connected by a shaft pivotally connected with said piston rod, two pairs of other lugs carried by the bar and connected with the respective rear ends of said bars, and spring pressed scraper members carried by the uppermost of said members and normally engaging the drive wheels of the engine, said scrapers being rotatably mounted whereby to be swung into inoperative position.

8. A road scarifying apparatus including a supporting frame, a scarifier comprising a transversely extending bar carrying a plurality of inclined, ground-engaging picks, links pivotally connected to the frame and bar and supporting said bar for up and down movement, means for forcing said bar and picks downward, means for limiting the downward movement of the picks, and means for maintaining the picks in all vertically adjusted positions at the same inclination with respect to the horizontal plane of the roadway.

9. A scarifying apparatus including a wheeled supporting frame, a scarifier comprising a transversely extending bar carrying a plurality of inclined, ground-engaging picks, the picks being adjustable with relation to the bar, links pivotally connecting the frame and bar and permitting the bar to have vertical movement, means for raising or lowering the bar, ground-engaging means limiting the downward movement of the bar, and means for maintaining said picks always at the same inclination with respect to the horizontal plane of the surface being scarified in all vertically adjusted positions of the picks.

10. In a scarifying apparatus, a supporting frame, a road sacrifier including a bar mounted upon the supporting frame for movement vertically and having a plurality of downwardly and forwardly extending picks, the bar extending beyond the sides of the frame, and gauge members associated with said bar and moving therewith and adapted to engage the surface of the road to limit the downward movement of the bar, said gauge members being disposed inward of the extremities of the bar whereby a strip of road may be scarified wider than the distance between the gauge members.

11. In a scarifying apparatus, a supporting frame, a road scarifier including a bar mounted upon the supporting frame for movement vertically and having a plurality of downwardly and forwardly extending picks, the bar extending beyond the sides of the frame, and gauge wheels operatively connected to said bar to move therewith and disposed in advance of the bar and picks and adapted to engage the surface of the road to limit the downward movement of the bar, said gauge wheels being disposed inward of the extremities of the bar whereby a strip of road may be scarified wider than the distance between the gauge wheels.

In testimony whereof I affix my signature.

HENRY D. JONES.