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ROAD BREAKING OR SCARIFYING DEVICE

APPLICATION FILED JAN. 10, 1912.

1,095,376. **Patented May 5, 1914.**

Fig. 1.

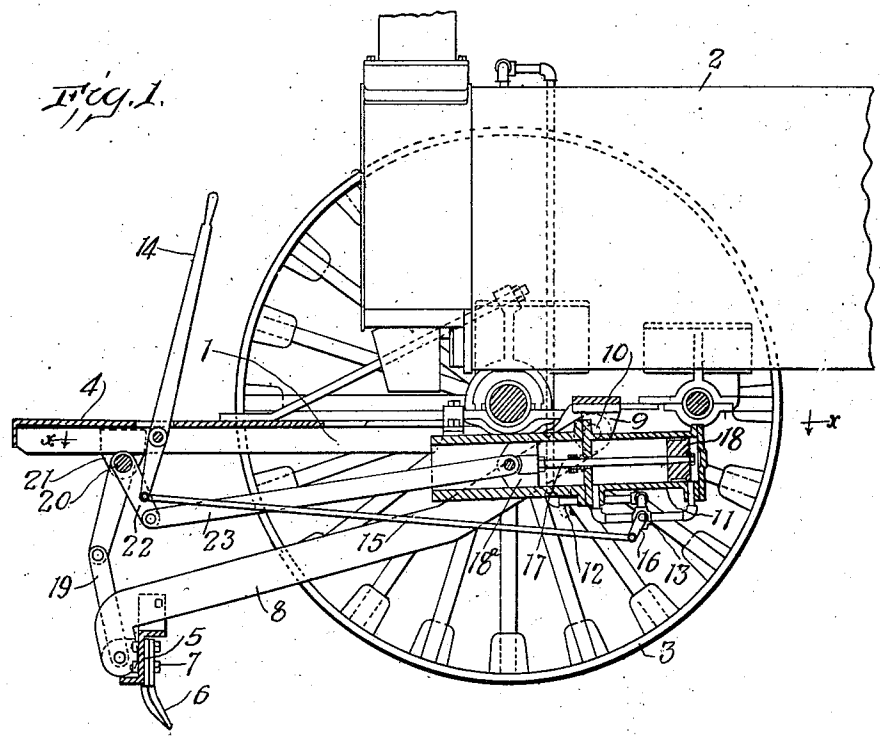
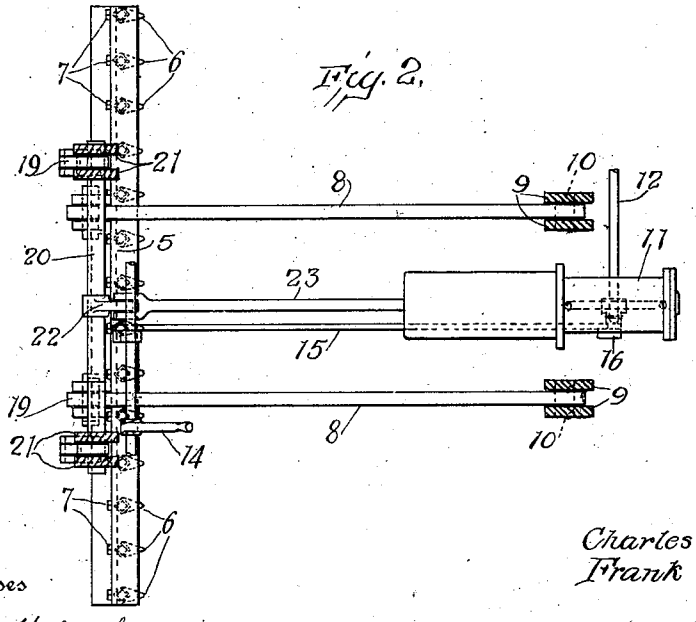


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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ROAD BREAKING OR SCARIFYING DEVICE.

1,095,376. Specification of Letters Patent. Patented May 5, 1914.

Application filed January 10, 1912. Serial No. 670,406.

To all whom it may concern:

Be it known that we, CHARLES M. BROWN, residing at Degraff, in the county of Logan and State of Ohio, and FRANK GARVER, residing at Marion, in the county of Marion and State of Ohio, both citizens of the United States, have invented certain new and useful Improvements in Road Breaking or Scarifying Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a road-breaking or scarifying device and is designed more particularly as an attachment to a road engine, such as the ordinary traction engine or steam roller. Devices of this character are utilized largely in rebuilding old roads and many of these roads are of macadam or other very hard material and much difficulty is experienced in causing the teeth of the breaking member or harrow to enter the hard surface of the road.

The object of the present invention is to provide a device of this character which will be held in engagement with the road-bed with sufficient force to cause it to tear up or break the road to the desired depth; in which the harrow or road-breaking member will be held in engagement with the road-bed by a yielding pressure which will yield to permit the harrow to pass over unbreakable portions of the road, such as pieces of solid rock, the degree of pressure exerted upon the harrow being such that it will be permitted to move upward before the strain becomes sufficient to cause injury to it; and further, to provide the harrow with means under the control of the engineer for raising and lowering the harrow at will and for controlling the amount of pressure exerted thereon.

A further object of the invention is to provide such a device which will be of a very simple and very strong construction and which can be readily attached to existing engines without material modification thereof.

In the accompanying drawings, Figure 1 is a longitudinal, sectional view of the rear portion of a road engine showing the invention applied thereto; and Fig. 2 is a horizontal section taken on the line x x of Fig. 1 and looking in the direction of the arrows.

In these drawings we have illustrated one embodiment of our invention and have shown the same as applied to an ordinary road engine comprising a frame 1 upon which is mounted the boiler 2 and which, in turn, is supported by the ground wheels 3. The frame 1 extends beyond the ground wheels and is provided with an operator or engineer's platform, as shown at 4.

It will be understood that while we have here illustrated the invention as applied to an ordinary road or traction engine it is applicable to many devices of a similar character and the term "road engine" is used to indicate any power-operated mechanism which can be propelled over the road by its own power.

The scarifying or road-breaking device proper comprises a toothed member, which in the present instance consists of a transverse frame 5 having secured thereto and depending therefrom a series of teeth 6 which are secured to the frame by means of bolts 7. The character of this toothed member may, of course, be varied to accommodate the same to various conditions. The toothed member is pivotally connected with the engine and, in the construction here shown this connection is formed by means of two drag bars 8 secured at their rear ends to the frame 5 and extending forwardly and upwardly to a point near the axis of the engine where they are pivotally connected to the engine, preferably by extending the ends thereof between lugs 9 carried by the frame and connecting the same to these lugs by pins 10. This arrangement enables a strong forward pull to be exerted on the toothed member and at the same time permits the latter to rise and fall, thereby enabling it to be moved into and out of engagement with the road-bed. A suitable cushioning device such as a fluid cylinder 11 is interposed between the toothed member and the engine to control the rise and fall of the toothed member when it is in its operative position that is when it is in engagement with the road-bed. The yieldability of the cushioning device is such that it will normally hold the toothed member firmly in engagement with the road-bed but if the toothed member should come in contact with a solid rock or a piece of road-bed which could not be broken the cushioning device will yield and permit the toothed member to

ride over the obstruction before the strain becomes sufficient to break the toothed member.

By interposing the cushioning device between the toothed member and the engine the whole weight of the engine, which is very great, is opposed to the bodily movement of the cushioning device and it is permitted to have a yielding movement only. Consequently, the toothed member cannot rise until the strain upon the same has become sufficient to cause the cushioning device to yield. It is also desirable that the cushioning device should be of such a character that the pressure thereof can be regulated, thus accommodating the device to road-beds of different hardness and enabling the toothed member to be caused to break up the road-bed to the desired depth. We prefer to accomplish these results by the use of a fluid-actuated device which, in the present instance, consists of the fluid cylinder 11 which is rigidly secured to the engine and connected by a suitable steam pipe 12 with the boiler 2. A valve 13 controls the admission of steam to the opposite ends of the cylinder and is adapted to be actuated from the engineer's platform 4. In the present instance a lever 14 is pivotally mounted adjacent to said platform and connected by a rod 15 with an arm 16 of the valve 13. The rod 17 of the piston 18 which is mounted in the cylinder, is provided at its outer end with a shoe 18ª which travels in a suitable guideway and is operatively connected with the toothed member of the device to control the movement of the latter. In the present device we have connected the toothed member with the frame of the engine by means of two toggle levers 19 arranged on opposite sides of the center of said toothed member and rigidly secured at their upper ends to a shaft 20 journaled in brackets 21 carried by the frame of the engine. An arm 22 is rigidly secured to the shaft 20 and connected by means of an arm 23 with the piston rod. The length of the toggle levers 19 is preferably such that they will not, under working conditions, be moved into a straight position which would tend to form a rigid connection between the toothed member and the engine. On the contrary the two members of each lever preferably extend at all times at an angle one to the other, thus permitting the toothed member to rise when the strain becomes sufficient to overcome the pressure of the steam upon the piston 18. By manipulating the lever 14 and consequently the valve 13, the steam pressure upon the piston, and consequently upon the toothed member of the device, can be regulated.

The operation of the device will be readily understood from the foregoing description and it will be apparent that the bodily movement of the fluid cylinder, which constitutes the cushioning device, will be prevented by the engine to which it is attached; and that the toothed member can only rise when the upward pressure thereon has become greater than the pressure of the steam in the cylinder. In practice it has been found that the pressure of the steam in the cylinder will cause the toothed member to break up road-beds of extreme hardness. Further, it will be apparent that the device can be raised and lowered by the engineer at will by the simple manipulation of the valve controlling lever 14. The yielding connection not only prevents the breakage of the toothed member in case of contact with an unbreakable substance but it permits the toothed member to follow the irregularities of the road-bed and breaks the latter to a uniform depth.

While we have shown and described one embodiment of our invention it will be understood that this has been chosen for the purpose of illustration only and that we do not desire to be limited to the details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

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

1. The combination, with a road engine, of a road scarifying attachment therefor comprising a toothed member extending transversely beneath the rear portion of said engine, drag bars connected with said toothed member, extending forwardly and upwardly and pivotally connected with said engine, a toggle lever connecting said toothed member with the rear portion of said engine, said toggle lever being so constructed and arranged that the parts thereof will normally extend at an angle one to the other to permit said toothed member to move upward relatively to said engine, a steam cylinder carried by said engine, a piston in said cylinder, a connection between said piston and said toothed member to resist said upward movement of said toothed member when steam is admitted to one side of said piston, and to impart movement to said toothed member when steam is admitted to the other side of said piston, and means under the control of the operator to admit regulated quantities of steam to either side of said piston.

2. The combination, with a road engine, of a toothed scarifying device supported beneath the rear portion of said engine, drag bars pivotally connecting said toothed member with said engine at a point in advance of said toothed member, a connecting device interposed between said toothed member and said engine and constructed and arranged to permit said toothed member to

rise and fall relatively to said engine, a cylinder, a piston mounted in said cylinder, a connection between said piston and said connecting device to resist the upward movement of said toothed member when pressure is applied to one side of said piston and to impart upward movement to said toothed member when pressure is applied to the other side of said piston, and means under the control of the operator to admit fluid to either side of said piston.

In testimony whereof, we affix our signatures in the presence of two witnesses.

CHAS. M. BROWN.
FRANK GARVER.

Witnesses:
S. E. BARLOW,
A. W. NEWBY.