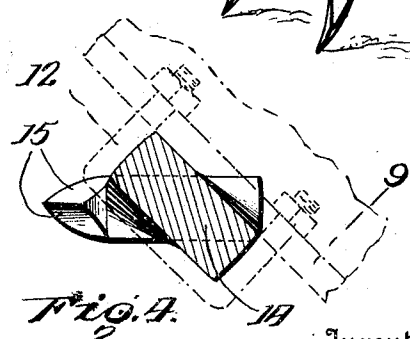
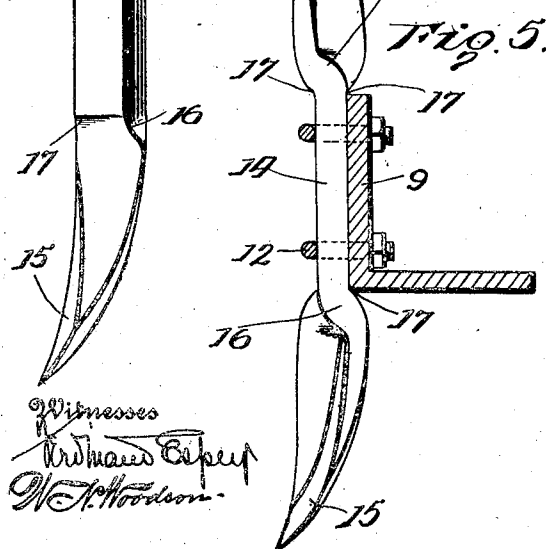
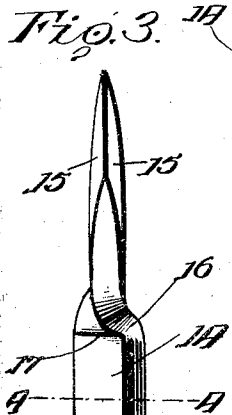
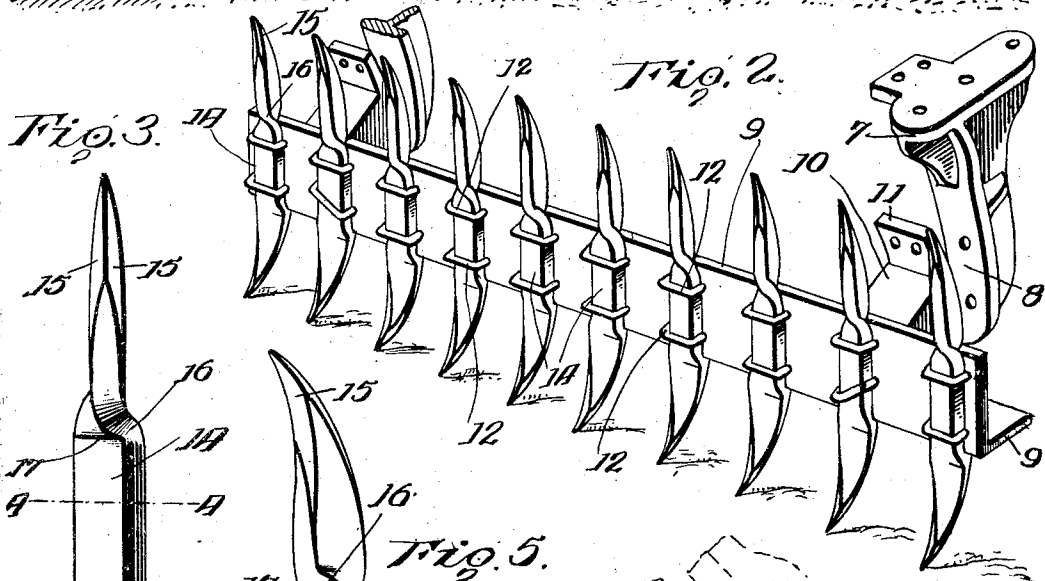
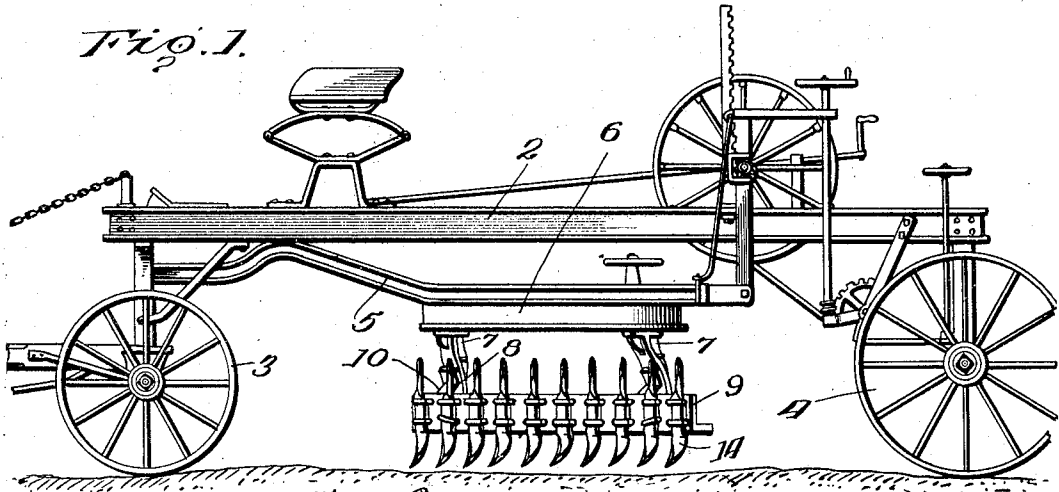


D. C. BOYD.
 SCARIFYING ATTACHMENT FOR ROAD MACHINES.
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SCARIFYING ATTACHMENT FOR ROAD-MACHINES.

1,058,841.

Specification of Letters Patent.

Patented Apr. 15, 1913.

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To all whom it may concern:

Be it known that I, DAVID C. BOYD, 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 Scarifying Attachments for Road-Machines, of which the following is a specification.

My invention relates to road making machines and particularly to a scarifying attachment therefor.

The primary object of my invention is the provision of a scarifying attachment so constructed that it may be readily applied to the mold-board brackets by which a scraper or mold-board of a road making machine or grader is supported.

A further object is to provide an attachment of this character with removable and reversible teeth.

A still further object is to provide scarifying teeth disposed at an angle of about forty-five degrees to the line of draft and so twisted that the cutting or scarifying points face the line of draft, that is, are disposed transversely to the length of the machine, the teeth being so formed as to provide shoulders assisting in holding the teeth from any vertical movement and centering the teeth with relation to the tooth carrying bar upon which they are mounted.

Further objects will appear in the course of the following description.

An embodiment of my invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of a road machine equipped with my scarifying attachment; Fig. 2 is a perspective view of the scarifying attachment; Fig. 3 is an elevation of one of the scarifying teeth; Fig. 4 is a transverse sectional view on the line 4-4 of Fig. 3; Fig. 5 is a vertical section through the tooth supporting bar, the tooth attached thereto being shown in side elevation.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

My invention is adapted to be applied to any ordinary road grader or scraper and such a road grader or scraper is illustrated in Fig. 1. The scraper supporting frame may be of any suitable or usual construction but is shown composed of side bars 2

which diverge toward the rear of the machine and which are supported at their front end by front wheels 3 and at its rear end by the rear wheels 4.

Pivotally mounted upon the front end of the machine and extending rearwardly between and below the bars 2 of the frame, are the vertically movable frame bars 5. The free ends of these bars are shown as being supported for vertical adjustment. The particular details of this vertical adjustment however, need not be described as they form no part of my invention and as means for securing this vertical adjustment are old and well known.

Mounted upon the bars 5, is an annulus 6 which may be rotatably adjusted relative to the axis of the scraper. Projecting downward and outward from the annulus 6, are the brackets 7. These brackets may be attached to the annulus in any suitable manner and each bracket is formed with a concave scraper supporting face 8. Where the machine is used as a road grader or scraper, a vertically concave scraping blade is mounted upon these brackets, the convex face of the blade contacting with and engaging the concave faces of the brackets 7. My invention consists in the provision of a scarifier adapted to be disposed upon these brackets in place of the scraper blade so that the scraper blade and the scarifying attachment may be interchanged whenever necessary and the machine thus adapted for scarifying or cutting up a hard road bed or for scraping or grading said road bed. This scarifying attachment consists of a bar 9 angular in cross section. To the rear side of this bar are attached supporting members 10 which, when the scarifier is in place, form continuations of the brackets 7. Each of these supporting brackets is approximately T-shaped and formed with a convexly curved head 11 adapted to fit snugly against the concave face 8 of the brackets 7 and to be bolted to the brackets 7 so that the members 10 form practically continuations of the brackets 7. The outer end of each supporting bracket is angular in form so that one face of the end will fit against the upwardly extending flange of the angle iron 9, while the lower face of the end will fit against the horizontally and rearwardly extending flange of the angle iron. This provides a very firm resistance to the strain exerted upon the angle bar 9

when the scarifier is in action. The pressure against the lower ends of the scarifier teeth would tend to twist the bar 9 but the rearwardly projecting flange of the bar, bearing as it does against the lower faces of the forwardly projecting ends of the bracket 10, resists this rotation of the bar and holds these scarifier teeth in a vertical position so that the pressure against the teeth is transmitted to the brackets 8. Passing through the face of the bar 9, are a plurality of pairs of U-shaped bolts 12, the bolts of each pair being arranged in vertical relation and so disposed as to clamp a scarifying tooth 13 firmly into engagement with the bar.

It is peculiarly essential that the scarifying teeth be held from any vertical movement with relation to the bar 9, and that the scarifying points of the teeth be directed parallel to the line of draft. To this end, the teeth are each formed of a flat bar of tool steel two inches across by one inch thick. The middle portion of the bar, designated 14, has a length approximately equal to the height of the vertical flange of the bar 9 and is hence adapted to lie flat and firm against the vertical face of the bar 9. The lower and upper portions of each tooth above and below the middle portion 14 are twisted in opposite directions so that each end of the tooth is at an angle of forty-five degrees with the face of the middle portion. It will be seen that this twisting of the material of each tooth brings the edge of the material at an angle of about forty-five degrees with the face of the middle portion 14, and that the ends of the bar above and below the middle portion thus form the points or cutting ends of the scarifying tooth. The edges of the bar above the middle portion are beveled as at 15 and the points are bent outward so that the front of the cutting extremity of the tooth is somewhat concavely curved, while the back of each cutting extremity is convexly curved, thus each cutting extremity has approximately the shape of a plow peculiarly adapted to dig in and cut through the ground.

It is to be particularly noted that the twist given to the extremities of the tooth, which twist begins at the point 16, provides opposed shoulders 17 which engage the upper and lower edges of the bar 9 when the teeth are in place, and these shoulders so engaging the bar 9, prevent any vertical shifting of the tooth when the bolts 12 are clamped tightly upon the tooth. Furthermore, these shoulders act to center the tooth properly with relation to the bar so that in adjusting the tooth no particular care need be taken so long as the tooth lies flat against the face of the bar 9, the tooth must be properly centered because of these shoulders, thus all of the teeth will cut to the same

depth. Furthermore, it will be seen that as the teeth are double pointed and the pointed parts are twisted a quarter turn the teeth are reversible.

The proper manner of using the scarifier is to dispose the bar 9 on a slant of about forty-five degrees to the line of draft. The one quarter turn or twist given to the extremities of the scarifier teeth will cause the teeth to squarely enter the surface of the ground or the macadam and follow straight and true to the line of draft. It will be seen that the teeth may be easily removed or replaced, and that if one of the cutting ends of a tooth is broken it may be readily reversed. It will be seen further that the opposite ends of the tooth are curved in such a manner that when the position of the tooth on the bar is reversed the lower end of the tooth will always be turned forward.

I have found in practice that the scarifying attachment above described is extremely convenient. As before stated, it permits a road machine to be used either as a scarifier or as a scraper, and while the teeth are held rigidly against vertical movement relative to the bar 9, they may be readily removed, replaced or reversed when worn.

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

1. The combination with the frame of a road making machine, an annulus supported on the frame, oppositely disposed brackets supported on the annulus projecting downward therefrom and having concavely curved outer faces, of a scarifying attachment comprising a supporting bar extending transversely to the line of draft, said supporting bar being angular in section and having a vertical flange and a horizontal flange, supporting members having their forward ends formed to fit against both the horizontal and the vertical flange of said bar and having their rear ends formed with a vertically extended head having a convex inner face adapted to fit against the concave faces of the brackets, said supporting members being removably attached to the brackets, and detachable vertically arranged scarifying teeth mounted upon said bar.

2. A scarifying attachment for road making machines comprising an angular bar having a vertical flange and a rearwardly projecting horizontal flange, supporting members projecting from the rear face of the bar, the end of each supporting member having a horizontal face and a vertical face to fit against the vertical and horizontal flanges of said bar, the rear ends of said supporting members being vertically enlarged and the rear face of each supporting member being convexly curved, a plurality of pairs of U-shaped clamping bolts arranged in vertical relation along the bar, and a plurality of scarifying teeth each sup-

ported upon the face of the bar by upper and lower clamping bolts, each tooth having a flat middle portion fitting flat against the face of the bar and having a length equal to the vertical width of the bar, the upper and lower ends of each tooth above and below the bar being tapered and twisted in opposite directions to provide scarifying points facing in angular relation to the middle portion of the tooth, each of these terminal ends being curved laterally, the bases of the twisted portions forming shoulders engaging the upper and lower edges of the bar to assist in preventing any vertical movement of the tooth and to center the tooth with relation to the bar. 15

In testimony whereof I affix my signature in presence of two witnesses.

DAVID C. BOYD. [L. s.]

Witnesses:

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DEAN C. TALBOTT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."