June 19, 1928. 1,674,110

T. H. HARDEN

GRADER

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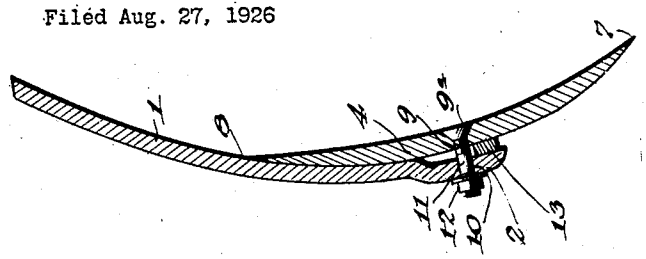


Fig. 2.

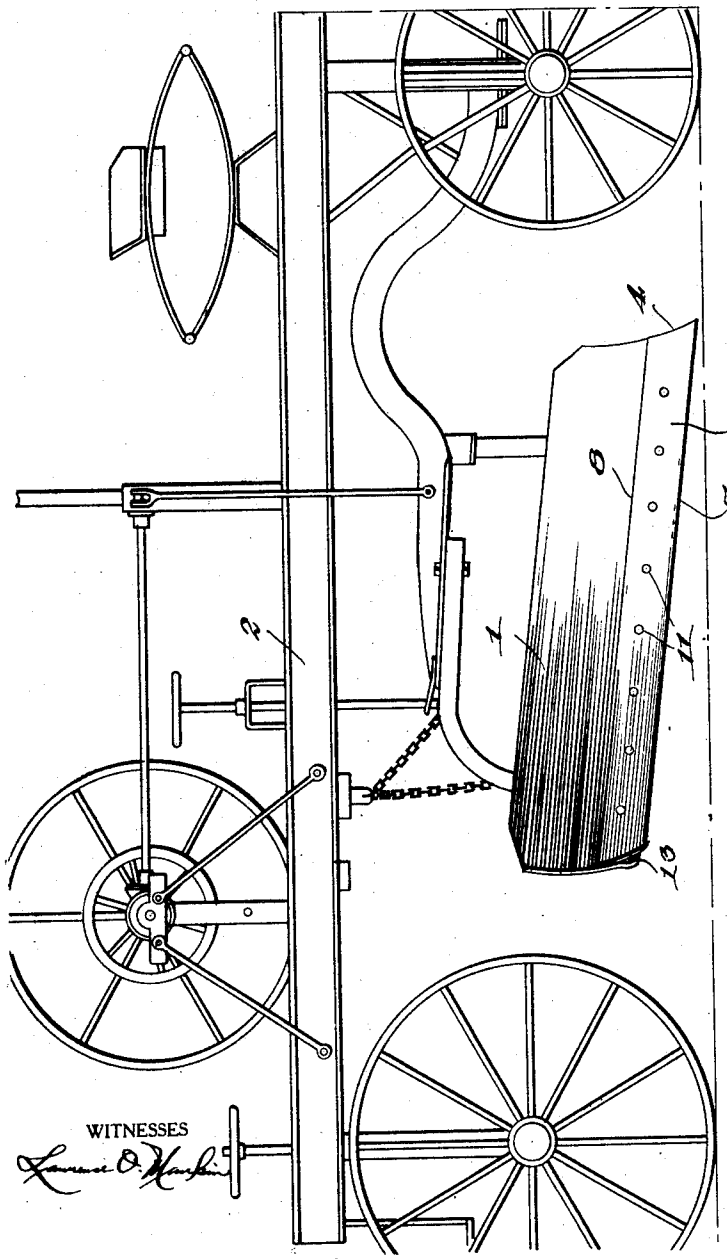


Fig. 1.

WITNESSES

INVENTOR

T. H. Harden,

BY Munn & Co.

ATTORNEYS

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THOMAS HUDSON HARDEN, OF DAWSON, GEORGIA.

GRADER.

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My invention relates generally to improvements in road or street graders of that type which includes a mold board and a cutting or scraping blade-bit detachably secured to the mold board, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of the present invention is the provision in a grader of the character described of a blade-bit which can be used a relatively long time in service without resharpening or replacement.

A further object of the invention is the provision in a grader of the character described of a reversible double-edged blade-bit and efficient means for clamping the blade-bit securely to an associated mold board when either of the cutting edges of the blade-bit is in position for use.

Other objects and advantages of the invention will be apparent from the following description, considered in conjunction with the accompanying drawings, in which:

Figure 1 is a fragmentary side elevation of a grader having a mold board equipped with a blade-bit embodying the invention.

Figure 2 is a fragmentary vertical section through the associated portions of the mold board and the blade-bit.

In Figure 1, the numeral 1 designates a mold board which is supported, adjustably or otherwise, in any suitable known manner from the frame structure 2 of a road or street grader. The specific means for supporting the mold board forms no part of the present invention and therefore will not be described.

The mold board 1 has the lower edge portion offset rearwardly at 2 and is substantially convexo-concave in vertical sectional configuration with the concavely curved face at the front, as is usual in a grader of the type hereinbefore referred to. A blade-bit formed according to the invention is indicated at 4 and is made of a suitable material, preferably steel. This blade-bit is fashioned so that its rear face will be convexly curved from the lower edge of the blade-bit to the upper edge of the blade-bit substantially in conformity with the general curvature of the front face of the mold board. The front face 6 of the blade-bit is nearly plane but may be slightly concave from the lower edge of the blade-bit to its upper edge as shown. The lower and upper edge portions of the blade-bit taper toward their edges to provide cutting edges 7 and 8 respectively at the lower and upper edges of the blade-bit. The width of the improved blade-bit from its upper edge to its lower edge is considerably greater than is usual for a blade-bit for a grader of the type referred to.

The blade-bit is provided with a series of spaced transverse openings 9 intermediate its upper and lower edges and corresponding in number and relative arrangement with transverse openings 10 through the offset lower edge portion 2 of the mold board. The openings 9 preferably are square in cross section for part of their length from the rear face of the bit-blade but are enlarged at their forward ends to produce the tapering counter-bores at 9^a for the reception of the heads of bolts 11 which are projected through registering openings 9—10 and have their shanks engaged with nuts 12 which are tightened against the rear face of the offset lower edge portion 2 of the mold board to secure the blade-bit to the mold board. The heads of the bolts 11 thus will be flush with the front faces of the blade bit when the nuts 12 have been tightened. The portions of the shanks of the bolts 11 which extend through the non-circular openings 9 also are non-circular to prevent turning of the bolts when the nuts are tightened.

The convexly curved rear face of the blade-bit will contact for a part of its area with the concavely curved front face of the mold board. In order to relieve the bolts 11 of some of the strain incident to the maintaining of the blade-bit rigid with the mold board and to assure a relatively firm engagement of the blade-bit with the mold board, I provide a spacing rod or bar 13, which is disposed between the convexly curved rear face of the blade-bit and the front face of the offset lower edge portion 2 of the mold board below the level of the series of bolts 11 and it is manifest that this spacing rod 13 will be clamped securely in place betwen the blade-bit and the lower edge portion of the mold board when the nuts 12 have been tightened on the bolts 11. The member 13 is substantially rectangular in cross sectional configuration but decreases slightly in thickness toward its upper edge.

The openings 10 in the lower edge portion of the mold board are located at a distance above the edge of the mold board sufficient to assure the supporting of the blade-bit on the mold board with the lower edge por-

tion of the blade-bit depending below the lower edge of the mold board when the blade-bit has been secured to the mold board in the manner hereinbefore described with either of its edges 7 or 8 turned downward. The front face of the blade-bit will be substantially continuous with the front face of the portion of the mold board above the blade-bit so that the loose earth or other material which impinges against the front faces of the mold board and the blade-bit will not lodge between the upper edge of the blade-bit and the mold board and moreover the upper edge of the blade-bit will be protected against wear by reason of its position on the concavely curved front face of the mold-board.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. The blade-bit, being double-edged and reversible, will be capable of use in service for at least twice the time that a single-edged blade could be used without being re-sharpened. Moreover, the double-edged blade-bit can have both its cutting edges sharpened at the same time, thus also making for economy in the time and labor that will be required to keep a road-grader that is equipped with the invention in condition for service.

While the spacing member 13 is shown as being substantially rectangular in cross section, it is obvious that it may have any other desirable configuration in cross section without departing from the spirit and scope of the invention.

Obviously, the invention is susceptible of embodiment in forms other than that which is illustrated in the accompanying drawings and I therefore consider as my own all such modifications and adaptations thereof as fairly fall within the scope of the appended claims.

I claim:—

1. In combination a transversely curved mold board having a rearwardly offset lower longitudinal edge, a concavo convex scraper blade arranged with its convex surface against the concave surface of the mold board with its upper edge merging into and continuous with said concave surface, spacer elements interposed between the offset edge and scraper blade, and fastenings passing transversely through the scraper blade and offset end.

2. In a grader, the combination with a mold board having its front face adjacent to its lower edge substantially concave in vertical sectional configuration, a blade-bit having its longitudinal edges formed as cutting edges and having its rear face curved convexly transversely of the blade-bit to conform substantially to the vertical curvature of the front face of the mold board, said blade-bit and the lower edge portion of said mold board having alined transverse openings, bolts passing through said openings and nuts threadedly engaged with said bolts for cooperating with said bolts to clamp said blade-bit to said mold board so that the lower edge portion of said blade-bit will depend below the lower edge of the mold board, and an elongated spacing member disposed between said blade-bit and said mold board below the level of said bolts.

3. In a grader, a mold board having a rearwardly offset lower edge portion and having its front face concavely curved in vertical sectional configuration above the juncture of said offset portion with the remainder of the mold board, a blade-bit having both its longitudinal edges formed to produce cutting edges and having its rear face curved convexly transversely of the blade-bit to conform to the concavely curved portion of the front face of the mold board, the front face of the blade-bit being slightly convex in transverse curvature, fastening devices securing said blade-bit along its longitudinal median line to the offset portion of said mold board, the lower edge portion of said blade-bit depending below the lower edge of said mold board, and an elongated non-circular spacing member disposed between said blade-bit and the offset portion of said mold board below the level of said fastening devices.

THOMAS HUDSON HARDEN.