Nov. 6, 1962 R. L. VIOLETTE 3,061,955

SLOPING ATTACHMENT FOR ROAD GRADER BLADE

Filed May 5, 1961

2 Sheets-Sheet 1

Fig.1

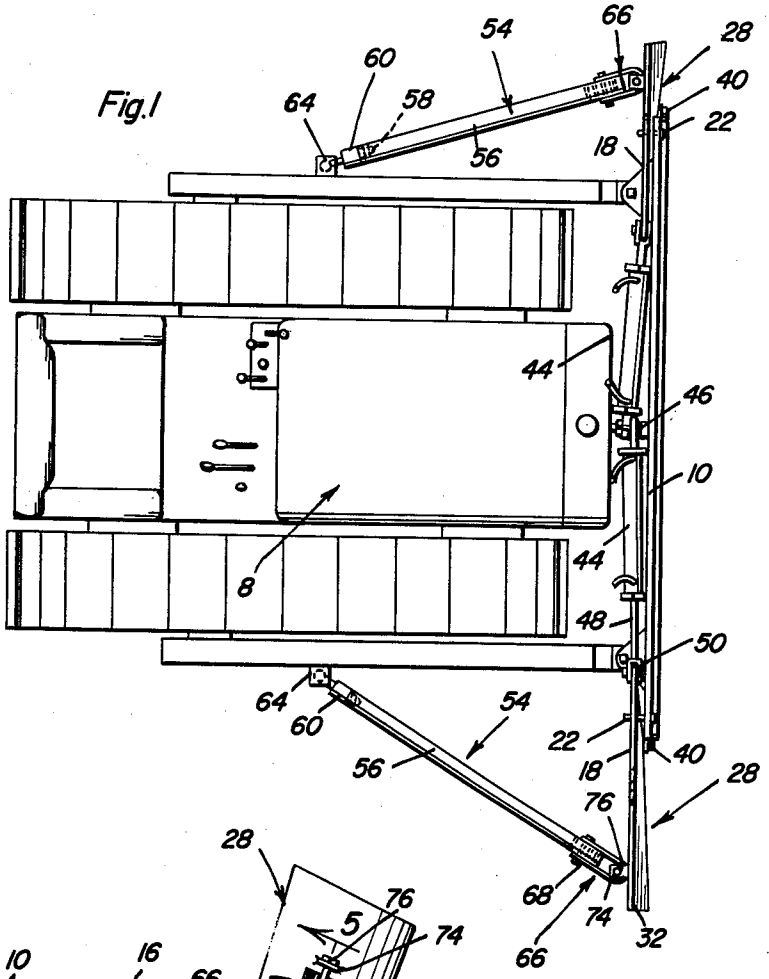


Fig.4

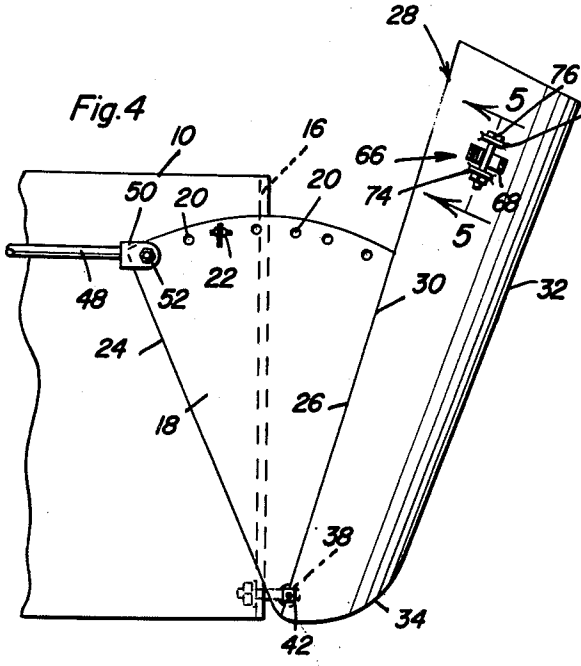
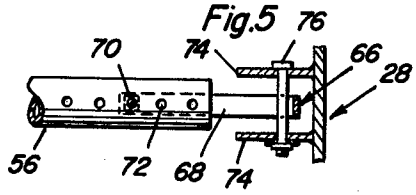


Fig.5



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Fig.2

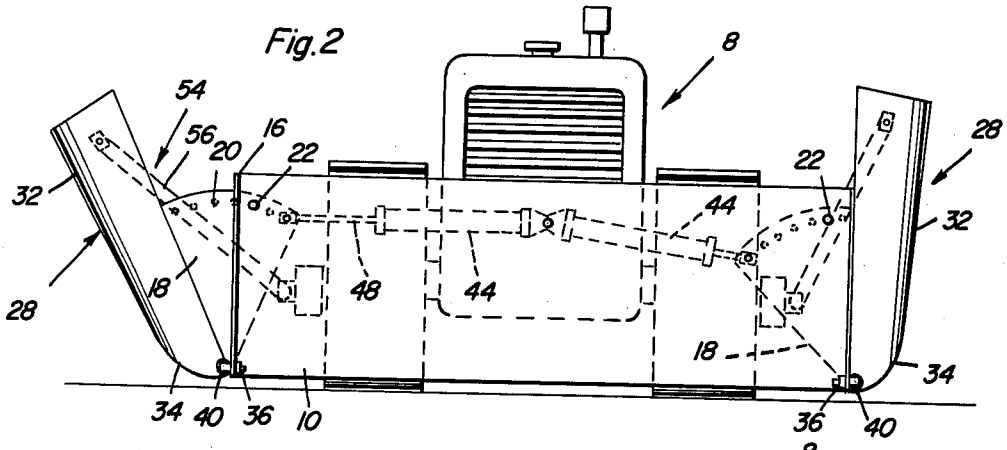


Fig.3

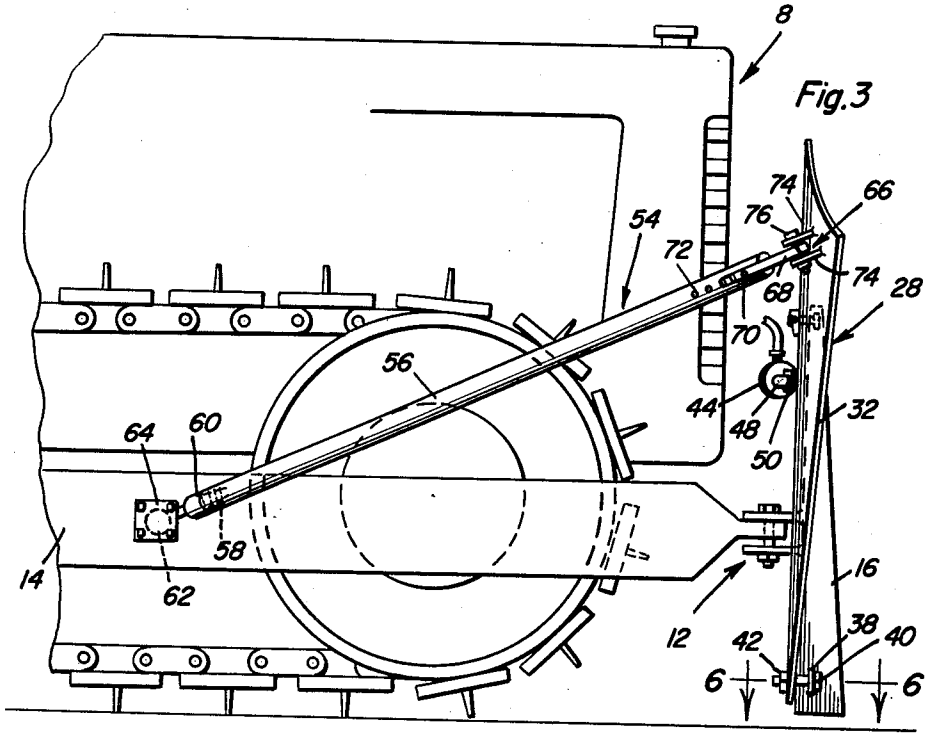
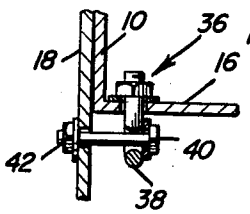


Fig.6



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SLOPING ATTACHMENT FOR ROAD GRADER BLADE

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The present invention relates to mechanical means which serves to shape, grade and otherwise impart a desired slope to a bank bordering the marginal side of a road or highway and has to do, more particularly stated, with an improved attachment for at least one vertical end of the customarily used grader blade on a crawler tractor or an equivalent road grading and leveling machine.

Persons conversant with the art to which the present invention relates are aware that dozer-type grading machines embody a forwardly disposed horizontally positioned earth moving or grader blade and that it is not new in the art to provide an attachment of one type or another at an outer end of the grader blade which is constructed and arranged to achieve the desired bank sloping effect. An object of the present invention is to provide a simple, practical and structurally distinct attachment which will more aptly and satisfactorily withstand the same pushing pressure as is simultaneously applied to the grader blade.

Another object of the invention is to so construct and arrange the attachment that the operator is able to install or remove the principal components of said attachment with a minimum of effort and within a minimal period of time.

The concept also features a construction whereby adjustment needs may be had either manually or hydraulically. Then, too, the blade and the plate which is adjoined thereto constitutes a solid unit the construction of which prevents material from passing between the cooperating grading and sloping blade in order to effect results. Further, the improved construction and arrangement is such that when the blade is not in use it can be folded or adjusted to an out-of-the-way position. Briefly and considered from an overall combination standpoint the invention is characterized by a road grading and surface conditioning machine having a generally horizontal grader blade at a front portion of the frame structure, at least one bank sloping attachment comprising a vertically elongated blade, means hingedly and tiltably mounting a lower end portion of said sloping blade on an outer end portion of said grader blade, means for moving the sloping blade from idle to working position, means for positively fastening said blade in a predetermined set position, and means for stabilizing said sloping blade.

More specifically the invention has to do with a two-part unit embodying a sector-shaped plate, means for hingedly and adjustably mounting the same on a cooperating end portion of the grader blade and an elongated suitably shaped blade united with an outer vertical edge of the plate, and bracing and operating means.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a top plan view of a crawler-type tractor provided on the forward end with a grading blade and sloping attachments at the respective outer ends thereof;

FIGURE 2 is a view in front elevation, a view observing FIGURE 1 in a direction from right to left;

FIGURE 3 is a fragmentary view on an enlarged scale wherein significant parts are clearly illustrated;

FIGURE 4 is a fragmentary view showing principal components of the attachment as constructed and mounted at one end of the grader blade and with the same in extended ready-to-use position;

FIGURE 5 is an enlarged view in section and elevation taken on the plane of the line 5—5 of FIGURE 4; and

FIGURE 6 is a fragmentary sectional view on the horizontal line 6—6 of FIGURE 3.

The numeral 8 in FIGURES 1 to 3 designates generally a road grading machine of any suitable construction insofar as the present invention is concerned. The one illustrated is a crawler type dozer which is provided at its forward end with a horizontal earth-moving grader blade 10 suitably mounted as at 12 (FIG. 3) on the frame 14. The grader blade is provided with forwardly projecting end flanges 16.

While the grader blade is here shown at both ends with sloping attachments it will be evident that each attachment is the same in construction. A description of one will suffice for both. To this end and with reference first to FIG. 4 it will be noted that the numeral 18 designates a flat-faced vertically disposed fan-shaped plate (also referred to as sector-shaped) the upper arcuate edge of which is provided with selectively usable keeper holes 20 for an adjusting and retaining pin 22 removably mounted in a hole provided therefor in the grader blade. The inner vertical edge, the one to the left in FIG. 4, is denoted by the numeral 24 and the one to the right by the numeral 26 and the sloping blade proper 28 is joined along its inner lengthwise edge 30 to the edge 26. The upper end portion of the blade projects above the corresponding end of the plate 18. The outer vertical or lengthwise edge 32 is shaped to provide a leading cutting edge and the lower portion thereof 34 is rounded off to accomplish the desired bank grading and shaping effect (not illustrated).

With reference now to FIG. 6 the numeral 36 designates an eye bolt mounted on the lower portion of the forward flange 16 the eye 38 providing a bearing for an assembling and journaling bolt 40. The shank of the bolt is journaled in the eye and the threaded nut-equipped end of the bolt is separably connected as at 42 to the lower end or apical portion of the plate. Thus the desired hinging joint and separable connection is had, making it easy and practical to readily install and remove the unit made up of the plate 18 and blade 28.

Whereas with the construction so far described the sloping blade unit (components 18 and 28) may be adjusted, that is swung in or out by hand and then fastened, it is within the purview of the concept to accomplish this in and out movement mechanically. To this end a hydraulic cylinder or jack may be provided. This jack comprises an arrangement as shown best in FIG. 1 and wherein the cylinder is denoted at 44 and suitably bolted or mounted pivotally at 46 on the central rear side of the grader blade 10. The plunger rod 48 is provided (FIG. 4) at an operating end with a fork 50 pivoted to a corner of the plate as shown at 52. This jack or cylinder may be operated from any appropriate remote control means (not shown) located adjacent to the operator's seat.

The rigidifying and bracing means is denoted generally by the numeral 54 and comprises an elongated barrel or tube 56 the lefthand end (FIG. 3) of which is internally screw-threaded to accommodate the coarse threads on a connecting plug 58 constituting a part of a fitting 60 having a ball head 62 mounted in a socket member 64 and

thus providing an appropriate ball and socket connection between the tube **56** and the frame member **14**. The upper or outer end of the tube is detachably and adjustably connected to the upper end portion of the blade **28**. This is accomplished as shown for example in FIG. 5 wherein a strap is bent into U-shaped form to provide a coupling clevis **66**. The arms **68** of the clevis straddle the tube and are adjustably bolted as at **70** to bolt holes **72** provided for that purpose in the manner illustrated. The bight portion of the clevis is linked to the fixed spaced parallel lugs **74** on the rear side of blade **28** by way of assembling and pivoting bolt **76**.

Depending on whether the left bank or right bank bordering the highway is to be graded and sloped the desired sloping attachment is accordingly brought into play. That is to say the sloping blade means may be adjusted, as is generally the case, by hand and then fastened in place with the insertable and removable fastener **22** fitting into the keeper holes **20**. By properly positioning the blade and fastening it and adjusting the jacks, where jacks are being used, and also the brace means **54**, the invention is ready for use.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. For use in shaping, grading and sloping a bank bordering a marginal side of a road or highway, an attachment for a flanged end portion of a grader blade comprising a generally flat-faced plate sector-shaped and having an upper arcuately curved end portion provided with longitudinally spaced selectively usable keeper holes adapted for reception of an adjusting and retaining keeper pin carried by the aforementioned grader blade, an elongated sloping blade of a length greater than the length of the plate and disposed in a plane common with the plane of the plate and having a lengthwise edge integrally joined to a corresponding lengthwise edge of the plate, a substantial upper end portion of said blade projecting beyond the arcuately curved end of said plate, the lower end portion of said blade being rounded and adjoined to the apical lower end portion of said plate, said blade having an outer lengthwise edge projecting forwardly and constituting a cutting edge, a linking pin fixed to a rearward upper portion of said blade, an elongated brace having means at a rearward end whereby said ends may be joined to a relatively stationary frame member embodied in the frame of a road grading machine, and an adjustable clevis carried by the forward end of said brace and detachably and adjustably connected with said linking pin.

2. In combination with a road grading machine, a grader blade and a bank sloping attachment for an end thereof, said attachment comprising a flat sector-shaped mounting and adjusting plate, said plate having an upper arcuately curved enlarged end portion provided with longitudinally spaced selectively usable keeper holes and a reduced lower end portion, means detachably and hingedly mounting said reduced lower end portion on the lower end of one edge of the grader blade, said plate being parallel to but slightly behind said grader blade thereby enabling the folding of said plate behind said grader blade, means on the upper end of said one edge of the grader blade selectively engageable with said keeper holes for maintaining said plate in an adjusted position relative to said grader blade, an elongated sloping blade of a length greater than the length of the plate, said sloping blade having a longitudinal edge secured along the outer edge of said plate and adjustable therewith, a substantial upper end portion of said sloping blade projecting beyond the arcuately curved end portion of said plate, the lower end portion of the sloping blade being rounded and adjoined to the apical lower end portion of said plate for the shaping of the transition area adjacent the slope formed by the sloping blade, and an elongated adjustable brace pivotally secured to and between a fixed point on the grading machine and the rearward upper portion of the sloping blade.

3. The structure defined in claim 2 including means for adjusting said sloping blade, said means comprising a hydraulic cylinder having a reciprocable push-pull rod, said cylinder being secured to the road grading machine and the rod being connected to the upper arcuate end of the plate.

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