

Jan. 23, 1934.

W. L. SPOON

1,944,307

CHANNELER ATTACHMENT TO ROAD GRADING MACHINES

Filed Dec. 8, 1931

3 Sheets-Sheet 1

Fig. 1.

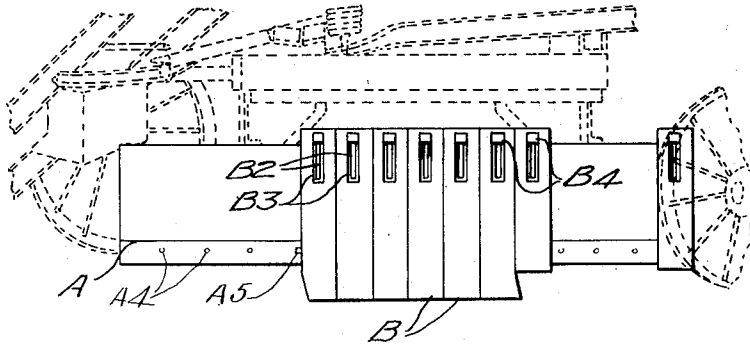


Fig. 2.

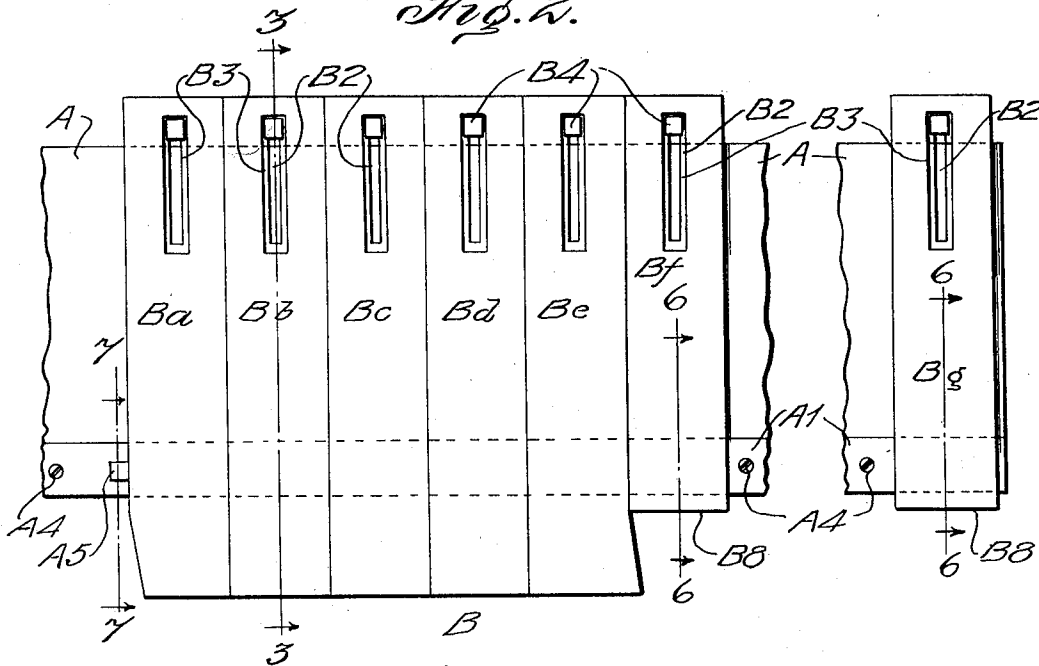
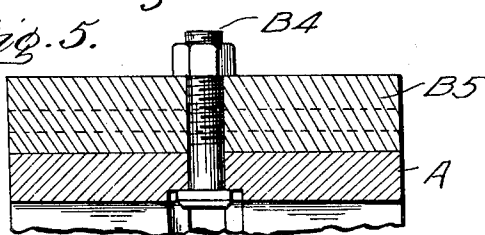


Fig. 5.



INVENTOR.
W. L. Spoon
BY *Cyrus K. K.*
ATTORNEY

Jan. 23, 1934.

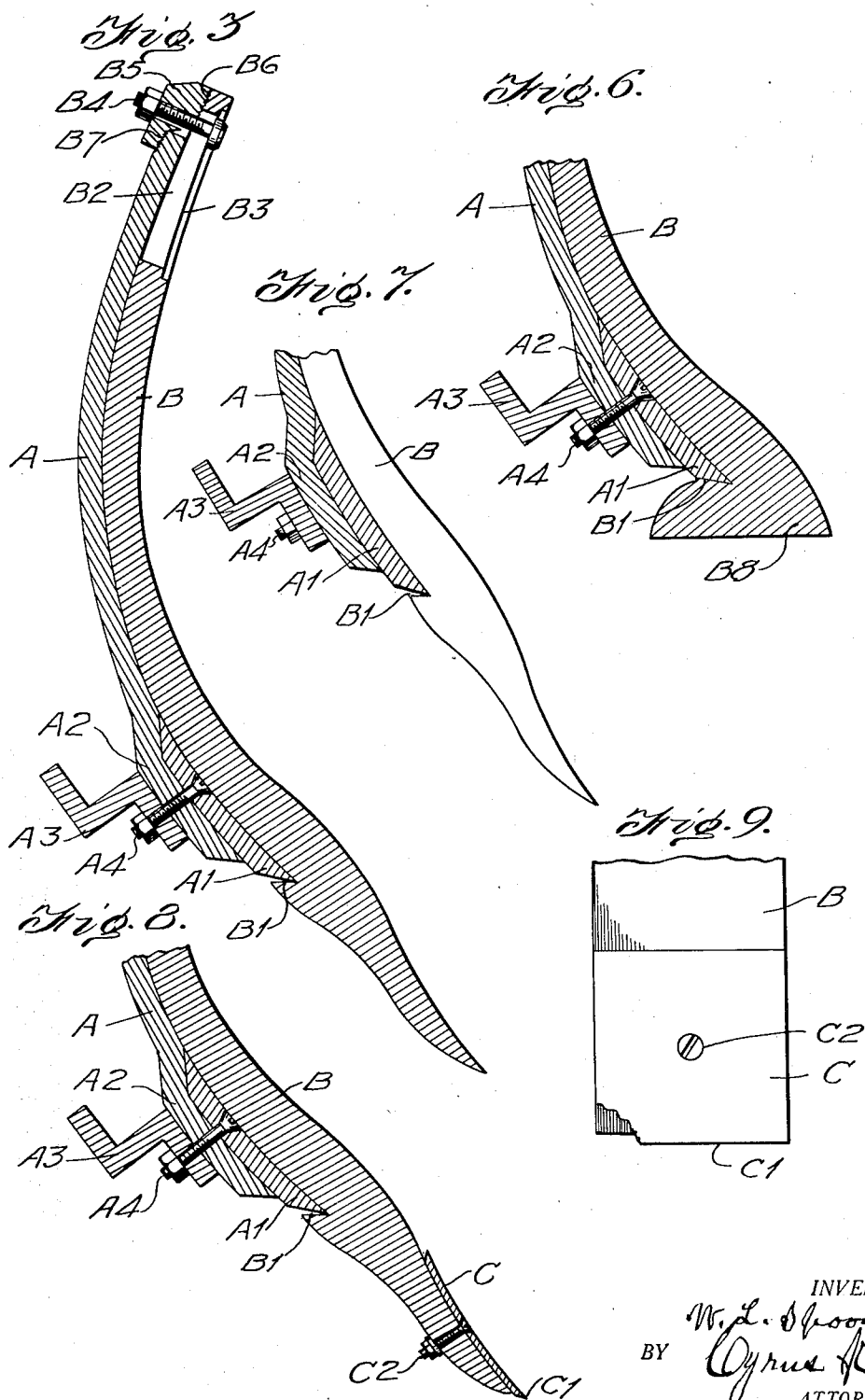
W. L. SPOON

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CHANNELER ATTACHMENT TO ROAD GRADING MACHINES

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3 Sheets-Sheet 2



INVENTOR.
W. L. Spoon
BY *Cyrus Keller*
ATTORNEY

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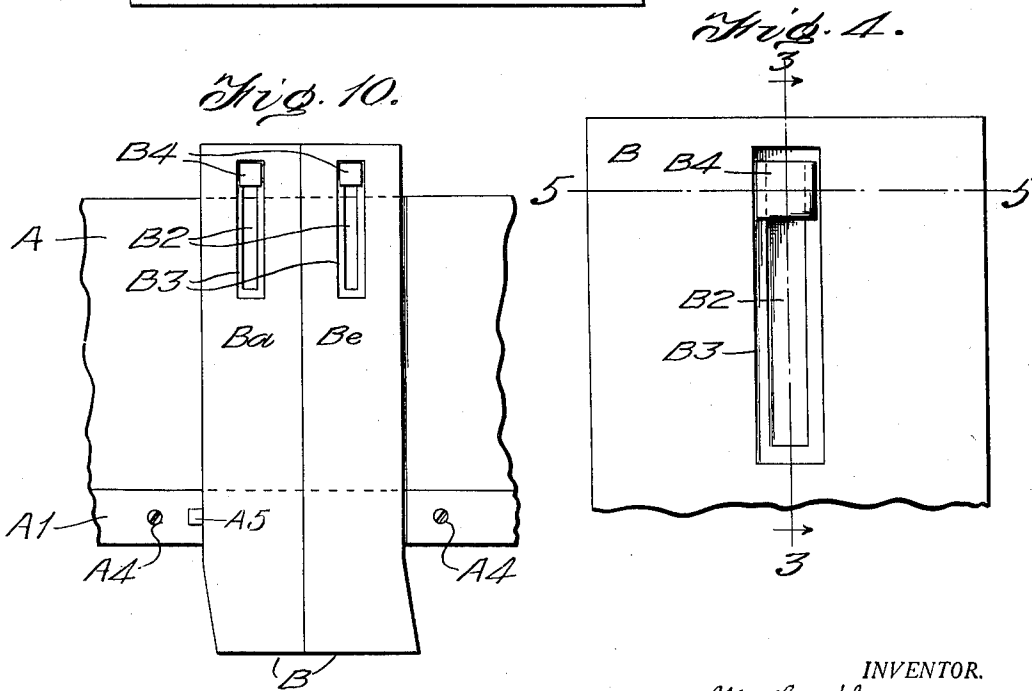
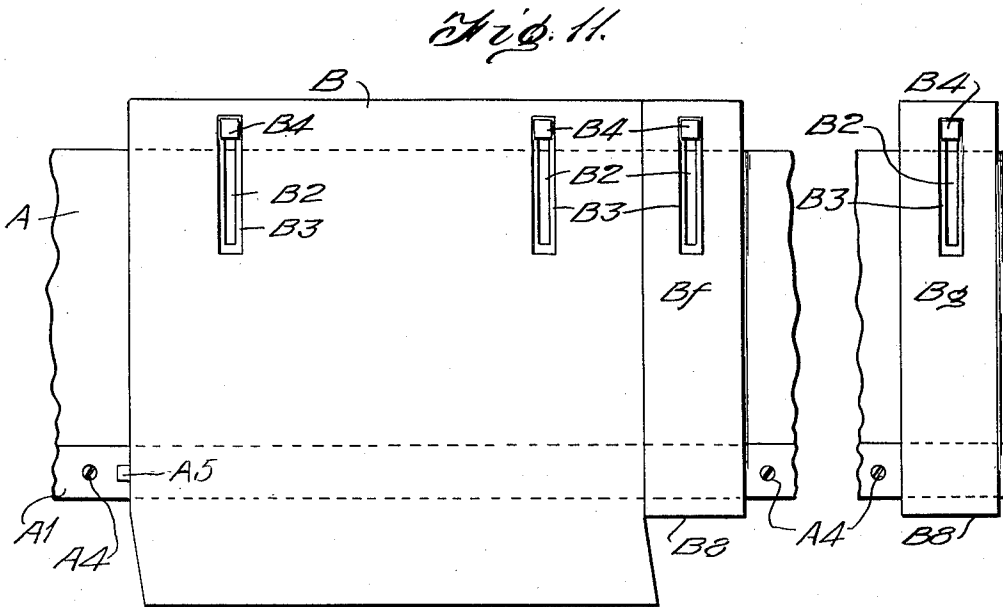
W. L. SPOON

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CHANNELER ATTACHMENT TO ROAD GRADING MACHINES

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3 Sheets-Sheet 3



INVENTOR.
W. L. Spoon
BY *Cyrus Kelly*
ATTORNEY

UNITED STATES PATENT OFFICE

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CHANNELER ATTACHMENT TO ROAD
GRADING MACHINES

William L. Spoon, Burlington, N. C.

Application December 8, 1931. Serial No. 579,741

26 Claims. (Cl. 37-143)

My invention relates generally to road grading machines, and particularly to an extension to be applied or attached to the moldboards of such machines, the purpose of said attachment being to adapt the machine to cut a channel or trench in a dirt shoulder preparatory to adding to the width of a hard-surfaced road or pavement.

Many roads have been built with a hard-surfaced middle portion and a dirt shoulder at each side having its upper surface even with the upper face of the hard middle portion. In many places, along many hundreds of miles of highways, increase in automobile highway traffic has made it apparent that the hard-surfaced middle part of the road is too narrow to allow automobiles and auto trucks to at all times remain on the hard-surfaced part, and frequently the outer wheels of such vehicles go outward beyond the hard-surfaced portion and on the dirt shoulder, that shoulder yielding and allowing the making of ruts along the edge of the substantial middle portion of the pavement. Repetition of the running of such wheels on the dirt shoulders serves to make the ruts deeper. Rain water accumulating in the ruts acts to further soften the dirt shoulder and allow further yielding when wheels traverse the shoulders. Because the ruts form close to the upright faces of the firm middle part of the roadway, the tires of wheels are damaged by slipping into the ruts and grinding on said upright faces.

Furthermore when wheels thus slip downward due to the yielding of the dirt shoulder, sometimes serious accidents result, those accidents involving the wrecking of automobiles and seriously injuring or killing occupants of the automobiles.

Accordingly it is recognized in highway engineering, that it is highly desirable to replace dirt shoulders with substantial belts or strips forming additions to the hard-surfaced middle part or body of the road as previously constructed.

The object of my invention is to provide means adapted to be attached to the moldboard of road grading machines now in use, said attachment being so placed on the moldboard as to allow one end of the moldboard to be above the hard surface and allow the attachment to extend across a suitable width of the dirt shoulder and there remove the dirt shoulder to the desired depth, the dirt so released being moved outward beyond the channel thus formed, said channel then being ready to receive crushed stone or gravel, concrete, asphalt, or any other suitable material

adapted to make a substantial addition to the main part of the pavement, that addition having its upper face continuous with the upper face of said main part.

For convenience in description, my attachment will herein be termed a channeler.

In the accompanying drawings,

Fig. 1 is a perspective of a part of a road grading machine, showing the moldboard in the working position and supporting my channeler formed of segments, other parts being dotted;

Fig. 2 is a front elevation of parts of the moldboard detached from the machine, my channeler being in position on the moldboard, and the channeler being shown composed of sections or segments;

Fig. 3 is an upright section on the line, 3-3, of Figs. 2 and 4, looking toward the right;

Fig. 4 is a front elevation of the upper part of one of the segments of the channeler;

Fig. 5 is a horizontal section on the line, 5-5, of Fig. 4;

Fig. 6 is an upright section on the lines, 6-6, of Fig. 2, looking toward the right;

Fig. 7 is an upright section on the line, 7-7, of Fig. 2, looking toward the right;

Fig. 8 is a view like the lower part of Fig. 3, with a cutting plate attached;

Fig. 9 is a front elevation of the lower part of Fig. 8;

Fig. 10 is a view of a part of the moldboard showing only two channeler segments attached;

Fig. 11 is a view similar to Fig. 2, the main part of the attachment being a single piece.

For convenience in description, the end of the moldboard which is the farther from the body of the machine is considered the outer end of the moldboard, while the other end is considered the inner end of the moldboard.

For convenience, the channeler is preferably made of a plurality of individual pieces or segments, placed side by side and closely fitted against each other and individually firmly secured to the moldboard. While it is practicable to make the body of the channeler a single piece, the manufacturing and applying of the channeler are facilitated by making it in pieces. Furthermore, in practice, it will be desirable to vary the width of the trench or channel to be cut. That makes it desirable to vary the horizontal dimension of the whole channeler on the moldboard. By forming individual pieces, a sufficient number of the pieces may be applied to the moldboard to provide for making the channel of the desired width.

Referring to the drawings, A, is the usual moldboard in graders of this general type, the moldboard being supported diagonally by well-known means. Along the lower part of the moldboard and forming a part thereof is shown the usual auxiliary cutting blade, A1, seated on the offset part, A2, of the moldboard, (Fig. 3), whereby the front face of said blade is brought even with the main part of the front face of the moldboard. Extending parallel to the rear face of the offset portion, A2, of the moldboard is a Z-bar, A3 (Fig. 3), having one flange lying flatwise against the rear face of the offset portion, A2, of the moldboard. Bolts, A4, suitably spaced from each other, extend through the cutting blade and the moldboard and said flange of the Z-bar and firmly bind said three members together. The forward or outer ends of said bolts are counter-sunk and the opposite ends have nuts. The Z-bar, heretofore in use, forms a brace for the moldboard.

The channeler is designated by the letter, B. In the form shown by the drawings, the channeler is applied to the front face of the moldboard, and approximately midway between the ends of the moldboard. The rear face of each piece or segment of the channeler conforms to and bears against the front face of the moldboard. At and along the lower edge of the moldboard, the rear face of the channeler is provided with a groove, B1, of approximately V-form, to receive the lower edge of the cutting blade, A1, of the moldboard, which blade is bolted to the moldboard, as above described. This engagement resists upward and forward movement of the attachment.

The channeler extends downward on the general course of the curvature of the moldboard to a line which is parallel to the lower edge of the moldboard and far enough below the level of said edge to make a distance equalling the desired depth of the trench or channel to be cut in the dirt shoulder. But, from the V-form groove, B1, downward, the channeler inclines downward out of what would be the course if the curvature of the moldboard were followed. By making this incline, the cutting edge of the channeler is brought to the desired channel or trench depth without making the downward extension of the channeler unnecessarily long. Furthermore, this inclination makes the lower portion of the channeler approximately right for functioning as a moldboard relative to the material to be moved for making the trench.

The upper end of each segment of the channeler extends upward far enough to extend above the highest moldboard to which the channeler is to be applied. Each segment is provided with an upright slot, B2, which extends above the upper edge of the moldboard far enough to allow a bolt, B4, to pass horizontally through said slot above the upper edge of the moldboard. A clamp block, B5, is applied to the rear face of the segment and extends across the upper edge of the moldboard and downward over the rear face of the moldboard. When the bolt, B4, is tightened, the upper front face, B6, of the block is pressed against the adjacent part of the rear face of the segment, and the lower forward face, B7, of said block is pressed firmly against the rear face of the moldboard. The faces, B6 and B7, of the block are shown roughened or channeled to facilitate engagement with the faces with which they make contact.

As shown by Figs. 3 and 4, the slot, B2, is widened at the outer face of the member, B, to

form lateral shoulders, B3, to support the head of the bolt, B4, the head having straight lateral faces adapted to bear against the faces extending outward from the shoulder, B3, whereby turning of the bolt is prevented, and whereby the bolt may slide in the slot, B2, when the nut of the bolt has been loosened.

When the moldboard is lower than as shown in Fig. 3, the bolt, B4, and the clamp block, B5, may be moved downward, the bolt being made to slide in the slot, B2, to make the clamping engagement shown in Fig. 3.

Provision is made for supporting the moldboard slightly above and free from the adjacent concrete face. The drawings show the main attachment composed of upright segments, Ba, Bb, Bc, Bd, Be and Bf, the segment, Bf, being extended downward only a little below the V-form groove, B1, and being then turned backward to form a shoe, B8, (Fig. 6) adapted to rest on and slide on the upper face of the adjacent concrete, while the segment, Be, extends downward along the upright edge of the concrete. At the right hand or outer end of the moldboard is a segment, Bg, of the same shape as segment, Bf, and having also a shoe, B8, adapted to rest on the upper concrete surface to support the moldboard free from the concrete. The thickness of the shoe, B8, on the segments, Bf and Bg, may be varied to vary the height of the moldboard and consequently the depth to which the channeler will cut. The front edge of the shoe of segment, Bf, should be shaped to conform to the slant of the lower edge of the moldboard to serve as a diagonal scraper for pushing from the concrete any dirt thrown on the concrete by the cutting segments. This is a special function of the shoe in addition to supporting the moldboard relative to the pavement. The lower part of the outer edge of the segment, Be, adjacent the pavement is to be cut slanting to make said part of said edge parallel to the adjacent upright face of the concrete, in order that said edge of the segment may clean away all dirt to the full depth of the channel, preparatory to receiving the substitute material.

The lower part of the outer edge of the segment, Ba, is to be cut slanting to make it upright and parallel to the course of travel of the machine, in order that said segment may cut that side of the trench or channel with a clean upright face.

When the lower ends of the segments, Bf and Ba have been thus formed for upright facing of the trench or channel, they are adapted to use in those two outer positions, regardless of the number of segments. It will now be seen that the channeler is to be adjusted for varying the width of the channel or trench by varying the number of segments between the segments, Ba and Be. If a narrow trench or channel is to be cut, only one of the intermediate segments may be used. If a still narrower trench or channel is to be cut, all the intermediate segments may be omitted and the segments, Ba and Be, placed side by side and against each other. (See Fig. 10.)

It will usually be found desirable to use the segment, Bg, as a second support for holding the moldboard free from the upper face of the concrete pavement.

It will be understood that engagement of the channeler against the edge of the concrete pavement and against the earth to be removed by the channeler, tends to make the channeler slide

toward the rear or left-hand end of the moldboard, in opposition to the grip of the clamps, B5, and the bolts, B4, and the engagement in the V-form groove, B1.

5 To constitute a stop or stay against such movement, I remove one of the Z-bar bolts, A4, and substitute a similar bolt, A5, having a head extending above the adjacent front face of the moldboard in position to be met by the adjacent
10 left-hand edge of the channeler. If the channeler is made in segments, then, for assembling, the appropriate moldboard blade bolt, A4, is removed and a bolt, A5, having a suitable head is inserted in lieu of the bolt taken out. Next the
15 segment, Ba, is put into position on the moldboard and against said bolt head and clamped to the moldboard by means of the bolt, B4, and the clamp block, B5. There being no tendency for the channeler to slide in the opposite direction, no additional means for confining or securing the channeler is necessary to hold it securely
20 in place while in operation.

Some operators may deem it desirable to have an auxiliary, detachable cutting member on the
25 lower ends of the channeler segments. For that purpose, Figs. 8 and 9, show a relatively thin plate, C, of a length and width to extend over the lower part of the front face of the member, B, the lower edge, C1, of the plate extending below
30 the lower edge of the member, B. A bolt, C2, extends through the plate, C, and the adjacent part of the member, B, to bind the plate, C, to the member, B. The head of the bolt is countersunk in the plate, C. The bolt is preferably placed mid-
35 way between the upper edge and the lower edge of the plate, C, and each of said edges being made sharp, in order that the plate may be applied with either edge up, the plate thus being made reversible. The plate, C, is to be made of
40 metal adapted to receive and retain good cutting edges. When this plate, C, is not used, the lower edge of the member, B, may be "chilled" to make it hard.

When the shoulders are composed of very hard
45 earth or are stony, it will be desirable to precede the channeler with a scarifier to break up the hard shoulder. Under ordinary conditions, that will be unnecessary. For deep or wide channels, two or more cuts may be necessary, because the
50 amount of earth to be removed may be larger than the moldboard of the road machine can handle at one operation. This is a matter of operation well understood by road machine operators.

If the bottom of the channel is to be inclined, the entire moldboard is correspondingly tilted in
55 the usual manner. When that is to be done, the length of the segments, Bf and Bg, below the moldboard, may be made unequal to the desired extent. Furthermore, the bottom of the channel
60 may be inclined in cross section, by making the cutting segments extend to different distances below the moldboard. If the greater depth is to be adjacent the concrete, the long segments will be adjacent the concrete and the other segments
65 being made successively shorter.

I claim as my invention,

1. In combination, a road grader moldboard extending horizontally over the road surface and over the adjacent area which is to be channeled, a channeler adapted to be mounted on said moldboard away from the inner portion of the moldboard and having a horizontal lower edge extending downward below the moldboard, the portion of the moldboard inward of the channeler being adapted to reach over the adjacent road surface,
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and means supported on that portion of the moldboard adjacent the channeler and adjacent the end of that portion, said means being spaced apart and each extending below the moldboard a distance suitable to form a foot for supporting the moldboard at two points free from the road surface, whereby the channeler may work in the dirt shoulder while the inner portion of the moldboard is supported on and traverses the adjacent road surface without cutting said surface.
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2. In combination, a road grader moldboard, a channeler adapted to be mounted on said moldboard away from the inner portion of the moldboard and engaging horizontal edges of the moldboard and extending downward below the moldboard, the portion of the moldboard inward of the channeler being adapted to reach over the adjacent road surface, and means supporting that portion of the moldboard and extending below the moldboard a distance suitable to form a foot for supporting the moldboard free from the road surface, whereby the channeler may work in the dirt shoulder, while the inner portion of the moldboard is supported on and traverses the adjacent road surface without cutting said surface.
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3. In a channeler attachment to a road grader moldboard, the combination of an excavating body adapted to lie against the front of the moldboard intermediate the ends of the moldboard and extend to the upper edge of the moldboard and below the lower edge of the moldboard and having a horizontal lower edge and having in its rear face, near said lower edge, a channel to receive and detachably engage the lower edge of the moldboard, and means in operative relation with the upper part of said body and the upper part of the moldboard to detachably secure said body to the upper part of the moldboard.
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4. In an attachment to a road grader moldboard, the combination of a supporting body adapted to lie against the front of the moldboard and extend to the upper edge of the moldboard and below the lower edge of the moldboard and clamping means in operative relation with said body and the moldboard to detachably secure said body to the moldboard, the lower end of said body extending below the moldboard a distance suitable to allow said body to rest on the road surface and support the moldboard free from said surface, the rear face of said body, near its lower part, being channeled to receive the lower edge of the moldboard.
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5. A channeler attachment for a road grader moldboard, said attachment being adapted to lie against the front face of the moldboard from the lower edge approximately to the upper edge of the moldboard and being shaped for and including means for making engagement with the upper part of the moldboard and with the lower part of the moldboard.
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6. A channeler attachment for a road grader moldboard, said attachment having a horizontal lower edge being adapted to lie against the moldboard from the lower edge approximately to the upper edge of the moldboard and formed to make engagement with the lower part of the moldboard to resist upward pressure and movement away from the moldboard and including means for securing the attachment to the upper part of the moldboard said attachment being located intermediate the ends of the moldboard.
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7. A channeler attachment for a road grader moldboard, said attachment being adapted to extend adjacent the upper edge of the moldboard and below the lower edge of the moldboard and
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lie against the moldboard and being recessed at its back to receive the lower edge of the moldboard and including clamping means adjacent the upper edge of the moldboard for securing the attachment to the moldboard.

8. A channeler attachment for a road grader moldboard, which attachment is adapted to lie against the moldboard and is shaped for and includes means for making engagement with the upper part of the moldboard and with the lower part of the moldboard, and stop means for forming engagement between the moldboard and the outer upright edge of the attachment.

9. A channeler attachment for a road grader moldboard, which attachment is adapted to lie against the moldboard and is shaped for and includes means for making engagement with the upper part of the moldboard and with the lower part of the moldboard, and a stop bolt supported by the moldboard and extending forward from the face of the moldboard adjacent the outer upright edge of the attachment.

10. In a channeler attachment for a road grader moldboard, said attachment being adapted to lie against and extend below and formed to make engagement with the lower part of the moldboard and the upper part of the attachment extending above the upper part of the moldboard and having an upright slot, and binding means for engaging in said slot and engaging the moldboard.

11. In a channeler attachment for a road grader moldboard, said attachment being adapted to lie against and extend below and formed to make engagement with the lower part of the moldboard and the upper part of the attachment extending above the upper part of the moldboard and having an upright slot, binding means for engaging in said slot and engaging the moldboard, and stop means adapted to engage the moldboard and the outer upright edge of the attachment.

12. Channeler attachment means for a road grader moldboard, said means comprising a main attachment adapted to lie against the moldboard and being shaped for and including means for making engagement with the upper part of the moldboard and with the lower part of the moldboard, and a supporting member adapted to be secured to a part of the moldboard inward from the main attachment and extend below the moldboard and rest on the adjacent road surface to support the moldboard free from the road surface.

13. Channeler attachment means for a road grader moldboard, said means comprising a main attachment adapted to lie against the moldboard and being shaped for and including means for making engagement with the upper part of the moldboard and with the lower part of the moldboard, and a supporting member formed to lie against the moldboard and extend to and make engagement with the upper part of the moldboard and with the lower part of the moldboard and extend below the moldboard to support the moldboard free from the adjacent road surface.

14. A channeler attachment for a road grader moldboard, said attachment being adapted to lie against the moldboard and being shaped for and including means for making engagement with the upper part of the moldboard and with the lower part of the moldboard, the free edges of the part of the attachment extending below the moldboard being oblique to place them into

upright planes parallel to the course of travel of the machine.

15. A channeler attachment for a road grader moldboard, said attachment comprising a plurality of upright segments each of which is adapted to lie against the moldboard and is shaped for and includes means for making engagement with the upper part of the moldboard and with the lower part of the moldboard.

16. A channeler attachment for a road grader moldboard, said attachment comprising a plurality of upright segments each of which is adapted to lie against the front face of the moldboard and is shaped for and includes means for making engagement with the upper part of the moldboard and with the lower part of the moldboard.

17. A channeler attachment for a road grader moldboard, said attachment comprising a plurality of upright segments each of which is adapted to lie against the moldboard and is shaped to make engagement with the lower part of the moldboard to resist upward pressure and movement away from the moldboard and includes means for securing the attachment to the upper part of the moldboard.

18. A channeler attachment for a road grader moldboard, said attachment comprising a plurality of upright segments each of which is adapted to lie against the front face of the moldboard and is shaped to make engagement with the lower part of the moldboard to resist upward pressure and movement away from the moldboard and includes means for securing the attachment to the upper part of the moldboard.

19. A channeler attachment for a road grader moldboard, said attachment comprising a plurality of upright segments each of which is adapted to extend adjacent the upper edge of the moldboard and below the lower edge of the moldboard and lie against the moldboard and being recessed at its back to receive the lower edge of the moldboard and including clamping means adjacent the upper edge of the moldboard for securing the attachment to the moldboard.

20. A channeler attachment for a road grader moldboard, said attachment comprising a plurality of upright segments each of which is adapted to extend adjacent the upper edge of the moldboard, and below the lower edge of the moldboard and lie against the moldboard and being recessed at its back to receive the lower edge of the moldboard and including clamping means adjacent the upper edge of the moldboard for securing the attachment to the moldboard, and means for forming engagement between the moldboard and the outer upright edge of the attachment.

21. A channeler attachment for a road grader moldboard, said attachment comprising a plurality of upright segments each of which is adapted to lie against the moldboard and is shaped for and includes means for making engagement with the upper part of the moldboard and with the lower part of the moldboard, the outer and inner of said segments having their lateral free edges of their extensions below the moldboard made oblique to stand in planes which are upright and parallel to the course of travel of the machine.

22. A channeler attachment for a road grader moldboard, said attachment being adapted to lie against the moldboard and being shaped for and including means for making engagement with the upper part of the moldboard and with

the lower part of the moldboard, and a detachable cutting plate applied to the front lower face of the attachment, and a bolt securing said plate to the attachment.

5 23. A channeler attachment for a road grader moldboard, said attachment being adapted to lie against the moldboard and being shaped for and including means for making engagement with the upper part of the moldboard and with the
10 lower part of the moldboard, a cutting plate applied to the front lower face of the attachment, and a bolt extending through the cutting plate midway between the upper and lower edges of said plate and through said attachment whereby said plate is reversible.

15 24. A channeler attachment for a road grader moldboard, said attachment being adapted to lie against and extend below the front face of the moldboard and being shaped for and including means for engagement with the upper part
20 and the lower part of the moldboard to permit

lateral adjustment of the channeler along the length of the moldboard.

25. A channeler attachment for a road grader moldboard, said attachment comprising a plurality of upright parallel members each being adapted to lie against and extend below the front face of the moldboard and being shaped for and including means for engagement with the upper part and the lower part of the moldboard to permit lateral adjustment of the channeler along the length of the moldboard.

26. A channel attachment for a road grader moldboard, said attachment being adapted to lie against and extend below the front face of the moldboard and being shaped for and including means for engagement with the upper part and the lower part of the moldboard to permit lateral adjustment of the channeler along the length of the moldboard, and a moldboard supporting member extending below the moldboard and adapted to rest on the road surface.

WILLIAM L. SPOON.

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