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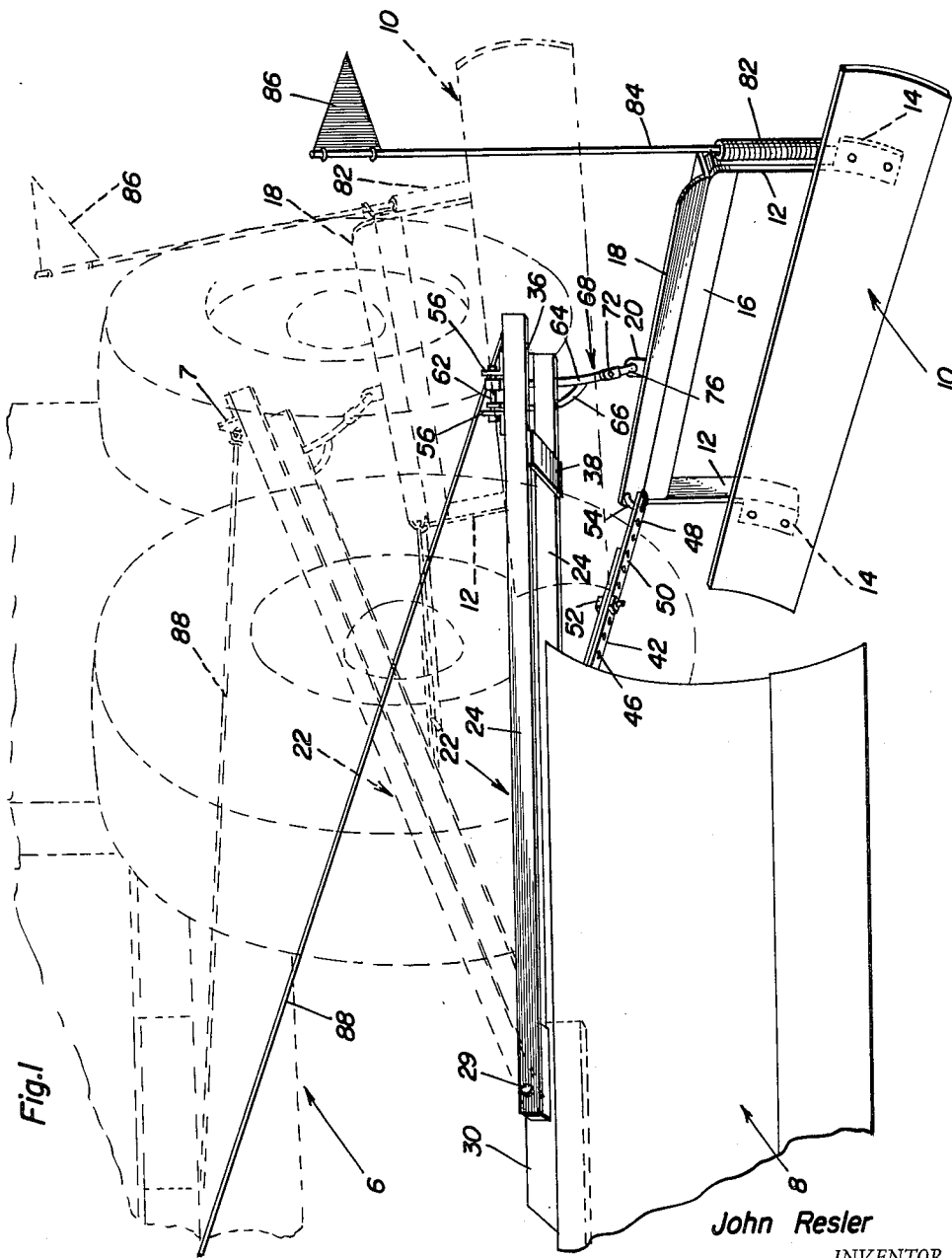
J. RESLER

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AUXILIARY GRAVEL AND DIRT LEVELLING BLADE

Filed Sept. 19, 1958

2 Sheets-Sheet 1



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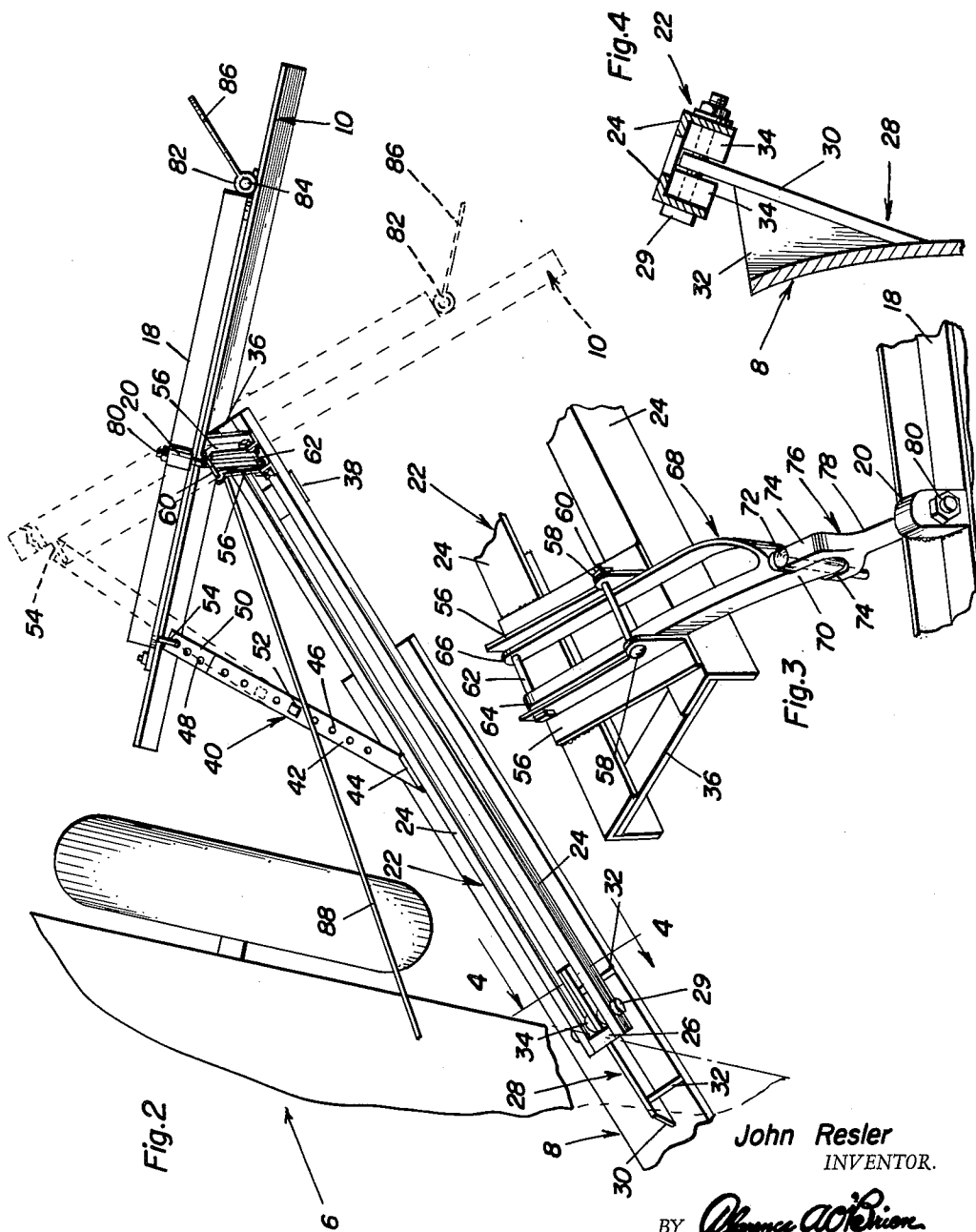
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2 Sheets-Sheet 2



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AUXILIARY GRAVEL AND DIRT LEVELLING BLADE

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The present invention relates to certain new and useful improvements in a readily applicable and removable auxiliary blade attachment for the main or patrol blade of a highway grader, for example, a highway motor patrol grader.

More specifically, the concept has to do with a simple, practical and efficient attachment or device which is expressly designed and constructed to effectually trap and temporarily retrieve gravel and dirt which is normally discharged at the outward end of a mobile patrol blade when the latter is being operated on a gravel or dirt surface. Briefly, the invention is characterized by an auxiliary blade which deflects and gradually works the excess or overflow material back into the surface of the highway and levels it, whereby to thus eliminate mounds and ridges of gravel or dirt usually not properly handled and therefore left over by the motor patrol or similar road grader. The construction is such that it not only retrieves and saves valuable road surfacing material which usually works out toward the margins but avoids objectionable pile up in the ditch or gutter. The invention, therefore, functions to level off the overflow gravel and dirt and adequately smooths the surface so that objectionable and dangerous piles, mounds and ridges of dirt are eliminated and the surface is satisfactorily readied for safe road travel by speedily driven motor vehicles.

In carrying out the preferred embodiment of the invention a construction has been evolved and produced which has many features and advantages. That is to say, the means which functions to operatively associate the auxiliary blade with the main blade is such that the overall device or attachment can be easily attached to any standard highway patrol blade now in use for levelling gravel and dirt roads. The attachment can also be interchanged from one end of the main blade to the other and is intended for continuous use inasmuch as it may be hoisted to an out-of-the-way position when not needed and lowered for use whenever the existing surface conditions require its use.

Another object of the invention is to provide a structurally and effectually reliable auxiliary blade and mounting means therefor which is characterized by cooperating components which may be quickly and easily assembled or dismantled into four major components or parts, thus permitting the thus dismantled device to be carried in a pickup truck or automobile trunk. The construction is also such that the auxiliary blade itself is interchangeable with a blade equipped with harrow teeth set at about three and one-half inches apart for the purpose of breaking up clods and lumps and working them into the surface of the road. As a matter of fact the construction allows for the utilization of rollers, packers, and the like.

Novelty is also predicated upon a readily adaptable attachment characterized by the aforementioned auxiliary blade and wherein the construction is such that the blade is left free to follow the contours of the road's surface. To this end the auxiliary blade is so poised and balanced on its support means not only to enable it to have limited pivotal movement and be adjustable to assume the desired obliquity of angularity relative to the cooperating outer end of the main blade but also to balance the earth loads distributed along the auxiliary blade thereby re-

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ducing stresses and bending forces on the blade and attachment parts.

Stated otherwise the invention has to do with an auxiliary blade adapted to trap and retrieve excess gravel and dirt, deflect and re-distribute it on the highway surface and level it in a manner to eliminate dangerous mounds and ridges which are usually left at the outer end of the main blade comprising an elongated blade supporting, positioning hitching beam having means at its inward end hingedly connectible with said main blade, the outer end portion of said beam extending beyond the outer end of the main blade, means suspending a median portion of the auxiliary blade selected to permit said auxiliary blade to be disposed and sufficiently load balanced within the range of angular positions of the auxiliary blade relative to the main blade, and additional means affording an adjustable connection between said beam and the trailing end of said auxiliary blade.

Other objects, features and advantages will become more readily apparent from the following description and the accompanying drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the views:

FIG. 1 is a perspective view showing the motor patrol or machine in phantom lines, a portion of the main or patrol blade in full lines and the auxiliary blade and its attachment and supporting means in full line as well as in dotted or phantom lines which latter illustrate the out-of-the-way or elevated position of the auxiliary blade.

FIG. 2 is a plan view of the construction seen in FIG. 1.

FIG. 3 is an enlarged perspective view showing the outer end of the beam or arm and the linkage means which is bracketed to the arm and operatively joined to the median portion of a frame carried by the auxiliary blade; and

FIG. 4 is a cross-section on an enlarged scale taken on the plane of the line 4-4 of FIG. 2, looking in the direction of the arrows.

Referring now to the drawings the mobile machine or patrol grader is denoted generally by the numeral 6. The main or patrol blade thereon is denoted by the numeral 8 and it is, obviously, on this part that the improved attachment is mounted and utilized. The auxiliary blade which while shown at one end of the main blade may, of course, be mounted on the opposite end (not shown). In any event the auxiliary blade is denoted by the numeral 10 and carries an upstanding frame structure embodying frame members 12 suitably joined at 14 to the blade 10, braced across their upper ends by a rigidifying member 16 atop which is an angle iron or the like 18. As shown in FIG. 3 this angle iron is provided with a bored lug 20.

Before describing the articulating joint which is associated with the lug 20 reference will now be made to the readily attachable and detachable arm or beam 22. This beam is a horizontally elongated structure (which might also be called a boom) and may vary in particularized construction. Here it is shown as comprising a pair of spaced coplanar parallel angle irons 24 connected together at the left hand end as at 26. This end portion is provided with a connecting and pivot bolt or hinge 29 (FIG. 4) which is hingedly mounted on an adapter fixture 28. This fixture comprises a flange or plate 30 joined by webs or the like 32 to the rear or convex side of the main blade 8. The bolt 29 is hinged or pivoted on the plate 30 and spacing or filler collars 34 are mounted on the bolt 29 at opposite sides of the plate 30.

The outer ends of the angle irons are connected in part by a crosspiece (FIG. 3) 36 and if desired a bottom brace 38 (FIG. 1).

With reference now to FIG. 2 in particular, the numeral 40 designates adjusting and connecting means be-

tween the auxiliary blade 10 and the beam 22. This means may vary in construction. Practice has shown that an extensible and retractable stay or equivalent means will do. The means shown comprises a suitable strap metal member 42 fixed at 44 to a median portion of one of the angle irons 24. This member is disposed at an oblique angle and the bolt holes 46 therein are adapted to cooperate selectively with bolt holes 48 in a companion strap or member 50 to accommodate the bolt 52 and to allow the ends to be overlapped and adjustably connected. The outer end of the member 50 is pivotally joined to a U-shaped connector or clevis 54 carried by the upper corner portion at the left of the frame shown in FIG. 1.

The linkage or equivalent means which is employed to provide the desired articulating joint and connection between the auxiliary blade's frame and the outer end portion of the beam is seen in FIG. 3. First reference will be made to the bracket or bracketing means. This comprises a pair of spaced suitably angled angle irons 56 welded or otherwise mounted atop the angle irons 24. The outward ends of the vertical flanges are provided with upstanding ears 58 to accommodate an insertable and removable bolt 60 which constitutes a limiting stop. The vertical flanges at the other end are apertured to accommodate an insertable and removable pivoting or hinging bolt 62 which serves to connect the arms or limbs 64 and 66 thereto. The median portions of the arms extend between the stop or limiting bolt 60 and the adjacent underlying angle iron 24. This construction and arrangement provides for vertical swinging on a horizontal axis of the yoke 68. The outer end of the yoke has an extension 70 with a vertical bearing therein to accommodate a hinging and connecting pin or spindle 72 which serves to pivotally join the arm portions 74 of the clevis or fork 76 thereto. The stem 78 is provided with a screw threaded extension which passes through a hole provided therefor in the aforementioned lug 20, the same being held in place by an assembling and clamping nut 80.

In FIG. 1 the numeral 82 designates a suitable flexible or spring socket to accommodate the staff 84 of a danger or warning flag 86.

It follows that the beam or arm 22 is detachably hinged to the adapter fixture 28. In practice another similar fixture may be provided at the other end of the main blade just in case it is desired to apply this attachment to said other end. The hinging and bolting means 29 provides not only a separable connection but the desired hinge joint between the fixture 28 and beam 22. The outer projecting end portion of the beam shown in FIG. 3 may rise and fall and may also be bodily lifted up to an out-of-the-way position by a hoisting cable 88 which may be reeled in any suitable manner on the grader 6 (not shown). The linkage means made up of the yoke 68 and clevis 76 provide the desired articulating or "universal" joint between the outer end of the beam and the frame-equipped auxiliary blade 10. The point of connection provides for poised or balanced suspension of the auxiliary blade from the beam resulting in the necessary angling and freedom of motion of the auxiliary blade so that it is left free to follow the contours of the road surface. The stay means 40 provides an adjustable connection between the auxiliary blade and the beam so that the blade may be suspended for use at an angle relative to the outer end of the main blade which is most satisfactory for the job under consideration.

While it is old in the art to appropriate and use auxiliary blades in conjunction with main blades I know of none having the particular construction herein shown nor which in any manner compare with the efficient mechanical means which is used to attach the auxiliary blade to the main blade.

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. A highway grader having a main blade, an auxiliary blade designed and adapted to trap and retrieve excess gravel and dirt, deflect and redistribute it on a highway surface and level it in a manner to eliminate dangerous mounds and ridges which are usually left at the outer end of the main blade, an elongated auxiliary blade supporting, positioning and hitching beam having means at an inward end thereof hingedly connectible with a top portion of said main blade, the outer end portion of said beam being disposed in a plane above the main blade and extending beyond the outer end of said main blade, pivot means suspending a median portion of the auxiliary blade in balanced condition from the outer end of said beam and permitting said auxiliary blade to be located and operatively balanced in variable angular positions relative to the grading surface and end of said main blade, and additional means providing and affording an adjustable connection between a median portion of said beam and a trailing end portion of said auxiliary blade, said first-named means embodying an articulated jointing connection between the beam and the main blade which permits said auxiliary blade to have balanced freedom of motion and action and to conformingly follow and act on the deviating contours of the highway surface traversed thereby.

2. The structure defined in claim 1 and wherein said additional means embodies a stay, said stay being longitudinally adjustable by manual regulation, one end of said stay being rigidly secured to a median portion of the beam, the other end of the stay having positive but self-adapting mechanical connection with a cooperating end portion of said pivot suspending means.

3. For use on and in combination with the main blade of a road grader, a beam adapting and mounting fixture, said fixture being of one-piece construction and fixed to an end portion of a rear side of said main blade and having a portion projecting to a plane above the top of the main blade, a straight rigid elongated beam having an outer end and an inward end connected by a horizontal pivot to the upper portion of said fixture and permitting the beam to swing up and down in a vertical plane when in use or to be bodily lifted to assume an out-of-the-way position when not in use, said outer end of said beam extending beyond the corresponding outer end of said main blade, an auxiliary gravel and dirt levelling blade, suspension linkage means located at the outer end of said beam for operatively connecting the beam with a median portion of said auxiliary blade, the parts of said linkage means being rigid and including a first hinging joint providing a connection of the beam to the linkage means and also a second vertical hinging joint connected to the auxiliary blade to provide limited vertical movement through the first joint and limited horizontal movement by way of the vertical hinging joint, the auxiliary blade being thus free to functionally follow the ever varying contours of the highway surfaces over which it is poised and operatively dragged, said first joint embodying a yoke hinged on the beam, and said second joint embodying a fork carried by the auxiliary blade, said fork being pivotally connected to a cooperating end of said yoke.

4. An attachment for a main grader blade comprising a one-piece adapter fixture adapted to be mounted atop an end portion of the main grader blade, an elongated beam having one end separably and hingedly connected with an upper portion of said fixture so that the beam may be permitted to rise and fall in a vertical plane during normal course of use or may be wholly and bodily swung up to an out-of-the-way position when not being used,

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extensible and retractable stay means adapted to provide an adjustable connection between said beam, said stay means being rigidly connected at its inner end to an intermediate portion of said beam and assuming an oblique angle relative to the longitudinal axis of the beam, a yoke having an end thereof resting atop but hingedly mounted on an outer end portion of said beam, a fork-type clevis having a fork hingedly mounted on a cooperating end of said yoke, said clevis having a stem, an auxiliary grader blade, a frame carried by a medium upper portion of said blade, and a separable swivel connection between said stem and suspending means.

5. An auxiliary gravel and dirt levelling attachment for a main grader blade comprising an elongated auxiliary blade, uprights fixed at their lower ends to end portions of said blade at longitudinally spaced points and at equidistant points from the respective ends of said blade and rising vertically above the upper edge of the blade and having a member connecting the upper ends and defining an inverted U-shaped suspending and balancing frame, a fork-type clevis having a stem, means providing a swivel separable connection between said stem and a centralized portion of said frame, a yoke having arms, said yoke provided at one end with an extension, the arms of said fork straddling said extension and being separably and hingedly connected thereto by way of a vertical pivot pin and providing a hinging connection between the yoke and clevis, an elongated beam, means hingedly connected to an inner end of the beam whereby said beam may be bracketed on an upper portion of a main grader blade, bracket means fixed atop an outer end portion of said beam and having spaced parallel upstanding flanges, the arms of said yoke being confined for operable movement between the flanges, means hingedly connecting free end portions of the yoke arms to corresponding end portions of said flanges.

6. The structure defined in claim 5 and wherein said

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flanges are provided with a stop limiting pin bridging the space between the flanges and overlying median portions of the yoke arms in a manner to limit the upward swinging movement of the yoke arms relative to the beam and flanges.

7. An auxiliary blade attachment for the main blade of a highway grader comprising, auxiliary blade mounting means having a load balancing point thereon, blade balancing suspension means hingedly connected to the main blade and projecting beyond one end of the main blade including means for operatively connecting said suspension means to said blade mounting means at said load balancing point on the blade mounting means, and adjustable connecting means operatively interconnecting said suspension means to the blade mounting means independently of the operative connecting means at a point spaced from the load balancing point to position the blade mounting means in balanced condition at a desired angular position relative to the suspension means whereby stressing of the adjustable connecting means and bending of the auxiliary blade is reduced.

8. The combination of claim 7 wherein said operative connecting means and adjustable connecting means include limited universal connections to the blade mounting means for permitting limited pivotal movement of the auxiliary blade in response to earth loading irregularities.

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