May 15, 1956 G. P. GREEN 2,745,326

ROLLER FOR ROAD MACHINES

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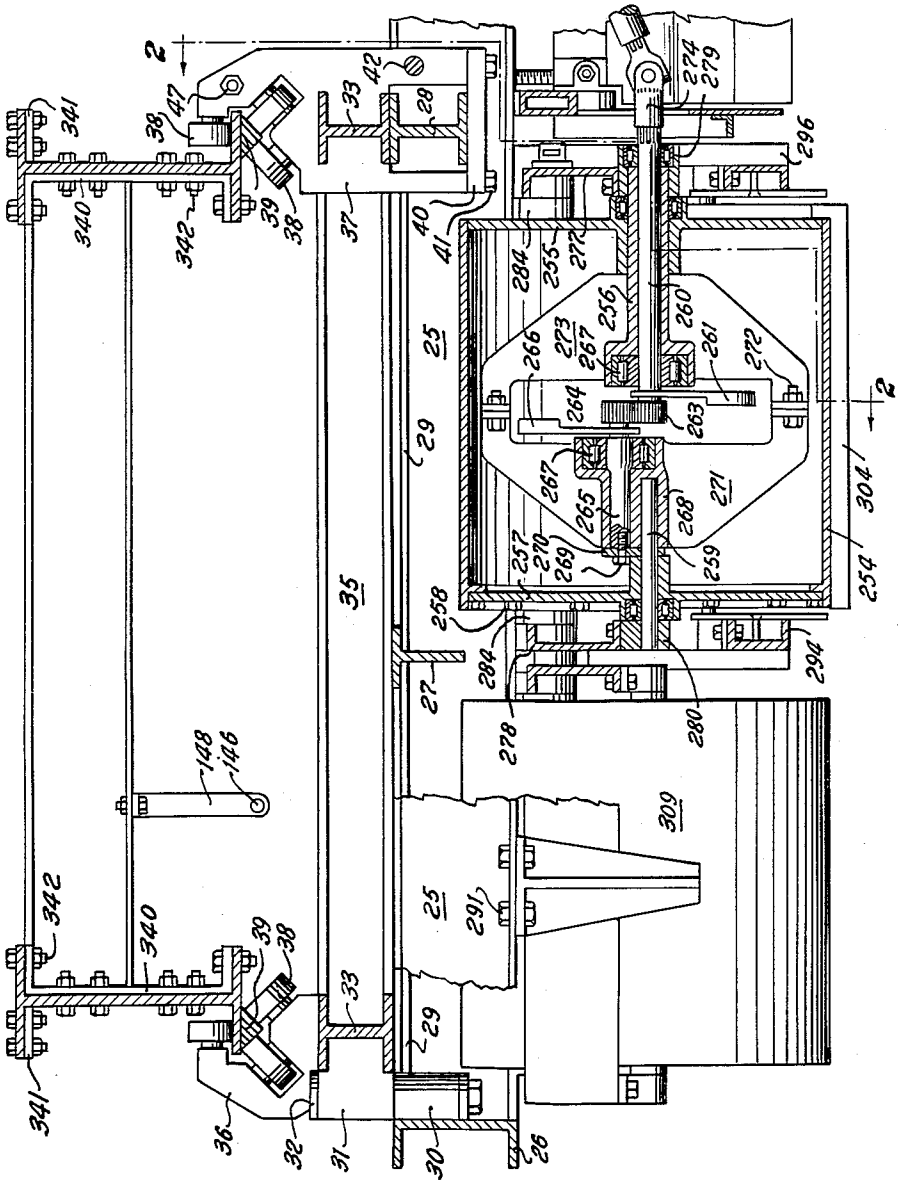


Fig. 1

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Fig. 2

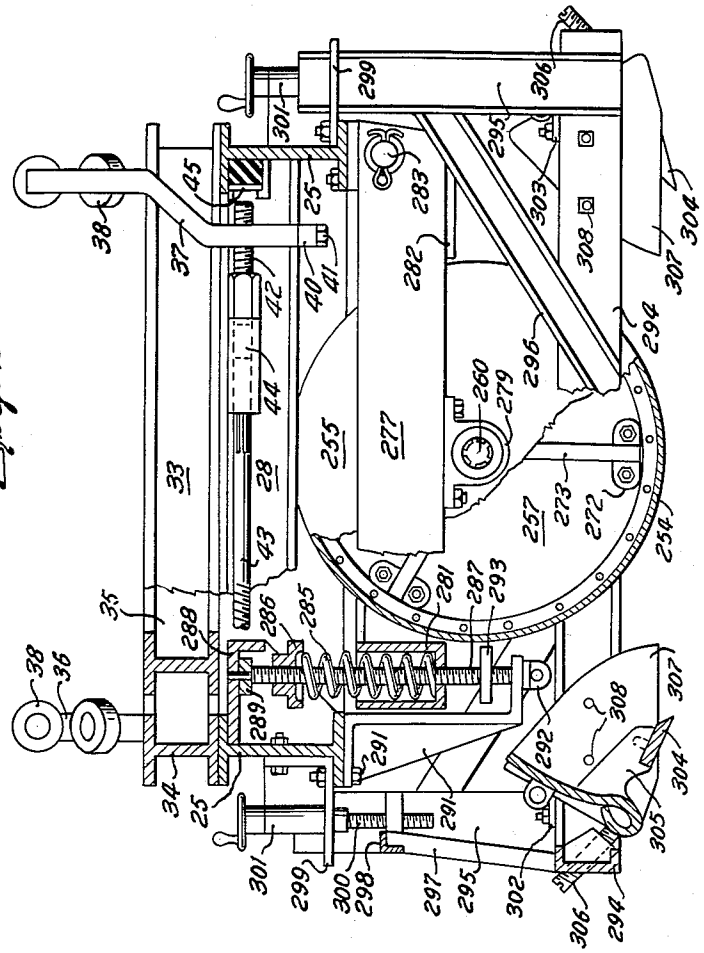
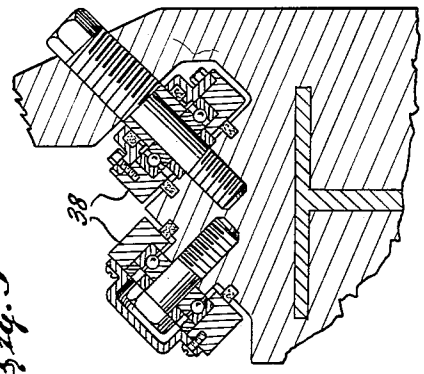


Fig. 3



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ROLLER FOR ROAD MACHINES

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Application May 17, 1952, Serial No. 288,478

5 Claims. (Cl. 94—48)

This invention relates to an improvement in road machines, and the principal object is to provide a machine of this class which may be advantageously applied in construction operation relative to road subgrades, base courses, surface courses and other work of similar nature such as terracing, leveling, compacting and miscellaneous construction of this nature. These and other objects are hereinafter more fully described, illustrated in the drawings, and specifically pointed out in the appended claims; it being understood that construction deviations may be made so long as they fall within the scope of the claims.

This application is a continuation-in-part of my copending application Serial No. 580,882, now Patent No. 2,601,277.

Figure 1 is an elevation, partly in section, through the rear part of the carriage supporting the roller assembly.

Figure 2 is an elevation, partly in section, taken transversely of the portion shown in Figure 1 along line 2—2 of Figure 1, and

Figure 3 is a section of a portion of the rail rollers of carriage support member.

Similar numerals refer to similar parts throughout the several views.

In general, the machine comprises a horizontal frame provided with supporting wheels at each end, to travel along a strip of work, with the woodworking structure spanned transversely thereto; and a carriage frame roller mounted on the structure and supporting certain members such as a mixer, blades and rollers adapted to perform a sequence of road construction operations as the carriage is propelled back and forth across the work. The travel rate of the entire machine along the strip of work is coordinated with the carriage travel, so that the operations lap to produce a uniformly work section, all of which structure is fully described and claimed in my Patent Nos. 2,801,277, 2,718,850 and 2,718,831 and my co-pending application Serial No. 278,250.

The invention herein described and claimed relates to the vibrating roller assembly and mounting of my road machine.

The carriage which supports the various road operation performing members comprises a frame consisting of main members 25, Fig. 1, with cross braces 26, 27 and 28. Strap-like cross braces 29 may be placed diagonally on the frame. The carriage frame is pivotally fixed to an intermediate frame by bearing member 30 on the carriage frame connected to bearing member 31 of the intermediate frame by pin 32.

The intermediate frame consists of cross members 33, longitudinal members 34 (Fig. 2), and diagonal members 35. The intermediate frame has two roller supporting members 36 fixed to the back, and two members 37 fixed to the front as shown in Figs. 1 and 2. Rail rollers 38 are arranged on supports 36 and 37 in a manner to roll on beams 1 and 2 with fixed rail portions 39 as shown. The pivoting of the carriage frame about pin 32 is maintained in a plane with the intermediate frame by means of cross member 28 of the carriage frame being slidably

retained between intermediate frame member 33 and plates 40 which are secured to support members 37 by bolts 41.

The range of the sliding motion and related pivoting of the carriage frame relative to the intermediate frame is limited by stop screws 42 and 43, Fig. 2, which are oppositely threaded through the respective support members 37 and operated by a nut and spline member 44. Rubber cushioned pads 45 fixed on members 25 at each side of the carriage frame serve as stop contacts for screws 42 and 43. The purpose of this arrangement, whereby the angle at which the carriage frame may pivot relative to the intermediate frame may be predetermined by adjusting screws 42 and 43, is to position the carriage frame at right angles to its path of travel over the work, for reasons hereinafter set forth.

The carriage frame, members 25, etc., with the attached operation members and the intermediate frame are propelled back and forth along beams 1 and 2 of the span structure, by means of cable, not shown, which is attached to each support member 37 by means of eye bolts 47, Fig. 1.

The vibrating roller and associated leveling members are shown in Figs. 1 and 2. Roller cylinder 254 is fixed to end 255 rotatably supported on hollow shaft 256, and end 257 secured to cylinder 254 by bolts 258 is rotatably supported on shaft 259. A shaft 260 with eccentrically attached weight 261 and is provided with gear 263 adapted to cooperate with a similar gear 264 fixed to a shaft 265 with eccentrically attached weight 266. Shaft 265 is rotatably supported by bearing 267 mounted in member 268 fixed to a non-rotating shaft 259. A screw 269 secures thrust bearing 270 to shaft 265. These frame members 271 fixed to member 268 extend radially within the roller and are joined by means of bolts 272 to three similar frame members 273 which are fixed to hollow shaft 256. The frame members 271 and 273 cooperate to support the first and second shafts 260 and 259, respectively, through the hollow members 256 and 268. Shaft 260 is connected through universal joint 274, to a drive shaft, not shown, for rotative actuation. Roller support shafts 256 and 259 are fixed to roller frame members 277 and 278 by parts 279 and 280. These frame members are joined by end members 281 and 282, and the frame unit is pivotally supported about shaft 283 (Fig. 2) which is secured to carriage member 25 by brackets 284 (Fig. 1).

Compression spring 285 is arranged between roller frame member 281 and cap 286, threaded to adjusting screw 287 which bears on bracket 288 through thrust washer 289 at the upper end of the screw. The lower end of screw 278 is retained by support 290 secured to carriage member 25 by bolts 291. An adjusting screw eye 292 is provided for turning, a stop nut 293 is provided on the screw to set the roller frame supported upwardly out of operative position.

The pressure of the roller 254 is predetermined by setting the compression spring 285. Vibration is provided by the centrifugal force of weights 261 and 262, occurring in unison at the upper and lower points of the respective rotation orbits.

The leveling member associated with the roller 254 is illustrated in Fig. 12, and comprises a rectangular frame 294, vertical support 295, diagonal braces 296 and 207, and end cross braces 298 (Figs. 1 and 2). Vertical supports 295 are slidably retained by guide brackets 299 fixed to carriage member 25, and frame 294 is set in a predetermined position by cooperative control screws 300 rotatably fixed to carriage members 25 by parts 301. Similar and opposed leveling mold boards 302 are pivotally supported to each end of frame 294 by bearings 303, and have blades 304 fixed thereto by brackets 305. Screws 306 of frame 294 function to limit and predetermine the

pivotal arc of mold board **302**. End plates **307** secured to frame **294** by bolts **308** are provided to retain material. Leveling is accomplished by blade **304** of the mold board **302**, which trails in operation travel, functioning to loosen material which is leveled by passing under the mold board.

The final roller member **309** is similar to the roller hereinabove described except it is not arranged for vibration.

The vibrating roller **254** is set at the desired pressure by spring **285** and appropriate centrifugal weights **266** and **261** are rotated at a rate to obtain the desired amplitude and frequency in the roller vibration. The leveling members **302**, **304**, etc. which are associated with the vibrating roller, in the case of most materials, are adjusted so that they loosen the material only to the depth necessary to include the lower spots left by the roller, and maintain sufficient surplus on the mold board of the functioning member to leave the material in a uniform condition by means set forth suitable for final rolling. The vibrating roller, associated leveling member and final roller may be operated as described above in connection with these operations.

As mentioned hereinbefore, the usual operative speed of the machine as a whole, relative to the crosswise travel speed of the carriage assembly, is such that the carriage travels from one side of the work to the other and returns while the machine travels a distance equal to the width of work covered by one of the individual operation members. When operated at this ratio the work is covered twice by the same operation and the passes overlap one another, which is very advantageous in obtaining a uniform and thoroughly worked section. In case of some materials which are difficult to handle the forward travel rate may be relatively reduced to give additional passes of the same operations over the material.

In operations where lapping is not necessary, the machine may be held stationary during the transverse movements of the carriage.

It is possible to operate the machine on material against a curb, or along the trimmed edge of other work as applicable in construction of a wider section than can be covered in one work strip. In such application the various operation members lap over the edge of the curb or work being joined, and the surplus material deposited thereon a head of the vibrating roller serves to protect the curb or work being joined from direct impact of the roller. Surplus material is removed from the curb or work surface by the leveling member following the vibrating roller. The application just described is without use of the mixer rotor and the scarifier member described in my Patent No. 2,601,277, which would obviously interfere with the curb or work being joined in most cases, if lowered for operation.

The above description and drawings are merely an illustration of my invention in one of many possible forms of application, and the scope of protection contemplated is to be taken from the appended claims interpreted as broadly as is consistent with the prior art.

What is claimed is:

1. In a machine of the type described, a hollow roller; a first and second shaft mounted on said machine and extending into said roller from opposite directions, said roller being rotatably mounted on said shafts for rotation about a horizontal axis; means within said hollow roller for supporting the inner ends of said first and second shafts in axial alignment; a weight mounted on and spaced from said first shaft for rotation therewith within said drum; a third shaft mounted on said second shaft and disposed parallel to and spaced from said second shaft; a second weight rigidly mounted on said third shaft and spaced therefrom for rotation within said drum about an axis parallel to and spaced from the longitudinal axis of said first shaft; means connecting said first and third shafts for causing said first and third shafts to rotate at equal speeds in opposite directions, said weights when extended horizontally from their axes of rotation being on opposite sides of their axes, said weights moving simultaneously downwardly and upwardly; and means for rotating said first shaft.

2. In a machine of the type described, a hollow roller; a first and second shaft mounted on said machine and extending into said roller from opposite directions, said roller being rotatably mounted on said shafts for rotation about a horizontal axis; means supporting the inner ends of said first and second shafts in axial alignment; a weight mounted on and spaced from said first shaft for rotation therewith within said drum; a third shaft mounted on said second shaft and disposed parallel to and spaced from said second shaft; a second weight rigidly mounted on said third shaft and spaced therefrom for rotation within said drum about an axis parallel to and spaced from the longitudinal axis of said first shaft; gears on said first and third shafts meshing with one another for causing said first and third shafts to rotate at equal speeds in opposite directions, said weights when extended horizontally from their axes of rotation being on opposite sides of their axes, said weights moving simultaneously downwardly and upwardly; and means for rotating said first shaft.

3. In a machine of the type described, a hollow roller; a first and second shaft mounted on said machine and extending into said roller from opposite directions, said roller being rotatably mounted on said shafts for rotation about a horizontal axis; means within said roller for maintaining axial alignment of said first and second shafts; a weight mounted on and spaced from said first shaft for rotation therewith within said drum; a third shaft mounted on said second shaft and disposed parallel to and spaced from said second shaft; a second weight rigidly mounted on said third shaft and spaced therefrom for rotation within said drum about an axis parallel to and spaced from the longitudinal axis of said first shaft; gears on said first and third shafts meshing with one another for causing said first and third shafts to rotate at equal speeds in opposite directions, said weights when extended horizontally from their axes of rotation being on opposite sides of their axes, said weights moving simultaneously downwardly and upwardly; means for rotating said first shaft; said roller being rotatably mounted on a frame mounted on said machine for pivotal movement about a vertical axis perpendicular to said first mentioned axis; and adjustable means resiliently biasing said frame and said roller downwardly.

4. In a machine of the type described, a hollow roller; a first and second shaft mounted on said machine and extending into said roller from opposite directions, said roller being rotatably mounted on said shafts for rotation about a horizontal axis; means supporting the inner ends of said first and second shafts in axial alignment; a weight mounted on and spaced from said first shaft for rotation therewith within said drum; a third shaft mounted on said second shaft and disposed parallel to and spaced from said second shaft; a second weight rigidly mounted on said third shaft and spaced therefrom for rotation within said drum about an axis parallel to and spaced from the longitudinal axis of said first shaft; means connecting said first and third shafts for causing said first and third shafts to rotate at all speeds in opposite directions, said weights when extended horizontally from their axes of rotation being on opposite sides of their axes, said weights moving simultaneously downwardly and upwardly; means for rotating said first shaft, said roller being rotatably mounted on a frame mounted on said machine for pivotal movement about a vertical axis perpendicular to said first mentioned axis; and adjustable means resiliently biasing said frame and said roller downwardly.

5. In a machine of the type described, a hollow vibrating roller; a first shaft and a second shaft mounted on said machine and extending into said roller from opposite directions, said roller being rotatably mounted on said first and second shafts for rotation about a horizontal axis;

means supporting the inner ends of said first and second shafts in axial alignment; a bearing means mounted on said second shaft within said roller, a third shaft rotatably mounted in said bearing means; gears on adjacent ends of said first and third shafts meshing with each other to cause said shafts to rotate at equal speeds in opposite directions; eccentric weights mounted on said first and third shafts, said weights when extended horizontally from their axes of rotation being on opposite sides of their axes, said weights moving simultaneously downwardly and upwardly; and means for rotating said first shaft.

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