

July 23, 1940.

F. J. DU VALL

2,209,083

ROAD RIPPER

Filed Jan. 21, 1938

3 Sheets-Sheet 1

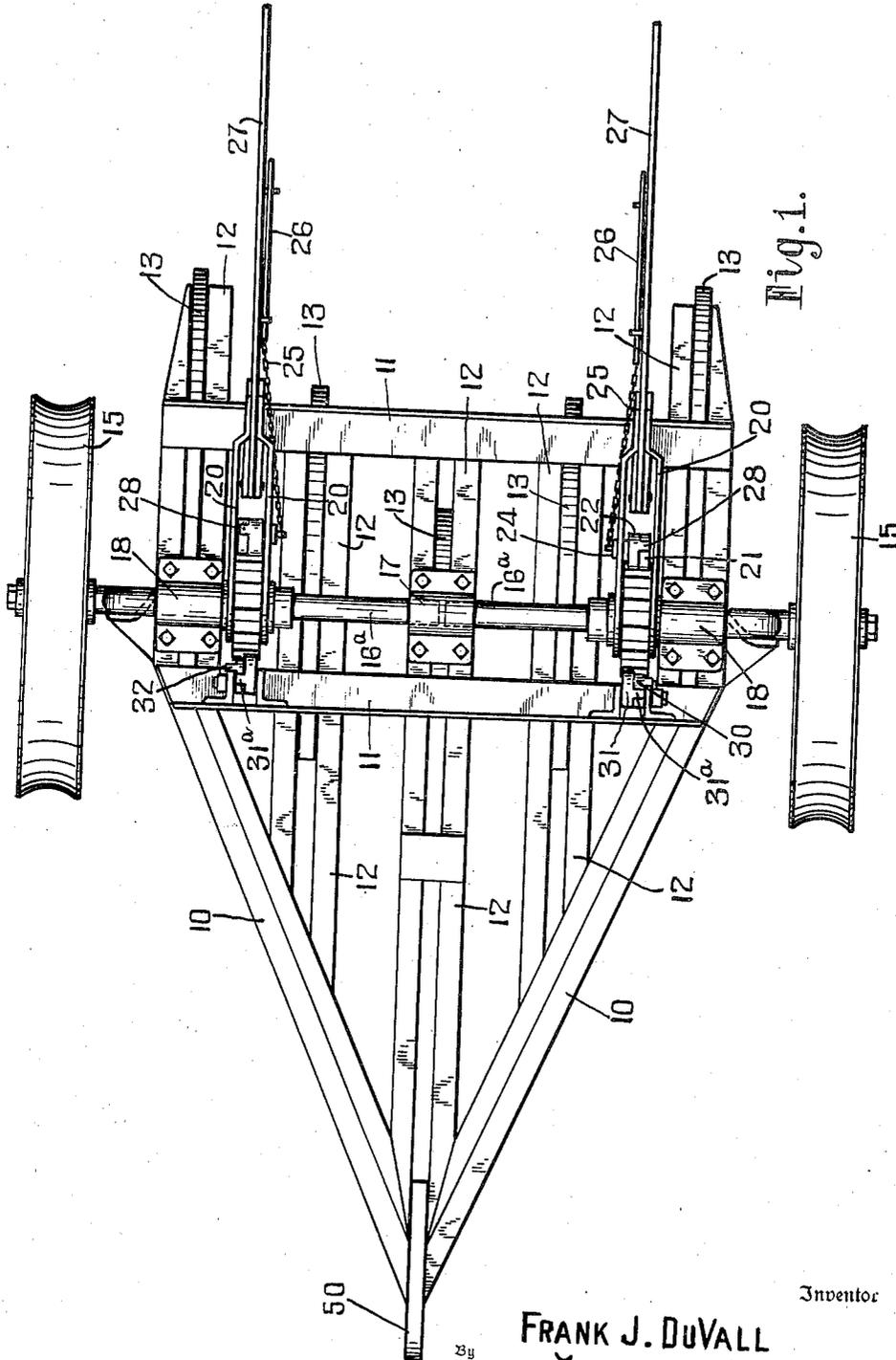


Fig. 1.

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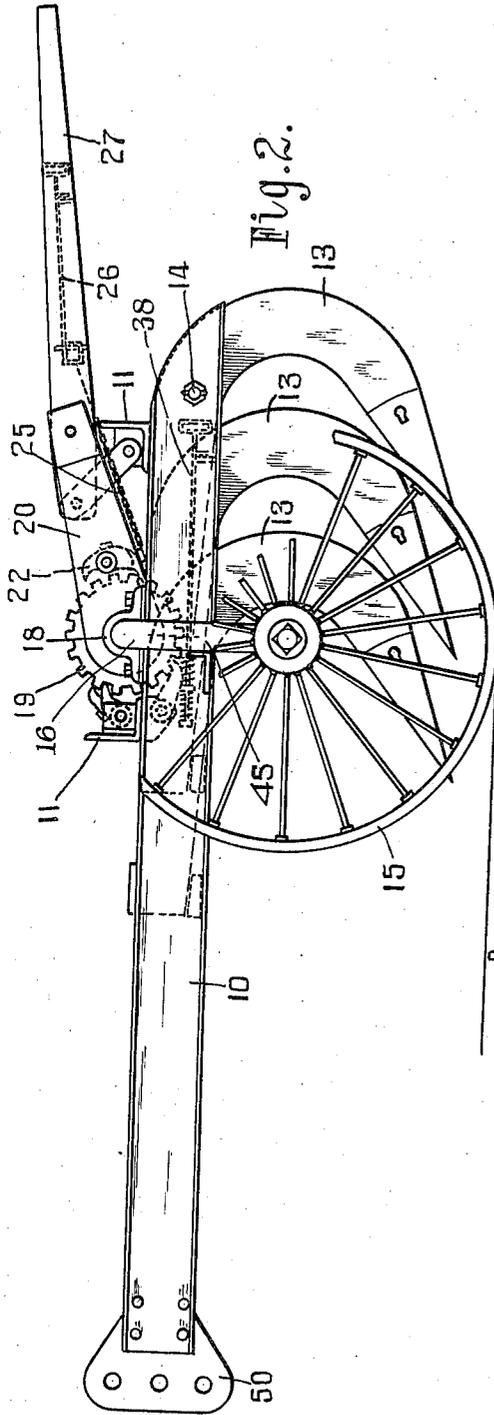


Fig. 2.

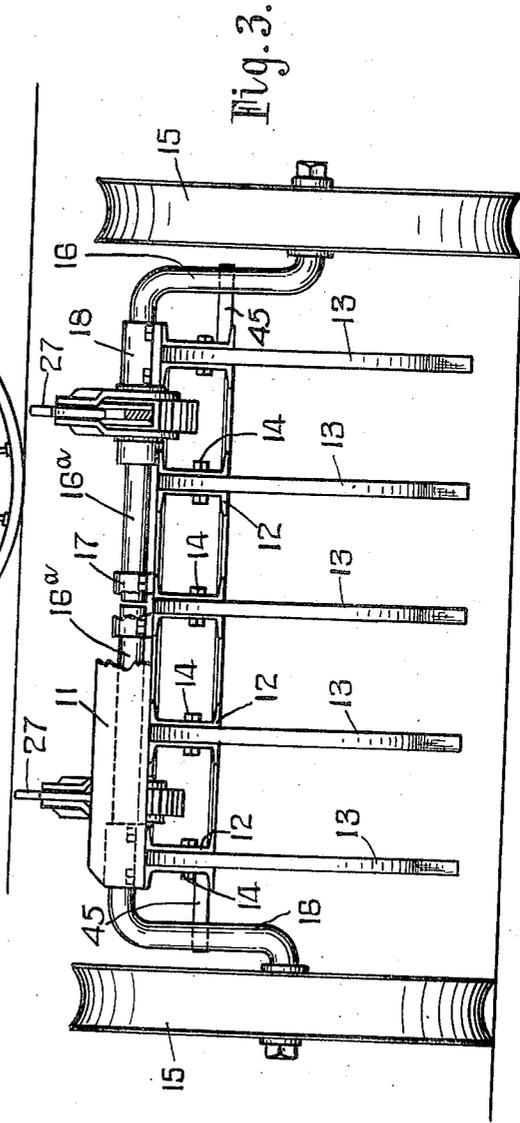


Fig. 3.

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3 Sheets-Sheet 3

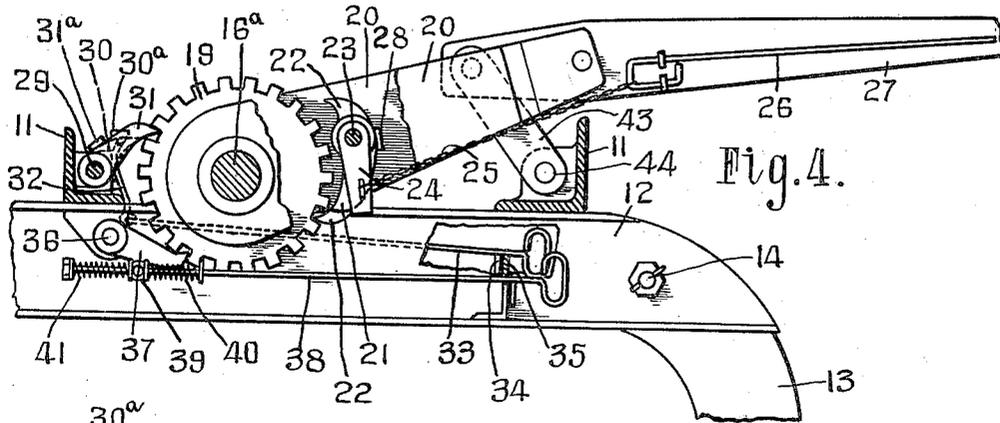


Fig. 4.

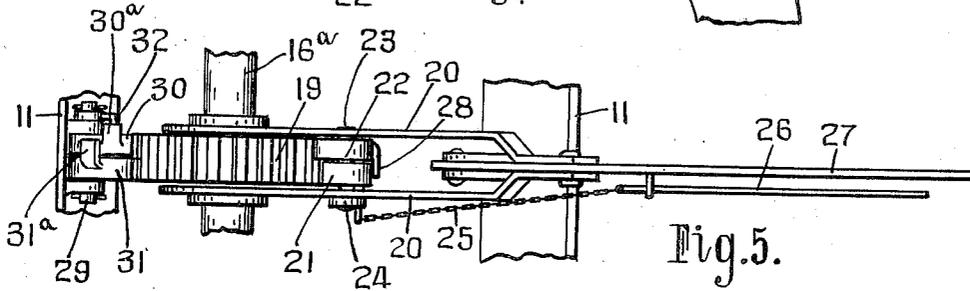


Fig. 5.

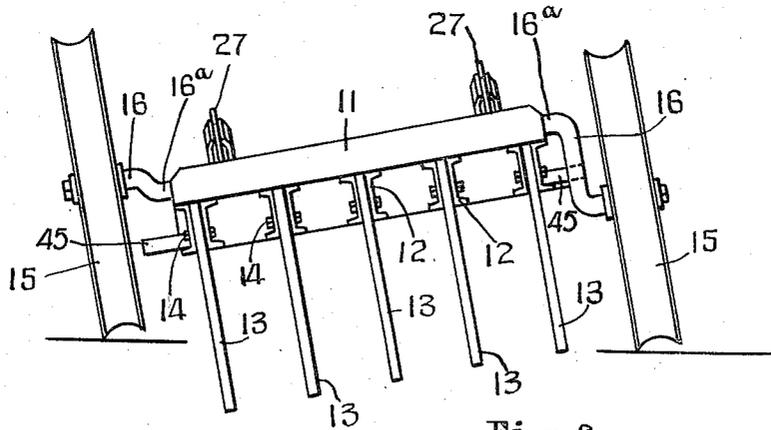


Fig. 6.

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UNITED STATES PATENT OFFICE

2,209,083

ROAD RIPPER

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Application January 21, 1938, Serial No. 186,173

6 Claims. (Cl. 262-8)

This invention relates more particularly to apparatus for ripping up old roads for replacement with new ones or for abandonment of a road or portion thereof.

5 In such machines there is employed a gang or plurality of ripping tools mounted in a frame carried by a pair of wheels, said ripping tools having their cutting members arranged to cut in different travel lines so that when the apparatus is drawn a wide ribbon of road is cut or ripped ready for the removal of the fragments thereby produced.

15 One object of this invention is to provide in such an apparatus means whereby the cutting or ripper members are kept near the axis of the carrying wheels in order that the cutting members shall be kept in a balanced position for moving from place to place and more steadily held in proper working position at different depths.

20 Another object is to provide in connection with the foregoing a two-part or split axle for the wheels, each part having a crank extension upon the end of which the supporting wheel is journaled so that either side of the tool carrying frame can be raised or lowered independently of the other and held in such relation to the ground and thereby transversely tilt the cutting tool carrying frame and the line of the cut of the tools in a plane slanting to the horizontal.

30 A further object is to provide improved means for moving and holding the axles of the carrying wheels to place them in the position necessary to secure the desired elevated or lowered position of the tool carrying frame.

35 Other objects of the invention will appear from the disclosure herein.

The invention is embodied in the example herein shown and described, the features of novelty being pointed out in the claims appended hereto.

40 In the accompanying drawings—

Figure 1 is a plan view of the apparatus according to the invention.

45 Fig. 2 is a view in side elevation looking at the lower side of Fig. 1, said side being the left hand side of the apparatus.

Fig. 3 is an elevational view of the rear of the apparatus with parts broken out.

50 Fig. 4 is a side view broken out to show the means for adjusting and holding the axles in adjusted position.

Fig. 5 is a top plan view of the means shown in Fig. 4.

55 Fig. 6 is a rear view illustrating, on a smaller scale, the axles adjusted to cause an inclination of the tool carrying frame and the tool cutting line.

Referring first to Figs. 1 to 4 inclusive, 10 designates the ripping tool carrying frame, said frame including transverse bars 11 to which are secured longitudinal members 12 and between

which latter the ripping tools 13 are fixed at their shanks by bolts 14, the forward ends of the shanks being held from oscillation. The said bolts 14 are preferably frangible so that if a tool should, in operation, meet with an unyielding obstruction the tool will, if the drawing power be ample, be released by the fracture of its said holding bolt 14, and drawn out.

15 In the apparatus depicted five of the ripping tools 13 are shown, two at each side of the middle one. The ripping tools are so located at each side of the middle one as to have their working points at each side of the middle one in a line slanting to the direction of the draft on the apparatus in order to facilitate the draft and more effective and thoroughly to rip the road.

20 The character 15 designates the carrying or ground wheels, said wheels having transversely concaved rims thereby causing them to bite into the road and prevent them from slipping laterally. Each of said wheels 15 is journaled on the end of a crank extension 16 of an independent axle 16^a, said two axles being journaled in suitable bearings at 17 and 18 so as to be rotated and fixable to raise or lower the frame.

25 Referring now to Figs. 4 and 5, the character 19 designates a ratchet wheel or spur gear-like form which is suitably secured to the axle 16^a. Straddling said ratchet wheel and pivotally connected with the axle is a pair of arms 20 between which arms are two pawls 21 and 22 each pivoted on the same pin 23 secured between said arms 20.

30 The pawl 21 is a single one and the pawl 22 a double one. The single pawl 21 has secured to it an arm 24 that works outside the arms 20 and has attached to it a chain 25 extended to a rod 26 sliding on an operating hand lever 27. The double pawl 22 has a lug 28 extending across the rear of the single pawl 21 so that when the chain 25 is drawn upward it strikes the said lug 28 and moves the lower end of the pawl 22 from the ratchet 19 and the upper end of the double pawl into engagement with the ratchet 19.

45 When the upper end of the double pawl is thus engaged the ratchet 19 is turned anti-clockwise by properly operating the handle 27 and the tool frame lowered. When the rod 27 and chain 25 are released the lower end of the pawl 22 and the pawl 21 normally lie, by gravity, in the path of the teeth of the gear 19, and engage said teeth consecutively when the hand lever is properly rocked to turn the axle clockwise to raise the tool carrying frame.

55 Pivoted on the tool carrying frame forward of the ratchet 19 on a transverse pin 29 is a pair of pawls 30 and 31, each of which is adapted to engage the ratchet 19, but when one is engaged with a tooth of said wheel the other rests on the top of an adjacent tooth of the wheel. For controlling the operation of this pair of pawls there 60

is provided on the pawl 31 a lug 31^a that overlies the pawl 30, said pawl 30 also being provided with a lug 30^a that lies in the path of an oscillating controlling arm 32 that is pivoted on said pin 29.

The arm 32 has connected with it a handled rod 33 for swinging said arm 32 to raise the said pawl 30, which, by reason of the lug 31^a, causes also the raising of the pawl 31 and thereby releasing ratchet wheel 19 for rotation anti-clockwise. The handled operating rod 33 has on it a stop 34 that engages a stop 35 fixed on the tooth carrying frame for limiting the rearward movement of said rod.

Pivoted on a pin 36 in the frame below the pivot of the pair of pawls just described is a stop pawl 37 adapted, when the operation of the ratchet wheel 19 is reversed, to engage the ratchet to latch the same against clockwise movement, said stop pawl being controlled by a slidable rod 38. Said rod 38 extends through a stationary eye 39 on the pawl 37 and on said rod 38 between stops thereon at opposite sides of said eye are coil springs 40 and 41 adapted yieldingly to hold said pawl either in or out of engagement with the ratchet.

The main operating lever 27, pivoted at 27^a between the arms 29, is connected at its end to one end of a link 43, the other end of said link being connected with a fixed pin 44 in a bracket in the rear transverse cross bar 11 of the frame. The link 43 and the pin 44 constitute a fulcrum of and limiting means for the throw of the said operating lever.

At 45 (see Fig. 2) is a stop for preventing forward swing of the crank extension of the axle when in the down vertical position so that the only direction in which said axle extension can be raised or lowered is in an arc or curvilinear direction at the rear or ripping tool side or close to the vertical plane of the axis of the wheels. The advantage of this provision is that the operating draft on the tools is kept steady and close to the axes of rotation of the carrying wheels and therefore the tools work in straight lines rather than in up and down wavy lines due to remoteness of the working tools from the wheel axles.

The ratchet and pawl mechanism and the operating parts therefor for raising and lowering the frame are equivalents at each side of the apparatus and each can be operated independently of the other in order that transverse inclination, as respects the horizontal of the frame of the apparatus and the tools carried thereby, can be obtained, an instance of which is illustrated in Fig. 6 for ripping inclined surfaces as at the shoulder of a road.

In practice the apparatus is drawn by means of a sufficiently powerful tractor or other engine suitably coupled to the forward end of the frame, as at 50, while the operator in the rear operates the devices for adjusting the position of the frame in accordance with the work to be done.

The form, number and dimensions of the parts can be changed without departing from the gist of the invention as claimed.

What I claim is:

1. A ripping implement of the class described including a rigid frame, independent axles secured on said frame, a pair of ground wheels on

said axles for supporting said frame, a plurality of ripping tools secured on said frame having one or more of their working points extended forwardly under said frame between said wheels and forward of a vertical plane coinciding with said axles, and means for upwardly and downwardly adjusting and fixing said frame with respect to said wheels.

2. A ripping implement of the class described including a rigid frame, independent axles secured on said frame, a pair of ground wheels on said axles for supporting said frame, a plurality of ripping tools secured on said frame having one or more of their working points extended forwardly under said frame between said wheels and forward of a vertical plane coinciding with said axles, and means for upwardly and downwardly adjusting and fixing said frame with respect to one of said wheels.

3. A ground ripping implement of the class described including a rigid frame, independent axles secured on said frame, said axles having crank extensions beyond the sides of said frame, ground wheels supported on said crank extensions, means for shifting said crank arms angularly, and means for holding them in shifted position, and a plurality of ripping tools secured on said frame having one or more of their working points extended forwardly between said wheels to a point or points forward of a vertical plane coinciding with said axles.

4. A ground ripping implement of the class described including a rigid frame, independent axles secured on said frame, said axles having crank extensions beyond the sides of said frame, ground wheels supported on said crank extensions, means for shifting one of said crank arms angularly, and means for holding it in shifted position, and a plurality of ripping tools secured on said frame having one or more of their working points extended forwardly between said wheels to a point or points forward of a vertical plane coinciding with said axles.

5. A ground ripping implement of the class described including a rigid frame, independent axles secured on said frame, said axles having crank extensions beyond the sides of said frame, ground wheels supported on said crank extensions, means for shifting one of said crank arms angularly, and means for holding it in shifted position, and a plurality of ripping tools secured on said frame having one or more of their working points extended forwardly between said wheels to a point or points forward of a vertical plane coinciding with said axles and means for limiting the angular shifting of said crank arm to positions substantially in rear of said vertical plane of the axle.

6. In a ripping implement of the class described including a frame, ground wheel spindles secured on said frame, one of which is movable in respect to the frame, ground wheels on said spindles, a plurality of ripping tools secured on said frame having one or more of their working points extended forwardly under said frame between said wheels and forward of a vertical plane coinciding with the points of connection of said spindles with said frame, and means for upwardly and downwardly adjusting and fixing said frame with respect to said movable wheel spindle.

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