Nov. 24, 1936. C. N. POGUE 2,062,232

APPARATUS FOR LEVELING ROADS

Filed Dec. 30, 1935 2 Sheets-Sheet 1

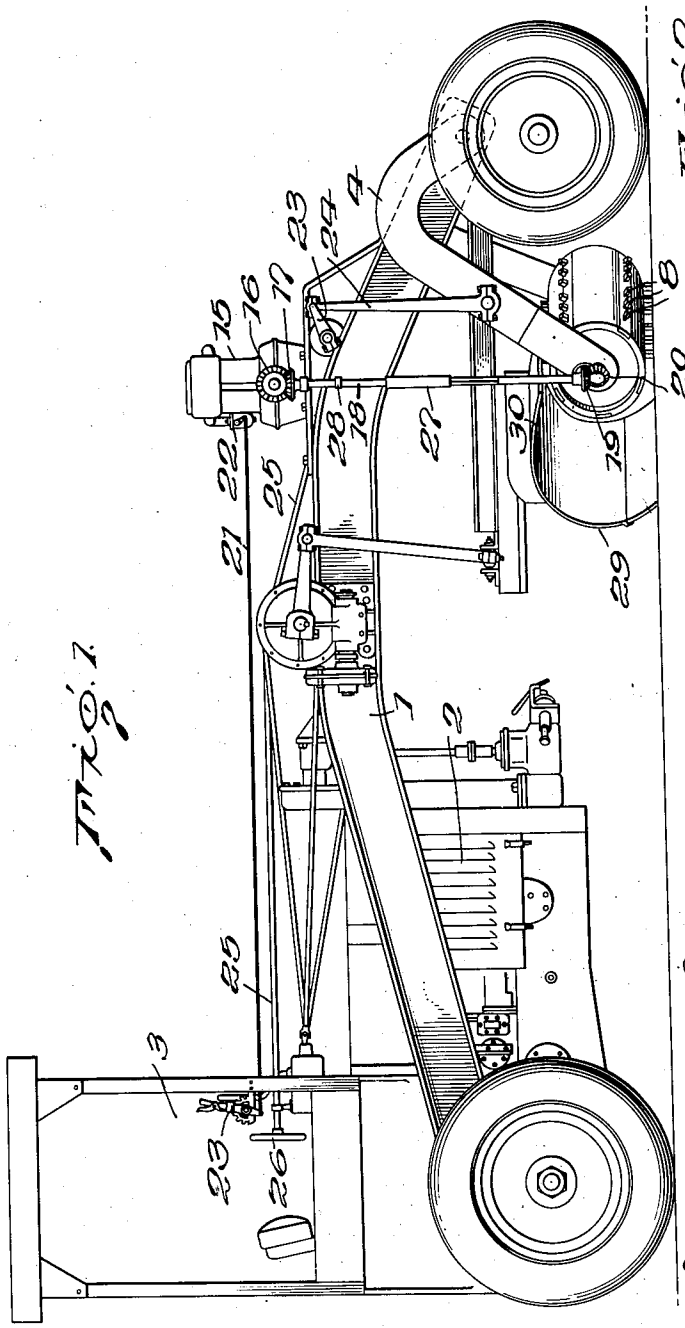


Fig. 1.

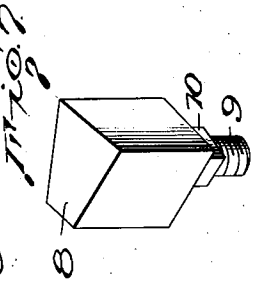


Fig. 7.

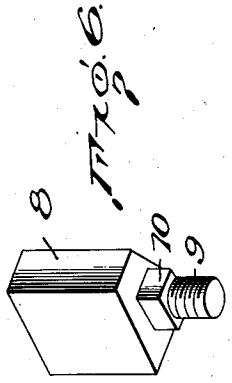


Fig. 6.

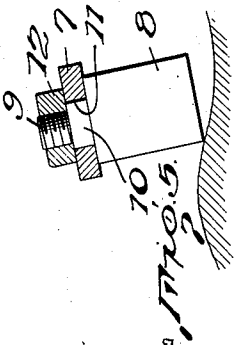


Fig. 5.

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APPARATUS FOR LEVELING ROADS

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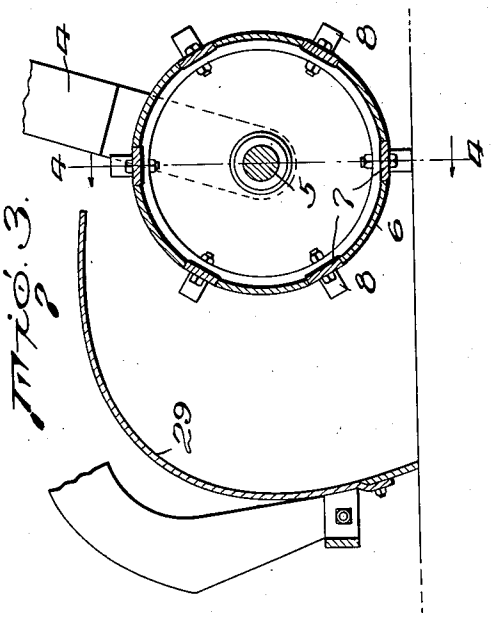


Fig. 3.

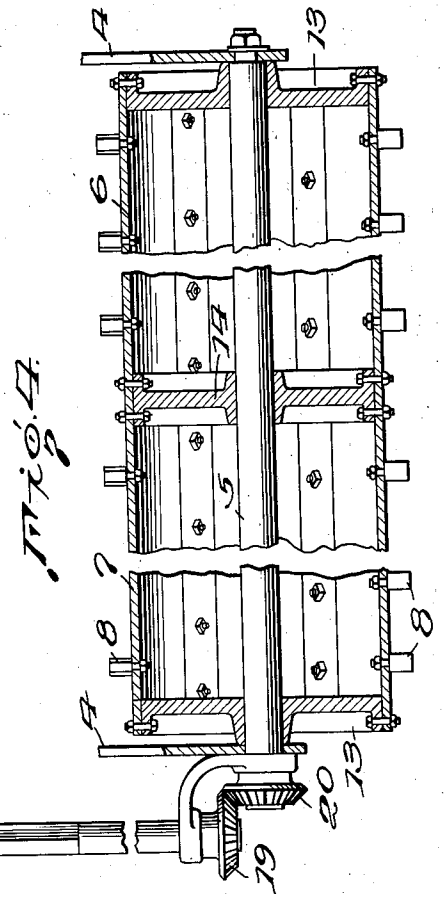


Fig. 4.

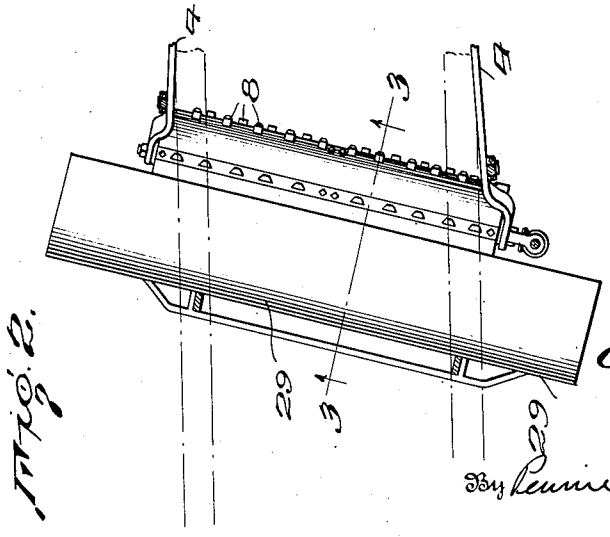


Fig. 2.

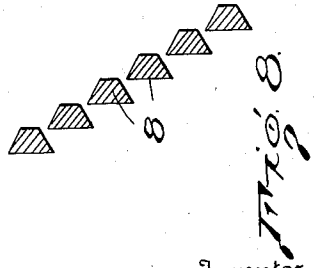


Fig. 8.

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UNITED STATES PATENT OFFICE

2,062,232

APPARATUS FOR LEVELING ROADS

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Application December 30, 1935, Serial No. 56,812

2 Claims. (Cl. 37—108)

This invention relates to a machine adapted to be propelled along dirt, gravel, and other roads which have not been given a permanent hard surface, and which will break or cut away ridges and like high spots in the road and scrape the dirt or gravel broken or cut away from the high spots into the low places, whereby the road will be left with a smooth surface.

Notwithstanding the extensive road-building programs which have been in effect in many States for the past several years, there still remain many secondary dirt, gravel, or other non-permanent surfaced roads which require frequent treatment to maintain them in a usable condition.

The present practice in the treatment of secondary roads such as those referred to above is to drag a scraper having a long knife-like blade along the road. The machine may or may not be equipped with a scarifier positioned in front of the scraper blade, which comprises a bar carrying a series of teeth, much like those on an ordinary harrow, which are intended to dig into the surface of the road and break the crust ahead of the scraper blade.

Scrapers which rely entirely upon a scraper blade to smooth the surface of the road are not satisfactory if the road has a gravel or other relatively hard surface, as the blade, having a wide ground-engaging surface, merely rides up over the ridges or high spots, without cutting them down. A scraper which is provided with a stationary toothed scarifier which precedes the scraper blade is far from satisfactory also, as the teeth soon become dull and ride up over the ridges or high spots, the same as the scraper blade. With either type of scraper, a road having a relatively hard surface is nearly as rough after treatment as it was prior thereto.

In accordance with the present invention, reliance is not placed upon a scraping blade or stationary scarifier teeth which are dragged along the ground to cut down and remove the high spots in the road, but the high spots are given a sharp blow which will break away and shatter the ridges and high spots of the road. To that end, the present invention relates to leveling or treating roads and a machine therefor, which is provided with means for causing a series of rapid and hard hammer-like blows to be given to the ridges or high spots, simultaneously to break them away and to shatter the particles thereof so that no large lumps or chunks are left in the road after treatment.

More particularly, the invention comprises a road-leveling or treating machine having a cylinder or drum which is adapted to be rotated at relatively high speeds and which has protruding from its outer surface a plurality of impact elements, which when the drum is rotated at high speeds, and the machine propelled along the road, will strike the high spots or ridges with a hammer-like blow which simultaneously will break and shatter the crust of the ridges or high spots. As the impact elements protrude from the periphery of the drum or cylinder, they also will dig into the ridges and high spots, and in addition to breaking and shattering them, will perform the function of a scarifier. A scraper blade of the general type now used may be, and preferably is associated with the rotative drum or cylinder, and positioned to the rear thereof, to drag the loose dirt, gravel, or like particles removed from the high spots, into the low places in the road.

The invention will be described in more detail in connection with the accompanying drawings, but such further description and disclosure, is by way of amplification, and the invention is not to be considered as limited thereby.

In the drawings:

Fig. 1 is a side elevation of a road-leveling machine embodying the invention;

Fig. 2 is a horizontal cross-sectional view on line 2—2 of Fig. 1;

Fig. 3 is a transverse section on line 3—3 of Fig. 2;

Fig. 4 is a longitudinal sectional view through the drum which carries the impact elements, with the driving means therefor shown in elevation;

Fig. 5 is a view showing the position of one of the impact elements as it engages a ridge or high spot in the road;

Figs. 6 and 7, are perspective views of one of the impact elements; and

Fig. 8 is a diagrammatic view showing the manner in which the impact elements are spaced around the drum.

In the accompanying drawings my invention is shown embodied in a road-leveling machine of a type now well known and which comprises a main frame 1 and an engine 2 for propelling the machine along the road. Suitable controls for the engine 2 and a wheel for steering the front wheels are located in an operator's cabin 3. The details of the frame structure and the manner in which the machine may be propelled and controlled will not be described, because they are well known and form no part of the present invention.

Frame members 4 are pivoted to each side of the forward end of the main frame 1 and their

lower ends form bearings for an axle 5 to which a hollow drum or cylinder 6 is rigidly secured. The outer periphery of the drum or cylinder is provided with circumferentially-spaced openings for the reception of longitudinally-extending bars 7 which carry spaced calk-like impact elements 8 of hardened tool steel. As shown in Figs. 6 and 7, the impact elements are wedge-shaped, with their narrow edge at the forward or leading side as the drum rotates. The elements 8 of adjacent bars 6 are about two inches wide at their widest side and the elements of adjacent bars are staggered in such manner that with six bars spaced around the drum, at least two of the elements will lie in any plane normal to the axis.

The elements 8 have studs 9 extending from one end thereof for securing them to the bars 7. Each stud has a squared portion 10 adjacent the main body of the member which is adapted to fit in correspondingly squared openings 11 in the cross bars 7, as shown in Fig. 5. The outer ends of the studs 9 are threaded for engagement with nuts 12 so that when the nuts are tightened on the outer threaded ends of the studs, the elements 8 are non-rotatively held in proper position with the narrow edge forward. The bars 7 are secured to the drum by bolts passing through outwardly-extending flanges of end members 13 of the drum, and through similar flanges on a central reinforcing member 14.

The drum 6 is adapted to be rotated by an internal combustion engine 15 mounted upon a forward portion of the frame 1. Power from the engine is transmitted to the drum 6 by means of upper bevel gears 16 and 17, a drive shaft 18 and lower bevel gears 19 and 20, the latter being rigidly secured to the axle 5 of the drum or cylinder 6. The speed at which the drum rotates may be controlled by regulating the speed at which the engine operates. For that purpose a rod 21 which controls the carburetor 22 of the engine extends rearwardly to a control lever 23 located in the operator's cabin.

In order to adjust the vertical position of the drum, a crank 23 is connected to the upper end of a pitman 24, which at its lower end is pivotally connected to the side members 4 in which the drum 6 is rotatively mounted. The crank may be turned by worm gearing or the like through a rod 25 having an operating wheel 26 located in the cabin 3.

To permit vertical adjustment of the drum 6 without interfering with the driving connection from the engine 15, the drive shaft 18 is provided with a telescoping section 27 and a universal joint 28. If desired, a clutch may be interposed in the driving connection from the engine 15 to the drum 6, so that by disconnecting the clutch the rotation of the drum may be discontinued without stopping the engine.

Positioned rearwardly of and relatively close to the drum 6 is a scraper blade 29 such as commonly is used on road machines, and which may be adjusted to various positions transversely of the rod. A guard blade 30 of sheet steel or the like is connected to the upper portion of the scraper blade 29 and extends forwardly to a position adjacent the drum 6 to intercept lumps of dirt or stones which may be thrown into the air as the drum rotates in contact with the road surface. In the operation of the machine, the drum 6 is driven at a relatively high speed, for example two hundred to five hundred revolutions per minute, or faster, depending upon the particular composition and condition of the road being leveled. As the machine is propelled over the road with the drum rotating at such speeds, the impact elements 8 will strike the high places with a hammer-like blow, which not only will break them away, but at the same time will shatter them so that no large lumps or chunks are left. After shattering the high places of the road, the protruding impact elements will act much like the teeth of a rack to level the surface of the road. However, the final leveling preferably is accomplished by means of the scraper blade 29 which follows the rotating drum and scrapes the material broken and loosened from the high places into the low places of the road.

While a separate engine 15 has been shown for rotating the drum 6, it will be understood that if desired the drum may be rotated from the engine which propels the machine along the road. In a like manner, it will be understood that the use of the rotating drum or cylinder is not limited to those machines which are self-propelled and may be used with equally satisfactory results with machines which are pulled along with a tractor or the like.

From the foregoing description it will be seen that in accordance with the present invention the roads are given an entirely new type of treatment, in that reliance is placed upon rapidly-rotating impact elements which simultaneously break away and shatter the high places as the machine traverses the road, rather than upon scraper blades or scarifiers which for the most part merely ride over the high places and leave the road nearly as rough after treatment as before.

I claim:

1. A road leveling or treating machine adapted for movement over a road, comprising a drum or cylinder, means for rotating said drum or cylinder, a plurality of rows of spaced impact elements protruding from the outer surface of said drum or cylinder and adapted to strike and break away high places in the road, the impact elements of each row being staggered relative to the elements of adjacent rows, a scraper located at the rear of said drum or cylinder for scraping particles broken from the high places into the low places of the road, and a guard extending forwardly from said scraper for intercepting particles loosened by said impact elements and thrown into the air.

2. A road leveling or treating machine adapted for movement over a road comprising a drum or cylinder, means for rotating said drum or cylinder, and a plurality of impact elements protruding from the outer surface of said drum or cylinder and adapted to strike and break away high places in the road, said impact elements being generally of trapezoidal shape in transverse cross-section, and wedge-shaped circumferentially of the drum or cylinder, with the narrower side being the leading side as the drum or cylinder rotates.

CHARLES NELSON POGUE.