

(No Model.)

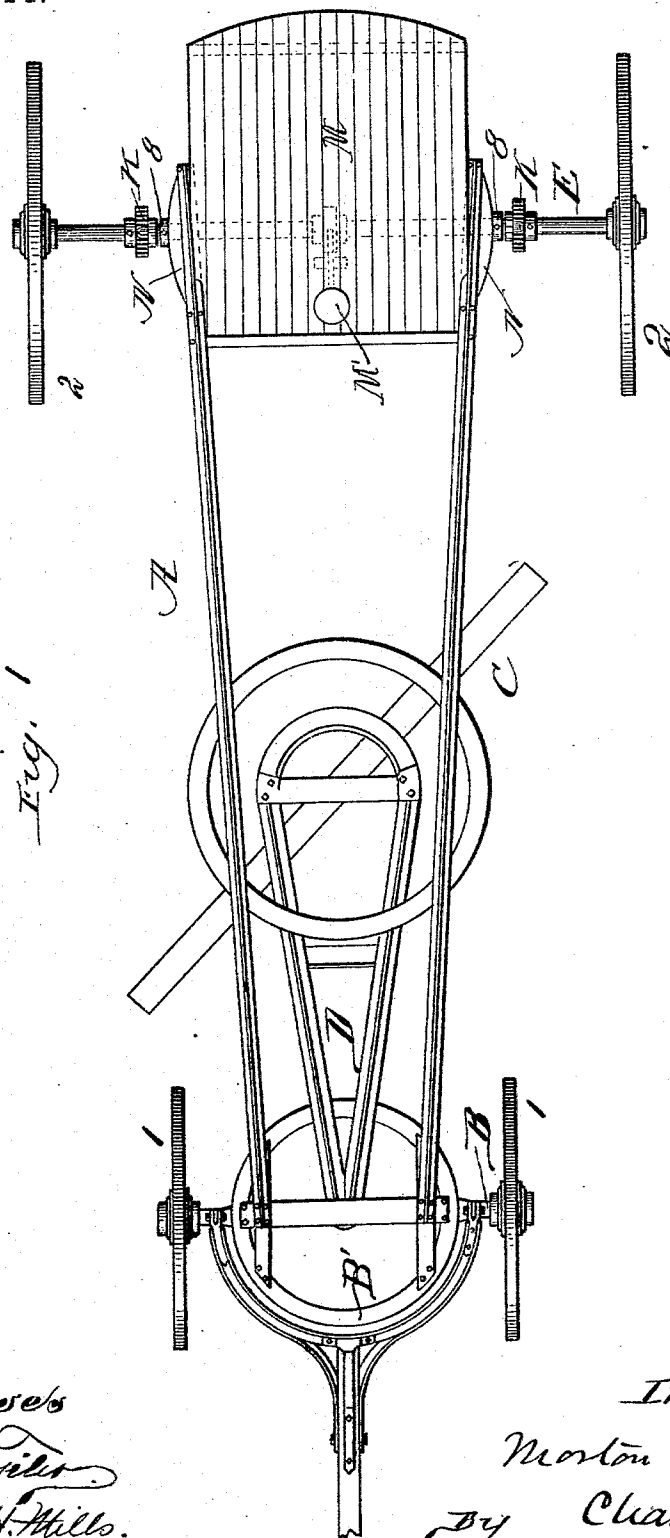
2 Sheets—Sheet 1.

M. G. BUNNELL.

MACHINE FOR MAKING OR REPAIRING ROADS.

No. 515,744.

Patented Mar. 6, 1894.



Witnesses

W. Rossiter.  
Fred. H. Mills.

*Inventor*

Morton G. Bunnell

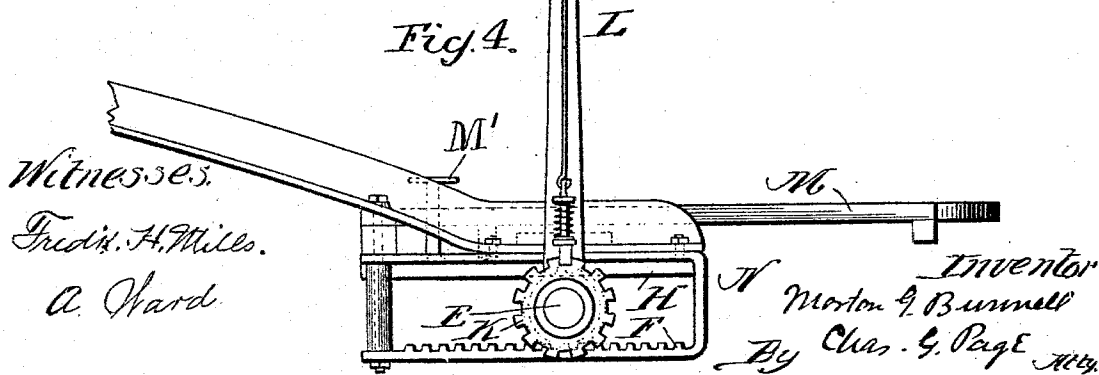
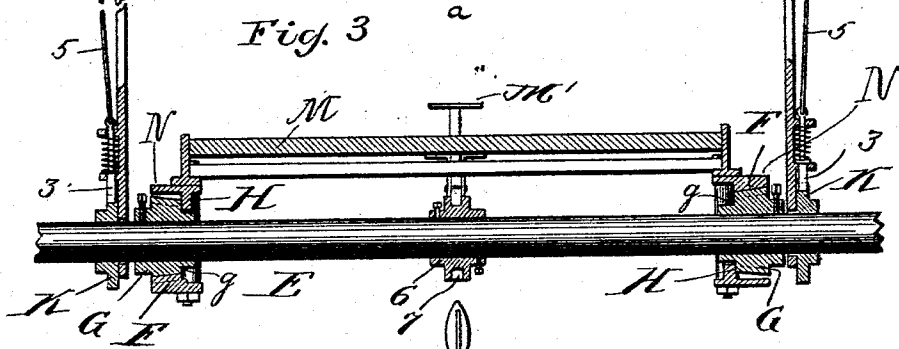
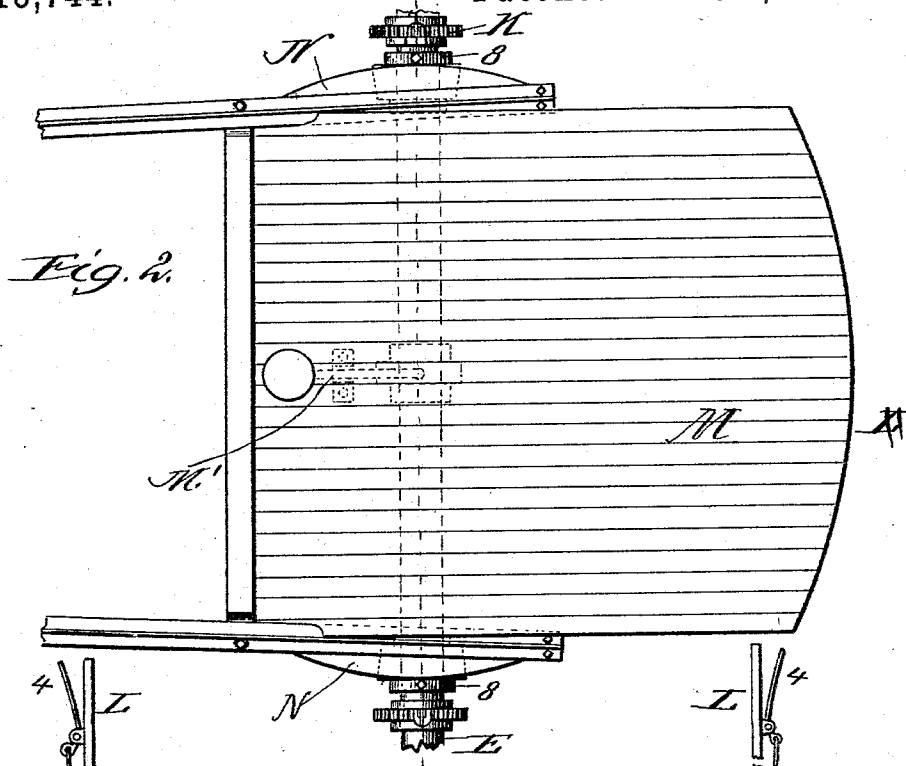
By Chas. G. Page  
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A. Ward.

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Morton G. Bunnell  
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# UNITED STATES PATENT OFFICE.

MORTON G. BUNNELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO FREDERICK C. AUSTIN, OF SAME PLACE.

## MACHINE FOR MAKING OR REPAIRING ROADS.

SPECIFICATION forming part of Letters Patent No. 515,744, dated March 6, 1894.

Application filed March 2, 1891. Serial No. 383,392. (No model.)

*To all whom it may concern:*

Be it known that I, MORTON G. BUNNELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Making and Repairing Roads, of which the following is a specification.

The object of my invention is to provide novel and improved means for effecting the horizontal swinging adjustment of the rear axle.

In the accompanying drawings; Figure 1, illustrates, in top plan a road-working machine embodying my invention, but divested of various matters which while understood to be present, are so common and well known in the art as not to require special illustration. Fig. 2, is a top plan on a large scale, of the rear portion of the machine, with the ends of the rear axle broken away. Fig. 3 is a cross section on line *a-a* in Fig. 2, the axle being shown in elevation. Fig. 4 is a side elevation of Fig. 2.

The body-frame A is, at its forward end, pivotally supported upon the front axle B; a preferred pivotal connection between the two being a fifth wheel B', although any other known or suitable pivotal connection can be employed.

The scraper-blade C, is arranged to extend across the space between the front wheels 1 and rear wheels 2; and is diagonally adjustable; that is to say, it is pivotally held between its ends, so that it can be swung horizontally about its longitudinal middle; and, hence, be set more or less oblique to the line of progress. The scraper-blade can be pushed by or drawn from the body-frame; but is preferably drawn by a horizontally-swinging and vertically-tilting draft-bar D, with which it is pivotally held at the forward end of the machine.

It is understood that, in practice, means are provided for swinging and tilting the draft-bar and for adjusting the scraper-blade independently of the draft-bar, so as to vary the horizontal angle or diagonal adjustment of the blade relatively to the line of road; and also that means are provided for effecting the raising and lowering of the blade. Various

devices have been provided for effecting such adjustments on the part of the draft-bar and scraper-blade; hence, the same need not be herein illustrated, it being observed, however, that efficient devices for such purposes have been devised by me, and embodied in Letters Patent of the United States, Nos. 427,738 and 427,739.

The body-frame carries a couple of curved racks F, arranged at opposite sides thereof; and the rear axle is provided with cog-wheels or pinions G, which are fixed upon the axle and arranged to engage said racks. The racks are arranged respectively at opposite sides of the rear axle; that is to say,—one rack is arranged above and the other rack arranged below said axle. When, therefore the rear axle is rotated about its axis, one of its cog-wheels will travel toward the front while the other cog-wheel will travel toward the rear of the machine, and, thereby, swing the axle horizontally about a point midway of its ends. As a matter of course, a longitudinal movement on the part of the racks respectively in opposite directions would rotate and cause a swing on the part of the rear axle, but I prefer to arrange the racks rigid upon the body-frame, and rotate the rear axle by suitable means. If however, it is desired to move the racks, they could be adjustably attached to the body-frame, and if preferred any suitable mechanical device such as a screw or lever could be used for adjusting them.

In order to prevent the rear axle from tilting, independently of the body-frame; and to further guard against end thrust on the part of said axle; I provide, in conjunction with each rack, a curved bearing or guide H, which is fixed upon the body-frame and formed on a curve corresponding with the circle in which the end portions of the axle swing. I have provided each cog-wheel or pinion G with an annular offset formed at its inner end and arranged to receive one of said guides, as in Fig. 3. These racks F and guides H are conveniently formed along U-shaped bars N, which are secured to the body-frame.

As a means for rotating the rear axle, I provide it with ratchets or notched wheels or disks K, fixed upon the end portion of the axle; and, in connection with each notched

wheel or ratchet, I provide a vibratory hand lever L, which is loosely fulcrumed on the axle so as to swing independently thereof, and provided with a spring latch 3, arranged  
 5 to engage the ratchet. The spring latches 3, are conveniently operated by thumb or hand pieces 4, which are pivoted on the hand levers and connected with the latches by rods 5. When the hand levers are locked to the  
 10 axle by the latches 3, the axle can be turned by operating either hand lever; although, as a desirable mode of operation, the attendant will swing the hand levers; it being understood that, after swinging the hand levers in  
 15 directions to turn the axle, they can be brought back to their first position after the operator has disengaged the latches from the ratchets.

Various devices can be provided for locking the rear axle against rotation, the locking device herein shown being a collar or hub  
 20 6, fixed upon the axle, and provided with teeth or recesses 7; and a foot latch M', supported by the platform M, and arranged for engaging said hub.

In application, Serial No. 383,140, filed by me on February 28, 1891, I have provided a horizontally swinging rotary rear axle, but in place of the rack and pinion movement herein embodied, I have provided straps and eccen-  
 30 trics. While the two devices involve different constructions, it will be seen that in each case I provide a horizontally swinging rotary adjustable rear axle.

What I claim as my invention is—

35 1. The combination substantially as hereinbefore set forth in a road-working machine, of a wheel supported body-frame, a diagonally adjustable scraper-blade arranged between the front and rear wheels, and a horizontally  
 40 swinging rotarily adjustable rear axle, for the purpose described.

2. The combination in a road-working machine provided with a diagonally adjustable scraper-blade arranged between the front and  
 45 rear wheels, of a rotary and horizontally swinging rear axle adjustable independently of the body-frame, and a rack and pinion for adjusting the rear axle, substantially as set forth.

3. The combination in a road-working machine provided with a diagonally adjustable scraper-blade arranged between the front and rear wheels, of the rotary and horizontally  
 50 swinging rear axle, a pair of racks carried by the body-frame and arranged respectively above and below the rear axle and cog-wheels or pinions on the rear axle engaging the racks  
 55 substantially as set forth.

4. The combination in a road working machine provided with a diagonally adjustable scraper-blade arranged between the front and rear wheels, of the rotary and horizontally  
 60 swinging rear axle, a pair of racks F, fixed upon the body-frame and arranged respectively above and below the rear axle, and cog-

wheels or pinions on the rear axle engaging the racks; substantially as set forth.

5. The combination in a road-working machine provided with a diagonally adjustable  
 70 scraper-blade arranged between the front and rear wheels, of the rotary and horizontally swinging rear axle, a pair of racks secured upon the body-frame and arranged respectively above and below the rear axle, and  
 75 means suitable for rotating the rear axle, and the wheels carried by the rear axle for engaging with the racks substantially as and for the purpose set forth.

6. The combination in a road working machine provided with a diagonally adjustable  
 80 scraper-blade arranged between the front and rear wheels of the rotary and horizontally swinging rear axle, a pair of racks secured upon the body-frame and arranged respectively above and below the rear axle, cog-  
 85 wheels on the rear axle engaging the racks, and means for rotating the rear axle comprising a vibratory hand lever supported upon but arranged to swing independently of the rear axle, ratchets or notched wheels fixed  
 90 upon said axle, and latches carried by the hand levers and engaging said ratchets, substantially as set forth.

7. The combination in a road working machine provided with a diagonally adjustable  
 95 scraper-blade, of the rotary horizontally swinging rear axle, a rack F, on the body-frame, a cog-wheel on the rear axle engaging the racks, and a guide H, substantially as and for the purpose set forth. 100

8. The combination in a road-working machine provided with a diagonally adjustable scraper blade, of the horizontally swinging rear axle provided with cog-wheels, racks F,  
 105 on the body-frame engaged by the cog-wheels, and guides H, secured upon the body-frame and arranged as guide bearings for the cog-wheels, substantially as set forth.

9. The combination substantially as hereinbefore set forth in a machine for making and  
 110 repairing roads, involving a scraper-blade arranged for diagonal work, of a body-frame, U-bars N secured to the body-frame and each provided with a rack, the horizontally swinging rotary rear axle extending from one of  
 115 the said U-shape bars to the other, and provided with cog wheels which engage with said racks a hand lever loose upon the rear axle and provided with a latch arranged to engage  
 120 a gear fixed upon the rear axle, a disk or annular shoulder 6 fixed upon the rear axle and provided with latch receiving holes or notches, and a foot latch supported on the body-frame and arranged to engage in the holes or notches of said disk or shoulder.

MORTON G. BUNNELL.

Witnesses:

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