

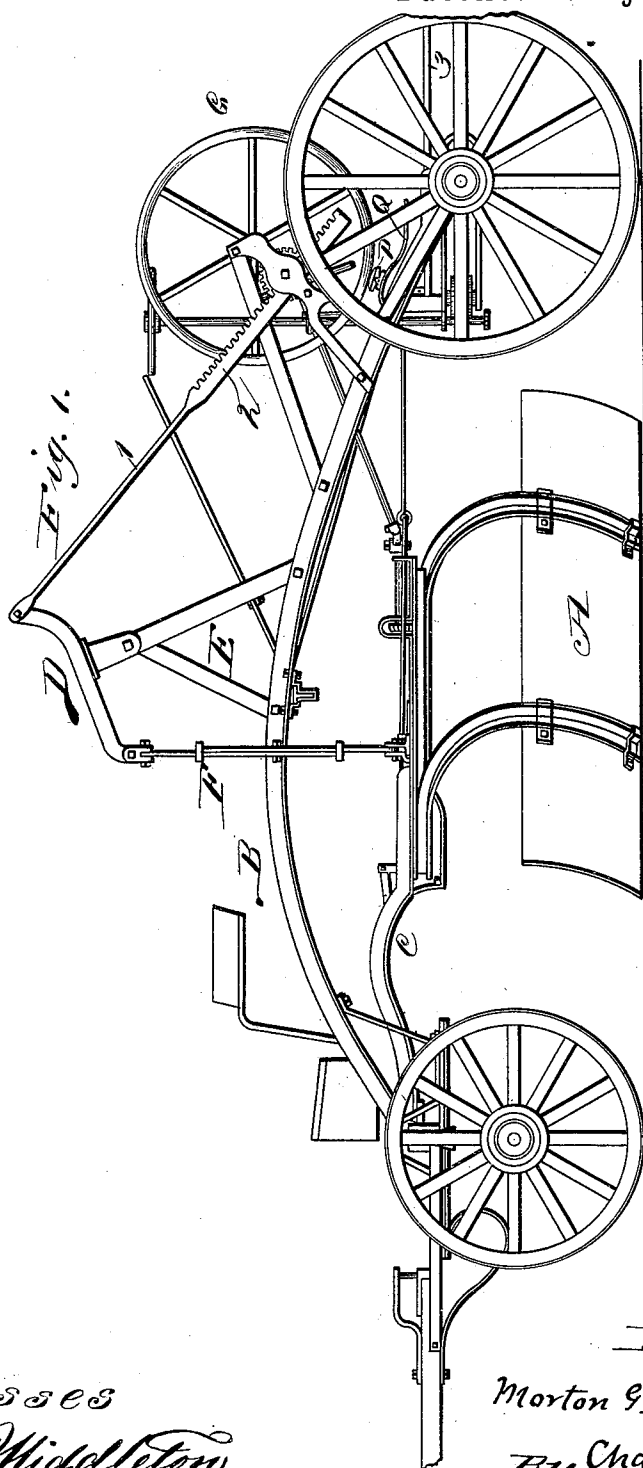
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5 Sheets—Sheet 1.

M. G. BUNNELL.
ROAD WORKING MACHINE.

No. 479,700.

Patented July 26, 1892.



Witnesses
W. H. Middleton
Reta M. Wagner

Inventor
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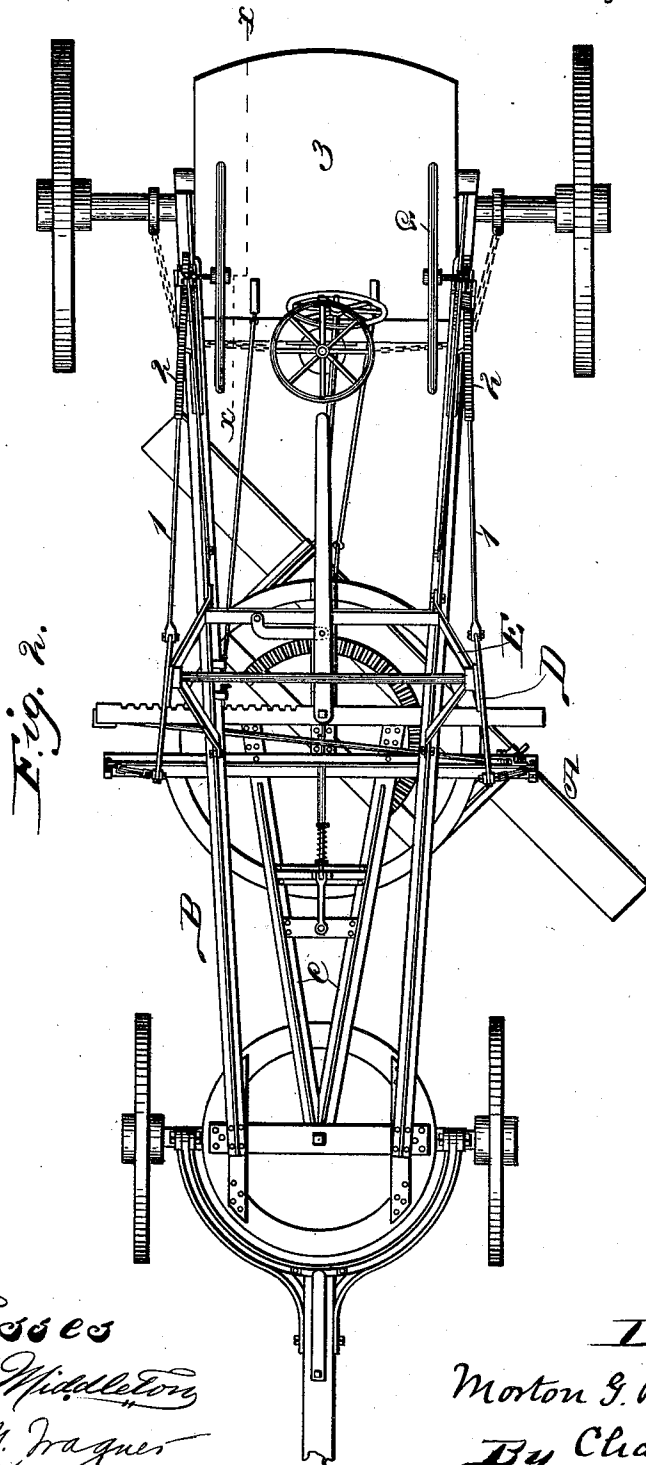
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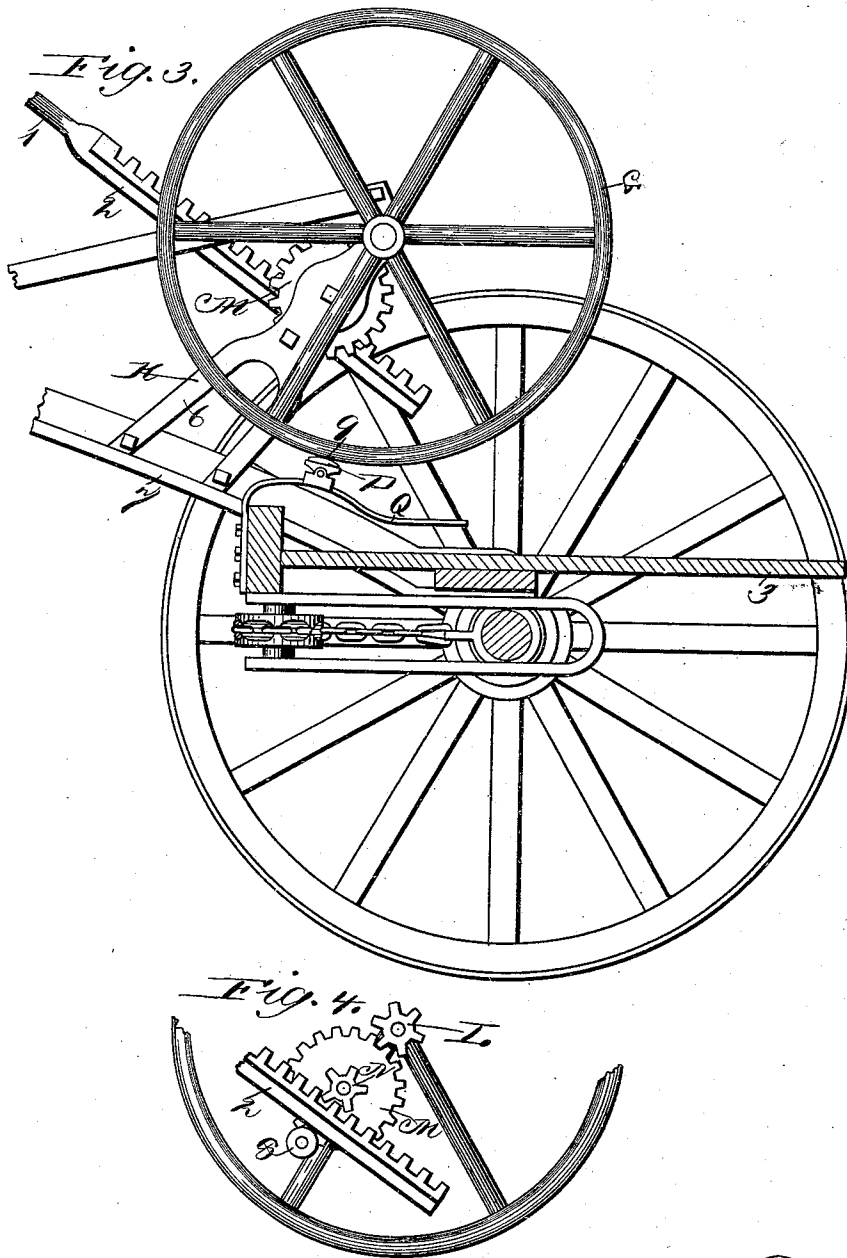
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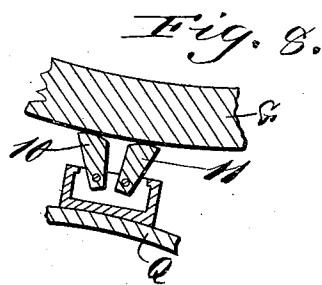
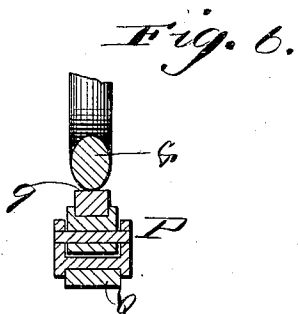
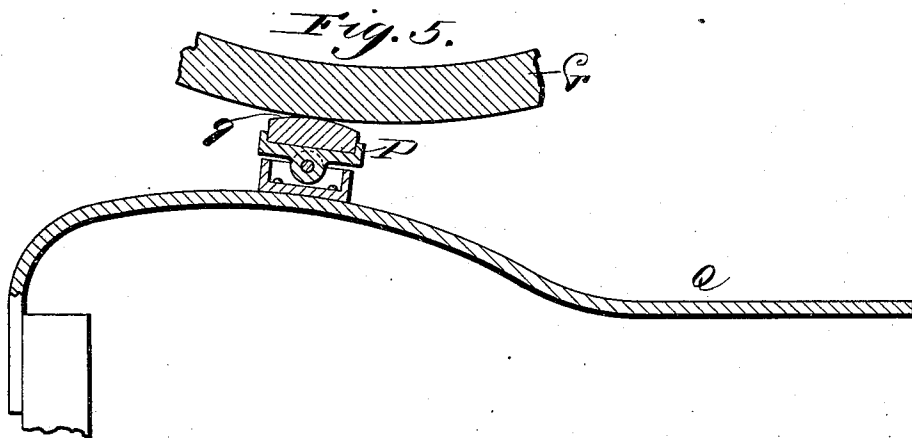
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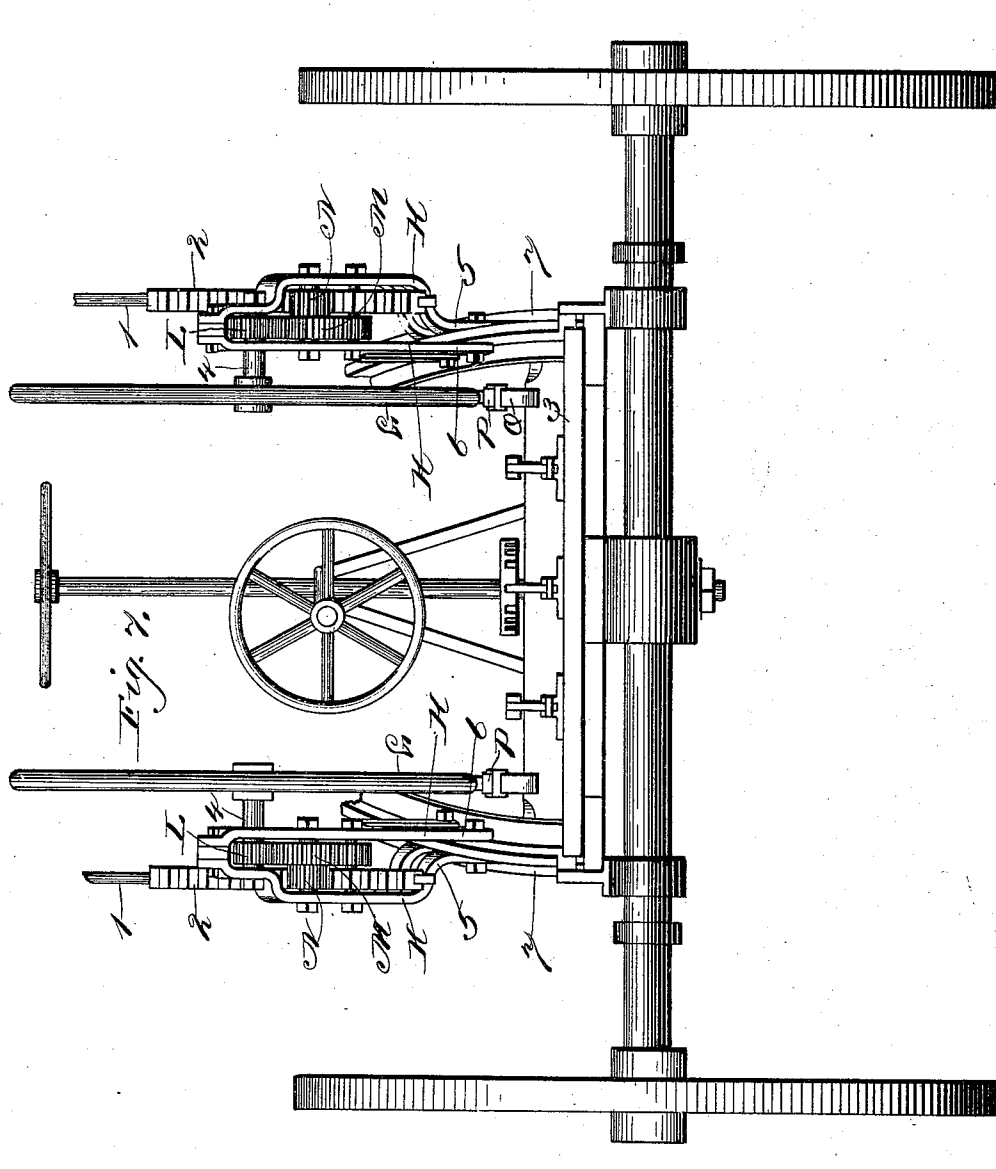
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UNITED STATES PATENT OFFICE.

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

ROAD-WORKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 479,700, dated July 26, 1892.

Original application filed March 24, 1891, Serial No. 386,184. Divided and this application filed April 26, 1892. Serial No. 430,715. (No model.) Patented in Victoria, September 16, 1891, No. 9,054.

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 a certain new and useful Improvement in Road-Working Machines, of which the following is a specification.

This application is filed as a division, in part, of my application for Letters Patent of the United States, Serial No. 386,184, filed on or about March 24, 1891, and patented in Victoria by Letters Patent No. 9,054, dated September 16, 1891, upon an application made by me and assigned to Frederick C. Austin, and comprises as such division the means therein described for raising and lowering the scraper-blade, in addition to which said matters my present application also comprises an improved construction of brake for locking the hand-wheels.

The objects of my invention are, first, to provide efficient and easily-operated means for raising and lowering and holding down the scraper-blade, and, secondly, to provide a simple and highly-effective construction of brake adapted for positively locking the hand-wheels herein employed and arranged so that it can be quickly and easily freed therefrom.

To the attainment of the foregoing and other useful ends my invention consists in matters hereinafter set forth, and particularly pointed out in the claims.

In carrying out my invention I suspend the scraper-blade by any suitably-constructed hangers from rocking or vibratory supports, which are sustained in elevated positions upon the body-frame of the machine. These rocking or vibratory supports are arranged to operate independently of one another and are connected with hand-wheels arranged upon the rear portion of the machine through the medium of long rack-bars which at their forward ends are jointed to the rocking or vibratory supports and at their rear portions gear-connected with their respectively-allotted hand-wheels. The rocking or tilting supports are relatively high, so as to secure general efficiency of operation, while on the other

hand the hand-wheels are relatively low, so as to place them within convenient reach of an attendant standing upon the rear platform. The rack-bars incline upwardly and forwardly from their gear connections with the hand-wheels and extend upwardly to and connect with the elevated rocking or vibratory supports from which the scraper-blade is suspended. When the hand-wheels are turned in a direction to raise the scraper-blade, the rack-bars will move longitudinally and will exert a back and down pull upon the said vibratory supports, by which arrangement I avoid getting the operative parts of such mechanism on dead-centers. The rear portions of the rack-bars are supported upon anti-friction rolls, which permit the rack-bars to tilt in conformity with the movements of the elevated vibratory supports for the blade, and which also maintain the toothed portions of said bars in engagement with the cogs or gear-wheels allotted thereto; and as a matter of further improvement I provide a train of gearing between each hand-wheel and its allotted rack-bar, so as to permit an operator to readily and rapidly raise and lower the scraper-blade.

In connection with each hand-wheel I provide a spring-supported rocking cam or shoe, which is eccentrically pivoted and arranged, so that when in engagement with the hand-wheel a disposition on the part of the latter to turn in either direction will result in a movement on the part of the cam or shoe in a direction to crowd it between its support and the hand-wheel, and thereby cause it to bind against the hand-wheel proportionally to the power tending to turn the latter. In this way the cam or shoe affords an initial resistance to the turning of the wheel, which said initial resistance is supplemented by the resistance of its spring-support. Should the scraper-blade encounter, for example, a positive resistance—such as a bowlder embedded in the ground—something must give or the machine will break, and where the scraper-blade meets with such positive resistance the spring-support for the cam or shoe will then

so yield as to permit the hand-wheel to turn, and thus allow the scraper-blade to rise and ride over the obstruction. The leverage for depressing the spring-support can also be such as to allow an attendant to readily depress the same, and thereby free the shoe from the hand-wheel with ease. The provision of the cam or eccentrically-pivoted shoe for the foregoing purpose permits the application to the hand-wheel of a more positive resistance than can be attained by the use of the old construction non-pivoted brake-shoe either secured upon or arranged subject to a spring, as hereinafter more fully explained.

In the accompanying drawings, Figure 1 represents in side elevation a road-working machine embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 shows on a larger scale a longitudinal vertical section through the rear portion of the machine on line *xx* in Fig. 2. Fig. 4 is a detail view showing the anti-friction roller that supports the rack-bar. Fig. 5 is a section on a vertical central plane through the cam or shoe and its spring-support on a plane coincident with the plane of the hand-wheel, of which latter a portion only is shown. Fig. 6 is a section taken transversely through the cam or shoe and spring-support. Fig. 7 represents the rear end portion of the machine in rear elevation. Fig. 8 is a section on a vertical central plane through a divided shoe embodying my invention.

In said drawings, A indicates the scraper-blade, B the body-frame of the machine, and C the swinging draft-bar, from which the scraper-blade is drawn. The elevated rocking or vibratory supports D, from which the blade is suspended by hangers F, are pivotally sustained upon standards E, which rise, respectively, from opposite sides of the body-frame. The rack-bars 1 are at their forward ends pivoted to the vibratory supports D and may have only their rear portions 2 provided with rack-teeth. The hand-wheels G are arranged to be in convenient reach of an attendant standing upon the rear platform 3 of the machine and are respectively gear-connected with their allotted rack-bars.

In order to provide powerful means for operating the rack-bars, each hand-wheel is connected with its allotted rack-bar by a train of gearing. As herein shown, each hand-wheel has its axle 4 provided with a small gear or cog L, which engages a large gear M, the latter being rigid with a small gear or cog N, which engages with one of the rack-bars. The axles of the hand-wheels and the journals of said cogs or gears are supported by the sides 5 and 6 of frames K, which are secured upon and arranged to rise from the sides 7 of the body-frame of the machine, and the cogs or gears are arranged within the spaces between said sides of the frames K, as best shown in Fig. 7. Each frame K also contains an anti-friction roll for its allotted rack-

bar to rest and ride upon, one of said rolls being indicated at 8 in Fig. 4. These rolls, while serving to uphold the rear portions of the rack-bars and maintain them in engagement with the cogs or gears N, also permit said rack-bars to tilt in conformity with the movements of the vibratory supports D, to which the rack-bars are jointed at their forward ends, it being obvious that the rack-bars thus arranged can tilt upon the supporting-rolls and also tilt or rock about the said cogs and thus provide an easy-working and efficient construction.

The foregoing-described arrangement of a train of cogs or gears of varying sizes permits an operator to raise the heavy blade with comparative ease and is of special importance in conjunction with the hand-wheel, which must be turned by the operator in order to effect the lift of the blade, and which has, of course, a comparatively short leverage. On account of the great weight of the scraper-blade and devices for holding it, it is not only desirable to thus provide means for allowing the operator to raise the blade with ease, but also to permit him to so control the blade in plowing that it can be readily adjusted with great nicety, and to such end I provide the said train of differently-sized gears, which subserves both of such purposes. Said gearing is brought within small limits and serves to multiply the leverage in a convenient way and also permits the rack-bar to readily tilt while being thrust forward or back. It will also be observed that the train of gearing serves as an auxiliary to the brake as a means for holding the blade down to its work and against the enormous resistance incurred in plowing, and at the same time permits the operator to raise the blade with ease after the brake has been taken off the hand-wheel.

In connection with each hand-wheel I provide a rocking cam or shoe P, which is spring-supported and pivoted eccentric to the axis of the hand-wheel. This shoe is in the nature of a double cam—that is to say, it has its acting face 9 so arranged that no matter in which direction the hand-wheel is turned a binding action will follow. The acting face of the cam or shoe is preferably curved and on the arc of a circle, and the shoe is pivoted eccentric to such circle. When, therefore, the hand-wheel tends to turn to the left, it will, by reason of its frictional engagement with the shoe, swing the shoe to the left and obviously cause the shoe to bind against the hand-wheel proportionally to the extent to which the shoe is thus swung. On the other hand, a disposition on the part of the hand-wheel to turn to the right will swing the shoe to the right, and hence cause the shoe to bind proportionally to the extent to which it is thus swung. The shoe may, however, be at any time instantly freed from the hand-wheel by depressing the spring-support whereon the shoe is pivotally held.

While I might employ light springs or provide the shoe with a lower balance-weight for the purpose of causing the shoe to first engage the wheel at a point between the ends of the acting face of the shoe after the spring-support has been released and allowed to rise for the purpose of automatically applying the brake, I find in practice that even should the shoe become tilted one way or the other when its spring-support is depressed by an attendant the highest portion of the shoe will, upon the releasement of its spring-support, strike the wheel in such way that the shoe will be righted, and thus be brought into position for locking the wheel against rotation in both directions. Regardless, therefore, of the strength of the spring-support, the rocking shoe itself constitutes a brake, and if its support were rigid the shoe would of itself form a cam-brake. It is desirable, however, that under circumstances hereinbefore described the support for the shoe should yield, and hence I provide a spring-support. I also prefer employing a bent spring-arm Q as a support for the shoe, since the rear end of said arm can be used as a treadle whereon the attendant can conveniently press his foot, the entire spring-arm in such case forming a strong spring-lever. It will also be observed that the binding action of the shoe thus arranged tends to a large extent to exert an end-thrust against the spring-arm rather than a direct downward thrust, tending to depress the spring. In place of the spring-arm, I may obviously use a rigid arm pivotally supported and upheld by a spring, as in many old brakes having rigid shoes.

While I prefer providing a single double-acting shoe, as hereinbefore described, I may divide the shoe, so as to provide, in effect, a shoe composed of a couple of pivoted sections, as in Fig. 8, wherein the shoe comprises a couple of sections 10 and 11, pivotally held upon the spring-support. With such arrangement the shoe-section 10 will be caused to bind against the hand-wheel when the latter is turned in one direction, while on the other hand the shoe 11 will be caused to bind against the wheel when the same is turned in a contrary direction. In effect, therefore, these shoe-sections may be said to represent halves of the shoe P, hereinbefore described.

With further reference to the cam or cam-shoe herein described, I desire it to be understood that the same can be employed in connection with a hand-wheel and any known or suitable blade raising and lowering mechanism arranged as a connection between the hand-wheel and scraper-blade, and that I do not limit myself in this respect to the particular construction of raising and lowering mechanism or devices herein illustrated.

What I claim as my invention is—

1. The combination, in a road-working machine, of a scraper-blade, a vibratory raising

and lowering support from which the scraper-blade is suspended, a tilting and longitudinally-movable rack-bar having a jointed connection with and extended back from said vibratory support, and a hand-wheel gear connected with the rack-bar, the latter being moved longitudinally by the gear and being supported in connection therewith so as to tilt about the gear in conformity with the independent vibratory movement of the support from which the scraper-blade is suspended, substantially as described.

2. The combination, in a road-working machine, of a scraper-blade, an elevated vibratory support from which the scraper-blade is suspended, the inclined longitudinally-movable rack-bar attached to and extended downwardly and rearwardly from the said vibratory support and arranged so that the vibratory action of the latter shall be caused by an independent end-thrust on the part of the rack-bar, and a hand-wheel gear connected with the rack-bar, substantially as described.

3. The combination, in a road-working machine, of the elevated vibratory levers D and the scraper-blade suspended therefrom by hangers, the rack-bars I, having at their forward ends direct jointed connections with the rear ends of said vibratory levers and extended rearwardly from the same, and hand-wheels respectively gear-connected with one and the other of the rack-bars, substantially as described.

4. In a road-working machine comprising a scraper-blade and means suitable for suspending, raising, and lowering the same, a hand-wheel and a rack-and-pinion movement arranged for operating said means for the purposes set forth, and comprising, in combination therewith, a tilting and longitudinally-movable rack-bar arranged to tilt about the gear, which operates to cause an end-thrust on the part of the rack-bar, and a hand-wheel for actuating the gear, substantially as and for the purpose described.

5. The combination, in a road-working machine, of the scraper-blade, a vibratory support from which the scraper-blade is suspended, the tilting and longitudinally-movable rack-bar having a jointed connection with the vibratory support and extended rearwardly therefrom, a hand-wheel gear connected with the rack-bar, and an anti-friction roll supporting the rack-bar in engagement with the gear and permitting the rack-bar to tilt in conformity with the movement of the vibratory support from which the scraper-blade is suspended, substantially as described.

6. In a road-working machine, the combination, with the scraper-blade, hand-wheel, and suitable connection between the hand-wheel and scraper-blade as a means for raising and lowering the latter, of a spring-supported rocking brake-shoe normally in engagement with the hand-wheel and arranged to rock and

operate as a cam or wedge for locking the hand-wheel, substantially as and for the purpose set forth.

5 7. In a road-working machine, the combination, with the scraper-blade, a hand-wheel, and suitable connection between the hand-wheel and scraper-blade as a means for raising and lowering the latter, of the spring-supported rocking brake-shoe normally in engage-

ment with the hand-wheel and the spring-lever whereon said rocking brake-shoe is pivotally supported, substantially as and for the purpose described.

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Witnesses:

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