(No Model.) 4 Sheets—Sheet 1.

M. G. BUNNELL.

ROAD SCRAPING MACHINE.

No. 404,774. Patented June 4, 1889.

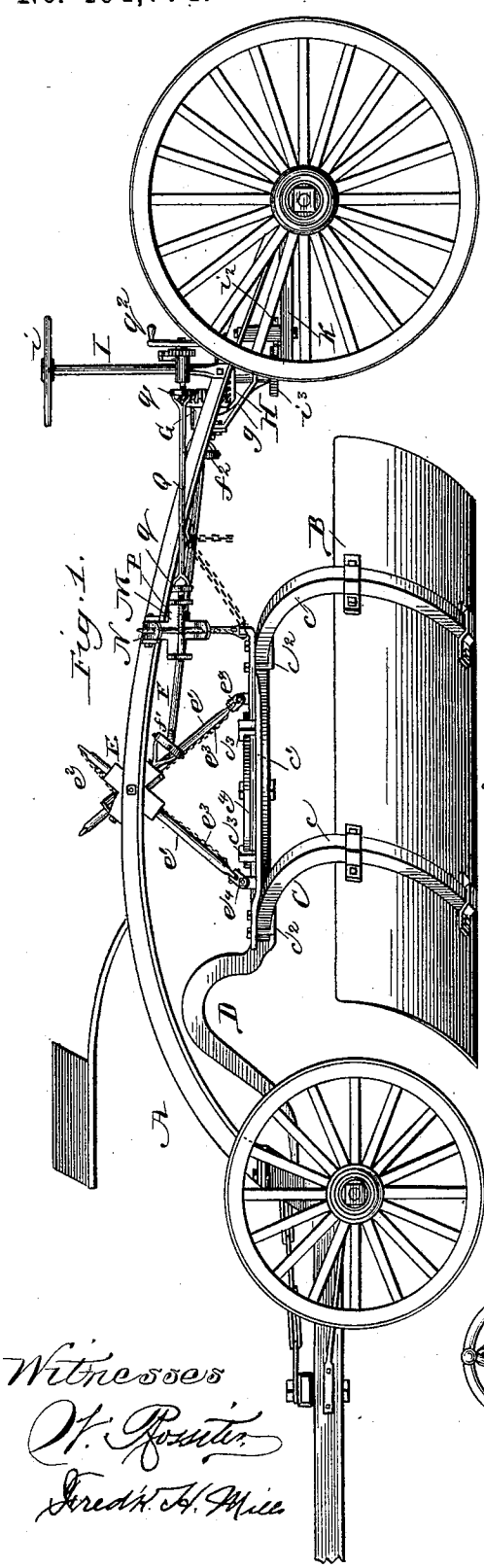


Fig. 1.

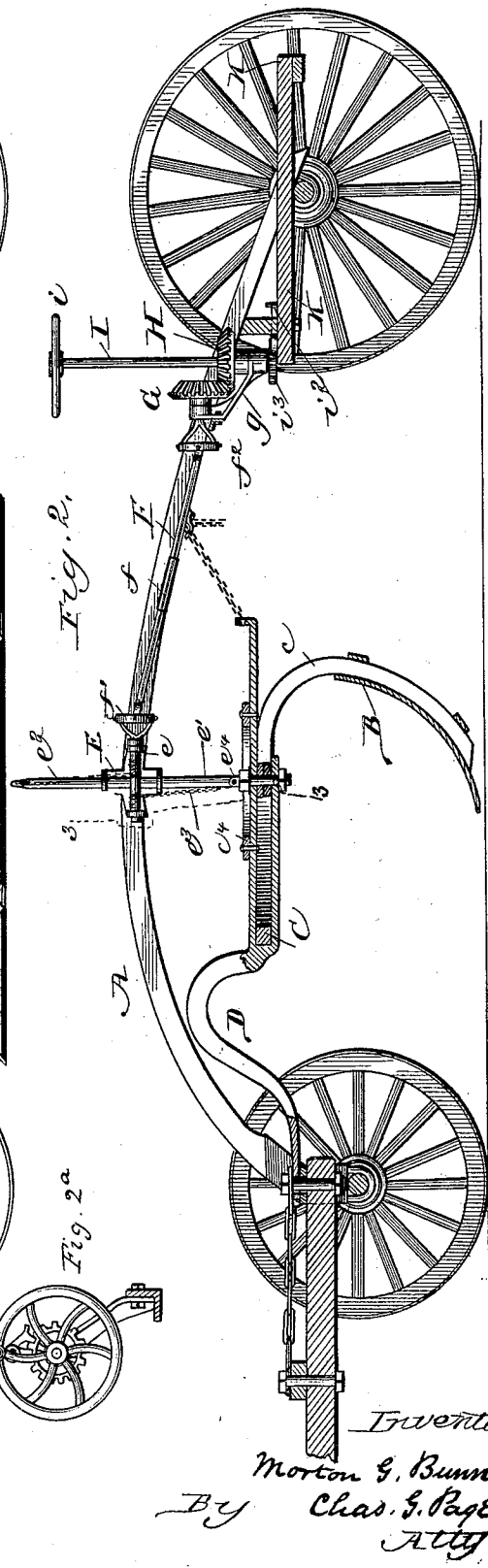


Fig. 2.

Fig. 2a

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M. G. BUNNELL.

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Fig. 3.

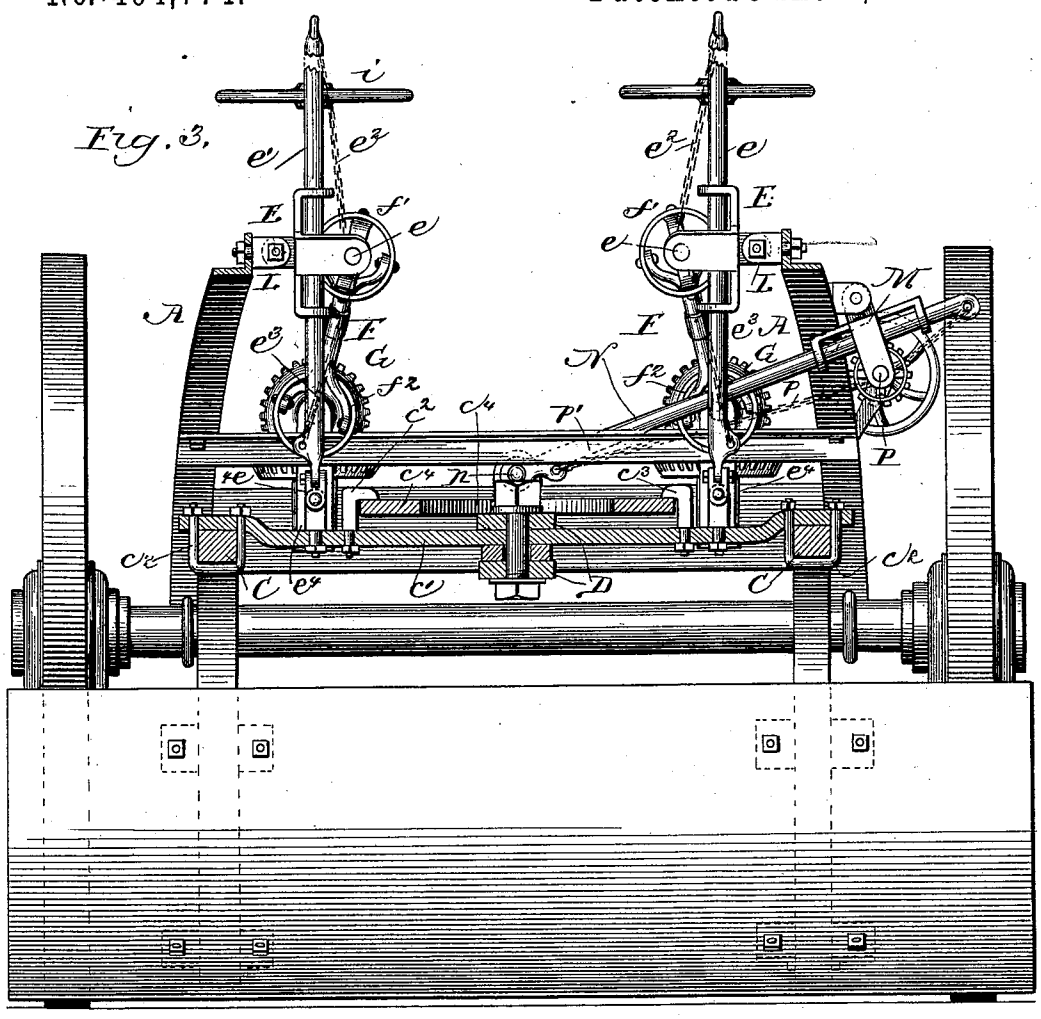
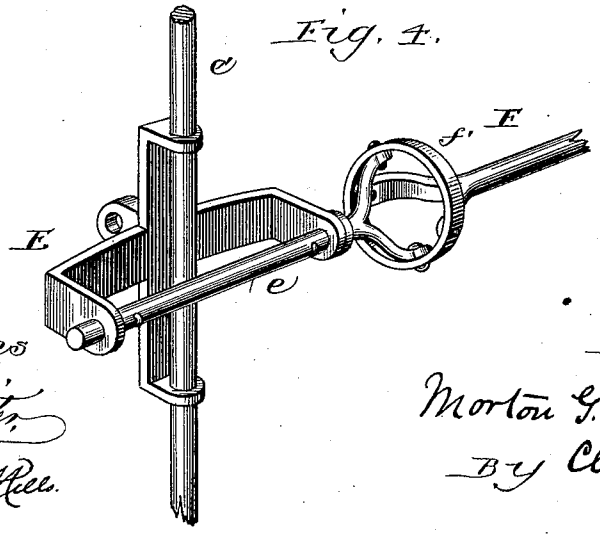


Fig. 4.



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M. G. BUNNELL.

ROAD SCRAPING MACHINE.

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Fig. 6.

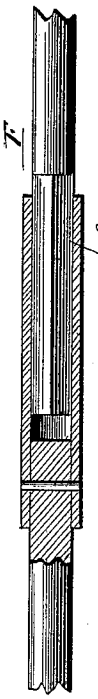


Fig. 5.

Fig. 7.

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ROAD SCRAPING MACHINE.

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Fig. 8.

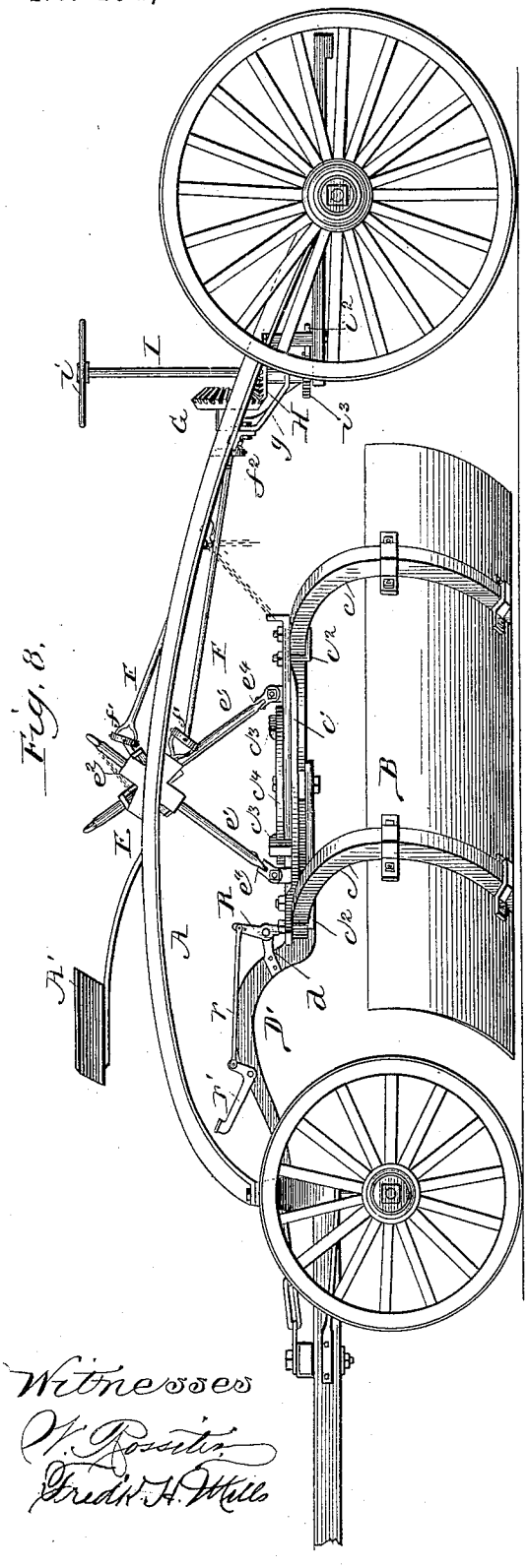


Fig. 10.

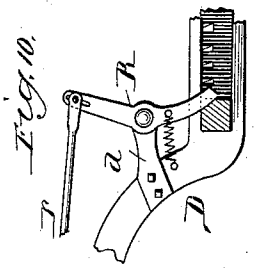
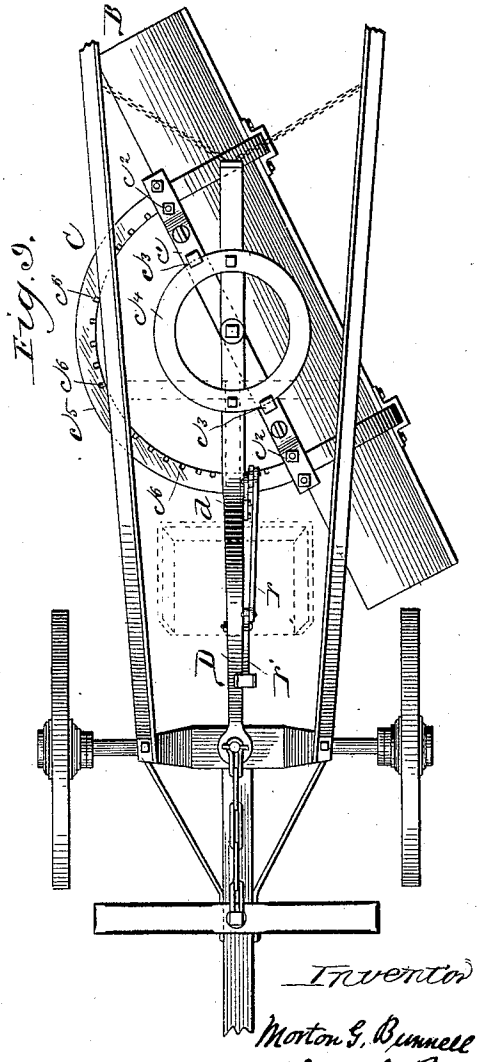


Fig. 9.



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UNITED STATES PATENT OFFICE.

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ROAD-SCRAPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 404,774, dated June 4, 1889.

Application filed January 2, 1889. Serial No. 295,243. (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 a certain new and useful Improvement in Road-Scraping Machines, of which the following is a specification.

My invention relates to road-scraping machines wherein the scraper-blade is to be raised and lowered for the purpose of either lifting it clear of the ground or lowering and holding it down to its work; and it further relates to road-scraping machines wherein the scraper, which is arranged to be raised and lowered, as aforesaid, can also be thrown toward either side of the machine for well-known purposes.

The more prominent objects of my invention are to so suspend the scraper-blade that it can be raised and lowered at either end with perfect freedom and without the cramping or binding of its suspending devices, to permit the scraper-blade to be readily moved toward either side of the machine without cramping or binding the means whereby it is raised or lowered, to permit the blade to be freely adjusted to different angles and positions relatively to the condition of the road, to give greater freedom of movement to the scraper-blade than heretofore, to avoid certain objectionable positions of the blade which have heretofore attended the raising of the blade while in a position oblique to the line of progression, to provide certain improved means for raising and lowering the scraper-blade, to provide improved means for throwing the blade toward either side of the machine, to provide simple and convenient means for locking a segment to which the scraper-blade is attached, and to provide certain improved details serving to promote the general efficiency and serviceability of road-scrapers.

In the accompanying drawings, Figure 1 represents in side elevation a road-scraping machine embodying the principles of my invention. Fig. 2 is a longitudinal section taken on a vertical plane centrally through Fig. 1. Fig. 2^a is a detail showing a device for locking the hand-wheel q^2. Fig. 3 is a transverse section taken through Fig. 2 on line 3 3, the scraper-blade being, for convenience of illustration, shown at right angles to the line of progression. Fig. 4 is a detail representing in perspective a portion of one of the raising and lowering blade-suspending devices. Fig. 5 represents in perspective one of said raising and lowering blade-suspending devices and means for operating the same. Fig. 6 represents, partly in section, a sliding jointed portion of the power-transmitting shaft shown in Fig. 5. Fig. 7 represents one of the universal joints hereinafter referred to. Fig. 8 is a view similar to Fig. 1, with the addition of means for locking a segment to which the scraper-blade is attached. Fig. 9 is a top plan view of Fig. 8, with both the rear portion thereof and the blade raising and lowering devices omitted and the driver's seat indicated in dotted lines. Fig. 10 is a detail showing in side elevation a portion of the draft-bar and segment-locking device, and also a portion of the segment, partly in cross-section, on a vertical plane parallel with the draft-bar.

In said drawings, A indicates the main body-frame, which is wheel-supported in any suitable manner. The scraper-blade B is of the reversible type, and to such end it can, for example, be attached to the downwardly-bent arms or ends *c* of the segment or half-circle C, which said segment has its horizontal portion supported by an arrangement to slide in or upon suitable bearings at the rear portion of the draft-bar D. The draft-bar is pivoted at the forward end of the machine, whereby it can be swung both vertically and horizontally, the horizontal swing of the draft-bar serving to permit the scraper-blade to be thrown to either side of the machine, while on the other hand the vertical swing or tilt of the draft-bar permits the scraper-blade to be raised and lowered. In this connection it will be readily understood that the draft-bar can at its forward end be pivoted so loosely as to permit it to have what may be termed a "universal swinging movement," but that, if desired, any other suitable form of universal joint can be employed for connecting the forward end of the draft-bar with the forward axle or other part of the machine.

As a means for suspending the scraper-blade and for raising and lowering the same, the body-frame carries a couple of brackets or bearings E, which are supported upon the body-frame by universal joints, and which are each provided with a rotary winding-drum or winding-shaft *e*, which is suitably journaled

in its allotted bracket E. Each bracket E also carries a sliding rod e', arranged to work through suitable bearings in the bracket, and connected by chains or cords e^2 and e^3 with the winding-shaft on said bracket. The two raising and lowering chains e^2 and e^3, which are allotted to each sliding rod e', are respectively attached to opposite ends of said sliding rods, and are arranged to wind upon the winding-shaft in opposite directions, whereby, when the winding-shaft is operated, one of the chains or cords will wind upon the shaft, while the remaining chain or cord will simultaneously therewith unwind from the shaft, so that while the pull of the chain that is winding upon the shaft will cause a longitudinal movement of the slide-rod, the simultaneous unwinding of the remaining chain will obviously permit such movement of the rod. The rods e' are at their lower ends connected by universal joints e^4 with the scraper-blade, said connection between the rods and blade being made indirectly through such means as may be provided as a bearing for the segment or other like fixture with which the scraper-blade is connected, it being observed that I have herein applied the joints e^4 to a cross-bar c', having stirrups c^2, through which the horizontal portion of the segment is arranged to pass, and that said cross-bar is by cleats c^3 attached to a circle c^4, which is in turn attached to the draft-bar.

The winding-shafts e are connected with suitable driving-gear through the medium of the universal jointed power-transmitted shafts F, which said shafts are also provided with extensible joints f, so as to accommodate them in length to the swing of the winding-shafts. A convenient arrangement of power-transmitting shaft for the foregoing purposes is best shown in Fig. 5, wherein one of the winding-shafts e is connected with an extensible shaft F by a universal joint f', and said shaft connected in turn with the spindle of a bevel-gear G by a universal joint f^2. The spindles of the bevel-gears G are mounted in brackets g upon the body-frame of the machine, and said bevel-gears are arranged to engage similar bevel-gears H, which latter are operated by rods I, having at their upper ends suitable hand-wheels i within convenient reach of an attendant standing upon the rear platform K. By operating either one of these hand-wheels the jointed and extensible power-transmitting shaft to which it is allotted can be operated so as to raise or lower one end of the scraper-blade, while by operating both hand-wheels the scraper-blade can obviously be raised or lowered as a whole. During the rising and falling of the scraper-blade and the consequent tilt or vertical swing of the draft-bar the brackets E will move in conformity to the movement of the draft-bar, and likewise when the draft-bar is swung to either side the brackets E will move and adapt themselves to such side swing.

As a simple construction, each bracket is principally composed of a cross-shaped piece, whereof two of its arms can be provided with bearings for one of the slide-rods e', while its remaining two arms can be provided with bearings for one of the winding-shafts e. Each bracket is pivoted at its inner side to a bearing L, which is in turn pivoted to the body-frame, (or any suitably-raised bearing thereon,) thereby adapting the jointed connections between said brackets and their support to all movements which the brackets may be required to make by reason of the various movements necessary to be performed by the scraper-blade during a season of work.

The shafts F can be locked against rotation in various ways—as, for example, by pawls i^2, arranged for engaging ratchets i^3 on the rods I and located within convenient reach of the foot of an attendant standing on the rear platform.

While various known forms of joints for universally-jointed shafting can for the broader purposes of my invention be herein employed, I have herein shown a specially-devised construction of universal joint formed by providing yoke-arms on the ends of two sections of shafting and pivoting said arms to a ring or collar, as best shown in Figs. 4 and 5, wherein the yoke-arms f^3 at one end of shaft F and the yoke-arms e^4 at one end of shaft e are pivoted to a ring e^5, said shaft F being at its opposite end connected with the spindle of gear G by a connection similar to the foregoing.

As a means for swinging the draft-bar horizontally, so as to throw the scraper-blade toward either side of the road, I can employ and have herein shown a shifting device similar to that hereinbefore described as a means for raising the blade at either end. Said shifting device is shown in Figs, 1 and 3, and consists of a bracket M, connected with the body-frame by a universal joint and provided with bearings for a slide-rod N and a winding-shaft P. Cords or chains p and p' are attached to the winding-shaft P and arranged to wind thereon, respectively, in opposite directions, said cords or chains being also respectively connected with opposite ends of the slide-rod N, as best shown in Fig. 3, wherein the chain p' is mainly indicated in dotted lines. The slide-rod N is arranged transversely to the length of the machine and at one end connected with the draft-bar at n by a universal joint, and the winding-shaft P is connected with a rotary power-transmitting shaft Q by a universal joint q, similar, for example, to either the joint f' or f^2. The shaft Q is connected, by a joint similar to the foregoing, with a rotary shaft or spindle carrying a hand-wheel q^2, which latter is arranged within convenient reach of an attendant upon the rear platform. By operating the hand-wheel q^2 the winding-shaft P can be actuated so as to actuate the slide-rod N in the same way that either of the rods e' may be oper-

ated, whereby the draft-bar can be swung to one side or the other, according to the direction in which the hand-wheel is turned. The jointed connections between rod N and the draft-bar and bracket and the jointed connection between the said bracket and body-frame permit the rod to accommodate itself to the up and down movements of the scraper-blade, as will be obvious without further description.

The rear portion of the draft-bar D is divided horizontally, so as to provide space for the passage of the horizontal portion c^4 of the segment and also provide a bearing through which said portion of the segment may slide when the segment as a whole turns about a vertical axis, which is arranged centrally of the circle c^4. The segment consists simply of a stout metal bar having downwardly-bent end portions that are attached to the back of the scraper-blade. As a means for permitting the driver occupying seat A′ to readily lock and unlock the segment, the horizontal portion c^5 of the segment is provided along its inner side with a series of notches c^6, formed directly in the bar of which the segment is composed.

The draft-bar is at a point just forward of the segment provided with a bearing d (see Figs. 8, 9, and 10) for a spring-controlled vibratory locking-lever R, which is at a point between its ends pivoted upon the bearing d.

The lower end of the locking-lever R is arranged for engaging the notched portion of the segment-bar, while the upper end of said locking-lever is by a connecting-rod r connected with a vibratory foot-lever r', that is pivoted upon a draft-bar at a point where it can be conveniently reached by the driver's foot.

Various constructions of locking devices have been proposed in the old art for locking the scraper-blade against turning horizontally, and hence I do not broadly claim a locking device for such old and well-known purpose. It may, however, be herein noted that I form the notches directly in the single bar that is bent to form a segment and back the blade, and that I dispense with objectionable arrangements of straps, pulleys, notched flanges, and sliding foot-pieces, and provide upon the draft-bar a simple and efficient arrangement of locking device.

In conclusion it may be stated that, broadly considered, the slide-rods and brackets provide extensible hangers suspended by universal joints and arranged to swing in all directions, thereby permitting a free and wide range of movement on the part of the scraper-blade, it being seen that each hanger comprises a member which is hung by a universal joint and a member which is suitably connected with the scraper-blade and also connected by a sliding or extensible connection with the member which is hung by the universal joint, and also that as to matters of details the brackets provide swinging bearings which carry the winding-shafts and with which the slide-rods have sliding connections.

What I claim as my invention is—

1. The combination, substantially as hereinbefore set forth, of the scraper-blade and a pair of extensible swinging hangers therefor, each comprising a member hung by a universal joint upon a support on the body-frame of the machine and a member having a suitable connection with the scraper-blade and a sliding connection with the said member which is hung by a universal joint, for the purpose described.

2. The combination, substantially as hereinbefore set forth, of the scraper-blade and a pair of sliding rods having jointed connections with the scraper-blade, and brackets supported from the body-frame of the machine by universal joints and provided with bearings with which the slide-rods have sliding connections, for the purpose described.

3. The combination, substantially as hereinbefore set forth, with the scraper-blade, of a swinging hanger therefor, comprising a slide-rod having a suitable connection with the scraper-blade, a swinging bearing with which the said rod has a sliding connection, and a winding-shaft supported with the swinging bearing and connected with the slide-rod by chains respectively for raising and lowering the same.

4. The combination, substantially as hereinbefore set forth, with the scraper-blade, of a swinging hanger therefor, comprising a slide-rod, a swinging bearing with which the said rod has a sliding connection, a winding-shaft connected with the slide-rod by chains, for the purpose specified, and a jointed rotary shaft connected with the rotary winding-shaft as a means for operating the same.

5. The combination of the scraper-blade and means for moving the scraper-blade toward either side of the machine, consisting of a slide-rod having a jointed connection with the scraper-blade and a sliding connection with a joint-supported bearing, and winding device, such as set forth, for operating the slide-rod.

6. The combination, substantially as hereinbefore set forth, of the scraper-blade, the segment C, consisting of a bar having its horizontal curved portion provided with notches and its bent ends secured to the scraper-blade, the draft-bar having a bearing for the horizontal portion of the segment, the locking-lever R, pivoted upon the draft-bar, a foot-lever r' below the driver's seat, and a rod r, connecting the foot-lever with the locking-lever, for the purpose described.

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