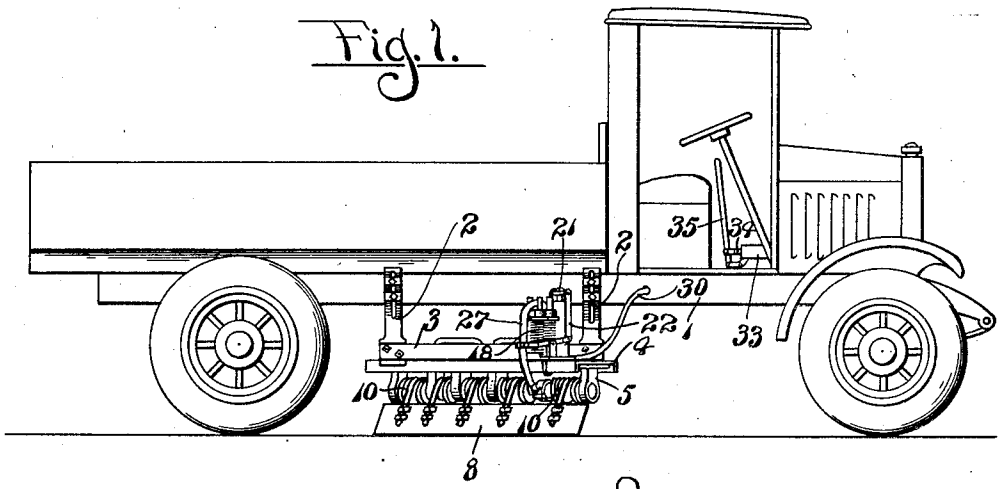
May 16, 1933. G. E. DEAN 1,909,854

HYDRAULIC LIFT FOR SCRAPER BLADES

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Fig. 1.



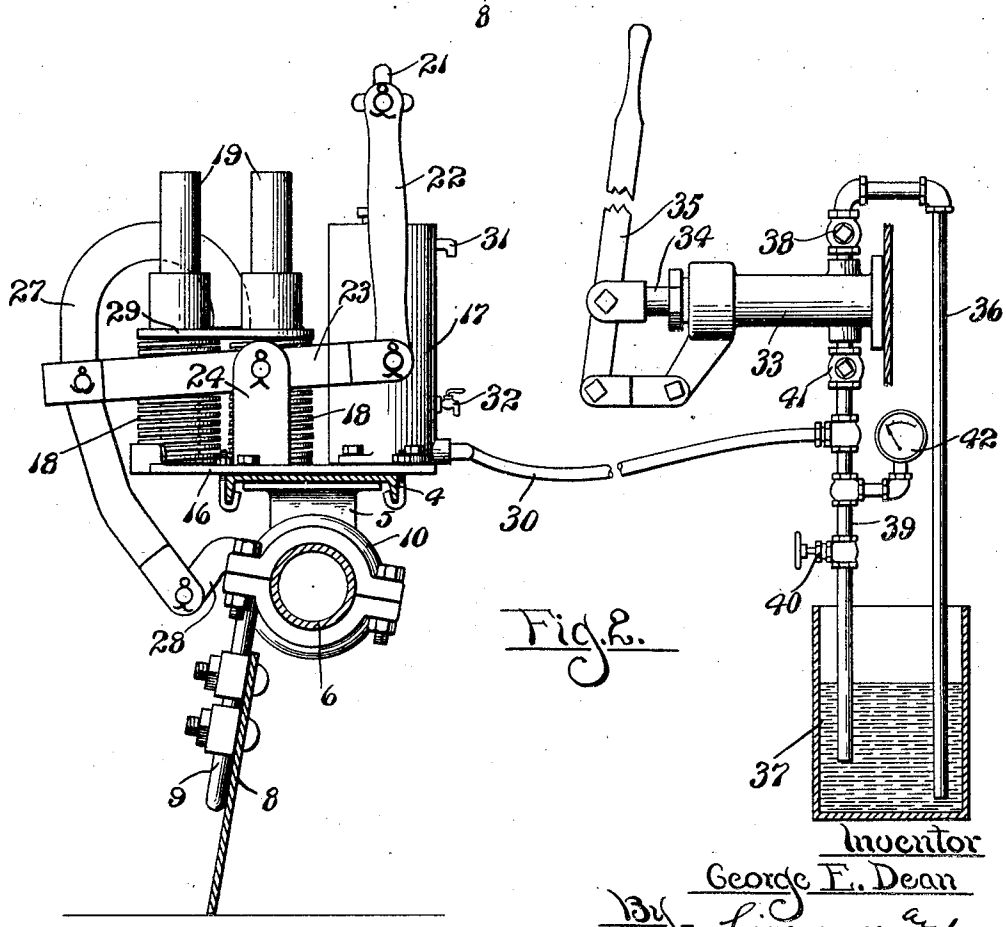


Fig. 2.

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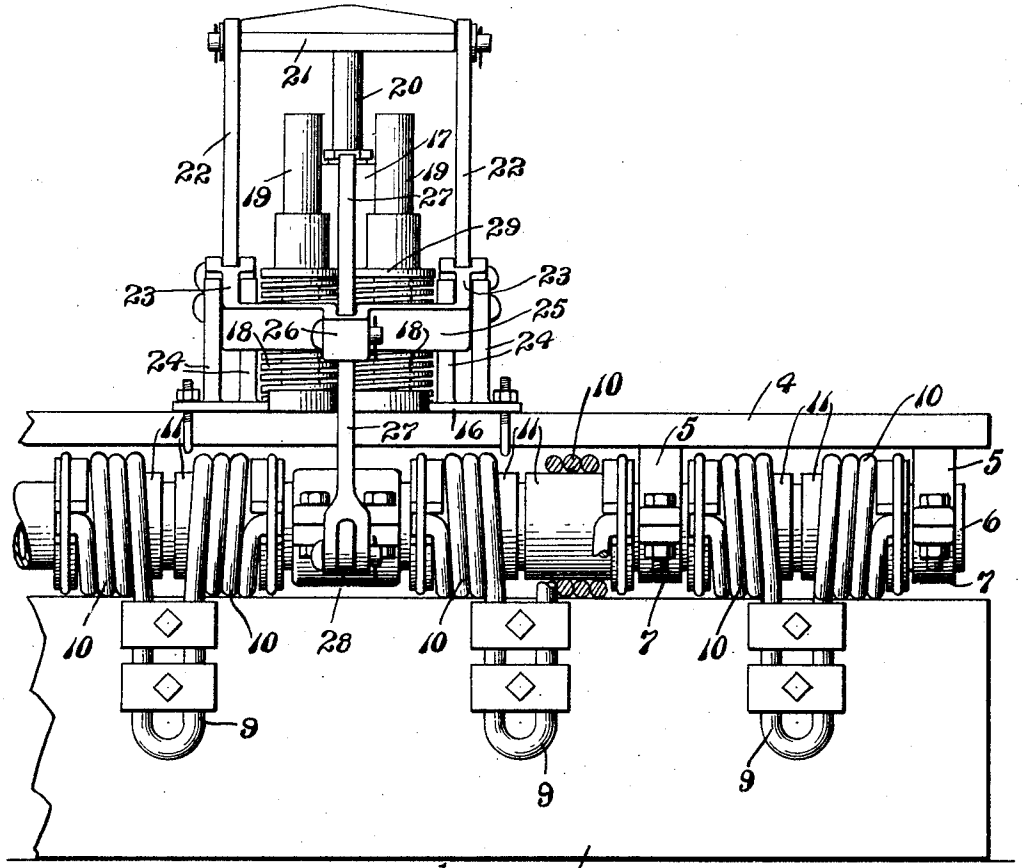


Fig. 3.

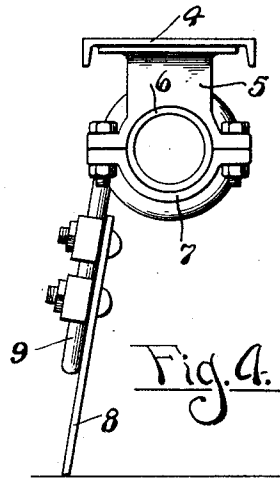


Fig. 4.

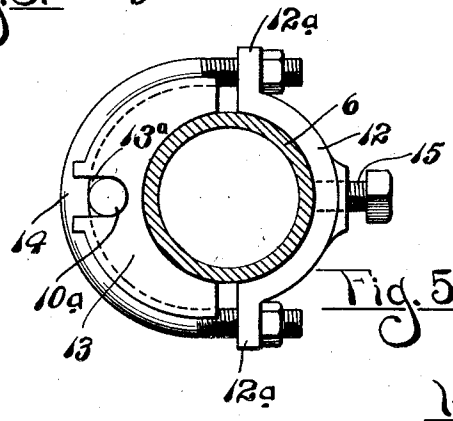


Fig. 5.

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UNITED STATES PATENT OFFICE

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HYDRAULIC LIFT FOR SCRAPER BLADES

Application filed November 26, 1928. Serial No. 321,892.

This invention relates to a hydraulically operated mechanism used in conjunction with a scraper blade mounted for rocking movements, for forcing the blade into contact with a road surface which it is to grade or scrape, the blade being normally lifted to an upper position when the hydraulic force is removed. The scraper blades are mounted upon vehicles such as motor trucks, to pass over the road and the present invention is directed to a very efficient and practical hydraulic means for bringing the blade against the road surface with any desired degree of pressure.

The invention for the attainment of these ends, as well as many others not at this time specifically described, may be understood from the following description taken in connection with the accompanying drawings, in which,

Fig. 1 is a side elevation of a motor truck having the scraper blade and the new operating mechanism therefor mounted thereon.

Fig. 2 is a fragmentary enlarged elevation and partial vertical section of the operative hydraulic mechanism used in conjunction with the scraper blade.

Fig. 3 is a fragmentary enlarged rear elevation of the scraper blade and the actuating mechanism therefor.

Fig. 4 is an end elevation of the blade and the manner in which it is detachably mounted, and

Fig. 5 is a fragmentary enlarged end elevation and vertical section illustrating the details of structure used in attaching the spring supports for the blade to the rocking shaft.

Like reference characters refer to like parts in the different figures of the drawings.

The motor truck is of any conventional form and to the side chassis frame members 1 thereof adjustable vertical suspending brackets 2 are secured in pairs between which horizontal bars 3 are mounted for the adjustable connection of a supporting beam 4, preferably of channel iron, which may be mounted on the bars 3 for adjustment to different angular positions with respect to the length of the road or the beam 4 and the scraper blade carried thereby may be reversed so as to scrape the side of the road on going in opposite directions, or opposite sides of the road when going in the same direction. This manner of mounting the supporting beam 4 is old and forms no part of the present invention.

From the lower side of the beam 4 at spaced apart intervals brackets 5 extend downwardly, shaped at their lower ends with concave recesses and with outstanding horizontal ears for the reception of the scraper blade rock shaft 6 which is held in place by clamps 7 (see Fig. 4) recessed to receive the lower sides of the shaft 6 and having outstanding ears lying against the ears of the brackets 6. Bolts passed through the contiguous ears secure the shaft in place, and by removing said bolts the shaft may be removed.

The scraper blade 8 is a blade of flat metal, extends parallel to the shaft 6 and is mounted thereon by means of coiled spring members each formed of a spring rod bent at its middle into a U-shaped arm 9 to lie against and be bolted to the rear side of the blade 8, both legs of the U being coiled into spring coils 10. The coils 10 are located around sleeve parts 11, there being two of the same within each coil 10. The two sleeve parts 11 come against opposite sides of the shaft 6 and one of said parts at one end, indicated at 12, Fig. 5, has outwardly projecting ears 12*a*. The oppositely disposed sleeve part 11 is formed into a head, as indicated at 13, which at its outer side, has a notch 13*a* in which the laterally extending end 10*a* of a coil 10 is seated. A U-shaped bolt clamp 14 fits in a groove in the head 13 and clamps against the end 10*a* of the spring coil seated in the notch 13*a*, the ends of the clamp passing through the ears 12*a* and being threaded to receive nuts as shown in Fig. 5. A set screw 15 passes through the end 12*a* of the sleeve part 11 against shaft 6.

With this construction the ends of the coils 10 are rigidly secured to the rock shaft 6 and when the shaft is rocked in one direction, that is, a clockwise direction, the blade is lifted to upper inoperative position. But on rocking the shaft in the opposite direction the blade is brought against the road

surface and held thereagainst by yielding spring pressure.

On the upper side of the beam 4 a supporting plate 16 is permanently secured transversely of the beam. At the front portion of said plate a vertical hydraulic cylinder 17 is mounted, back of which are a plurality of heavy coiled springs 18 located around vertical guide posts 19 extending from the base plate 16 as shown. There are four of the springs 18 but the number used is not an essential feature of the present invention. The upper end of the piston 17 is closed by a head through which a piston rod 20 slidably extends at the upper end of which is a cross head 21. Links 22 are pivotally connected at their upper ends to the ends of the cross head, extend downwardly alongside of cylinder 17 and have pivotal connection at their lower ends to the front ends of the legs 23 of a U-shaped rocking member, said legs being pivotally mounted at the upper ends of supporting posts 24 connected to and extending upwardly from the base plate 16. The rear ends of the legs 23 are connected by a cross bar 25 forming a part of the U-shaped rocking member which, at its middle, is formed into a U-shaped stirrup 26. A bar 27 is pivotally connected between its ends to and lies between the sides of the stirrup 26. The bar 27 extends below the pivot toward and back of the rock shaft 6 and has a pivotal connection to an arm 28 suitably attached to the rock shaft. The bar 27 above said pivot extends upwardly and is then curved forwardly and downwardly as shown in Fig. 2 to come against a plate 29 which is slidably mounted on the posts 19 and bears against the upper ends of all of the springs 18.

The piston 17 has an inlet at its lower end to which a flexible hose connection 30 leads, the same extending into or toward the cab of the truck. The piston 17 has a vent 31 at its upper end and a pet cock drain 32 a short distance above the lower end of the cylinder, whereby should there be any leakage of the liquid used to operate the piston within the cylinder it may be drained from above the piston when the piston is in its lowermost position.

A horizontal pump cylinder 33 is secured to the dash or other suitable support at the front of the cab, having a piston therein and a piston rod 34 extending from its rear end connection to an operating handle 35, which may be rocked back and forth on the mountings shown in Fig. 2, to reciprocate the piston. A pipe 36 extends into a liquid holding receptacle 37 going therefrom to a side of the cylinder 33, there being a suitable valve 38 adapted to open automatically when the pump is operated in one direction so as to draw liquid into the cylinder and close automatically when the pump piston is moved in the opposite direction to force the liquid from the cylinder. An outlet pipe 39 leads from the opposite side of the cylinder 33 with which the hose is connected, there being a valve 41 between the cylinder and the pump cylinder which opens automatically to permit the flow of liquid from the pump cylinder through the hose 30 but which automatically closes to stop any backward flow of liquid when the pump is operated to draw liquid through the pipe 36 into the cylinder 33. A valve 40 manually operable is interposed in the pipe 39 between the receptacle 27 and the hose 30 and a gauge 42 to indicate pressure is connected with the pipe 36 between said valve 40 and the hose 30.

Upon operating the lever 35, valve 40 being closed, liquid is pumped into the lower end of the cylinder 17, lifting the piston rod 20 and turning the scraper blade 8 to operative contact with the road surface. At the same time the springs 18 are compressed due to the downward movement of plate 29. The gauge at 42 will indicate the pressure which is being exerted by the blade on the road surface and this pressure may be made greater or less in accordance with the extent of operation of the pump. When it is desired to lift the scraper blade all that is required is to open the valve 40 whereupon the springs 18 will move plate 29 upwardly, lift the scraper blade 8 and move the piston within cylinder 17 downward forcing the oil into the receptacle 37 from which it may be drawn when the blade is, at a later time, to be turned to its operative position.

The only manual operations that are necessary with this construction is the operation of the pump lever 35 and the opening and closing of the valve at 40 when required. The construction is very practical and effective. It has proved practical in service and economical to build. The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

While this device has been shown and described as being located under the body of a truck between its wheels for the customary road scraping operation it is readily adaptable to be located at other positions on the vehicle which carries it, such for example as forward of the vehicle on extended brackets for snow scraping. The flexibility of the hose 30 readily permits the change of positions as may be desired.

I claim:

1. In a construction of the class described, a horizontally positioned supporting beam, a base plate thereon, a rock shaft mounted on the said beam, a cylinder mounted upon and extending upwardly from the base plate, a piston rod extending out of the upper end of said cylinder, a rocking member pivotally mounted on and above the base plate, means

connecting the piston rod with said rocking member at one end thereof, a link connecting the opposite end of the rocking member with said rock shaft to turn the rock shaft in a direction to lower the scraper blade on upward movement of said piston rod, coiled compression spring means carried on and above the base plate at one side of said cylinder, a plate bearing against the upper end of said spring means, and means connecting the last mentioned end of said rocking member with said last mentioned plate to move the same downwardly and compress the spring means when the piston rod is moved in an upward direction.

2. In a construction of the class described, a supporting beam, a rock shaft mounted on said beam, a prime mover also mounted upon said beam, a rocking member pivotally mounted on said beam, means connecting the rocking member at one of its ends to the said prime mover, a link connecting the opposite end of the rocking member to the said rock shaft to turn the same in a direction to lower the scraper blade or raise the scraper blade, and spring means for counterbalancing the scraper blade, said spring means including a plurality of vertically located springs mounted upon the said beam and a plate bearing downwardly against the top of the said springs, said link means extending in abutting relationship to the said plate whereby its downward movement causes compression of the said springs.

3. In combination, a beam of the class described, brackets fixed to said beam, a rock shaft revolubly mounted in said brackets, a scraper blade attached to said rock shaft, an arm extending from said rock shaft, a link pivotally connected to the said arm and extending past the said beam and then being return bent to terminate in abutting relationship to the other side of the said beam, and spring means located between the return bent end of the link and the beam to serve as a counterbalance.

4. In combination, a beam, a supporting plate thereon, a cylinder mounted upon said supporting plate, a piston operative in said cylinder, a scraper blade pivotally mounted onto the said beam, and linkage means connected between the said piston and the said scraper blade to operate the said scraper blade, said linkage including a member which moves toward the beam whenever the scraper blade is moved to an operative position, and spring means inserted between the beam and the said member for the purpose described.

In testimony whereof I affix my signature.

GEORGE E. DEAN.