

Jan. 15, 1929.

D. R. THROOP

1,699,167

LEVELER

Filed March 21, 1927

2 Sheets-Sheet 2

Fig. 2

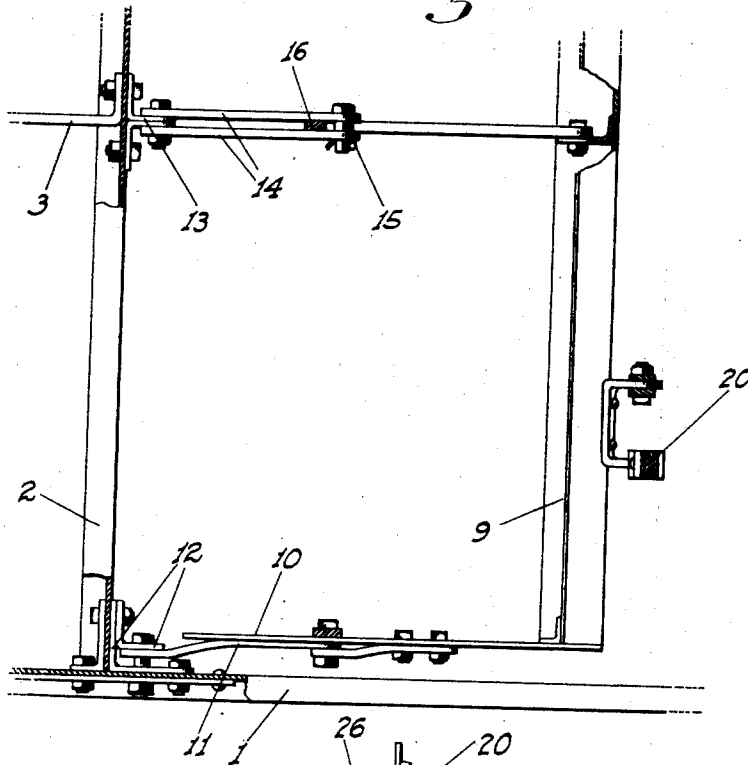
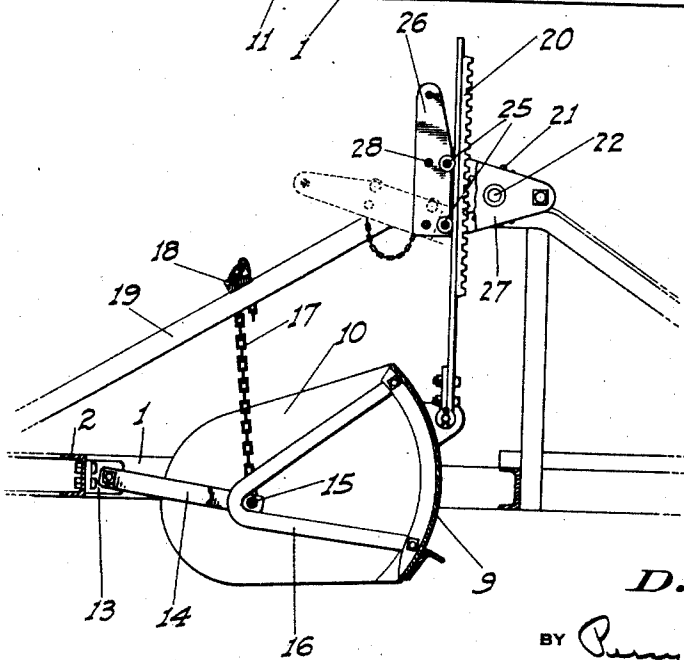


Fig. 3



INVENTOR

D. R. Throop

BY

Peny J. [Signature]

ATTORNEY

Patented Jan. 15, 1929.

1,699,167

UNITED STATES PATENT OFFICE.

DAMON R. THROOP, OF STOCKTON, CALIFORNIA.

LEVELER.

Application filed March 21, 1927. Serial No. 176,940.

This invention relates to improvements in leveling scrapers, and particularly represents improvements over the devices shown in my Patent No. 1,220,379, dated March 27th, 1917, and others.

The main objects of the present invention are to provide in connection with a leveling blade raised and lowered by transversely spaced racks and pinions, means for releasing one rack from its pinion at will so as to enable the blade to be set at a transverse tilt; to provide connection means between the blade and frame so that a pull under load is transmitted equally to the sides and center of the blade; to provide supporting means for the blade so arranged that when raised and lowered it will turn about a single transverse axis; and to provide a novel means of attaching the drawbar clevis to the frame so that it permits of easy removal when the clevis-pin hole has undue wear.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a perspective elevation of my improved leveler.

Fig. 2 is a fragmentary plan view of the blade and adjacent parts partly in section.

Fig. 3 is a fragmentary longitudinal section of the leveler.

Fig. 4 is a plan view of the front end of the main frame showing the detachable clevis connection means.

Referring now more particularly to the characters of reference on the drawings, the frame of the leveler comprises a pair of transversely spaced side members 1 which are parallel to and adjacent each other at their forward ends as at A; then diverge for a certain distance as at B; and then extend again parallel to each other to their rear ends as at C; the spacing of the frames for this portion being sufficient to receive the leveling blade therebetween. A transverse beam 2 connects the side frames at the junction of the portions B and C thereof, and a longitudinal bar 3 extends from said beam to the front end of the frame 1, the bar being disposed between and

secured to said frame members at their forward ends.

Round bearing wheels 4 support the frame at its rear end. The front end of the frame is adapted to be supported from a tractor or the like by a clevis 5, whose pin 6 projects through a U-shaped plate 7 which at its rear end straddles the main frame structure at the forward end thereof and is removably connected thereby by bolts 8. It will therefore be seen that when the clevis-pin hole in the plate member wears unduly, said plate may be easily removed and replaced.

A curved leveling blade 9 is mounted between the frames 1 ahead of the wheels and has forwardly projecting side plates 10 provided in rigid connection therewith. Pivoted onto the side plates and extending thence forwardly are links 11 which are pivoted at their forward ends onto and between angle bracket plates 12 which are disposed at the junction of the side frames 1 and the cross beam 2 and aid in bracing these parts. Pivoted onto lugs 13 mounted on the beam 2 centrally of the width thereof (or in longitudinal alinement with the bar 3) are links 14 which extend rearwardly from the beam 2. Connecting the links at their rear end is a cross pin 15 which is disposed in common transverse alinement with the pivotal connection of the links 11 with the side plates 10. Secured onto the blade 9 and projecting forwardly therefrom is a vertical V-shaped strap or yoke 16 which passes about the pin 15 and extends between the links 14, so that said pin may engage the apex of the yoke and the links are held in parallel alinement with the links 11. When the structure is not under load the pin 15 is disposed a short distance to the rear of the apex of the yoke and does not actually engage the same. The reason for this arrangement is as follows:

When a pull is applied to the clevis and the leveling blade is engaged with dirt, the pull is imparted directly to the links 14, since said links are in common alinement with the clevis and a non-yielding structure is formed between said pin 15 and the clevis. The said frame portions B and C, however, inevitably yield or spring to a certain extent unless made unduly and impractically heavy, so that an effective pulling strain is not imparted to the side links 11 until this yielding or spring of the side frames has been taken up. If, therefore, the pin 15 constantly engaged the yoke the side links would only be effectively placed

in tension, if at all, by warping or distorting the leveler blade. By locating the pin 15 normally to the rear of the apex of the yoke 16 a certain predetermined distance the spring or give of the frame causes the side links and central links to all pull on the leveler blade with equal effectiveness. Of course if the center links are omitted the pull is taken in any event by the side links, but in a large machine having a side blade it is necessary to pull on the blade at the center as well as at the sides in order to prevent buckling of the blade.

To maintain the side plates 10 at a predetermined position relative to the ground and to also hold the blade at a predetermined angle to the ground, chains 17 are connected to the plates 10 in common with the pivotal connection of the links 11 therewith, the upper ends of said chains detachably engaging the notched ends of a crossbar 18 which is mounted on truss frames 19 projecting upwardly from the side frames 1. It will therefore be seen that by altering the points of engagement of the chains with said bar, the side plates 10 will be raised or lowered, the angle of setting of the blade relative to the ground will be correspondingly altered, while the axial line of the various link pivots will be raised and lowered likewise. This construction, as will be evident, enables the blade to be then raised and lowered with a movement about a common transverse axis, with the operation of the blade raising and lowering means and regardless of the level at which said axis is located.

The raising and lowering means for the blade comprises a pair of transverse spaced rack bars 20 pivoted onto and projecting upwardly from the back of the blade. These racks are engaged by pinions 21 fixed on a common shaft 22 which is mounted on the frames 19. The shaft is rotated in either direction in any suitable manner by the operator such as for instance by means of a hand wheel 23 arranged in driving relation with the shaft by a suitable gearing means enclosed in a housing 24.

The racks are maintained in operative engagement with the pinions by vertically spaced rollers 25. The rollers engaging one rack are mounted in connection with a movable support 26 which is pivoted at its lower end onto and between the side plates 27 which straddle the pin and rack. The rollers are normally held in engagement with the rack by a removable pin 28 projecting through the members 26 and 27. The pivotal connection of the member 26 with the plates 27 is so located that when said member is swung forwardly, the rollers will move away from the rack sufficiently to enable the rack to be then swung clear of the pinion teeth. If the shaft 22 is then rotated the other rack and the corresponding side of the blade will be raised

or lowered, but the side to which the disconnected rack is attached will remain stationary. This action takes place owing to the flexibility of the plate. This enables the angle of setting of the blade to be tilted laterally relative to the ground and to the setting of the frame and wheels, so as to enable road crowning operations to be effectively carried out. When the blade has been tilted to the desired extent the member 26 is again raised and fastened so as to cause the rollers to again engage the rack and allow the rotation of the pinion shaft to cause both racks to then move up and down. This will cause the blade to be raised or lowered, while maintaining the same at the tilt to which it was previously set. If necessary in conjunction with the tilting operations the chain 17 on the side of the disengaged rack may be adjusted so as to be longer or shorter as the case may be.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. In a leveler, a main frame which includes side members spaced apart and a transverse beam extending therebetween; a leveling member disposed between the side frames rearwardly of the beam, links connected onto the sides of said member and to the frame structure ahead, another link unit connected onto the beam centrally of the width of the leveling member and extending rearwardly of said beam, a rigid element secured to and projecting forwardly from the leveling member and adapted to be engaged by the link unit after said unit has moved forwardly relative to the leveling member a certain distance, and a rigid bar adapted for connection to a draft means, secured to the beam in transverse alinement with said link unit and extending ahead of the beam.

2. In a leveler, a main frame which includes side members spaced apart and a transverse beam extending therebetween, a leveling member disposed between the side frames rearwardly of the beam, links connected onto the sides of said member and to the frame structure ahead, another link unit connected onto the beam centrally of the width of the leveling member and extending rearwardly of said beam, a cross pin on the rear end of said unit, a V shaped yoke disposed in a vertical plane attached to the leveling member and passing about the pin a certain distance ahead of the same, and means for applying

a direct pulling strain to the beam in the transverse plane of said link unit.

3. In a leveler, a main frame structure, a leveling unit comprising a blade having side members, links pivoted onto the side members and extending thence forwardly to pivotal connections with the frame structure, and vertically adjustable supporting means depending from the structure to connections with the side members in common with the pivotal connections of the links therewith.

4. In a leveler, a main frame structure, a leveling unit comprising a blade having side members, links pivoted onto the side members and extending thence forwardly to pivotal connections with the frame structure, supporting means depending from the structure to the pivotal connection of the links with the side members, and means applied to the leveling unit for raising and lowering the same.

5. In a leveler, a transverse leveling blade, transversely spaced rack bars projecting upwardly therefrom, pinions normally engaging the racks, a roller bearing against the face of one rack-bar opposite to its pinion, and means supporting the roller in a manner to enable the same to be swung away from the rack bar at will.

6. In a leveler, a transverse leveling blade, transversely spaced rack bars projecting upwardly therefrom, pinions normally engaging the racks, a roller bearing against the face of one rack-bar opposite to its pinion, a plate member mounted in connection with the pinion, and a member into which the roller is secured pivoted onto said member for movement to and from the rack bar.

7. In a leveler, a main frame structure, a leveling unit comprising a blade having side members, draft means pivoted onto the side plates, vertical supporting means pivoted onto the plates in connection with the draft means, and means for swinging the blade vertically about the pivotal connection of the draft and supporting means with the side plates as an axis.

8. In a leveler, a frame structure, a leveling blade member, pivots fixed on the member at the sides thereof, longitudinal elements connected to said pivots and frame, vertically adjustable means for directly supporting and holding said pivots stationary, and means for turning the blade about said pivots as an axis.

In testimony whereof I affix my signature.

DAMON R. THROOP.