

Jan. 19, 1943.

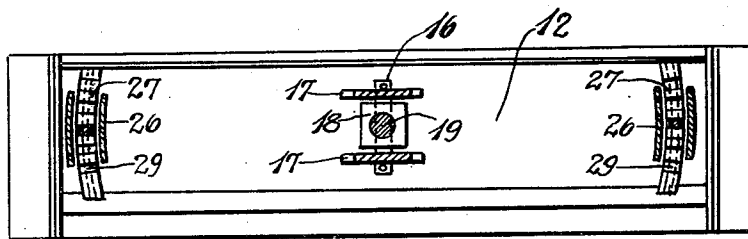
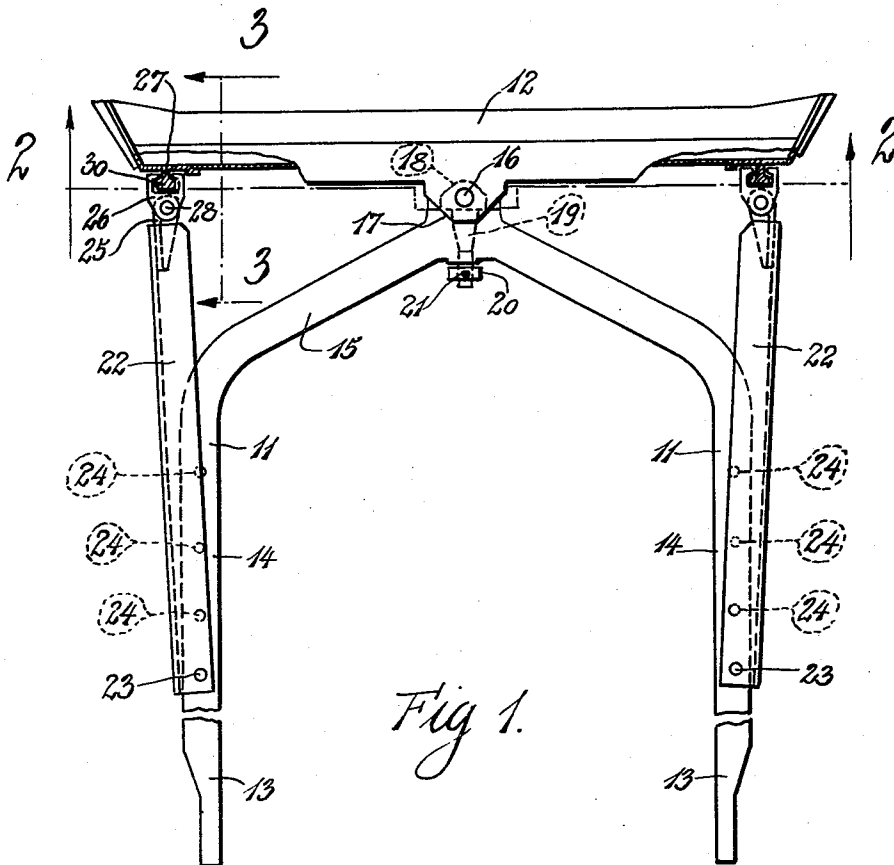
T. R. PAULSEN

2,308,535

BULLDOZER

Filed Sept. 4, 1941

2 Sheets-Sheet 1



Thomas R. Paulsen,
INVENTOR.

BY Hoar & Ruhloff

ATTORNEYS.

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2 Sheets-Sheet 2

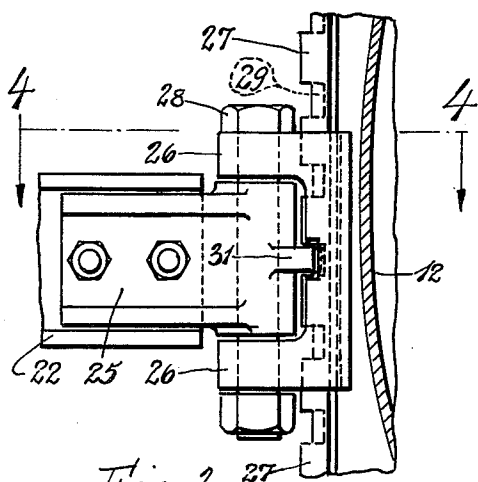


Fig. 3

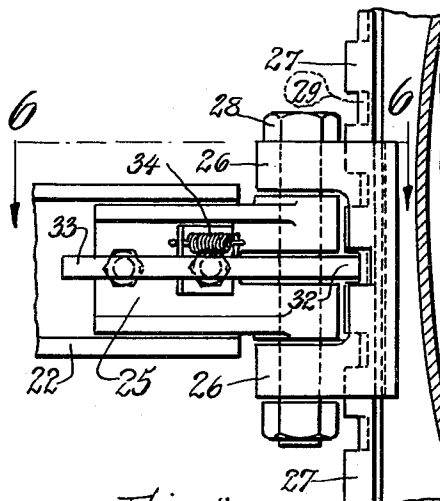


Fig. 5

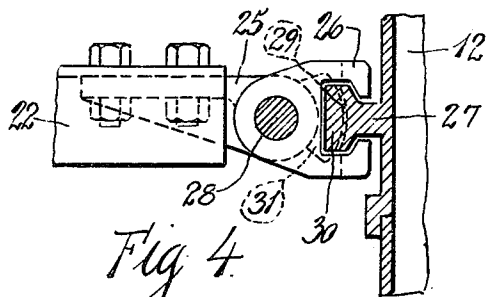


Fig. 4

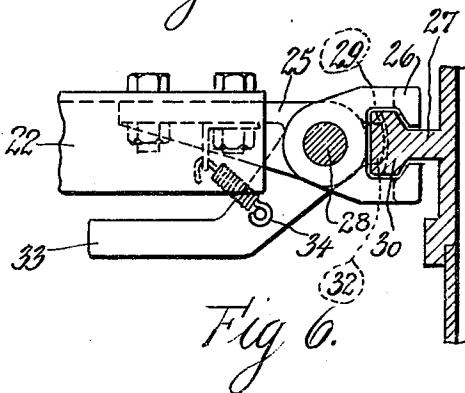


Fig. 6

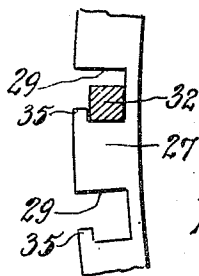


Fig. 7

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UNITED STATES PATENT OFFICE

2,308,535

BULLDOZER

Thomas R. Paulsen, South Milwaukee, Wis., as
signor to Bucyrus-Erie Company, South Mil-
waukee, Wis., a corporation of Delaware

Application September 4, 1941, Serial No. 409,555

8 Claims. (Cl. 37-144)

My invention relates to new and useful im-
provements in tractor operated bulldozers, more
particularly to an improved means for connect-
ing the landsides with the earth moving blade
whereby the blade may be tilted about the longi-
tudinal axis of the tractor and secured at se-
lected tilting angles.

A present form of such a blade tilting ad-
justment means comprises a T-shaped block, on the
forward end of the landside, dovetailed and
adapted to slide vertically within an arcuate C-
shaped rail or bracket on the back of the earth
moving blade. Sliding the C-rail over the T-
shaped landside block effects tilting of the blade.
Heretofore the C-rail has been secured against
sliding at any selected point by a wedge which
has been inserted between the forward end of
the landside and the terminal surfaces of the C-
rail. The wedge method of securing the blade
at a given tilting angle is objectionable because
the wedge is liable to wear and slip out, and
because the terminal surfaces of the C-shaped
rail must be machined in order to secure proper
functional engagement with the wedge.

Accordingly it is a principal object of my in-
vention to provide means whereby the bulldozer
blade may be locked in selected tilted positions
by a simple tooth and notch, or latch means, lo-
cated between the landside and the blade.

Another object of my invention is to provide
a connecting and locking means which is inex-
pensive to manufacture and does not require ac-
curate machining.

Another object of my invention is to provide
a tilting and locking means which may be man-
ually controlled by one man without expensive
and complicated hydraulic apparatus.

In addition to the objects above stated, I have
worked out a number of novel and useful details,
which will be readily evident as the description
progresses.

My invention consists in the novel parts, and in
the combination and arrangement thereof, which
are defined in the appended claims, and of which
two embodiments are exemplified in the accom-
panying drawings, which are hereinafter partic-
ularly described and explained.

Throughout the description, the same reference
number is applied to the same member or to sim-
ilar members.

Referring now to the accompanying drawings,
it will be seen that:

Figure 1 is a plan view of a bulldozer showing
the blade, the U-shaped supporting frame, and

the landsides and landside blocks connecting the
ends of the blade to the sides of the U-frame.

Figure 2 is a rear elevation of the bulldozer
blade and landside connecting means, taken
along the line 2-2 in Figure 1.

Figure 3 is an enlarged side elevation of my
landside adjusting block taken along the line
3-3 in Figure 1, and showing one embodiment
of my invention.

Figure 4 is an enlarged top plan view of my
landside adjusting block taken along the line
4-4 in Figure 3.

Figure 5 is an enlarged side elevation similar
to Figure 3, but showing another embodiment of
my invention.

Figure 6 is an enlarged plan view similar to
Figure 4, but showing the embodiment of Figure
5, taken along the line 6-6 of Figure 5.

Figure 7 is an enlarged rear elevation of a por-
tion of the left hand one of the T-shaped tracks
on the back of the bulldozer blade, showing a
particular type of notch.

Referring now to Figures 1 and 2, we see that
11 represents a conventional U-shaped bulldozer
supporting frame which serves to mount the bull-
dozer blade 12 forwardly of a tractor (not
shown). The rear ends 13 of the side arms 14
of the U-frame are usually pivotally connected
to the sides of the tractor (not shown) so that
the U-frame may be raised and lowered about
the horizontal transverse axis of the tractor (not
shown). The bulldozer blade 12 is disposed
transversely of the frame 11 in advance of the
front portion 15 of the U-frame. It is mounted
to be swung in a normally horizontal plane about
the axis of the king pin 16 which extends verti-
cally through rearwardly projecting spaced lugs
17 on the back of the bulldozer blade 12 and
through a swivel block 18 positioned between said
lugs 17. The swivel block 18 has formed integral
therewith or otherwise secured thereto a rear-
wardly extending stud bolt or pin 19 which loose-
ly fits in a hole in the front portion 15 of the
frame 11, there being a retaining collar 20 and
pin 21 (or other equivalent means) to hold the
block 18 against the frame portion 15. Since the
pin 19 is parallel to the longitudinal axis of the
frame 11 and at a right angle to king pin 16, it
serves as a pivot on which the bulldozer blade 12
may be tilted in a vertical plane about said longi-
tudinal axis.

Accordingly it is seen that the bulldozer blade
12 may be swung in a horizontal plane into se-
lected positions with respect to the longitudinal
axis of the frame 11; and it may be tilted in a

vertical plane into selected positions with respect to the horizontal transverse axis of said frame.

In order to retain the bulldozer blade in a given position in the horizontal plane, channel retaining bars 22, known to the trade as "landslides," are provided between the side arms 14 and the ends of the bulldozer blade 11. The rear end of each landslide 22 carries a pin 23 which is receivable in one of holes 24 longitudinally spaced along each side arm 14. The landslide end casting 25 on the forward end of each landslide 22 carries a C-shaped adjusting block 26 which dovetails with and slides vertically over a T-shaped arcuate rail 27 (with center of curvature at the center of pin 19) secured to the back of the bulldozer blade at each end thereof. The C-shaped adjusting block 26 is pivotally mounted on the landslide end casting 25 by means of the bolt 28 (or other suitable means) to permit swinging about a vertical axis.

In order to retain the bulldozer blade 12 in a given tilted position in its normally vertical plane, I have provided the arcuate rails 27 with peripherally spaced notches 29 which extend radially across the face of the heads 30 of each rail 27 and are adapted to receive locking means such as a latch means in the form of a tooth 31 integral with the landslide 22 (see Figures 3 and 4) or a latch bar 32 pivoted on the landslide 22 (see Figures 5 and 6). By latch means it is understood that I mean any bar, tooth, latch or other equivalent movable piece which is adapted to enter selected notches 29 to lock the rails 27 against vertical movement relative to the landslides 22. For example, the tooth 31 on the end of the landslide 22, and integral therewith, is such a latch means because it is swingable about the vertical axis of pin 28 so that it may engage a selected notch 29 and perform the above mentioned locking function. Similarly latch bar 32. Furthermore it is understood that my invention is not limited to any particular number or to any particular arrangement of latches and/or notches, nor to any particular form of sliding interlock between the landslide and bulldozer blade. To avoid confusion, I have shown merely certain simple illustrative embodiments of my invention.

When the locking means consists of a forwardly projecting tooth 31, which may be integral with the landslide end casting 25, the following procedure is necessary in order to change the tilt of the bulldozer blade 12 about the swivel pin 19. The rear end of each landslide 22 is disengaged by pulling out the pin 23 and each landslide is swung laterally outwardly on pivot pin 28 until each tooth 31 is disengaged from its notch 29 and clear of the rail head 30 so that each T-shaped rail 27 is free to run through the C-shaped adjusting block 26 with which it is dovetailed. The blade 12 is then tilted about swivel pin 19 (the landslides 22 being held fast in a horizontal plane by any suitable independent means) until another pair of notches corresponding to the desired tilt position come into horizontal alignment with the teeth 31, whereupon the blade 12 may be locked in position by swinging landslides 22 inward into engagement with side arms 14 of the frame 11. It is seen that the blade 12 will then be locked against tilting relative to the frame 11, since each tooth 31 is rigid with the landslide 22 and the top and bottom flanges of each channelled landslide fit over the corresponding side arm 14 of the U-frame 11.

Referring now to Figures 5 and 6, it is seen that an alternative locking means, in place of the

integral tooth 31, is a latch 32 pivotally mounted on the landslide end casting 25 by means of the vertical pivot pin 28. The advantage of this modification of my invention is that the adjusting block 26 may be unlocked by simply turning the handle 33 of the latch bar inwardly about pivot pin 28 (see Figure 6) to swing the latch 32 out of engagement with the notch 29, and it is unnecessary to disconnect and swing outwardly the heavy landslides 22 and hold them in a horizontal plane while the blade is tilted into its new position. The latch 32 may be held in locked position by any suitable means such as a spring 34 (see Figures 5 and 6) or a ridge 35 at the entrance of the notch 29 (see Figure 7) there being sufficient play in the pin connections 23 to permit the latch to be lifted over the ridge. Figure 7 should be compared with the left-hand T-shaped track shown in Figure 2. In the device in Figure 7, slots 29, instead of being open clear across as in Figure 2, extend only part way across, being closed at the right. And, at the left, each slot 29 is partially closed by ridge 35.

Having now described and illustrated a number of forms of my invention, I wish it to be understood that my invention is not to be limited to specific forms or arrangements of parts herein described and shown, except as specifically covered by my claims.

I claim:

1. In a bulldozer, the combination of: a supporting frame; a blade pivotally mounted thereon to tilt about the longitudinal axis of the frame; a landslide; a forwardly projecting tooth, rigid with the landslide; means removably connecting the rear end of the landslide to a side portion of the frame; means slidably connecting the forward portion of the landslide to the blade to permit said tilting; said second means comprising interlocked arcuate track members, the center of curvature of the arcuate track members lying on the tilting axis; one track member being pivotally mounted on the landslide to swing, with respect to the landslide, about a vertical axis; the other track member being rigidly mounted on the blade and having longitudinally spaced transverse notches adapted to receive the tooth.

2. In a bulldozer, the combination: a supporting frame; a blade pivotally mounted thereon to tilt about the longitudinal axis of the frame; a landslide; a forwardly projecting tooth, carried by the landslide; means removably connecting the rear end of the landslide to a side portion of the frame; means slidably connecting the forward portion of the landslide to the blade to permit said tilting; said second means comprising interlocked arcuate track members, the center of curvature of the arcuate track members lying on the tilting axis; one track member being pivotally mounted on the landslide to swing with respect to the landslide, about a vertical axis; the other track member being rigidly mounted on the blade and having longitudinally spaced transverse notches adapted to receive the tooth.

3. In a bulldozer, the combination of: a supporting frame; a blade pivotally mounted thereon to tilt about the longitudinal axis of the frame; a landslide; a forwardly projecting tooth, pivotally supported by the landslide to swing about a vertical axis; means removably connecting the rear end of the landslide to a side portion of the frame; means slidably connecting the forward portion of the landslide to the blade to permit said tilting; said second means comprising inter-

locked arcuate track members, the center of curvature of the arcuate track members lying on the tilting axis; one track member being pivotally mounted on the landside to swing, with respect to the landside, about a vertical axis; the other track member being rigidly mounted on the blade and having longitudinally spaced transverse notches adapted to receive the tooth.

4. A bulldozer according to claim 7, further characterized by having means to maintain the tooth in engagement with said notches.

5. A bulldozer according to claim 7, further characterized by having spring means to maintain the tooth in engagement with said notches.

6. In a bulldozer, the combination of: a supporting frame; a blade pivotally mounted thereon to tilt about the longitudinal axis of the frame; a landside; a forwardly projecting tooth, rigid with the landside; means removably connecting the rear end of the landside to a side portion of the frame; means slidably connecting the forward portion of the landside to the blade to permit said tilting; said second means comprising interlocked members; one such member being pivotally mounted on the landside to swing, with respect to the landside, about a vertical axis; the other member being an arcuate track rigidly mounted on the blade, having its center of curvature on the tilting axis, and having longitudinally spaced transverse notches adapted to receive the tooth.

7. In a bulldozer, the combination of: a supporting frame; a blade pivotally mounted thereon to tilt about the longitudinal axis of the

frame; a landside; a forwardly projecting tooth, pivotally supported by the landside to swing about a vertical axis; means removably connecting the rear end of the landside to a side portion of the frame; means slidably connecting the forward portion of the landside to the blade to permit said tilting; said second means comprising interlocked members; one such member being pivotally mounted on the landside to swing with respect to the landside, about a vertical axis; the other member being an arcuate track rigidly mounted on the blade, having its center of curvature on the tilting axis, and having longitudinally spaced transverse notches adapted to receive the tooth.

8. In a bulldozer, the combination of: a supporting frame; a blade pivotally mounted thereon to tilt about the longitudinal axis of the frame; a landside; a forwardly projecting tooth, carried by the landside; means removably connecting the rear end of the landside to a side portion of the frame; means slidably connecting the forward portion of the landside to the blade to permit said tilting; said second means comprising interlocked members; one such member being pivotally mounted on the landside to swing with respect to the landside, about a vertical axis; the other member being an arcuate track rigidly mounted on the blade, having its center of curvature on the tilting axis, and having longitudinally spaced transverse notches adapted to receive the tooth.

THOMAS R. PAULSON.