

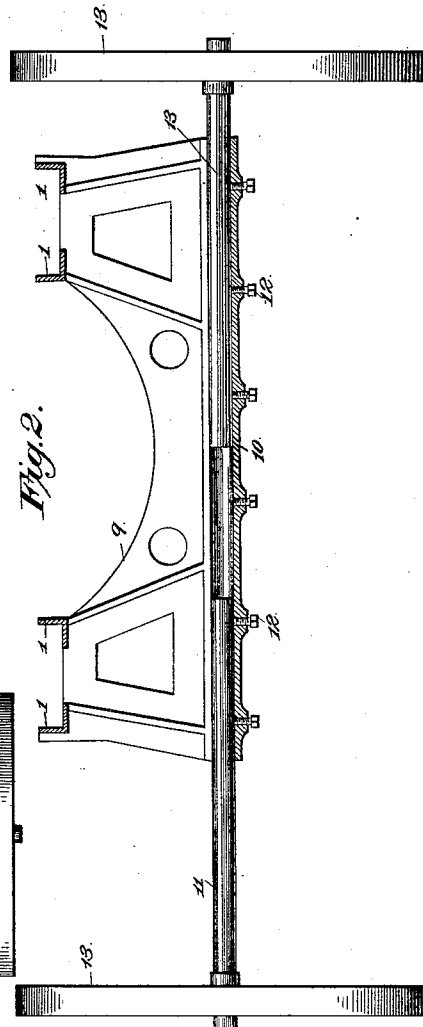
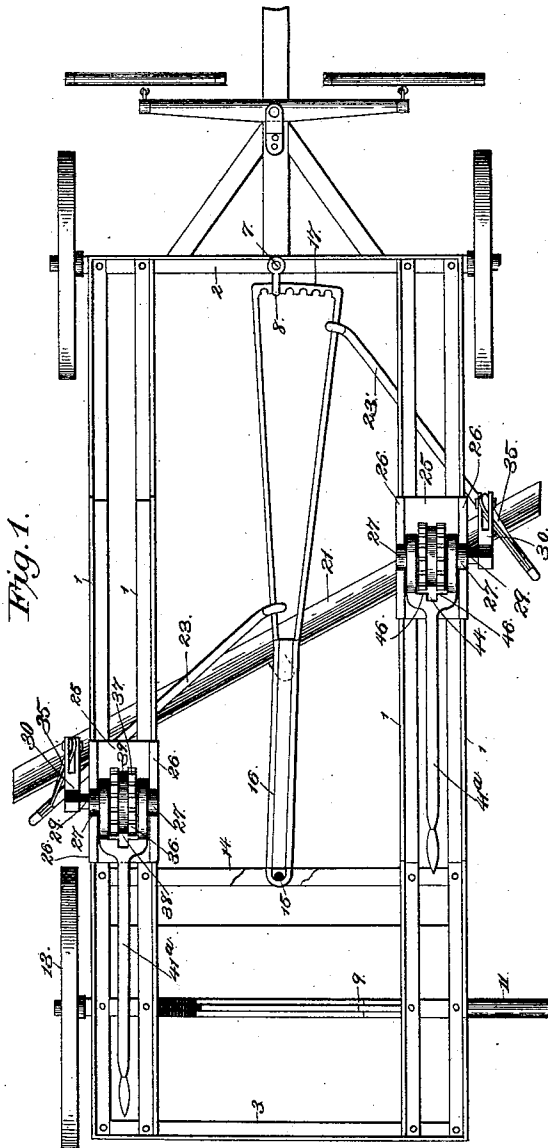
(No Model.)

3 Sheets—Sheet 1.

J. M. HOLLAND.
ROAD GRADER.

No. 484,428.

Patented Oct. 18, 1892.



Witnesses:

M. Fowler
W. S. Duval

Inventor
James M. Holland

By his Attorneys

C. A. Snow & Co.

(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

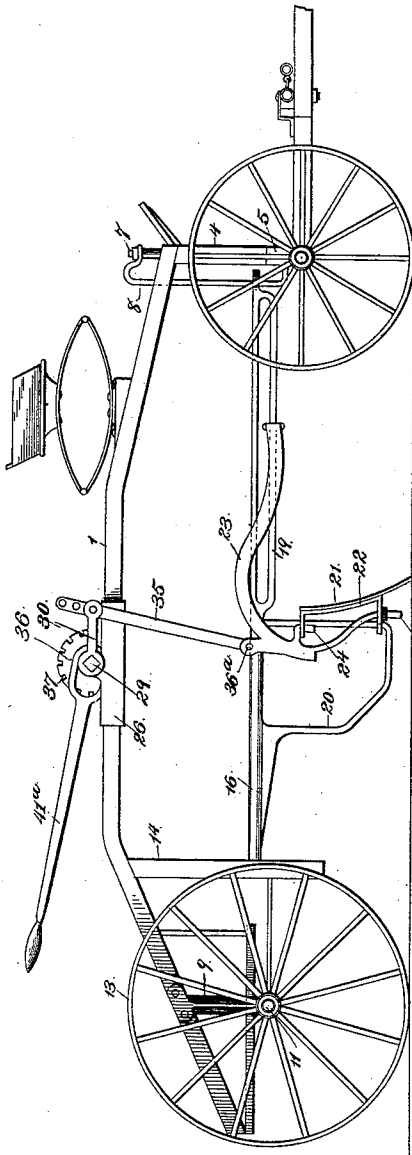
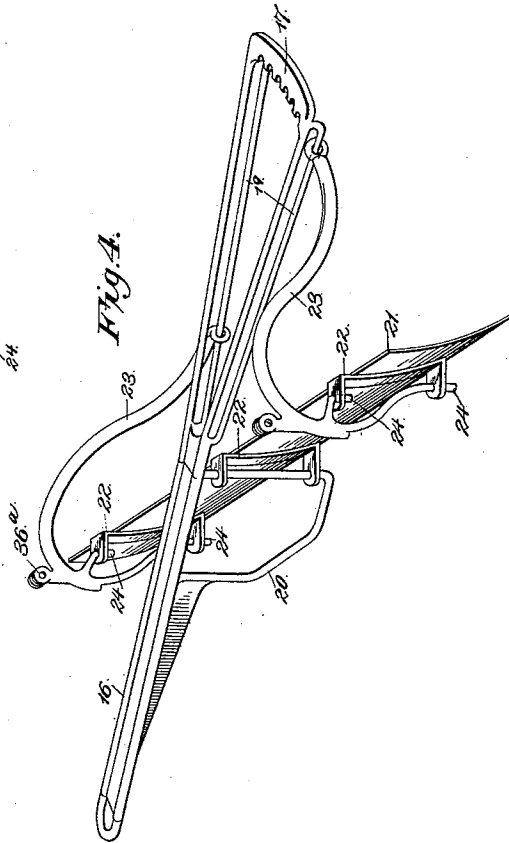


Fig. 4.



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Fig. 5.

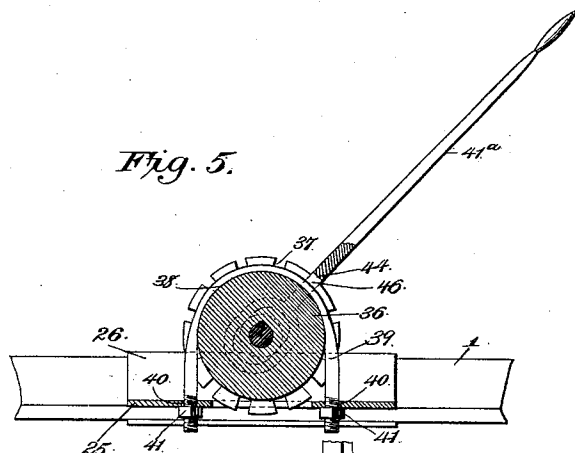


Fig. 6.

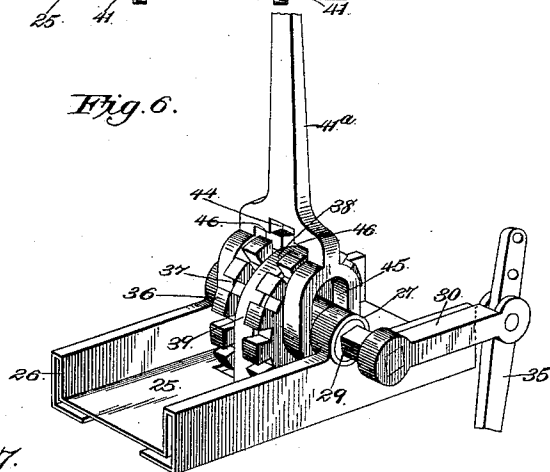


Fig. 7.

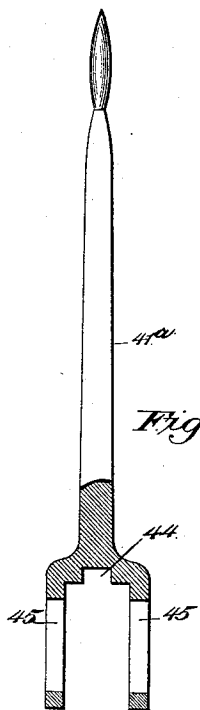
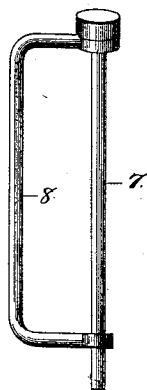


Fig. 8.



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UNITED STATES PATENT OFFICE.

JAMES M. HOLLAND, OF MOUNT PLEASANT, IOWA, ASSIGNOR TO THE MOUNT PLEASANT ROAD GRADER COMPANY, OF SAME PLACE.

ROAD-GRADER.

SPECIFICATION forming part of Letters Patent No. 484,428, dated October 18, 1892.

Application filed September 7, 1891. Serial No. 404,996. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. HOLLAND, a citizen of the United States, residing at Mount Pleasant, in the county of Henry and State of Iowa, have invented a new and useful Road Grader or Scraper, of which the following is a specification.

This invention relates to improvements in road-graders, and has special reference to an improvement upon Patent No. 442,975, granted me December 16, 1890.

Heretofore a great objection to road graders or scrapers has resided in the difficulty experienced in preventing the machines from drifting or sliding sidewise, such being caused by the side pressure or resistance offered by the dirt being removed and directed against the inclined scraping-blade. Difficulty has also been experienced in reducing the inner edges of the trenches formed at the sides of newly-scraped roads, such reduction, as is well known, being for the purpose of rounding off the bed of the road and directing this surplus of dirt to the center of the road-bed. During this reduction, by reason of one side or pair of the wheels necessarily traveling along the inner inclined surface of the trench, it took but little force or resistance upon the part of the dirt to start the machine and slide it sidewise and otherwise down the trench. Various devices and arrangements to overcome the above objections have been heretofore employed, all of which were found to be more or less inefficient, costly, and unnecessarily clumsy.

The objects of my present invention are therefore to obviate the above-enumerated disadvantages and objections and to overcome them in a positive efficient manner and by a cheap and simply-constructed arrangement.

With the above objects in view the invention consists in certain features of construction hereinafter specified, and particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a plan of a road-scraper constructed in accordance with my invention and embodying my improvements. Fig. 2 is a transverse section of the same. Fig. 3 is a side elevation. Fig. 4 is a detail in perspective of the scraper-blade, the draft-bar, and the means for at-

taching the same to the blade. Fig. 5 is a longitudinal section through the locking-cog. Fig. 6 is a perspective of the same in detail, together with the locking-lever and blade-elevating lever. Fig. 7 is a transverse section through the cog locking-lever. Fig. 8 is a detail view of the clevis.

Like numerals of reference indicate like parts in all the figures of the drawings.

1 designates the side sills of the frame, which sills, as shown, are formed of angle-iron and are arranged in pairs.

2 designates the front cross-sill, and 3 the rear cross-sill, the whole constituting a rectangular framework. The front sills rest upon the bolster or head-block 4, through which and the axle 5 of said sill is passed the clevis-bolt 7, to which is attached loosely the E-shaped clevis 8. The rear bolster 9 is bolted to the sills and at its lower edge is provided with a bearing 10 the entire length of the bolster, and in said bearing is mounted a pair of axle-sections 11, made adjustable by means of set-screws 12, each of said axle-sections carrying the usual ground-wheel 13.

By the employment of the extensible axle I am enabled to extend or separate to a greater degree the wheels of the grader, and in so doing I can adapt the machine for straddling ditches and filling the same. Furthermore, as heretofore mentioned, the machine is thereby adapted for reducing the shoulders at the inner edges of freshly-cut roads, so that the resistance offered to the blade of the machine cannot increase the already-existing tendency upon the part of the machine to travel down the inclined side of the trench; but, to the contrary, said wheels may travel upon flat surfaces and the machine operate in the same manner as when working at the center of a road.

In a bolster 14 in the rear end of the machine there is pivoted at 15 the draft-bar 16, said draft-bar being bifurcated the major portion of its length toward its front end and connected at said bifurcated diverged end by means of a curved plate 17, the inner edge of which is notched at intervals, any one of the notches being adapted for engagement with the E-shaped clevis of the front bolster. Extending under the diverging bifurcations at

the front end of the draft-bar and parallel with said bifurcations is a pair of guide-rods 19 and immediately in rear of the juncture of the bifurcations depends from the draft-bar a bracket 20.

21 designates the scraper-blade, and the same is provided near its ends and at its center with brackets 22, the ends of which are vertically oppositely perforated. The central bracket loosely receives the depending bracket 20, whereby said blade is centrally pivoted in position upon the draft-bar. Draft-arms 23 are loosely connected at their front ends to the guide-rods 19, and at their rear ends are pivoted to the end brackets by means of reduced bearing portions 24.

In operating the scraper the resistance of the dirt, as is well known and as heretofore stated acting against the scraping-blade causes the machine to drift to the opposite side, so that it becomes necessary to provide some steady-
ing means. In this connection and to meet this requirement I have provided the later-
ally-adjustable hitch or connection between
the front bolster at the line of draft and the
draft-bar, so that, as will hereinafter be ap-
parent, by changing the line of draft or point
of connection between the front end of the
draft-bar and the clevis I am enabled to ex-
ert the strength of the team or other power
operating the grader to overcome the resist-
ance of the dirt and consequent tendency
upon the part of the machine to deflect or
drift. Taking the parts in the position shown
in Fig. 1, it will be obvious that the machine,
scraping at the left, so as to deflect the dirt in
that direction, will be forced to the opposite
direction, or right, and the hind wheels will
have a tendency to slide to the right. Now by
changing the line of draft to the left—that
is, engaging one of the left notches to con-
nection with the clevis—it will be apparent
that the line of draft will be thrown to the
left, and consequently will be exerted against
the resistance of the dirt, and, being the
stronger, will overcome such resistance, and
thus the machine will travel in a straight line.
It will be obvious that the means employed,
while extremely simple and cheap is positive
and sure in its action, and the objectionable
features are thereby overcome.

Upon each pair of side sills there is mount-
ed for sliding a plate 25, which plate has its
edges upturned to form sill-embracing flanges
26. Bearings 27 are formed upon the oppo-
site edges of the plates, and in each pair of
bearings a shaft 29 is mounted for rotation.
Each shaft 29 has one end squared to receive
a crank-arm 30, the free end of which is bi-
furcated to receive the upper end of a link or
connecting-bar 35, the lower end of the bar
being connected to the rear part of the draft-
bar 23, as at 36^a. Upon each of the shafts a
locking-wheel 36 is mounted, said wheel be-
ing provided with peripheral notches 37 and
with a central peripheral groove 38. This
groove is embraced by means of a U-shaped

friction-band 39, the terminals of which are
threaded and passed through perforations 40,
formed in the movable plates. Below the
plates the terminals have nuts 41 mounted
thereon, which nuts may be operated to
clamp the band upon the wheel to any desired
degree.

41^a designates a locking-wheel-operating
lever, and the same is provided with bifurca-
tions 44 at its lower end, each of said bifurca-
tions having an elongated slot or loop 45
formed therein. The bifurcations embrace
loosely the locking-wheel, the shaft of which
passes through the elongated loops. At the
inner ends of the bifurcations the lever is
provided with a pair of opposite shoulders 46,
which may be brought into engagement with
the notches of the wheel by pushing the lever
toward the shaft or may be disengaged from
said notches by drawing the lever away from
the shaft.

The blade-operating levers are necessarily
powerful, and consequently their short ends
must be extremely short, in order to lend lev-
erage of sufficient length to their longer ends,
so that there has heretofore existed a diffi-
culty in elevating the point of the scraper
sufficiently to pass over obstructions calcu-
lated to impair it by contact, and hence clumsy
devices—such as gearing, and other means
for elevating beyond the limit of the lever—
have been employed. Such devices were not
only costly and clumsy, but slow in their op-
erations, and it was necessary oftentimes
either to stop the machine entirely previous
to their operation or to begin such operation
some distance in advance of the arrival of
the machine at the obstacle. It will, however,
at once be obvious that by means of the wheel-
operating lever said wheel may be partially
rotated and will be held in any of its posi-
tions by means of the friction-band, and a sub-
sequent movement or operation of the blade-
operating lever will be quite sufficient to pass
the blade over any ordinary obstacle.

From the above description, taken in con-
nection with the accompanying drawings, it
will be obvious that I have provided a cheap
and simple means for overcoming objections
existing in road-machines of the present day,
and although I have herein shown and de-
scribed such improvements as applied to ma-
chines invented by myself, yet it will be ob-
vious that with few, if any, modifications said
improvements may be readily adapted and
applicable to most of the ordinary styles and
constructions of scraping-machines now upon
the market.

I will also herein state that I do not limit
my invention to the exact details of construc-
tion and means of accomplishing the advan-
tageous results enumerated, but may in some
instances conclude to vary the same and yet
be within the scope of my invention.

One of the greatest difficulties with road-
machines heretofore has been their tendency
to move sidewise while being operated, on ac-

count of the blade being carried forward on an angle to the line of draft. In other words, they are like a plow without a landside. Now, to overcome this objection many devices have
 5 been tried and used, such as fixing rudders to the hind end of the machine to hold it in line, setting the hind wheels obliquely to the line of draft, throwing the wheels out of perpendicular and leaning them to one side, af-
 10 fixing spuds to the rim of the wheels, and various other devices for preventing side movement. I employ compensating leverage by shifting the line of draft laterally and relatively to the draft-bar or its equivalent at the
 15 point where the draft-bar engages with the ordinary drawing devices used in such machines of a similar kind, thereby overcoming to a large extent this objectionable feature before mentioned. All other machines have
 20 a pivotal hitch without any such shift, thereby fixing their line of draft relative to their draft-bar at a given or fixed point, which line of draft exerts no influence over their draft-bar, and thereby to the scraper-blade.

25 Having described my invention, what I claim is—

1. In a road-scraper, the combination, with the front and rear trucks and a clevis loosely connected to the front truck, of a draft-bar piv-
 30 oted at its rear end to the rear truck, a toothed curved bar located at the front end of the draft-bar and adapted for removable engagement with the clevis, and a scraper-blade connected with the draft-bar, substantially as
 35 specified.

2. In a road-scraper, the combination, with the draft-bar bifurcated at its front end, a transversely-disposed and toothed connecting-
 40 bar, diverging ways or guide-rods located under the bifurcations of the draft-bar, front and rear trucks, to the latter of which the bar is pivoted, and a clevis mounted in the front truck and loosely engaging the teeth of the
 45 the draft-bar, a scraper-blade pivoted to the bar, and a pair of opposite draft-arms pivoted to the scraper-blade at opposite sides of its center and terminating at their front ends in eyes for loosely riding upon the guide-rods,
 50 substantially as specified.

3. In a road-scraper, the combination, with the framework comprising opposite ways and the scraping-blade, of a peripherally-toothed wheel mounted above each way, a shaft for
 55 the same, a bearing mounted for reciprocation upon the way and receiving the shaft, a bar connected to the end of the blade, a crank-arm mounted on the shaft and fulcrumed to

the bar, means for locking the wheel at any point of its rotation, and a lever loosely ful- 60 crumed at the side of the wheel and having the shoulder adapted to be thrown into engagement with the teeth of the wheel, substantially as specified.

4. In a road-scraper, the combination, with 65 the framework and the scraping-blade, of a shaft loosely journaled above the blade, a peripherally-toothed and annularly-grooved locking-wheel mounted on the shaft, a friction-band embracing the groove of the shaft, 70 a bifurcated lever embracing the wheel and having loops formed in its bifurcations for loosely receiving the shaft and above said loops provided with shoulders for engaging the teeth of the wheel, a crank-arm mounted 75 on the shaft, and a connecting-bar pivoted to the crank-arm and blade, substantially as specified.

5. In a road-scraper, the combination, with the framework comprising the opposite par- 80 allel ways, the scraper-blade, and the plates mounted for reciprocation upon the ways and having their edges embracing the same and provided with transversely-opposite bearings, of shafts mounted in the bearings and termi- 85 nating outside of the same in squared portions, an arm mounted upon the squared portion of each shaft, a bar pivoted to the free end of each arm, connections between the bars and blade, a wheel mounted on each 90 shaft and provided with peripheral notches and a central annular groove, a U-shaped friction-band mounted in the groove and having its terminals passed through perforations in the plates and there provided with binding- 95 nuts, and the locking-levers, one for each wheel, each lever being bifurcated at its lower end and having its bifurcations provided with loops loosely receiving the shaft at opposite sides of the wheel and provided above the 100 loops with shoulders for engaging the notches of the wheel, substantially as specified.

6. In a road-scraper, the combination, with a bolster having a bearing along its under edge, of a pair of axle-sections mounted at 105 opposite ends of the bearing and carrying ground-wheels and binding-screws mounted in the bearings and bearing on the axle, substantially as specified.

In testimony that I claim the foregoing as 110 my own I have hereto affixed my signature in presence of two witnesses.

JAMES M. HOLLAND.

Witnesses:

C. M. SNYDER,

R. W. BUCHANAN.