

No. 689,186.

Patented Dec. 17, 1901.

C. L. HEISLER.
STEAM ROAD ROLLER.

(Application filed Dec. 4, 1900.)

(No Model.)

6 Sheets—Sheet 1.

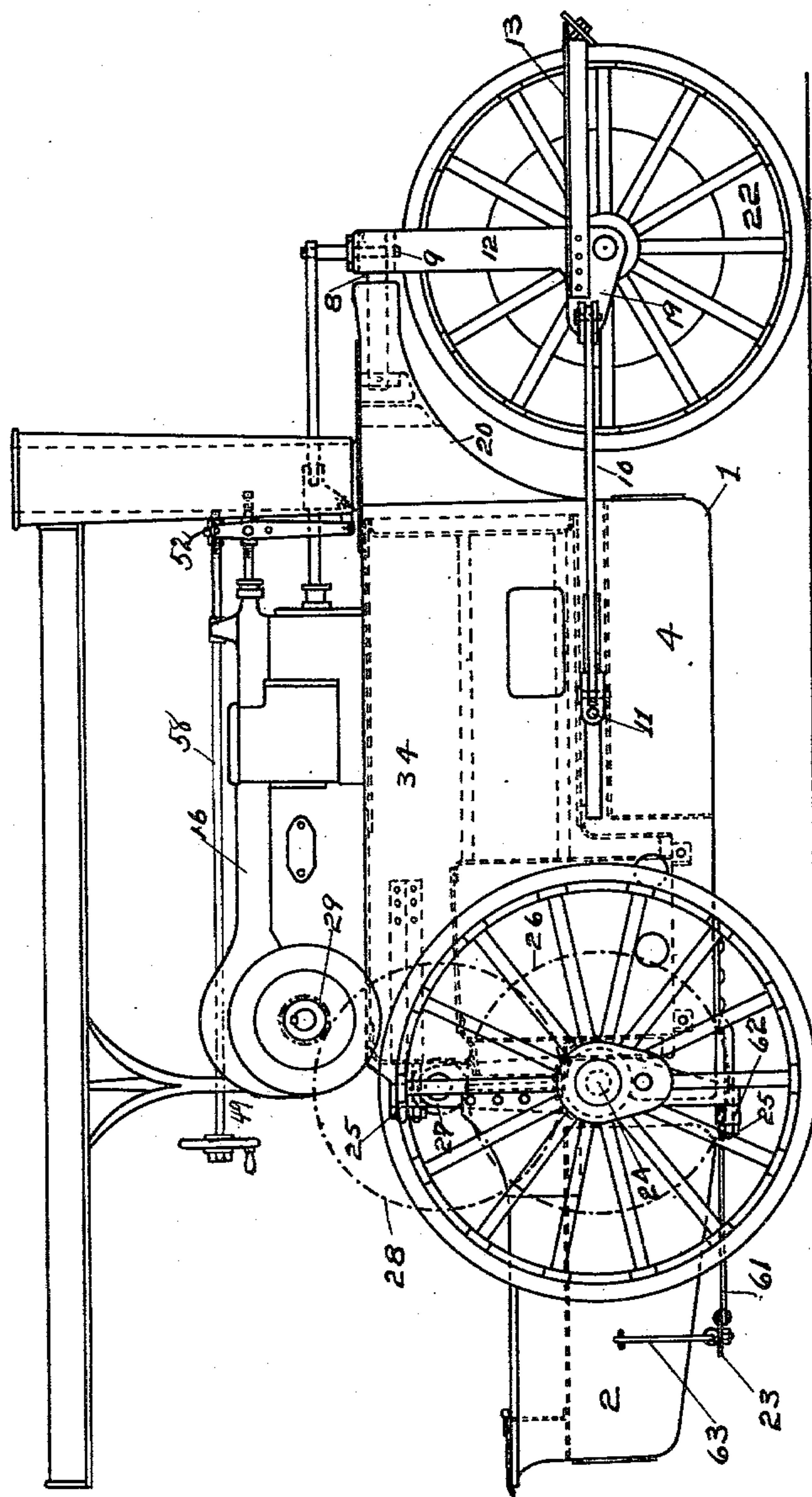


Fig. 1.

WITNESSES:

R. F. Sanga
Geo. M. Richards

INVENTOR

Charles L. Heisler

BY

W. L. Lind.

ATTORNEY

No. 689,186.

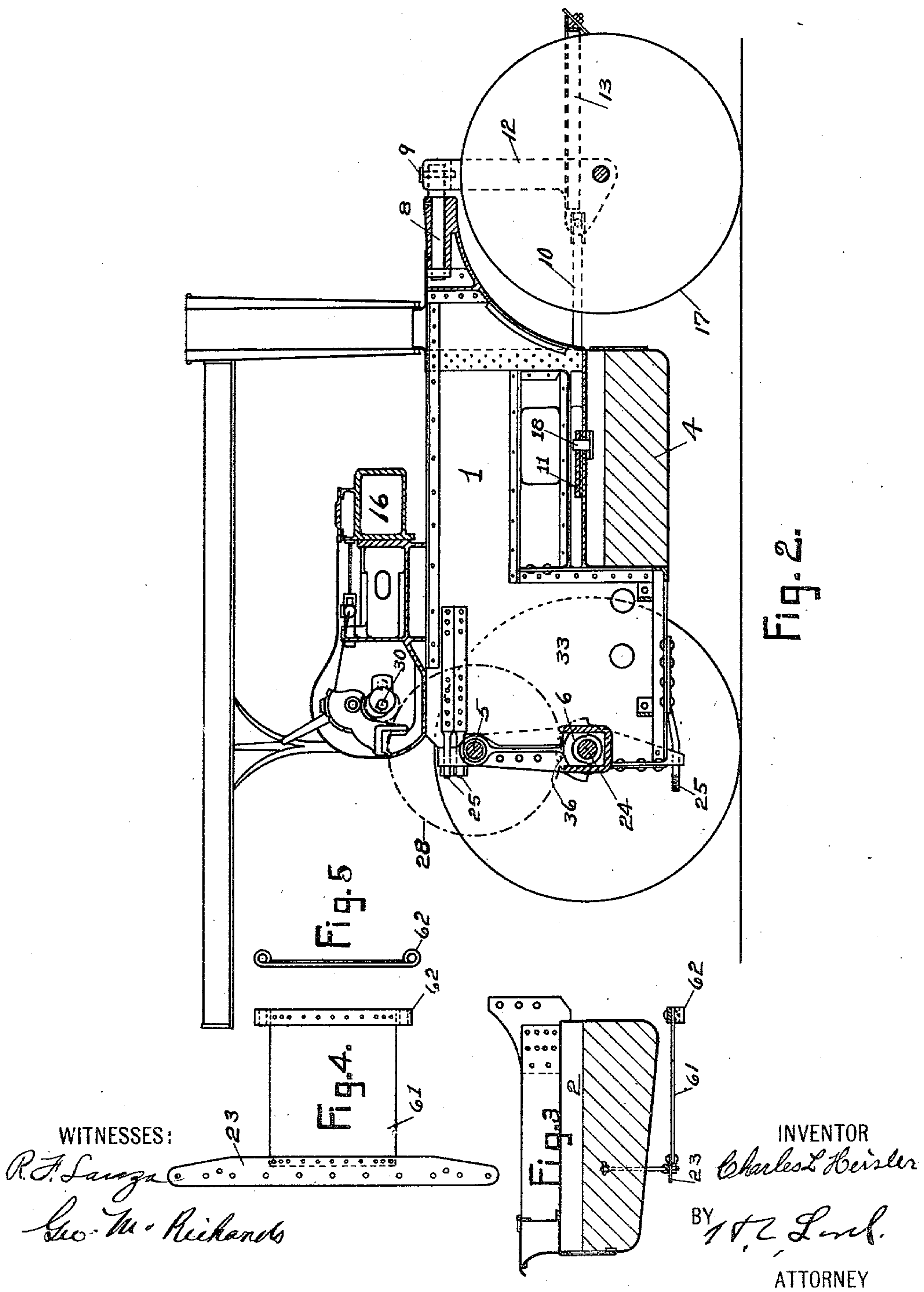
Patented Dec. 17, 1901.

C. L. HEISLER.
STEAM ROAD ROLLER.

(Application filed Dec. 4, 1900.)

(No Model.)

6 Sheets—Sheet 2.



No. 689,186.

Patented Dec. 17, 1901.

C. L. HEISLER.
STEAM ROAD ROLLER.

(Application filed Dec. 4, 1900.)

(No Model.)

6 Sheets—Sheet 3.

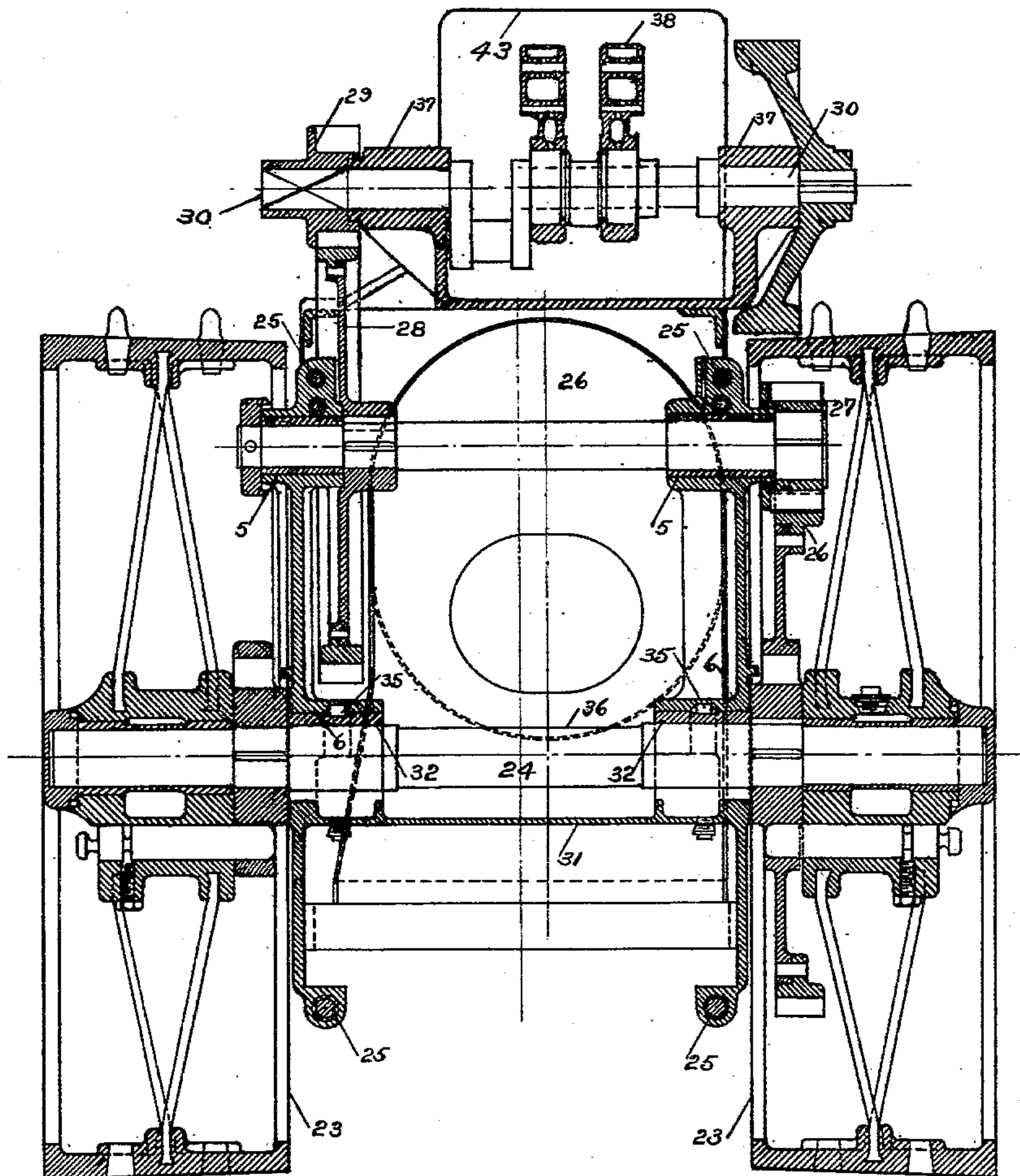


Fig. 6.

WITNESSES:

R. F. Sanza

Geo. M. Richards

INVENTOR

Charles L. Heisler

BY

W. Z. Lind

ATTORNEY

No. 689,186.

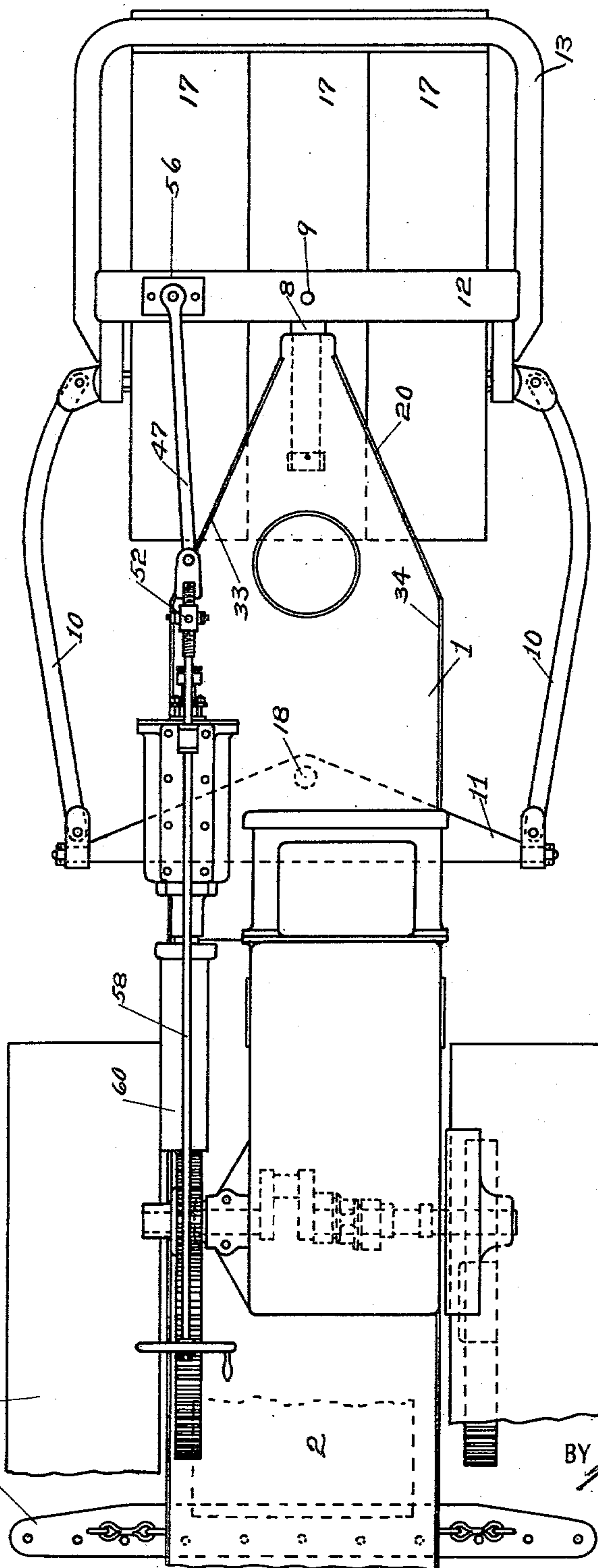
Patented Dec. 17, 1901.

C. L. HEISLER.
STEAM ROAD ROLLER.

(Application filed Dec. 4, 1900.)

(No Model.)

6 Sheets—Sheet 4.



WITNESSES:

WITNESSES:
R. J. Sanza
Geo. W. Richards

INVENTOR

Charles L Heister

BY

BY At Lind

ATTORNEY

No. 689,186.

Patented Dec. 17, 1901.

C. L. HEISLER.
STEAM ROAD ROLLER.

(Application filed Dec. 4, 1900.)

(No Model.)

6 Sheets—Sheet 5.

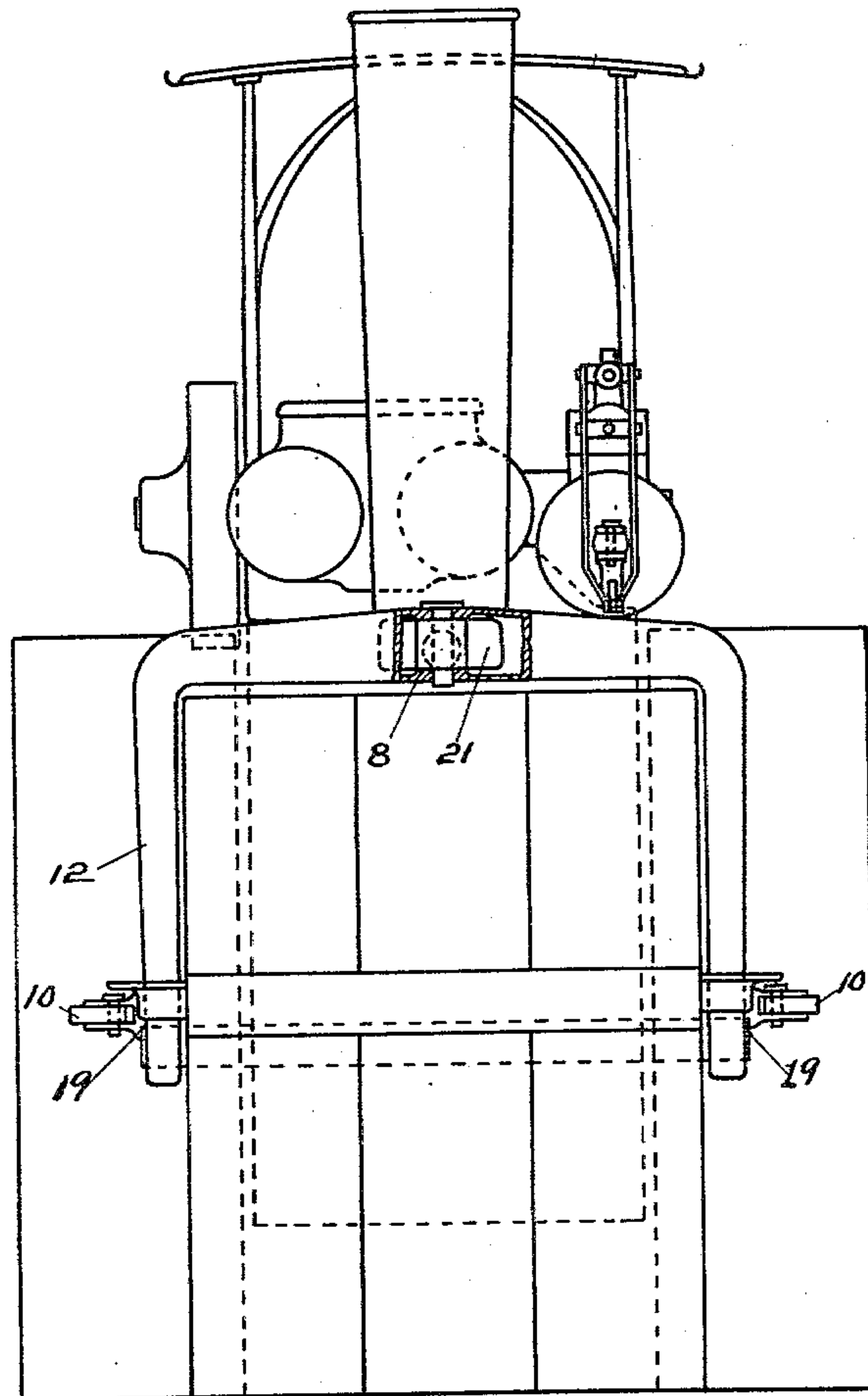


Fig. 8.

WITNESSES:

R. F. Sanza
Geo. W. Richards

INVENTOR

Charles L. Heisler

BY

N. L. Lind

ATTORNEY

No. 689,186.

Patented Dec. 17, 1901.

C. L. HEISLER.
STEAM ROAD ROLLER.

(Application filed Dec. 4, 1900.)

(No Model.)

6 Sheets—Sheet 6.

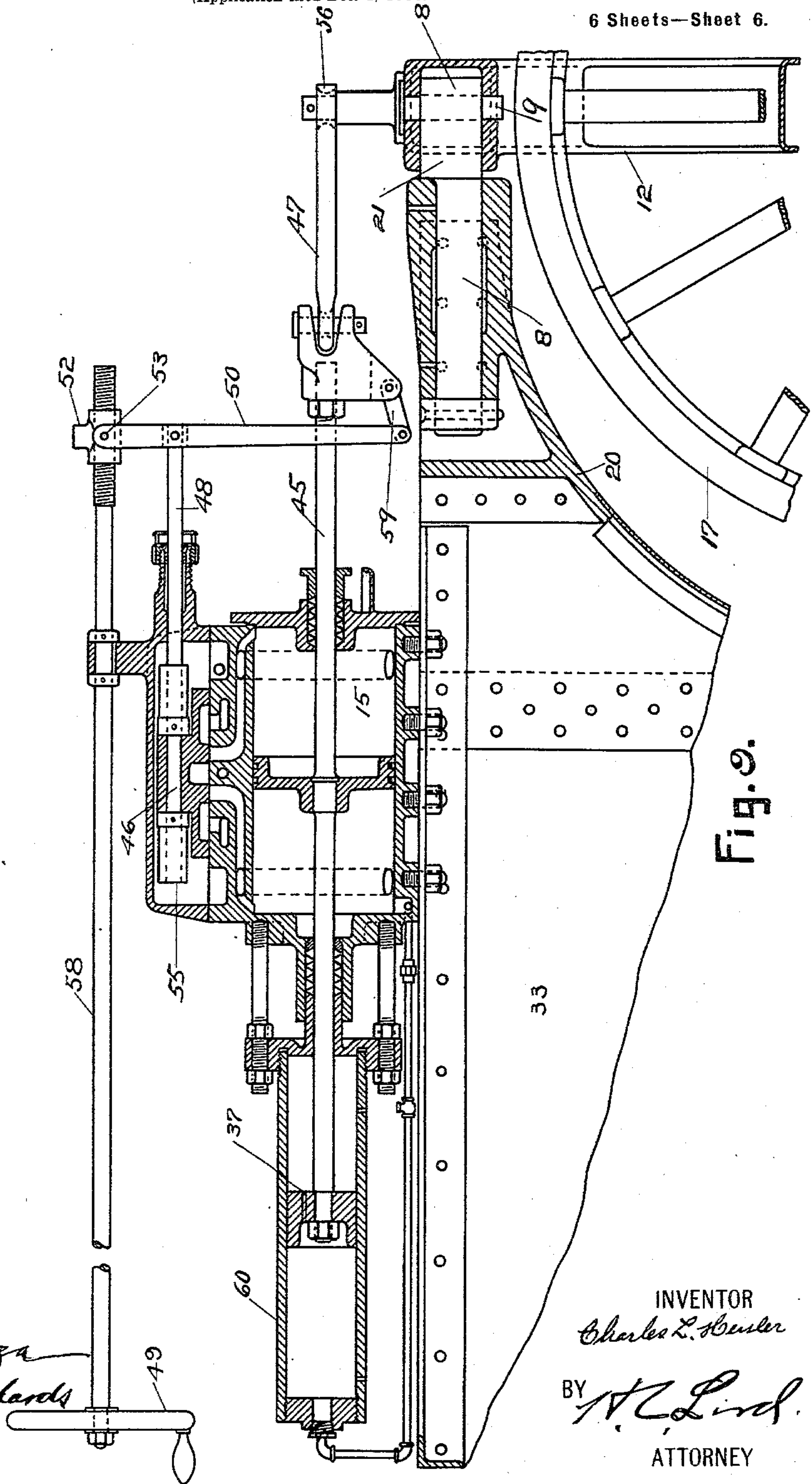


Fig. 9.

WITNESSES:

R. F. Sanza
Geo. W. Richards

INVENTOR

Charles L. Heisler

BY

H. C. Lind

ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES L. HEISLER, OF ERIE, PENNSYLVANIA.

STEAM ROAD-ROLLER.

SPECIFICATION forming part of Letters Patent No. 689,186, dated December 17, 1901.

Application filed December 4, 1900. Serial No. 38,714. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. HEISLER, a citizen of the United States, residing in Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Steam Road-Rollers, of which the following is a specification.

The drawings, Figures 1 to 6, inclusive, show the arrangement and construction of the improvements as embodied in a steam road-roller. Fig. 1 is a side elevation showing the general exterior view of the machine. Figs. 2, 3, and 5 represent a side view of the longitudinal cross-section with the boiler removed after having disconnected the rear tank and draw-bar from the main frame, as shown. Fig. 6 is a rear view of the machine, axle, gearing, and the boiler in place, but the tank removed. Fig. 7 is a top view of the machine. Fig. 8 is a front exterior view. Fig. 9 is a detail of the steering-gear. Figs. 2 and 6 also show the gear-bracket 31 as attached to the main frame.

The objects of my invention are, first, to make the front rolls as large and heavy, consequently as effective, as the rear rolls; second, to prevent any stresses or distorting forces other than those produced by the steam-pressure from coming upon the boiler; third, to provide an arrangement that will readily permit the removal of the boiler for repairs and inspection; fourth, a distinctly separate main frame upon which all the machinery and the boiler are mounted, so as to simplify and reduce the cost of construction, and, moreover, to permit the use of front rolls having a larger diameter; fifth, to provide a device that will minimize the stresses on the front-roll yoke, universal connection, and king-post, which will directly transmit the pushing or pulling forces from the main frame to the front rolls at or near the junction of the yoke with the axle and at the same time permit a free movement of the rolls when turning or passing over obstacles; sixth, to provide an effective, simple, and powerful steering-gear, so arranged that it will turn the front rolls or guide-wheel to a position corresponding to that of the tiller lever or wheel, then to hold it there without the use of worm-gear, chains, or complicated locking devices.

Heretofore in this class of steam-rollers the

front rolls were made of small diameter and the machine was so proportioned that they approximately exerted but one-half as much pressure as the rear rolls upon the road-surface. Consequently the rear rolls were alone effective in actually compressing the material. With the old machines it was necessary to roll the entire surface with the rear rolls, whereas the front rolls merely acted as guide-wheels. The front rolls make a path equal in width to the path of the rear rolls. Therefore if they are equally effective the capacity of the machine would evidently double. To bring about such results, it is necessary to make the front rolls as heavy and practically as large as the rear rolls, for if they were much smaller in diameter the road material would be pushed ahead of the rolls, and thus retard them and produce a defective road-surface. In the older machines it was impracticable to make the front rolls of large diameter or greater weight, because all the power necessary to propel them is conducted from the boiler-shell of the old machine through the universal connection and yoke that retain the front rolls. Consequently even with the light front rolls excessive and abnormal stress is thrown upon the guiding-yoke and boiler-shell, so that their destruction is soon brought about. Evidently if the rolls were made heavier the destructive forces would be further increased. Again, if the rolls were made larger then the yoke would have still greater leverage upon the universal connections and the boiler, so that they would be soon injured or dangerously weakened, particularly if the rolls came against any obstacle on the road.

The new device overcomes the foregoing difficulties and is shown in Figs. 1, 2, 7, 8, and 9. It consists of two floating side bars, pivotally connected on their rear ends to the cross-bar 11, which is pivoted near or at its middle to the main frame at 18. The main frame 1 will be described later. At their front ends the floating side bars 10 are universally connected to the front-roll axle-bearing 19 or yoke 12 at or near the axle, as shown. The front-roll yoke is of the usual construction, excepting that at the upper universal connection it is open at the back side, (indicated by the figure 21 in Fig. 9.) The yoke is of box-section and built of plates or of a sin-

gle steel casting. The drawings show that the king-post 8 is not in the usual vertical position, but has a horizontal bearing in the main-frame "gooseneck" 20 and enters the yoke 12 at the back-side opening 21, previously referred to. A short pin 9 passes vertically through the eye of the king-post 8 and the yoke 12, the whole forming a complete and simple universal connection that will permit the use of a maximum diameter of rolls, producing a device which not only accomplishes all the functions of the universal connections of the old machines in which a vertical king-post is used, but in addition produces new and useful results that are important and of great value by making it possible to use very large front rolls, (as large as the rear rolls,) which is impossible with the king-bolt arranged vertical, because the gooseneck would need be as high as the stack to give the vertical king-bolt a proper length of bearing. Manifestly this would be impractical and unsightly. Moreover, the vertical bearing for the king-bolt would be at a great distance from the main frame or boiler, to which it is attached in all the old machines of this type. Consequently it would call for a much stronger gooseneck, or it would weaken the already-overburdened construction of the old machine, this being their weakest point, and which is entirely eliminated by my improved form of gooseneck having the horizontal king-post. Evidently the king-post may be slightly inclined from the horizontal, if desirable to meet particular conditions of constructions, and yet not depart from the spirit of the invention. My improved form of gooseneck with the horizontal king-post is much shorter, therefore a much stronger, simpler, lighter, neater, and cheaper construction. It requires less head-room, and it is only because of its peculiar construction, including the arrangement of the king-post, that it is possible to use the much-desired large diameter of guiding-rolls.

The universal yoke connection and the floating bars 10, in combination with the cross-bar 11, are so arranged that the rolls are free to turn to the right or left, and as the floating bars are loosely pin-connected to the cross-bar 11 the floating bars have considerable free vertical motion at their front ends, thus permitting the front rolls to pass over any ordinary obstacle which would cause the rolls to swing about an axis coinciding with that of the king-post. It is evident that the floating bars can be connected to the axle or yoke conveniently near the axle, so they will effectively transmit any forces coming to or from the rolls, and thus minimize the stresses acting through the universal-connected yoke above. The removable dead-weights 22 can be removed from the front rolls when desired. An auxiliary yoke 13 is arranged to reinforce the yoke 12.

The main frame 1 is shown in the several drawings. It consists of two sheet-steel walls

33 and 34, extending from the universal connection with the front-roll yoke to the rear end of the machine. To the back or rear section of the main frame is attached the usual tank 2 and coal-box, the top of the tank forming the engineer's foot-plate. The main frame is divided in a vertical plane passing through the rear driver or roll axle 24 in such a manner that after loosening the clamping-bolts 25 the axle-boxes 6 and gear-shaft boxes 5, which are part of the gear-bracket 31, are free from the front section of the main frame, so that the back tank 2 or the gear-train and back tank can be taken away to permit the ready removal of the boiler. At the front and bottom of the main frame an auxiliary tank 4 is formed. On top of this tank, but beneath the waist of boiler, a large pivotal pin 18 is riveted to the tank or main frame and forms a bearing for the cross-bar 11. In the gooseneck 20 is formed the smoke-box, upon which the smoke-stack is mounted. In the gooseneck is also arranged the horizontal bearing for the king-post 8. The sides 33 and 34 may be made of sheet-steel or lattice-work, but preferably of sheet-steel, so as to form a box-like structure, in which the boiler 26 rests, as shown. However, without departing from the spirit of the invention a portion or all of top of the main frame may be covered by plates. Upon the box-shaped main frame a single or double motor engine is mounted.

The gear-train is of the usual construction and consists of the master-gear 26, meshing with the pinion 27, and the pair 28 and 29, the pinion 29 being mounted on the squared end of the crank-shaft 30. The axle-bearing 6 is formed in gear-bracket 31, fitted to the side walls of the main frame. At each side of the gear-bracket 31 is secured a half-box 32, which is held by the pin 35, cast upon its upper surface. The half-box can be removed by lifting the machine free from the axle, then sliding the half-box along the axle toward the middle, and finally lifting it out of the opening 36 on the upper open side of the shell formed in the gear-bracket 31.

The motor-engines 16 are self-contained. The crank-shaft 30 is quartered, as shown, with bearings at each end directly at the outside of the cranks, (shown by 37.) The eccentrics 38 are on the shaft 30 and fill the space between the crank, as shown.

Heretofore the boiler was necessarily placed centrally. Consequently gears of but very narrow face could be used. Fig. 6 shows the new arrangement of boiler at one side to give ample room for gearing at the other, at the same time retaining the exterior symmetry of the entire machine.

Figs. 2 and 6 show the detail construction of the gear-bracket 31, which supports the bearings 5 and 6 and forms a self-contained frame, so that the bearings will always remain in permanent alinement when subjected to the severe jars and stresses transmitted from the gear-train. By means of the bolts 25 the

bracket is made to form a readily-detachable part of the main frame, so that the boiler can be easily removed or the gear-train with the driving-axle and rolls.

5 In the old machines it has been usual to steer the guide-wheel by a hand device or by the usual small engine operating a worm-wheel and chain steering-gear. Either of the foregoing arrangements were too slow and laborious or of complicated construction. The new device shown in Figs. 7, 8, and 9 is of simple construction and avoids the objections common to the older devices, and consists, essentially, of a large cylinder 15, fitted with the usual piston-rod 45 and slide-valve 46. The yoke-link 47 connects the piston-rod 45 directly with the guiding-wheel frame or yoke 12. The valve 46 is connected to and moved by a suitable operator's wheel 49 by means of the valve-stem 48, connected to the swivel-nut 52 and the trick-lever 50. It is also moved by the piston-rod 45 through the trick-lever 50 swinging about the pivot 53, the lever end of the trick-lever being connected by the link 25 59 to the piston-rod 45. If the steering-wheel 49 is rotated, the valve 46 will then be moved in the direction of the dart 55, which will cause the piston to move in the opposite direction and swing the guide wheel or yoke in the direction of the dart 56 until this action again slides the valve back to its central position by means of the trick-lever 50, as is clearly shown by the drawings. Evidently the device can be readily controlled by the hand-wheel 49 or any similar device. Moreover, if the rolls 17 are turned the least by striking an obstacle the trick-lever causes the valve to open the ports on the proper side and admit steam in opposition to the resistance 40 of the obstacle. By adjusting the size of the choke-ports 57 in the dash-pot 60 excessive rapidity of motion can be prevented.

The location of the entire steering-gear is preferably arranged, as shown, on top of the machine proper, so as to be fully protected and clear of all obstructions and convenient of access. The direct lever connection between the piston and guide-wheel yoke is preferable to one of chain or rope, as it prevents 50 all lost motion and instantly transmits the piston movement to the yoke. Moreover, it is much simpler.

To prevent undue stress upon the rear tank, and thus cause leakage by the pull upon the draw-bar 23, the latter is connected directly to the main frame by the plate 61 and eye-bar 62, as shown, Figs. 1, 3, 4, and 5.

What I claim is—

1. In a steam road-roller, the combination 60 of a main frame; a yoke for the front guide-roller and a pivotal connection between said yoke and the frame, having its main supporting or king post arranged in an approximately horizontal position.

2. In a steam road-roller, the combination 65 of a main frame having a gooseneck at its forward end; a support or post arranged sub-

stantially horizontally in and projecting forwardly from said gooseneck; and a yoke for a guide-roller connected to said post and adapted to vibrate about a vertical axis relatively thereto. 70

3. In a steam road-roller, the combination of a main frame; a front guide-roller; a yoke supporting said roller and pivotally connected to the main frame; and an auxiliary yoke connected to the main yoke and extending around and in front of said roller. 75

4. In a steam road-roller, the combination of the front guide or roll yoke, and the universal connection having the king-post fitted in an approximately horizontal bearing formed in the gooseneck, substantially as described. 80

5. In a steam road-roller, the combination of the front guide or roll yoke having a central opening at the top back side, a horizontal king-post fitted to a bearing in the gooseneck, a vertical pin passing through the yoke and the eye of the king-post, substantially as described. 85 90

6. In a steam road-roller, the combination of the front guide or yoke, and the universal connection having the king-post fitted to a horizontal bearing in the gooseneck, and the auxiliary yoke fastened to the front guide or roll, for the purpose and in the manner described. 95

7. In a steam road-roller, the combination of a guide-yoke; an engine-frame; a pivotal connection between said guide-yoke and said engine-frame; an axle carried by said yoke; guide wheels or rolls arranged upon said axle; the floating bars connected to said guide-yoke adjacent to the axle; and means for transmitting the endwise strains on the guide-yoke through said bars to the main frame. 100 105

8. In a steam road-roller, the combination of the guide-yoke universally connecting its upper end, to the gooseneck, so as to swing freely about a vertical axis, and provided with an axle upon which is mounted one or more guide-wheels, or rolls; the floating bars pivotally connected with the said guide-yoke, or axle, and means for transmitting the forces acting along the floating bars, to the machine proper, for the purpose described. 110 115

9. In a steam road-roller, the combination of the front guide or roll yoke universally connected at its upper end, to the gooseneck, and provided with an axle upon which is mounted one or more guide-wheels, the floating side bars pivotally connected with the guide yoke or axle, a cross-bar pivotally connected at its ends with the floating side bars, and mounted upon a pivot that is secured to the machine proper, for the purpose described. 120 125

10. In a steam road-roller, the combination of a guide-yoke provided with an axle upon which is mounted one or more guide-wheels, the horizontal king-post forming part of the universal connection between the upper end of the yoke and gooseneck; means for transmitting the forces propelling the guide-wheels, from the machine proper, independ- 130

ent of the universal connection, for the purpose described.

11. In a steam road-roller, the combination of a main frame; a boiler mounted on said frame between the side walls thereof; an engine mounted on the main frame; and a train of gearing connected to the engine and the driving-rolls, the boiler being arranged relatively near one side wall of the main frame whereby space is provided between the opposite wall and the boiler for said gearing.

12. In a road-roller, the combination of an independent main frame fitted at one end with a gooseneck swivelly connected with the roll-yoke, engines mounted upon the main frame, and gear-connected with the rear driving-rolls, located at opposite sides of the main frame, a boiler arranged between the side walls of the main frame but mainly at one side to make room for the gear at the opposite side, in the manner described.

13. In a steam road-roller, mounted upon front guiding-rolls arranged with a swiveling yoke, and a pair of rear driving-rolls located at opposite sides of the machine proper and gear-connected with motor-engine mounted upon the main frame, which consists of a pair of vertical walls rigidly connected with the gooseneck and extends longitudinally backward between the rear rolls that are provided with suitable axle-bearings to carry the machine, a boiler supported by the main frame and located between the walls thereof, for the purpose described.

14. In a steam road-roller mounted upon front rolls arranged with a swiveling yoke, and a pair of rear driving-rolls located at opposite sides of the frame or machine proper, and gear-connected with a suitable motor, the vertical side walls rigid with the gooseneck and extending longitudinally backward between the rear rolls that are provided with axle-bearings for supporting the machine, a boiler mounted upon the machine mainly between the side walls of the main frame, and a tank or tanks secured to the main frame, for the purpose described.

15. In a steam road-roller, the combination of a main frame; guiding and driving rolls mounted in bearings on said frame; the boiler-support upon the frame; and a supply-tank connected to the rear end of the frame and forming the engineer's platform.

16. In a steam road-roller, the front guide-roller, the rear drivers, arranged at opposite sides of the machine, a main frame provided with vertical side walls supported on the guide-roller and drivers, a boiler located between the vertical side walls of the main frame, and a tank secured to the main frame at the rear of the boiler, for the purpose described.

17. In a steam road-roller, the combination of an independent main frame fitted at one end with a connected guide-yoke, motor-en-

gine arranged upon the frame and gear-connected with the rear drivers, a boiler arranged between the side walls of the frame, and a cover-plate rigidly connecting the top edges of the side walls, for the purpose described.

18. In a steam road-roller, the combination of a main frame, having vertical side walls; guide and driving rolls mounted in bearings on said side walls; a boiler located between the vertical side walls of the frame; and a supply-tank detachably connected to the main frame in rear of the boiler.

19. In a steam road-roller, the combination of a main frame; a guide-roller connected to the forward end of said frame; a boiler mounted on said frame; and a supplemental frame detachably secured to the main frame in the rear of the boiler, the axle for the rear rolls being mounted in said supplemental frame.

20. In a steam road-roller, the combination of the vertical side walls of the main frame, the boiler located between the side walls, and the connected guide-yoke, and means for readily disconnecting the rear tank, driving-axle and parts necessary to permit the ready removal of the boiler, as described.

21. In a steam road-roller, the combination of a main frame; a guide-roll pivotally connected to the front of said frame; an axle for said guide-roll; a yoke extending from said axle over said guide-roll; a pivotal connection between said yoke and the front of said frame; means extending from the axle to the frame and arranged to sustain the endwise strain on the yoke; the drive-roll; and means on the frame for supplying power to the drive-roll, said drive and guiding rolls being of approximately the same size.

22. In a steam road-roller, the combination of a main frame; guide-rolls; an axle for said guide-rolls; a yoke extending from said axle over said guide-roll; a pivotal connection between said yoke and the main frame; a beam pivoted on the main frame and bars, connecting said beams with the yoke adjacent to the axle whereby the endwise strain incident to the rolling action is transmitted through the bars and beam to the frame.

23. The combination in a steam road-roller of a main frame; a front guiding-roll carried by a suitable yoke; a pair of rear driving-rolls arranged on each side of the main frame; means for propelling the driving-rolls; a tank attached to the main frame at the rear of the machine and between the driving-rolls; a draw-bar arranged under and secured to said tank; and a suitable connection between the draw-bar and the main frame for the purposes described.

CHARLES L. HEISLER.

Witnesses:

L. G. HEISLER,
V. E. NEWBY.