

No. 694,661.

Patented Mar. 4, 1902.

T. R. McKNIGHT.
GRADING MACHINE.

(Application filed Mar. 8, 1901.)

(No Model.)

4 Sheets—Sheet 1.

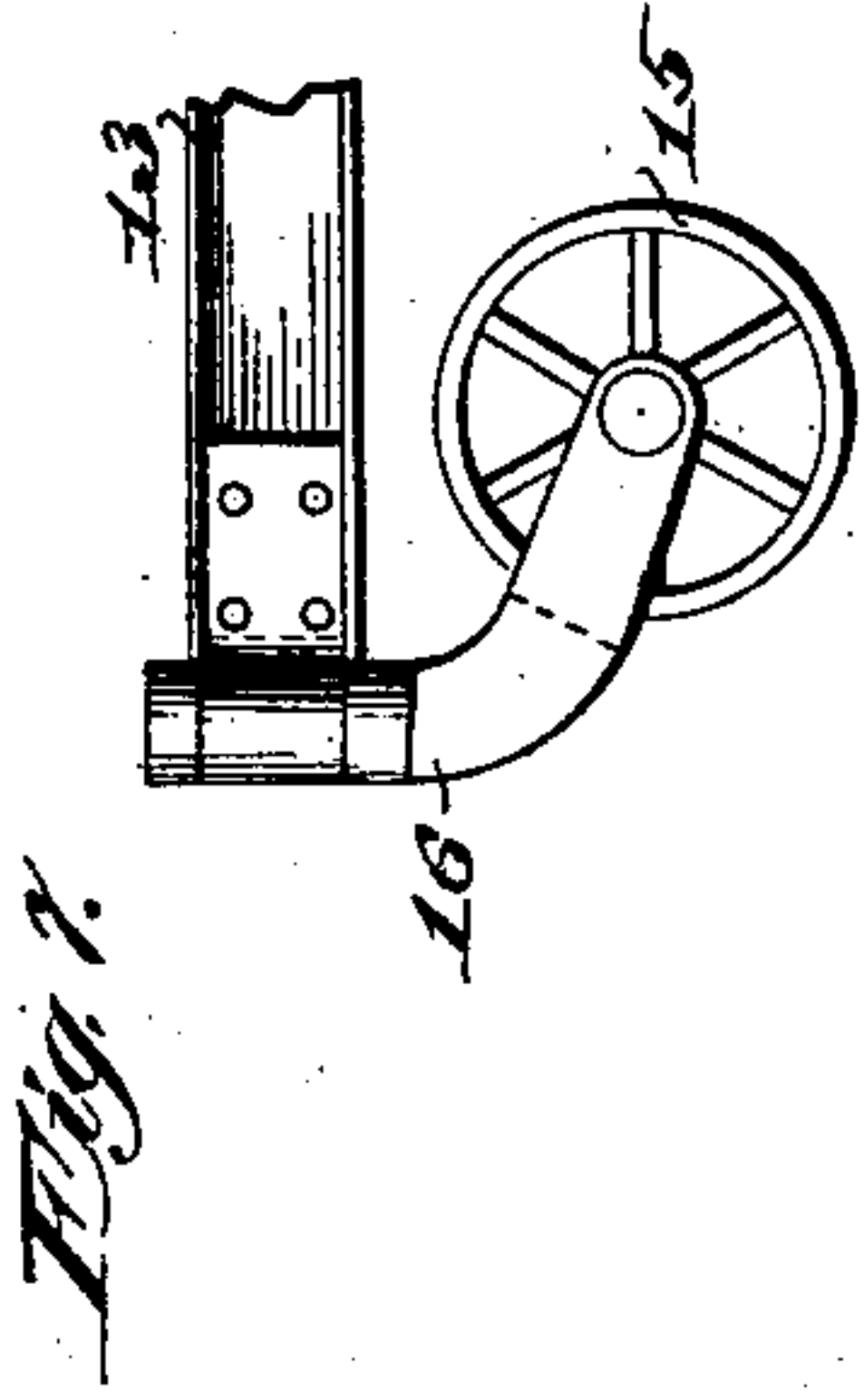
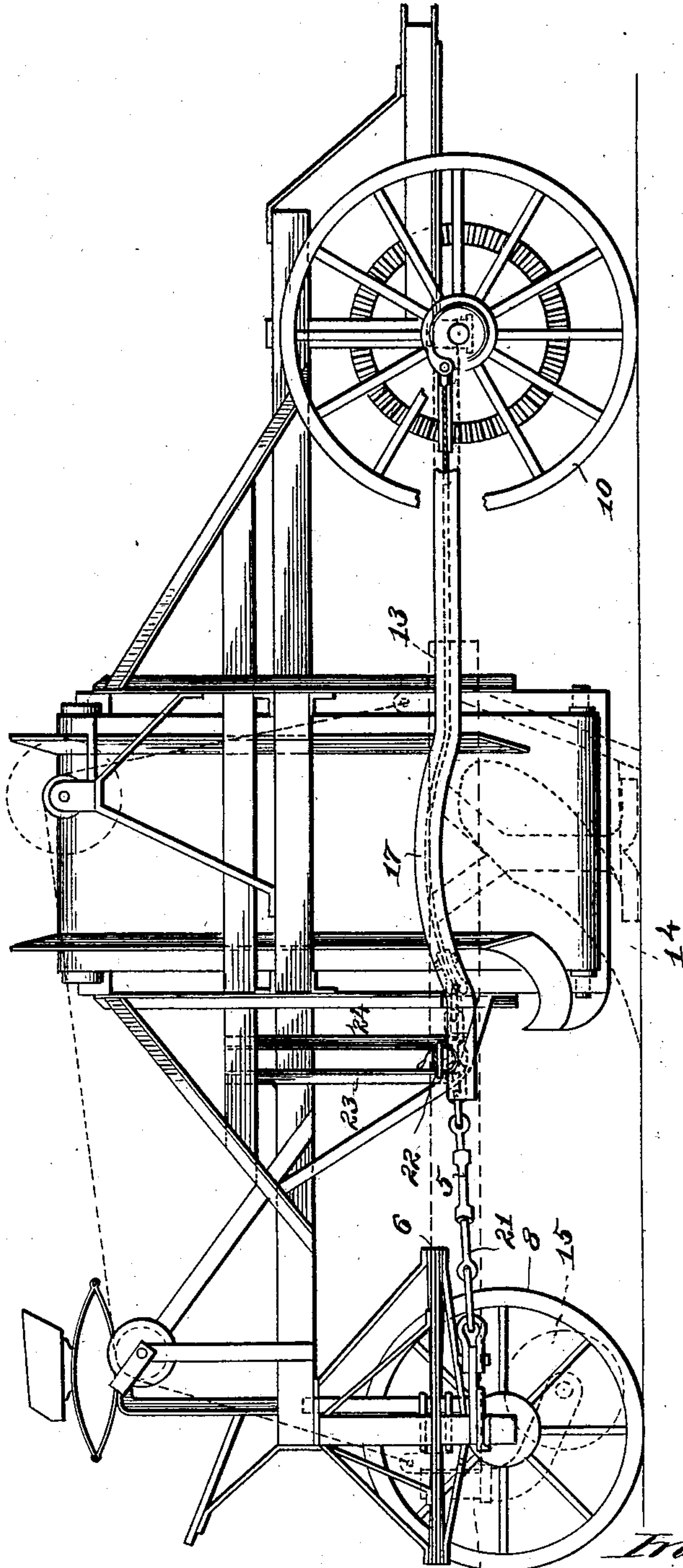


Fig. 1.



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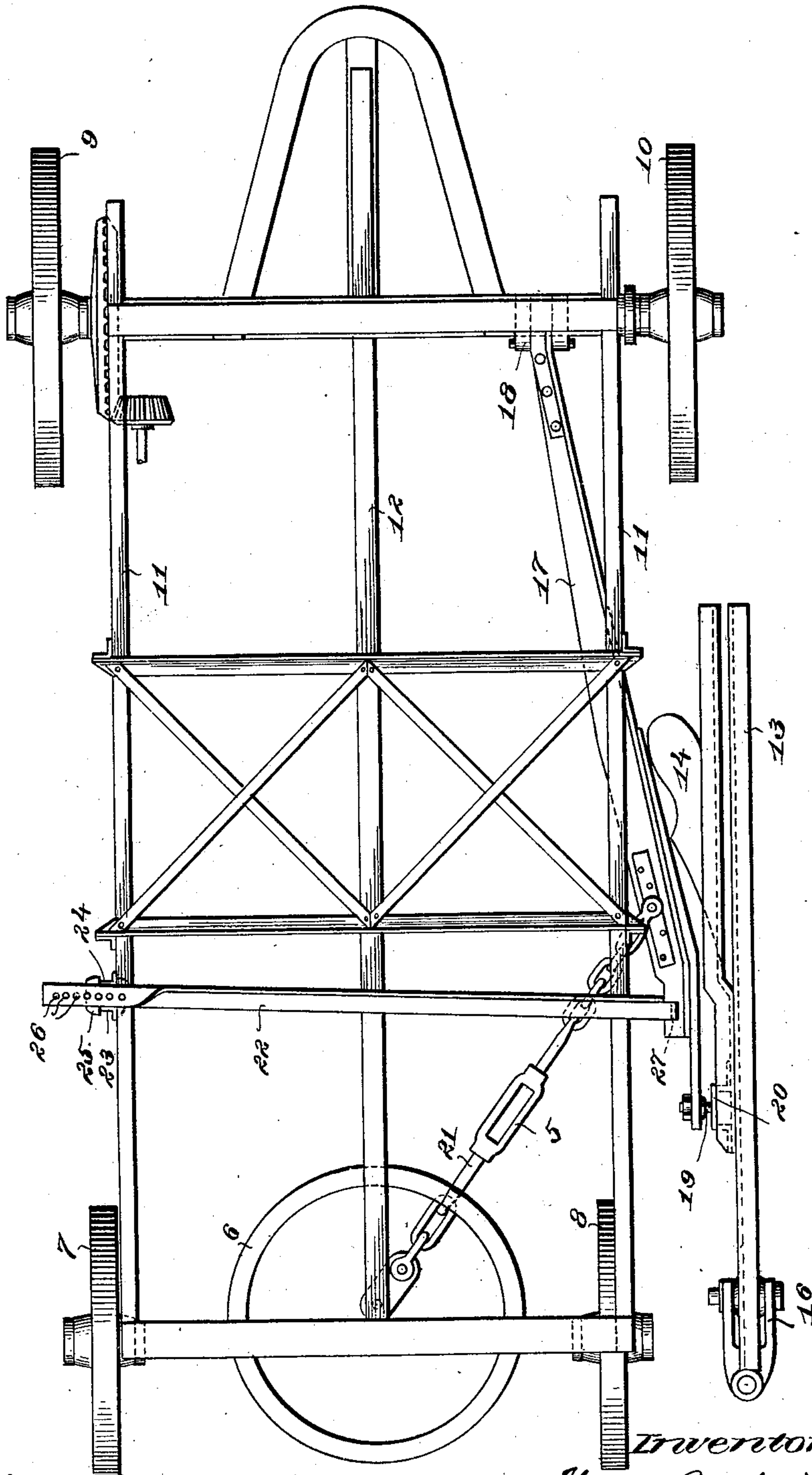
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4 Sheets—Sheet 2.

Fig. 2.



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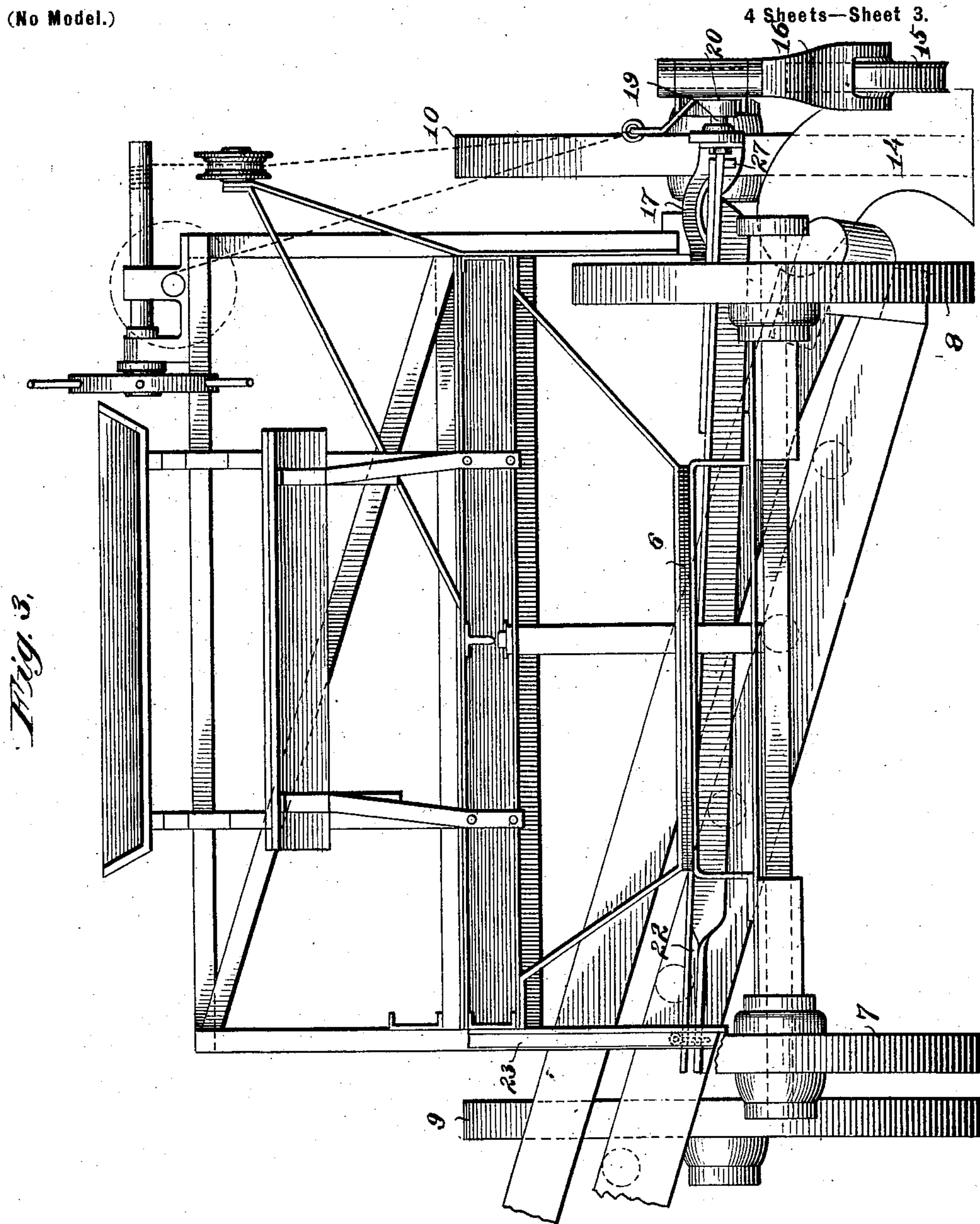
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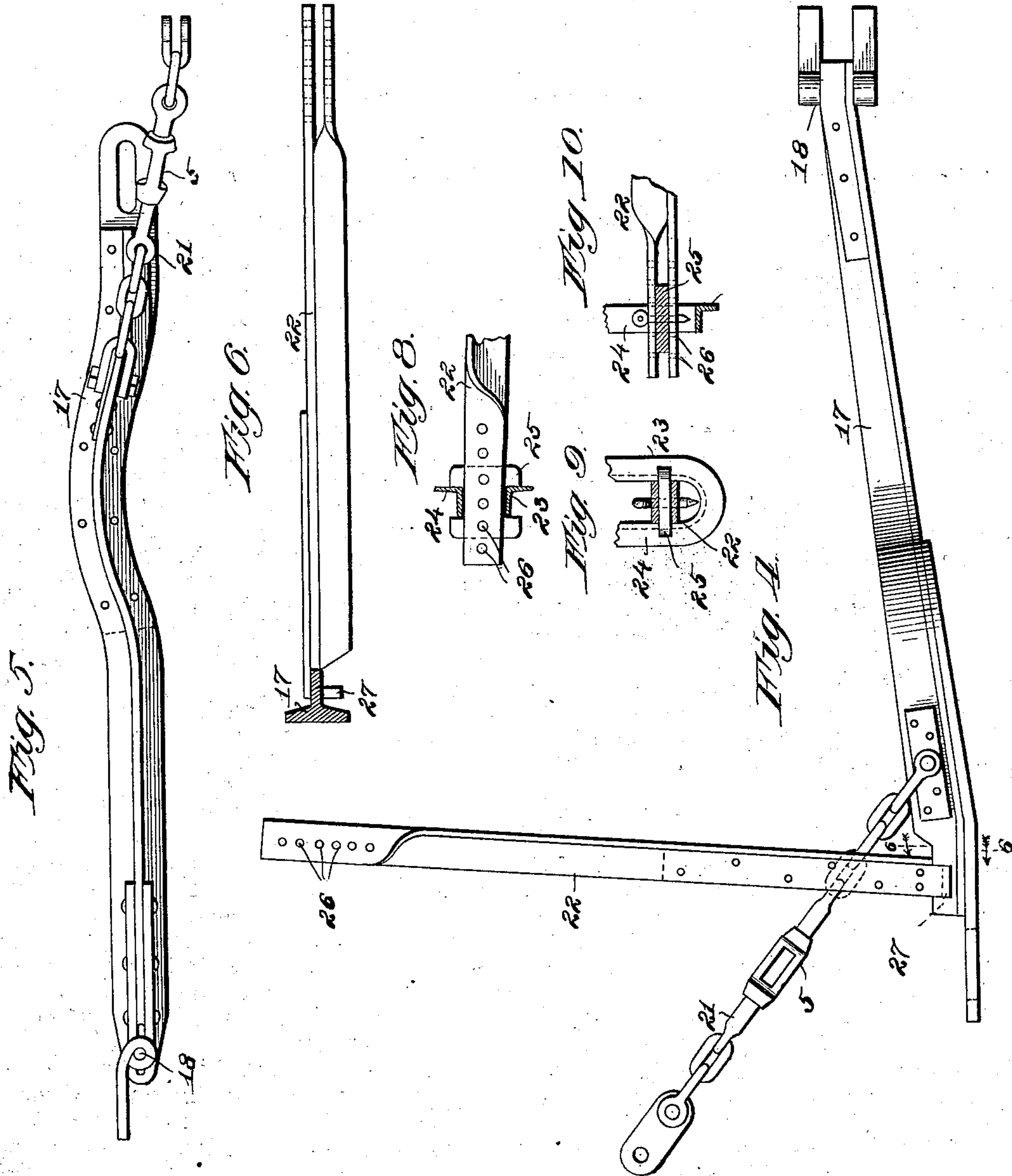
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(No Model.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

THOMAS R. McKNIGHT, OF AURORA, ILLINOIS, ASSIGNOR TO WESTERN
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GRADING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 694,661, dated March 4, 1902.

Application filed March 8, 1901. Serial No. 50,300. (No model.)

To all whom it may concern:

Be it known that I, THOMAS R. McKNIGHT, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Grading-Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to machines used for grading roads, involving the use of a plow or equivalent device, such machines being also usually provided with elevating and conveying mechanism by which the dirt thrown up by the plow is received and conducted away from the grader and discharged either on the bank or into wagons or cars.

The object of my invention is to provide certain improvements in machines of this type; but such improvements are not limited in their application to machines provided with such conveyers.

My improvements relate more particularly to the devices by which the plow is carried in the machine and operated thereby; and they consist generally in an improved arrangement of the connecting devices for the plow by which the plow mechanism is held in operative position by pulling devices, as well as by pushing devices.

It consists, further, in improved means for counteracting the thrust of the plow and at the same time reducing the danger of overturning the carriage, which exists in prior machines.

In the accompanying drawings, Figure 1 is a partial side elevation illustrating my improvements. Fig. 2 is a partial plan view. Fig. 3 is a front view. Fig. 4 is a plan view of the plow-controlling devices. Fig. 5 is a side elevation of the push-bar and draft-chain by which the plow is operated. Fig. 6 is an edge view of the thrust-bar, showing the push-bar in section, taken on line 6-6 of Fig. 4. Fig. 7 is a detail showing the mounting of the gage-wheel, and Figs. 8, 9, and 10 are sectional views illustrating the locking devices of the thrust-bar.

Referring to the drawings, 7 8 indicate the front wheels, and 9 10 the rear wheels, of the carriage. The wheels are supported in the

frame 11 of the machine, which is of the usual form.

12 indicates a brace or connecting-bar which extends back through the frame and is connected thereto, as shown in Fig. 2.

13 indicates the plow-beam, which is arranged at one side of the carriage. The beam 13 carries the plow 14, which is fixedly secured thereto. At the forward end of the beam is a gage-wheel 15, suitably supported in a suitable bracket 16, arranged to turn about a vertical pivot after the manner of a caster-wheel bracket, as shown in Fig. 3.

17 indicates a push-bar, the rear end of which is pivoted on a horizontal pivot 18 to the rear portion of the frame 11, the front end of said push-bar being connected by a bolt 19 to the beam 13 at one side. As shown in Fig. 2, the push-bar 17 extends forward and outward from the pivot 18, so that the plow-beam is held properly at a short distance outside of the frame 11. The bolt 19 is connected to the beam 13 a short distance in advance of the plow 14 and is so arranged as to permit slight oscillation of the plow-beam 13. To this end the head of the bolt 19 is fitted in a bracket 20, carried by the plow-beam, the shank of the bolt passing through a suitable slot in said bracket in the manner described in patent to S. F. Welch, No. 619,374, dated February 14, 1899.

21 indicates a draft-chain, the forward end of which is connected to the frame of the machine at the center of the fifth-wheel 6, its rear end being connected to the push-bar 17, near the forward end thereof, so that the draft-chain 21 assumes an angular position, extending backward and outward from the front end of the frame of the machine. The length of the draft-chain may be adjusted by means of a turnbuckle 5, so that the relative angular positions of the draft-chain and push-bar may be varied at pleasure.

22 indicates a thrust-bar which is connected to the forward end of the push-bar 17 and extends transversely of the machine, being secured to the opposite side of the frame thereof in substantially the manner described in the Welch patent above referred to, so that it is free to move vertically as may be necessary

in the operation of the machine. As described in said patent, the thrust-bar 22 passes between vertically-disposed angle-bars 23 24 and carries a lock-plate 25, which also passes
 5 between said bars and is provided with recesses to receive them, as shown in Fig. 2. The thrust-bar 22 is provided with a number of holes 26, adapted to receive a pin by which it is adjustably connected to the lock-plate
 10 25. By this arrangement the thrust-bar cannot move transversely of the machine independently of the lock-plate, but it can be adjusted transversely by adjusting its position on the lock-plate. The opposite end of the
 15 thrust-bar is secured to the push-bar 17 by a downwardly-projecting lug 27, which passes through a suitable slot in the end of the push-bar, as shown in Fig. 6, thus permitting angular adjustment of the push-bar with refer-
 20 ence to the thrust-bar. It will be noted that the end of the thrust-bar 22 adjacent to the plow-beam 13 is not connected to the frame of the machine, but is free to move as may be necessary in the operation of the machine, so
 25 that in case of excessive vertical movement of the plow the thrust-bar may move freely without danger of overturning the carriage.

In operation the draft is transmitted to the plow-beam through the carriage and push-
 30 bar 17, the latter being held in proper position by the draft-chain 21 and also by the thrust-bar 22. By means of the draft-chain 21, which helps to hold the push-bar in proper position, a part of the draft is also trans-
 35 mitted to the plow, giving a pulling as well as a pushing effect, and the push-bar and draft-chain, together with the thrust-bar 22, serve to hold the plow-beam steady while in operation.

40 Instead of using a plow, as illustrated and described, any other equivalent device may be employed.

That which I regard as my invention, and desire to secure by Letters Patent, is—

45 1. In a grading-machine, the combination of a carriage, a plow, a push-bar connected at its rear end to the carriage and at its forward end to the plow-beam, and a flexible draft connection connecting the forward por-
 50 tion of said push-bar with the carriage, substantially as described.

2. In a grading-machine, the combination of a carriage, a plow, a push-bar connected at its rear end to the carriage and at its forward end to the plow-beam, a flexible draft
 55 connection connecting the forward portion of said push-bar with the carriage, and means for resisting lateral thrust of the plow, substantially as described.

60 3. In a grading-machine, the combination of a carriage, a plow, a push-bar connected at its rear end to the carriage and at its forward end to the plow-beam, a flexible draft connection connecting the forward portion of
 65 said push-bar with the carriage, a thrust-bar

extending transversely of the carriage, means preventing said thrust-bar from moving trans-
 versely of the carriage, and means connect-
 ing said thrust-bar with the plow, substan-
 70 tially as described.

4. In a grader, the combination of a car-
 riage, a plow, a push-bar pivoted at its rear
 end to the carriage and pivoted at its forward
 end to the plow-beam, and a thrust-bar pivot-
 ally connected to said push-bar near the for-
 75 ward end thereof and extending transversely
 of the carriage, the opposite end of said thrust-
 bar being connected to the carriage, substan-
 tially as described.

5. In a grader, the combination of a car-
 80 riage, a plow, a push-bar pivoted at its rear
 end to the carriage and pivoted at its forward
 end to the plow-beam, a thrust-bar pivotally
 connected to said push-bar near the forward
 end thereof and extending transversely of the
 85 carriage, the opposite end of said thrust-bar
 being connected to the carriage, and a flexible
 connecting device connecting the forward por-
 tion of said push-bar with the forward portion
 of the carriage, substantially as described. 90

6. In a grader, the combination of a car-
 riage, a plow arranged at one side thereof, a
 push-bar pivoted at its rear end to said car-
 riage and extending forward and outward,
 the forward end of said push-bar being con-
 95 nected to the plow-beam, and a connecting
 device connecting the forward portion of said
 push-bar with the carriage, said connecting
 device extending forward and inward from
 said push-bar, substantially as described. 100

7. In a grader, the combination of a car-
 riage, a plow arranged at one side thereof, a
 push-bar pivoted at its rear end to said car-
 riage and extending forward and outward,
 the forward end of said push-bar being con-
 105 nected to the plow-beam, and a flexible con-
 necting device connecting the forward por-
 tion of said push-bar with the carriage, said
 connecting device extending forward and in-
 ward from said push-bar, substantially as de- 110
 scribed.

8. In a grader, the combination of a car-
 riage, a plow arranged at one side thereof, a
 push-bar pivoted at its rear end to said car-
 riage and extending forward and outward,
 115 the forward end of said push-bar being con-
 nected to the plow-beam, a connecting device
 connecting the forward portion of said push-
 bar with the carriage, said connecting device
 extending forward and inward from said
 120 push-bar, and a transversely-arranged thrust-
 bar pivotally connected at one end to said
 push-bar and adjustably secured at the other
 end to the carriage, substantially as de-
 scribed.

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Witnesses:

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