

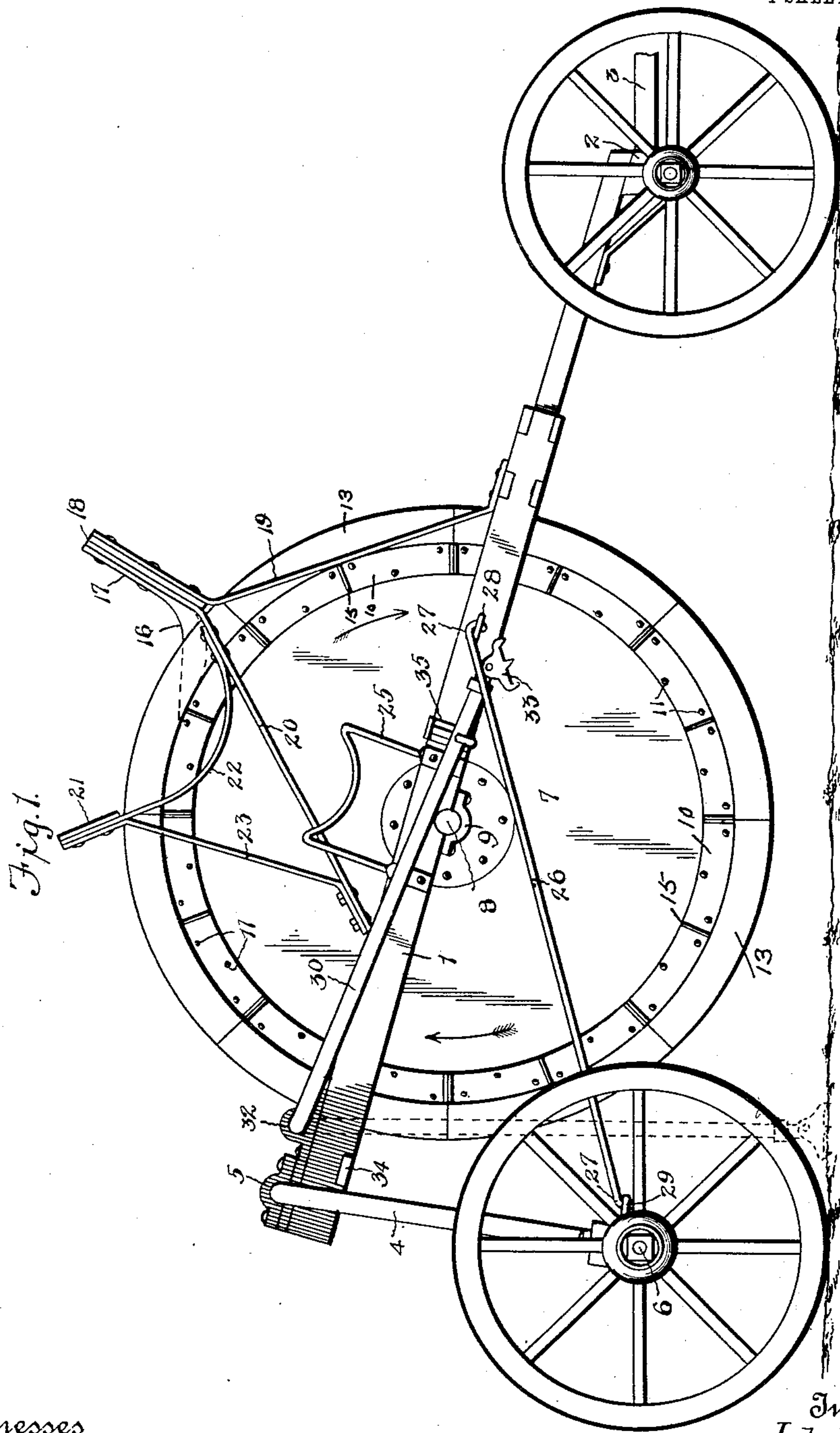
No. 750,686.

PATENTED JAN. 26, 1904.

J. PAGE.
DITCHING MACHINE.
APPLICATION FILED MAR. 26, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses
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H. J. Shepard.

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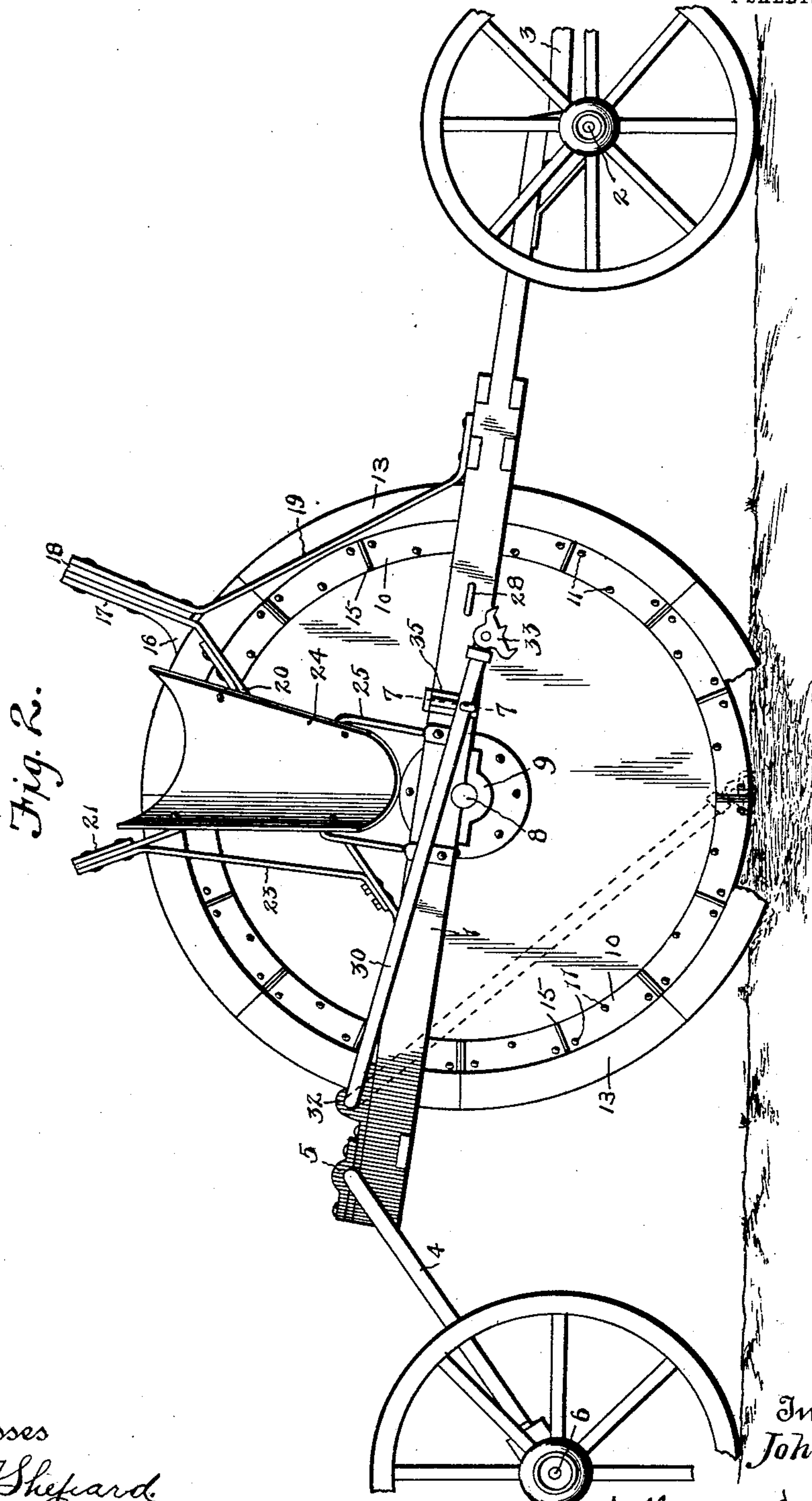
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4 SHEETS—SHEET 3.

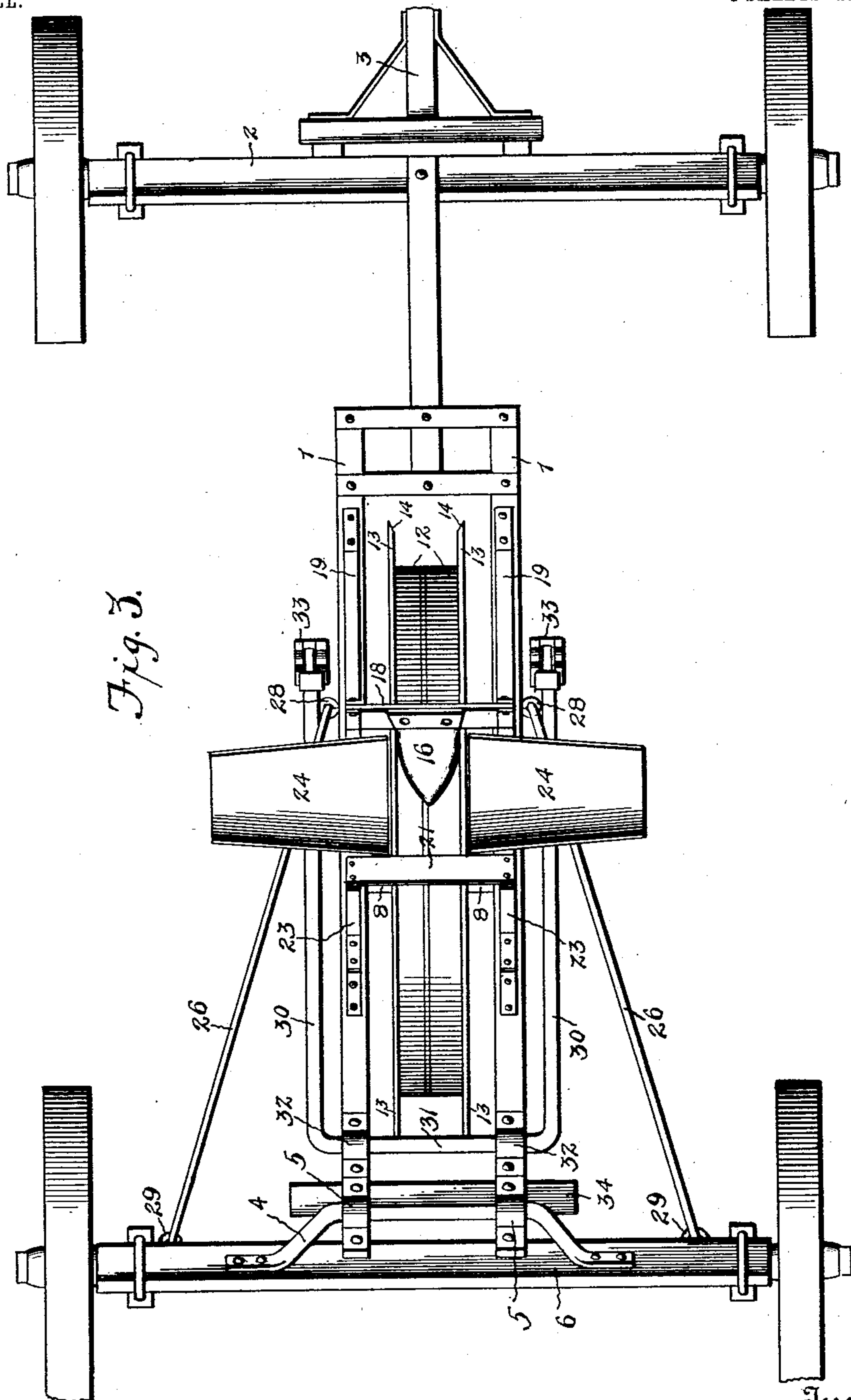


Fig. 3.

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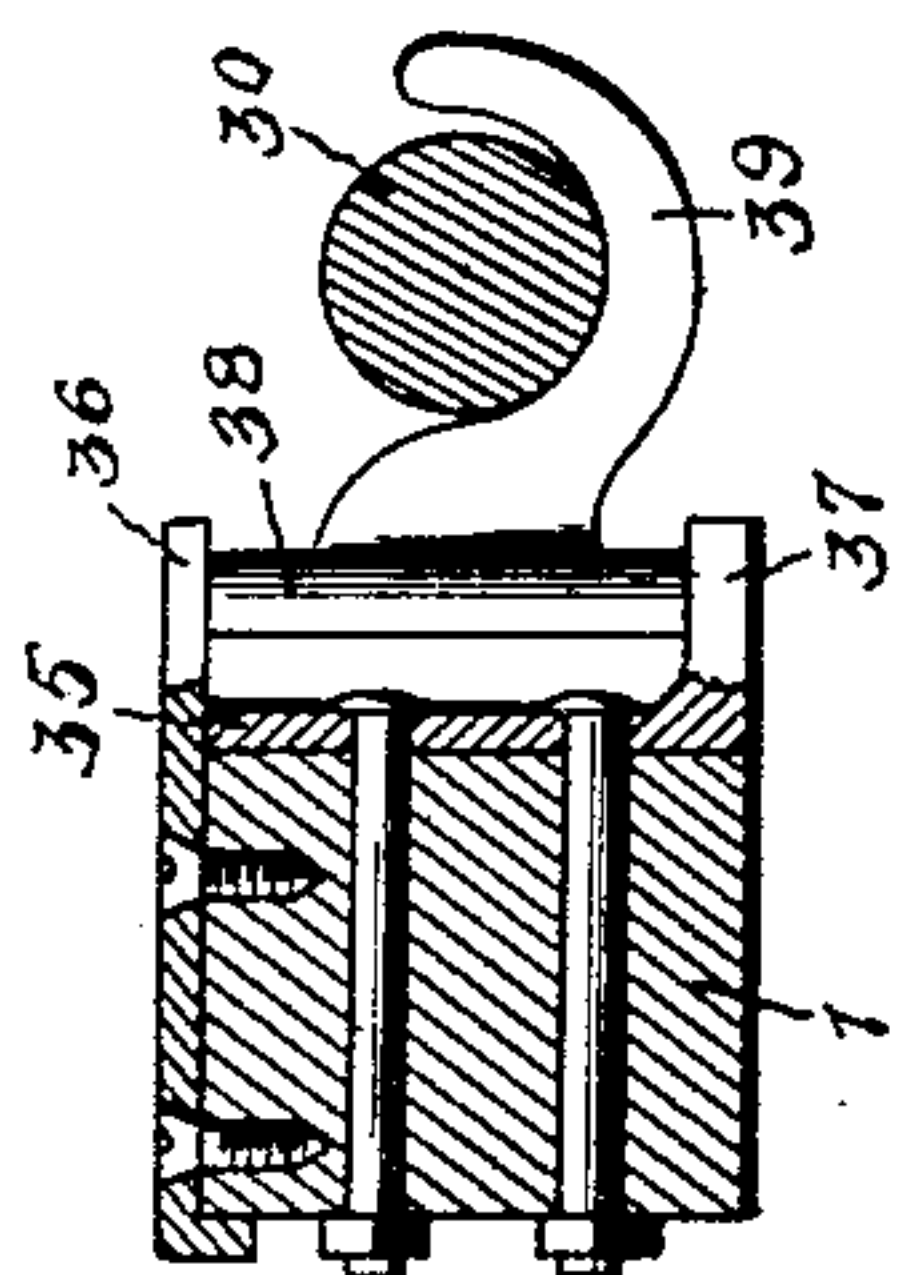


Fig. 7.

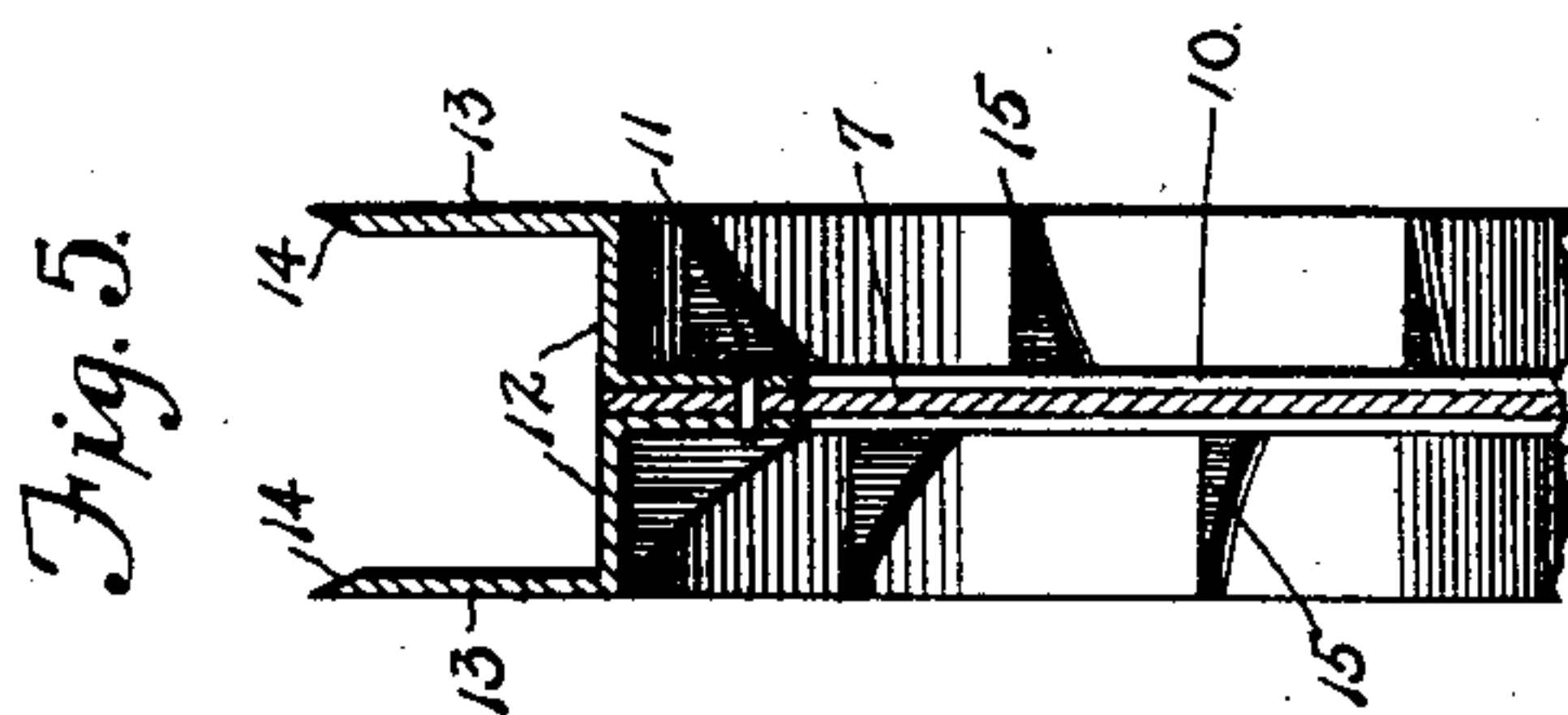


Fig. 5.

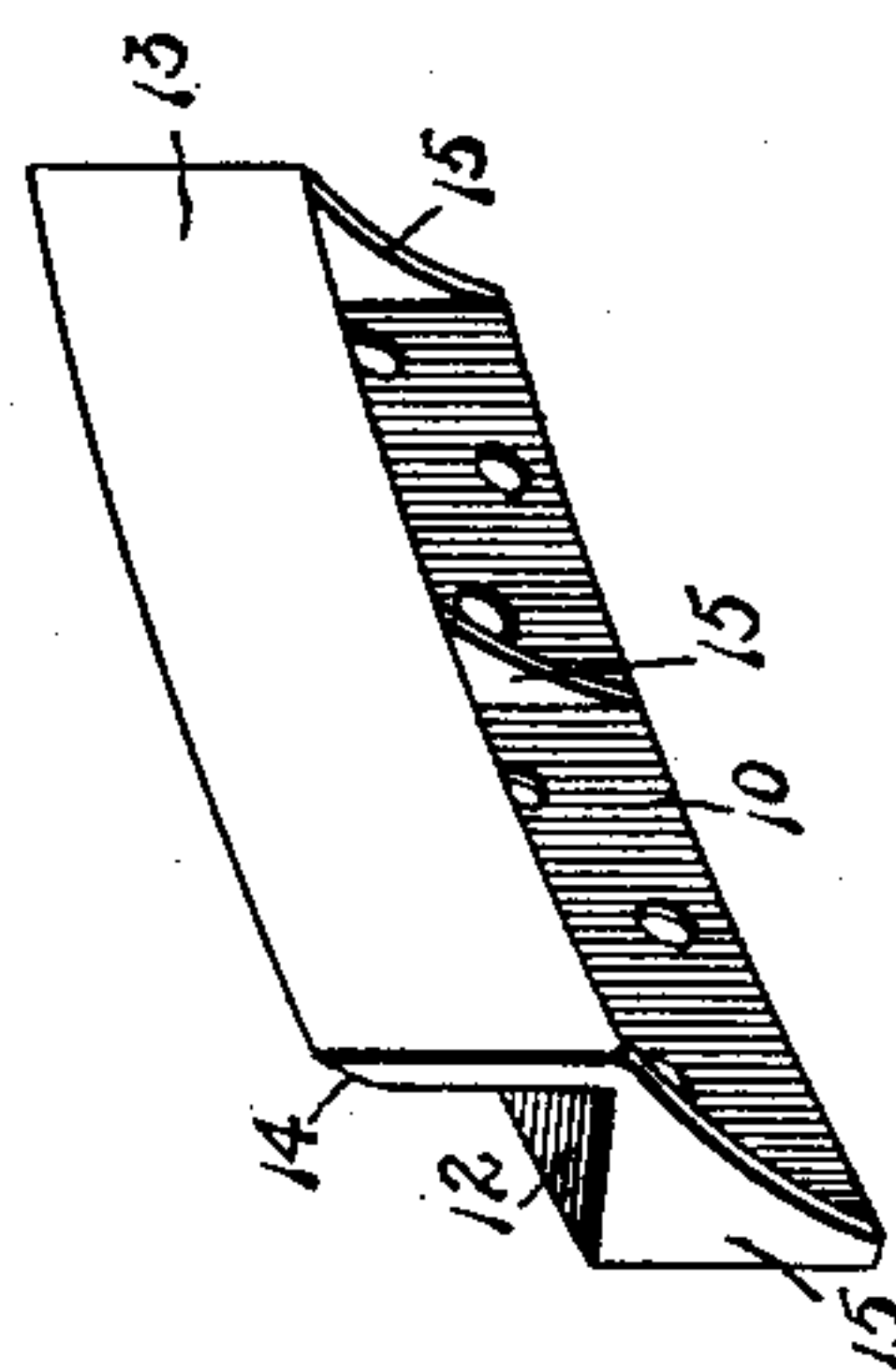


Fig. 6.

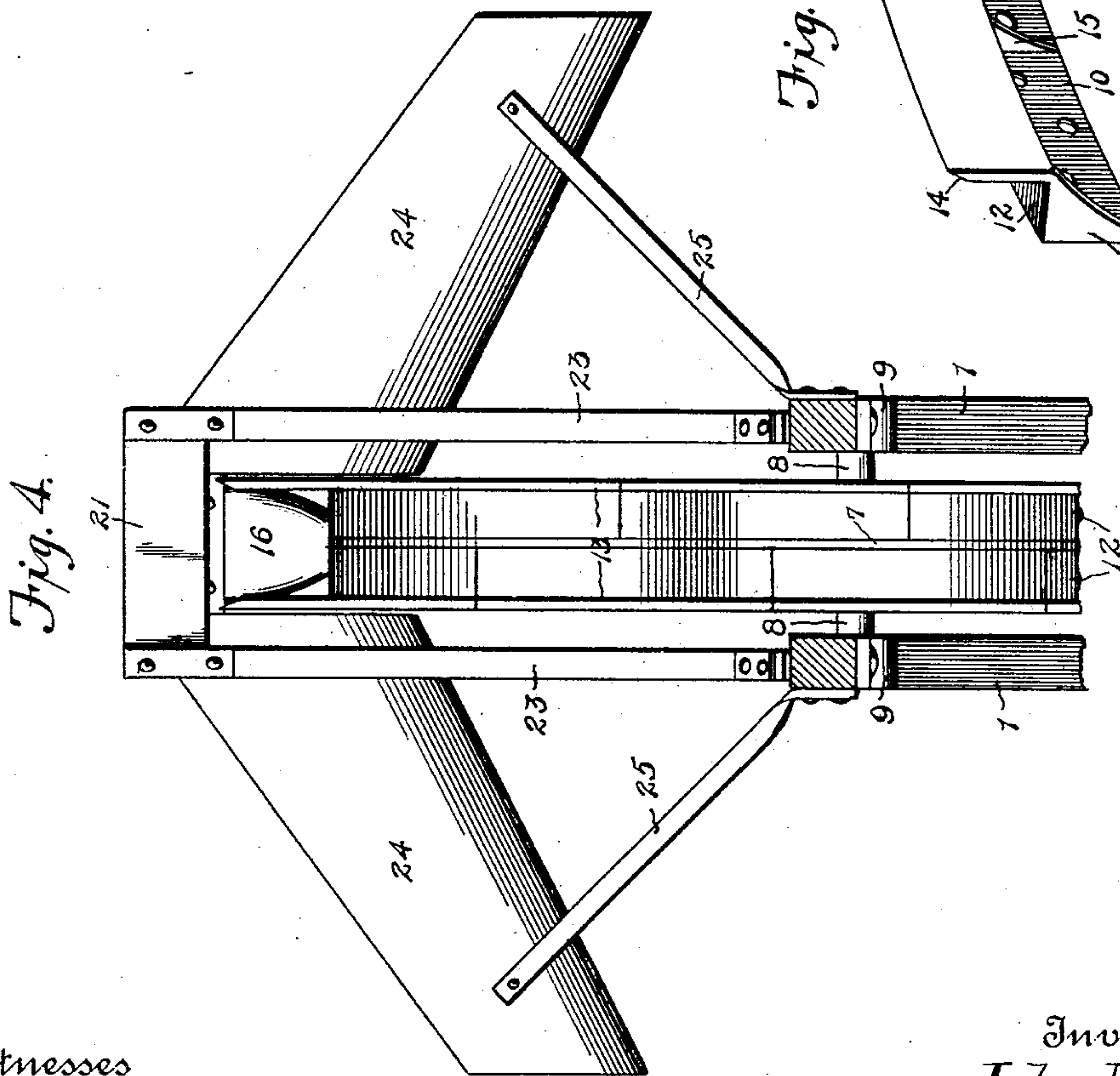


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN PAGE, OF LIMA, OHIO.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 750,686, dated January 26, 1904.

Application filed March 26, 1903. Serial No. 149,659. (No model.)

To all whom it may concern:

Be it known that I, JOHN PAGE, a citizen of the United States, residing at Lima, in the county of Allen and State of Ohio, have invented certain new and useful Improvements in Ditching-Machines, of which the following is a specification.

This invention relates to excavating-machines, and is particularly designed for digging ditches or trenches, and is adapted to be drawn along over the ground by one or more teams, so as to dig a continuous trench and by traveling back and forth to dig a ditch or trench of any desired width and depth.

It is, furthermore, designed to provide for conveniently throwing the machine into and out of operative condition, thereby to facilitate transportation over roads and such places where it is not desired to excavate, particularly to facilitate the turning of the machine at the end of a cut when it is desired to travel in the opposite direction and make a new cut.

Another object of the invention is to arrange for discharging the excavated earth from the machine to one or both sides thereof, and thereby prevent choking of the excavating-wheel, rendering the same continuously operative.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a side elevation of a ditching-machine embodying the features of the present invention and shown in condition for transportation. Fig. 2 is a similar view showing the machine in operative condition. Fig. 3 is a plan view thereof. Fig. 4 is a detail view showing the relation of the discharge spouts or chutes with relation to the excavating-wheel. Fig. 5 is a detail transverse sectional view of the excavating-wheel. Fig. 6 is a detail perspective view of one of

the rim-sections of the excavating-wheel, and Fig. 7 is an enlarged detail sectional view on the line 7 7 of Fig. 2.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

For convenience in transporting and manipulating the present machine there is provided a wheeled frame consisting of the main open rectangular frame 1, the front of which is supported upon a wheeled axle 2, the latter being provided with any ordinary tongue or pole 3, to which draft-animals are adapted to be connected for moving the machine. As best indicated in Figs. 1 and 2 of the drawings, it will be seen that this main frame is normally inclined downwardly and forwardly, and the rear end of the frame is supported in an elevated position by means of a yoke or arch 4, the upper transverse end portion of which passes across the top of the frame and is pivotally mounted in bearings or boxes 5, carried by the frame, the opposite ends of the arch being connected to a wheeled axle 6.

Located within the open frame is the excavating-wheel, which consists of a metallic disk 7, having a central axle 8, that is journaled at each end in a box or bearing 9 on the corresponding sides of the frame. The cutting-rim portion of the wheel is made up of rim-sections 10, one of which has been shown in detail in Fig. 6 of the drawings. These rim-sections are abutted and arranged to break joints upon opposite sides of the wheel, with what might be termed the "shank" portions embracing the wheel, as best indicated in Fig. 5 of the drawings, and bolted or riveted thereto, as at 11. At the outer edge of the shank portion of each rim-section there is an outwardly-directed flange 12, and at the outer edge of the flange 12 there is a cutting rim member 13, substantially parallel with the shank portion and having its outer edge beveled upon the inner side thereof, as at 14, to produce a cutting edge. Suitable webs 15 are formed in the angle between the shank and flange portions 10 and 12, so as to brace and strengthen each rim-section. It will here be noted that the intermediate or flange portions 12 of the rim-sections at opposite sides of the wheel are

arranged flush with the outer peripheral edge of the disk or body of the wheel 7.

From the foregoing description of the construction of the wheel it will be understood
5 that when the machine is drawn along with the cutting edges of the wheel in contact with the ground the weight of the wheel will force the rim portions 13 into the ground, as indicated in Fig. 2, whereby that portion of the
10 soil between the rim portions 13 will be wedged therebetween under the action of the beveled edges 14 and will be carried upwardly with the wheel, thereby leaving a trench or ditch in rear of the wheel equal in depth to
15 the width of the rim portions 13 and in width equal to the space between said rim portions. By running the machine back and forth in the same path the depth of the ditch or trench may be increased, and by running the machine
20 back and forth first on one side and then on the other of each cut the width of the trench may be increased.

For clearing the collected earth from between the cutting rim portions of the wheel
25 there is provided a scraper 16, somewhat in the shape of a shovel-plow, located between the rim portions and at or near the top of the wheel. This scraper is provided with an upstanding or outwardly-directed shank portion
30 17, which is bolted or riveted to a cross-bar 18, extending across and clear of the rim of the wheel, each end of the bar being embraced between and fastened to front and rear standards 19 and 20, rising from the adjacent side
35 bar or sill of the main frame. In rear of the scraper is a cross bar or plate 21, extending across the peripheral edge of the wheel and supported upon front and rear braces or brackets 22 and 23, rising from the adjacent
40 standard 20. It will here be understood that as the machine moves forwardly and the wheel rotates in the direction of the arrows the soil will be elevated by the rear portion of the wheel and eventually come in contact with
45 the scraper 16, from which it will be deflected laterally in opposite directions across the cutting edges of the wheel, whereby the latter will be scraped or cleaned in order that the front thereof may be in condition to make a
50 new cut when it reaches the ground. It is designed to carry the discharged soil clear of the wheel, and to accomplish this result there has been provided duplicate discharge spouts or chutes 24 at opposite sides of the wheel. The
55 inner end of each chute or spout is supported in the seat or hanger afforded by the adjacent brace or bracket 22 and is bolted or riveted thereto, as shown in the drawings. Each chute is inclined downwardly and outwardly
60 and is supported in a bracket 25, preferably consisting of a bar bent intermediately to form a seat for the reception of the spout, with its opposite end portions extended downwardly and secured to the adjacent side bar of the main frame. By this arrangement the

soil deflected by the scraper 16 is directed into the spouts or chutes 24 and is carried by the latter and discharged to the ground at opposite sides of the wheel. Should it be desired to discharge the soil at one side only of the
70 wheel, the scraper 16 could be bent or shaped so as to deflect the soil in one direction only, and it will be understood that my invention contemplates such an arrangement in addition to that shown in the drawings. In addition
75 to connecting and bracing the rear ends of the seats or brackets 22 the cross-bar 21 prevents the soil loosened by the scraper from being crowded over the back of the wheel and aids in directing such loosened soil to the
80 spouts or chutes 24.

When it is desired to have the cutting-wheel inactive—as, for instance, during transportation—it is intended that the wheel be
85 elevated out of contact with the ground, and it is for this reason that the rear end of the main frame is swung from or pivoted to the arched support 4 in order that the rear end of the frame may be elevated, as in Fig. 1, and depressed, as in Fig. 2. To hold the cutting-
90 wheel in an elevated position, it is designed to lock the main frame and the arched support 4 against relative pivotal movements, and this is accomplished by means of a pair of rods 26—one at each side of the frame and detachably
95 connected at opposite ends with the rear axle and the main frame. Preferably each rod is provided at opposite ends with integral hooks 27 for engagement with eyes or keepers 28 and 29 upon the main frame and the rear axle,
100 respectively. When the locking-rods are in position, they cooperate with the main frame and the arch 4 to form triangles, and thereby lock the arch and the frame against pivotal movements. By removing the locking-rods
105 26 the weight of the excavating-wheel is sufficient to force the main frame downwardly upon its rear pivotal support, and thereby force the rear axle rearwardly, as indicated in Fig. 2, whereby the excavating-wheel may be brought
110 into engagement with the ground. It will thus be seen that the arch 4 balances and keeps the excavating-wheel upright and steady when it is in operation; otherwise the excavating-wheel would topple over to one side or the
115 other while in operation.

For convenience in raising the excavating-wheel from its operative position to its inoperative position there has been provided an elevating device embodying substantially parallel arms or standards 30, lying at opposite
120 sides of the main frame and connected at their rear ends by cross-bar 31. In practice it is preferred to have the standards 30 and cross-bar 31 formed from a single bar, which is
125 given a substantially U shape, as clearly shown in Fig. 3 of the drawings. The cross-bar 31 extends across the top of the frame and in rear of the excavating-wheel and is pivotally mounted in suitable bearing-boxes 32
130

upon the opposite side members of the frame, whereby the arms or standards 30 are adapted to swing vertically at opposite sides of the wheel. A suitable clawed foot 33 is pivoted to the forward free end of each arm 30 and is adapted to engage the ground when the yoke-shaped elevating device is dropped to the position indicated by dotted lines in Fig. 2, whereby as the machine moves forwardly the rear end of the main frame will be elevated to the position shown in Fig. 1 upon the arms or standards 30, acting in the capacity of a propping-lever. When the rear end of the frame has been elevated to its limit by reason of the arch 4 striking the stop projections afforded by the opposite ends of the cross-bar 34, carried by the under side of the main frame, the rods 26 are engaged with the eyes 28 and 29 and the main frame thereby rigidly locked to hold the excavating-wheel in an elevated inoperative position. When not in use, each member of the elevating device is supported in the full-line position shown in Figs. 1 and 2 by the means best illustrated in Fig. 7 of the drawings. This means consists of a bracket 35, bolted or otherwise secured to the adjacent side bar of the main frame and provided with upper and lower outwardly-projected bearing-ears 36 and 37, in which are pivotally mounted the opposite ends of an upright rotatable stem 38, provided with an intermediate substantially horizontal hook 39, which is adapted to form a seat for the adjacent arm 30 to hold the same in an elevated position.

From the foregoing description it is apparent that the machine of the present invention is an exceedingly simple and efficient excavator, as it is made up of few parts and requires but very little attention during the operation thereof and that only to remove and replace the locking-rods 26 and drop and elevate the arms 30 for throwing the excavating-wheel into and out of operation.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In an excavator, the combination with front and rear wheeled axles, of a frame connected to one of the axles, a support rising from the other axle and pivoted to the frame to permit raising and lowering of one end of the latter, excavating means carried by the frame, and means to lock the frame and the support against relative movement when the frame is in its elevated position to maintain the excavating means out of engagement with the ground.

2. In an excavator, the combination with front and rear wheeled axles, of a frame having one end supported upon one of the axles, an arched support rising from the other axle and pivotally connected to the adjacent end of the frame, whereby the latter may be raised and lowered, excavating means carried by the

frame, and means to connect the arched support and the frame against relative movement when the frame is in its elevated position.

3. In an excavator, the combination with front and rear wheeled axles, of a frame supported at one end upon one of the axles, a support rising from the other axle and pivotally connected to the adjacent end of the frame, excavating means carried by the frame, corresponding keepers upon the axle having the support rising therefrom and the frame, and rods having hooked terminals for engagement with the keepers to lock the support and the frame against relative movement.

4. In an excavator, the combination with an open substantially rectangular frame, of a wheeled axle supporting the front of the frame, a rear wheeled axle, supporting-arms rising from the rear axle and pivotally connected to the rear end of the frame to support it in an elevated position, an excavating-wheel mounted within the frame, corresponding keepers upon opposite sides of the frame and the rear axle, and opposite rods having terminal hooks for detachable engagement with the corresponding keepers to lock the frame and the supporting-arms against relative movements in the elevated position of the frame.

5. In an excavator, the combination with a wheeled frame, of a support rising from one of the axles and pivotally connected to the frame, excavating means carried by the frame, and means carried by the frame for engagement with the ground to elevate said frame upon its pivotal support by a forward movement of the machine.

6. In an excavator, the combination with a vertical adjustable wheeled frame, of excavating means carried by the frame, and means carried by the frame for engagement with the ground to elevate the frame by forward movement of the machine.

7. An excavating-machine, having means for engagement with the ground to automatically elevate the excavating means out of engagement with the ground by a forward movement of the machine.

8. An excavating-machine, having a pivotal arm which is mounted to have its free end dropped into engagement with the ground and form a propping-lever to elevate the excavating means when the machine is moved forward.

9. In an excavator, the combination with a vertically-adjustable wheeled frame, of excavating means carried thereby, and a pair of arms pivoted at their rear ends to opposite sides of the frame with their forward free ends arranged to be dropped into engagement with the ground and form elevating-levers to elevate the frame when the machine is moved forwardly.

10. In an excavator, the combination with a vertically-adjustable wheeled frame, of excavating means carried thereby, of a yoke-shaped elevating device straddling the frame

with its cross-bar portion pivoted thereto and the free ends of its side arms normally held in an elevated position and capable of being dropped into engagement with the ground and form levers for elevating the frame when the machine is moved forwardly.

11. In an excavator, the combination with a vertically-adjustable wheeled frame, of an excavating-wheel carried thereby, of a yoke-shaped elevating device straddling the excavating-wheel with its cross-bar portion in rear of the wheel and journaled upon the frame, the forward free ends of the opposite side arms of the device being normally elevated and capable of being dropped into engagement with the ground to form elevating-levers for raising the frame when the machine is moved forwardly.

12. In an excavator, the combination with a vertically-adjustable wheeled frame, of excavating means carried thereby, an elevating-arm having its rear end pivoted to the frame and its front free end capable of being dropped into engagement with the ground and form a lever for elevating the frame when the machine is moved forwardly, and means for normally supporting the arm in an elevated position, embodying a hook-shaped seat hinged to the frame for adjustment out of the path of the arm when raising and lowering the same.

13. In an excavator, the combination with front and rear wheeled axles of a frame having its front ends supported upon the front axle, opposite supporting members rising from the rear axle and pivoted to the frame, excavating means carried by the frame, and an elevating device having its rear end pivoted to the frame with its forward free end normally elevated and capable of being dropped into engagement with the ground and automatically swing the rear end of the frame upwardly upon its pivotal support when the machine is moved forwardly.

14. In an excavator, the combination with front and rear wheeled axles, of a frame having its front end supported upon the front axle, opposite supporting members rising from the rear axle and pivoted to the rear end of the frame, opposite rods having detachable connections with the frame and the rear axle to lock the frame and the supports against relative movements, excavating means carried by the frame, elevating-arms having their rear ends pivotally connected to opposite sides of the frame and their front ends capable of being dropped into engagement with the ground, and means for supporting the free ends of the arms in elevated positions.

15. An excavating-wheel, comprising a wheeled body, and sectional rim members embracing and secured to the outer edge portion of the body, each member being provided at its outer edge with an outwardly-directed flange, and also provided at the outer edge of

the flange with a rim portion set at substantially right angles thereto and beveled to form an outer cutting edge.

16. An excavating-wheel, comprising a wheel-body and rim-sections embracing the outer edge portion of the body and disposed to break joints, each section being angular in cross-section and provided with an outer peripheral cutting-flange.

17. An excavating-wheel, comprising a wheel-body and rim-sections embracing the outer edge portion of the body and disposed to break joints, each section being angular in cross-section and provided with an outer peripheral cutting-flange, and brace-webs between the members of each rim-section.

18. An excavating-wheel, comprising a wheel-body and rim-sections embracing the outer edge portion of the body and disposed to break joints, each section being angular in cross-section and provided with an outer peripheral cutting-flange, and brace-webs disposed in the angle between the members of each rim-section.

19. In an excavating-machine, the combination with a frame, of an excavating-wheel carried thereby, a bracket carried by the frame, a wheel-scraper carried by the bracket, a second bracket, and a chute carried between and by the two brackets for the purpose set forth.

20. In an excavating-machine, the combination with a frame, of an excavating-wheel carried thereby, a bracket carried by the frame, a wheel-scraper carried by the bracket, a second bracket in rear of the first-mentioned bracket, a plate carried by the second bracket and disposed across the periphery of the wheel, and a chute carried between and by the two brackets with its inner end disposed to receive the soil discharged from the wheel by the scraper.

21. In an excavating-machine, the combination with a frame, of an excavating-wheel mounted thereon and provided with opposite peripheral cutting-flanges, front and rear brackets rising from the frame at opposite sides of the wheel, bars disposed across the periphery of the wheel and carried by the respective pairs of front and rear brackets, a scraper carried by the front cross-bar and projected rearwardly therefrom between the flanges of the wheel, seats carried by and extending between the front and rear brackets at each side of the wheel, and discharge-chutes supported in the seats with their upper ends disposed to receive the soil discharged from the wheel by the scraper.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN PAGE

Witnesses:

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