

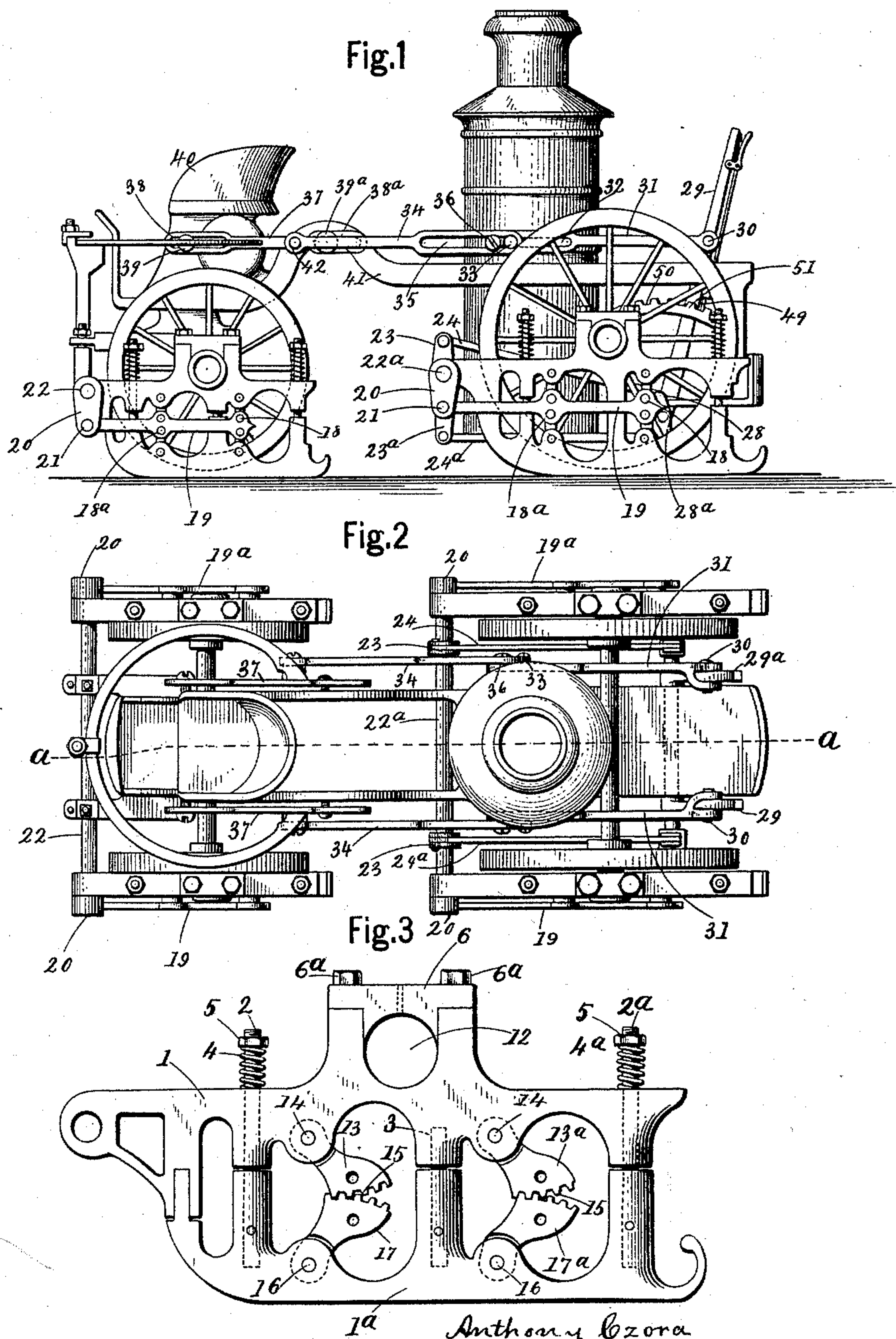
(No Model.)

2 Sheets—Sheet 1.

A. CZORA, C. K. ERNST, Jr. & C. J. DERNBRAK.
COMBINED SLEIGH AND WAGON.

No. 522,973.

Patented July 17, 1894.



Witnesses:

H. C. Ernst
Harriet Johnson

Anthony Czora
Charles K. Ernst, Jr. Inventors.
Charles J. Dernbrack.
By James Sangster.

Attorney.

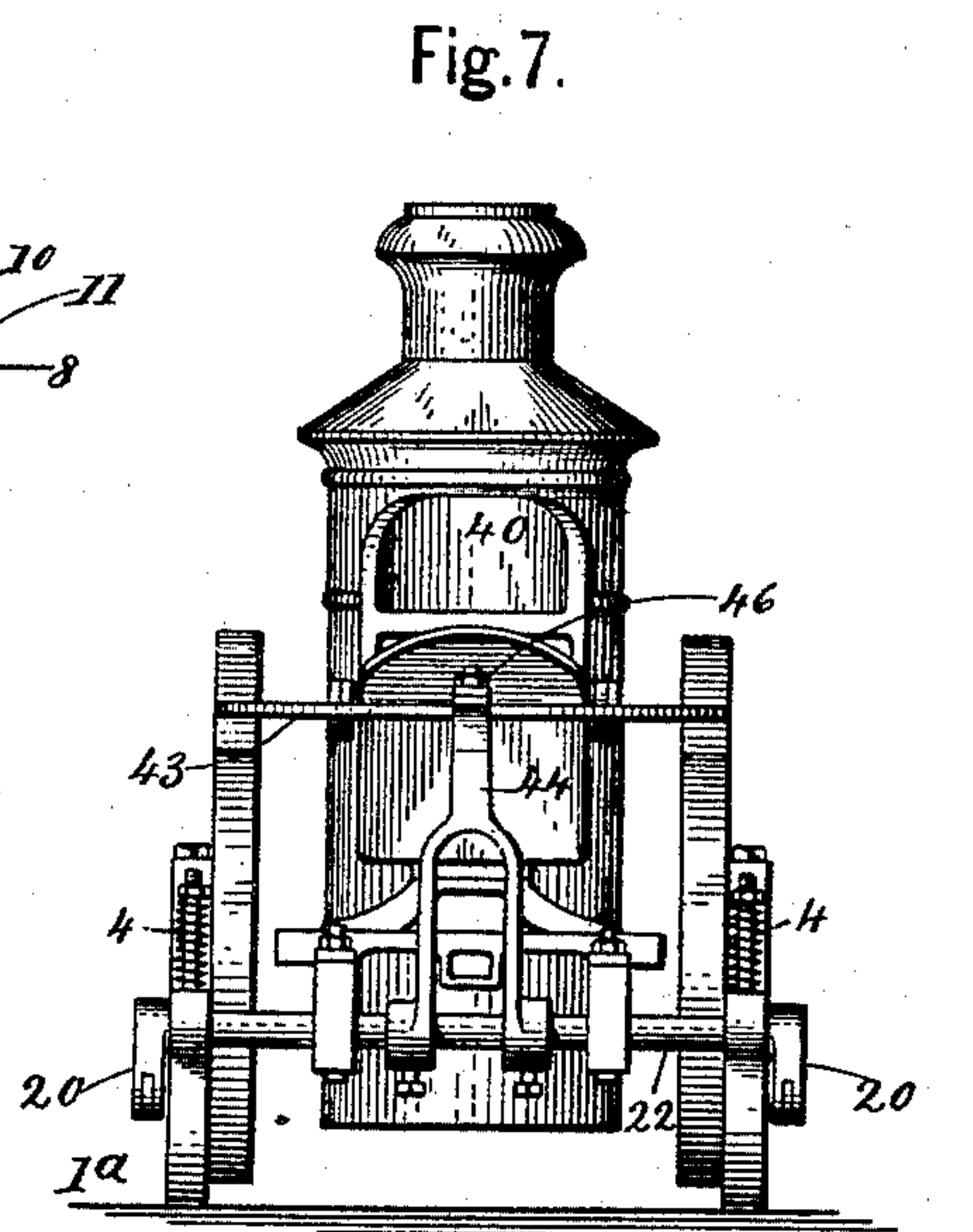
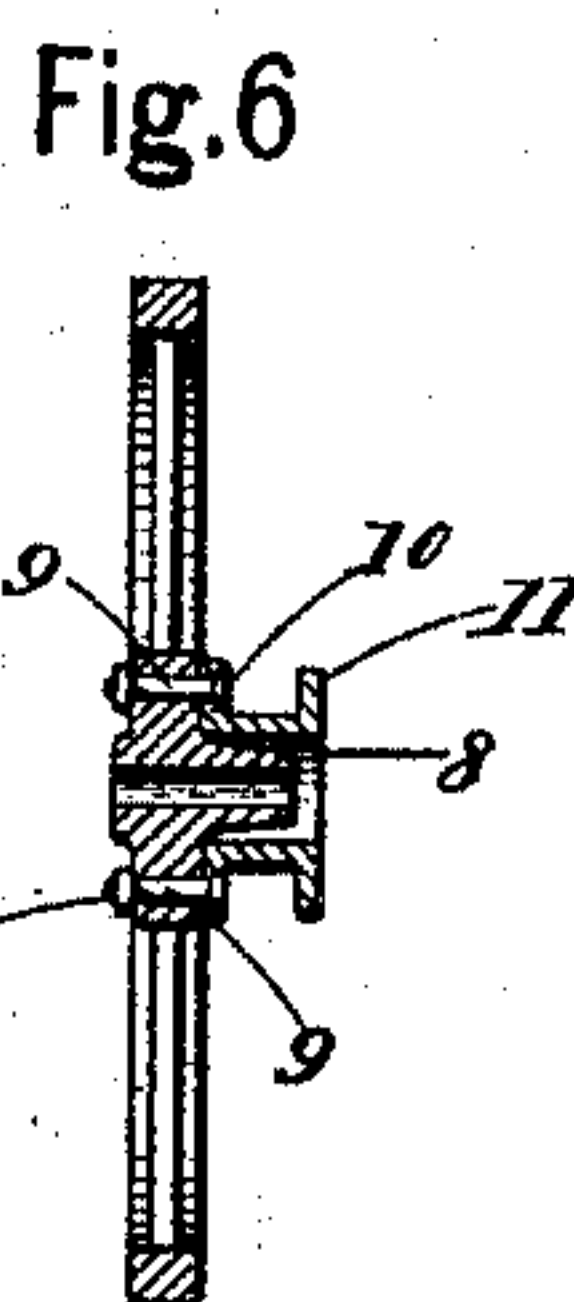
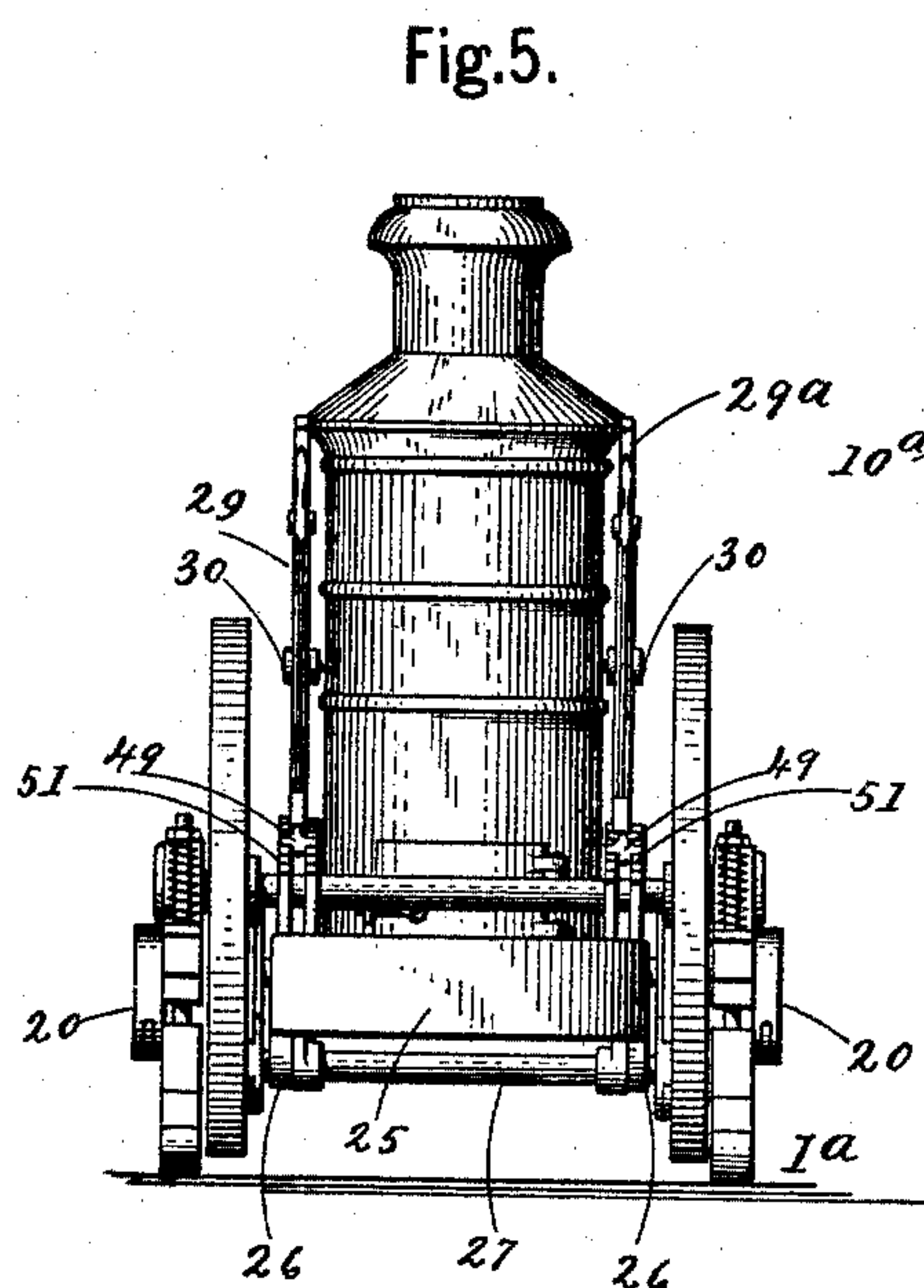
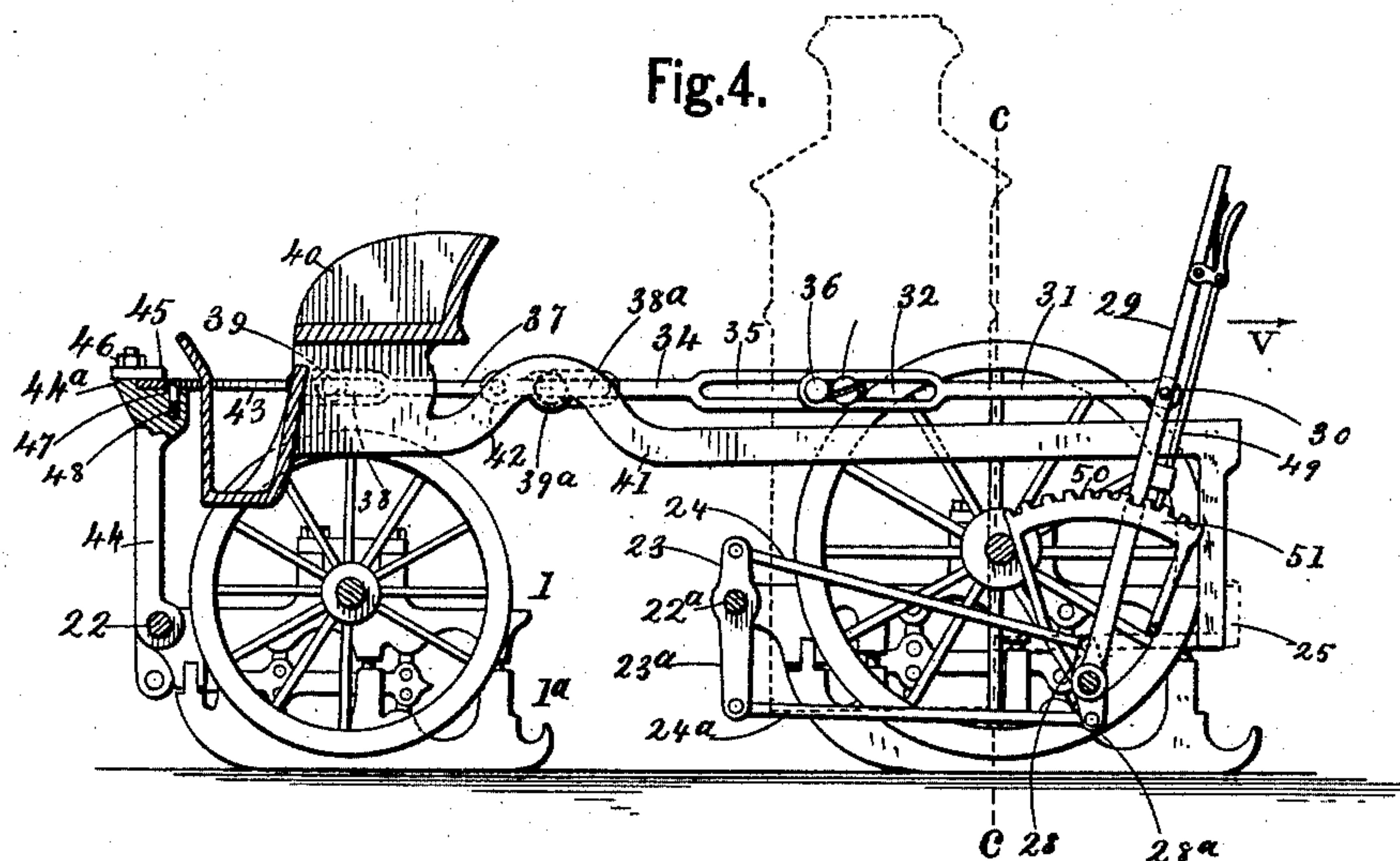
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Attorney.

UNITED STATES PATENT OFFICE.

ANTHONY CZORA, CHARLES K. ERNST, JR., AND CHARLES J. DERNBRACK, OF
BUFFALO, NEW YORK.

COMBINED SLEIGH AND WAGON.

SPECIFICATION forming part of Letters Patent No. 522,973, dated July 17, 1894.

Application filed April 10, 1894. Serial No. 507,028. (No model.)

To all whom it may concern:

Be it known that we, ANTHONY CZORA, CHARLES K. ERNST, Jr., and CHARLES J. DERNBRACK, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in a Combined Sleigh and Wagon, of which the following is a specification.

The object of our invention is to provide the means whereby a vehicle can be instantly changed from a wagon to a sleigh and as quickly from a sleigh to a wagon, even when the wagon is running on the road, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a fire engine upon which we have shown the device for the purpose of illustrating our invention. Fig. 2 is a plan or top view of the engine and our apparatus connected therewith. Fig. 3 is an enlarged detached side elevation of a sleigh runner in which a portion of our invention is shown. Fig. 4 is a vertical longitudinal section in or about line *a a*, Fig. 2. Fig. 5 is a rear elevation of the invention, showing a similar view of the runners and parts of the operating mechanism. Fig. 6 is a detached cross section through one of the wheels in or about line *c c*, Fig. 4. Fig. 7 is a front elevation of the machine, showing the mechanism at that end of the machine for operating the same.

The sleigh runner is made in two parts 1 and 1^a. In the lower portion of the runner are rigidly secured three pins or bars 2—2^a, and 3. The upper portion of the runner is provided with vertical perforations corresponding in size and position with the bars 2—2^a and 3, so it can be slipped down over them, see Fig. 3.

To keep the two parts of the runner together we employ spiral springs, 4 and 4^a, the force of these springs is regulated by the screw nuts 5.

The runners are secured to a vehicle by means of the cap 6, and nuts 6^a, and a holding portion shown in Fig. 6, this holding portion is provided with a central opening 8, and is rigidly secured to the wheel by a series of countersunk-head bolts 9, which pass through

the flange 10, and are secured by nuts 10^a, on the inner side of the wheel, substantially as shown in said Fig. 6. The holding portion is also provided with an outer flange 11.

The box being removed the runner is lifted up so that the opening 12, see Fig. 3, as the runner is passed up between the flanges 10, and 11, embraces the holding portion, the cap 6, is then put on and rigidly secured by the nuts 6^a, thereby holding all the parts and the runner securely in place. The runners need not be removed from the vehicle in the winter because the device can be instantly changed from a wheeled vehicle to a sleigh, and vice-versa, at any time, as will appear farther on.

Referring to Fig. 3, the upper portions 1, of both runners are (the front and rear) each provided with the upper parts 13 and 13^a, of a toggle joint, both of which are pivoted by pins 14, and each is provided at its bottom end with a series of gear teeth 15.

To the lower portions are pivoted by pins 16, the under parts 17 and 17^a, of the toggle joint, each of which is provided with gear teeth that gear in with the gear teeth 15, substantially as shown in said Fig. 3. These toggle joints are connected by pins 18—18^a, to arms 19 and 19^a (one on each side of the vehicle).

The front ends of the arms 19 and 19^a, are each provided with a pivotal connection to a crank or arm 20, (the pins 21.) Both of these crank arms are rigidly connected to a transverse shaft 22, at the front and two similar arms 19 and 19^a, are secured to the shaft 22^a, near the rear of the vehicle, being secured in suitable bearings at the front upper portion of each pair of runners. Both front and rear pairs of runners are substantially alike, consequently similar parts in each, as far as described, are designated by similar numbers.

On the shaft 22^a, at each side of the vehicle, is rigidly secured in any well known way, a double arm, the upper portions or arms being designated by 23, and the lower portions of the arms by 23^a.

To the upper end of the arm 23, is pivoted a connecting-rod 24, (one at each side of the vehicle,) and to the lower end of the lower arms is pivoted a connecting-rod 24^a.

To the fuel box 25, see Fig. 5 on the under

side are secured two journal boxes 26, and in these boxes is mounted a transverse shaft 27, on which is rigidly secured in the well known way, a pair of double arms one near each end of the shaft 27, the upper ends of these arms being designated by 28, and the lower ends by 28^a. To the upper ends 28, are pivoted the opposite ends of the connecting-rods 24, and the opposite ends of the connecting-rods 24^a, are pivoted to the lower arms 28^a, see Fig. 4.

Rigidly secured to the shaft 27, (see Fig. 5,) are two operating arms 29 and 29^a. These operating arms are used when it is desired to change the device from a wagon to a sleigh.

To the operating arms, on each side of the vehicle, at or about the point 30, are pivoted the connecting rods 31, these connecting-rods 31, are each provided with a slot 32, at their forward ends and are each connected by a pin 33, rigidly secured to each arm 34, which are each also provided with a slot 35.

To the end of each arm 31, is rigidly secured a pin 36. These pins 36, are connected in the slots so they cannot be withdrawn therefrom but are free to slide back and forth in said slots. This construction allows the slotted bars to slide back and forth by each other. To the forward part, (at each side of the vehicle) is a bar or connecting-rod, 37, both arms having at each end a slotted portion 38 and 38^a, through the slots 38 and 38^a, (each of them) is a pin 39, and 39^a, having a flat head, these pins pass through the slots 38 and 38^a. The pins 39, are rigidly attached to the sides of the seat 40, and the pins 39^a, are firmly secured to the supporting frame 41. By this construction it will be seen that the connecting-rods, or slotted bars, 37, can be reciprocated back and forth on the pins 39 and 39^a, which keeps them in line. To this bar 37, the forward end of the bar 34, is connected by a pin 42.

A curved bar 43, forming the greater portion of a circle is connected at its ends rigidly to the two bars 37, so that as the bars 37, are moved back and forth, this curved bar is moved.

On the shaft 22, is rigidly secured an arm 44, which projects upward to the curved bar 43, the portion 44^a, projecting up to the top of the front edge of the curved bar and is provided with a plate 45, that projects over the top of the curved bar 43, and is held in place by a nut 46. Inside of the curved bar is a small bolt 47, fitted in the top of the arm 44, and kept up by a spring 48. The top of the bolt 47, inclines backward and downward.

The operation of this device is as follows:—
When it is desired to throw the sleigh runners into position for use all that is required

is to pull the operating levers or arms 29 and 29^a, backward in the direction of the arrow V, in Figs. 1 and 4, and then secure them in that position by allowing the bolts 49, to move into one of the notches 50, in the curved bars 51. This operation, by means of the connecting mechanism hereinbefore described, causes the toggle joints to be moved so that their centers are in or substantially in a vertical line with each other, substantially as shown in Figs. 1 and 4, thereby lifting the vehicle upward by the forcing of the lower portions of the runners downward.

When it is desired to throw the wheels into action, the operating arms are moved in an opposite direction, thereby dropping the vehicle and lifting the lower portions of the runners upward. This operation brings the toggle joints substantially in the position shown in Fig. 3.

We claim as our invention—

1. A sleigh runner consisting of an upper and lower part, slideway bars for keeping the two parts of the runner in line, springs on said bars for holding the two parts of the runner together with a yielding force, toggle joints pivoted to the upper and lower parts of the runner and means for moving one portion of the runner up from the other, substantially as described.

2. A sleigh runner consisting of an upper and lower part, the upper part being adapted to slide on slideways on the lower part and means substantially as above described for moving the two parts toward or from each other, substantially as described.

3. In a combined sleigh and wagon, the combination with the lower portions of the runners each provided with vertical bars 2 and 2^a, of upper portions 1, each having vertical openings that pass over said bars so that the two parts of the runners may be moved toward or from each other, springs for holding the two parts together with a yielding force, toggle joints for moving the two parts away from each other so as to lift the wagon from the ground and support it upon the runners, and means substantially as described for operating the toggle joints to either lift the wheeled vehicle and support it on the runners or lower the wheeled vehicle and lift the runners up from the ground, for the purposes described.

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