

C. L. GARFIELD.
Railroad Snow-Plow.

No. 94,102.

Patented Aug. 24, 1869.

Fig. 4.

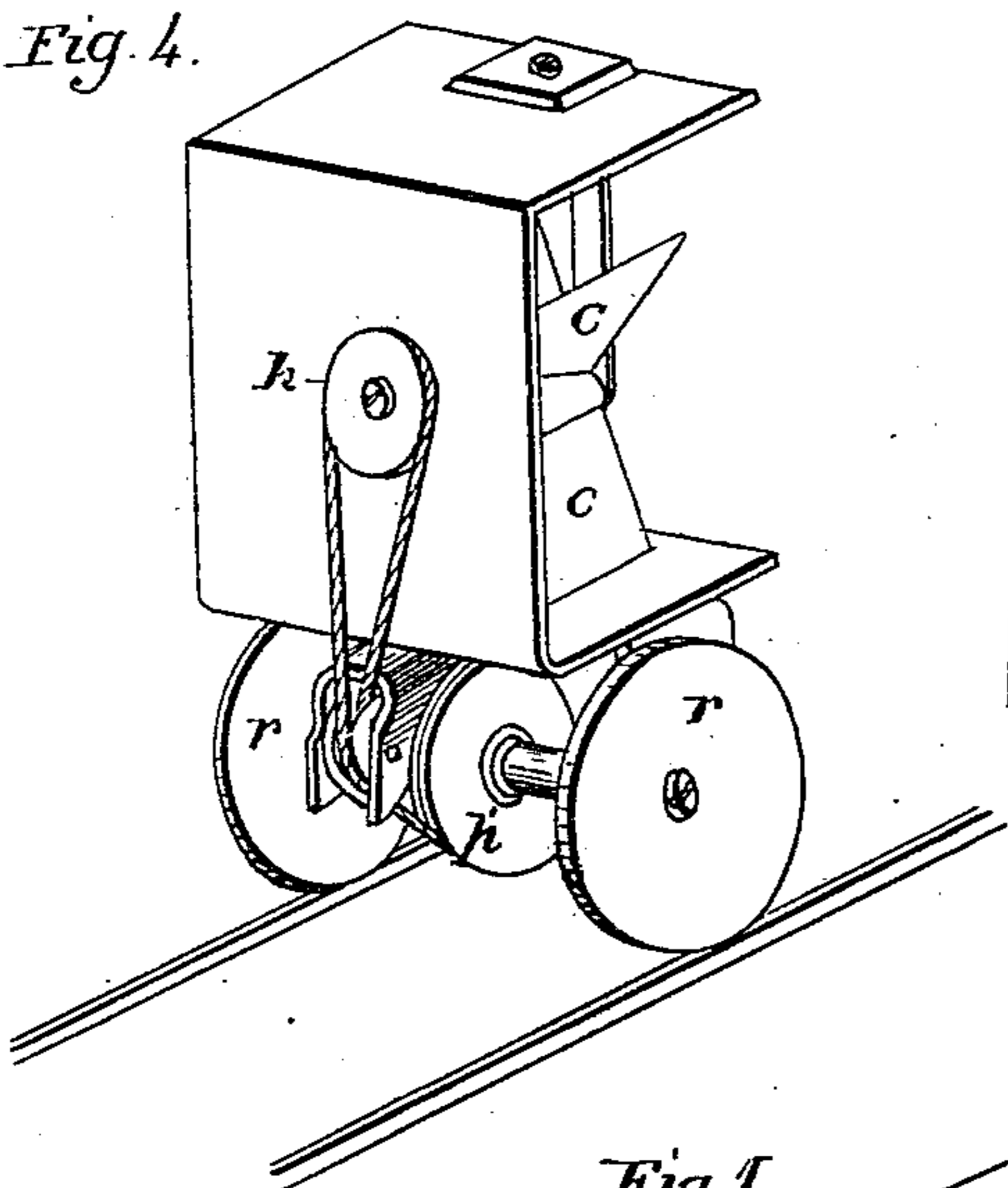


Fig. 2.

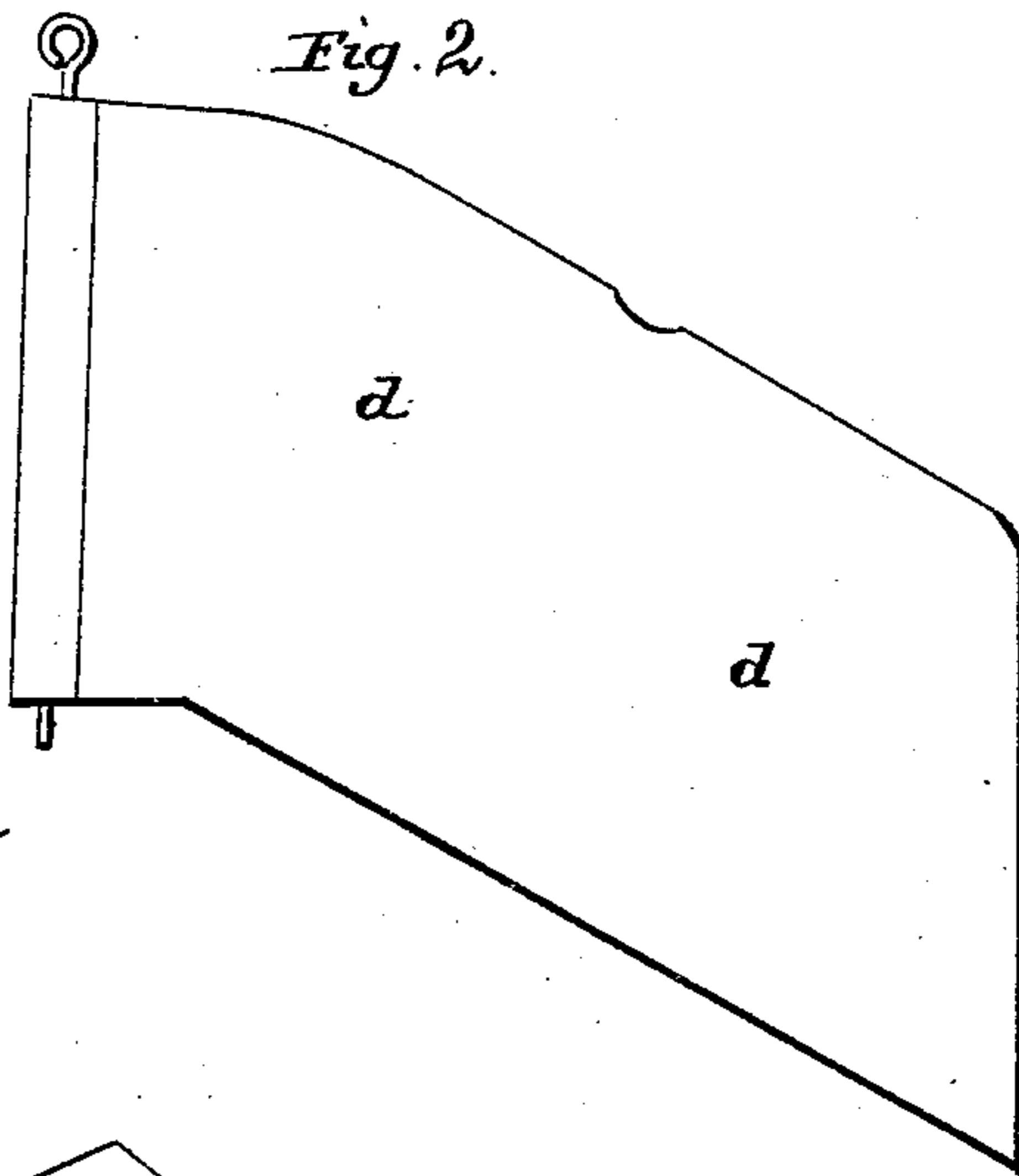


Fig. 1.

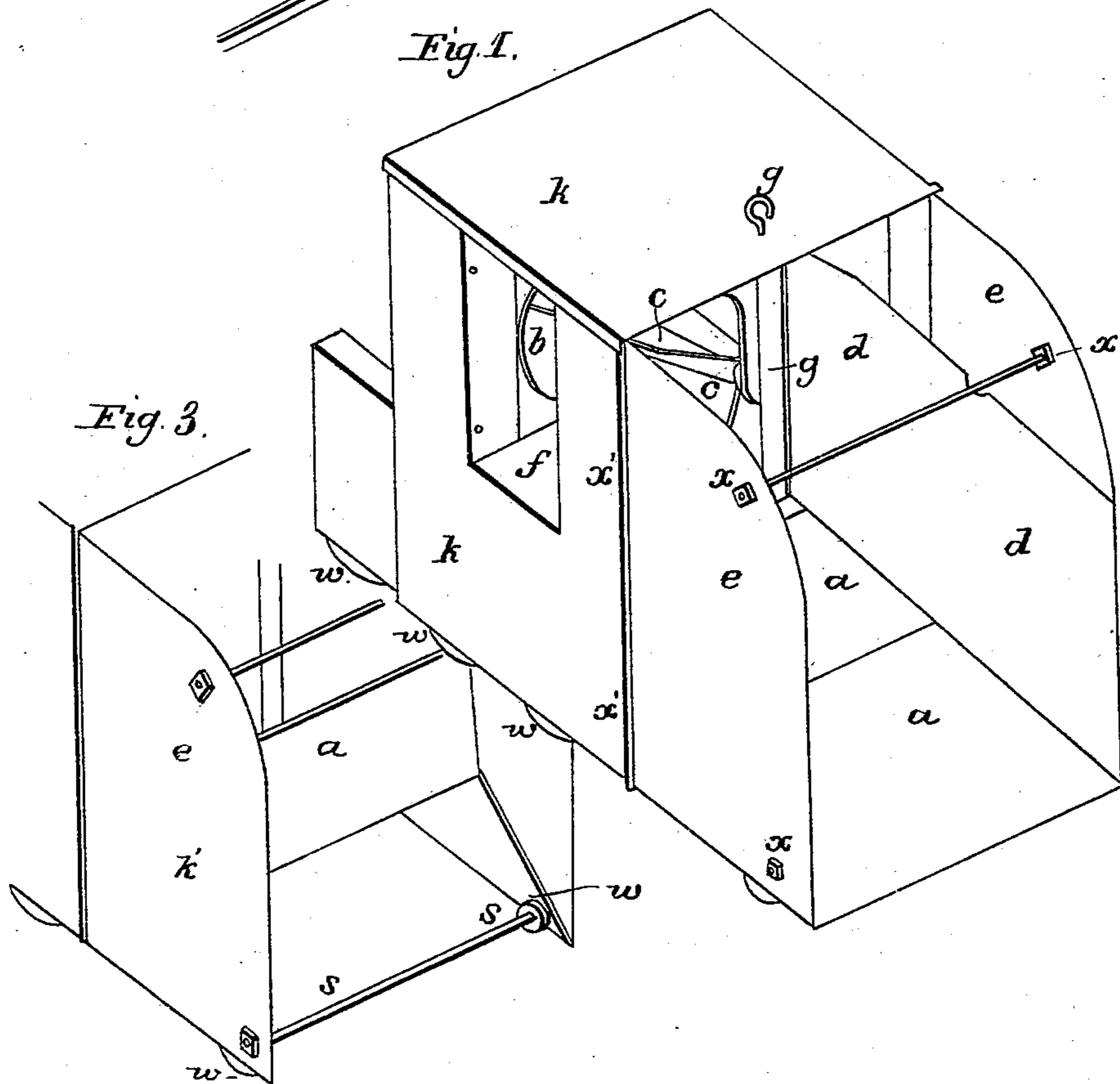


Fig. 3.

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Fig. 8.

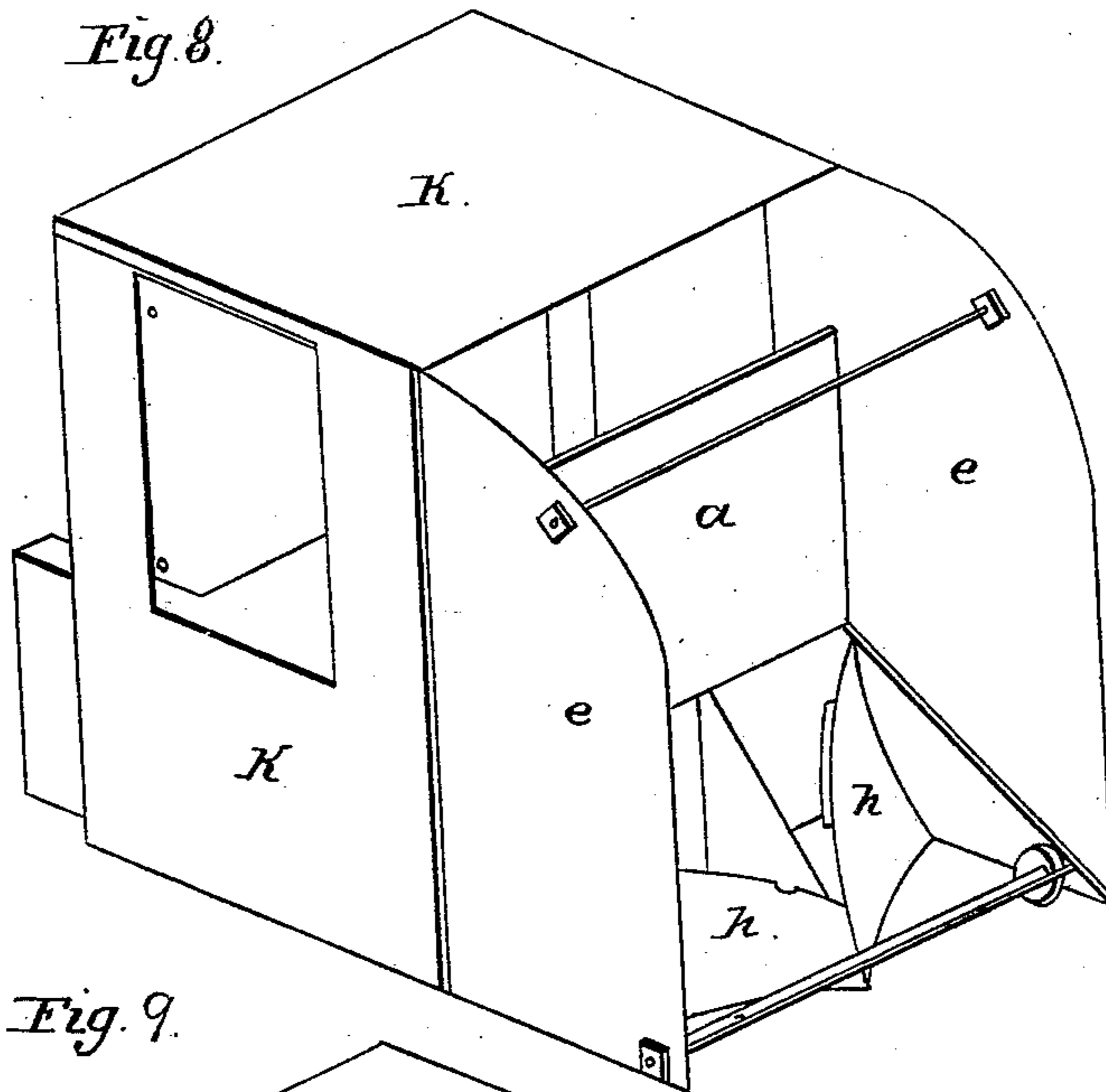
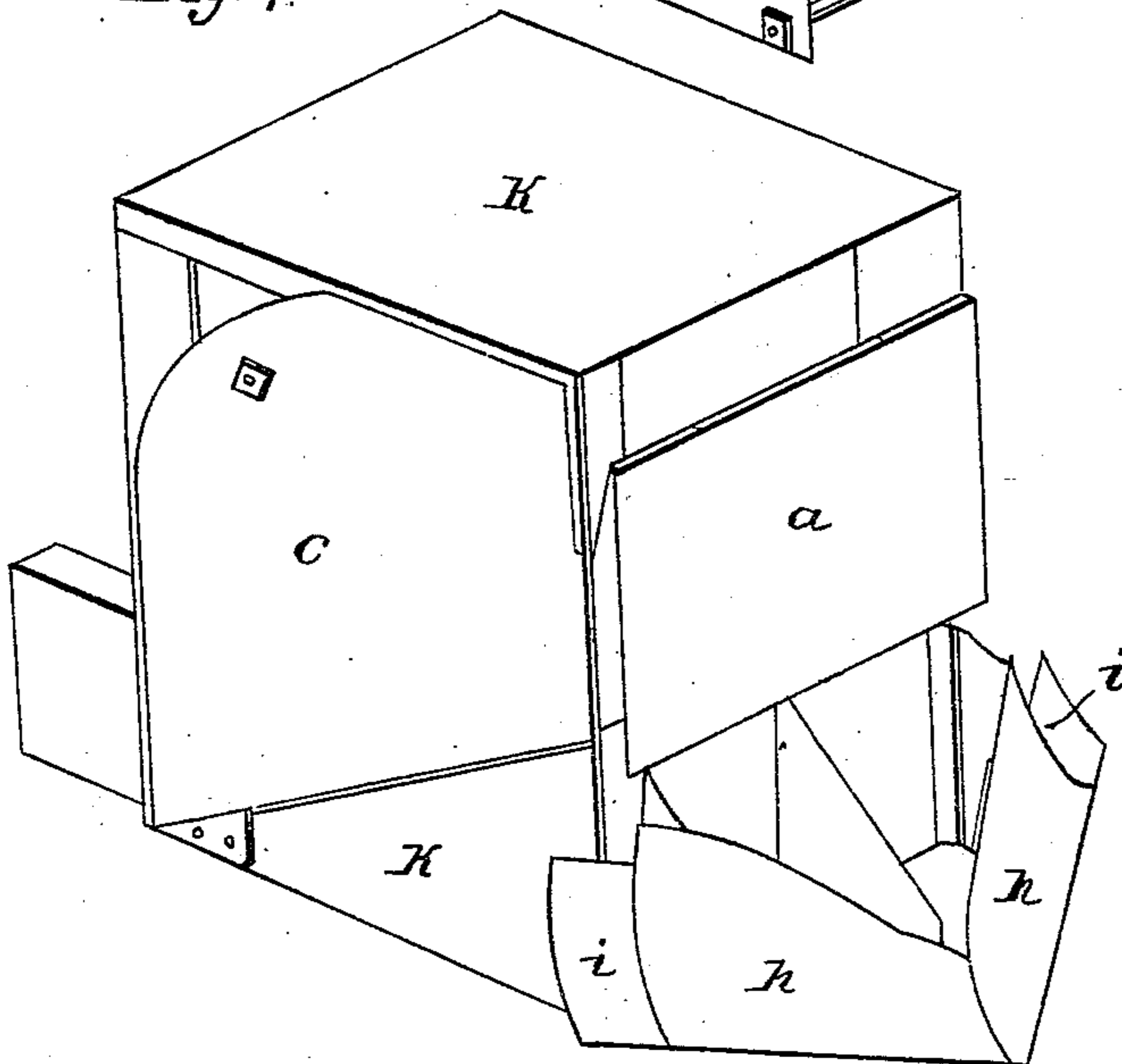


Fig. 9.



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S. O. Hurd.
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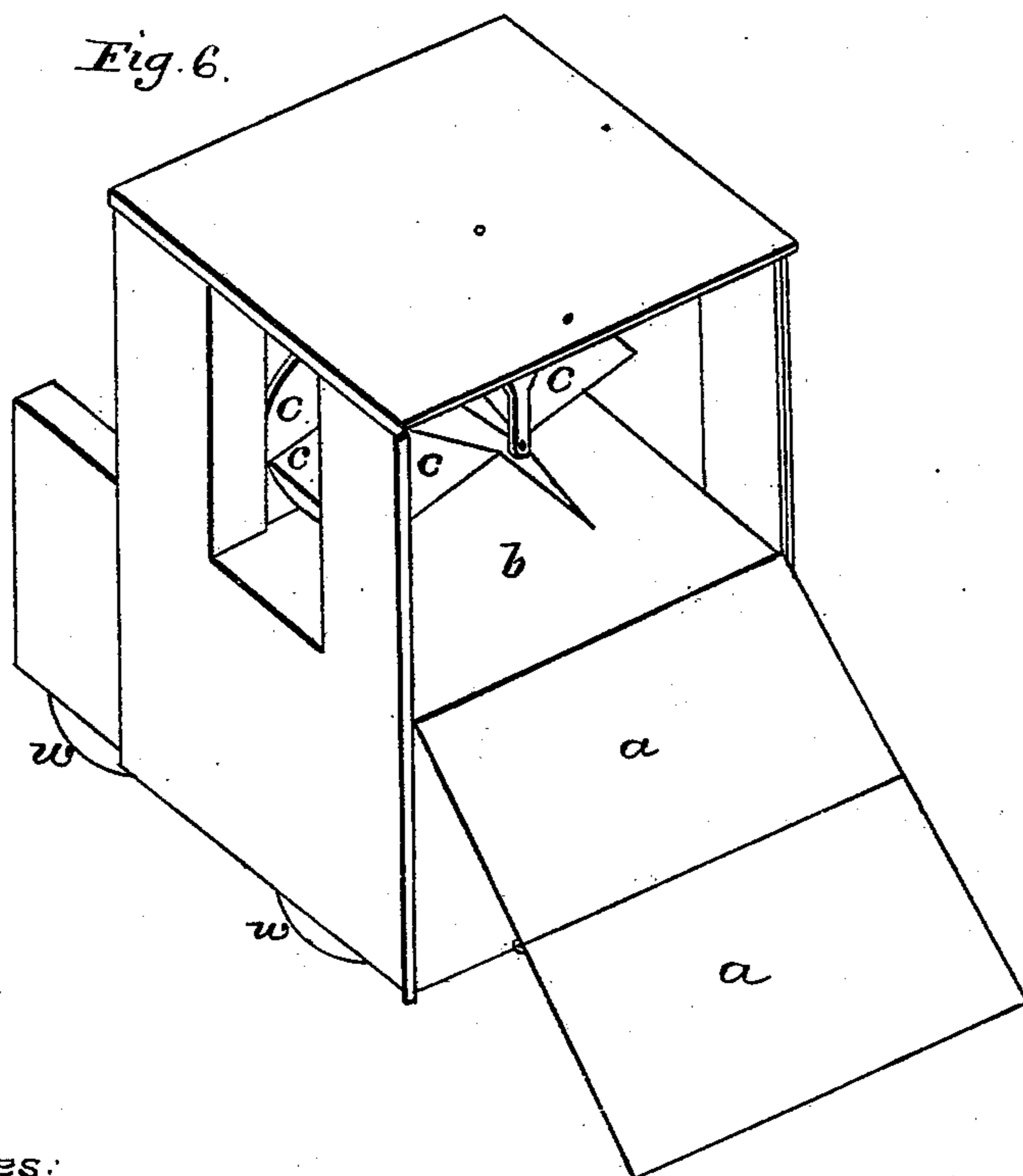
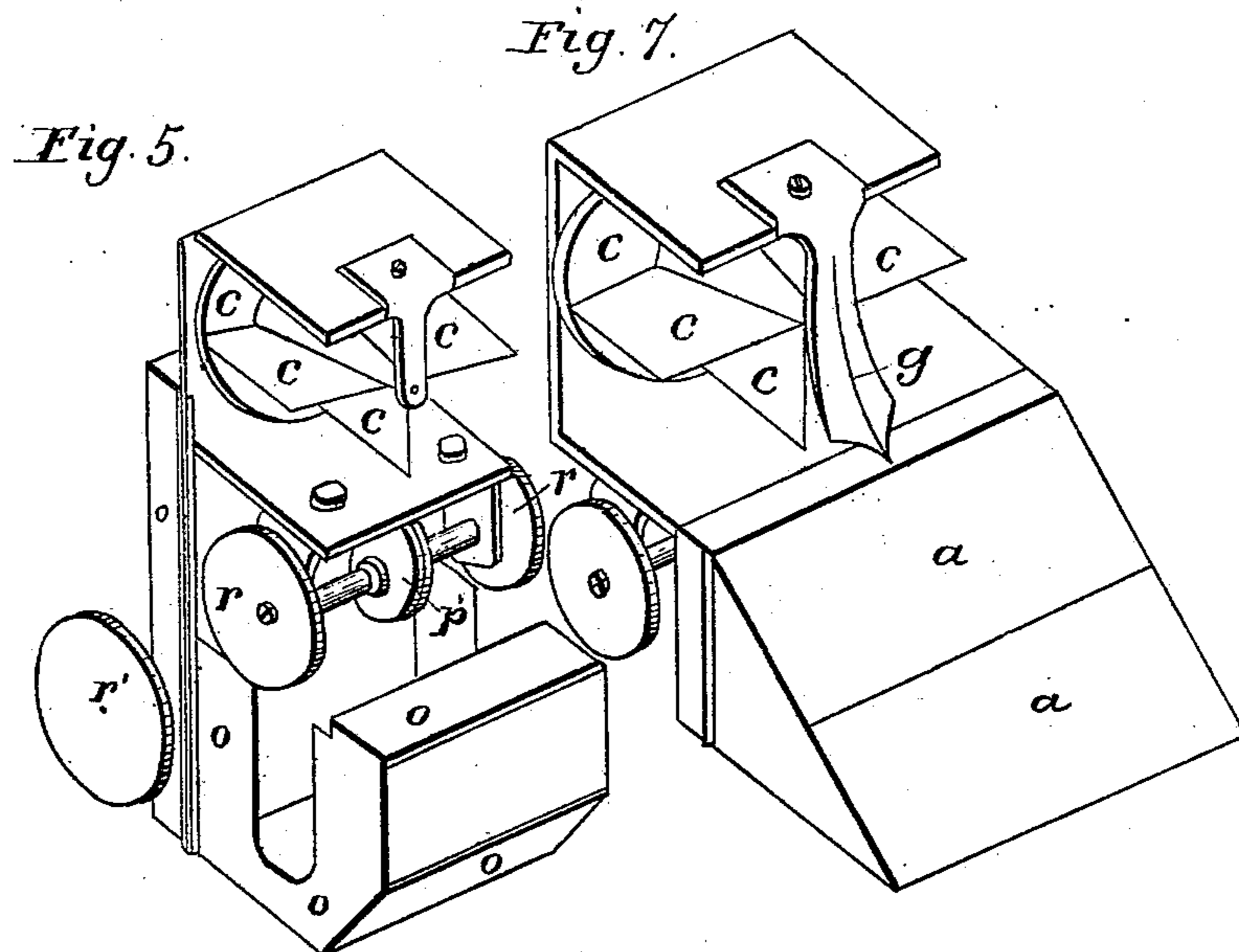
C. L. Garfield

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3 Sheets—Sheet 2.

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Witnesses:
S. H. H. H.
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United States Patent Office.

CHARLES L. GARFIELD, OF ALBANY, NEW YORK.

Letters Patent No. 94,102, dated August 24, 1869.

IMPROVED SNOW-FLOW FOR RAILWAYS.

The Schedule referred to in these Letters Patent and making part of the same.

To whom it may concern:

Be it known that I, CHARLES L. GARFIELD, of the city and county of Albany, and State of New York, have invented a new and useful Improvement in Snow-Plows; and I hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification, the same letters always referring to the same part of the machine.

My said improvement has for its object the removal of snow from railroad-tracks, and from other roads, to prevent the same from becoming an impediment to travel; and

It consists, mainly, in the combination of means by which the snow is elevated above the track or bed of the road, and, while in motion, in respect to the machine, is ejected to one side, into, over, and upon the snow adjoining the track or bed.

My combination of means consists, mainly, in the employment of an inclined plane, equal in breadth, at least, to the road-bed, or track to be cleared of snow, and approaching very nearly to the surface of the road-bed or rails at the lowest part of the incline, and thence, gradually inclining upward to the height to which it is deemed necessary to raise the snow before ejecting the same to one side. This inclined plane is likewise combined with a horizontal plane, and with a horizontal wheel, turbinated in form, having broad blades revolving around an axis parallel with the lines of the rail or track of the road, so as to receive the snow while the same is in motion, in respect to the machine, upon the blades of the wheel, and cast it out one side, over the snow at the side of the road.

In the accompanying drawings—

Figure 1 is a representation of the several parts of the plow, combined together for united action. It is there represented as enclosed in an outer case, so as to extend the case over the trucks, wheels, &c., beyond the rails or track of the road, for the purpose of protecting the machinery and trucks from the impediment of the snow. The combination includes, among other things, the inclined plane *a a*, the horizontal plane *b*, the turbinated wheel *c c c*, the guide or director *d d*, the front lateral wings *e e*, the truck-wheels *w w w w*, and the means by which they are connected for united action.

Figure 3 is a partial representation of the front part of the casing or front lateral wings *K*, with the inclined plane *a a* partially folded back, to show the position of the shaft or axle *s s*, and the wheels *w w*, placed there for the purpose of supporting the lower extremity of the incline plane, the wheels *w w* resting and turning upon the rail or track.

Figure 4 is a representation of so much of the im-

provement as shows the mode of operating the turbinated wheel *c c c*, by means of the truck-wheels *r r* and connecting-axle, and the pulley-wheels *p'* and *p* with the connecting-cords.

Figure 2 represents the guide or director *d d*, used in combination with the inclined and horizontal planes, and the turbinated wheel, for the purpose of guiding the snow to the one or the other side of these planes in its ascent to the wheel, according to the side of the road upon which it is desirable to deposit the same.

Figure 5 is a front view of that part of the improvement represented by fig. 3, together with its encasing accompaniment, and it is drawn to represent the mode of applying such casing to fig. 3, the process of such application being represented by fig. 5.

Figure 6 is a representation substantially of fig. 1, with the front wings *e e* in said figure removed, and the director omitted.

Figure 7 is a similar view, having the triangular sides supporting the incline plane, substituted for the front wings, and the front and upper portions of the sides of the casing *k k* removed.

Figure 8 is a representation similar to fig. 1, with the incline plane folded back, to show the position of the plow when used for light snows.

Figure 9 is a representation of the front wings *e e*, folded back, and the incline plane *a a* folded up, ready for using the ordinary plow for light snows *h h*, with its extension-wings *i i*.

The turbinated wheel, in the accompanying drawings, is represented as revolving on a horizontal axis. It may be advisable to construct some machines with such wheel revolving on a vertical axis, where the machine is to be used for great depth of snow. Either method of revolving the wheel will answer as an element of my said improvement.

This improvement is constructed upon the principle that the snow upon the track or road-bed to be removed, must, in general, be lifted or raised up, by means of the inclined plane, so as to be in position to be ejected on one side of the track, into, over, and upon the adjoining snow, by means of the turbinated wheel, which is made to revolve in either direction, according as desired. The incline plane is so constructed as to reach a horizontal plane a few inches before meeting the wheel, for the purpose of bringing the snow and blades of the wheel into contact before the snow falls upon the surface of the horizontal plane, and comes to a state of rest in respect thereto; because, while the snow is relatively in motion, and before coming in contact with the surface of the horizontal plane, it will require much less power to cast it aside than after coming into such contact; for, if the snow fall upon, or be found in contact with the surface of a plane, adhesion at once takes place be-

tween it and the plane, which will add, to the resistance to removal, an amount equal to such resistance multiplied by the velocity of the blades.

In the construction of machines for the removal of snow, it becomes important at all times to avoid, as much as possible, friction between the surfaces of the machine and the snow; for this reason, the change of the incline to a horizontal plane, just before reaching the ejecting-wheel, becomes a very important improvement.

In operating the incline plane for raising the snow above the track or bed, the pressure of the snow upon the incline plane, when running with the necessary speed, will be great, making it necessary to support the plane by means of wheel and axle, as represented in fig. 3. The wheel and axle should be small in diameter, so as to come very nearly to the front of the incline plane, and at the same time, should be very strong, to sustain any amount of pressure necessarily acting upon it.

In providing for revolving the turbinated wheel, in the drawings, I have used pulleys and cord. Other mechanical means may be employed for such purpose, as the ordinary bevel-gear, pinions, &c. The adjustments for reversing the motion of the turbinated wheel, when desired, are well-known mechanical devices, deemed unnecessary to be represented.

For the purpose of protecting the machinery used in revolving the wheel, the casing *o o o o*, &c., fig. 5, is prepared, into which the machine, represented in fig. 4, is adjusted, as shown in fig. 5. Without such casing, the snow and ice might adhere to the wheels, pulleys, cords, &c., and interfere with the successful operation of the machinery. To protect the entire machine, including wheels, trucks, &c., from impediment, the outer casing, as shown in fig. 1, is used. When the snow is not deep, the ordinary plow, or one as represented in fig. 7, may be used. In fig. 7 the front end of the axle of the wheel *c c c* is supported by the triangulated guide-post *y*.

In passing through deep snow or drifts, where tunnelling is desirable, the arrangement of fig. 1 may be

vertically duplicated, that is, the incline and wheel may be placed above another incline and wheel, or a mere dividing-plow may be placed above the top of the machine, fig. 1, or, as above suggested, the turbinated wheel may be elongated, and be made to revolve vertically instead of horizontally.

Having thus fully described my said improvement and invention, I will proceed to set forth what I claim as my invention, and what I desire to secure by Letters Patent.

I do not claim, broadly, the use of an inclined plane for raising the snow above the bed or track, to be cast aside, over and off the side of the track; nor do I claim the combination of the inclined plane with the guide or director *d d*, made adjustable to either side of the track; nor do I claim, broadly, the wheel *c c c*, for ejecting the snow over the side of the road or track; but

What I claim as my invention, is—

1. The combination of the incline plane *a a*, the horizontal plane *b*, the guide or director *d d*, and the wheel *c c c*, for united action, substantially as described.
2. The supporting-wheels *w w*, and connecting-axle *s s*, at the front of the incline plane *a a*, in combination with such incline plane, horizontal plane *b*, director *d d*, and wheel *c c c*, for united action.
3. The front wings *e e*, in combination with the incline plane *a a*, the horizontal plane *b*, director *d d*, and wheel *c c c*, substantially as described.
4. The case *o o o o*, in combination with the turbinated wheel *c c c*, and the truck, pulley, wheels *r r*, *p p'*, substantially as described.
5. The outer casing *k e*, in combination with the incline plane, the horizontal plane, the director, and the wheel *c c c*, for united action, as described.
6. The incline plane, the horizontal plane, and turbinated wheel, in combination.

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Witnesses:

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