(No Model.)

3 Sheets—Sheet 1.

J. L. BOYER.

CINDER CAR.

No. 280,903.

Patented July 10, 1883.

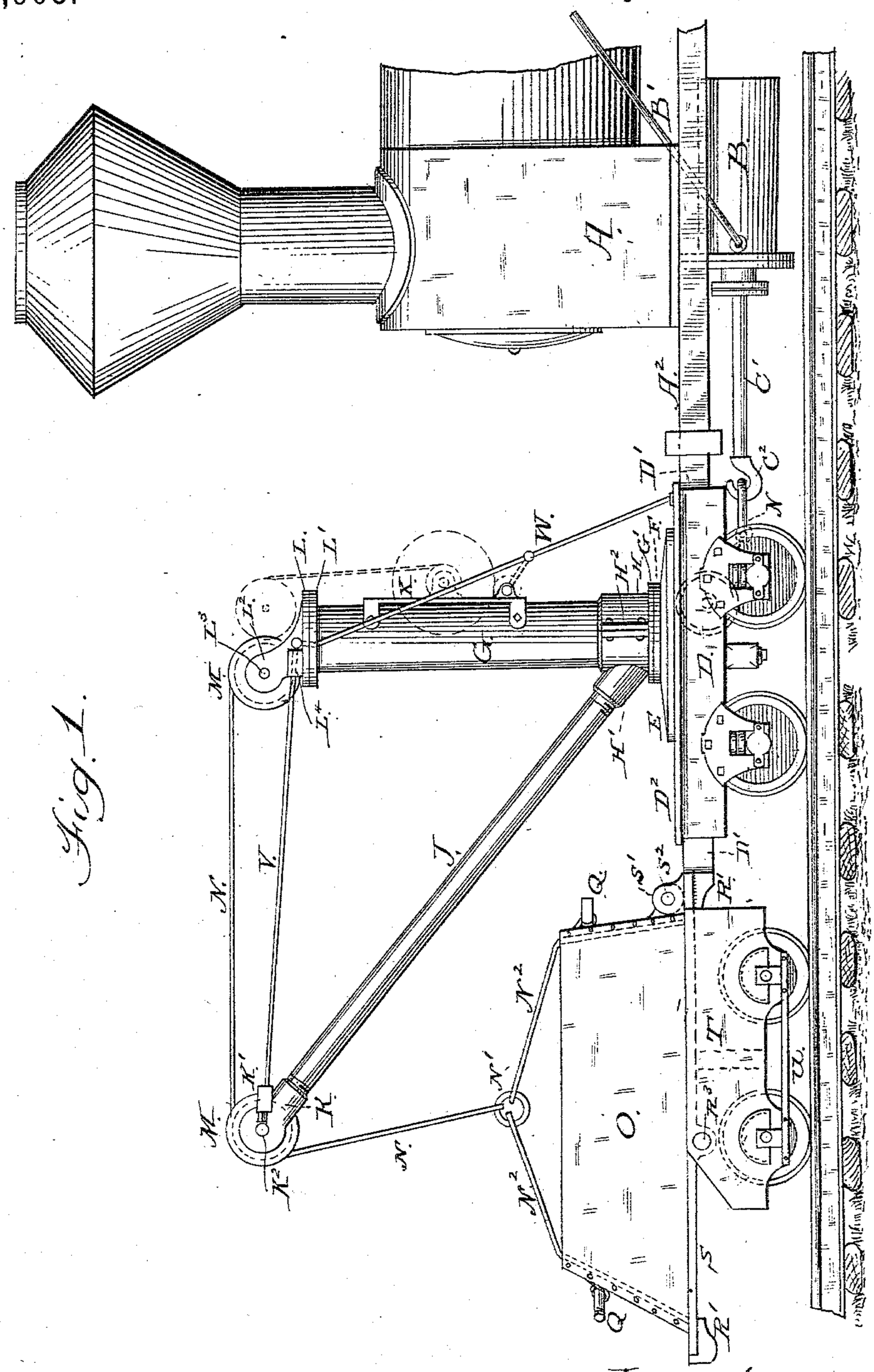

Fig. 1.

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(No Model.)

3 Sheets—Sheet 2.

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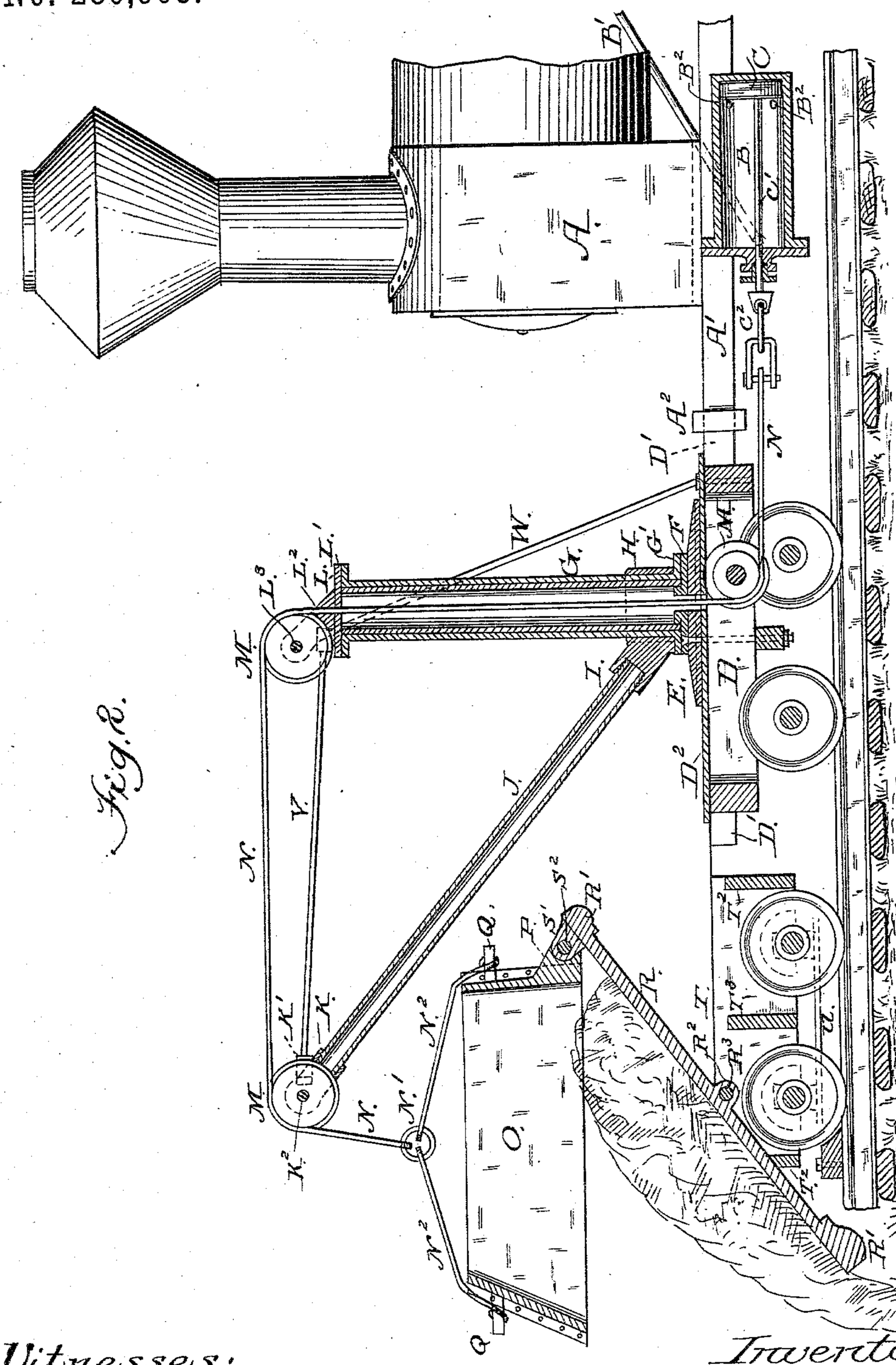

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

J. L. BOYER.

CINDER CAR.

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Fig. 3.

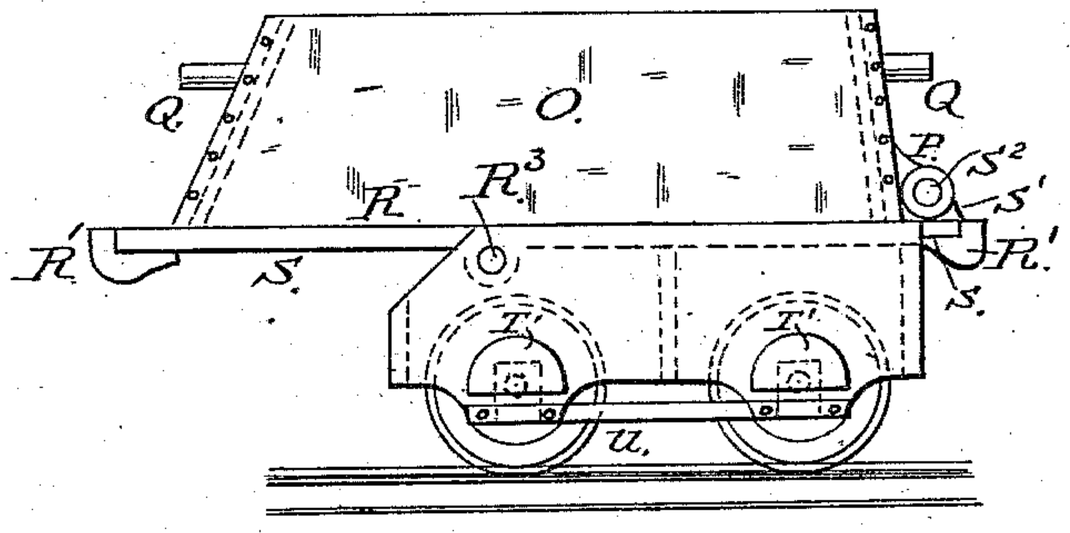


Fig. 4.

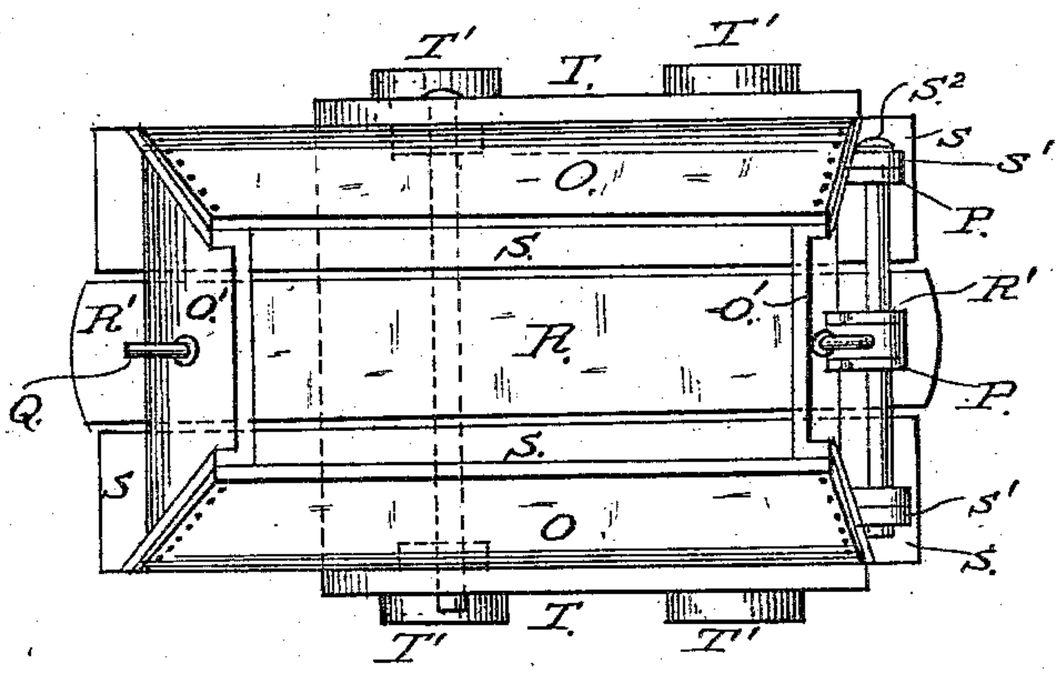
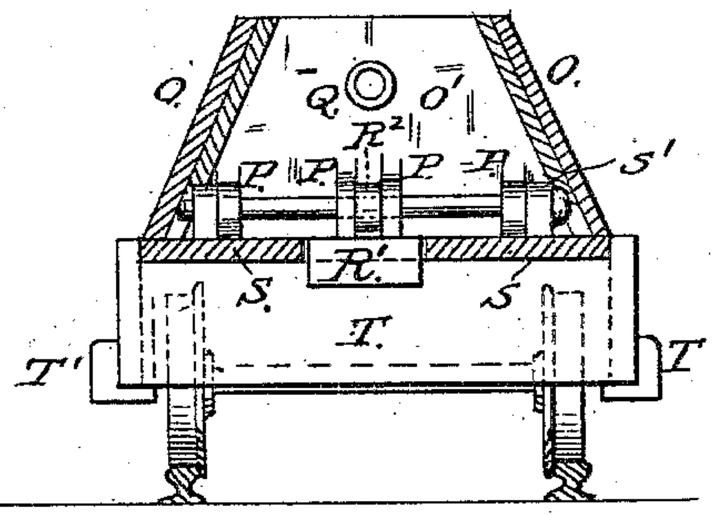


Fig. 5.



Witnesses;
T. Walter Fowler.
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Inventor;
Jerome L. Boyer;
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UNITED STATES PATENT OFFICE.

JEROME L. BOYER, OF COLUMBIA, PENNSYLVANIA.

CINDER-CAR.

SPECIFICATION forming part of Letters Patent No. 280,903, dated July 10, 1883.

Application filed April 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, JEROME L. BOYER, a citizen of the United States, and a resident of the borough of Columbia, county of Lancaster, State of Pennsylvania, have invented a new and useful Improvement in Cinder-Cars, of which the following is a specification.

My invention relates to improvements in the handling of cinder from blast-furnaces by means of special appliances and cars therefor.

My object is to reduce the cost of handling cinder, to dispose of the same more rapidly than under the present system, and to enable furnace-men to deposit upon the same area of dumping-ground at least four times the quantity of cinder that the present system of dumpage would place upon the same.

The above objects I attain by the use of the cars and apparatus shown in the accompanying drawings, forming a part of this specification, in which corresponding letters designate corresponding parts.

Figure 1, Sheet 1, is a side elevation of my cinder-tipping apparatus in position to operate the car. Fig. 2, Sheet 2, is a sectional elevation of the working part of the apparatus, showing the power applied and the car ready to dump. Fig. 3, Sheet 3, represents a side elevation of the car detached from the lifting or dumping power. Fig. 4, Sheet 3, is a plan of the same; Fig. 5, Sheet 3, a sectional view of the car, in all of which—

A represents the front or smoke-box end of a locomotive; A′, side frame; A², bumper of same; B, an open-end cylinder; B′, pipe leading from the cylinder up within the locomotive-cab, where it is provided with a three-way cock; B², exhausting-holes; C, piston; C′, piston-rod; C², hook (swivel) or coupler on end of piston-rod; D, derrick-car; D′, bumpers upon same; D², floor of same; E, base-plate of derrick; F, stationary post secured to plate E and turned upon its exterior; G, exterior movable post or pipe, having a bearing-flange, G′, at the base, and a bolting-flange, L′, at the top; H, a collar in two parts, bolted by flange at the base of the post, and provided with a hub, I, for the jib. J is the jib, formed of pipe threaded at the ends, at the lower end fitted in the boss or hub I, and at the top in the head-piece K, which is forked for the sheave M, and is provided with hubs K′ for the tension-rods and sheave-pin K². The cap L has standards L² and pins L³ for the sheave M. It also has a central hole for the chain or wire rope to pass through, and hubs L⁴ for the tension-rods, and is bolted to the flange L′ of the movable post G. M represents the sheaves, located as shown. N represents the wire rope or chain for hoisting purposes; N′, the ring of the sling, and N² N² the car-body sling. O represents the sides, and O′ the ends, of the receptacle or box. P P are ears cast upon the end O′ of the receptacle. Q Q are the trunnions or lifting-pins. R represents the center plate of the bottom of the receptacle or floor of the car; R′, an extension and thickening of the ends of the center plates to form bumpers to the car. R² are ears cast upon both the center and side plates, through which a fulcrum-pin, R³, is passed and supported in the sides of the car-body. S represents the side plates of the bottom. S′ are ears cast upon both the center and side plates of the bottom. Matching with the ears P P of the end O′, a pin, S², passing through the same, forms a hinge, as shown in Fig. 2, Sheet 2. T represents the cinder-car-body truck; T′, caps over the axle-bearing boxes; T², ends; T³, center cross-bar. The floor S R S in its normal state rests upon T² and T³. U represents a wrought-iron bar connecting the jaws of the axle-box pedestals. V represents the tension-rods, there being two of them. W are temporary stays used when the derrick is not required to swing around. X represents a manual-power attachment, which may be applied when horses are used to remove the cinder.

The usual course at the furnace is to fill the cinder-cars and let them stand until the cinder is sufficiently cooled off to permit barring off of the car. The cars are then drawn out to the dump, either by horse or locomotive power, and placed under a fixed crane, when the box or top is lifted off of the hardened cinder. The car is then shoved to the end of the dump, where laborers with bars pry the cinder-cake off of the car. This requires time, and is fraught with danger to the operators, the shell often breaking and letting the fluid cinder spurt upon them. The cinder-cakes occupy a great deal of room, and rap-

idly fill up the dumping-ground, extending the run from the furnace year by year and necessitating continual additions to the dumping area of the furnace.

With my improvement the cars are filled as usual, but as soon as full are attached to the locomotive and hauled to the dumping-ground, where the car is backed out to the end of the dump. The chain or rope N is connected with the piston-rod hook, (or swivel,) as shown in Fig. 1, Sheet 1. Steam is turned into the cylinder B by the engineer, which drives the piston C toward the rear, and thus, through the connection of the chain or rope N with ring N′, links N², and trunnions Q of the box O O′, hinges P S, and fulcrum R³, puts the box O O′ and floor R S in the position shown in Fig. 2, Sheet 2, when the cinder slides onto the dump in a liquid or semi-liquid state, which fills all the interstices left by the previous dumpage; and the subsequent dumps being of similar character the result is such close packing that ground now covered by one year's operation of the furnace will, by the use of my improvement, last for four years' service.

Independent of time and space saved by my mode of dumping the cinder in a fluid state, there is a saving of seventy-five per cent. in the labor and about fifty per cent. in the number of cars necessary to handle the production of cinder from two or more furnaces.

I have referred more particularly to the use of a locomotive for the handling of the cinder-cars, as it is more reliable and rapid in its movement, and will deliver the cinder in a more fluid state upon the dump, and the readiness of the steam to operate the hoisting-piston makes the locomotive the most desirable for the purpose; but where horses are employed there is still great economy in the use of my apparatus and cars. A manual-power crab would then be placed upon the post of the derrick, as shown in dotted lines in Fig. 1, and the car dumped in that way; or a portable boiler may be placed conveniently upon the dump and an open-end cylinder similar to B suspended from the derrick-car floor. A simple connection by a flexible pipe between the boiler and cylinder would then furnish the hoisting force.

The application of the locomotive-power hoist and portable derrick will be found of special service on wreck-trains, saving time and labor in handling of wrecks.

The drawings are so fully detailed that an expert can readily understand the construction of the apparatus, the whole of the work being within the capacity of nearly all of our modern furnace-plants.

Great difficulty has heretofore been found in securing permanence in the boxes and floors of the cinder-cars, occasioned by the unequal expansion and contraction of their several parts. The floors were and are generally composed of a single plate, or of an open frame filled out with plates, in either case strengthened by heavy wrought-iron bars riveted thereon. These bars, or the construction of the floor, also adds to the time requisite to bar the cinder-cake off of the car, owing to the roughness of the floor occasioned by their use. The sides of the boxes are also secured by wrought-iron bars, but, notwithstanding the above precautions, are continually giving out and must be replaced.

In my construction of car, I form the bottom or floor of detached longitudinal plates, preferably of one central piece, R, and two side pieces, S, the central piece somewhat longer than the side pieces, and provided with bumpers R′ and ear R² as a fulcrum acting on pin R³, and a hinge, S′, at the rear. The side pieces also have the fulcrum-ear R² and the hinge S′ at the rear, a pintle, S², being common to all the ears of the hinge. The box is in form similar to those at present in common use, the ends being provided with trunnions Q, whereby to raise the box, and the rear end provided with hinge-ears P P corresponding with the hinge-ears S′ of the floor, and moving upon the pintle S² common to the same. The sides and ends I make of a taper section, about one and one-half inch at the base where they rest upon the floor, and about one inch thick at the top edge. I find that this construction enables me to dispense with all wrought-iron strengthening-bars, which simplifies the car, gives it increased life, and, when broken, can go at once into the furnace as scrap, without the labor involved in the separation of the wrought from the cast iron, as under the usual construction.

I am aware that I am not the first to apply a movable derrick or hoist in a train in connection with cars coupled thereto, as it is a common expedient in railroad-wrecking practice to so apply them; but I believe myself to be the first to use a derrick or hoist of the construction shown, in combination with a car dumped by raising the top box, in the manner shown and described. I do not, therefore, broadly claim a mounted derrick or hoist—simply the combination of the one described with my special cinder-car.

Having shown the construction, advantages, and application of my improvement, I desire to secure by Letters Patent the following claims thereon:

1. In a cinder-car for the dumpage of fluid cinder, the floor constructed of two or more parts, having a central thickened end projection as bumpers thereon, provided with fulcrum-ears R² beneath the face, oscillating upon a pin, R³, and hinge-ears S′ at the rear end of the car on the face of the floor, in combination with the box O O′, of the form shown, and provided with hinge-ears P P, mating the hinge S′, a pintle, S², common thereto, and trunnions Q, whereby the same is adapted to be raised at an angle with the track, the box clear of the car contents, and the same at liberty to slide

therefrom, substantially as shown, and for the purpose specified.

2. In a cinder-car for carrying fluid cinder, a movable connected top box of truncated form, its four sides of taper section rigidly combined or cast as a whole, in combination with a suitably-arranged hoist acting on trunnions Q, and connected with the floor S R S by the ears P, mating with floor-ears S′, a pintle, S^2, common to both, the floor, as described, fulcrumed on to the truck T by ears R^2 and pin R^3, the whole arranged to operate as and for the purpose set forth.

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Witnesses:
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A. R. BOYD.