

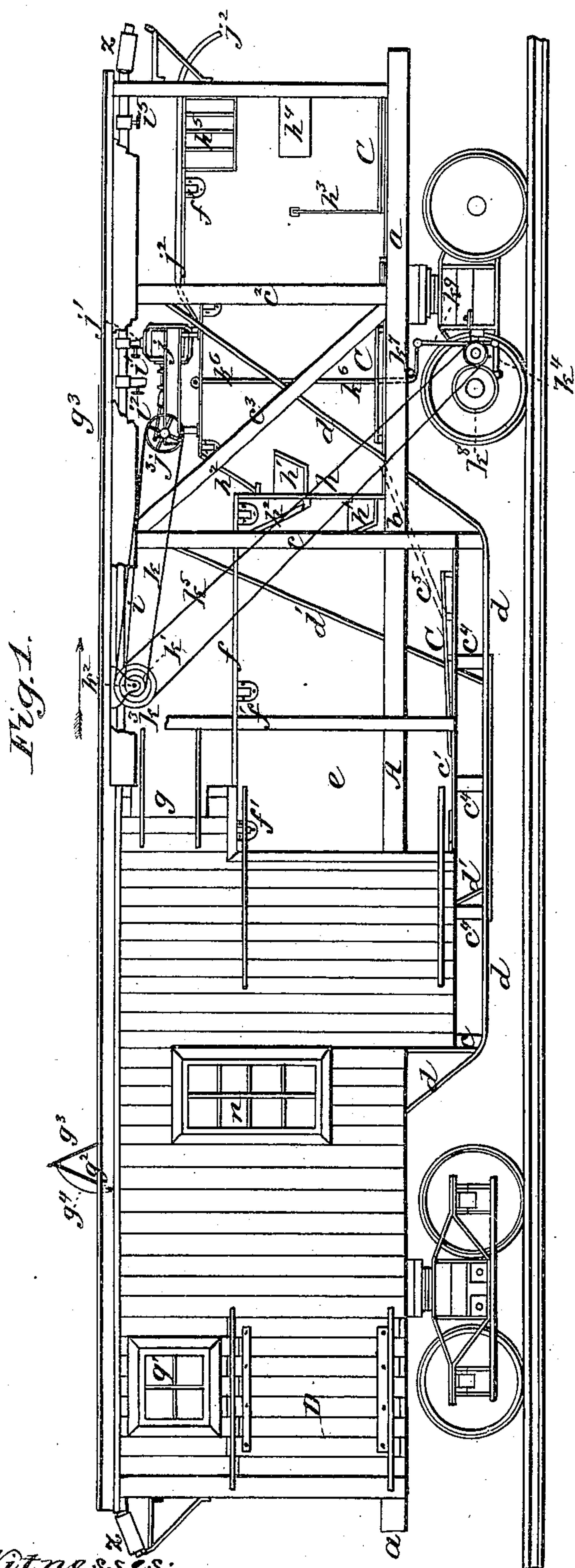
(No Model.)

3 Sheets—Sheet 1.

W. H. WARD.
RAILWAY CAR.

No. 246,926.

Patented Sept. 13, 1881.



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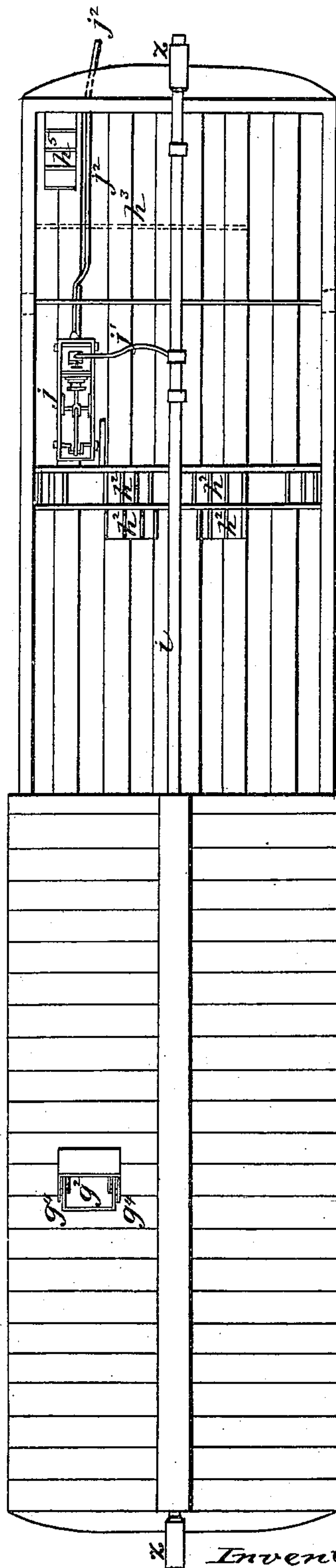


Fig. 2.

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Fig. 6.

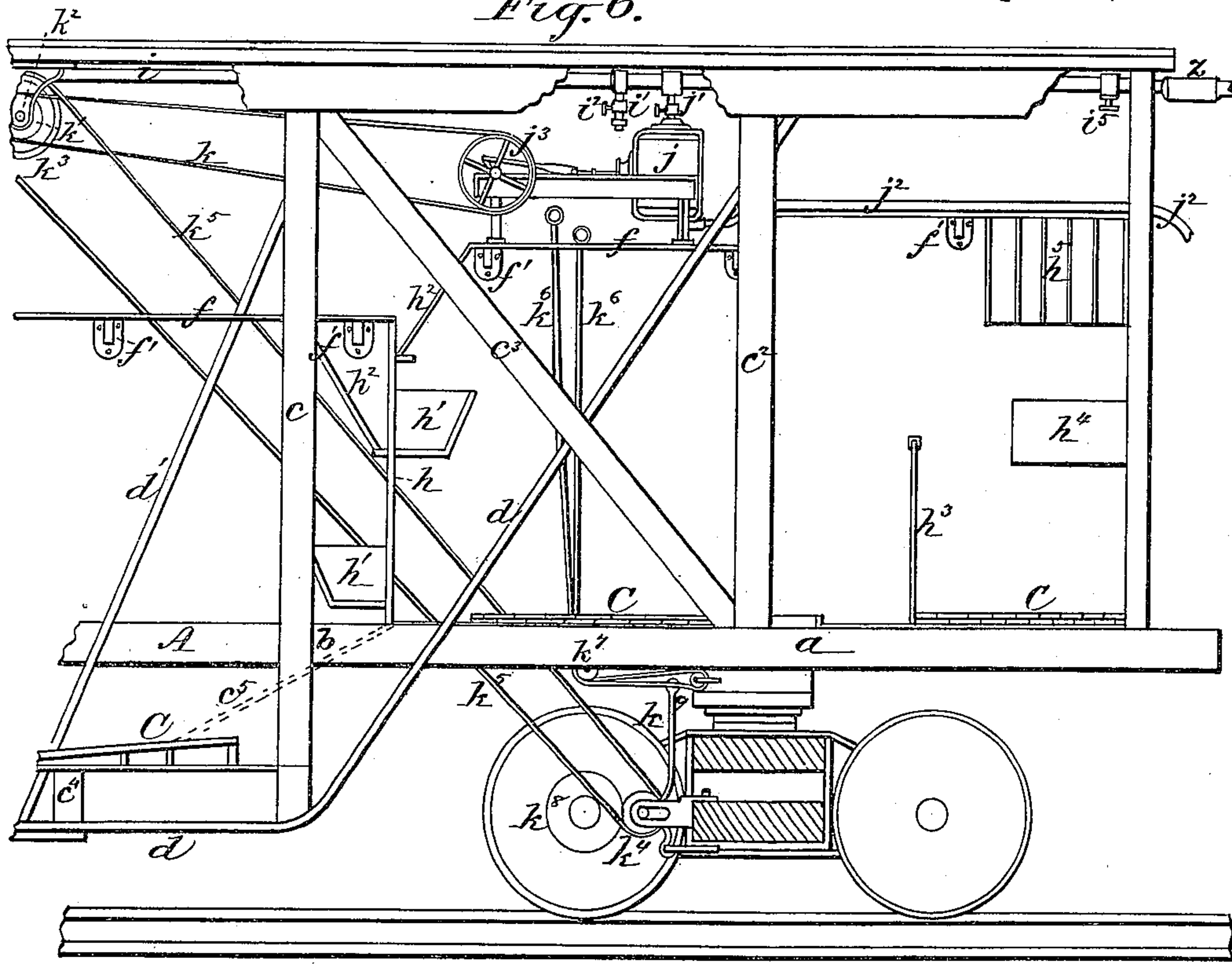
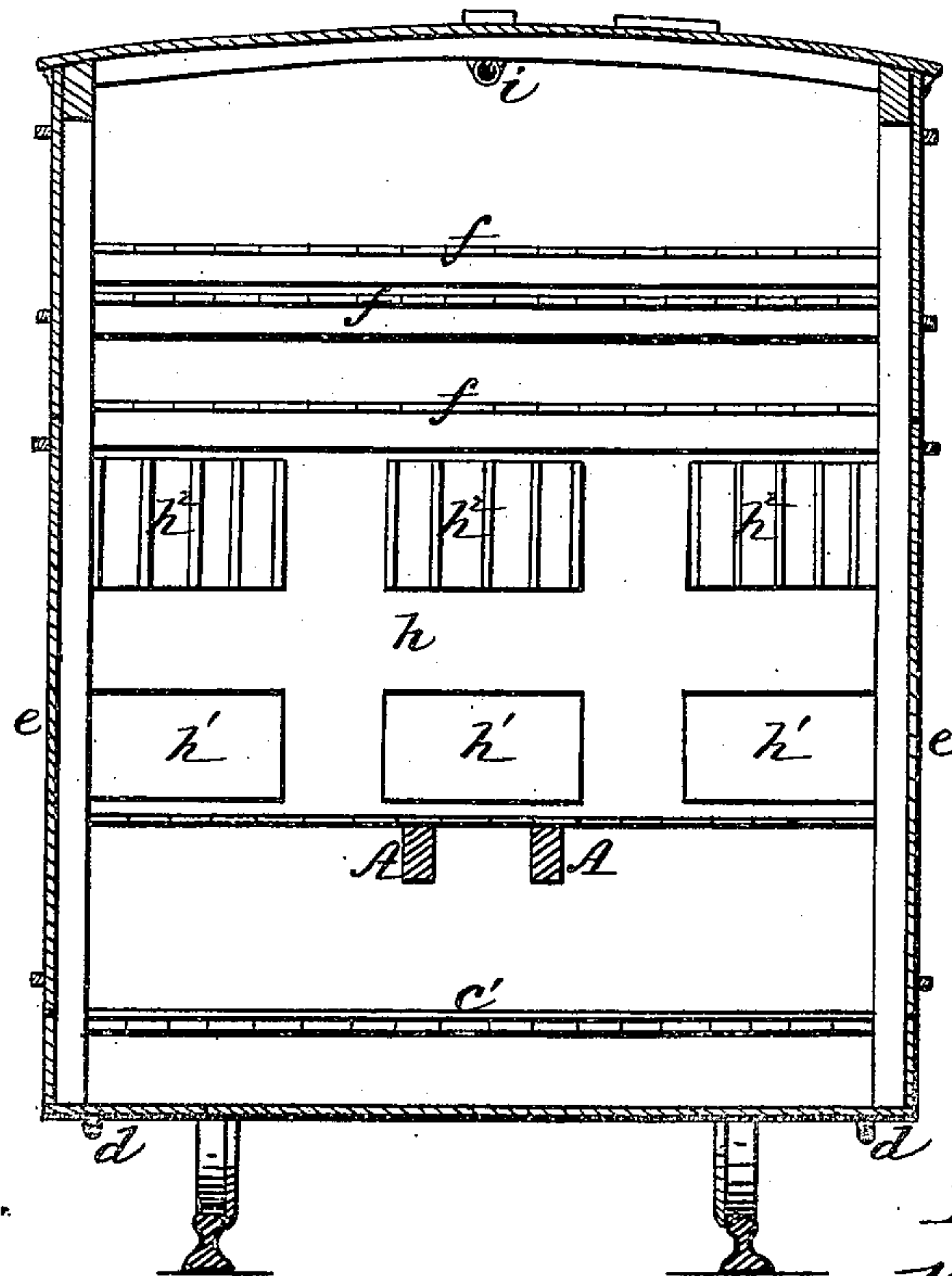


Fig. 3.



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(No Model.)

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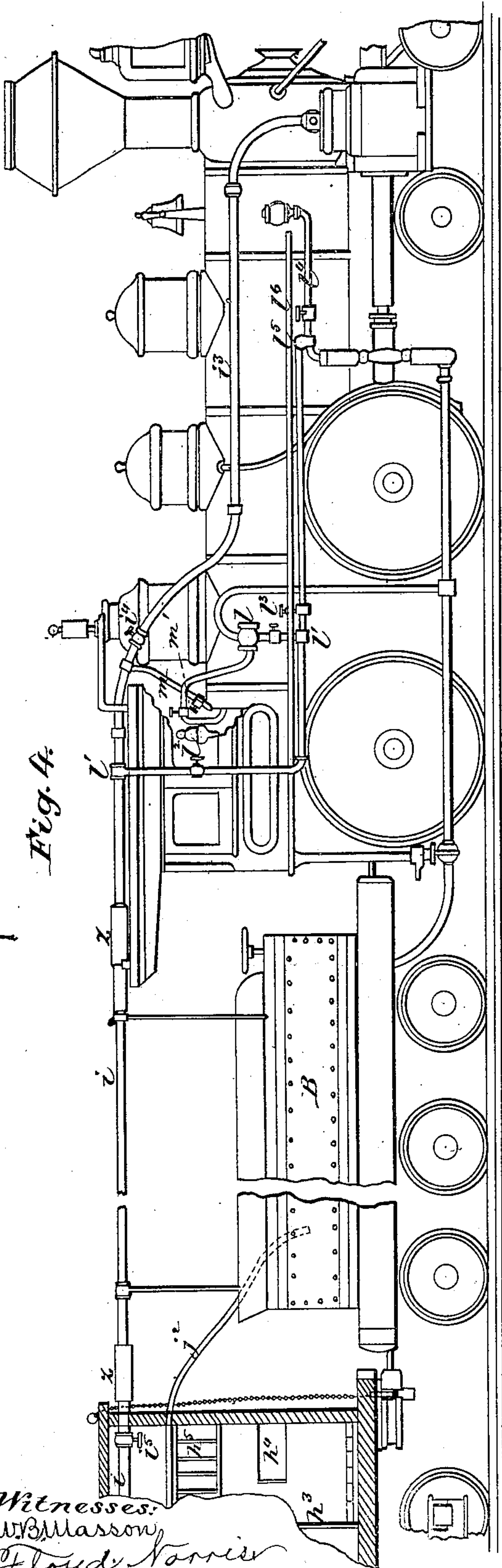


Fig. 4.

Witnesses:
W. B. Masson
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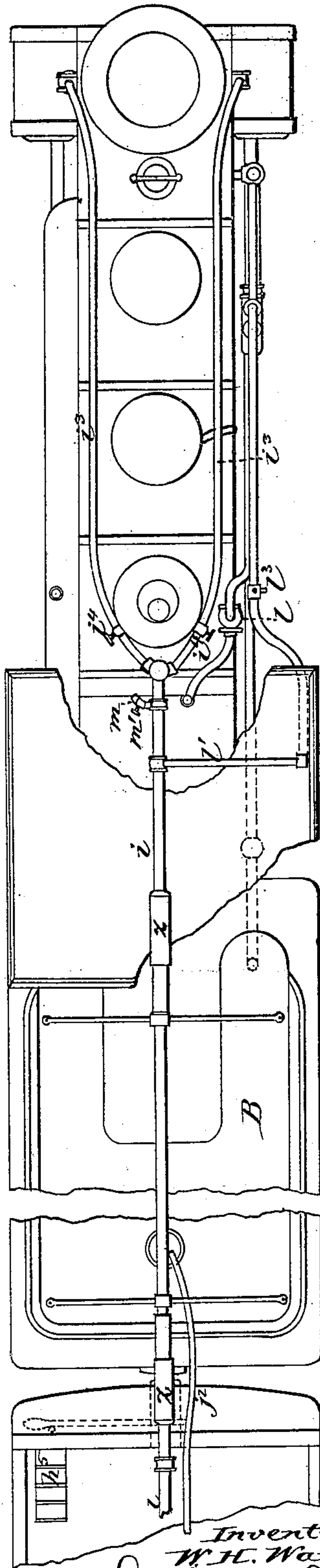


Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM H. WARD, OF PITTSBURG, PENNSYLVANIA.

RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 246,926, dated September 13, 1881.

Application filed January 29, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY WARD, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improved Railway-Car, of which the following is a specification.

My invention is directed to the production of an improved construction of cars for the transportation of live stock or other freight by rail, and to means for watering, feeding, warming, and caring for the stock while *in transitu*, so that the same may be delivered in an improved condition.

In lowering the car-floor between trucks the middle longitudinal floor and buffer-timbers are left intact, so as to form a substantial "backbone" for the car-body, for the purpose of giving the required longitudinal resistance for the train pull and push, while the side-floor timbers are cut between the trucks to bring the flooring as near the rail as safety will allow to obtain convenience for ingress and egress for the stock at the side doorways; for easy freight loading and unloading from track-level, and to obtain increased interior space for an overhead floor for the storage of food; for the arrangement of a pump and food-crusher, and facilities for operating the same; to afford more head-room for certain classes of freight that cannot be carried in the ordinary box-cars, and to provide a passage-way on the overhead floor from one end of the car to the other for the attendant to feed and water the stock, provision being made for his entrance into said overhead space by properly-guarded roof-openings.

To prevent the car from being train-crushed or drawn asunder its middle or draw-head stringers must cross the depressed flooring in unbroken lines, so as to resist the concussions and longitudinal strain which are so destructive to railway rolling-stock.

Each car is provided with a longitudinal overhead pipe, adapted for continuous train-connection and to be put into communication with a water tank or reservoir to supply water to the stock in the cars of the train while in motion through the medium of a pump arranged in each car and the injector of the locomotive and suitable hose and nozzle-pipe connections

with said feed-supply pipe, the said pump being under the control of the attendant to operate it either by hand or through frictional power obtained from the axle of the car-wheel at pleasure. This supply-pipe of feed-water is provided with suitable means for cutting off such supply whenever required, and for being put in open communication with the exhaust-ports of the locomotive-engines, or with the steam-chamber of the locomotive-boiler, whereby the said water supplying feed-pipe is converted into a steam warming-pipe throughout the train.

Referring to the accompanying drawings, Figure 1 represents a car, in half-vertical section and elevation, constructed in accordance with my invention; Fig. 2, a top view of the same; Fig. 3, a cross-section; Fig. 4, an elevation of a locomotive, and partially of the tender, showing the feed-water and warming pipe connections for the train, a portion of the first car of which is shown in section; Fig. 5, a top view of that part of the train shown in Fig. 4; and Fig. 6, an enlarged section, showing the pump and its operating-connections.

To enable others skilled in the art to construct railway-cars for a stock-train in accordance with my invention, I will proceed to describe specifically the several matters which constitute my invention.

In carrying out the construction of cars for a railway stock-train it will be understood that the use of the special provisions by which the train is adapted for the transportation, feeding and watering and caring for the stock can be dispensed with—that is to say, the partitions and the feeding and watering troughs and feed-racks which they support are made movable, as is the overhead flooring of the depressed portion of the car-body, and the train adapted for carrying freight, the removed parts being stored over the second floor, at the ends of the car, directly over the trucks.

In the construction of the car the central sill-timbers, A A, of the floor of the car-body remain intact for stiffness, strength, and resistance, but may be separated a sufficient distance apart to constitute a stall. The side-sill floor-timbers, *a*, are cut between trucks, as shown at *b*, where they join the side vertical timbers, *c*,

at which point the floor c' is dropped down to within a safe distance of the surface of the track. This depressed portion of the car-floor is supported by truss-rods d , which are secured to the top longitudinal timbers of the car, directly over the truck-bolsters, at which point the top of the car is supported against any yielding of the truss by uprights c^2 , while truss-rods d' have their resistance over the side uprights, c , which are trussed by struts c^3 , by which means the suspended portion of the car-body and its load between the trucks is brought in abutment-bearing position directly upon the bolsters of the car-trucks. The flooring c' is supported on cross-timbers c^4 , that have their bearing on the horizontal portions of the truss-rods d , which flooring is additionally supported in the center by the truss-rods d' , which extend from each side of the doorways e , arranged in the sides of the car, in the center of the depressed floor part. The doorways are provided with ordinary sliding doors. By reason of suspending the depressed portion of the floor the top, side, or plate timbers are made deeper, to give increased strength.

The depression of the car-floor in the manner described, without cutting the main resisting-timbers of the car-body, gives important advantages, among which are the retention of the resisting force and strength of the car-body; easy access for loading of living freight from track-level into the lower floor-level, from which, by bottom plank walk, c^5 , (shown by dotted lines in Fig. 1,) said living freight can load itself in the ends of the car. It affords greater facilities in loading and unloading all descriptions of freight, and more especially living freight. This floor-depression furnishes extra overhead space for an overhead flooring, f , laid upon joists f' , which, with said flooring, are made removable. This upper space forms an overhead passage beneath the roof from one end to the other of the car for the storage of food for the living freight within the said car, whereby the attendant is enabled at all times to feed the stock in said or any other car of the train. Slide-doors g are made in the upper central portion of the car, for the admission of food, while windows g' at the opposite sides and ends of the car serve to give light to the overhead space.

Man-holes g^2 are provided in the roof of the car for ingress and egress of the attendant, enabling him to attend to the stock of the train at all times. These man-holes are provided with covers g^3 , which are opened toward the direction of travel for the purpose of preventing sparks from the locomotive entering said man-hole, and also affording a vacuum-draft for ventilation. They are also provided with closed ends, which assist in forming the vacuum-draft and preventing sparks entering. The covers are hinged, and are held open to any desired extent by an eye-jointed rod fastened to the cover by the eye-joint, the other end passing through an accommodating eye-

joint socket provided with a thumb-screw for retaining it in position.

The construction of this car is such that it will admit of the most approved method for arranging the partitions and food and water troughs. In the arrangement shown the partitions h serve to partition the lower or central stalls from the upper or end stalls, and to carry the feed and water troughs h' on either side thereof, and the hay-racks h^2 , arranged above said troughs. These troughs are arranged crosswise, so that the stock will stand tails toward each other in the lower stalls, while those in the upper spaces stand facing those in the lower stalls. One or more additional partitions, h^3 , at each end of the car serve to form additional stalls in which the stock stand crosswise of the car and feed from side troughs, h^4 , and hay wall-racks h^5 , as shown in Fig. 1.

Having described the general construction of the car and the provisions for feeding the stock, it now remains to describe the means for supplying water to the stock during transportation, whether moving or standing.

A pipe, i , passes through the car centrally just beneath the roof, and extends sufficiently beyond its ends to allow of being continuously connected by suitable couplings, z , with a similar pipe in each car throughout the train.

To supply the pipe i a pump, j , is provided in each car, having a suitable pipe-and-cock connection, j' , with said pipe i , and also a flexible-hose connection, j^2 , with the water-tank B of the locomotive-tender. The pump crank-shaft has a band-wheel, j^3 , in one of the arms of which is fixed a wrist-pin, by which means the attendant is enabled to operate the pump and draw the water from the tender-tank to supply the wants of the living freight in said car through the pipe and nozzle hose-connections with said pump. Means are provided for utilizing the rotation of one of the car-wheel axles to operate said pump, which means consist of a belt, k , from the leading pulley j^3 of the pump to a driving-pulley, k' , which is secured to an overhanging shaft, k^2 , on which is a leading pulley, k^3 , which receives its motion from a driving-pulley, k^4 , through the medium of the connecting-belt k^5 . The driving-pulley k^4 is mounted on a shaft which is secured in suitable bearings which are supported from the lower bolster-timber of the truck and in horizontal plane with the axles of the wheels. On this shaft is affixed a friction-roll corresponding in size to the pulley k^4 on said shaft, one end of which is secured in a swing-lever, k^6 , which has its fulcrum pivot at its lower end, and from its upper end a cord, k^6 , leads around a sheave, k^7 , to the upper floor, near the pump, the pulling up of which cord by the attendant moves the friction leading roll and puts it in frictional contact with a driving friction-roll, k^8 , on the truck-axle, so that the movement of the train imparts motion to the pump. This pump-connection is entirely under the attendant's control for supplying

water from the tender-tank to the stock of the train when in motion and whenever required.

The pipe *i* is provided with one or more T-branches, *i'*, having a nipple and cock, *i²*, for the attachment of hose by which to water the stock and cleanse the car. The said hose is not shown, but is provided with the usual stop-cock nozzle by the use of which the stock is watered. The hose having been attached to the cock *i²* of the supply-pipe *i*, and the nozzle-cock being closed, the attendant opens the cock *i²*, letting water into the hose, the free end of which he then carries with him to the stock-floor and supplies a sufficient quantity of water to the respective troughs.

The pump, with its described appliances and connections, is the primary means for supplying water to the stock of the train. In cold weather the pump will be prevented from working by the freezing of the water in the pipes and pump. To provide against this contingency the supply-pipe *i* is extended or continued over the tender, and is connected to the locomotive-injector *l*, thereby using its feed-water-pipe connections to supply the pipe *i* from the tender-tank through said injector *l*, by which the temperature of the water is raised, so as to flow freely throughout the pipes of the train. The injector *l* is connected to the feed-pipe *i* by a branch pipe, *l'*, which has a cut-off cock, *l²*, to prevent the flow of water into the feed-pipe *i* when the injector is required to supply feed-water to the boiler of the locomotive; but when said injector *l* is required to supply feed-water to the cars of the train then the cut-off cock *l²* must be closed to prevent the water from passing into the locomotive-boiler.

It is important in this connection to notice that the pump and the injector may be operated together when the train is in motion; or the injector *l* will supply the pipes *i* when the train is standing and the pumps can only be operated by hand, and for this purpose the supply-pipe of the train is connected with the pumps of the several cars and with the locomotive-injector.

In the event of the primary pump being out of order, or a car having no pump being next the tender, then provision is made for such contingency by connecting the injector-pipe *l'* to the locomotive-feed-water pipe *l⁴* by an extension of the injector-pipe *l'* to a connection, *l⁵*, with the pump-connection pipe *l⁴*, and thus put the pump of the locomotive in communication with the feed-pipe *i*. By an interposing stop-cock, *l⁶*, the flow of the water into the boiler is prevented when required to supply water for the train.

Having described the pipe *i* as the means for supplying feed-water to the train, by suitable connections the said pipe is converted into a warming-pipe for the train, using the exhaust and live steam for the purpose, to accomplish which the pipe *l* has branches *i³* *i³*, which are connected with the exhaust-ports of

the locomotive-engine, as shown in Figs. 4 and 5, the said branches being provided with stop-cocks *i⁴*, which being opened and the water-cocks *i' i²*, Figs. 4 and 6, being closed, and the feed-water-pipe cocks *i⁵*, which are located at the joint ends of the feed-pipe *i*, being opened, will allow the flow of the exhaust-steam throughout the pipe *i* of the train and raise the temperature in each car, imparting comfort to the live stock, and prevent freezing of perishable freight; but when the train is standing it may be found necessary to keep up this temperature, to effect which a branch pipe-connection, *m*, is made between the feed-pipe *i* and the steam-chamber of the locomotive-boiler, which branch connection has a feed and stop cock, *m'*, by opening which and closing the cocks *i⁴* of the branch pipes *i³* the live steam will flow into and through the pipes *i* throughout the train.

Referring now to the construction of the car, the lower floor-timbers, *c⁴*, are shown as being arranged crosswise; but they may be placed lengthwise of the car and planked upon the lower side above the truss-rods, by which more head-room is obtained.

The trussing is shown as supporting the middle depressed portion of the car-floor in such manner as to bring the supporting resistance directly over the bolsters of the trucks; and while this construction is preferable, yet it is obvious that different truss-connections may be used to bring the resistance over the trucks in the manner of bridge-abutments.

A car constructed with a floor-depression between trucks, having the middle buffer-timbers intact, will be found advantageous for general freight, baggage, express, and postal service, in addition to that of stock service, as stated.

When the car or the train is to be used for conveying freight the partitions, with their feed-troughs and the depressed portion of the second floor, are removed and stored upon the end portions of said second floor, whereby a large head room is obtained for freight, heretofore difficult of shipment in the ordinary box-cars. The car is provided with side windows, *n*, for light and ventilation. The arrangement shown of the feed and water troughs, their partitions, and the described positions of the stock in the car is probably the best; but other arrangements of these parts may be made whereby the same desirable ends may be obtained.

It is manifest that in the construction of this car a space hitherto not utilized is utilized for carrying purposes without impairing the resisting strength of the car.

The couplings *z* of the supply-pipes *i* are adapted to accommodate themselves to the longitudinal and lateral movements of the train without depression; but as such construction of these pipe-couplings is more fully set forth in an application filed January 19, 1881, for warming the cars of a railway-train, it is not necessary to further describe such coupling herein.

To enable the animal to be placed in the stall formed by the buffer-timbers, removable steps or a batten plank walk is provided for such purpose, and from which the animal can step

5 over the said timber or timbers.

The back-bone buffer-timbers A A have been described as forming a middle stall in the depressed floor part; but this is not essential, as such timbers may be placed the usual distance

10 apart in ordinary car construction.

Raised inclined platforms C are provided for the stock, to give better cleanliness, and to form a waste-food receptacle at the raised ends thereof.

15 Sliding open-slatted doors D are provided at each end and on opposite sides of the car, for comfort and ventilation.

The overhead floor, *f*, may be made closed or slatted, as most desirable.

20 It will be understood that the controlling-lever *k*⁹ of the friction-power device is provided with means to secure the said friction device into or out of frictional contact at pleasure.

It is also understood that when using the continuously-connected supply-pipe *i* as a heater all its throughway-cocks *i*⁵ are open, so as to allow freedom for the steam exhaust.

25 In using the frictional pump-driving device the counter-shaft performs an important function in compensating for the spring movement between axle and car-body without affecting the effectiveness of the driving-belts.

I claim—

35 1. In a railway-car, the combination, with a depressed floor between the trucks and the side floor-sills, *a*, interrupted at such depression, of the uninterrupted middle draw-head stringers or buffer-timbers, A A, and the truss-rods *d d'*, arranged to support the said depressed

40 floor from points over the trucks, substantially as described, for the purposes specified.

2. In a car having its main floor depressed between the trucks and side sills interrupted at such depression, the combination, with such

45 depressed floor, of the truss-rods *d d'*, supporting said depressed floor part, and the uninterrupted middle draw-head stringers or buffer timbers A A, the said supporting truss-rods being arranged on each side of the doorways

50 *e*, and secured to the top timbers or plates, substantially as described, for the purpose specified.

3. A railway-car having its floor *e'* depressed between interrupted side sills, *a a*, and the

55 trucks, and the draw-head stringers or buffer-timbers A A, crossing the said depressed floor part, substantially as described, in combination with the truss-rods *d d'*, the side studs, *c c*², and the struts *c*³, the said studs and struts being

60 arranged in the relation to said truss-rods, the depressed floor *e'*, and the bolster-timbers of the trucks substantially as described, for the purpose specified.

4. In a railway stock-car having its main

65 floor depressed and supported from the top timbers or plates, substantially as described, the overhead floor, *f*, extending from one end

of the car to the other, and having a depressed part corresponding with the depressed main-floor part, and the partitions *h*, dividing the

70 space transversely between the said main and overhead floors, and provided with troughs and racks for feeding and watering the stock, substantially as described.

5. In a railway stock-car having its main

75 floor depressed and supported, as described, the overhead floor, *f*, forming a space beneath the roof, the partitions *h*, dividing the space between the said main and overhead floors transversely, and provided with troughs for feed-

80 ing and watering the stock, and roof ingress and egress openings provided with hinged covers *g*³, adapted to close and to guard said openings, substantially as described.

6. In a railway stock-car having its main

85 floor depressed and supported as described, the overhead floor, *f*, forming a space beneath the roof, the partitions *h*, dividing the space between the said main and overhead floors transversely, and provided with means for feeding

90 and watering the stock, the said overhead space being provided with side doors, *g*, windows *g'*, and roof-covered openings, substantially as described, for the purpose specified.

7. A railway stock-car constructed with a

95 main floor depressed between the trucks and an overhead floor, forming a space beneath the roof, the space between the floors being divided transversely at the junctions of the depressed part with the main floor by partitions

100 *h*, to form the middle stall-space separate from the end stall-spaces of the car, and adapted to support troughs *h'* within the middle and the end stall-spaces, the said overhead space provided with means for supplying water, sub-

105 stantially as described.

8. In a railway stock-car constructed with an overhead floor, *f*, forming a space extending from end to end of the car, and provided with roof-covered openings, the supply-pipe *i*,

110 arranged within said space and provided with couplings *i'* *i*² for a nozzled hose, and the troughs for feeding and watering the stock arranged between the main and overhead floors of the car, substantially as described.

9. A railway-car for the transportation of live stock, constructed with a flooring, *f*, beneath the roof, the supply-pipe *i*, provided with the connection *i'* *i*² for a nozzled hose, and cock *i*⁵, and also with means for forcing

120 water into said supply-pipe from a reservoir, substantially as described, for the purpose specified.

10. The combination, in a stock-car, of the overhead floor, *f*, and the supply-pipe *i*, provided with a connection, *i'* *i*², for a nozzled hose, and cocks *i*⁵ within the car, with the pump *j*, having a connection, *j'*, with said pipe, and a connection, *j*², with a supply-reservoir, the counter-shaft *k*², the belt-connections *k k*⁵, and

130 a controllable friction device, operated substantially as described, for the purpose specified.

11. A railway stock-car constructed with an

overhead floor extending from one end of the car to the other, and forming a roof-space for the purpose described, the said floor having a removable middle depressed part, substantially as described, for the purpose specified.

12. As a means of supplying water to stock in railway-cars, the connected supply-pipes *i* of the train, provided with a connection, *i'* *i*², for a nozzled hose and cocks *i*⁵ within each car, substantially as described, the said connected supply-pipes having water-communication with the tender-tank through a pump, *j*, in each car, and through the injector *l* of the locomotive, substantially as described, for the purpose specified.

13. As a means for supplying water to stock in railway-cars, the connected supply-pipes *i* of the train, provided with a connection, *i'* *i*², for a nozzled hose and cocks *i*⁵ within each

car, substantially as described, the said connected supply-pipes having water-communication with a reservoir through the forcing agency of either a pump or an injector located for connection with said supply-pipes, substantially as described.

14. In a stock-train the cars of which are provided with supply-pipes continuously connected throughout the train, means whereby the said connected supply-pipes may be used for watering the stock and for warming the cars of the train, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

W. H. WARD,

Witnesses:

A. E. H. JOHNSON,

J. W. HAMILTON JOHNSON.