3 Sheets—Sheet 1.

T. T. PROSSER.
Freight-Car.

No. 224,724. Patented Feb. 17, 1880.

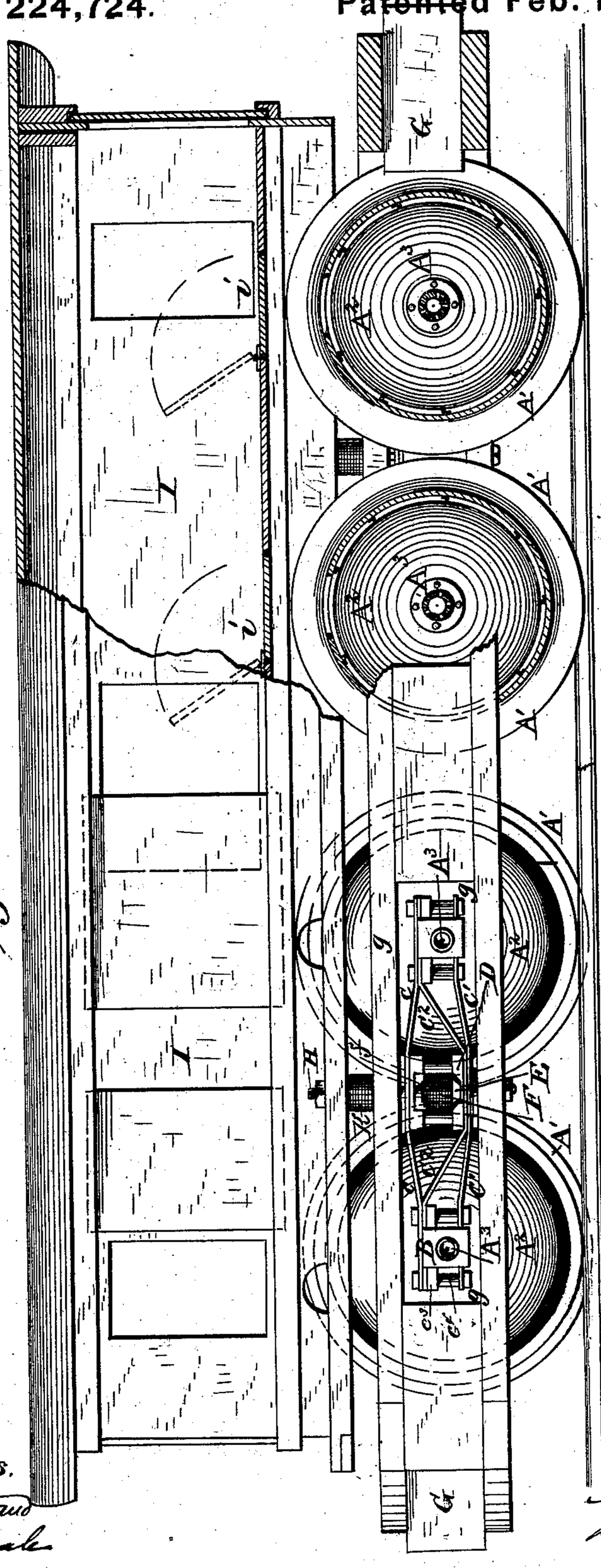

Fig. 1.

Witnesses.
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3 Sheets—Sheet 2.

T. T. PROSSER.
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Fig. 2.

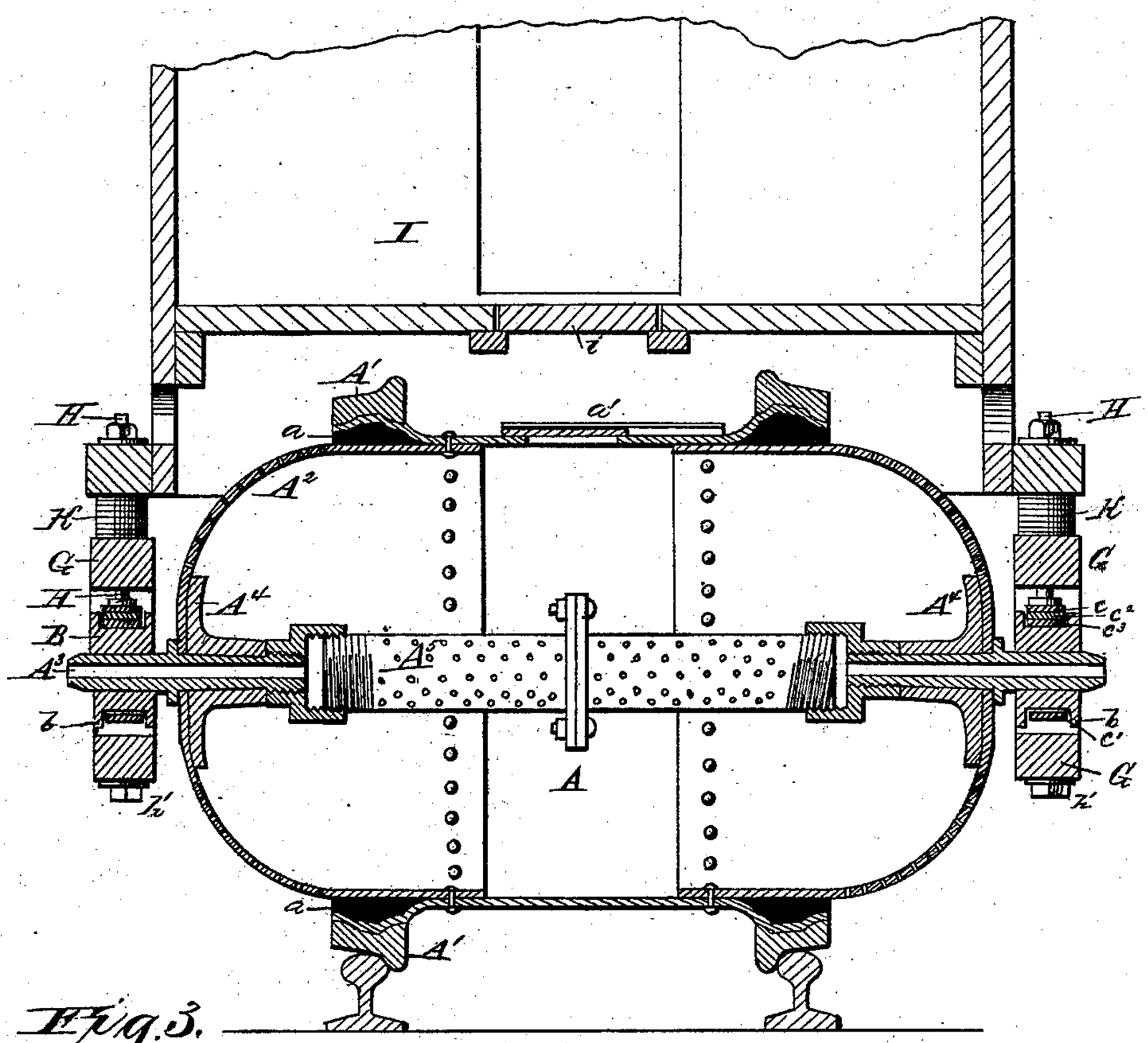
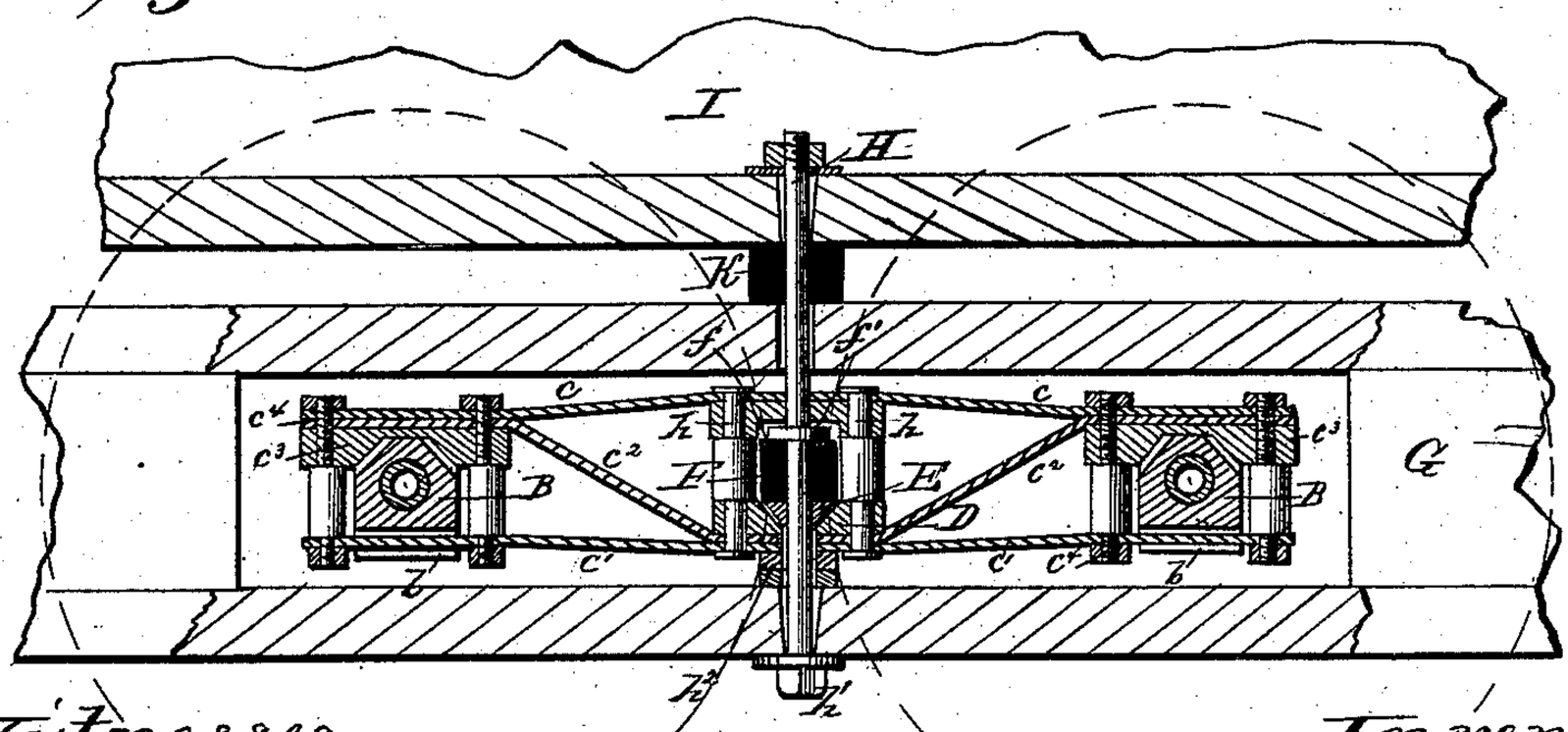


Fig. 3.



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3 Sheets—Sheet 3.

T. T. PROSSER.
Freight-Car.

No. 224,724. **Patented Feb. 17, 1880.**

Fig. 4.

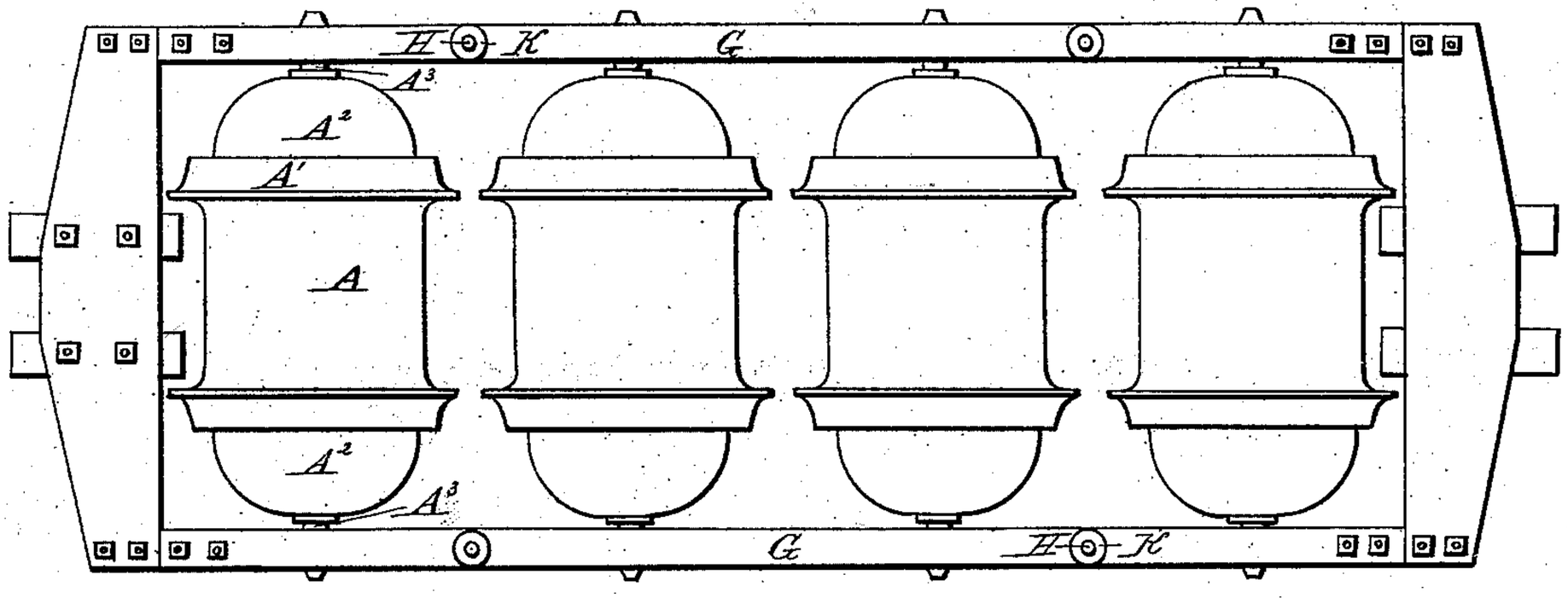
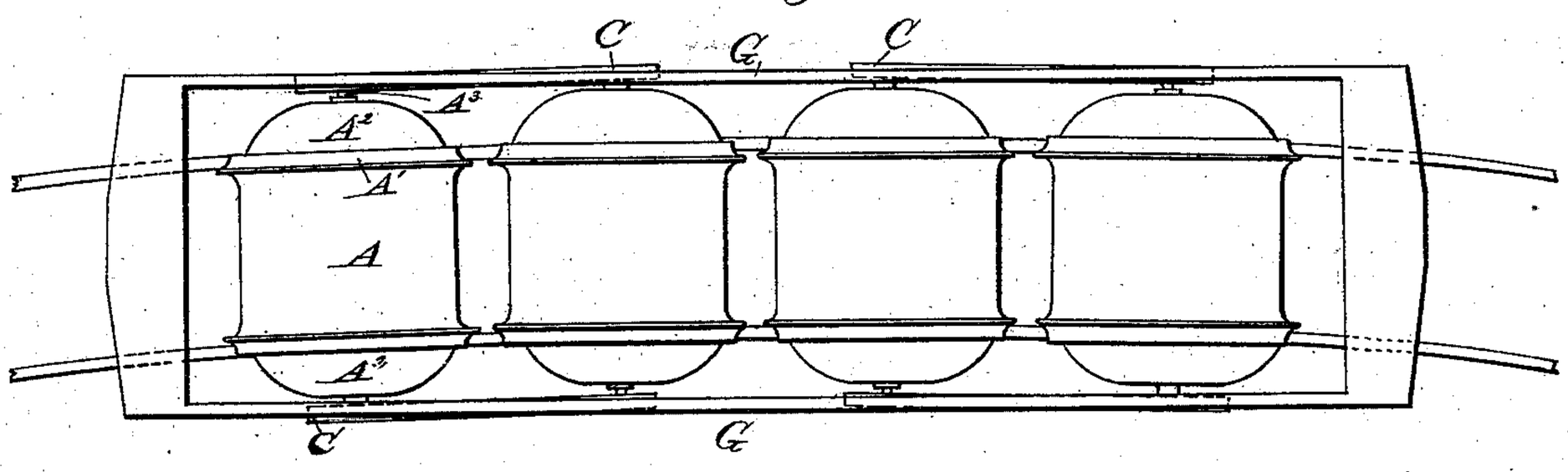


Fig. 5.



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UNITED STATES PATENT OFFICE.

TREAT T. PROSSER, OF CHICAGO, ILLINOIS.

FREIGHT-CAR.

SPECIFICATION forming part of Letters Patent No. 224,724, dated February 17, 1880.

Application filed November 1, 1879.

To all whom it may concern:

Be it known that I, TREAT T. PROSSER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Freight-Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to freight-cars principally designed for carrying grain in bulk, and to that end in part composed of large cylinders, which lie across and run directly on the track, on which they are supported by flanged tires.

The object of my invention is to construct the rolling cylinders in such a way that the flanged tires may have some comparatively independent elastic action to lessen vibrations and noise in running, and that the overhanging ends of the cylinders may have a tendency to push aside rather than to mount obstructions; also, to connect the rolling cylinders in pairs to the draft-frame, and in such a manner that said cylinders may adjust themselves independently as well as conjointly on the draft-frame, to the end of running with a minimum amount of friction in passing curves, switches, frogs, and inequalities of the track, and of relieving the draft-frame from cross-strains to a great extent; also, to combine the advantages of a box-car with the advantages of a rolling-cylinder car.

To these ends my invention consists of a rolling cylinder constructed with dome-shaped ends, and with flanged tires mounted on enlargements joined to the cylinder along one side, but open along the other side for the reception and retention of a rubber or other suitable elastic packing; also, of certain combinations and arrangements set forth in detail in claims at the close of this specification, and made up out of a box-car, a pair of cylinders, (or two pairs, according to the length of the car,) vibratory frames for connecting the cylinders in pairs, a draft-frame, king-bolts for connecting the vibratory frames and box-car to the draft-frame, and other devices associated with said enumerated parts.

In order that my invention may be clearly understood, I have illustrated in the annexed drawings and will proceed to describe the best form thereof so far devised by me. It should be understood, however, that some of the details of construction may be varied considerably to suit circumstances or the views of car builders and users without departure from the principle of my invention; also, that parts of my invention may be used without other parts thereof.

Figure 1 is a side view, partly in elevation and partly in section, of my improved car as it appears when constructed with two pairs of cylinders and a superimposed box-car. Fig. 2 is a vertical transverse section in the axial plane of one of the rolling cylinders. Fig. 3 is a detail view, in section, showing one of the vibratory frames and its connections with the journal-boxes of the cylinders, the draft-frame, and the box-car. Fig. 4 is a plan, the box-car having been removed. Fig. 5 is a diagram, showing the car running on a curve.

The same letters of reference are used in all the figures in the designation of identical parts.

The rolling cylinders are composed of the shell A, encircled by the flanged tires A′ A′, the dome-shaped heads A^2 A^2, and the hollow journals A^3 A^3. The shell and dome-shaped heads are preferably formed of seamless sheet metal. The dome-shaped heads terminate in cylindrical ends adapted to enter the shell, to which they are secured by rivets or bolts. The ends of the shell project some distance beyond the rivet-seams, and are expanded, preferably by spinning, into the flanged tires, which have an irregular interior contour, in order that they may be securely held in position on the overhanging ends of the shell when said ends have been expanded into the tires.

The tires are so much larger than the main body of the shell that by the expansion of its overhanging ends circular recesses are formed between these expanded ends and the heads A^2, in which circular recesses a rubber or other elastic packing, *a*, is inserted. This elastic packing cushions the tires on the cylinder, and in great measure absorbs shocks upon said tires, so as to lessen the injurious effect of such shocks on the cylinder. These shocks are also, in a measure, diverted from the cyl-

inder, because the tires are seated upon enlargements of its shell angularly joined thereto or extending therefrom. The elastic packing also serves as a sound-deadener.

Seating the tires upon enlargements of the shell has the effect of elevating the cylinder above the track to that extent beyond the line to which the tires would lift it if secured upon the plain portions of the cylinder, so that the cylinder can pass higher obstructions between the rails.

The dome-like shape of the cylinder-heads is not only desirable by reason of the superior strength imparted thereby to the whole cylinder, but also because, by reason of this form, the overhanging ends of the cylinder will push aside any obstructions they may run against, and, furthermore, because the grain can be much more readily discharged from the ends of a cylinder having such dome-shaped heads.

The shell A has a slide, a', covering an opening through which to load and unload the cylinder.

The hollow journals A^3 of the cylinder are firmly secured within the hubs of cheek-plates A^4 on the interior side of the dome-shaped heads. The inner ends of the hollow journals are connected by a sectional perforated pipe, A^5, through the perforations of which the air entering through the hollow journals is discharged into the mass of grain in the cylinders.

In order to maintain a circulation of air through the grain for ventilating and drying purposes, the cylinder has very numerous fine perforations. In damp weather the hollow journals may be temporarily plugged up, if deemed expedient.

The rolling cylinders are connected in pairs by means of vibratory frames C C, one of which connects the journals of the cylinders at one end thereof and the other of which connects the journals of the cylinders at the other end thereof.

The vibratory frames are exactly alike in construction, so that it is only necessary to describe one of them in detail. It is a trussed frame composed, in the main, of a top chord, c, a bottom chord, c', and an angular brace, c^2. At the ends the chords and brace are rigidly secured together by stay-bolts c^4, which also secure the box-seats c^3 to the brace under the top chord.

The box-seats are plates of metal of about the same width as the vibratory frame at the points of connection therewith, and are provided with a transverse recess having reversely-inclined edges, as clearly shown in Fig. 3. The journal-boxes B, in which the cylinder-journals turn, have a flat top surface, on which the flat portion of the recess-bottom of the box-seat can find a solid bearing; but their upper edges are chamfered to form inclines corresponding to the inclined edges of the recesses in the box-seats. The flat bottom of the box-seat recess is of somewhat greater extent than the flat top of the box, in order that the vibratory frame, with its box-seats and the journal-boxes, may have some longitudinal motion on one another without bringing the inclines on the box-seats in contact with the inclines on the journal-boxes.

The height of the journal-boxes is somewhat less than the distance between the recess-bottom of the box-seat and the bottom chord of the vibratory frame, between which the said boxes are included. Hence the vibratory frame may rise up on the journal box or boxes to some extent whenever an incline of its box-seats is forced against an incline of the journal-boxes, or vice versa. This loose connection of the journal-boxes with the vibratory frame also admits of a limited independent vertical play of the cylinders in running over joints and uneven places of the track, so that under such circumstances there will be no binding of the boxes on the journals, and consequently no heating of the latter.

The journal-boxes are held in position as against endwise displacement by flanges b, which overlap the sides of the vibratory frame; but a certain amount of play is also provided for between the flanges of the boxes and the sides of the vibratory frame, in order that the boxes may assume oblique positions within certain limits without binding on the vibratory frame, and thus accommodate themselves to the constantly shifting relative positions of the cylinders.

The vibratory frames are connected to the draft-frame by king-bolts H. The draft-frame G, when made of wood, has its sides constructed, preferably, of two parallel pieces of timber, at intervals connected by solid blocks of wood, as best seen in Fig. 1, leaving suitable openings for the accommodation of the vibratory frames. The sides of the draft-frame are rigidly secured together by end sills, of which two are employed at each end to correspond to the two longitudinal beams of each side, in line with which the end sills are arranged, so that shocks received by the end sills will be transmitted in direct lines to the beams of the sides. The draft-frame constructed in this manner possesses very considerable elasticity, and is strong and durable. Suitable draw-heads should be attached to the end sills.

The king-bolts H pass through the center of the vibratory frames. The arrangement of the several king-bolts and the construction and combination of parts immediately associated therewith being the same for all, it will only be necessary to explain these points with regard to one.

For the purpose of providing for elastic action between the draft-frame and the vibratory frame, and, consequently, the cylinders, I employ a spring, F, which encircles the king-bolt, and is confined between a cheek-plate, f, under a collar, f', on the king-bolt and a loose disk, E, which encircles the king-bolt below the spring and has a chamfered edge corresponding to the inclined edge of a recess in a plate, D, secured to the lower chord of the vi-

bratory frame. The recess in plate D is a little larger than disk E, so that there may be some little motion of these parts without causing the inclines to act one on the other.

In order to stiffen the vibratory frame at the center, stay-bolts *h h* are employed between the chords, which stay-bolts serve also to secure the plate D and a somewhat similar plate placed under the top chord for additional strength.

The lower end of the king-bolt is provided with a nut, *h'*, by turning up which the spring F may be compressed to any desired degree.

Washers or distance-plates h^2 are placed between the lower chord of the vibratory frame and the lower beam of the draft-frame, so as to keep the center of the vibratory frame a little elevated above the lower beam of the draft-frame, in order that said vibratory frame may rock to a limited extent in vertical planes in the opening of the draft-frame.

All the holes in the draft-frame and the vibratory frame and disks through which the king-bolt passes are somewhat larger than the king-bolt, in order to afford the latter a little lateral or canting play without wrenching on the vibratory frame.

It will be understood that a head might be formed on the lower end of the king-bolt, in which case the collar *f'* would have to be replaced by a nut, the upper end of the king-bolt being suitably formed to admit of the application of the nut above the spring F.

The king-bolts are made sufficiently long to pass through the side sills of a box-car, I, which is superimposed upon the draft-frame G, resting upon springs K, encircling the king-bolts. Nuts are applied to the upper ends of the king-bolts to screw down upon the side sills of the box-car.

The box-car is made of such a height that as an entirety my compound rolling cylinder and box-car will be of about the same height as an ordinary box freight-car, if desired. The floor of the box-car is provided with suitable hatchways *i* over the cylinder to correspond with the openings therein, in order to afford facilities for loading and unloading the cylinders through the box-car.

The length of the cylinders is some less than the distance between the sides of the draft-frame, or the distance between the journal-boxes of two opposite vibratory frames, so that the cylinders may have some endwise play without turning the vibratory frames.

The draft-frame should be strengthened by cross-ties at several available points along its length. Suitable brakes should be applied to act on the flanged tires of the cylinders.

The rolling cylinders of my improved car have such freedom of action that the car can run with great ease and little friction on curves of a much smaller radius than they are now usually constructed, or as may be seen by inspecting Fig. 5 of the drawings, which figure shows my car running on a curve of a radius of about three hundred feet.

In starting my car the draft-frame pulling upon the vibratory frames causes them to ride up on the journal-boxes of the cylinder-journals, in consequence of which a compression of the springs F takes place; but the resilience of the springs quickly returns the vibratory frames after the car has been started and the first great strain in overcoming the inertia of the car has been exerted.

In stopping the car the vibratory frames move in the opposite direction but very little, being held comparatively steady by the king-bolts; but the momentum of the cylinders forces the journal-boxes against the opposite inclines of the vibratory frames, pushing them up and compressing springs F. Thus elastic action between the draft-frame and the cylinders in stopping, starting, and buffing is provided for by the springs F, and in addition to this elastic action there is a yielding action, due to the lifting of the draft-frame, vibratory frames, and box-car by the inclines of the journal-boxes operating on the inclines on the vibratory frames. The canting tendency of the king-bolts is counteracted by the springs encircling them, the springs F being then acted on by the cheek-plates *f* above, as well as by the bevel-edged plates or disks E below.

The cylinders are interiorly provided with longitudinal flanges or ribs to take hold of the grain and check its tendency to roll in the cylinders.

By connecting the cylinders in pairs to the draft-frame through intermediate vibratory frames, it is entirely practicable to place two pairs of cylinders of large capacity within a single draft-frame, so as to extend the length of the entire car to about the length of the ordinary box freight-car.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The rolling cylinder of a freight-car having dome-shaped ends or heads, substantially as before set forth.

2. The rolling cylinder of a freight-car having its flanged tires seated on overhanging enlargements thereof, substantially as before set forth.

3. The rolling cylinder of a freight-car having its flanged tires seated on overhanging enlargements expanded into the tires for securing said tires, substantially as before set forth.

4. The combination, substantially as before set forth, of the rolling cylinder of a freight-car, the flanged tires seated on overhanging enlargements of the cylinder, and elastic packing under the overhanging enlargements.

5. The combination, substantially as before set forth, of a pair of rolling cylinders of a freight-car, the vibratory frames for connecting the journals of the cylinders, the draft-frame, and the king-bolts for connecting the vibratory frames to the draft-frame.

6. The combination, substantially as before set forth, of the vibratory frames and the journal-boxes for the cylinder-journals, loosely arranged in the vibratory frames and having

inclines on top to act on corresponding inclines on the vibratory frames.

7. The combination, substantially as before set forth, of the draft-frame, the vibratory frames for connecting the journals of a pair of rolling cylinders, the king-bolts, the springs included in the vibratory frames, and the journal-boxes having inclines on top to act on corresponding inclines on the vibratory frames.

8. The combination, substantially as before set forth, of the draft-frame, the king-bolt, the vibratory frame, the spring within said vibratory frame, and the disk or plate under the spring having inclined edges to act on corresponding inclines on the vibratory frame.

9. The combination, substantially as before set forth, of a single draft-frame and two pairs of rolling cylinders, each pair being connected to the draft-frame by separate vibratory frames and king-bolts.

10. The combination, substantially as before set forth, of the rolling cylinders, the draft-frame, and the box-car.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of October, 1879.

TREAT T. PROSSER.

Witnesses:
WM. HAUSBROUGH,
W. R. WILSON.