No. 751,476. PATENTED FEB. 9, 1904.

J. DEW.

SAFETY TRUCK FOR RAILWAYS.

APPLICATION FILED MAR. 23, 1901.

NO MODEL. 3 SHEETS—SHEET 1.

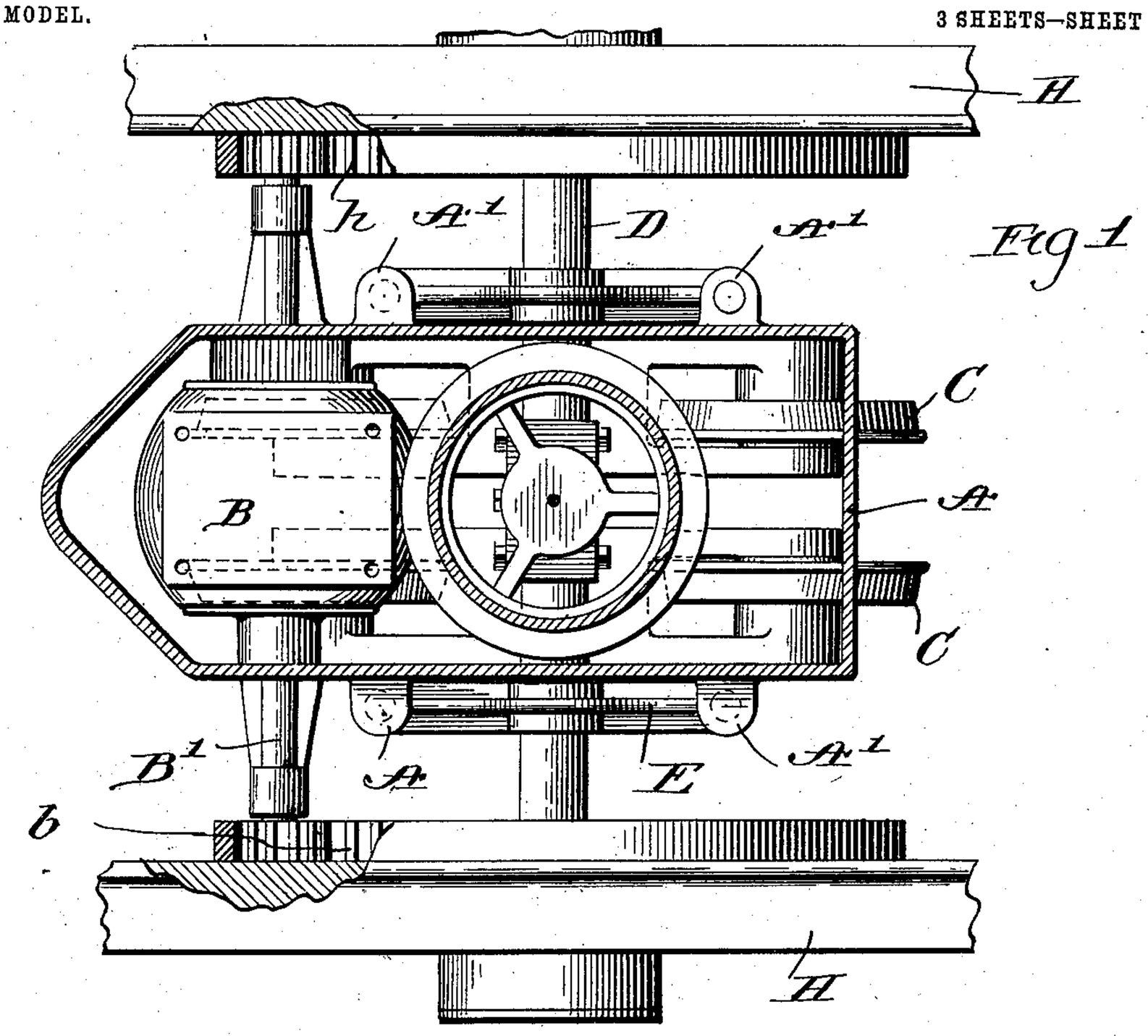

Fig. 1

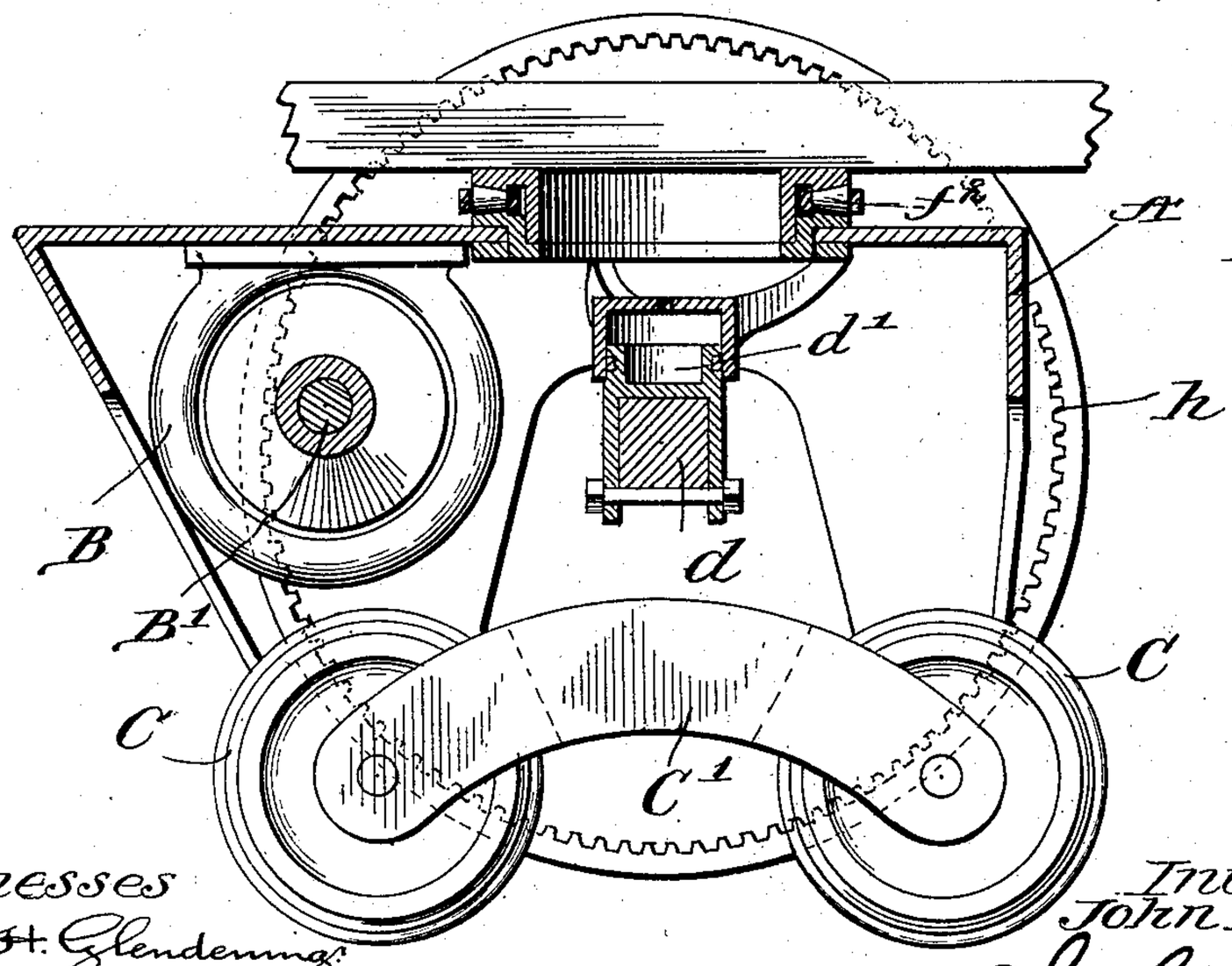

Fig. 2

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3

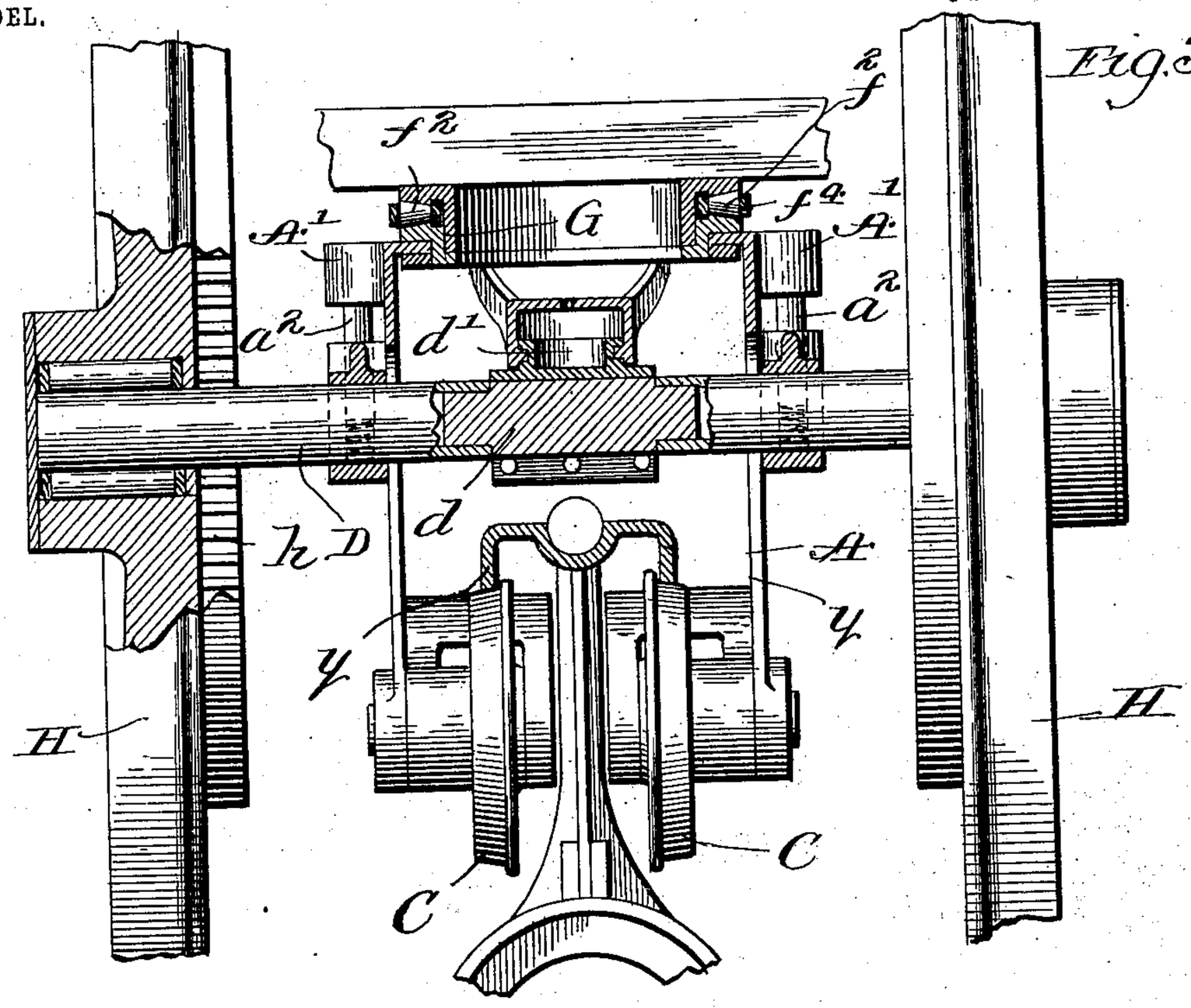


Fig. 4

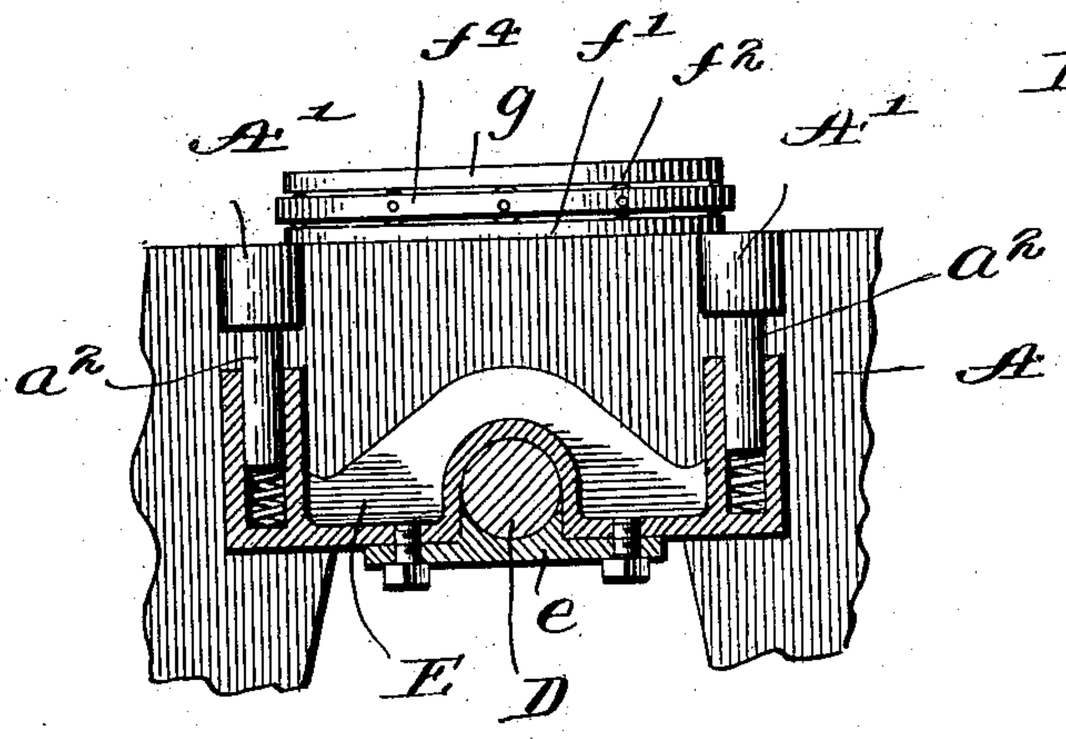
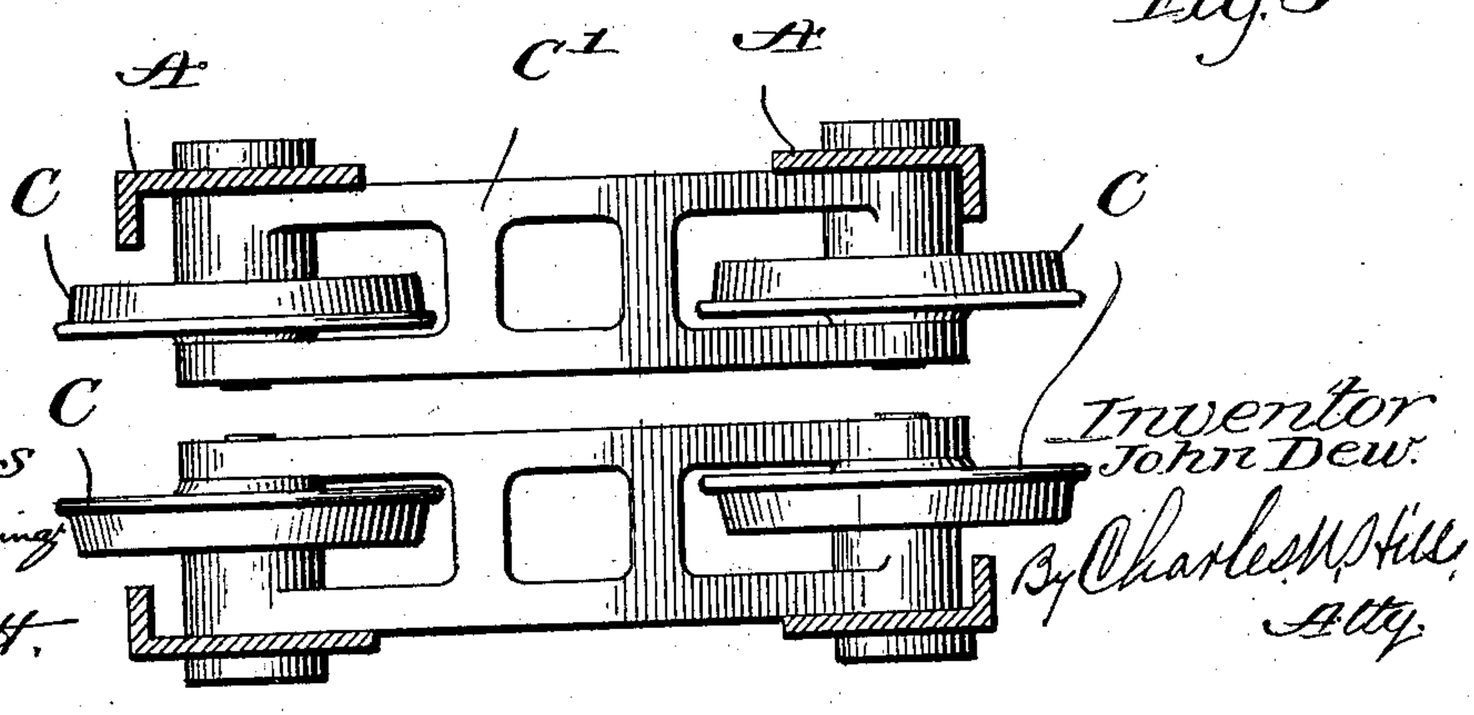


Fig. 5



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 6

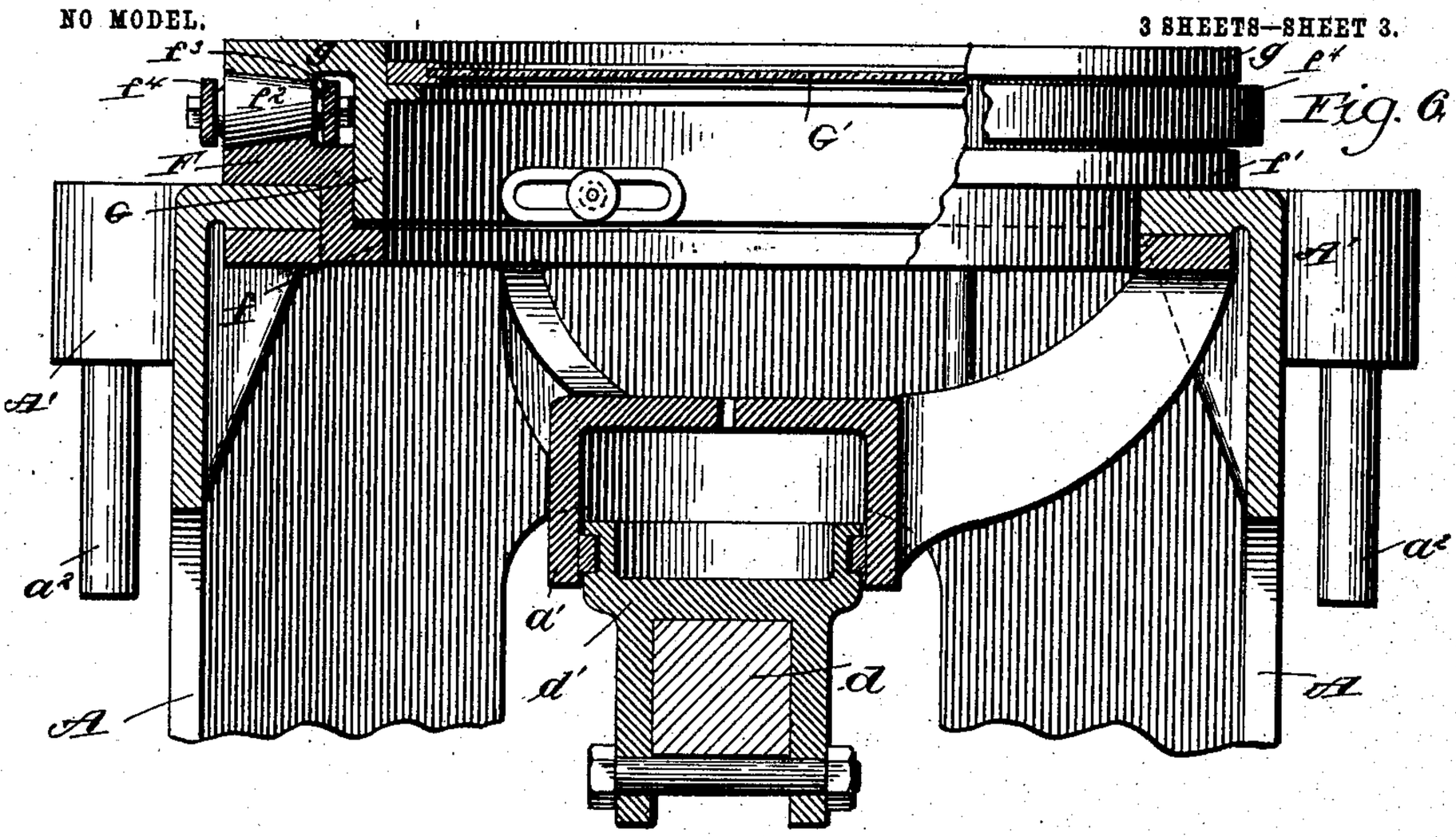
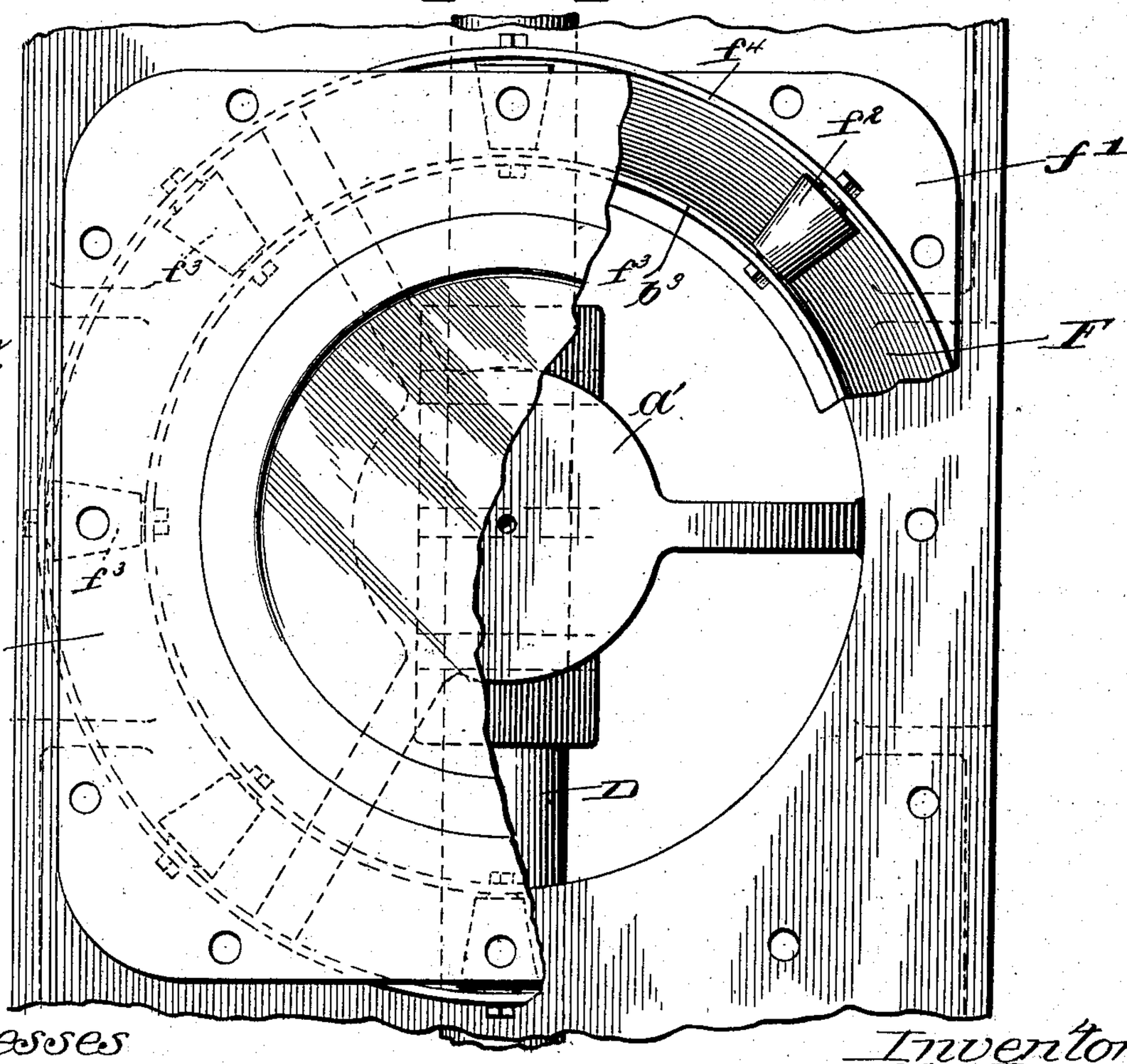


Fig. 7.



Witnesses
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Inventor
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By Charles J. Hills,
Atty

No. 751,476. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

JOHN DEW, OF CHICAGO, ILLINOIS, ASSIGNOR TO L. S. M. HOOD, TRUSTEE, OF CHICAGO, ILLINOIS.

SAFETY-TRUCK FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 751,476, dated February 9, 1904.

Application filed March 23, 1901. Serial No. 52,483. (No model.)

To all whom it may concern:

Be it known that I, JOHN DEW, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Safety-Trucks for Railways; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to safety-trucks for railways, and more particularly to safety-trucks provided with means for increasing the pressure of the track-wheels upon the rails, and at the same time oppositely engaging a rail or rails intermediate of the track-rails in a manner to prevent derailment of the car.

The object of the invention is to provide a railway-truck adapted for use on high-speed railways, and provided with guard-wheels supported on the truck and adapted to engage rails intermediate of and above the track-rails in such a manner as to firmly bind the track-wheels to the track.

The invention also has for its object the reducing of vibration when a car provided with my improved trucks is in motion provided with means for pneumatically supporting the weight of the car.

The invention embraces many novel features of construction; and it consists of the matters hereinafter described, and more fully pointed out and defined in the appended claims.

In the drawings, Figure 1 is a view of a device embodying my invention, partly in top plan view and partly in horizontal section. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a fragmentary transverse section of the same. Fig. 4 is a detail of a hanger or saddle embodied in my invention. Fig. 5 is a horizontal section taken above the guard-trucks. Fig. 6 is an enlarged vertical section, partly broken, of the upper part of the truck. Fig. 7 is a fragmentary top plan view of the same.

In said drawings, A indicates the truck-frame, as shown, constructed of cast metal, and consisting of a forwardly-projecting pointed end portion adapted to contain the motor B, herein shown as an electric motor. Said frame extends downwardly at each corner forming the bearings for the guide-wheels C C, as shown, four in number, located two on each side of a longitudinal median line of the truck and adapted to engage beneath the downwardly-directed guard-rails *y y*. Said trucks C are journaled transversely of the frame in the arched tie-pieces C′ C′, which are apertured transversely at each end to receive the axles therefor. Said tie-pieces, as shown, are constructed integrally and slotted longitudinally at the ends, as indicated in Fig. 5, to receive the wheels, which may be of any desired construction, but which, as shown, are arranged with the flanges turned inwardly. The bearings for said wheels may, if preferred, be antifriction-bearings, such as ball or roller bearings of any desired kind. The main axle D extends transversely of said frame A above and between the front and the rear guard-wheels and may be constructed tubular, as shown in Fig. 3. If so constructed, the same may be conveniently made in two sections and welded to a central core *d*, about which is rigidly secured by bolting or like means a casing or jacket of wrought metal, as indicated in Figs. 1 and 3, which is provided centrally on the upper side of the shaft with a tubular vertical projection *d′*, preferably concave on its upper end. Rigidly secured in the top of said frame and depending centrally within the same and connected to the frame by a plurality of radial arms is the downwardly-opening cylinder *a′*, which fits closely to said cylindric projection *d′* and forms the other member of a compression-chamber. A packing-ring of any desired kind is provided on one of said members, as shown, *d′*, to afford an air-tight joint. The chamber formed between the members *a′* and *d′* is adapted to receive air under pressure sufficient to support the weight of the truck-frame and one end of the car supported thereon, thereby serving as an air-cushion or pneumatic spring for cars. By increasing pressure therein the frame may be lifted with respect to the shaft D, thereby drawing the

guide-wheels C into more positive engagement with the guide-rails and proportionately increasing the frictional contact of the track-wheels H H with the track-rails.

For the purpose of supporting the frame laterally integral projections A′ A′ are provided on each side of the frame having secured therein the downwardly-projecting pins a^2 a^2. As shown in Fig. 1, there are two such downwardly-extending pins on each side of said car-frame, one on each side of the axle D. A hanger or saddle E is provided, comprising a forging or casting formed centrally to fit on the shaft D, as shown in Figs. 1 and 3, and provided at each end with an upwardly-opening socket adapted to engage said pin, as shown in Fig. 4. Strong spiral or other pushing springs are seated in said sockets, so that a considerable upward strain is thereby at all times maintained on the pins. A plate *e* is rigidly bolted or otherwise secured on said saddle beneath the shaft, and serves as a brace therefor as well as holding the same in position. Said saddle may obviously be provided with a strengthening-web of any desired form or size to enable the same to stand the thrust of said pins due to the tendency of the car to sway laterally.

For the purpose of enabling the truck to have a slight swiveling motion the better to enable the same to turn curves the top of the frame is provided with a large circular aperture concentric with the axis of the air-cushion and opening between the arms thereof. A ring F, more plainly indicated in Figs. 6 and 7, is seated therein and provided with an inwardly-directed flange *f* and a flange *f′*, which extends along the top of the frame and is rigidly bolted thereto, as shown in Fig. 7. Said outer flange *f′* is beveled outwardly and downwardly on its upper surface to correspond with the slant of the conical rollers f^2, a plurality of which are disposed around said aperture, as indicated in partly dotted lines in Fig. 7. Said rollers are journaled at their opposite ends in the inner and the outer rings f^3 f^4, which form a bearing therefor and serve to keep said rollers in place. The sleeve G fits closely in the member F, as indicated in Fig. 6, and is provided at its top with a laterally-directed flange *g*, the under surface of which is beveled complementally to the slope of said conical rollers and is adapted to move thereon. Said sleeve extends within said member approximately to the flange *f*, and for the purpose of securing the same therein it is provided with a plurality of circumferential slots extending therethrough, each adapted to receive a stud-shaft, as shown in Fig. 6, rigidly secured in the ring F. A roller of any desired kind adapted to reduce friction is secured on said stud-shaft and fits closely in said slot. The sills of the car are rigidly secured on the top of the sleeve G, as indicated in Fig. 2.

For the purpose of affording access to the interior of the truck-frame when the car is in motion a plate G′ is fitted closely in the central aperture of the sleeve G, as indicated in Figs. 6 and 7, said sleeve being provided with an internal circumferential flange for the purpose of supporting the same. Said cover or fitting may be constructed in part of thick plate-glass to enable the interior of the truck to be inspected without removing the same. The track-wheels H H are preferably of large diameter, secured on the ends of the axles D by means affording antifriction-bearings of any preferred form. As shown in Fig. 3, a roller-bearing is used, though obviously any suitable antifriction-bearing may be employed.

Any preferred motive power may be used. As shown, an electric motor B is located slightly in advance of the axle D, and the ends of the shaft B′ thereof extend to points adjacent to the inner sides of the track-wheels and provided with a gear-wheel *b*, which intermeshes with complemental gear-wheels *h*, rigidly secured on each driving-wheel.

The operation is as follows: The car being constructed with one or more trucks, similar to those hereinbefore described, said truck is adapted to turn sufficiently with respect to the car to enable the same to turn any ordinary curves. The air-cushions, supported centrally on the axles D, take up all vibration due to the movement of the car. The lateral sway or swing of the car is obviated by means of the thrust-pins a^2. Said trucks are designed more particularly for high-speed railway-trains and for cars of much less weight than those ordinarily in use. If it is desired to increase the frictional engagement of the track-wheels with the rails, air may be pumped into the chamber of the cylinder *a′* through any suitable pipe connection, with the effect of slightly elevating the truck-frame, thereby drawing the guide-wheels into closer engagement with the guard-rails and proportionately increasing the pressure of the track-wheels H H on the rails. Obviously while the frame is shown and has been described as constructed of cast metal malleable, the same may preferably be contructed of structural steel, forming a truss construction in a familiar manner, thereby greatly increasing the strength thereof as well as decreasing the weight.

Many features of construction may be varied without departing from the principle of my invention.

I claim as my invention—

1. A railway-truck comprising in combination with the frame and track-wheels, a pneumatically-adjustable guard-wheel supported below the axle and adapted to engage beneath a guard-rail intermediate of the track-rails.

2. In a device of the class described the combination with a truck-frame, an axle and the track-wheels thereon, of a pneumatically-adjustable guard-wheel journaled on said frame

below the axle and adapted to engage a rail intermediate of the track-rail and means for augmenting the pressure of the track-wheels and the guard-wheel on the respective tracks.

3. In a device of the class described the combination with a truck-frame, an axle and the track-wheels thereon, of a plurality of pneumatically-adjustable guard-wheels journaled on said frame below the axle and adapted to engage a rail intermediate of the track-rail and means for augmenting the pressure of the track-wheels and the guard-wheels on the respective tracks.

4. In a railway-truck, the combination with the truck-frame an axle and the track-wheels thereon of a guard-wheel journaled below the axle adapted to engage beneath a guard-rail rigidly supported intermediate of and above the track-rails and pneumatic means for varying the pressure of said wheels on the respective tracks.

5. In a railway-truck the combination with the truck-frame, an axle and the track-wheels thereon of a plurality of guard-wheels journaled below the axle adapted to engage a guard-rail rigidly supported intermediate of and above the track-rails and pneumatically-operated means for varying the pressure of said wheels on the respective tracks.

6. A railway-truck comprising in combination with the truck-frame, the axle and the track-wheels, a swivel carried on the frame and a pneumatic cushion supported on said axle and adapted to sustain the weight of the car, and means operated by said cushion to increase the tension of the track-wheels.

7. A railway-truck comprising in combination with the truck-frame, the axle and the car-wheels, pneumatically-operated means adapted to increase the downward pressure of said wheels and a pneumatic cushion supported on said axle and adapted to sustain the weight of the car.

8. The combination with a truck-frame, a non-rotative axle and track-wheels rotative thereon, of a pneumatic cushion supported centrally on the axle and acting to yieldingly support the truck-frame and car and means supported below the axle adapted to engage a downwardly-turned guard-rail intermediate of and above the track-rails.

9. The combination with a truck-frame, a non-rotative axle and track-wheels rotative thereon, of a pneumatic cushion supported centrally on the axle and acting to yieldingly support the truck-frame and car and a guard-wheel rotatively supported below the axle adapted to engage a downwardly-turned guard-rail intermediate of and above the track-rails.

10. In a truck for railways the combination with a car-frame, non-rotative axle and the track-wheels journaled at the ends of the same, of guard-wheels supported on the truck-frame below the axle and acting respectively to engage downwardly-directed guard-rails located intermediate of and above the track-rails, a pneumatic cushion supported on the axle and supporting the truck-frame and means for varying the pressure on said cushion whereby the car-frame may be elevated thereby forcing the guard-wheels into positive engagement with the guard-rails.

11. In a device of the class described, the combination with a truck-frame, the axle and track-wheels of a railway-truck, of a plurality of guard-wheels supported from the axle intermediate of the track-wheels by means affording a pneumatic cushion.

12. In a device of the class described the combination with a non-rotative axle of rotative track-wheels on the ends thereof, a plurality of guard-wheels located intermediate of the track-wheels and means for yieldingly supporting the same upon the axle.

13. The combination with a non-rotative axle, of a part secured centrally thereon adapted to form one of the members of a pneumatic cushion, the other member thereof being attached to the truck-frame and guard-wheels supported on the truck-frame.

14. In a device of the class described an axle, track-wheels secured on each end thereof, pneumatic means supported on the axle, acting to yieldingly support a truck-frame and weight imposed thereon, and a saddle yieldingly engaged on each side of the center adapted to absorb vibration due to the movement of the car.

15. In a device of the class described, the combination with a non-rotative axle, and rotative track-wheels secured thereon by means affording antifriction-bearings, of a truck-frame pneumatically supported on said axle centrally thereof and guard-wheels located below the axle and adapted to positively engage a downwardly-directed guard-rail.

16. In a railway-truck, the combination with a truck-frame supported centrally of a car-axle and pneumatic means for supporting the same, of a ring secured at the top of the truck-frame, a sleeve secured therein and adapted to support the car-frame, antifriction-bearings between said ring and sleeve.

17. In a device of the class described, the combination with a truck-frame supported centrally on a car-axle by means affording a pneumatic cushion, a ring secured in the top of said frame, a sleeve secured therein, a flange on the ring and on the sleeve and a plurality of conical rollers interposed between said flanges whereby the same are adapted to have rotative movement with respect to each other.

18. In a device of the class described the combination with a truck-frame supported centrally on a car-axle by means affording a pneumatic cushion, a ring in the top of said frame, a sleeve secured on the car end and fitting therein, a plurality of conical rollers interposed between said ring and sleeve whereby

the same are adapted to have rotative movement with respect to each other and interlocking means on said ring and sleeve acting to hold the same in operative relation.

19. The combination with a truck-frame and a car-axle of means comprising a member supported on the axle and a member secured on said frame together affording an air-cushion a hanger or saddle on each side of said frame adjacent to the axle and thrust-bearings secured laterally on the frame engaging therein.

20. The combination with a truck-frame and a car-axle of means affording a pneumatic spring or cushion comprising a member supported on the axle and a member secured on said frame, a saddle or hanger on each side of said frame adjacent to the axle, sockets therein and a thrust-pin or bearing on each side of the shaft engaging in said sockets in said saddle and a spring interposed in said sockets adapted to be compressed by said pins.

21. In a device of the class described, the combination with the axle of a truck-frame supported thereon, means comprising interfitting members on the axle and on the truck-frame together acting to form a pneumatic cushion, guard-wheels located below the axle and supported on said frame and adapted to be drawn upwardly into positive but yielding engagement with guard-rails.

22. In a device of the class described the combination with a pneumatically-supported truck-frame, of a downwardly-beveled ring secured axially thereof, a sleeve adapted to be secured to the car, interfitting with said ring and beveled upwardly and antifriction-bearings beveled to fit the beveled faces of the ring and sleeve, said members together forming a pivoted bearing of the truck with the car.

23. In a device of the class described, a car-axle, a car-frame supported thereon by means affording a pneumatic cushion, a pivotal bearing for said frame and the car adapted to be supported thereon comprising a ring rigidly secured in the top of said frame, a sleeve interfitting therewith, antifriction-bearings between the same, an opening leading through said members to the interior of the car-frame and a closure for said openings.

24. A railway-truck comprising in combination with the frame and track-wheels, a guard-wheel located below the axle, and adapted to engage a guard-rail intermediate of the track-rails, a motor supported on said frame and provided with means for engaging and operating the track-wheels and pneumatically-operated means for adjusting the guard-wheel opposite from the track-wheels acting to produce greater pressure of the latter upon their respective rails.

25. In a truck for railways the combination with a car-frame, non-rotative axle and the track-wheels journaled at the ends of the same, of guard-wheels supported on the truck-frame below the axle and acting respectively to engage downwardly-directed guard-rails located intermediate of and above the track-rails, a pneumatic cushion supported on the axle and supporting the truck-frame and means for varying the pressure on said cushion whereby the car-frame may be elevated thereby forcing the guard-wheels into positive engagement with the guard-rails and a motor supported on said frame and provided with means for engaging and operating the track-wheels.

26. In a device of the class described, the combination with a car-truck frame and its axle, of guard-wheels located below the axle on each side thereof and on each side of a longitudinal median line thereof and adapted to engage one or more guard-rails secured intermediate of the track-rails and above the same and pneumatic means for varying the elevation of said guard-wheels with respect to the track-wheels.

27. The combination with a car-axle of a cylindric member secured centrally thereon, a cylindric casing secured on a car-truck frame and adapted to receive the same, and therewith form a pneumatic cushion, means for introducing air under pressure therein and antifriction means for supporting a car on said frame, and guard-wheels supported from the truck-frame.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

JOHN DEW.

In presence of—
L. S. M. HOOD,
G. H. GLENDENNING.