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RAILWAY TRUCK.

APPLICATION FILED FEB. 27, 1911.

994,252. Patented June 6, 1911.

Fig. 1.

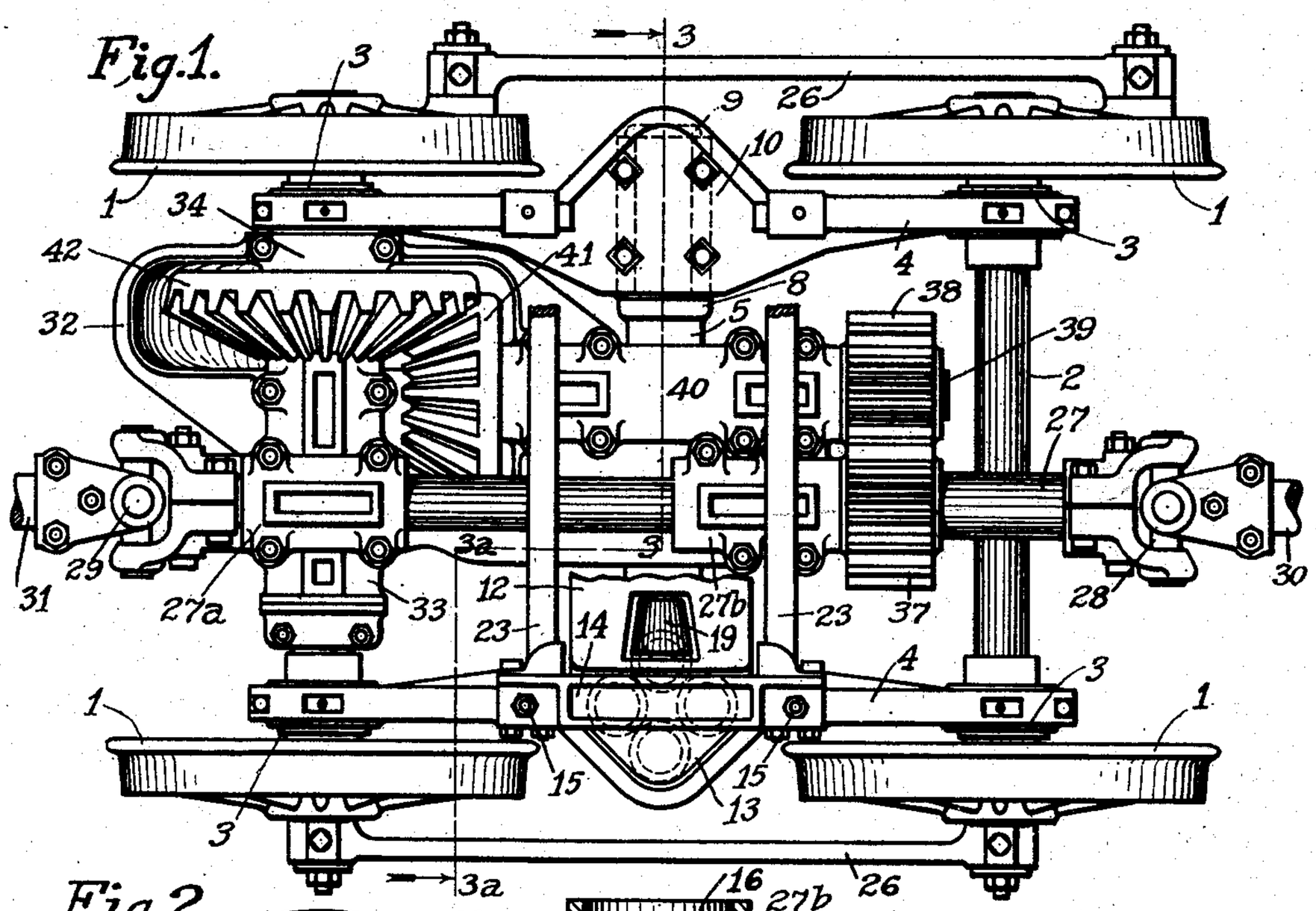

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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WILLIAM M. FAWCETT AND GEORGE L. SWABB, OF ERIE, PENNSYLVANIA, ASSIGNORS TO THE HEISLER LOCOMOTIVE WORKS, OF ERIE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

RAILWAY-TRUCK.

994,252. Specification of Letters Patent. **Patented June 6, 1911.**

Application filed February 27, 1911. Serial No. 611,241.

To all whom it may concern:

Be it known that we, WILLIAM M. FAWCETT and GEORGE L. SWABB, citizens of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Railway-Trucks, of which the following is a specification.

This invention relates to railway trucks, and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

More particularly the invention relates to locomotive trucks, especially that type of trucks known as geared locomotives.

The invention is peculiarly adapted for locomotives wherein it is desired to use more than two trucks from a single source of power. Where this is done, it is desirable to arrange a longitudinal shaft which will extend across the intermediate truck, and also drive the intermediate truck.

Among the important objects of the invention is to provide a railway truck in which the different members of the frame are so connected that variations in the track will not strain the frame, and to this end, we form the frame with frame sides which are mounted on the axles, and connect these frame sides with a cross bar, the connection being in the form of a joint with the axis of the joint crosswise of the frame. In this way, the ends of the side frames, or the different wheels may follow the sinuosities of the track in a vertical direction without imparting strain on the frame. The other portions of the frame, as well as the driving mechanism are made with a view to permit of this flexibility of the frame. At the same time, the frame is rigid in those directions in which rigidity is required.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 is a plan view of the truck, parts being removed to better show construction. Fig. 2 a central vertical section of the truck. Fig. 3 a section on the lines 3—3 and 3^a—3^a in Fig. 1. The part at the right of Fig. 3 being on the line 3^a—3^a in Fig. 1 and the part at the left of Fig. 3 being on the line 3—3 in Fig. 1. Fig. 4 a section of the web of the axle gear. Fig. 5 a sectional view of the axle gear rim.

1, 1, 1, 1, mark the truck wheels. These are fixed on the axles 2, 2. Bearings 3, 3, 3, 3, are arranged on the axles, and the side frames 4, 4, are carried by these bearings. A cross bar 5 connects the side frames, the side frames being provided with bearings 6 for this purpose. These bearings have the tops formed in the side frame, and have removable caps 7 at the bottom. The cross bar 5 has the shoulders 8 and 9 at the ends of the bearings 6, thus locking the side frames laterally with relation to the cross bar. It will be noted that the bearings are of considerable length so that the side frames are held in a vertical position by the cross bar, but at the same time, the ends of the side frames can swing on the cross bar and relatively to each other to follow the sinuosities of the track in a vertical direction.

The side frames are provided with the spring pockets 10. These are open at the top as clearly shown at the top of Fig. 1. Springs 11 are arranged in these pockets, the bottoms of the springs resting on the bottom of the pocket as clearly shown in Fig. 3. The spring bar 12 extends across the truck and the ends 13 of the spring bar extend into the pocket and rest on the springs. The ends, however, do not fit the pocket so closely as to interfere with the freedom of movement of the side frames on the cross bar. Caps 14 are arranged across the ends of the spring bar, and are secured to the side frames at the sides of the pockets by means of the bolts 15.

The center bearing plate 16 is arranged at the center of the spring bar, and the locomotive bolster 17 has a center bearing plate 18 which operates in the center bearing plate 16 of the spring bar in the usual manner.

In order to make the swinging of the truck on the bolster as free as possible, the cone rollers 19 are arranged at each side of the center of the spring bar 12. These cone rollers have the pins 20 which extend into the bearings 21 in the spring bar. The bearing plate 22 on the bolster is normally just in contact with these rollers. In this way the rollers receive any undue strain from the bolster, and relieve any friction there may be between the plate 22 and the spring bar.

We prefer to provide flexible tie rods 23 at the top of the truck. As shown, these are in the form of flat bars which have the

downwardly bent ends 24 and are secured to the side frames by means of the bolts 25. These tend to hold the upper parts of the side frames against spreading, and relieve the bearings 6 of some of this strain. It will be understood, however, that these tie rods are sufficiently flexible to permit of the free swinging of the side frames under strain on the bearings 6. The power is preferably supplied to one of the axles, and connected to the wheels on the other axle by the connecting rods 26 which are arranged to operate on the cranks on the wheels.

The driving mechanism is as follows: The drive shaft 27 extends longitudinally of the truck above the axles. The drive shaft 27 is connected by the knuckle joints 28 and 29 with the shafts 30 and 31. Ordinarily one of the shafts 30 or 31 conveys the power to the shaft 27 and the other of the shafts 30 or 31 is driven from the shaft 27 to communicate the power to another truck. It will be understood, however, that one of the shafts 30 or 31 may be and ordinarily is omitted where the truck as shown is used as an end truck. A gearing frame 32 is mounted on one of the axles by means of the bearings 33 and 34. This gear frame has the downwardly extending ears 35 which extend each side of a lug 36 extending upwardly from the cross bar 5. A pin 36^a extends through the ears and the lug forming a mounting for the gear frame on the cross bar 5, the mounting being in the form of a joint with the axis of the joint lengthwise of the truck. This allows the gear and frame to swing with the axle. The drive shaft 27 is mounted in the gear frame by means of the bearings 27^a and 27^b, these bearings being as widely separated as they can be conveniently to better support the shaft. A spur gear 37 is fixed on the shaft 27 and meshes a gear 38. The gear 38 is fixed on the auxiliary shaft 39 which is arranged parallel to the shaft 27 and is dropped below the plane of the shaft 27 a sufficient distance to bring the axis of the shaft 39 into alinement with the axis of the axle. The shaft 39 is mounted in the bearing 40 in the gear frame 32. The beveled gear 41 is fixed on the shaft 39 at the end of said shaft opposite the gear 38. The beveled gear 41 meshes the gear 42 fixed on the axle. In this way, the shaft 27 may be carried across the axles 2 and the power delivered to the axle of the truck by spur and beveled gears forming a very efficient means for communicating the power. At the same time, the gear frame is supported by one of the axles and the cross bar so that the gear frame may be made of sufficient rigidity to maintain the alinement of the shafts and the proper relation of the gears. The gear frame, it will be observed, extends around the gear 42 having a bearing at both sides of said gear so as to maintain the relation between the beveled gears. At the same time, this scheme of driving lends itself readily to a flexible truck frame, comprising frame sides with the cross bar connected with said side frames with a swivel joint.

We have shown beveled gear 42 in Figs. 4 and 5. It is formed of the center web 44 fixed on the shaft and the gear segments 43 carrying the gear teeth which are secured to the web 44 by the bolts 45. By arranging the gear at one side of the center of the axle and having the gear face toward the center of the axle, it is possible to remove these segments and renew them without taking down a large part of the gear frame. It also permits of a more satisfactory bearing for the bearing frame.

What we claim as new is:

1. In a device of the class described, the combination of truck axles; side truck frames mounted on the axles; a cross bar; a swivel connection between the cross bar and side frames, the axis of the connection being crosswise of the frame; and means independent of said bar for sustaining the load on the truck.

2. In a device of the class described, the combination of truck axles; side truck frames mounted on the axles; spring pockets in the side frames; a cross bar, a swivel connection between the cross bar and side frames, the axis of the connection being crosswise of the frame; and a spring bar resting on the springs, said spring bar being flexibly secured in place in the pockets.

3. In a device of the class described, the combination of truck axles; side truck frames mounted on the axles; spring pockets arranged in the side frames; springs in the pockets; a spring bar mounted on the springs and flexibly secured in the pockets; a cross bar; and a swivel connection between the cross bar and side frames, the axis of the connection being crosswise of the frame, said connection being arranged to sustain the side frames in position independently of the spring bar.

4. In a device of the class described, the combination of truck axles; side truck frames mounted on the axles; spring pockets arranged in the side frames; springs in the pockets; a spring bar mounted on the springs and flexibly and removably secured in the pockets; a cross bar; and a swivel connection between the cross bar and side frames, the axis of the connection being crosswise of the frame, said connection being arranged to sustain the side frames in position independently of the spring bar, said spring bar being removable with the side frames in place on the cross bar.

5. In a device of the class described, the combination of truck axles; side truck frames mounted on the axles; a cross bar;

a swivel connection between the cross bar and side frames, the axis of the connection being crosswise of the frame; and a flexible tie rod extending from the top of one side frame to the top of the other.

6. In a device of the class described, the combination of truck axles; frame sides mounted on said axles; a cross bar connecting the sides; a gear frame mounted upon one of the axles and the cross bar; a beveled gear on the axle carrying the bearing frame; an auxiliary shaft mounted in the gear frame; a beveled gear on said shaft meshing the gear on the axle; a drive shaft mounted on the gear frame; and a drive connection between the two shafts.

7. In a device of the class described, the combination of truck axles; frame sides mounted on said axles; a cross bar connecting the sides; a gear frame mounted upon one of the axles and the cross bar; a beveled gear on the axle carrying the gear frame; an auxiliary shaft mounted in the gear frame; a beveled gear on said shaft meshing the gear on the axle; a drive shaft mounted on the gear frame in parallel relation with the auxiliary shaft; and a drive connection between the two shafts.

8. In a device of the class described, the combination of truck axles; frame sides mounted on the axles; a cross bar connecting the sides; a gear frame mounted on one of the axles and having a swivel connection with the cross bar, the axis of the connection being lengthwise of the truck; a beveled gear on the axle carrying the gear frame; an auxiliary shaft mounted on the gear frame; a beveled gear mounted on the auxiliary shaft meshing the gear on the axle; a drive shaft extending over the axles; and a drive connection between the drive shaft and the auxiliary shaft.

9. In a device of the class described, the combination of truck axles; side truck frames mounted on the axles; a cross bar; a swivel connection between the cross bar and side frame, the axis of the connection being crosswise of the frame; a gear frame mounted on one of the axles and said cross bar; a drive shaft carried by the gear frame; and a gear connected between the drive shaft and the axle carrying the gear frame.

10. In a device of the class described, the combination of truck axles; side truck frames mounted on the axles; a cross bar; a swivel connection between the cross bar and side frame, the axis of the connection being crosswise of the frame; a gear frame mounted on one of the axles and said cross bar; a drive shaft journaled in the gear frame with its axis out of the plane of the axle carrying the gear frame; and a gear connection between the drive shaft and the axle carrying the gear frame.

11. In a device of the class described, the combination of truck axles; side truck frames mounted on the axles; a cross bar; a swivel connection between the cross bar and side frames, the axis of the connection being crosswise of the frame; a gear frame mounted on one of the axles and connected with the cross bar by a hinge joint, the axis of the hinge being lengthwise of the truck; a drive shaft mounted on the gear frame; and a gear connection between the drive shaft and the axle carrying the gear frame.

12. In a device of the class described, the combination of truck axles; side truck frames mounted on the axles; a cross bar; a swivel connection between the cross bar and side frames, the axis of the connection being crosswise of the frame; a gear frame mounted on one of the axles and said cross bar; a drive shaft having a bearing on the gear frame extending in a longitudinal direction past the axle carrying the gear frame; an auxiliary shaft carried by the gear frame, having its axis in the same plane as the axis of the axle carrying the gear frame; a beveled gear connection between the auxiliary shaft and the axle; and a drive connection between the drive shaft and the auxiliary shaft.

13. In a device of the class described, the combination of truck axles; side frames mounted on the axles; a cross bar connecting the frames; a beveled gear mounted between the wheel and the center of the axle and having its face toward the center of the axle, said gear being made up of a web fixed on the shaft, and gear faces attached to the web; a gear frame extending around said gear and having a bearing on the axle and attached to the cross bar; said frame having a longitudinal bearing adjacent to the axle for the drive shaft of the truck; the drive shaft journaled in said longitudinal bearing; and a drive mechanism connecting the drive shaft with said beveled gear, said driving mechanism comprising a beveled gear meshing the beveled gear on the axle and arranged between the beveled gear on the axle and the center of the axle.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

WILLIAM M. FAWCETT.
GEORGE L. SWABB.

Witnesses:
BLANCHE HARTMAN,
THOMAS C. MILLER.