E. H. SCHMIDT.

RADIAL DRAFT GEAR.

APPLICATION FILED DEC. 14, 1908.

1,013,072.

Patented Dec. 26, 1911.

4 SHEETS—SHEET 1.

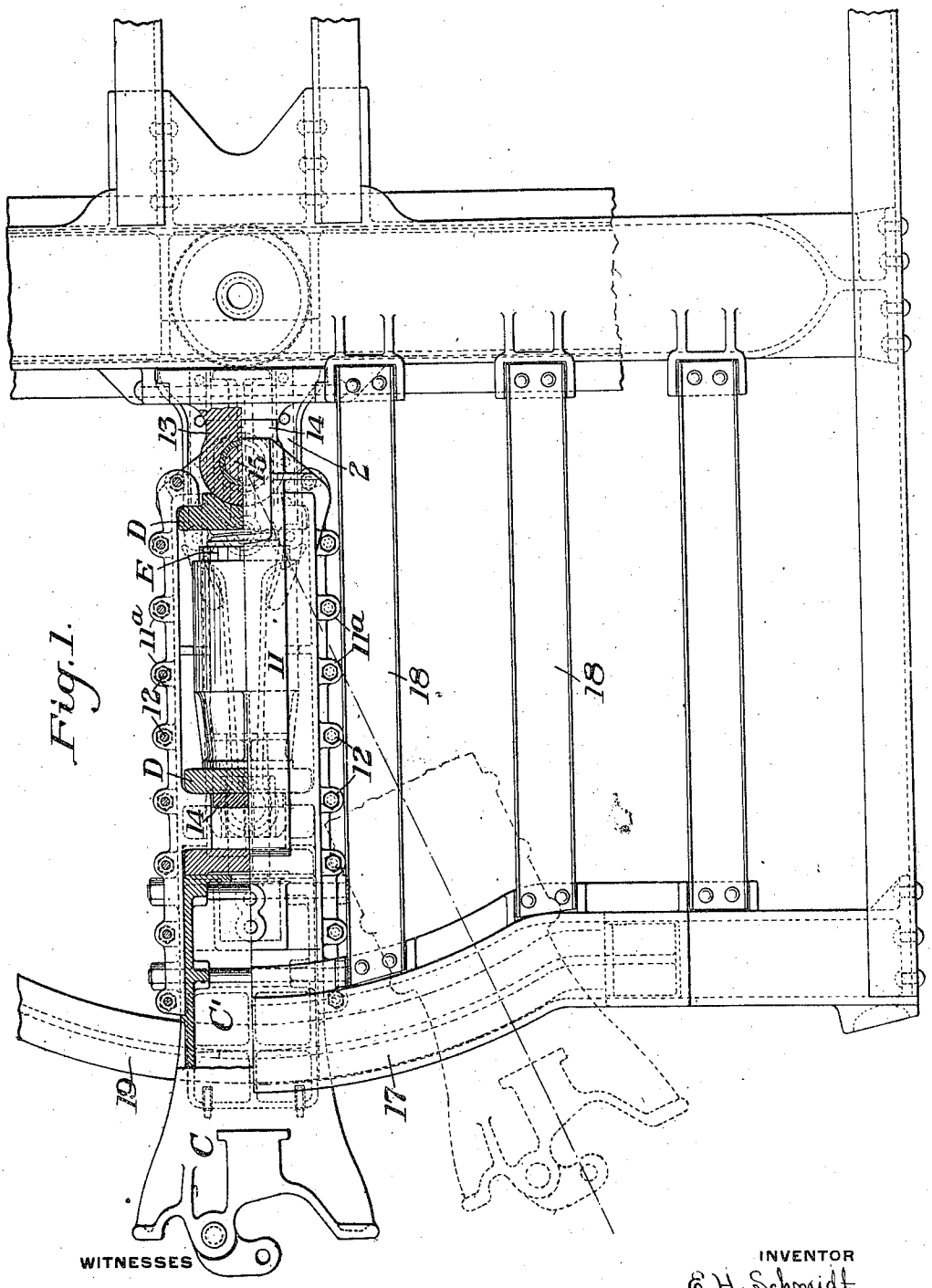


Fig. 1.

WITNESSES

R. A. Balderson.

G. L. Wheeler

INVENTOR

E. H. Schmidt,

by Bakewell, Byrnes & Parmelee,

his Attys.

E. H. SCHMIDT.

RADIAL DRAFT GEAR.

APPLICATION FILED DEC. 14, 1908.

1,013,072.

Patented Dec. 26, 1911.

4 SHEETS—SHEET 2.

Fig. 2.

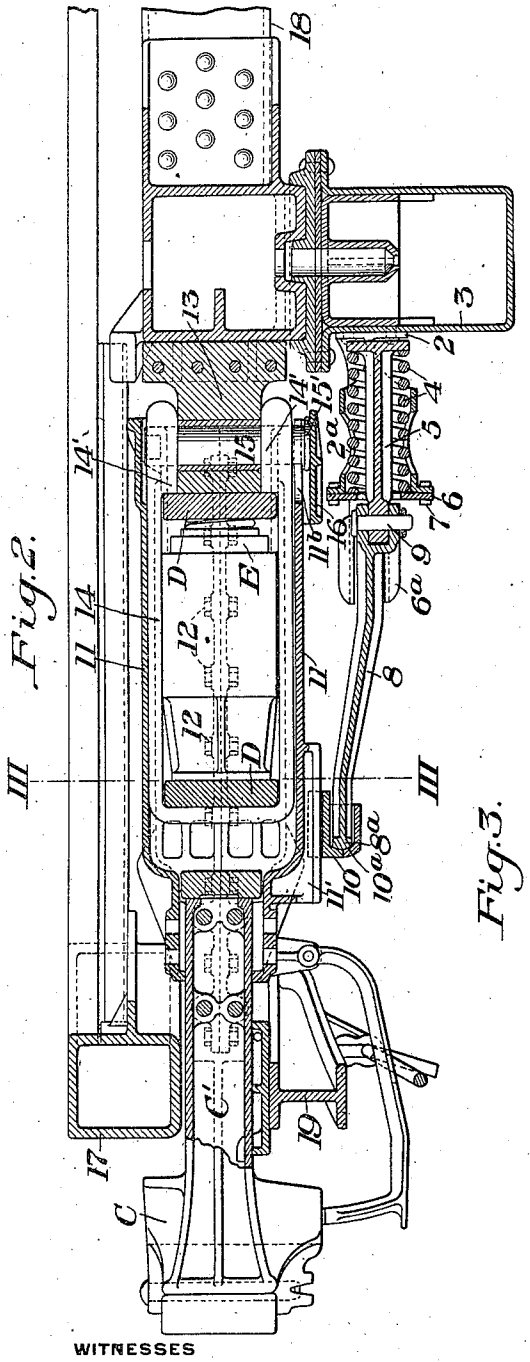
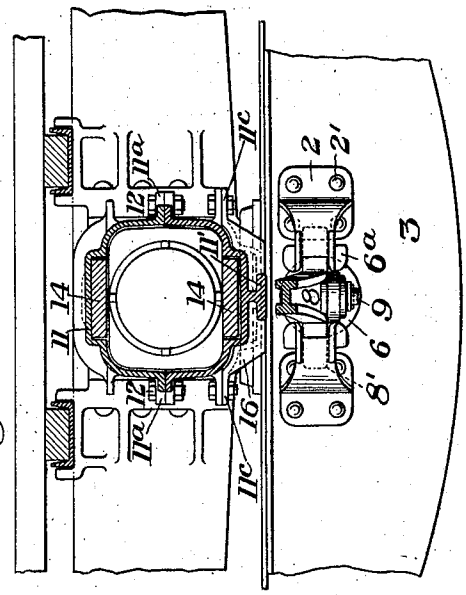


Fig. 3.



WITNESSES

R. A. Baldeson.

G. L. Winters.

INVENTOR

E. H. Schmidt,

by Bakewell, Byrnes & Parmelee,

his Attys.

E. H. SCHMIDT.

RADIAL DRAFT GEAR.

APPLICATION FILED DEC. 14, 1908.

1,013,072.

Patented Dec. 26, 1911

4 SHEETS—SHEET 3.

Fig. 4.

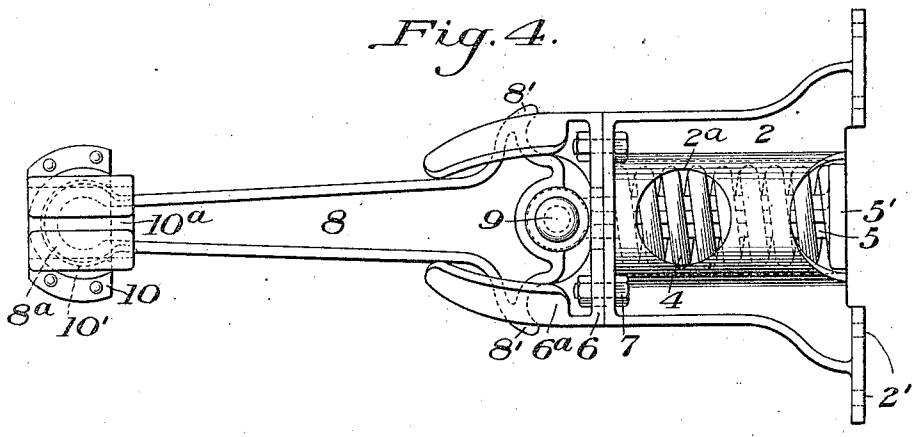


Fig. 5.

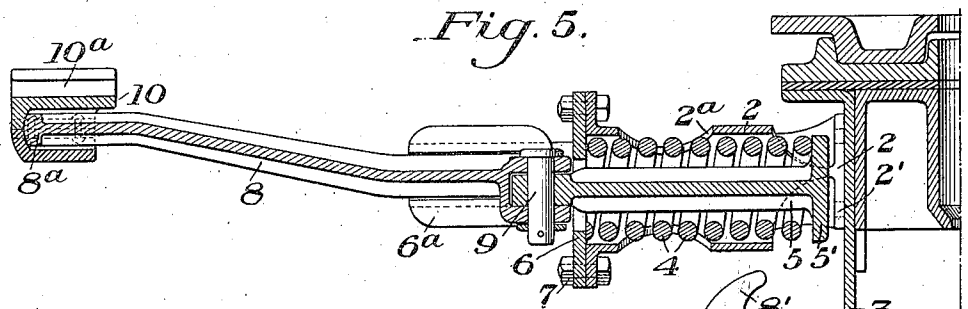


Fig. 6.

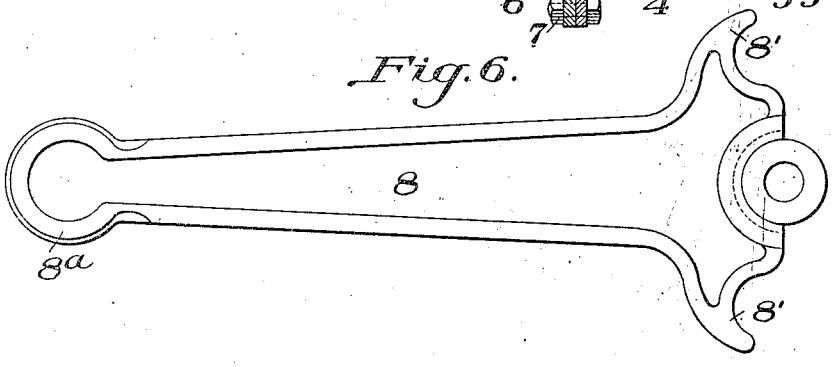


Fig. 7.

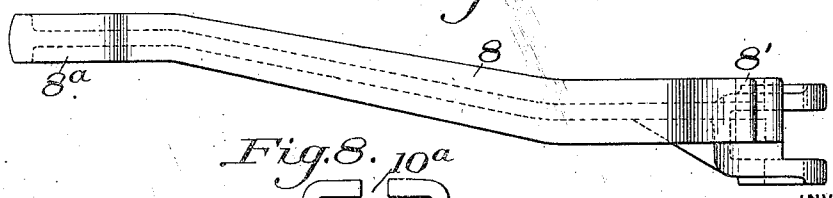
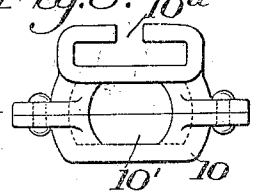


Fig. 8.



WITNESSES

R. A. Baldersoy.

G. L. Winters.

INVENTOR

E. H. Schmidt.

by Bakewell, Byrnes & Parmele.

his Attys.

E. H. SCHMIDT.

RADIAL DRAFT GEAR.

APPLICATION FILED DEC. 14, 1908.

1,013,072.

Patented Dec. 26, 1911.

4 SHEETS—SHEET 4.

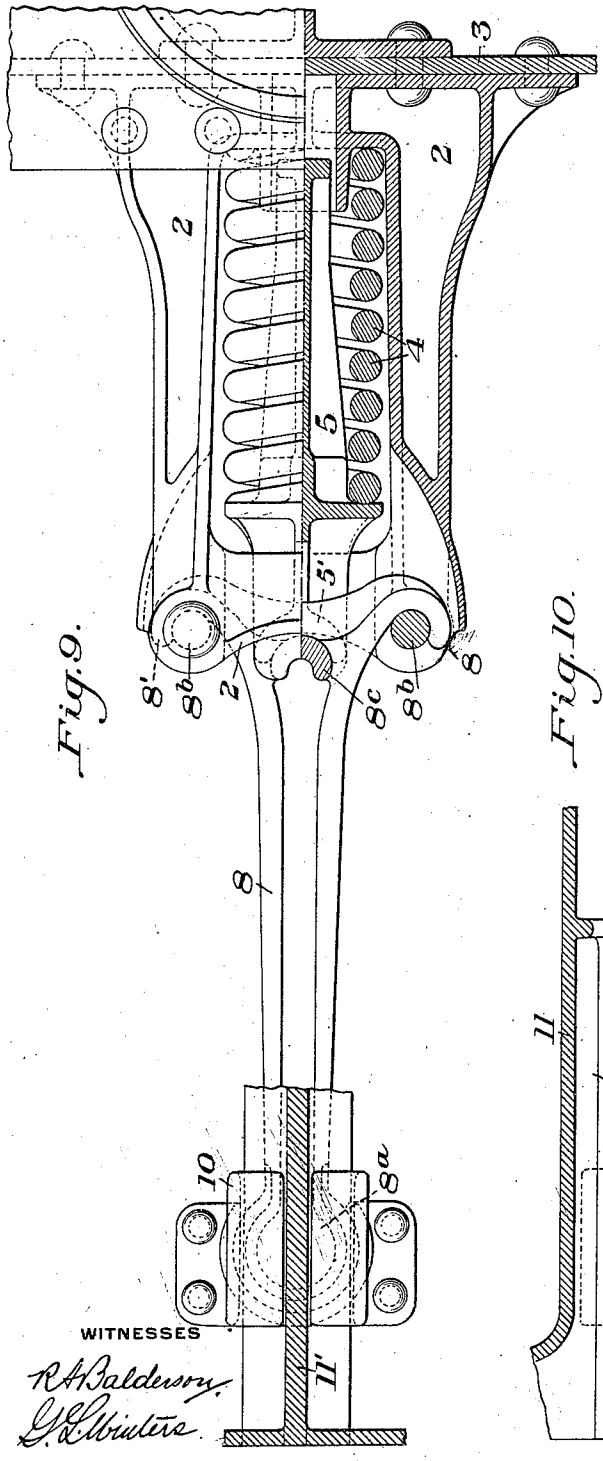


Fig. 9.

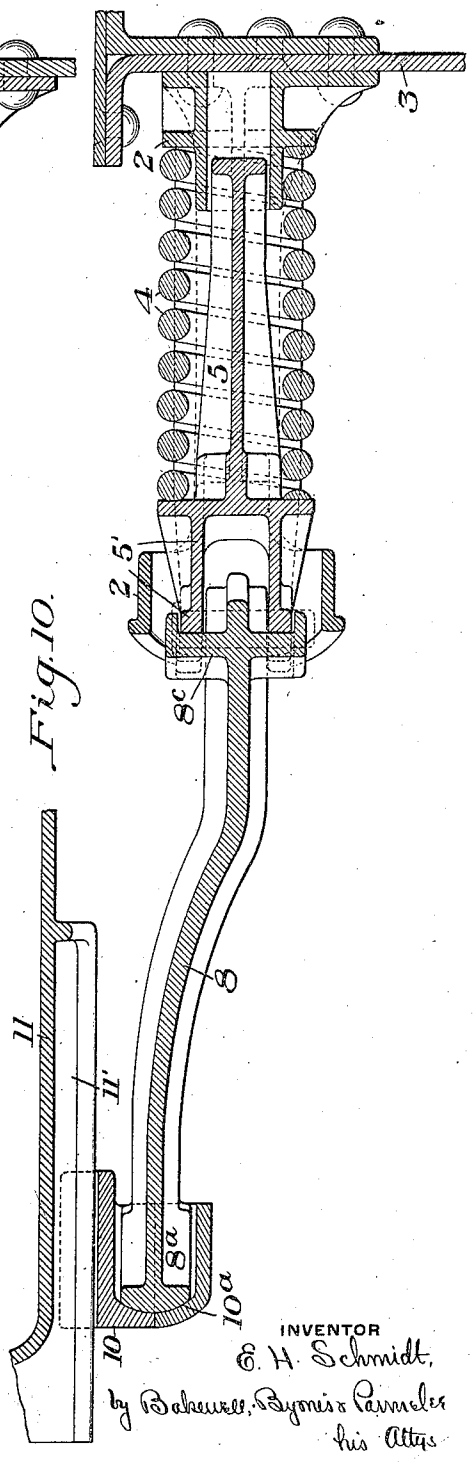


Fig. 10.

WITNESSES

R. A. Balderson.

G. L. Winters.

INVENTOR

E. H. Schmidt,

by Bakewell, Byrnes & Parmelee

his Attys

UNITED STATES PATENT OFFICE.

ERNEST H. SCHMIDT, OF CLEVELAND, OHIO, ASSIGNOR TO NATIONAL MALLEABLE CASTINGS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

RADIAL-DRAFT GEAR.

1,013,072. Specification of Letters Patent. Patented Dec. 26, 1911.

Application filed December 14, 1908. Serial No. 467,337.

To all whom it may concern:

Be it known that I, ERNEST H. SCHMIDT, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Radial-Draft Gears, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of a radial draft gear constructed in accordance with my invention; Fig. 2 is a vertical longitudinal section. The remaining figures are detail views, Fig. 3 being a vertical cross section on the line III—III of Fig. 2; Fig. 4 being a plan view of the truck connection; Fig. 5 a vertical longitudinal section; Fig. 6 is a detail view of the arm 8; Fig. 7 is a side elevation; and Fig. 8 is a detail view of the bracket. Figs. 9 and 10 show modifications of the invention.

Referring to the drawings, 2 represents a bracket for the truck connection, which bracket is riveted or otherwise secured at 2′ to the face of the truck bolster 3 and projects forwardly beneath the rear end of the radial draft gear, as shown in Fig. 2. A spring 4 is set upon a plunger 5, the rear head 5′ of which forms a spring seat. The spring and plunger are placed telescopically within the bracket 2 through its open end, as shown in Figs. 4 and 5, and in assembling the parts a temporary shim is placed between the rear head of the plunger and the face of the bolster. An annular face plate or head 6 is then passed over the front end of the plunger 5 and is secured to the front end of the bracket 2 by bolts 7, and when these bolts are tightened, thus drawing the head 6 into place, an initial compression is put upon the spring 4. When the parts have thus been assembled, an arm 8 which forms the guiding arm for the radial draft gear is pivoted to the front end of the plunger 5 by means of a pin 9. The guiding arm 8 has lateral projections 8′ (Fig. 6) which bear against the forward sides of lugs 6^a on the head 6 and hold the plunger 5 in forward position, keeping the spring under compression, and when the parts are thus assembled the temporary shim can be removed from the back of the head 5′. The forward end of the guiding arm 8 has the form of a flattened ball 8^a, the top and bottom surfaces being flattened and the lateral curved portion fitting within correspondingly curved surfaces 10′ in a bracket 10. This bracket, as shown in Fig. 8, is preferably made of two sections riveted together, and at its upper portion there is a recessed socket 10^a adapted to engage and slide upon a T-shaped guideway or extension 11′ at the bottom of the frame 11 of the draft gear.

The bracket 2 has a vertical hole 2^a (Fig. 4) through which the pivot pin 15 of the draft gear can be removed downwardly whenever it is necessary to do so. In order to remove the pivot pin it is, of course, necessary first to withdraw the spring 4 and plunger 5 from the bracket.

The draft gear shown in Figs. 1, 2 and 3 has a frame 11 made in two parts longitudinally divided and bolted together at the sides by means of vertical bolts 12 extending through lateral flanges 11^a (Fig. 3).

I derive an advantage from constructing the draft gear frame in two horizontally divided parts, since in this way I am enabled better to distribute the strains of buffing and draft to all the parts of the frame. The lugs against which the followers of the draft rigging bear are formed on the sides of the frame and are thus partly on the top member and partly on the bottom member and the strains therefrom are therefore evenly distributed.

The coupler C is rigidly fixed within a socket at the forward end of the frame, and the center line of the coupler shank C′ is coincident with the center line of the frame 11 of the draft rigging which is contained within the frame and with followers D and the spring mechanism or friction mechanism E. It is also coincident with the center line of the lug 13 to which the draft gear is pivotally connected by means of the pin 15. By placing these parts symmetrically in alinement a better action is secured than where the coupler is offset from a direct line with the draft rigging, and all tendency to bend the parts of the draft gear under severe buffing strains is avoided.

14 is the U-shape yoke of the draft rigging which is set within the frame, the closed portion of the U-shape yoke extending around the forward follower D. Heretofore the yoke has been reinforced at its rear end by having an upwardly extending rib at the top and a downwardly extending rib at the bottom; but in my present inven-

tion I construct the yoke at the top and bottom with inwardly projecting ribs 14′. This enables me to extend the top and bottom walls of the frame 11 in a substantially straight line rearwardly over the pivot pin 15, and to secure greater strength at the rear end of the frame and to form abutments for the ends of the yoke on the frame, which prevents the ends of the yoke from being spread vertically under pulling strains. The pivot pin 15 is inserted through the ends of the yoke and through the lug 13 from below, and as above stated can be removed downwardly through the hole 2^a. This is important, because when the pivot pin is inserted from above in cars having flooring directly above the pivot pin it is necessary to insert the pin and remove it through the floor, which is objectionable. By inserting it from below no hole need be provided in the upper wall of the frame 11, and it is only necessary to slot the bottom wall of the frame at 11^b sufficiently to inclose the small diameter of the pin and to permit the frame to slide longitudinally over the pin during buffing and draft. The head 15′ of the pivot pin is below the bottom wall of the frame, and in order to support the pin and to tie together the parts of the bottom of the frame in order to compensate for the slot 11^b, I provide a support 16 which is bolted to the strengthening ribs 11^c of the frame. The frame thus has a substantial bearing on the top of the lug 13 and it is not necessary to provide a rear carry iron for it.

17 is the end sill of the car frame, which is preferably made of a steel casting, the side portions being extended at right angles to the longitudinal sills 18 of the car and the central portion being curved on the arc of motion of the coupler, so as to maintain approximately the same distance between the horn of the coupler and the front face of the sill in any position of the coupler. Heretofore segmental buffing plates have been applied to the front face of a straight sill for this purpose, but the present construction accomplishes the result better by shaping the sill itself in the manner above described.

19 is the carry iron riveted to the bottom of the end sill and supporting the coupler shank.

The operation of the truck connection above described is as follows: The draft gear being free to move laterally on the pivot pin 15, the guiding arm 8, by reason of its sliding engagement with the coupler through the bracket 10, will guide the coupler substantially to the center of the railway track, whether the car is standing upon a straight portion or a curved portion of the track, for the arm 8 will be maintained at right angles to the truck bolster and the spring 4 will offer sufficient resistance to move the coupler laterally without further compression. The relative distances between the bracket 10, the pivotal point 15 of the draft gear and the head C of the coupler are such that the coupler head will be guided as described, substantially to the center of the track. When the coupler is forced laterally out of its normal position at the center of the track, the end 8^a of the guiding arm 8 will also be deflected laterally and the lateral projection 8′ on one side thereof will be drawn forwardly away from its bearing on the lug 6^a, while the lateral projection 8′ on the other side will maintain a pivotal bearing upon its lug 6^a and will serve as the fulcrum of the arm. This action will draw the pin 9 forwardly, also drawing forwardly the plunger 5 and causing the head 5′ thereof to compress the spring 4. When the force which has deflected the draft gear is removed, the spring 4 will resume its normal position and will draw the pin 9 rearwardly and restore the coupler to its normal position, substantially at the center of the track. At its normal position the spring is out of action upon the truck connection. When the lateral projection 8′ on one side of the arm 8 is drawn forwardly it is supported and guided by the top and bottom arms 6^b, which project forwardly on both sides of the head 6.

The purpose of the initial compression of the spring 4 which I have described above is to afford the necessary initial resistance, and also to secure accurate control of the coupler in its lateral movements by taking up slack between the parts when they are first assembled, or after they become worn.

In Figs. 9 and 10 I show a modification of my invention, constructed as follows: The bracket 2 is similar to the one above described, but it has no head 6 at its forward end. The arm 8 has lateral projections 8′ but they have pivotal bearing on the rear side of the pins 8^b which are secured to the forward end of the bracket 2. These pins hold the arm 8 against the forward end of the plunger 5, the arm 8 having curved trunnions 8^c on its upper and lower side which engage with the curved forward surfaces of the head 5′ which is at the forward end of the plunger. When the parts are assembled the spring 4 is placed under initial compression as described above, and when the coupler is deflected laterally out of its normal position, the forward end 8^a of the guiding arm 8 is deflected also and the lateral projection 8′ on one side is forced rearwardly from its pin 8^b while the lateral projection 8′ on the other side bears pivotally against its pin 8^b, with the result that the trunnions 8^c are forced rearwardly against the head 5′

of the plunger, thus compressing the spring. In assembling the parts of this device it is not necessary to use any temporary shim at the back of the spring, but a tool of some kind can be placed between the head of the plunger and the front wall of the bracket while the arm 8 and the pins 8^b are being set in place.

The advantages of my invention will be appreciated by those skilled in the art. It simplifies the construction of the radial draft gear and its parts and renders it more efficient in operation; and both of these advantages are of great importance in a device of this kind which is subjected to rough usage and must be simple and comparatively cheap in order to be practically efficient.

I have described herein the preferable construction of the coupler frame, the pivotal connection of the draft gear, and the construction of the end sill, in order to make clear the parts to which my invention pertains, but I do not claim them, for they are the invention of Henry F. Pope.

Within the scope of my invention as defined in the claims modifications may be made in the construction and arrangement of the parts, since what I claim as new is:

1. A radial draft gear having a truck connection comprising an arm, a spring head or plunger, and fulcrum-bearings at the sides of the spring head whereby deflection of the arm in either direction will compress the spring.

2. A radial draft gear having a truck connection comprising a fixed bracket, a plunger and spring confined within the bracket, and a guiding arm pivotally connected to the plunger and having side fulcrum-bearings.

3. A radial draft gear having a truck connection comprising a guiding arm, spring mechanism therefor, and a bracket fixed to the truck provided with a bottom support for said arm.

4. A radial draft gear having a truck connection comprising a guiding arm, spring mechanism therefor, and top and bottom guiding supports supporting said arm and fixed to the car truck.

5. A radial draft gear pivoted to the car, and a guiding connection extending beneath the pivot pin and parallel with the draft gear when in central position, said connection having an element provided with a vertically extending opening to allow upward insertion of the pivot pin, said connection having at its front end a ball-and-socket connection with the draft gear.

6. A radial draft gear pivoted to the car, and a truck connection extending beneath the pivot pin and having an element provided with an opening to allow upward insertion of the pivot pin, said connection having rear spring mechanism and being loosely connected to the draft gear at its front end.

7. A radial draft gear having a truck connection comprising a bracket, a spring and plunger contained therein, a guiding arm pivotally connected to the plunger and having side fulcrums, and guides on the bracket within which portions of the arm move.

8. A radial draft gear having a truck connection comprising a bracket fixed to the car-truck, a spring and plunger contained therein, a guiding arm pivotally connected to the plunger and having side fulcrums, and guides on the bracket within which portions of the arm move.

9. A radial draft gear having a truck connection comprising a bracket having a removable head, a spring and plunger contained therein, a guiding arm pivotally connected to the plunger and having side fulcrums, and guides on the bracket within which portions of the arm move.

10. A radial draft gear having a guiding connection with the truck, and a constantly acting spring therefor exerting spring action upon the parts when in normal position.

11. In combination with a radial draft member, a guiding truck connection, spring mechanism normally held under compression and offering sufficient resistance to the truck connection to move the draft member laterally with the pivotal motions of the car truck, said spring mechanism being adapted to be compressed by the truck connection when the draft member itself is deflected laterally relatively to the truck.

12. A radial draft gear having a radially movable truck connection and a spring bearing thereon and arranged substantially in the longitudinal vertical plane of the draft gear when the draft gear is in central position.

13. A draft gear having a radially swinging draft member, a pivot pin for connecting the car to the draft member, and a single, centrally located guiding connection extending beneath the pivot pin from the draft member to the central part of the truck, said connection having an element provided with a vertically extending passage for the insertion of said pin.

In testimony whereof, I have hereunto set my hand.

ERNEST H. SCHMIDT.

Witnesses:
OLIVER K. BROOKS,
HARRY E. ORR.