Sept. 11, 1928. 1,683,674

K. S. HOWARD

LOCOMOTIVE STRUCTURE

Filed Aug. 18, 1926

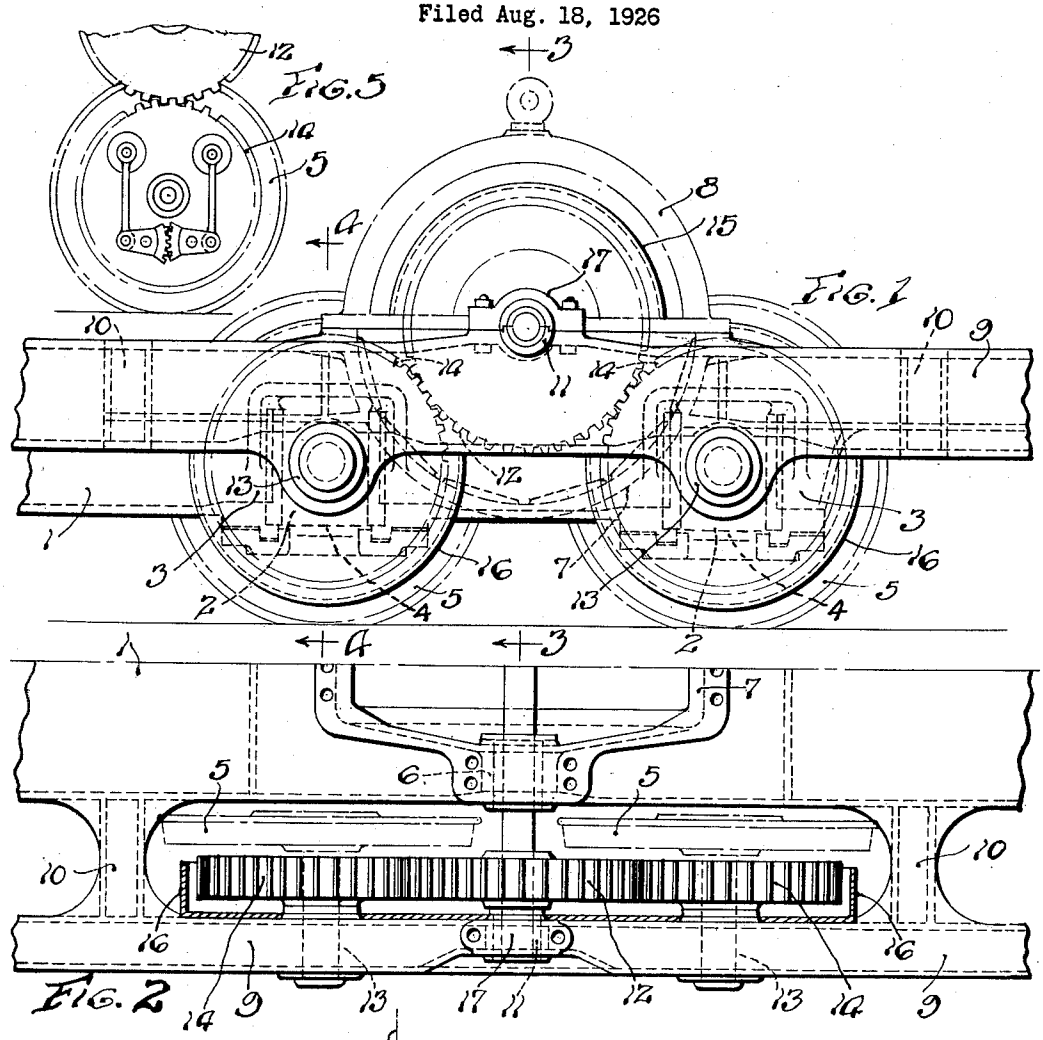

FIG. 2

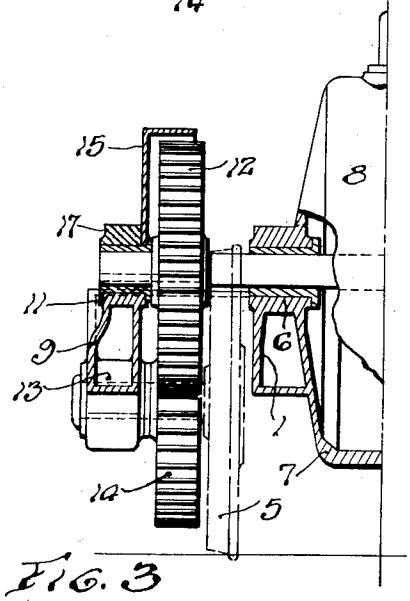

FIG. 3

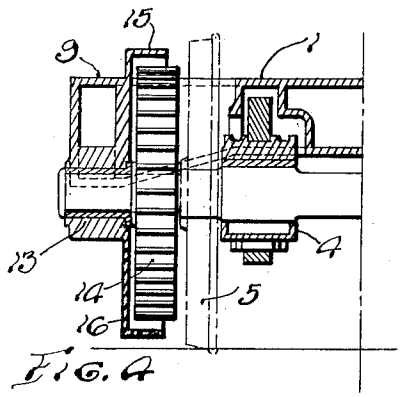

FIG. 4

INVENTOR
Karl S. Howard

BY Cornwall, Badell & James,
ATTYS.

Patented Sept. 11, 1928. 1,683,674

# UNITED STATES PATENT OFFICE.

KARL S. HOWARD, OF ST. LOUIS, MISSOURI, ASSIGNOR TO COMMONWEALTH STEEL COMPANY, OF GRANITE CITY, ILLINOIS, A CORPORATION OF NEW JERSEY.

## LOCOMOTIVE STRUCTURE.

Application filed August 18, 1926. Serial No. 129,935.

My invention relates to railway rolling stock and consists of an improved electric locomotive structure.

One object of my invention is to provide a motor drive for a plurality of driving wheels in which the motor is connected to each of the wheels independently of its connection to the other of the wheels. This arrangement is desired for the purpose of equalizing stresses created by the driving mechanism.

Another object of my invention is to mount the motor between two driving wheels which result in the more equal distribution of the weight of the motor to the two driving wheels and also makes it possible to design a bed which is better adapted for supporting the weight of the motor as the motor may be placed over the portion of the bed having deepest section rather than over the portions of the bed which form the pedestal recesses and are reduced in depth accordingly.

Additional objects of my invention are to form the bed in a one piece casting which includes two or more of the following elements, to wit, the pedestals, bearings for the driving gears, bearings for the motor shaft and guards for the driving gears and driving pinion.

In some respects the present invention is a modification and development of the invention described in my copending application, Serial No. 129,932 filed of even date herewith.

In the accompanying drawings which illustrate a selected embodiment of my invention—

Figure 1 is a side elevation of a portion of the bed of an electric locomotive illustrating two of the driving wheels and the driving mechanism assembled therewith.

Figure 2 is a one-half top view of the structure illustrated in Figure 1.

Figures 3 and 4 are transverse vertical sections taken on lines 3—3 and 4—4, respectively, of Figure 1.

Figure 5 illustrates a detail referred to later.

The locomotive bed includes two or more main sills 1 extending longitudinally of the locomotive and having recesses 2 at intervals, the sides of which form pedestal jaws 3 between which are slidably received the journal boxes 4 for the driving wheels 5 which are located outside of the sills 1.

Between the pedestal elements 3 at least one of the sills 1 forms an integral bearing 6 for the motor shaft and the adjacent portions of sills 1 are modified and enlarged to form the lower portion 7 of the frame for the motor 8.

A supplemental side member 9 is parallel with and spaced from one of the sills 1 and is integrally united therewith at intervals by transverse members 10. This member 9 forms a bearing 11 for the journal of the driving pinion 12 and also forms bearings 13 for the journals of the driving gears 14 which are flexibly connected to the driving wheels 5 by a mechanism which permits relative vertical movement between the wheels and the gears. Such a connection is illustrated in Figure 5. Member 9 also includes integral projections 15 and 16 which form a guard element for the pinion 12 and gears 14.

I have illustrated the bearings 13 as being completely formed integral with the bed casting but it will be understood that, if desirable, the lower portions of these bearings might be made detachable corresponding to the detachable portion 17 of the bearing 11 for the driving pinion 12.

With the construction described, the bearings for the motor and driving pinion and gears and the pedestals for the driving wheels are all formed integrally thereby eliminating the expense of material and labor for assembling the various parts illustrated and also making possible the more efficient distribution of metal and making possible the use of a lighter structure without sacrificing strength. The weight of the motor is distributed equally, or in any other desired proportion, to two driving axles instead of being concentrated on one of such axles as is the case where the motor is located above one of the driving axles.

The driving connection from the motor to two driving gears eliminates the necessity of an idler between the gears or the use of a connecting rod between the wheels.

Obviously the details of my invention such as those referred to above and others of like nature, may be made without departing from the spirit of my invention. For example, I have described the gear and pinion mounting located on one side of the bed and these features may be duplicated on the opposite side of the bed if desired or the locomotive driving mechanism may be wholly mounted on one side thus avoiding matching of gears and duplication of other parts. I contemplate the exclusive use of these and all other

modifications of my invention as are included in the scope of my claims.

I claim:

1. In an electric locomotive, a plurality of driving wheels, individual driving gears for said wheels, flexible elements operatively connecting said gears with their respective wheels, a common driving pinion for both of said gears, and a single member forming bearings for said gears and pinion.

2. In an electric locomotive, a bed provided with pedestals, a plurality of driving wheels with journal boxes slidable in said pedestals, individual driving gears for said wheels journaled in bearings formed integrally on said bed, a common driving pinion for said gears journaled on said bed, and flexible connections between said gears and wheels.

3. In a one-piece cast bed for an electric locomotive, a main longitudinal sill, pedestals provided at intervals on said sill, and a motor bearing formed on said sill equidistant from said pedestals.

4. In a bed for an electric locomotive, a main longitudinal sill, pedestals provided at intervals on said sill, a supplemental member spaced outward from said sill and paralleling the same, a driving pinion bearing in said member equidistant from said pedestals, and driving gear bearings in said member opposite said pedestals.

5. A single piece casting forming an electric locomotive bed with pedestals for driving wheels and bearings for driving gears and pinion all formed integrally, said pinion bearing being located equidistant from said pedestals.

6. A single piece casting forming an electric locomotive bed with pedestals for driving wheels and bearings for driving gears, pinion, and a motor shaft all formed integrally, said pinion and motor shaft bearings being located equidistant from said pedestals.

7. A casting forming an electric locomotive bed adapted to mount driving gears and a driving pinion, said casting having integral guards for enclosing said driving gears and pinion, said pinion guard being located between said gear guards.

8. In a one piece casting forming a locomotive bed, pedestals, driving gear bearings opposite said pedestals, a motor shaft bearing between said pedestals, a driving pinion bearing opposite said motor shaft bearing, and projecting portions partially surrounding said bearings and with the body of said bed forming a guard for enclosing said gears and pinion.

9. In an electric locomotive bed, a longitudinal sill recessed at intervals to form pedestals for the driving boxes, and a motor frame formed integrally with said sill and located equidistant from said pedestals.

In testimony whereof I hereunto affix my signature this 13th day of August, 1926.

KARL S. HOWARD.