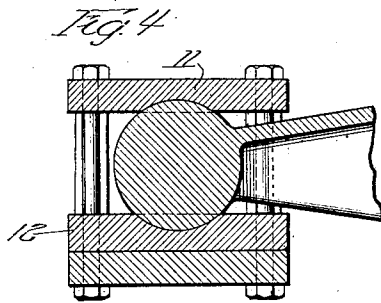
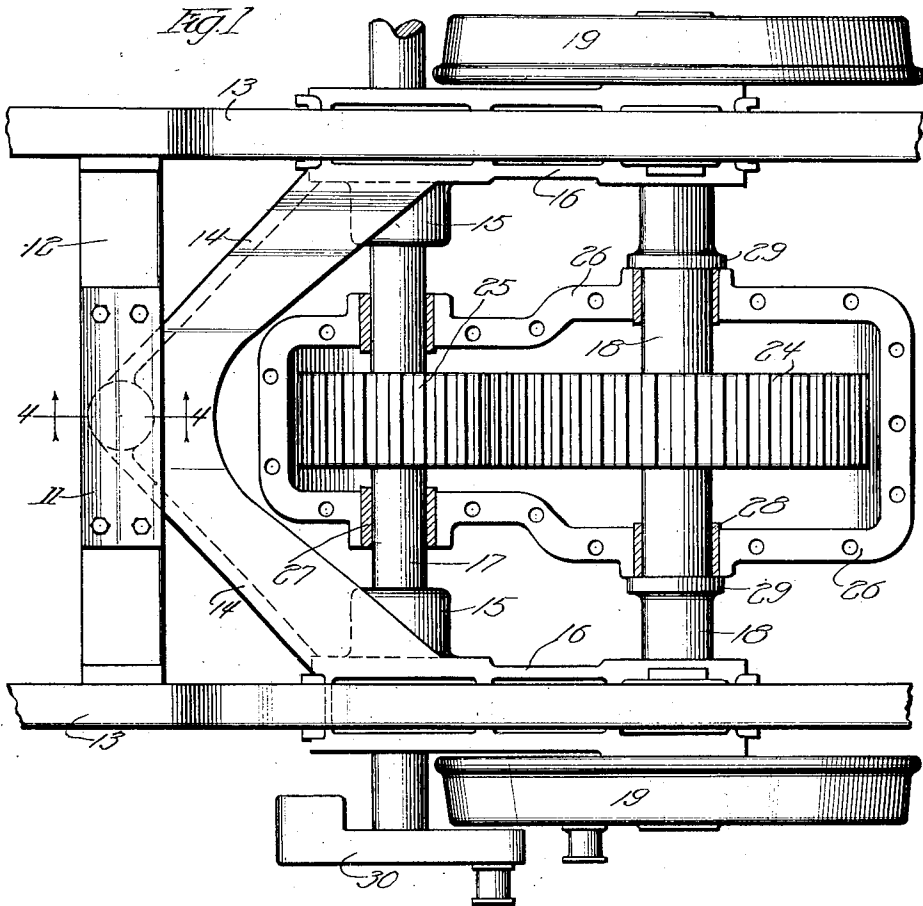


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APPLICATION FILED SEPT. 22, 1919.

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Patented Feb. 22, 1921.

2 SHEETS—SHEET 1.



INVENTOR
Elmer F. Backer
BY
Frank D. Thomason ATTORNEY

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FIG. 2

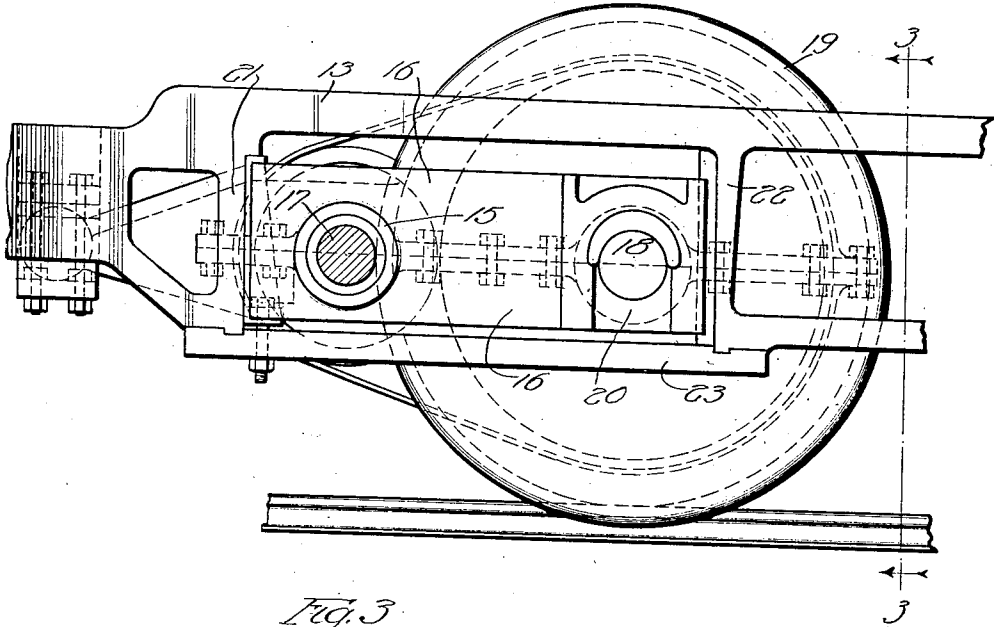
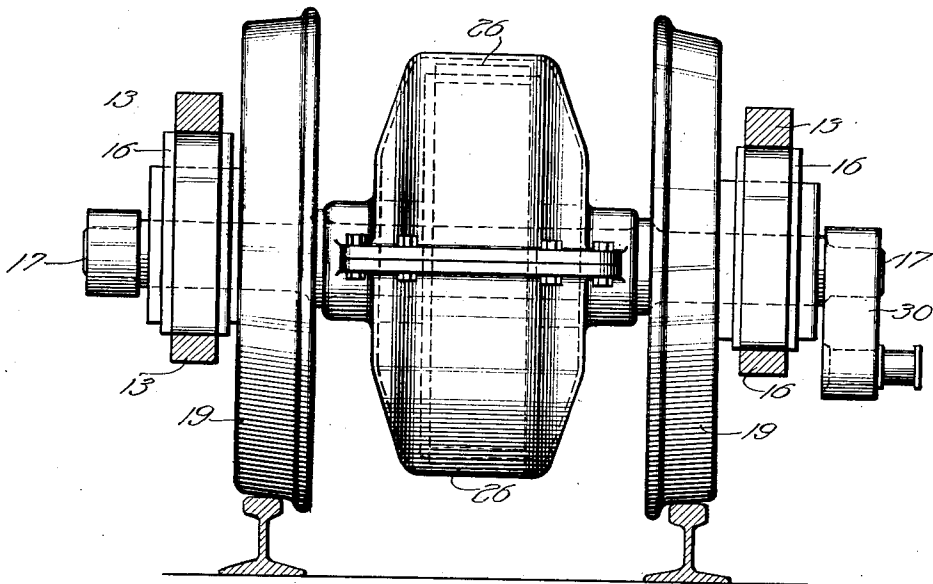


FIG. 3



INVENTOR.
Elmer F. Backer

BY
Frank D. Howasson ATTORNEY

UNITED STATES PATENT OFFICE.

ELMER F. BACKER, OF DAVENPORT, IOWA, ASSIGNOR TO DAVENPORT LOCOMOTIVE WORKS, OF DAVENPORT, IOWA, A CORPORATION OF IOWA.

GEARED LOCOMOTIVE.

1,369,212.

Specification of Letters Patent.

Patented Feb. 22, 1921.

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To all whom it may concern:

Be it known that I, ELMER F. BACKER, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented new and useful Improvements in Geared Locomotives, of which the following is a full, clear, and exact description.

My invention relates to geared locomotives, and particularly to the means for supporting the crank-shaft thereof.

One of the difficulties which builders of this type of locomotives have sought to overcome is to obtain a perfect geared connection between the crank-shaft and driving-axle of the locomotive. This class of locomotives is mostly used on temporary tracks, such as used in lumber camps or in highway work. Such tracks are generally of narrow gage and are very rough, and when the locomotive runs over them one wheel will frequently be lower than the one on the other side, owing to the constant difference in the level of the rails of the track. This causes the locomotive to sway from side to side, and this see-saw movement, together with the up and down movement of the bearings thereof and the end-thrust of the axle, has made it necessary to devise some means for keeping the axes of the gears substantially parallel and for avoiding the excessive wear and strain that would otherwise result.

Heretofore efforts have been made to overcome this difficulty by means of peculiar combinations and constructions of said gears.

The object of my invention is to avoid this difficulty by means that will always maintain the driving-axle and crank-shaft in their relative parallel positions, while permitting the driving-axle to accommodate itself to the rocking movement caused by its wheels traveling over uneven tracks. This I accomplish by the means hereinafter fully described, and as particularly pointed out in the claims.

In the drawings:

Figure 1 is a plan view of a broken away portion of the supporting-frame of a locomotive, showing my improvements applied thereto and with the upper section of the casing inclosing the gearing of said improvements, removed.

Fig. 2 is a side view of the same.

Fig. 3 is a transverse section, taken on dotted line 3, 3, Fig. 2.

Fig. 4 is a longitudinal section of a fragment of the supporting-frame, taken on dotted line 4, 4, Fig. 1.

My invention, broadly speaking, comprises means for suspending the elements that support the crank-shaft of a geared locomotive at three points; two of which points being located on the axle of the drive-wheel and one on the underframe of the locomotive midway between the longitudinal side-sills thereof. By suspending the crank-shaft in this manner said crank-shaft will always remain parallel to the axis of the drive-wheels.

The principal elements embodied in my improvements are a three-point-frame and a gear-housing, which will hereinafter be more fully described.

The three-point-frame referred to consists of a V-shaped frame or structure the apex of which is formed into a ball 10, that is swiveled between an upper and a lower transversely disposed horizontal plate, 11 and 12 respectively, located midway between the longitudinal side-sills 13, 13, of the underframe or supporting frame of the locomotive. The lower plate rests upon a cross-bar or transom connecting these side-sills, and the legs 14, 14, of the V-shaped frame or structure merge into the inwardly projecting bosses of the bearings, 15, 15, substantially as shown, and have corresponding parallel extensions 16, 16, extending beyond said bearings. A crank-shaft 17, is journaled in said bearings, 15, 15, and the axle, 18, of the drive-wheels, 19, is journaled in bearings, 20, 20, substantially as shown, made integral with the rear ends of the extensions 16, 16, substantially as shown in the drawings. These extensions, 16, therefore, extend from a suitable point in front of the crank-shaft to a suitable point at the rear of the drive-axle, and are inserted between and have their ends so formed as to engage the jaws 21 and 22 of a longitudinally elongated pedestal made in the side-sills 13, 13. The mouths of these pedestals are closed by the tie-bars 23, and the extensions 16, 16, are capable of a limited vertical play in said pedestals, and in addition permit of a limited lateral rocking

movement, resulting from the condition arising from the travel of the wheels, 19, 19, over the tracks.

The axle and the crank-shaft are connected, preferably at their centers of length, by a large gear 24 on the axle, and a small gear 25 on the crank-shaft, and these gears are inclosed by a housing 26 consisting of an upper and lower corresponding section, the meeting edges of which latter are flanged outward and bolted or otherwise secured together. This housing has bearings 27 and 28 for the crank-shaft and axle, respectively, that are made one half in the upper section and the other half in the lower section, and the axle has collars or flanges 29, 29, that bear against the outer ends of the bearings 28, to prevent lateral movement of the housing.

The ends of the crank-shaft extend a suitable distance beyond the bearings 15, 15, and are provided with cranks 30, the wrists of which are connected by suitable connecting rods (not shown) to the piston (not shown) of the engine. The drive-wheels may be situated outside of the side-sills of the underframe of the locomotive, as shown in Fig. 1 of the drawings, or the wheels may be mounted on the axle inside of said side-sills, as shown in Fig. 3 of the drawings.

My improvements permit the perfect freedom of movement of the bearing elements of the axle of the drive-wheels, and insures a corresponding movement of the crank-shaft and the maintenance of the parallelism of and the distance between the axes of the axle and the crank-shaft at all times, so that the gears connecting the two and imparting the motion of the crank-shaft to the axle will always remain in perfect engagement.

What I claim as new is:

1. In a geared locomotive, the combination with a locomotive supporting-frame; the axle of the drive-wheels thereof; and journal-boxes for said axle in the side members of said frame, of a transverse crank-shaft that imparts its motion to said axle; and means in which said crank-shaft is journaled that are pivotally mounted at one end on said axle, and pivotally supported at a single point at its opposite end, said crank-shaft being journaled in said means and retained thereby in constant parallelism with said axle.

2. In a geared locomotive, the combination with a locomotive supporting-frame; the axle of the drive-wheels thereof; and journal-boxes for said axle in the side members of the said supporting-frame, of a transverse crank-shaft through which motion is imparted to said axle, and means in which said crank-shaft is journaled, which has one end pivotally mounted on said axle at two points and the opposite end pivotally sup-

ported at one point independently of said axle.

3. In a geared locomotive, the combination with a locomotive supporting-frame, the axle of the drive-wheel thereof, and journal-boxes for said axle in the side members of the supporting-frame, of a transverse crank-shaft the ends of which extend through openings in said side-frames; gearing connecting said crank-shaft and drive-axle, a housing in which said shaft has stationary bearings one end of which is journaled on said axle at two points; and a ball forming a universal joint for connecting the same to the said supporting-frame.

4. In a geared locomotive the combination with the under-frame thereof, the axle of the drive-wheels; and bearings in the structure of said under-frame for said axle; of a floating transverse crank-shaft, gears connecting the same to said axle; a structure in which said crank-shaft is journaled, and a single universal journaling device connected to said axle through the medium of said structure whereby said crank-shaft moves parallel with said axle at all times.

5. In a geared locomotive the combination with the supporting-frame thereof; the axle of the drive-wheels; and bearings in the supporting-frame for said axle, of a floating transverse crank-shaft, gears connecting the same to said axle; bearings in said supporting-frame for said axle, a housing for said gears consisting of an upper and lower section and the rear end of which is mounted on said axle and through which the crank-shaft passes, a substantially V-shaped member the ends of which are connected to said resilient bearings; a ball made integral with the vertex of said member and a stationary bearing made integral with said supporting-frame in which said ball is journaled.

6. In a geared locomotive, the combination with a supporting-frame, the axle of the drive-wheels thereof; and journal boxes for the same; of a bifurcated frame the rear portions of the legs of which are pivoted on said axle; a journaling member at the confluence of said legs; suitable bearings for said journaling member integral with said supporting frame; a crank-shaft journaled in the legs of said bifurcated frame, and gears connecting said shaft and axle.

7. In a geared locomotive; the combination with a supporting-frame, the axle of the drive-wheels thereof; and journal boxes for the same; of a bifurcated frame the rear portions of the legs of which are pivoted on said axle; a swiveled journaling member at the confluence of said legs; suitable bearings for said journaling member integral with said supporting frame; a crank-shaft journaled in the legs of said bifurcated frame, and gears connecting said shaft and axle.

8. In a geared locomotive, the combination with a supporting-frame, the axle of the drive-wheels thereof, and journal boxes for the same of a bifurcated frame the rear 5 portions of the legs of which are made integral with said journal boxes, a journaling member at the confluence of said legs, suitable bearings for said journaling member integral with said supporting frame, a 10 crank-shaft journaled in the legs of said bifurcated frame, and gears connecting said shaft and axle.

9. In a geared locomotive, the combination with a supporting-frame, the axle of 15 the drive-wheel thereof, and resilient journal boxes for the same, of a bifurcated frame the rear portions of the legs of which are pivoted on said axle, a journaling member at the confluence of said legs, suitable 20 bearings for said journaling member integral with said supporting frame, a crank-shaft journaled in the legs of said bifurcated frame, gears connecting said shaft and axle, and a housing mounted on said 25 axle and crank-shaft inclosing said gear.

10. In a geared locomotive, the combination with a locomotive supporting-frame, the axle of the drive-wheels thereof, and 30 journal boxes therefor, of a transverse crank-shaft through which motion is imparted to said axle, and means through which said shaft extends and which has one end pivotally mounted on said axle at two 35 points and its opposite end extended and pivotally supported at one end independently of said axle.

11. In a geared locomotive the combina-

tion with the supporting-frame thereof, the drive wheels and the axle of the drive-wheels, of a floating transverse crank-shaft, 40 gears connecting the same to said axle, bearings in said supporting-frame for said crank shaft and axle, a housing for said gears consisting of an upper and lower section, the rear end of which is mounted on said axle, 45 and through which the crank-shaft passes, a substantially V-shaped member the ends of the arms of which are connected to said resilient bearings, a ball made integral with the vertex of said member, and a stationary 50 bearing made integral with said supporting-frame in which said ball is journaled.

12. In a geared locomotive the combination with the supporting-frame thereof, the axle of the drive wheels thereof, and drive- 55 wheels therefor, of a floating transverse crank-shaft, gears connecting the same to said axle, a housing for said gears, which is mounted on said axle and which passes through said crank-shaft, bearings for said 60 axle in said supporting-frame, a substantially V-shaped member the ends of the arms of which are connected to said resilient bearings, a ball made integral with the vertex of said member, and a stationary 65 bearing integral with said supporting-frame in which said ball is journaled.

In witness whereof, I have hereunto set my hand this 3rd day of September, 1919.

ELMER F. BACKER.

Witnesses:

JOHN J. KASTLIN,
HUGO A. AUZBERGER.