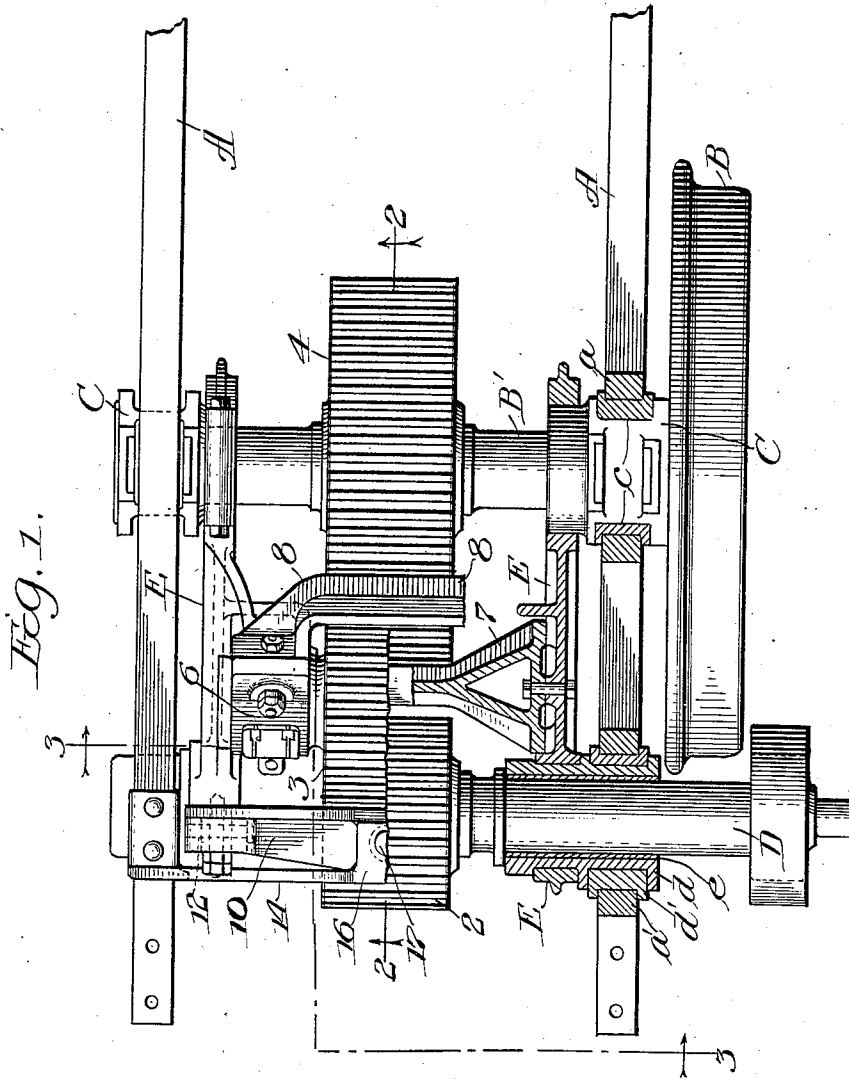


L. W. BARGER.  
 ARTICULATED ENGINE.  
 APPLICATION FILED FEB. 3, 1913.

1,060,883.

Patented May 6, 1913.

3 SHEETS-SHEET 1.



Witnesses  
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 E. K. Lundy.

Inventor  
 Lorin W. Barger  
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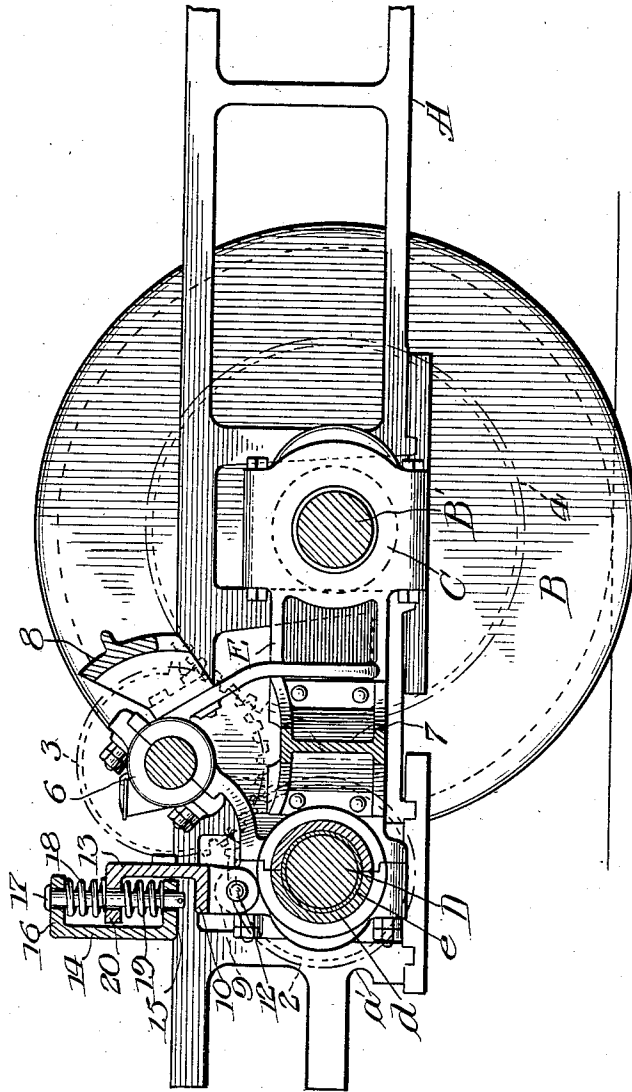
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3 SHEETS-SHEET 2.

Fig. 2.



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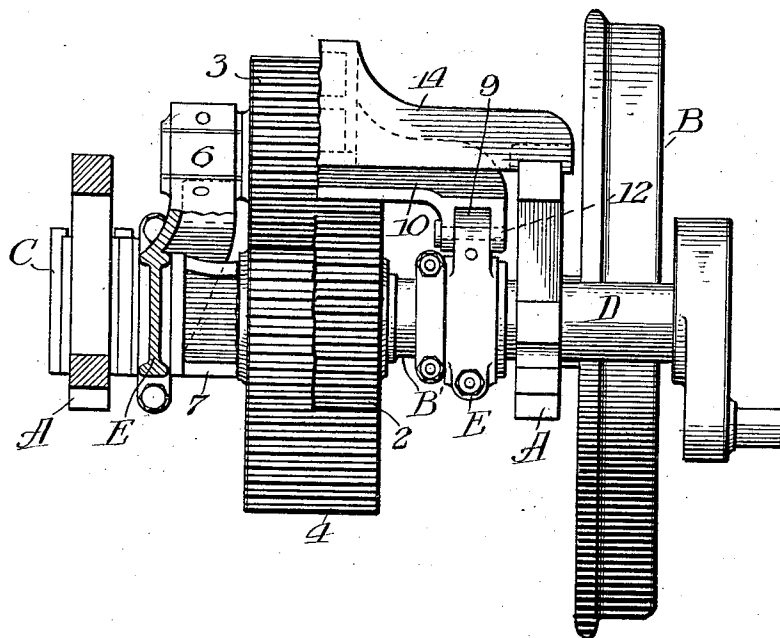
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3 SHEETS—SHEET 3.

FIG. 3.



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# UNITED STATES PATENT OFFICE.

LORIN W. BARGER, OF DAVENPORT, IOWA, ASSIGNOR TO DAVENPORT LOCOMOTIVE WORKS, OF DAVENPORT, IOWA, A CORPORATION OF IOWA.

## ARTICULATED ENGINE.

1,060,883.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed February 3, 1913. Serial No. 745,780.

*To all whom it may concern:*

Be it known that I, LORIN W. BARGER, 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 Articulated Engines, of which the following is a full, clear, and exact description.

My invention relates to the supporting structure for the gearing used to transmit power to the driving-wheels of the truck of an articulated engine.

The object of said invention is to provide a resilient structure for supporting said gearing, which is carried by the truck; which will permit the independent vibrations of the driving-wheels and truck-frames; which will not affect the connection between the actuating mechanism of the engine and the crank-shaft, and which will always maintain the relative position of the gearing for imparting the motion of the crank-shaft to the driving-wheel axle. These and other advantages are accomplished by my improvements, substantially as hereinafter fully described, and as particularly pointed out in the claims.

In the drawings: Figure 1 is a plan view of one end of an engine-truck of an articulated locomotive embodying my invention showing one side portion in horizontal section. Fig. 2 is a vertical longitudinal section thereof taken on dotted line 2, 2, Fig. 1. Fig. 3 is a vertical transverse section of said truck taken on dotted line 3, 3, Fig. 1, showing one side of the structure in transverse vertical section.

Referring to the drawings, A, A, represents the side-frames of a pedestal truck that supports the engine; B represents the driving-wheel and B' the axle therefor, and C represents the journal-boxes which are provided with suitable shoes and wedges *c*, that engage the pedestal jaws *a* of the side-frames of the truck, in the usual manner. At a suitable distance from the axis of the driving-wheel, and, preferably, at a point remote from the wheels of the truck, the side-frames A thereof are provided with another pedestal *a'*, and the jaws of this last-mentioned pedestal are engaged by the shoes and wedges *d'* of a suitable journal-box *d*, in which latter a sleeve *e* is journaled that provides bearings for the transverse crank-shaft D. The inner end of journal

box *d* is tubular and extends inward beyond its bearings a suitable distance and is journaled in stationary bearings in the vibratory ends of auxiliary side-frames E.

About its center of length the crank-shaft is provided with a suitable gear 2, and this gear meshes with and imparts its motion to an idle gear 3, which latter engages and drives a large gear 4 mounted upon the driving-axle B' about its center of length. The shaft on which the idle-gear 3 is mounted is journaled in suitable bearings 6 in the upper raised central portion of the auxiliary frames E and the bearings 6 extend inward toward each other. Below bearings 6 said frames E are connected by a cross-beam 7, and they are also connected by an arched bridge 8, the ends of which latter are connected to and spring from the side of bearings 6 nearest the car-axle. The central portion of cross-beam 7 is of substantially I-cross-section, and on either side of the plane of the train of gears 2, 3 and 4, its end portions are spread laterally to enable its extremities to present a large bearing surface to the auxiliary frame E, to which they are bolted or otherwise suitably secured. The bridge 8 passes in front of the idle-gear, and its under edge is recessed to provide clearance and protection for the engaging portions of gears 3 and 4.

The journal-boxes C have inwardly extending cylindrical portions upon which the ends of the auxiliary frames E, opposite the crank-shaft, are loosely mounted, and immediately above journal-box *d*, frames E are each provided with an upwardly projecting lug 9 to which the downturned ends of a yoke or hanger 10 are suitably secured by a bolt or pintle 12, substantially as shown in the drawings. Between these downturned ends, the yoke 10 extends horizontally from frame E on one side to frame E on the other side of the truck, and the center of length thereof is provided with an upwardly projecting vertical web 13, the upper edge of which has a horizontal lug 20 that extends, preferably, in the direction away from the gear 3.

A transom 14 connects side-frames A, in substantially the same vertical plane as the yoke 10, and the ends of this are seated upon and secured to the upper edge of said side-frames. The lower edge of this transom between side-frames A is, preferably,

horizontal and at about its center of length it is provided with a horizontal flange 15 that extends toward the gear 3. The central portion of the upper edge of said transom extends upward and is highest at its center of length where it is provided with a horizontal flange 16 that corresponds with its lower horizontal flange 15. When properly assembled, the lug 20 of the yoke 10 will project between the upper flange 16 and the lower flange 15 of the transom, and will be retained in this position so that it may vibrate up and down by means of a vertical pin or bolt 17, which latter extends down through a suitable perforation in the upper flange 16 of the transom, lug 20 of the yoke and the lower flange 15 of the transom, and coil-springs 18 and 19, respectively, surround said bolt 17 between said flanges and lug, and thus make a resilient connection between the yoke and transom.

From the foregoing description, it will be apparent that the crank-shaft, the journal-box thereof, the ends of the auxiliary frames in which the gear-shaft is journaled, and the gears 2 and 3 for transmitting the motion of the crank-shaft to the large gear on the driving-wheel axle are all suspended from transom 14 in such manner that any vibration thereof, due to the travel of the truck over the rails, or to the action of the mechanism that imparts motion to the crank-shaft, or to both, will be accommodated by the yielding connection between the yoke 10 and the said transom and will allow of that flexibility of connection between the actuating mechanism of the crank-shaft and the driving-wheel axle necessary to insure the practical and satisfactory operation of this part of an articulated engine to which my improvements are particularly adapted to be applied.

What I claim as new is:

1. A locomotive-truck comprising suitable side-frames, drive-wheels and axle, a transverse crank-shaft the ends of which extend through and beyond said side-frames, gearing connecting said crank-shaft and axle, and means for resiliently supporting the crank-shaft and gears.

2. A locomotive-truck comprising suitable side-frames, drive-wheels and axle and cushioned bearings for said axle, a transverse crank-shaft the ends of which extend through and beyond said side-frames, gearing connecting said crank-shaft and axle, and means for resiliently supporting said crank-shaft and gears.

3. A locomotive-truck comprising drive-wheels and axle, journal-boxes therefor, side-frames having pedestals for said boxes, a crank-shaft, journal-boxes for said shaft capable of vibratory movement in said side-frames, gearing connecting crank-shaft and

axle, and means for resiliently supporting said crank-shaft bearings and gears.

4. A locomotive-truck comprising suitable side-frames, drive-wheels and axle, a transverse crank-shaft the ends of which extend through and beyond said side-frames, gearing connecting said crank-shaft and axle, a transom connecting said side-frames, and means for resiliently supporting said crank-shaft and gears therefrom.

5. A locomotive-truck comprising suitable side-frames, drive-wheels and axle and cushioned bearings for said axle, a transverse crank-shaft the ends of which extend through and beyond said side-frames, gearing connecting said crank-shaft and axle, a transom connecting said side-frames, and means for resiliently supporting said crank-shaft and gears therefrom.

6. A locomotive-truck comprising suitable side-frames, a transom connecting said side-frames, drive-wheels and axle therefor, journal-boxes therefor connected to said side-frames, a transverse crank-shaft the ends of which extend through and beyond said side-frames, bearings therefor, gearing connecting said shaft and axle, a yoke for hanging said shaft bearings and resiliently connected to said transom.

7. A locomotive-truck comprising suitable side-frames, drive-wheels and axle therefor, cushioned bearings for said axle, a transverse crank-shaft, gearing connecting said shaft and axle, parallel longitudinally disposed auxiliary frames for supporting said crank-shaft and gearing, and means for resiliently supporting said auxiliary frames.

8. A locomotive-truck comprising suitable side-frames, drive-wheels and axle therefor, cushioned bearings for said axle, a transverse crank-shaft, gearing connecting the crank-shaft and axle, parallel longitudinally disposed auxiliary frames for supporting said crank-shaft and gears, one end of each of which is pivoted on said axle, a yoke suspending the other ends of said auxiliary frames, and resilient means for supporting said yoke.

9. A locomotive-truck comprising suitable side-frames, drive-wheels and axle therefor, cushioned bearings for said axle carried by said side-frames and having their inner ends extended inward, a crank-shaft, gearing connecting the crank-shaft and axle, longitudinally disposed parallel auxiliary frames for supporting said crank-shaft and gears one end of each of which is pivoted on the inner extensions of said cushioned bearings, a transverse yoke from which the other ends of said auxiliary frames are suspended, and resilient means for supporting said yoke.

10. A locomotive-truck comprising suitable side-frames, drive-wheels and axle therefor, cushioned bearings for said axle carried by said side-frames, a transverse crank-

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shaft, gearing connecting said crank-shaft and axle, longitudinally disposed parallel auxiliary frames for supporting said crank-shaft and gears one end of each of which is pivoted on said axle, a cross-beam connecting said auxiliary frame, a yoke suspending the other ends of said auxiliary frames, and resilient means for supporting said yoke.

11. A locomotive-truck comprising suitable side-frames, drive-wheels and axle therefor, cushioned bearings for said axle the inner ends of which are extended toward each other, a transverse crank-shaft, gearing connecting the crank-shaft and axle, longitudinally disposed parallel auxiliary frames for supporting said crank-shaft and gears one end of each of which is pivoted on the inner extension of said cushioned bearings, a cross-beam connecting said auxiliary frames, a yoke from which the other ends of said auxiliary frames are suspended, and resilient means for supporting said yoke.

12. A locomotive-truck comprising suitable side-frames, drive-wheels and axle therefor, cushioned bearings for said axle carried by said side-frames, a transverse crank-shaft, longitudinally disposed parallel auxiliary frames one end of each of which is pivoted on said axle and which have bearings for said crank-shaft in the opposite ends thereof, a yoke from which the opposite ends of said auxiliary frames are suspended, resilient means for supporting said yoke, a gear mounted on said shaft between its bearings, an idle gear deriving motion therefrom the shaft of which is journaled in said auxiliary frames, a gear on the axle engaged by said idle gear.

13. A locomotive-truck comprising suitable side-frames, drive-wheels and axle therefor, cushioned bearings for said axle carried by said side-frames, a transverse crank-shaft, longitudinally disposed parallel auxiliary frames one end of each of which is pivoted on said axle and which have bearings for said crank-shaft in the opposite ends thereof, a yoke from which the opposite ends of said auxiliary frames are suspended, a cross-beam connecting said auxiliary frames, resilient means for supporting said yoke, a gear mounted on said shaft between its bearings, an idle gear deriving motion therefrom, the shaft of which is journaled in said auxiliary frames, a gear on the axle engaged by said idle gear.

14. A locomotive-truck comprising suitable side-frames, drive-wheels and axle therefor, cushioned bearings for said axle carried by said side-frames, a transverse crank-shaft, longitudinally disposed parallel auxiliary frames one end of each of which is pivoted on said axle and which have bearings for said crank-shaft in the opposite ends thereof, a yoke from which the oppo-

site ends of said auxiliary frames are suspended, a cross-beam connecting said auxiliary frames below the idle-gear shaft, a bridge connecting said auxiliary frames above the plane of said idle-gear shaft, resilient means for supporting said yoke, a gear mounted on said shaft between its bearings, an idle gear deriving motion therefrom the shaft of which is journaled in said auxiliary frames, a gear on the axle engaged by said idle-gear.

15. A locomotive-truck comprising suitable side-frames, drive-wheels and axle, a transverse crank-shaft the ends of which extend through and beyond said side-frames, gearing connecting said crank-shaft and axle, a transom connecting said side-frames above the plane of said crank-shaft, and resilient means suspended from said transom for supporting said crank-shaft and gears.

16. A locomotive-truck comprising drive-wheels and axle, suitable side-frames and transom connecting the same, a transverse crank-shaft, longitudinally disposed parallel auxiliary frames one end of each of which is pivotally mounted on said axle, and the opposite ends of which support said crank-shaft, a yoke connecting the said opposite ends of said auxiliary frames, and springs connecting the center of length of said yoke to said transom.

17. A locomotive-truck comprising suitable side-frames, a transom connecting the same the upper and lower edges of the center of length of which are provided with horizontal flanges, drive-wheels and axle therefor, auxiliary frames one end of each of which is pivotally mounted on said axle, a crank-shaft journaled in the opposite ends of said auxiliary frames, a transverse yoke located under said transom from which the said opposite ends of said auxiliary frames are suspended, the center of length of which is provided with a horizontal lug normally disposed between the horizontal flanges of the transom and springs interposed between said lug and said flanges.

18. A locomotive-truck comprising suitable side-frames, a transom connecting the same the upper and lower edges of the center of length of which are provided with horizontal flanges, drive-wheels and axle therefor, auxiliary frames one end of which is pivotally mounted on said axle, a crank-shaft journaled in the opposite ends of said auxiliary frames, a transverse yoke located under said transom from which the said opposite ends of said auxiliary frames are suspended, the center of length of which is provided with a horizontal lug normally disposed between the horizontal flanges of the transom, a vertically disposed bolt extending down through openings in said flanges and lugs, and springs surrounding said bolt and interposed between said lug and said flanges.

19. A locomotive-truck comprising suitable side-frames provided with pedestals, a transom connecting the upper portion of said side-frames, the center of length of  
5 which is provided with an upper and lower horizontal corresponding flange, drive-wheels, an axle therefor, cushioned journal-boxes engaging said pedestals and having their inner ends extended toward each other,  
10 longitudinally disposed parallel auxiliary frames the corresponding ends of which are journaled on said journal-box extensions, cross-members connecting said auxiliary frames, a crank-shaft journaled in the end  
15 of the same opposite said axle, a transverse yoke, the center of length of which is pro-

vided with a horizontal lug, and from which the said opposite ends of said auxiliary frames are suspended, a vertical bolt extending through the flanges of said transom and  
20 the lug of said yoke, and coil-springs interposed between said lug and said flanges which surround said bolt, and gearing imparting motion of said crank-shaft to said  
25 axle.

In witness whereof I have hereunto set my hand this 30th day of January, 1913.

LORIN W. BARGER.

Witnesses:

W. CHADWICK,  
E. M. BROOKS.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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