

L. W. BARGER.  
ARTICULATED LOCOMOTIVE.  
APPLICATION FILED DEC. 9, 1912.

1,057,797.

Patented Apr. 1, 1913.  
2 SHEETS—SHEET 1.

Fig. 1.

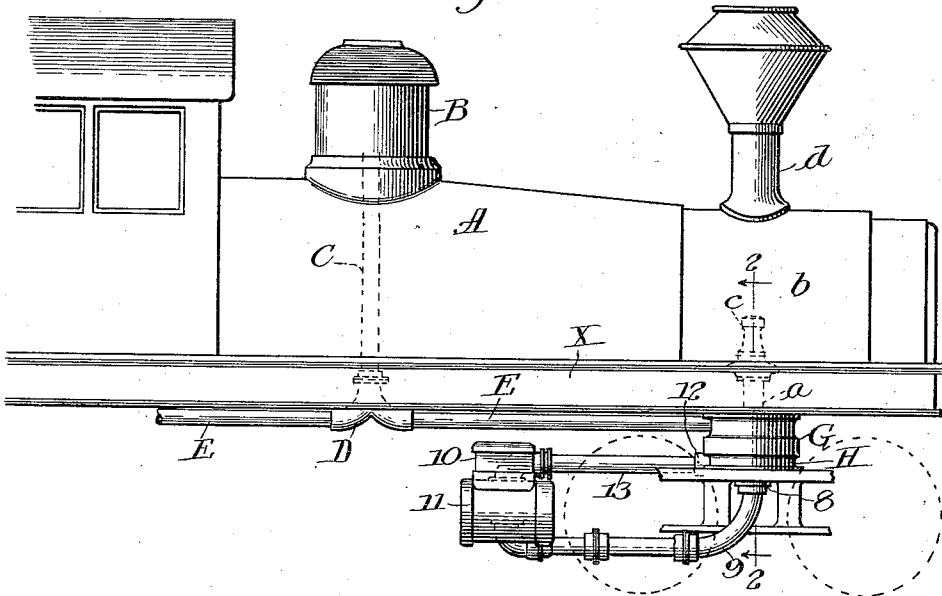


Fig. 2.

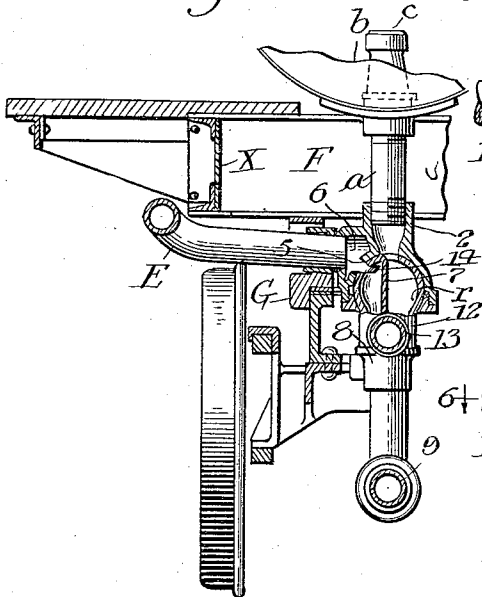


Fig. 6.

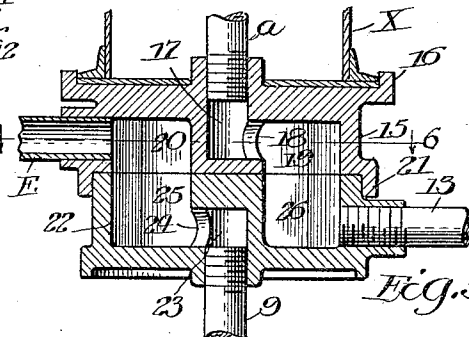
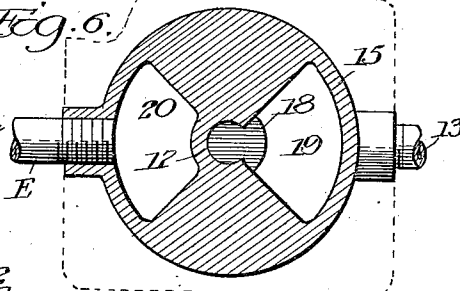


Fig. 5.

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2 SHEETS—SHEET 2.

Fig. 4.

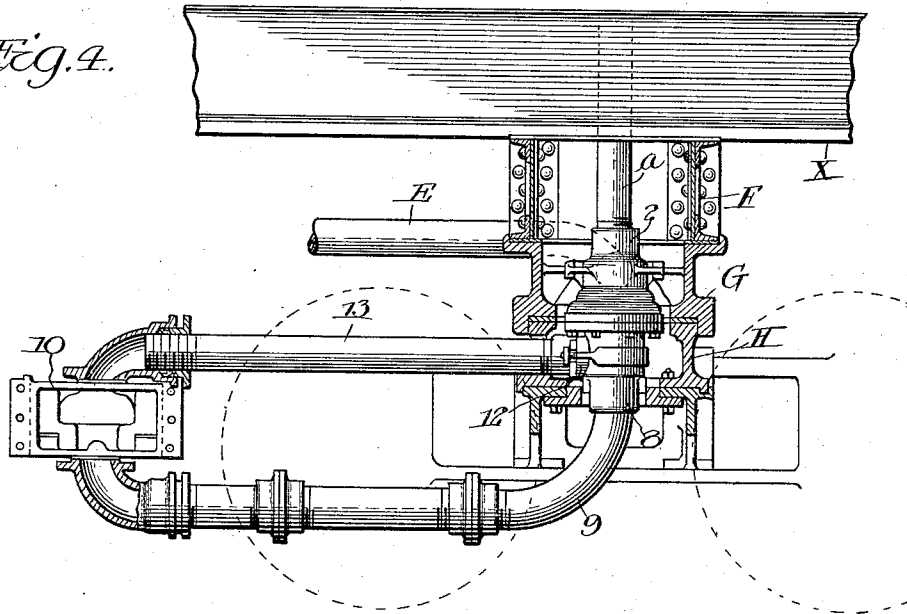
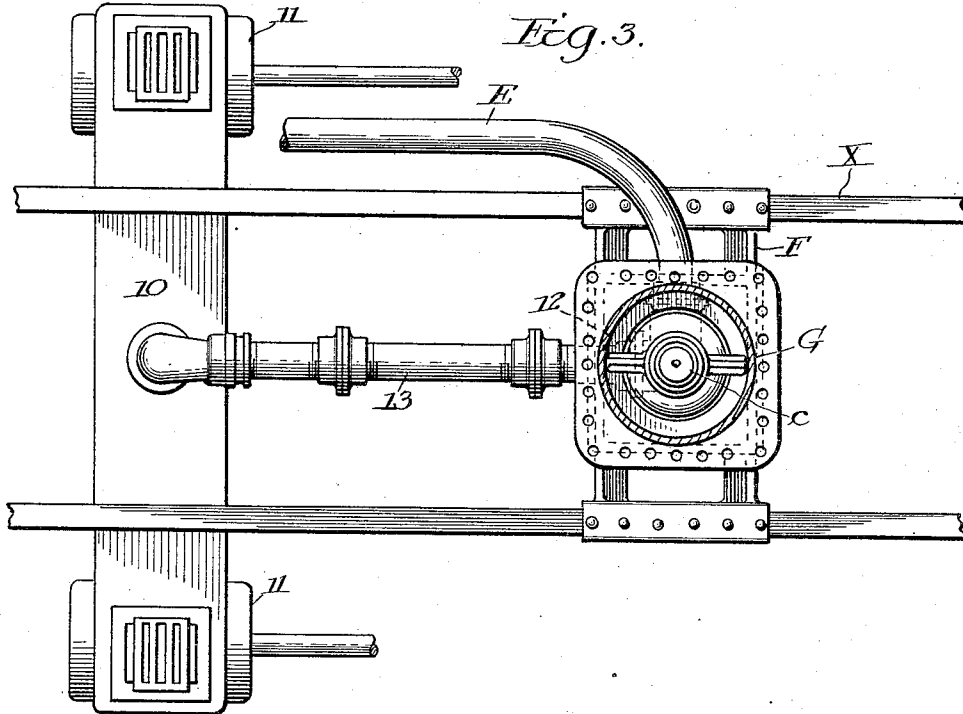


Fig. 3.



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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 LOCOMOTIVE.

1,057,797.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed December 9, 1912. Serial No. 735,604.

*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 Locomotives, of which the following is a full, clear, and exact description.

My invention relates to what is known as articulated engines, in which the cylinders and driving-gear are mounted on front and rear trucks, and the boiler is carried by a suitable underframe supported by said trucks, and generates the steam which is suitably conveyed to and exhausted from said cylinders.

My invention has for its object the transmission of the live and exhaust steam from the superstructure of the locomotive to the trucks and vice versa, in such manner that the turning of the trucks within the arc described by the curves of the track does not interfere with the passage of the same. This and other advantages I accomplish by the comparatively simple means hereinafter fully described, and as particularly pointed out in the claims.

In the drawings: Figure 1 is a side elevation of a portion of a locomotive embodying my invention. Fig. 2 is a transverse section thereof taken on dotted line 2—2, Fig. 1. Fig. 3 is a plan view taken below the plane of the boiler. Fig. 4 is a longitudinal section. Fig. 5 is a vertical central section of a modification of my invention. Fig. 6 is a horizontal section taken on dotted line 6—6, Fig. 5.

Referring to the drawings, A represents the boiler of a locomotive; B the steam-dome thereof, and C the pipes leading from the throttle-valve situated in said dome and extending down in a suitable direction out through the bottom of the boiler and there connected by a suitable inverted T-coupling D, to pipes E, E, leading, one toward and to the center bearing of the forward truck, and the other toward and to the center-bearing of the rear truck supporting the boiler and other superstructure of the locomotive.

The boiler is directly supported by a metal underframe, and the side-sills X of this metal underframe are connected at points immediately above the center-bearing of the truck by a bolster F. This bolster has secured to the lower edges of the channel beams that constitute its parallel transverse members, a center-bearing G that consists of a tubular casting the underside of which is depressed to form a seat for the upper portion of the center-bearing H of the truck with the pivotal axis of which its axis alines. Midway between the transverse members of the bolster is an exhaust nipple *a* that extends to and contacts with the underside of the smoke-box *b*, of the locomotive, and secured to the bottom of this smoke-box by means of a suitable circumferential flange is a vertically disposed exhaust-nozzle *c*, whose axis alines with and which is adapted to forcibly discharge the exhaust up through and out of the smoke-stack *d*.

The bore of the tubular center-bearing G is provided with a series of inwardly projecting lugs, and these lugs support and suspend, concentric with the exterior of center-bearing, the female portion of a valve-coupling, the upper part of which is formed into a pipe stub 2, which latter is connected by means of the nipple *a* to the lower end of the exhaust nozzle *c*, as stated. The lower portion of said female member is made semi-spherical and it is provided with an opening connecting the bore of the stub with the concavity thereof, and is also provided below its apex and below the plane of the opening leading from the bore of said stub 2, with a transversely elongated opening 5. Surrounding and inclosing this opening 5, is a boss 6 of suitable construction, that is cast integral with said female member and has an opening in its outer wall into which one end of a pipe E is inserted and suitably secured. Engaging and seated in the concavity of said female member, is the head *r* of a tubular male member, which is somewhat spherical in shape, and is adapted to fit snugly within the semi-spherical portion of the female member. The portion of the

male member below its head is reduced in diameter and its lower end terminates in a stub 8 into which a pipe 9 is inserted and secured. This pipe 9 leads to and has its opposite end suitably secured to the steam-exhaust 10 of a cylinder 11. The male member below its head is provided with a rearwardly projecting stub 12, and this stub is connected by means of a suitable pipe 13 to the exhaust chamber of the steam-chest. The male member is divided longitudinally into two passages by means of a transverse web or partition 7, that extends from a point just below the pipe stub 12 where it curves toward and merges into the exterior wall of the male member. The upper end of this web extends to and merges into the top portion of the head of the male member, and leaves one passage extending from the lower terminal stub 8 of said member to a transversely elongated orifice 14 that registers and communicates with the opening 5 of the semi-circular portion of the female member. Steam entering boss 6 from the pipe E will pass through opening 5 and through orifice 14 and down through the passage connecting the same with pipe 13, through which latter the steam will be conducted to and enter the steam-chest. The exhaust steam discharging from the steam-chest will pass through pipe 9, through stub 8 and into the other passage of the male member, and then up through the last mentioned passage through an opening in the top of the head thereof, and be discharged into the exhaust nipple *a* from the stub at the upper end of the female member. The opening in the upper end of the male member is so centrally located and the transversely elongated orifice 14 is of such length that the live steam and the exhaust steam will pass through said female and male members comprising said joint or coupling, no matter to what angle to the axis of the boiler the truck may turn in its travels over the rails of the car track. Under all conditions the passage of the live and exhaust steam through the center-bearings of the truck and body-bolster is maintained, and there is practically no danger of this center steam connection being injured or obstructed by any condition involving its use. In Figs. 5 and 6 of the drawings, I show a modified construction of means for permitting this simultaneous passing of the live and exhaust steam through the pivotal connections of the car-trucks with the superstructure of the locomotives. This modification comprises structural changes in the center-bearing castings of the locomotive under-frame, and trucks therefor, that dispense with the necessity for a pipe coupling such as hereinbefore described. The top of the upper or female center-bearing casting 15 is rectangular in shape, and its transverse edges 16 are flanged

upward, and it is secured flat against the underside of the body-bolster with said flanges lapping against the longitudinal edges of the same. This center bearing is provided with a central bore 17 that extends down into said bearing a suitable distance, but not clear through it, and it has a lateral orifice 18 adjacent its lower end that connects it with a chamber 19, which latter is, preferably, quadrant shaped in horizontal section, and extends from said orifice 18 down through the bottom of the bearing. This center bearing casting also has a chamber 20 therein which is located diametrically opposite and is, preferably, of the same shape and dimensions as chamber 19. The pipe E is tapped into bearing 15, and discharges into chamber 20, and a pipe *a* is tapped into the upper end of the bore 17, and connects it with the exhaust nozzle *c*. The lower end of the center bearing casting 15 is circular and it is provided with an outwardly and then downwardly projecting circumferential flange, 21, that provides a seat for and confines the upper circular end of the center bearing casting 22 of the truck. This truck bearing is secured in any well-known manner to the truck-bolster, and aside from its exterior shape, which differs from that of the upper bearing 15 to the extent required by its principal function, it is constructed just the reverse of the upper center bearing. In other words, it is, as will be observed, provided with a central bore 23 that extends from its under side to near the upper end of the casting, but not clear through it, and its upper end is provided with an orifice 24 that discharges into a chamber 25, which latter is quadrant shaped in horizontal section and extends from the orifice 24 up through the upper end of the casting, and when the truck is traveling in the direction of the length of the locomotive, it registers and communicates with chamber 20 of the upper casting to which it, preferably, corresponds in dimensions. Diametrically opposite chamber 25 this lower or truck center bearing casting is provided with a chamber 26 which corresponds in shape and dimensions therewith and extends from a point about in the same horizontal plane as the floor of chamber 25 and registers and communicates with chamber 19 of the upper bearing casting, to which it, preferably, corresponds in horizontal dimensions. The lower end of the bore 23 is connected by the pipe 9 to the steam exhaust of the cylinder and the chamber 26 of the lower center casting is connected to the discharge pipe 13 with the exhaust chamber of the steam chest.

In operation, live steam entering chamber 20 of the upper center bearing casting through pipe E will pass into chamber 25 of the lower center bearing casting and from thence through orifice 24 into bore 23 and

through pipe 9 to the steam-exhaust. The exhaust steam from the steam chest will pass through pipe 13 and enter chamber 26 of the lower center bearing casting and pass up into chamber 19, from thence through orifice 18 into the bore 17, and out through the nipple *a* into the exhaust nozzle *c* of the locomotive. The quadrant shape of the receiving-chambers 20 and 25 and of the exhaust-chambers 19 and 26 of these center-bearing castings will insure said chambers being in communication with each other all the time, because the established curves of railroad tracks seldom exceed 18 degrees, and thus the flow of the live steam from the boiler of the locomotive through these center-bearings to the cylinder supported by the trucks, and the exhaust steam from said cylinders through said center-bearings to and out of the exhaust-nozzle of the locomotive will never be interfered with.

I do not desire to be confined to any particular mechanical structure for passing the live and exhaust steam through the center-bearings of the body and truck bolsters, for, as hereinbefore demonstrated, this may be done in several ways. All means for accomplishing this result, I consider as coming within the scope of my invention.

What I claim as new is:

1. The combination with the superstructure of a locomotive including the boiler thereof, and upper center bearings secured thereto, trucks, steam actuated devices for propelling the same, and lower center bearings secured to said truck that pivotally engage said upper center bearings, said center bearings adapted to permit the simultaneous passage therethrough of the steam from said boiler to said steam actuated devices, and from said devices to the steam exhaust members of the locomotive superstructure.

2. The combination with the superstructure of a locomotive including the steam generator thereof, an upper center bearing secured to said superstructure, a truck, steam actuated devices mounted thereon, and the lower center bearing on said truck that pivotally engages said upper center bearing; said center bearings adapted to permit the passage therethrough of the steam from the generator to said actuating devices and from said devices to the steam exhaust members of the locomotive superstructure during both the pivotal and normal positions of the truck.

3. The combination with the superstructure of a locomotive including the steam generator thereof, an upper center bearing secured to said superstructure, a truck, steam actuated devices mounted thereon, and the lower center bearing on said truck that pivotally engages said upper center bearing; and steam fixtures connecting the said generator and actuating devices and also con-

nect said devices and the steam exhaust members of the locomotive superstructure, both of which pass through said center bearings.

4. The combination with the superstructure of a locomotive including the steam generator thereof, an upper center bearing secured to said superstructure, a truck, steam actuated devices mounted thereon, and the lower center bearing on said truck that pivotally engages said upper center bearing; and steam fixtures connecting the said generator and actuating devices and also connect said devices and the steam exhaust members of the locomotive superstructure, both of which pass vertically through said center bearing, and have a pivotally jointed connection in the vertical stretch thereof.

5. The combination with the superstructure of a locomotive including the boiler, furnace, smoke-box and smoke-stack thereof, an upper center bearing secured to said superstructure, a truck, steam actuated devices mounted thereon, and the lower center bearing on said truck that pivotally engages said upper center bearing; a live steam pipe extending from said boiler to said upper bearing, and an exhaust pipe communicating with and leading from said bearing and discharging into said smoke-box, a live steam pipe extending from said lower center bearing to said actuating devices and an exhaust pipe leading from said devices and communicating with said lower center plate, and a pivotal coupling connecting said steam pipes with said exhaust pipes.

6. The combination with the superstructure of a locomotive including the boiler, furnace, smoke-box and smoke-stack thereof, an upper center bearing secured to said superstructure, a truck, steam actuated devices mounted thereon, and the lower center bearing on said truck that pivotally engages at said upper center bearing; a live steam pipe extending from said boiler to said upper bearing, and an exhaust pipe leading from said bearing and discharges into said smoke-box, a live steam pipe extending from said lower center bearing to said actuating devices and an exhaust pipe from said devices to said lower center plate, and an integral common coupling connecting said steam pipes and said exhaust pipes.

7. In an articulated locomotive, an under-frame, a hollow upper center-bearing secured thereto, a truck, cross-member connecting the side-frames thereof, and a hollow lower center-bearing secured to said cross-member and supporting said upper center-bearing with the bore of which its bore communicates, a live steam pipe extending from said boiler laterally into the bore of the upper center-bearing, and an exhaust pipe leading axially from the top of the same, a live steam pipe leading axially from

the lower end of said lower center bearing,  
and an exhaust pipe leading laterally into  
the same, and a pivotal coupling consisting  
of an upper and lower member and support-  
5 ed within the bores of said bearings and con-  
nected the two live steam pipes and the two  
exhaust steam pipes.

In witness whereof I have hereunto set  
my hand this 19 day of November.

LORIN W. BARGER.

Witnesses:

VICTOR F. LUCHT,  
W. CHADWICK.

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