July 12, 1927. 1,635,813

J. L. BORSKI

LOCOMOTIVE DRIVING MECHANISM

Filed May 24, 1926

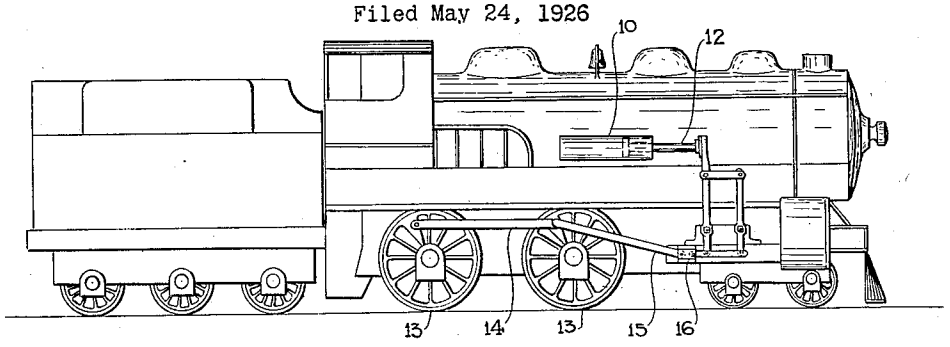


FIG. 1

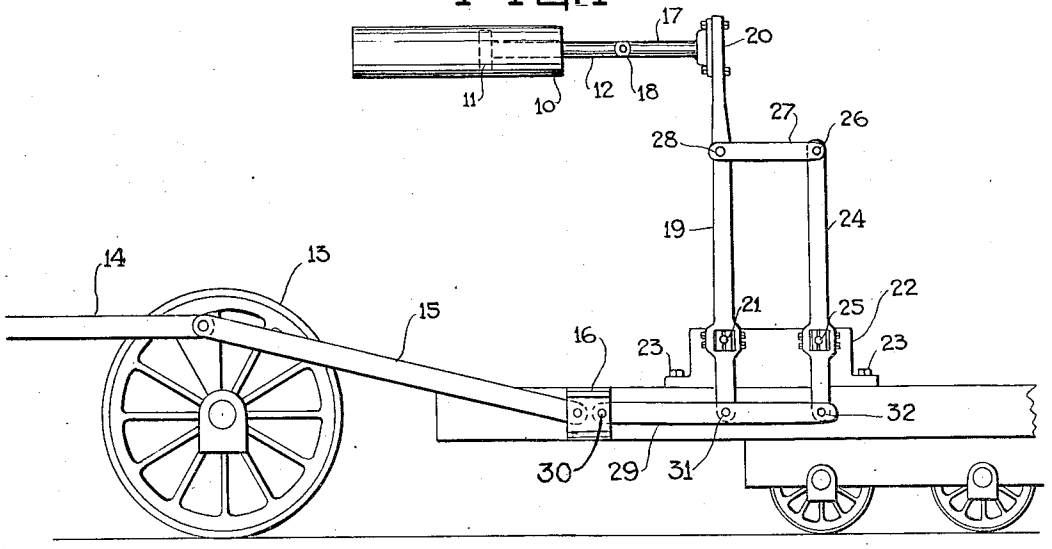


FIG. 2

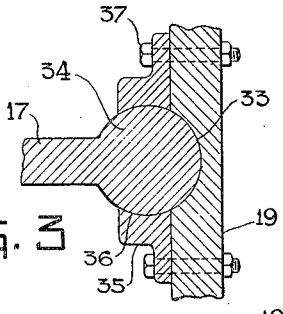


FIG. 3

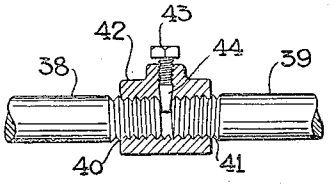


FIG. 4

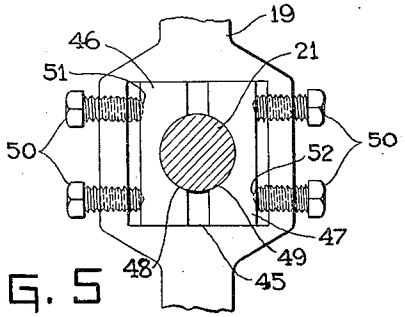


FIG. 5

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LOCOMOTIVE DRIVING MECHANISM.

Application filed May 24, 1926. Serial No. 111,127.

This invention relates generally to railroad locomotives, the invention having more particular reference to a novel type of driving mechanism for railroad locomotives.

The invention has for an object the provision of an improved driving mechanism which will increase the driving power of the locomotive, and decrease the speed of the locomotive.

A further object of the invention is the provision of an improved driving mechanism for locomotives embodying certain novel adjustable features.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claims in which the various novel features of the invention are more particularly set forth.

Fig. 1, of the drawing is a perspective view of a railway locomotive embodying my improved driving mechanism.

Fig. 2, is an enlarged side elevational view of my improved driving mechanism.

Fig. 3, is a central sectional view illustrating a modification of the pivoted connections as used in connection with my improved device.

Fig. 4, is a fragmentary detail view illustrating a modification of the adjustable means as used in connection with my improved device.

Fig. 5, is a detail view illustrating a modification of the bearings as used in connection with my improved device.

The cylinder 10 of an engine, the piston 11, the piston rod 12, the driving wheels 13, the driving wheel connecting rod 14, the driving rod 15, the cross head 16, are such as commonly used in railroad locomotives generally, and are operatively positioned and are suitably connected respectively, as clearly shown in Figs. 1 and 2 of the accompanying drawing.

The supplementary piston rod 17, is pivotally connected, as at 18, by a pin or the like, to the piston rod 12, and is pivotally connected to the upper extremity of the vertical driving rod 19, as at 20, by a pin or the like. The vertical driving rod 19 is pivotally attached to a pin 21 rigidly attached to the supporting block 22 suitably mounted in the running gear of a railroad locomotive and rigidly attached thereto, as at 23, by bolts, screws, studs or the like. The supplementary vertical driving rod 24, is pivotally attached by a pin 25 rigidly attached to the supporting block 22, and has pivotally attached at its upper extremity, as at 26, by a pin or the like, a cross rod 27, pivotally attached to the vertical driving rod 19, as at 28, by a pin or the like. The cross head rod 29, is pivotally attached, as at 30, to the cross head 16, and is pivotally attached, as at 31 and 32, to the lower extremities of the vertical driving rod 19 and the supplementary driving rod 24, respectively. It should be understood that the vertical driving rod 24 is pivotally attached to the pin 26, so as to reinforce the driving rod 19 and relieve the same of a portion of a strain applied thereon, and that the supplementary vertical driving rod 24 is parallel to the vertical rod 19 and is pivotally attached to the pin 25 positioned directly opposite to and in line with the said pin 21.

It also should be understood that the distance between the pivot 21 of the drive rod 19 is much greater than the distance between the said pivot and the lower pivot 31. This results in an upper lever arm of greater length than the lower lever arm. The upper lever arm may be considered as the power arm of the rod 19 for it is a piston of the cylinder and the lower arm is connected with the crosshead. It is obvious that the construction involves a lever of the first degree and that the ratio of the force applied at the upper end to the force derived from the lower end is inversely proportional to the ratio of length of the upper end of the lever to the length of the lower end thereof. Thus, power is gained by loss of distance of movement and a locomotive so equipped has increased power and decreased speed.

In order to make possible the employment of a long upper lever arm the auxiliary drive rod 24 is connected with the rod 19 between the upper end and the pivot 21 so as to prevent bending of the upper lever arm due to its length and thus reinforce the same.

The above construction is such as will permit the piston 11 to drive or rotate the driving wheels 13, at a comparatively slower speed than the speed of the said piston 11.

Referring in particular to Fig. 3, in which I have illustrated a modification of the pivoted connections, the vertical driving rod 19 is provided with a semispherical recess 33, adapted to receive the spherical head 34 of the supplementary piston rod 17. The cap 35, is provided with a partly spherical recess 36 to accommodate the inner portion of the semispherical head 34, and is removably attached to the vertical driving rod 19, by bolts 37, screws, studs, or the like. The above described construction is such as will pivotally attach the supplementary piston rod 17 to the vertical driving rod 19.

Referring in particular to Fig. 4, in which I have illustrated a modification of the supplementary piston rod 17; the piston rod 17 consists of two rods 38 and 39, provided with right hand threads 40 and left hand threads 41 respectively suitably formed at their adjacent extremities, to accommodate a turnbuckle 42, having threadedly attached thereto, a locking screw 43 provided with a lower tapered extremity 44. The above described construction is such as will permit the turnbuckle 42 to suitably adjust the length of the two rods 38 and 39, as may be desired, and which will permit the tapered lower extremity 44 of the locking screw 43 to maintain the said adjustment.

Referring in particular to Fig. 5, in which I have illustrated a modification of means of pivotally attaching the vertical driving rod 19 to the said pin 21, the vertical driving rod 19 is provided with an aperture 45, to slidably accommodate the pin bearing blocks 46 and 47, provided with semicircular recesses 48 and 49, to pivotally accommodate the pin 21. The set screws 50 are threadedly attached to the vertical driving rod 19, and are positioned so as to permit their extremities to engage suitable recesses 51 and 52 formed in the pin bearing blocks 46 and 47, respectively. The above described construction is such as will permit the set screws 50 to maintain the proper pivoting of the vertical driving rod 19.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent of the United States is as follows:—

1. In a driving mechanism, for railroad locomotives, of the class described, a supplementary piston rod pivotally connected to a piston rod and to the upper extremity of a vertical driving rod, the said vertical driving rod pivotally attached to a pin rigidly attached to a supporting block mounted on the running gear of the said railroad locomotive and rigidly attached thereto, a supplementary vertical driving rod pivotally attached to a second pin rigidly attached to the said supporting block, and having pivotally attached at its upper extremity a cross rod pivotally attached to the said vertical driving rod, a cross head rod pivotally attached to the cross head of the said locomotive, and pivotally attached to the lower extremities of the said vertical driving rod and the said supplementary driving rod, so as to decrease the linear motion of the said cross head relative to the linear motion of the said piston rod.

2. In a driving mechanism, for railroad locomotives, of the class described, a supplementary piston rod pivotally connected to a piston rod and to the upper extremity of a vertical driving rod, the said vertical driving rod pivotally attached to a pin rigidly attached to a supporting block mounted on the running gear of the said railroad locomotive and rigidly attached thereto, a supplementary vertical driving rod pivotally attached to a second pin rigidly attached to the said supporting block, and having pivotally attached at its upper extremity a cross rod pivotally attached to the said vertical driving rod, a cross head rod pivotally attached to the cross head of the said locomotive, and pivotally attached to the lower extremities of the said vertical driving rod and the said supplementary driving rod, so as to decrease the linear motion of the said cross head relative to the linear motion of the said piston rod, said supplementary vertical driving rod parallel to the said vertical driving rod, and pivotally attached to the said second pin positioned directly opposite to and in line with the said pin.

3. In a driving mechanism, for railroad locomotives, of the class described, a vertical driving rod provided with a semispherical recess adapted to receive the spherical head of a supplementary piston rod, a cap provided with a partly spherical recess to accommodate the inner portion of the said semispherical head, and removably attached to the said vertical driving rod, so as to pivotally attach the said supplementary piston rod to the said vertical driving rod.

4. In a driving mechanism, for railroad locomotives, of the class described, a supplementary piston rod consisting of two rods provided with right hand threads and left hand threads respectively, suitably formed at their adjacent extremities to accommodate a turnbuckle having threadedly attached thereto a locking screw provided with a lower tapered extremity, so as to permit the said turnbuckle to suitably adjust the length of the said two rods, and so as to permit the said lower tapered extremity of the said locking screw to maintain the said adjustment.

5. In a driving mechanism, for railroad locomotives, of the class described, a vertical

driving rod provided with an aperture to slidably accommodate pin bearing blocks provided with semispherical recesses to pivotally accommodate a pin, set screws threadedly attached to the said vertical driving rod, and positioned so as to permit their extremities to engage recesses formed in the said pin bearing blocks, so as to permit the said set screws to maintain the proper pivoting of the said driving rod.

In testimony whereof I have affixed my signature.

JOHN LOUIS BORSKI.