March 13, 1928. 1,662,595

W. E. WOODARD

LOCOMOTIVE ROD MECHANISM

Original Filed May 2, 1925 2 Sheets-Sheet 1

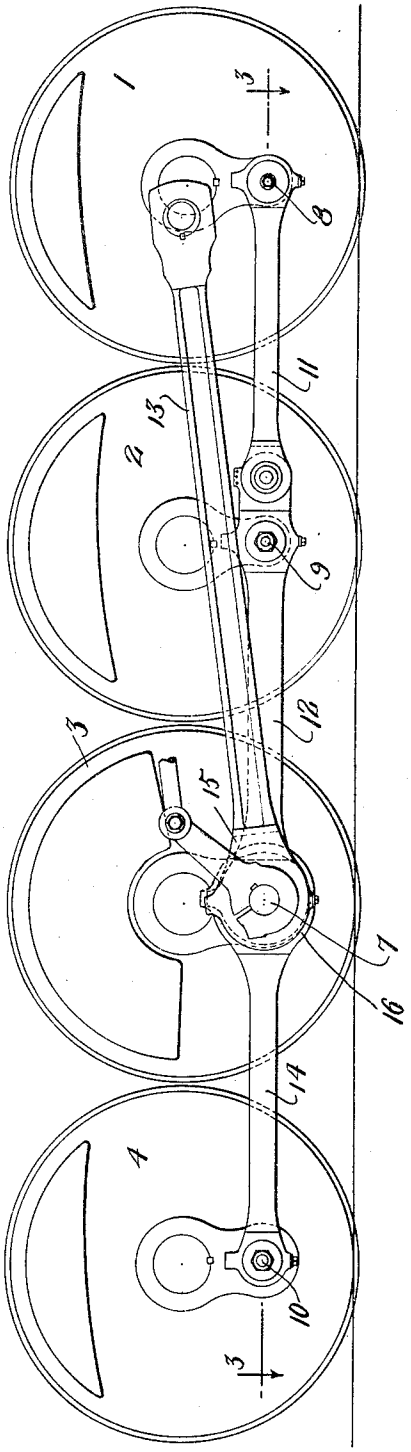


Fig. 1.

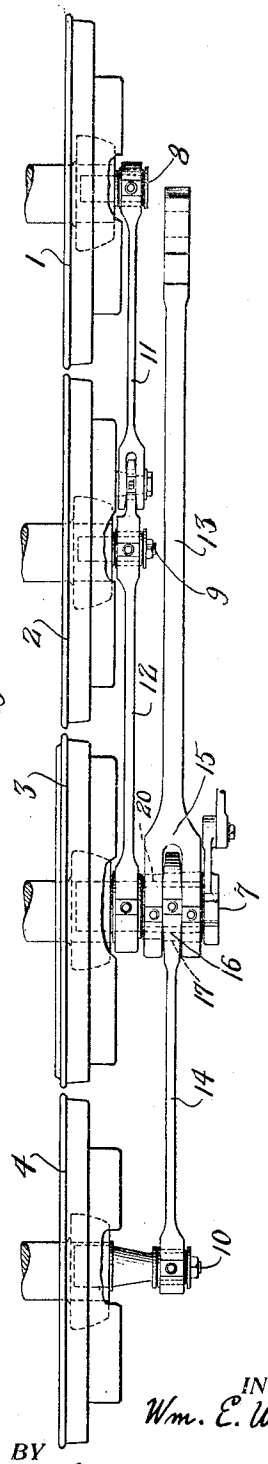


Fig. 2.

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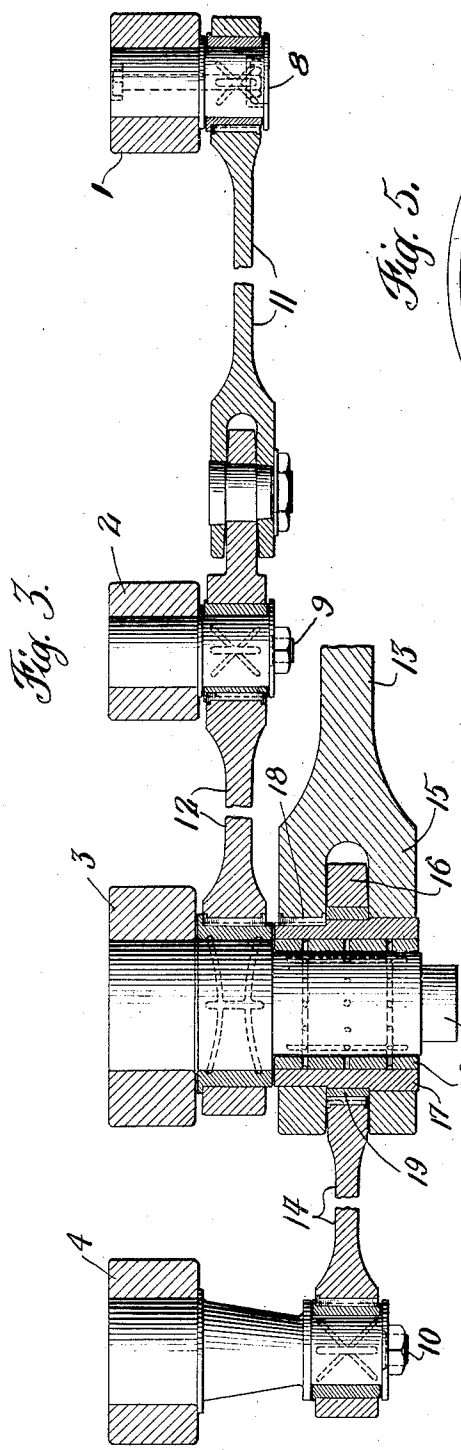


Fig. 3.

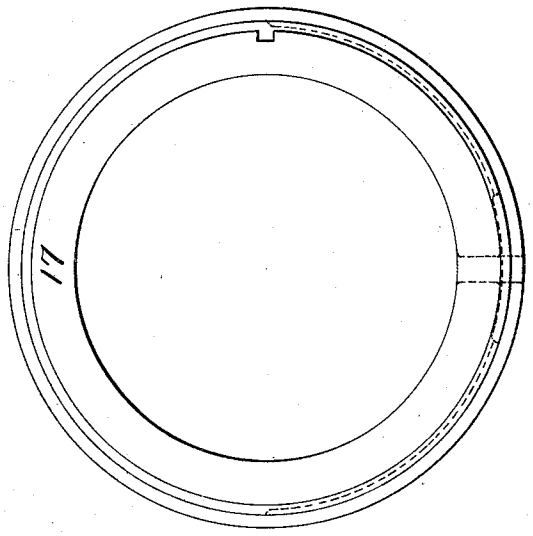


Fig. 5.

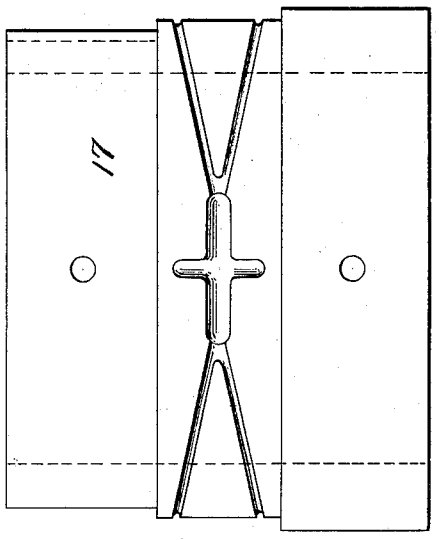


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM E. WOODARD, OF FOREST HILLS, NEW YORK.

LOCOMOTIVE ROD MECHANISM.

Application filed May 2, 1925, Serial No. 27,432. Renewed January 26, 1928.

The invention relates to locomotive rod mechanism and its nature, objects and advantages will be best understood from the following:

It has been heretofore contemplated in this art to provide an arrangement of the main or connecting rod and the rearward coupling rods, in which the main and the rearward coupling rods lie in the same vertical plane with a push and pull connection therebetween to distribute the stresses, while the forward coupling rods lie inside the plane of the main rod. An example of such construction is to be found in my Patent No. 1,253,451 issued January 15, 1918. In this construction, however, the parts have been detachably connected by special fastening means provided for this purpose so that the parts could be separately handled, as this has heretofore been regarded as essential from a practical standpoint. This involves increase in reciprocating and rotating weights and the arrangement also has the objection that the parts are liable to work loose under the piston thrusts. It was also difficult to secure and maintain accurate spacing of the centers.

In accordance with my invention, the main rod of the arrangement is made multipart, such parts, although articulated, being connected in such manner that the parts constitute an operative unit, applied and removed as such. By this, I am enabled to cut down rotating weights, to avoid any connections liable to work loose, to always ensure proper spacing of centers, and to obtain a perfectly practical structure which secures better distribution of the thrusts.

How these and other objects are secured, is illustrated in preferred form in the accompanying drawings, wherein

Fig. 1 is a side elevation of the drivers of a locomotive equipped with my improvments, four sets of drivers being shown for illustrative purposes only;

Fig. 2 is a plan view of the arrangement of Fig. 1;

Fig. 3 is an enlarged sectional view illustrating details of construction; and

Figs. 4 and 5 are respectively a top plan and end elevation of a bushing employed in carrying out the invention.

Referring to the drawings, the main crank pin 7 is carried by an intermediate driver, say, for example, No. 3 driver. Drivers Nos. 1, 2 and 4 have smaller pins 8, 9 and 10. Drivers 1, 2 and 3 are coupled by the side rods 11 and 12. The main rod lies outside the plane of the side rods, and it is of multipart construction. In the present showing it is composed of the member 13 and the member 14, since there is only one set of drivers to the rear of the wheels carrying the main crank pins.

The rear end of the member 13 is forked, as at 15, the fork being apertured. The eye 16 of the member 14 is shaped to fit between the fork for rocking to provide for the lateral flexibility required during curving. The parts are secured together as follows:

A bushing 17, see Figs. 3 to 5, is pressed into the fork 15, with the eye 16, of course, in place. The bushing may also be keyed, as by the key 18. Pressed into the eye is a bushing 19 which may also be similarly keyed. Between the bushing 17, (which is of a hard metal to withstand the thrusts), and the pin 7 is a rotating or floating sleeve 20, made of a suitable bearing metal. This fastening arrangement unites the members 13 and 14 into a unit, and the unit is applied or removed as such; and I have found that the construction, besides having the advantages hereinbefore mentioned, is practical, notwithstanding its unitary character.

The sleeve 19 is relatively narrow and fits sufficiently loosely on the bushing 17 to prevent pinching or binding when flexure of the rod occurs under service conditions.

The wear on the bushing 19 is negligible for all practical purposes. When the bearing sleeve 20 wears and is replaced, on account of the unitary structure of the rod, the parts are brought to true center when the bushing 17 is replaced.

It will be noted that the parts are internally lubricated by the grooves indicated in the drawings.

I claim:

1. A multi-part driving rod for locomotive driving wheels having adjacent parts articulated together as an operative unit for unitary application to and removable from a driving wheel pin.

2. In a locomotive having more than two sets of drivers, the combination of a multipart main rod having adjacent parts articulated together as a detachable operative unit, said multi-part main rod being coupled to

two drivers, and side rod means connecting drivers and extending inside the plane of the multi-part main rod.

3. A locomotive main rod comprising a pair of members articulated together as an operative unit for unitary application to and removal from a driving wheel pin.

4. A locomotive main rod including in combination a bifurcated member apertured to receive a driving pin, a second member having an eye adapted to fit into the bifurcation, and a sleeve pressed into the aperture and extending through the eye for articulating the members as an operative unit.

5. Locomotive rod mechanism comprising, in combination, a bifurcated member apertured to receive a driving wheel pin, a second member having an apertured end adapted to fit into the bifurcation, a sleeve pressed into the aperture of one of said members and extending through the apertured portion of the other to form an articulated joint between the members, and a floating bushing within the sleeve and adapted to bear on the pin.

6. Locomotive rod mechanism comprising, in combination, a bifurcated member apertured to receive a driving wheel pin, a second member having an apertured end adapted to fit into the bifurcation, one of said members having an anti-friction lining in the aperture, and a sleeve pressed into the aperture of one of said members and extending through the lined aperture of the other to form an articulated joint between the members.

7. Locomotive rod mechanism comprising, in combination, a bifurcated member apertured to receive a driving wheel pin, a second member having an eye adapted to fit into the bifurcation, a sleeve pressed into the aperture and extending through the eye to form an articulated joint between the members, and a floating bushing within the sleeve and adapted to bear on the pin.

8. Locomotive rod mechanism comprising, in combination, a bifurcated member apertured to receive a driving wheel pin, a second member having an eye adapted to fit into the bifurcation, a sleeve pressed into the aperture and extending through the eye to form an articulated joint between the members, and an anti-friction metal bushing interposed between the sleeve and the pin.

9. Locomotive rod mechanism comprising, in combination, a bifurcated member apertured to receive a driving wheel pin, a second member having an eye adapted to fit into the bifurcation, a sleeve pressed into the aperture and extending through the eye to form an articulated joint between the members, and a floating bushing within the sleeve and adapted to bear on the pin, said sleeve being of relatively hard material, to withstand the locomotive piston thrust, and said bushing being of relatively soft material, to minimize friction.

10. Locomotive rod mechanism comprising, in combination, a bifurcated member apertured to receive a driving wheel pin, a second member having an eye adapted to fit into the bifurcation, a sleeve pressed into the aperture and extending through the eye to form an articulated joint between the members, and an anti-friction lining in the eye where it bears upon the sleeve.

11. Locomotive rod mechanism comprising, in combination, a bifurcated member apertured to receive a driving wheel pin, a second member having an eye adapted to fit into the bifurcation, a sleeve pressed into the aperture and extending through the eye to form an articulated joint between the members, and a floating bushing within the sleeve and adapted to bear on the pin, together with anti-friction material interposed between the eye and sleeve.

12. A multi-part driving rod for locomotive driving wheels, having adjacent parts articulated together as an operative unit for unitary application to and removal from a driving wheel pin and anti-friction material at the articulated joint positioned to bear upon the driving wheel pin.

In testimony whereof, I have hereunto signed my name.

WILLIAM E. WOODARD.