

Aug. 5, 1924.

1,503,763

M. I. MOSELY

AUTOMATIC CUT-OFF DEVICE FOR LOCOMOTIVES.

Filed Dec. 5, 1923

2 Sheets-Sheet 1

Fig. 1.

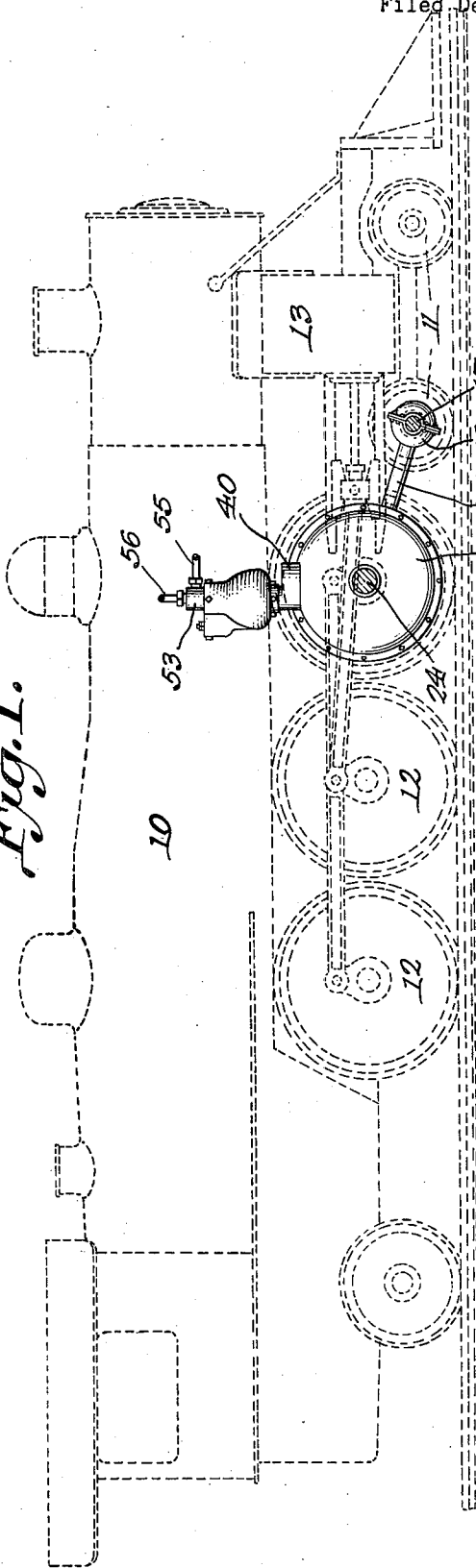
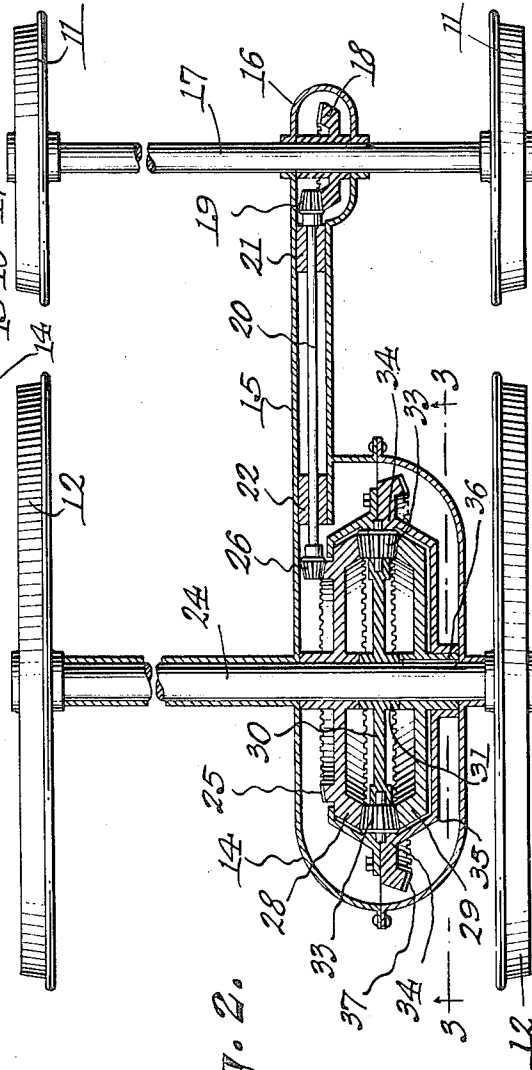


Fig. 2.



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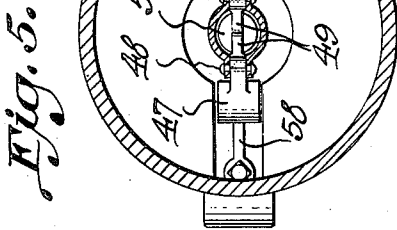
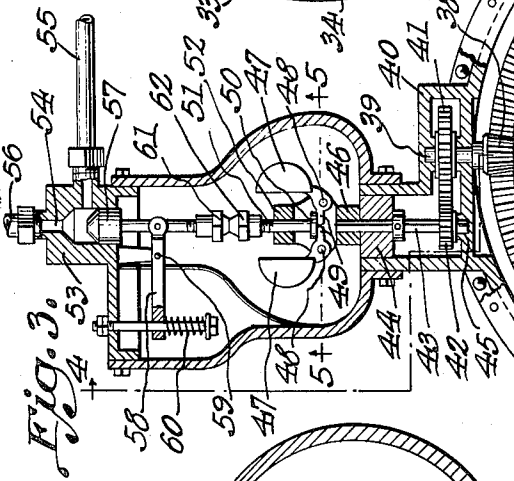
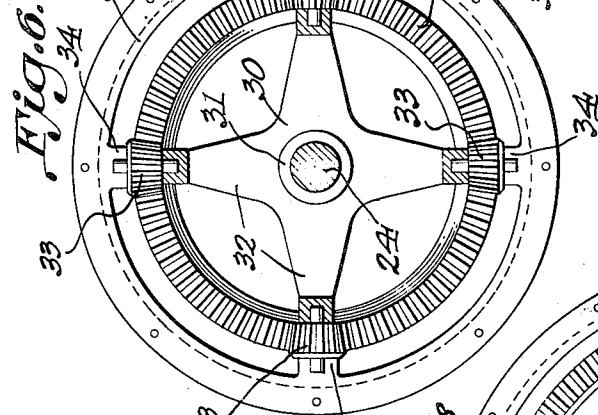
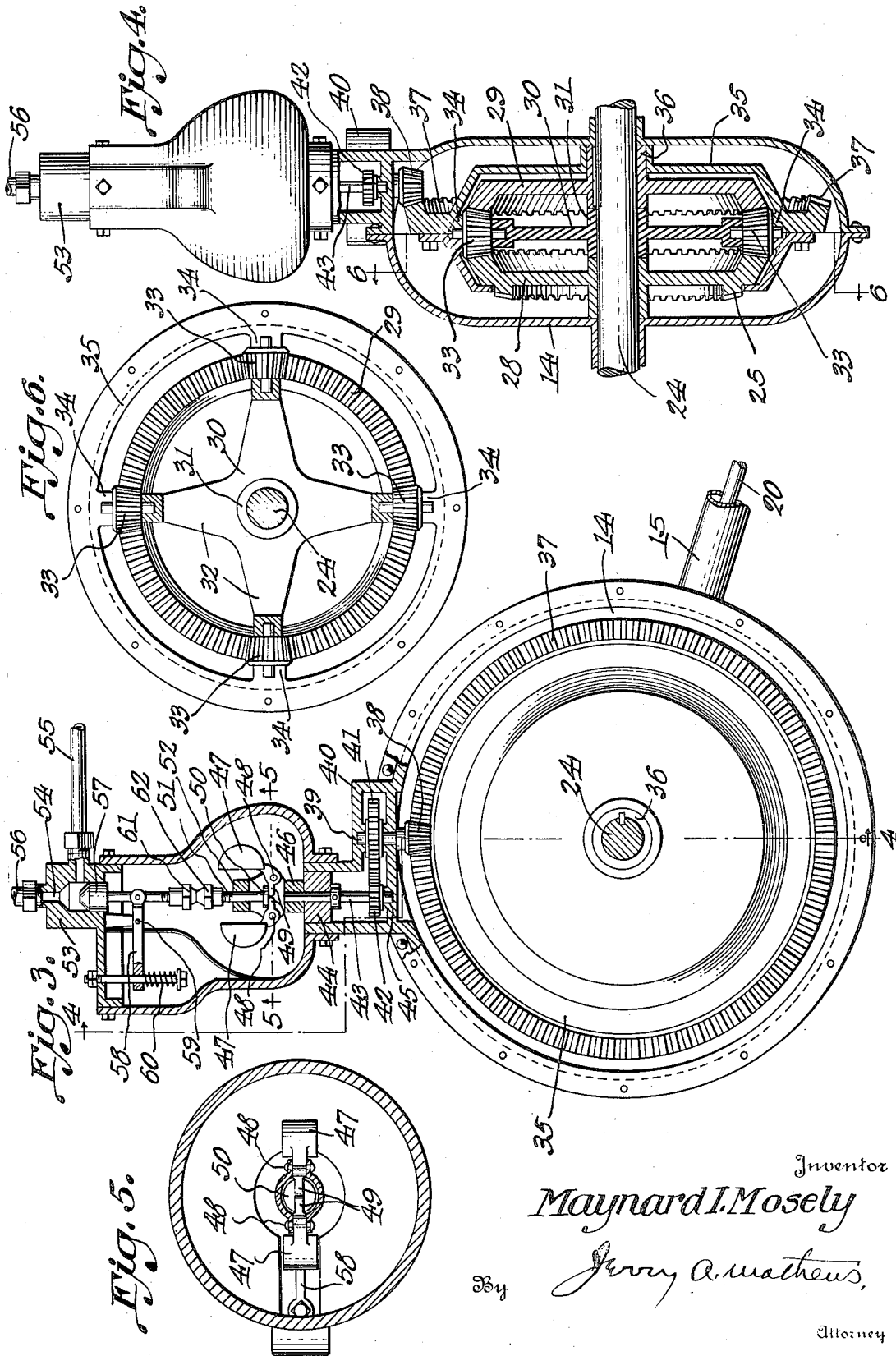
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

MAYNARD I. MOSELY, OF WISE RIVER, MONTANA.

AUTOMATIC CUT-OFF DEVICE FOR LOCOMOTIVES.

Application filed December 5, 1923. Serial No. 678,750.

To all whom it may concern:

Be it known that I, MAYNARD I. MOSELY, a citizen of the United States, residing at Wise River, in the county of Beaverhead and State of Montana, have invented certain new and useful Improvements in Automatic Cut-Off Devices for Locomotives, of which the following is a specification.

My invention relates to apparatus for use in connection with a railway locomotive, for reducing the slipping of the drivers.

An important object of the invention is to provide apparatus of the above mentioned character, embodying a differential gear device, driven from one truck wheel and one driver, and adapted to cut off the supply of steam to the cylinders of the engine, upon the slipping of the drivers.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of apparatus embodying my invention, showing the same applied to a railway locomotive,

Figure 2 is a horizontal sectional view taken through the center of the same and showing the method of applying the apparatus to the locomotive,

Figure 3 is a vertical longitudinal section taken on line 3—3 of Figure 2 and looking in the direction of the arrows,

Figure 4 is a vertical transverse section on the line 4—4 of Figure 3, parts being in section,

Figure 5 is a horizontal section taken on line 5—5 of Figure 3 and looking in the direction of the arrows, and,

Figure 6 is a central vertical longitudinal section taken through the rotatable drum on line 6—6 of Figure 4, looking in the direction of the arrows.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates a railway locomotive, supported by truck wheels 11 and drivers 12, as is customary. The numeral 13 designates cylinders of the locomotive.

My apparatus comprises a casing 14 which is supported on the driver axle 24, encircling the same, and suitably rigidly connected with the lower frame of the locomotive,

and this casing contains the differential gearing to be described. Connected with the casing 14 is a sleeve 15, extending longitudinally of the locomotive. This sleeve 15 has a gear casing 16 rigidly secured thereto, which casing encircles the axles 17 of the truck wheel 11. This axle has a gear 18 rigidly secured thereon, engaging a beveled gear 19, carried by a shaft 20. This shaft is journaled in bearings 21 and 22, held in the sleeve 15.

The numeral 29 designates a sun gear rigidly mounted on the driven axle 24 and arranged within the casing 14, while the numeral 28 designates a sun gear rotatably mounted on the axle 24 and also arranged within the casing 14. Arranged upon the rear side of the sun gear 28 is an annular beveled gear 25 which engages a beveled gear 26, arranged on the end of the shaft 20, so that the sun gear 28 will be driven by the truck wheel 11, through the medium of the gear 18, gear 19, shaft 20, gear 26, and gear 25. Attention is called to the fact that this gearing is such that the sun gear 28 will revolve at the same speed as the sun gear 29, in opposite directions, when the locomotive is traveling and the drivers do not slip.

Arranged between these sun gears is a support or spider 30, having a hub 31, rotatably receiving the axle 24. This spider embodies radial arms 32, upon which are mounted planetary gears 33 which are disposed between the sun gears 28 and 29 and engage therewith. The outer ends of the arms 32 fit within sockets 34, formed in a rotatable drum 35, which is rotatably mounted upon the hub 36 of the sun gear 29, as shown.

The drum 35 is provided with an annular gear 37, rigidly secured to its periphery, engaging a beveled gear 38, rigidly secured to a vertical shaft 39, suitably mounted in a casing extension 40. The shaft 39 has a gear 41 rigidly secured thereto, and this gear engages a similar gear 42 carried by a vertical shaft 43. This vertical shaft is journaled in bearings 44 and 45, and is free to revolve but cannot move longitudinally.

The shaft 43 has a cross head 46 rigidly secured to its upper end, and weights 47 are pivoted thereto, at 48, and have cranks 49. These cranks are adapted to engage a head 50 formed upon a slidable rod 51, operating in a guide sleeve 52. The weights 47 and associated elements constitute a centrifugal

speed responsive device, which is inactive or stationary, when the sun gears 28 and 29 are rotating at the same speed, or when a differential action occurs between the sun
5 gears, the speed responsive device is thrown into action, for a purpose to be described.

The numeral 53 designates a valve casing, having a port 54. The steam supply pipe 55 leads into one end of this port, and an
10 outlet pipe 56 into the other end thereof, the pipe 56 being forked and leading to the two cylinders of the engine.

The numeral 57 designates a normally open needle valve, which when moved up-
15 wardly, will close the port 54. This needle valve is pivotally connected with a lever 58, pivotally supported at 59. The outer end of the lever is forced upwardly by a spring 60, and hence the needle valve is normally
20 held downwardly. The needle valve has its lower end arranged in alinement with the rod 51, to be engaged thereby. Nuts 61 and 62 may be screwthreaded upon the ends of the needle valve and rod 51, and may con-
25 tact with each other, and they are provided to afford a fine adjustment in operation.

The operation of the apparatus is as follows:

When the locomotive is traveling and the
30 drivers are not slipping, the sun gears 28 and 29 will rotate in opposite directions at the same speed, and the planetary gears 33 will turn upon their axis, without bodily rotating with the drum 35, the centrifugal
35 speed responsive device not rotating during this operation and hence remaining normally inactive, whereby the valve 57 remains open. When the drivers slip, the sun gear 29 rotates faster than the sun gear 28, and
40 hence there is a differential action between the two gears. The planetary gears 33 are therefore caused to rotate upon their axis and to also travel bodily with the drum 35, about the sun gear 28. This rotation of the

drum drives the gear 37, which through the
45 medium of the intermediate gears will rotate the shaft 43. This rotation of the shaft will rotate the centrifugal speed responsive device and the weights 47 will be swung outwardly, and the rod 51 raised.
50 This rod will elevate the needle valve and close the port 54, thereby cutting off the steam to the cylinders and hence the slipping of the drivers will stop.

It is to be understood that the form of my
55 invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit
60 of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

The combination with the axles of the
65 truck and driver wheels of a locomotive, a gear mounted on the truck axle, a shaft, gears carried by the ends of the shaft, one of said gears engaging the gear on the truck axles, a sun gear rotatably mounted on the
70 driver axle, an annular gear carried by said sun gear and engaging the gear carried by the shaft, a second sun gear rigidly mounted on the driver axle, a drum rotatable about the sun gears and carrying an annular gear,
75 planetary gears connected with the drum and engaging between the sun gears, a normally inactive centrifugal speed responsive device, gearing connecting the speed responsive device and the annular gear carried by
80 the drum, and a normally open valve controlling the admission of steam to the cylinders of the locomotive, said valve being adapted to be closed by the action of the centrifugal speed responsive device.
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In testimony whereof I affix my signature.

MAYNARD I. MOSELY.