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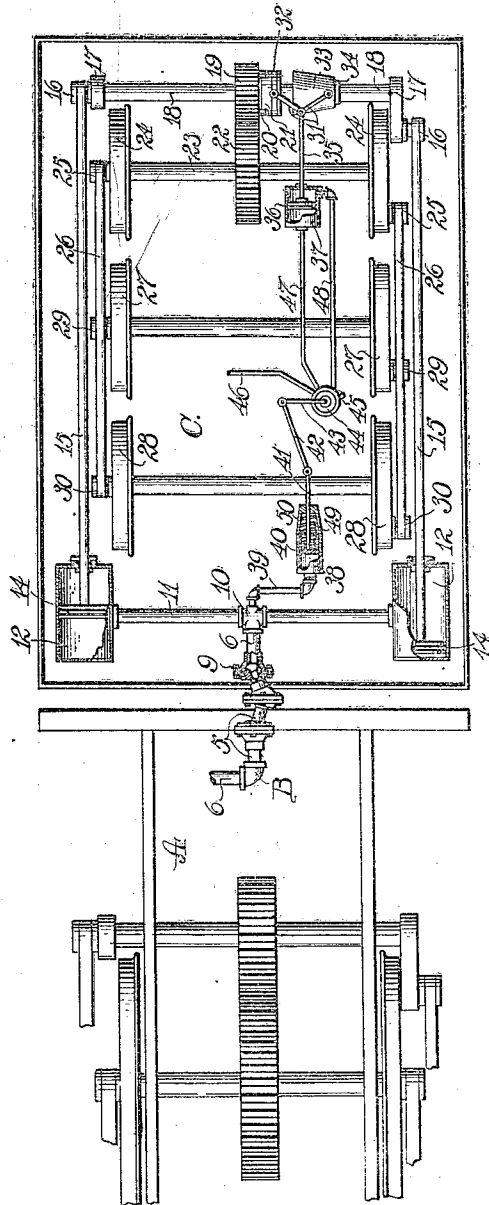
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AUTOMATIC CLUTCH CONTROLLING DEVICE FOR POWERED TENDERS

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2 Sheets-Sheet 1

Fig. 1.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC CLUTCH-CONTROLLING DEVICE FOR POWERED TENDERS.

Application filed March 1, 1922. Serial No. 540,347.

To all whom it may concern:

Be it known that I, EDWARD SPENCER JOHNSON, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Automatic Clutch-Controlling Devices for Powered Tenders, of which the following is a full, clear, and exact description.

My invention relates to power control for the driving mechanism of geared tenders or locomotives, and more particularly to locomotives having small tenders.

The object of my invention is to enable the engineer of the locomotive by turning on the steam to the tender to connect the crankshaft to the drivers and by turning off the steam to thereby disconnect the same. This I accomplish by the means hereinafter fully described and as particularly pointed out in the claims.

In the drawings:

Figure 1 is a plan view of the underneath side of a tender and a broken away rear portion of a locomotive having my improvements applied thereto.

Figure 2 is a similar view of a broken away portion of the tender drawn to a larger scale.

The drawings are more or less diagrammatical views looking at the tender and a broken away portion of the locomotive from underneath.

In the drawings, A, represents a locomotive that is, preferably, operated by steam. The steam may be distributed in any suitable manner, but the distribution system includes a steam-pipe B, that leads from the main-throttle (not shown), to flexible coupling members having short tubular and semi-spherical sections 5, whereby it is connected to the main steam-pipe 6 of the tender C. The coupling is flexible as the elements 5 thereof are headed for engagement with separable sockets that are constructed in the usual manner, and, therefore, do not need a more extended description.

The pipe 6, leads to and is coupled by means of a T-coupling 10, to the center of length of a transverse pipe 11, the ends of which latter are connected to the cylinders 12, and 12, in the manner shown. These cylinders and steam chests therefor, are of the usual construction, the steam chests not being shown, the cylinders being of the os-

illatory type and the piston-heads 14, are connected to piston rods 15. The opposite ends of said piston rods are connected to the wrist pins 16, of the cranks 17, secured to the ends of the transverse crankshaft 18, located at the end of the tender farthest from pipe 6.

The crankshaft is, preferably, at its center of length, provided with a pinion 19, that is loose thereon, and is provided on one side with a counterpart 20, for a clutch 21, that is splined to the crankshaft 18, and is movable thereon to and from the counterpart 20.

Pinion 19 engages a gear 22 securely mounted on the nearest axle, 23, of the drive-wheels 24, 24, which latter have pins 25, projecting outwards therefrom, to which connecting-rods 26, 26, are pivoted that transmit the motion thereof to the wheels 27, 28, through the medium of similar pins, 29 and 30, substantially as shown in the drawings.

In order to throw the clutch 21 into and out of gear with the counterpart 20 of the pinion 19, I provide a toggle-joint 31, the ends of the links of which are suitably secured to a loose annulus 32 on the clutch 21, and to a collar 33 that is loose on the crankshaft 18, but is immovable longitudinally thereon. This toggle-joint, 31, is actuated through the medium of a piston rod 35, that extends longitudinally toward the locomotive and has a piston-head 36 secured to its forward end that operates in a small closed air-cylinder 37, suitably secured to the tender.

A small steam-cylinder, 38, is placed to the rear of the steam pipe 11, and is connected thereto by a small pipe 39, and a piston-head 40 operates in this cylinder, that has one end open, and the piston-head has a piston rod 41 projecting longitudinally towards the rear of the tender. The rear end is connected by a pitman, 42, to the end of an arm, 43, the opposite end of which latter is mounted upon one end of the pivotal plug of a 3-way air-valve, 44. This air-valve has a discharge port 45, and has three pipes 46, 47, and 48 that lead thereto and therefrom. Pipe 46 leads direct from the air-supply cylinder (not shown) to the 3-way valve; pipe 47 leads from the casing of the 3-way valve, at a point adjacent to pipe 46, to the end of an air-cylinder, 37, to drive a piston 36 connected to a piston rod 35 that actuates the toggle 31, and a pipe 48 leads from the casing of

the 3-way valve, at a point adjacent to the exhaust port 45, to the end of cylinder 37, nearest the toggle.

In operation, when it is desired to throw the clutch 21 into engagement with the counterpart 20, of the pinion 19, steam is admitted to the pipe 6 whence it enters cylinder 38. This moves the piston 41 and the pitman 42 to the rear and turns arm 43 of the 3-way valve 44 so as to permit the air-pressure in pipe 46 to enter pipe 47, and to actuate the piston head 36 and piston rod 35. The latter pushes the links of the toggle more nearly into alinement, and thus moves the clutch 21 into engagement with the counterpart 20.

To separate the clutch member that engages pinion 19, air under pressure is cut off from the cylinder 37 by turning the valve 44, the steam supply to the pipe 11 being also cut off. The valve 44 is then moved by a spring 49 which is mounted within the reduced portion 50 of cylinder 38 having therein the piston head 40, the spring operating to move the head and its piston rod 41, link 42 and arm 43, said arm moving the plug 44 to cut off air pressure supplied through pipe 46 to the cylinder 37. The clutch is moved by a suitable operating means out of engagement with the clutch face of the pinion. The arrangement of the parts is such that pressure may be exerted upon opposite sides of the piston head to move the toggles and the movable member of the clutch.

The piston head 36 is operated by air pressure applied on opposite sides thereof by appropriate arrangement of parts in the plug 44 of the valve.

What I claim as new is:

1. A power control for locomotive tenders comprising drive-wheels and axles therefor, means for connecting the drive wheels, one of the axles having fast thereon a gear wheel, a crankshaft, a gear loose on the crank shaft for engagement with the gear on the axle, means for rotating said shaft, a flexible steam-pipe leading from the locomotive to the tender, a cylinder with which said steam-pipe is connected, a spring returnable piston head therefor, a piston rod and link connected thereto, an air-pipe, a valve in said pipe the spindle of which has a transverse arm to which said link is connected, and means actuated by steam pressure for driving the crank shaft, and for moving the valve in position to admit fluid pressure to means for holding the loose gear on the driven shaft in non-rotatable engagement therewith.

2. A power control for locomotive tenders

comprising drive-wheels and axles therefor, a driving crankshaft, a gear fast on one of the axles, a gear loose on the shaft engaging the same, means for rotating said shaft, a flexible steam-pipe leading from the locomotive to the tender, a cylinder with which said steam-pipe is connected, a spring returnable piston therefor, a pitman connected thereto, an air-pipe, a valve in said pipe the spindle of which has a transverse arm to which said pitman is connected, a cylinder, a piston therein actuated by air-pressure from said pipe a clutch on the loose gear, and a counterpart clutch slidable longitudinally on the crankshaft.

3. A power control for locomotive tenders comprising drive-wheels and axles therefor, a crankshaft, a gear fast on one of the axles, a gear loose on the shaft engaging the same, means for rotating said shaft, a steam-pipe leading from the locomotive to the tender, a cylinder with which said steam-pipe is connected, a spring returnable piston therefor, a pitman connected thereto, an air-pipe, a valve in said pipe the spindle of which has a transverse arm to which said pitman is connected, a cylinder, a piston therein actuated by air-pressure from said pipe, a clutch on the loose gear, and a counterpart clutch slidable longitudinally on the crankshaft but revolvable therewith, a collar on said crankshaft, and a toggle-joint one end of which is pivoted to said collar and the other to said counterpart, and to the joint of the two links of which said last mentioned piston is connected.

4. A power control for locomotive tenders comprising drive wheels and axles therefor, a crankshaft, a gear fast on one of the axles, a gear loose on the shaft engaging the same, means for rotating said shaft, a flexible steam-pipe leading from the locomotive to the tender, a cylinder with which said steam-pipe is connected, a spring returnable piston therefor, a pitman connected thereto, an air-pipe, a three-way valve in said pipe the spindle of which has a transverse arm to which said pitman is connected, a closed cylinder at one end of said air-pipe, a piston in said cylinder actuated by the air-pressure from said pipe, an exhaust pipe leading from said closed cylinder to said three-way valve, and means operated by said last mentioned piston to lock said loose gear to said shaft.

In witness whereof I have hereunto set my hand this 14th day of February, 1922.

EDWARD SPENCER JOHNSON.

Witnesses:

A. SEBELIEN,
L. E. BECKWITH.