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CONTROLLING MECHANISM FOR LOCOMOTIVES.

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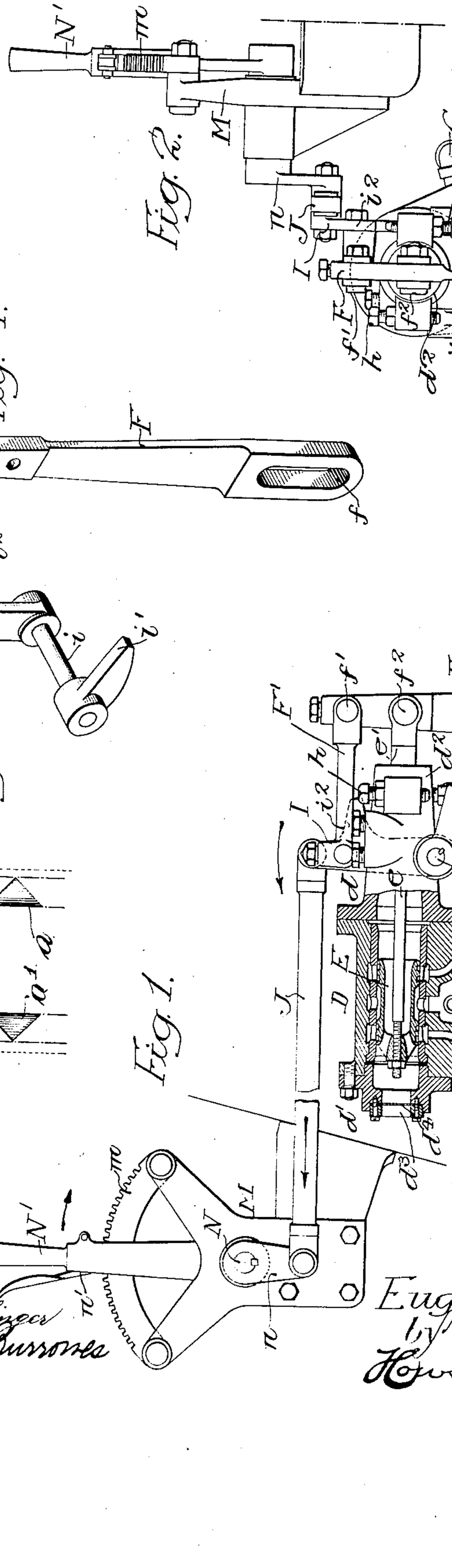

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

UNITED STATES PATENT OFFICE.

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CONTROLLING MECHANISM FOR LOCOMOTIVES.

No. 930,225. Specification of Letters Patent. Patented Aug. 3, 1909.

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To all whom it may concern:

Be it known that I, EUGENE L. RAGONNET, a citizen of the United States, residing in Bowdoinham, Maine, have invented certain Improvements in Controlling Mechanism for Locomotives, of which the following is a specification.

My invention relates to certain improvements in power mechanism for operating a locomotive reversing gear.

One object of my invention is to lock the piston of the mechanism in the position to which it is set so that said piston will not move due to leakage after once being set by the engine driver.

In the accompanying drawing:—Figure 1, is a side view partly in section illustrating sufficient of the reverse mechanism to illustrate my invention; Fig. 2, is an end view looking in the direction of the arrow, Fig. 1; Figs. 3 and 4 are perspective views of certain detail parts of my device; and Fig. 5 is a diagrammatic view illustrating the relative positions of the valve and cylinder ports.

In the above drawings A is a cylinder having a piston B and provided with a piston rod B′ extending through a stuffing box in one end. This rod is connected to a cross head C adapted to slide on ways C′.

B^2 is a connecting rod attached to the cross head C and to the means for operating the link motion of an engine of the locomotive. This link motion is not shown as it forms no part of the present invention and may be of any suitable form without departing from the essential features of said invention.

The cylinder has a valve chest D provided with heads *d*—*d*′ and containing a valve E having a rod *e*. This latter is enlarged at the outer end *e*′ where it passes through an extension d^2 of the head *d* and is attached to a lever F which is fulcrumed at *e* to the cross head C; the fulcrum in the present instance being a pin on which is mounted a block *c*′ fitting a slot *f* in said lever F.

A port *a* leads from the valve chest D to the forward end of the cylinder A, while a port *a*′ connects with the rear end, there being also an inlet port a^2 communicating with the valve chest midway between said two ports *a*—*a*′, and connected to a supply pipe G for air or other fluid under pressure. These ports *a* and *a*′ enter the cylinder A some distance from its ends so that a body of fluid is confined between the head and the piston when the latter approaches the end of its stroke so that it is cushioned and gradually brought to rest.

The valve E is open through its center so that one end of the valve chest communicates with the other at all times, and it also has in its outer surface a centrally placed annular groove, on each side of which are packing rings whereby communication is cut off between said groove and the two ends of the valve chamber.

As shown in Fig. 5, the valve has practically no inside lap though possessing a relatively large outside lap, while the valve chest ends of the ports *a* and *a*′ are of triangular section, so that one of them is opened to fluid under pressure immediately the valve is moved from its mid position. Moreover by the construction shown, these ports are not opened to exhaust until the valve has moved an appreciable distance and even then the exhaust is throttled owing to their angular form.

In the head *d*′ of the valve chest is an opening d^3 for the exhaust and when the device is used with air there is a screen d^4 placed in the same; otherwise a suitable pipe is connected to said head.

A lever I is mounted on a rock shaft *i* to which is secured a tappet *i*′ designed to strike the end of a set screw *h* mounted in a lug on the extension d^2 of the head *d* and said lever has an arm i^2 which is placed to contact with a set screw *h*′ on the opposite side of said head extension d^2. The end of this latter set screw extends in a direction opposite to that of the set screw *h* so that the tappet *i*′ limits the motion of the lever I in one direction and the arm i^2 limits its movement in the opposite direction.

Connected to the outer end of the arm I is a rod J which is attached to a crank *n* on a shaft N which is provided with an operating handle N′. This shaft is mounted on a frame M placed in the cab of a locomotive and said frame has a toothed segment *m* with which engages a handled pawl *n*′ on the arm N′ so

as to lock the latter in any position to which it is adjusted.

Connected to the lever I below the point of its connection with the rod J is a rod F′ attached to the lever F at f'; the valve rod being connected to the lever at f^2 so that when the operating arm N′ is moved in one direction or the other this movement is first imparted to the arm I on the rock shaft i which imparts motion to the lever F and thence to the valve D through the valve rod e. When the operating arm n' is moved, the pin c is the fulcrum for the lever F, but when the piston B moves and the slide C travels on the slideway C′, then the point f' becomes the fulcrum, so that in either case the valve is moved to open or close the ports.

If it is desired to shift the piston B in the cylinder to alter the position of the link, the lever N′ is moved, for example in the direction of the arrow, Fig. 1, causing the rod J to move in the direction of its arrow, and thereby moving both the arm I and the lever F in the direction of their arrows, with the result that the valve is shifted so as to allow air under pressure to be admitted through the port a' to the rear end of the cylinder. The piston B is then moved forward in the direction of its arrow, thereby pushing forward the slide C and moving the fulcrum c of the lever f, which in turn moves the valve E in a direction opposite to that in which it was first moved. It is thus brought back to the position where it cuts off the supply of air to the end of the cylinder and it is to be noted that in any case the movement of the operating lever N′ into any position to open either of the ports a or a' causes a movement of the piston B which will return the valve to a position with said ports closed, so that said piston is locked in any position to which it is shifted. Both ports are closed and the annular groove in the valve is opposite the port a^2, while both ends of the valve chest are open to exhaust.

The movement of the arm I and consequently the movement of the lever F by the operating lever N′ is controlled by the set screws h—h' against which the tappets i and i^2 strike when said arm is moved either to a forward or rear position.

While I have described my invention as operated by air under pressure, it will be understood that any fluid under pressure may be used to actuate the mechanism.

By the above described arrangement and construction of parts and more particularly by the use of a valve and ports proportioned as shown; the piston and valve are almost instantly brought to rest after having been operated, with but little or none of the vibration which has characterized similar devices of the same general character. By throttling the exhaust with ports shaped as shown, a compression of the fluid occurs which absorbs all shocks; the same end being furthered by locating the cylinder ends of the ports a and a' some distance away from the cylinder covers. Moreover, by the arrangement described the leakage is reduced to a minimum and the valve is brought to and maintained in its normal position with a minimum opening of the exhaust and consequent drain on the fluid supply.

I claim:—

1. The combination of a cylinder, a piston therein, a rod connected to the piston, a cross head attached to the rod, means for connecting the cross head with the link motion of an engine, an operating lever, a rock shaft, an arm on the rock shaft connected to said operating lever, tappets for limiting the movement of the rock shaft, a lever pivoted to the cross head and connected to the arm on the rock shaft, a valve chest having ports forming means of communication with each end of the cylinder, a valve in the valve chest, and a rod connected to the valve and to the cross head.

2. The combination of a cylinder, a piston therein, a rod attached to the piston, a cross head to which the rod is also attached, a slide for the cross head, means for connecting the cross head with the link motion of an engine, a valve chest having ports communicating with each end of the cylinder, an operating lever, a rock shaft, an arm on the rock shaft, a rod connecting said arm with the operating lever, a tappet on said arm, a set screw on the fixed portion of the mechanism against which the tappet strikes, a tappet secured to the shaft, a set screw for limiting the movement of said latter tappet whereby the movement of the rock shaft is limited in both directions, a pivot on the cross head, a slotted lever mounted on the pivot, a rod connecting the upper end of said lever with the arm of the rock shaft, a valve in the valve chest, and a rod connecting the valve with the cross head lever.

3. The combination of a cylinder, a piston therein, a valve chest having an inlet port and a port on each side thereof communicating with the cylinder, said cylinder ports entering the valve chest through openings whose width varies as they extend away from the inlet port, a valve in the chest having a central recess so constructed that the valve has outside lap and is practically without inside lap, means for connecting the piston with the engine reversing gear, means for operating the valve at will, and a device connecting the piston with said valve for automatically returning it to its normal position after each movement of the piston.

4. The combination of a cylinder, a piston, a valve chest connected to a source of fluid under pressure, and to said cylinder, a valve in said chest, means for operating the valve at will, means including a movable member

for connecting the piston to the reversing gear of the engine, a bar fulcrumed on said movable member and also connected to the valve, and means for operating said valve including an element also connected to said bar and capable of acting as a fulcrum therefor, and a device for limiting the range of movement of said bar in both directions.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

E. L. RAGONNET.

Witnesses:
BENJ. ADAMS,
ROBT. E. PATTEN.