

1,066,211.

2 SHEETS--SHEET 1.



WITNESSES.

Edward Wright.
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Carl J. Mellin, INVENTOR.
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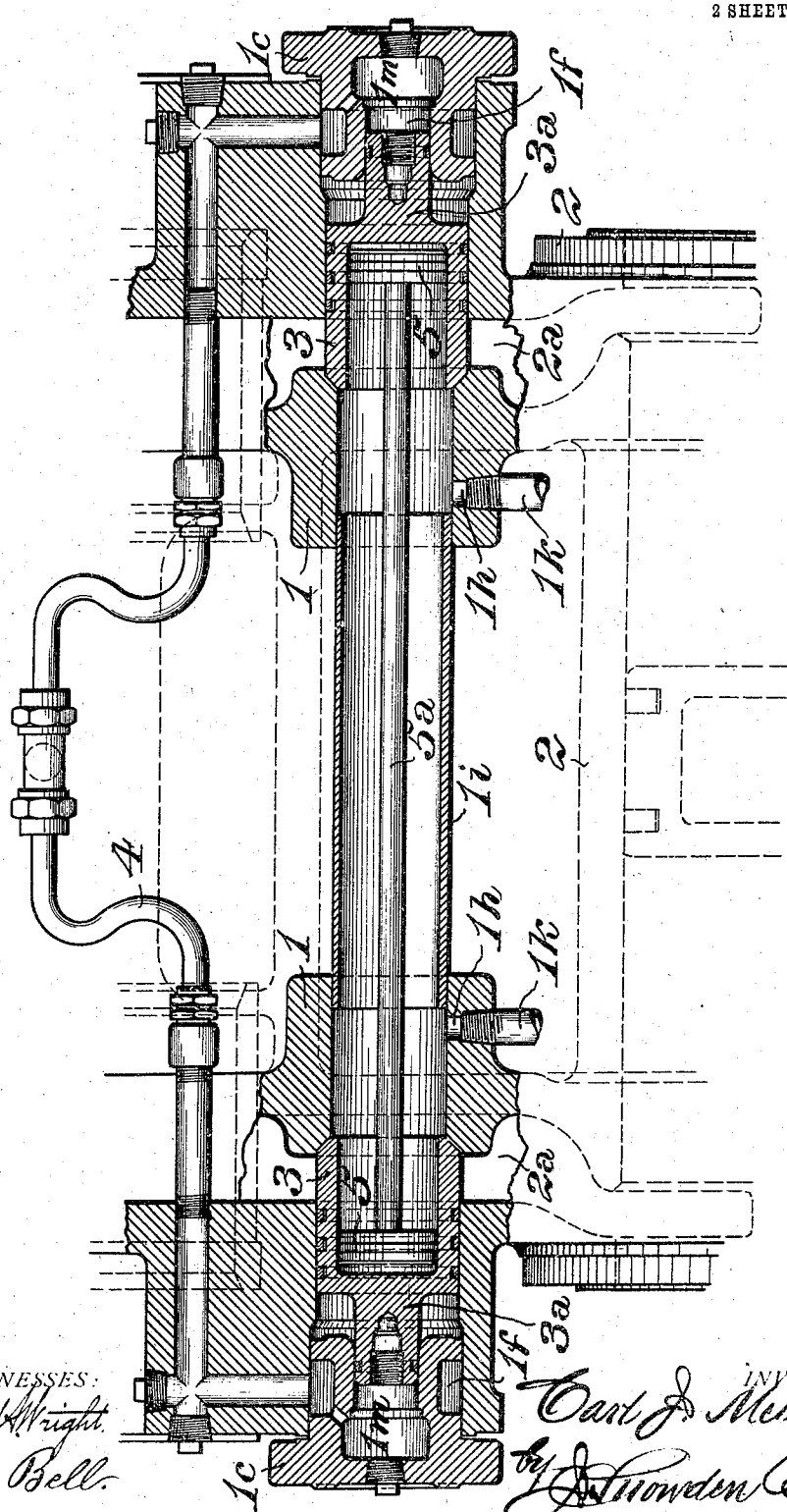
C. J. MELLIN.
 BY-PASS VALVE FOR LOCOMOTIVE ENGINES.
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2 SHEETS—SHEET 2.

-FIG. 3.-



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UNITED STATES PATENT OFFICE.

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BY-PASS VALVE FOR LOCOMOTIVE-ENGINES.

1,066,211.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed April 11, 1913. Serial No. 760,394.

To all whom it may concern:

Be it known that I, CARL J. MELLIN, of Schenectady, in the county of Schenectady and State of New York, have invented a certain new and useful Improvement in By-Pass Valves for Locomotive-Engines, of which improvement the following is a specification.

My present invention is an improvement upon that for which Letters Patent of the United States No. 587,505 were granted and issued to me under date of August 3, 1897, and its object is to insure the practical and satisfactory operation of the appliance under higher steam pressures than those for which it was originally designed.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings: Figure 1 is a vertical longitudinal central section through a by-pass valve appliance embodying my invention; Fig. 2, a transverse section through the same, on the line *a a* of Fig. 1; and, Fig. 3, a section taken similarly to Fig. 1, illustrating a structural modification.

Referring first to Figs. 1 and 2, in the practice of my invention I provide a valve chest or casing, 1, which is connected to the cylinder, 2, of a locomotive engine, through lateral tubular branches or nozzles, 1^a, each of which communicates with one of the steam induction and eduction passages, 2^a, of the cylinder, ball joint rings, 1^b, being interposed to insure properly steam tight joints. The valve chest, 1, is closed at each end, by a removable head, 1^c, secured to the chest by studs, 1^d, said heads fitting in the ends of the chest and being bored out at their inner ends to form plunger chambers, 1^m, of smaller diameter than the interior of the chest. Annular steam chambers, 1ⁱ, are formed around the plunger chambers, by peripheral grooves in the heads.

Communication between the interior of the valve chest and the cylinder ports, 2^a, is controlled by two by-pass valves, 3, 3, which are in the form of hollow pistons, closed at their outer ends, and provided with peripheral packing rings, 3^c, said pistons being adapted to close on annular seats, 1ⁿ, in the casing, which seats are located on the inner sides of the passages through the tubular branches, 1^a. A plunger, 3^a, fitting truly in the plunger chamber of the adjacent head, is formed upon the outer end of each of the

by-pass valves, 3, said plungers being fitted with packing rings, 3^b. A steam supply pipe, 4, leads from the adjacent valve chest or steam supply passage of the locomotive, into each of the steam supply chambers, 1ⁱ, and communicates with the plunger chambers, 1^m, through ports, 1^g, in the walls of said chambers. A small air admission port, 1^h, which may, if desired, be piped to any preferred location of admission of atmospheric air, is formed in the wall of the valve chest, intermediate of the valves, 3, said port admitting air at atmospheric pressure, to effect the unseating of the by-pass valves, when the supply of steam to the engine cylinders and distribution valves is cut off by the closure of the throttle. The by-pass valves may, if preferred, be unseated by an interposed spring, as shown in Letters Patent No. 587,505 aforesaid.

A floating piston, 5, is fitted in the tubular body of each of the valves, 3, said pistons being connected by a rod, 5^a, at such a distance apart that when the valves are seated, each piston will closely adjoin the closed end of the adjacent valve.

The detail modification shown in Fig. 3, accords, in all substantial structural and operative particulars, with that first described, the difference therefrom being that, in this instance, the valve chest, 1, is cast integral with the cylinder, 2, and comprises two end sections, connected by a pipe, 1ⁱ. An air admission port, 1^h, is formed in each section of the valve chest, and pipes, 1^k, leading to the exterior of the cylinder casting, are connected to said ports.

In the operation of the appliance, when the locomotive is running with the throttle valve open, steam from the valve chest is supplied to the plunger chambers, 1^m, through the pipes, 4, and ports, 1^g, and acting on the plungers, 3^a, forces the by-pass valves, 3, to their seats, and cuts off communication, through the valve chest, between the cylinder ports, 2^a. When the engine is drifting, or running with throttle closed, the vacuum produced in the cylinders by the movements of the pistons, releases pressure from the outer ends of the plungers, 3^a, and air at atmospheric pressure, entering the valve chest through the port, 1^h, unseats the valves, 3, and permits free circulation of air, through the valve chest, between the cylinder ports, 2^a. In the opening movements of the valves, the annular chambers between the

plungers, 3^a, and the wall of the valve chest perform the function of dash pots for cushioning the valves in their unseating movements, by causing the outer ends of the bodies of the valves to come to rest, without shock, against the inner ends of the heads, 1^a. A similar cushioning result is effected, in the closing or seating movements of the valves, by the dash pots formed by the spaces between the end walls of the valves and the pistons, 5.

I claim as my invention and desire to secure by Letters Patent:

1. The combination, with a locomotive engine cylinder, of a valve chest communicating with the induction and eduction ports thereof, two by-pass valves, each seating in said valve chest and controlling communication between the same and one of said ports, said valves being normally subject to and closed by distribution valve chest pressure, means for unseating said valves upon the relief of such pressure, and dash pot means for cushioning said valves in their unseating movements.

2. The combination, with a locomotive engine cylinder, of a valve chest communicating with the induction and eduction ports thereof, two by-pass valves, each seating in said valve chest and controlling communication between the same and one of said ports, said valves being normally subject to and closed by distribution valve chest pressure, means for unseating said valves upon the relief of such pressure, dash pot means for cushioning said valves in their unseating movements, and means, located on the opposite sides of said valves, for cushioning them in their seating movements.

3. The combination, with a locomotive engine cylinder, of a valve chest communicating with the induction and eduction ports thereof, heads, each detachably connected to and closing one end of said valve chest and having an inwardly projecting plunger

chamber, two by-pass valves, each seating in said valve chest, and controlling communication between the same and one of said ports, said valves being normally subject to and closed by distribution valve chest pressure, means for unseating said valves upon the relief of such pressure, and plungers fixed on said valves and fitting the plunger chambers.

4. The combination, with a locomotive engine cylinder, of a by-pass valve chest communicating with the induction and eduction ports thereof, heads, each detachably connected to and closing one end of said valve chest, and having an inwardly projecting plunger chamber surrounded by an annular steam chamber, a pipe for normally establishing communication between said steam chambers and a distribution valve chest of the locomotive, two by-pass valves, each seating in the by-pass valve chest and controlling communication between the same and one of the cylinder ports, means for unseating said valves upon the relief of pressure in the steam chambers, and plungers fixed on said valves and fitting the plunger chamber.

5. The combination, with a locomotive engine cylinder, of a valve chest communicating with the induction and eduction ports thereof, two tubular by-pass valves, each seating in said valve chest and controlling communication between the same and one of said ports, said valves being normally subject to and closed by distribution valve chest pressure, means for unseating said valves upon the relief of such pressure, dash pot means for cushioning said valves in their unseating movements, and connected floating pistons, each fitting in one of the tubular by-pass valves.

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Witnesses:

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