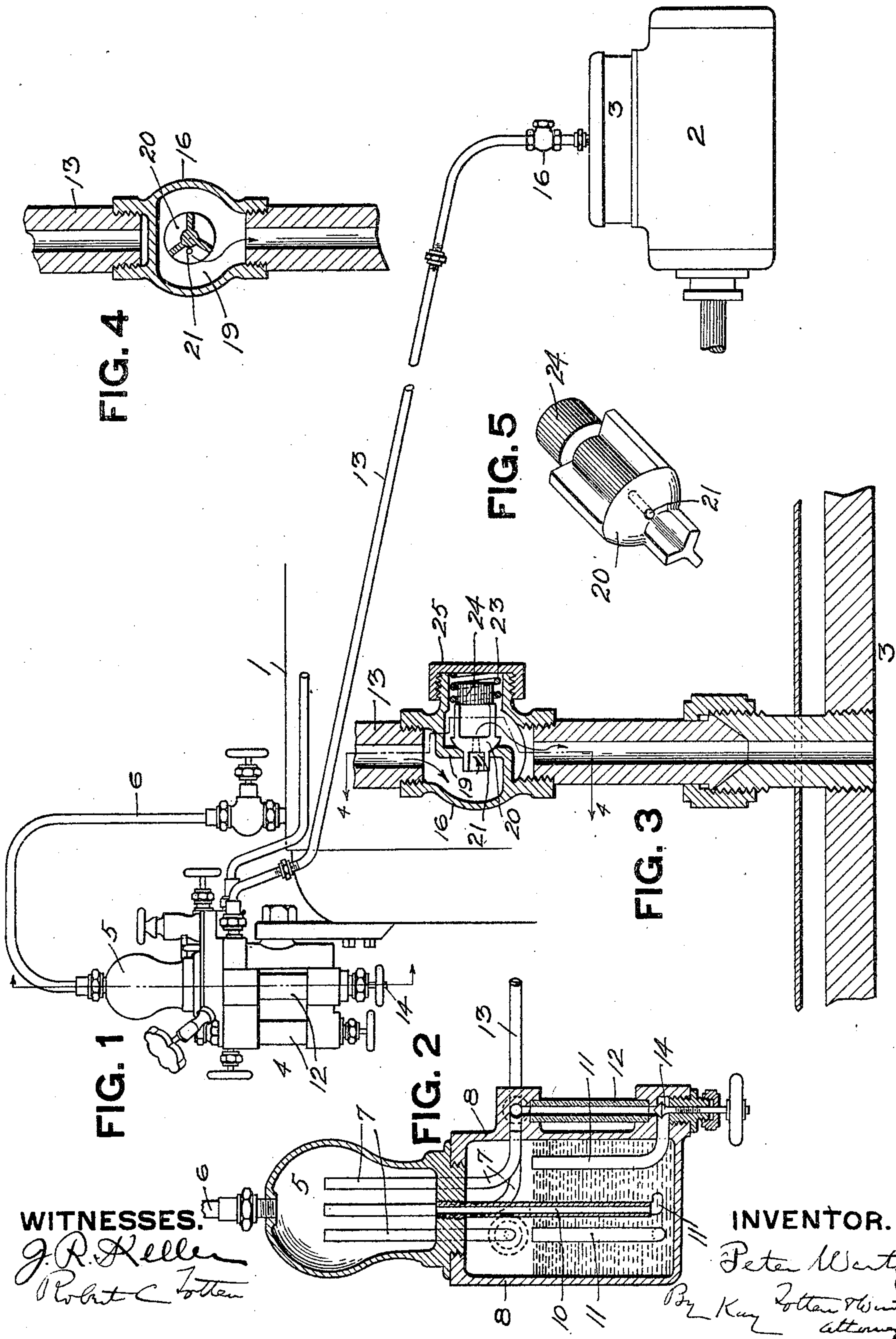


No. 798,470.

PATENTED AUG. 29, 1905.

P. WERTZ.
AUTOMATIC STEAM CHEST PLUG.
APPLICATION FILED DEC. 19, 1904.



WITNESSES.

J. R. Keller
Robert C. Totten

INVENTOR.

Peter Wertz
By Kay Totten & Wertz
Attorneys

UNITED STATES PATENT OFFICE.

PETER WERTZ, OF McKEES ROCKS, PENNSYLVANIA.

AUTOMATIC STEAM-CHEST PLUG.

No. 798,470.

Specification of Letters Patent.

Patented Aug. 29, 1905.

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To all whom it may concern:

Be it known that I, PETER WERTZ, a resident of McKees Rocks, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Automatic Steam-Chest Plugs; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to lubricators for steam-engines or the like, and more especially to the choke or steam-chest plug.

The object of my invention is to provide a choke or steam-chest plug which will automatically open when pressure in the steam-chest is reduced and allow the accumulated dirt to escape and prevent the clogging of the feeding-duct.

All locomotive-engines in use at the present day are provided with sight-feed lubricators for supplying oil to the cylinders and air-pump. These lubricators, as is well known, feed the oil by reason of an excess of steam-pressure on top of the oil over that in the steam-chest, this resulting from supplying to the top of the oil steam directly from the boiler, which is of a higher pressure than the steam in the steam-chest of the cylinder. This difference of pressure feeds the oil past a regulating-valve and through the choke-plug to the steam-chest. Choke-plugs are provided with a small duct, which will permit the requisite quantity of oil to pass through under the difference of pressure existing on opposite sides of said plug. The purpose of the choke-plug is to keep the pressure from the steam-chest from backing to the regulating-valve. Usually such plugs are placed at the lubricator and are connected to the steam-chest by a tallow-pipe from sixteen to eighteen feet long. The cross-area of this pipe is materially greater than that of the duct in the plug, and as a consequence the back pressure from the steam-chest when the engine is running acting on the greater area will prevent the oil from flowing to the steam-chest. It has been shown that the oil which feeds past the choke-plug will collect in the long tallow-pipe while the engine is running and as soon as the steam is shut off will all be forced into the steam-chest. As a consequence the cylinder is overlubricated when the engine is idle and is insufficiently lubricated when the engine is running. In my arrangement this is overcome by placing the choke-plug at the steam-chest, so that there is not the long pipe of larger cross-area in which

the oil can collect. Another difficulty with prior choke-plugs is that the minute duct is liable to become clogged with the dirt which is present in all oil. This not only stops the flow of the oil to the steam-chest, but also causes the accumulation of boiler-pressure in the glasses of the lubricator, thus frequently resulting in the bursting of the glasses and serious injury to the engineer or fireman.

My invention is intended to overcome the clogging of the duct of the choke-plug with dirt. To this end the plug is made in the form of a valve which is provided with the feeding-duct, this valve being arranged so that under normal pressures in the steam-chest it will remain seated; but when the pressure in the steam-chest drops abnormally said valve will open, and thus permit the escape of any accumulated dirt into the steam-chest. In this way the clogging of the feeding-duct is avoided.

The invention also consists in details of construction and arrangement which will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a diagrammatic view of portions of an engine and a lubricating device with my invention applied thereto. Fig. 2 is a vertical section through the sight-feed lubricator. Fig. 3 is a vertical section through my improved automatic plug. Fig. 4 is a section thereof on the line 4-4, Fig. 3; and Fig. 5 is a perspective view of the valve.

The boiler of the engine is shown at 1, the cylinder at 2, the steam-chest at 3, and the sight-feed lubricator at 4. This lubricator may be of any known or preferred form, and the drawings are intended merely to be illustrative of one type that may be used. This lubricator, as is well known, is provided with a pressure-chamber 5, which is connected, by means of a pipe 6, to the boiler 1 or steam-dome of the engine, so that live steam at the full boiler-pressure is communicated directly to the chamber 5. Projecting up into this chamber are a number of tubes 7, (three being shown,) which lead down through the floor thereof and out through the side of a lower casing 8, inclosing a chamber 9, in which the lubricating fluid is placed. Extending through the floor of the chamber 5 into the chamber 9 is a pipe 10, through which the water of condensation will pass, this water, as is well known, filling the bottom of the chamber 9 and floating the oil on top of the same. Projecting upwardly in the chamber 9 are a num-

ber of tubes 11, (three being shown,) open at their upper ends, so as to receive the oil, and at their lower ends projecting out through the sides of the casing 8 and connected to the lower ends of the glasses 12. The upper ends of these glasses connect with the outer ends of the pipes 7, and said pipes communicate with the supply or tallow pipes 13, leading to the valve-chests 3 or to the air-pump, as the case may be. A regulating-valve 14 is provided at the bottom of each glass 12, this valve serving to regulate the amount of oil which will pass through. By properly adjusting said valve the device will be set to feed the required number of drops of oil per minute.

The operation of this sight-lubricator is well known and is as follows: The oil in the chamber 9 will float on top of the water of condensation therein and will flow down into the tubes 11. The steam from the boiler enters the chamber 5 and passes through the tubes 7 and into the supply-pipes 13. As it passes the upper ends of the glasses 12 it will draw the oil up through said glasses on the principle of an injector, and thus feed the oil through the supply-pipes 13 into the chests. I claim nothing new in the apparatus so far described or in its mode of operation. In the supply-pipe 13 and preferably close to the valve-chest 3 is placed my improved automatic choke-valve. This comprises a casing 16, having the supply-pipe 13 communicating with its upper end and having its lower end in direct communication with the valve-chest by any suitable fitting. This valve-casing is provided with a partition 19, having an opening therethrough, with a valve-seat surrounding the opening. Coöperating with this valve-seat is the choke plug or valve 20, which may be of any suitable form and which is provided with a feeding-duct 21, extending therethrough and affording, when the valve is seated, a communication from one side of the partition to the other. This duct takes the place of the duct found in the ordinary stationary choke-plugs now in use. A suitable spring 23 is arranged to hold the valve normally on its seat. Preferably this spring will surround a stem 24 on the valve and will bear against the cap 25, which closes the valve-chamber. This spring will be of sufficient strength to hold the valve seated against the normal difference of pressure on the opposite faces thereof. When the engine is running, there will be steam-pressure in the valve-chest 3, and this will be communicated to the one face of the valve 20. The opposite face of the valve will be subjected to full boiler-pressure coming from the pipe 6 through chamber 5 and supply-pipe 13. This boiler-pressure will be higher than the steam-chest pressure. Usually a difference of twenty pounds exists. The spring 23 will be sufficiently strong to compensate for this difference of pressure, so that during the running

of the engine the valve 20 will be held on its seat, the oil meantime being supplied through the duct 21 in said valve. When the engine drifts or stops or when for any other reason the pressure in the steam-chest 3 drops abnormally, the boiler-pressure on the upper face of the valve will then be sufficient to overcome the tension of the spring 23, thus causing the valve to open. Any dirt which has accumulated on the upper face of the valve will thus be blown past the valve and down into the valve-casing. In this way the accumulation of dirt in front of the duct 21 is entirely overcome.

In the use of my device the regulating-valve 14 will be set so as to supply the requisite number of drops of oil per minute. This is what controls the quantity of oil flowing to the steam-chest at all times, whether the engine is running or standing still. The choke-orifice 21 is merely employed to regulate the back pressure from the steam-chest. My improvement places this choke-orifice in an automatically-opening valve, so that it cannot become clogged by the dirt which is always present in the oil.

What I claim is—

1. In a lubricating device, the combination with an oil-receptacle, of a fluid-pressure inlet thereto, a supply-pipe leading therefrom to a valve-casing, a regulating-valve for said supply-pipe, and an automatic choke-plug in said supply-pipe, said plug being provided with a duct and arranged to remain seated against the pressure in the supply-pipe under predetermined pressure in the valve-casing and to automatically open on decrease of this pressure, whereby lodgment of the dirt at the duct is prevented.

2. In a lubricating device, the combination with an oil-receptacle, of a fluid-pressure inlet thereto, a supply-pipe leading therefrom to a valve-casing, a regulating-valve for said supply-pipe, and an automatic choke-plug in said supply-pipe, said plug being provided with a duct and seating toward said oil-receptacle and being arranged to remain seated against the pressure in said oil-receptacle under predetermined pressure in the valve-casing and to automatically open on decrease of this pressure.

3. In a lubricating device, the combination with an oil-receptacle, of a fluid-pressure inlet thereto, a supply-pipe leading therefrom to a valve-casing, a regulating-valve for said supply-pipe, an automatic choke-plug in said pipe, said plug being provided with a duct, and a spring arranged to hold said plug on its seat against the pressure in the supply-pipe under predetermined pressures in the valve-casing and to permit said plug to automatically open on decrease of such pressure, whereby lodgment of dirt at the duct is prevented.

4. In a lubricating device for steam-engines,

&c., the combination with an oil-receptacle, of a pipe leading thereto from the boiler of the engine, a supply-pipe leading therefrom to the steam-chest of the engine, a regulating-valve for said supply-pipe, an automatic choke-plug in said supply-pipe, said plug being provided with a duct, and a spring arranged to hold said plug on its seat against the boiler-pressure in the supply-pipe under a predetermined pressure in the steam-chest and to permit the same to automatically open on a decrease of said pressure, whereby lodgment of dirt at the duct is prevented.

5. In a lubricating device for engines, &c., the combination with an oil-receptacle, of a pipe leading thereto from the boiler of the engine, a supply-pipe leading therefrom to the steam-chest of the engine, a regulating-valve for said supply-pipe, and an automatic choke-plug in said supply-pipe at the outlet end thereof, said plug being provided with a duct and arranged to remain seated against the boiler-pressure in the supply-pipe under a predetermined pressure in the steam-chest and to automatically open on a decrease of said pressure, whereby lodgment of dirt at the duct is prevented.

6. In a lubricating device for engines, &c., the combination with an oil-receptacle, of a pipe leading thereto from the boiler of the engine, a supply-pipe leading therefrom to the steam-chest of the engine, a regulating-valve for said supply-pipe, and a choke-plug in said supply-pipe at the outlet end thereof, said plug being provided with a duct and seated toward said oil-receptacle and being arranged to remain seated against the boiler-pressure in the supply-pipe under a predetermined pressure in the steam-chest and to automatically open on a decrease of said pressure.

7. An automatic choke-plug for lubricators, comprising a casing provided with a partition having a valve-seat, a valve coöperating with said seat and provided with a duct which, when the valve is seated, establishes communication between the chambers on the opposite sides of the partition, said casing having a

port on the valve-seat side for connection to the tallow-pipe, and a port on the valve side for connection to a steam chest or cylinder and a spring arranged to normally hold said valve on its seat, said valve and spring being so arranged that the valve will remain seated against boiler-pressure in the tallow-pipe under a predetermined pressure in the steam-chest and will automatically open on a decrease of said pressure.

8. An automatic choke-plug for lubricators, comprising a valve-casing provided with a partition having a valve-seat and having an opening at one side opposite said valve-seat, a valve coöperating with said seat and provided with a duct which, when the valve is seated, establishes communication between the chamber on the opposite sides of said partition, said casing having a port on the valve-seat side for connection to the tallow-pipe, and a port on the valve side for connection to a steam chest or cylinder, said valve having a stem, a spring surrounding said stem, and a cap for closing the opening in the valve-casing and bearing on said spring, whereby the latter will normally hold said valve on its seat.

9. An automatic choke-plug for steam-engine lubricators, comprising a casing provided with a valve-seat and having connection on one side of said seat to a tallow-pipe and on the opposite side of said valve-seat to a steam-chest, and a valve in said casing and provided with a duct establishing communication between the chambers on the opposite side of the valve-seat, said valve being arranged to remain seated against the boiler-pressure in the tallow-pipe under a predetermined pressure in the steam-chest and to automatically open on a decrease of this pressure.

In testimony whereof I, the said PETER WERTZ, have hereunto set my hand.

PETER WERTZ.

Witnesses:

E. J. LAUGHLIN,
CHAS. F. ENGEL.