No. 854,658. PATENTED MAY 21, 1907.

C. LORENZ.

GOVERNOR.

APPLICATION FILED MAY 26, 1906.

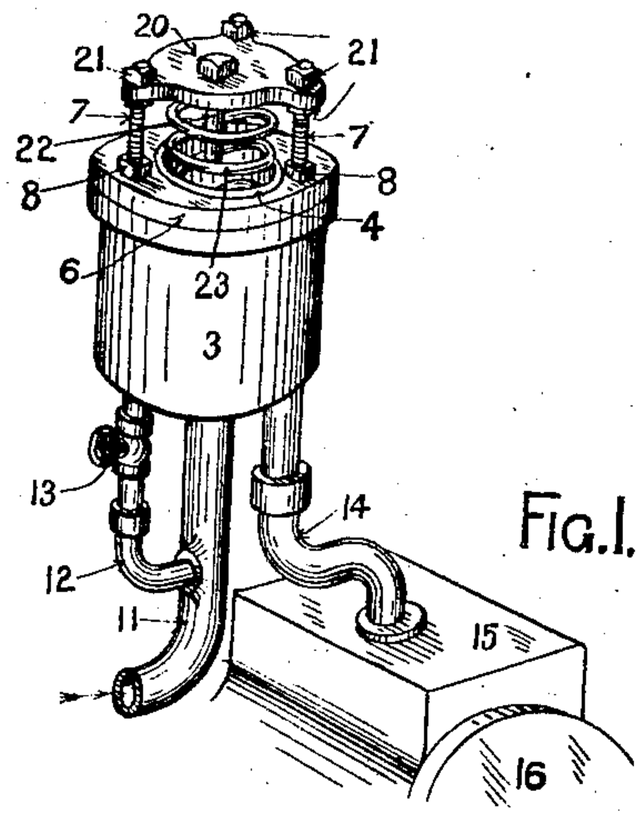

Fig. 1.

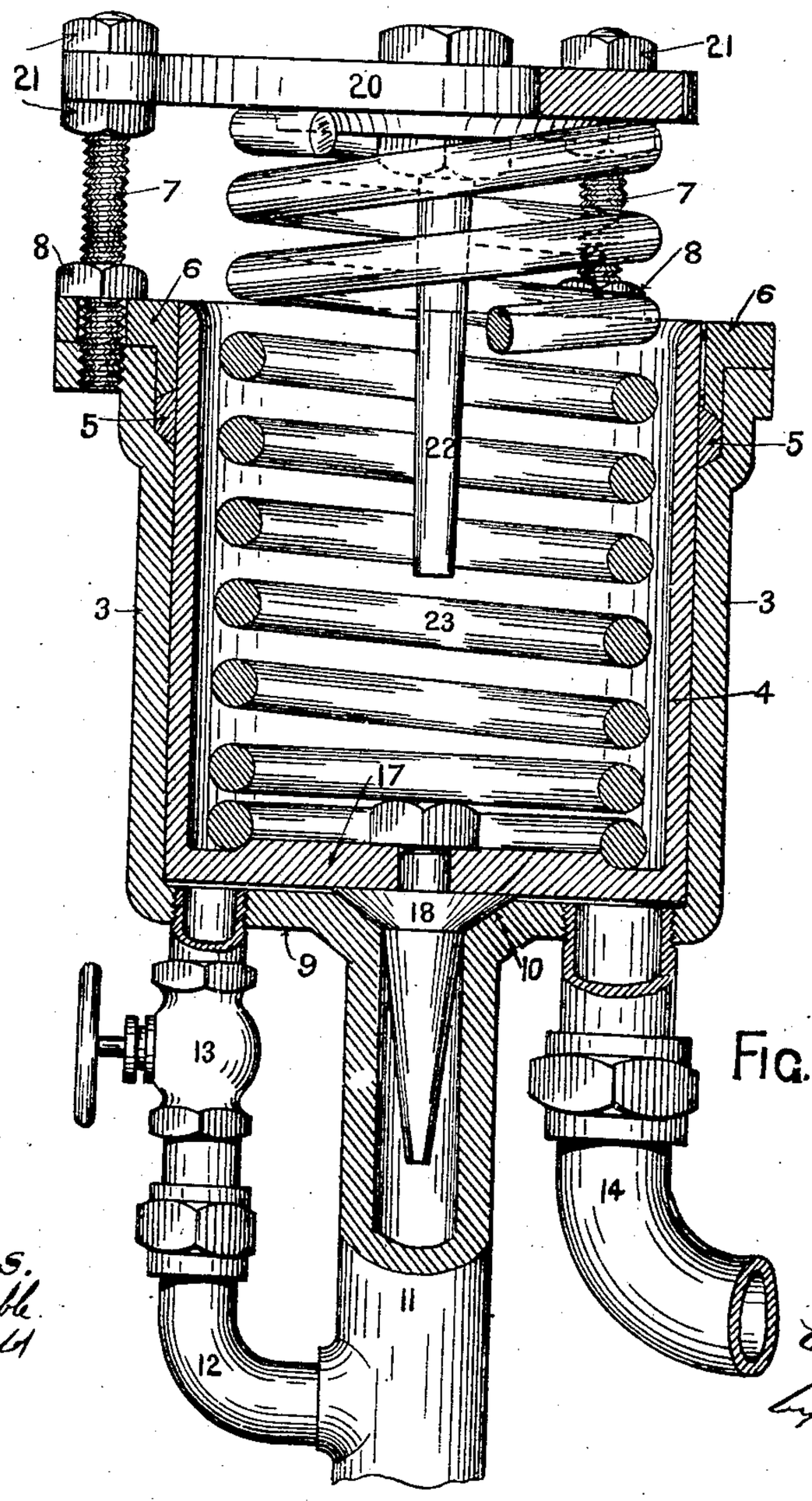

Fig. 2.

Witnesses.
H. L. Trimble.
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UNITED STATES PATENT OFFICE.

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No. 854,658. Specification of Letters Patent. Patented May 21, 1907.

Application filed May 26, 1906. Serial No. 318,895.

To all whom it may concern:

Be it known that I, CARL LORENZ, a subject of the King of Great Britain and Ireland, residing at Redfern, in the State of New South Wales, in the Commonwealth of Australia, have invented certain new and useful Improvements in Automatic Governors or Regulators for Steam or other Engines of a Like Class; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a device for regulating the speed of engines by controlling the supply of steam or other fluid thereto.

The essential of this invention is a valve in the power supply pipe balanced on one side by a spring and on the other by the engine load, so that any appreciable variation in the said load or appreciable variation in the number of engine exhausts in a given time will affect the valve and control the supply of power to the engine and thus regulate its speed.

Devices at present in use for controlling the supply of power to steam or other negines being mechanically operated do not come into action until the engine has reached or nearly reached its predetermined maximum speed or has fallen below the same: the device then operates and the supply of power is reduced or increased as the case may be. In the event of a sudden decrease in the engine load the action of a mechanically operated governor is too late to stop the engine greatly increasing its speed or racing.

This invention enables an engine to be governed with a greater degree of accuracy. The operator or engineer in charge can start the engine at whatever speed he desires either with a full load or no load at all and after the engine has been started and the speed determined the regulator or governor automatically controls the supply of power and the engine uniformly maintains the speed at which it was started, no matter what variation of load may occur.

In order that the invention may be clearly understood reference is now made to the accompanying sheet of drawings in which:—

Figure 1 is a perspective view of the invention as applied to a steam engine. Fig. 2 is a central sectional elevation of the regulator.

3 is a cylinder in which slides the regulator piston 4.

5 is packing, which may be of any description.

6 is a packing gland, and 7 and 8 are, respectively, gland studs and nuts.

9 is the cylinder head, in which there is a valve seat 10 leading to the steam supply pipe 11.

12 is a branch pipe leading from the supply pipe 11 to the cylinder 3.

13 is a regulator valve in branch pipe 12.

14 is steam supply pipe leading from the regulator to the steam chest 15 of the engine 16.

17 is the head of the regulator piston 4, centrally placed in which is the valve 18. This valve projects into the supply pipe 11 and corresponds with the valve seat 10 in the cylinder head.

In the drawings the valve 18 is shown as a spear or cone valve; but other types of valves are equally applicable to this invention.

The gland studs 7 and nuts 21 support a plate or bridge 20.

22 is a projecting pin or stop piece centrally placed in the plate 20.

23 is a spring between the plate 20 and the head 17 of the regulator piston 4. This spring, when the regulator is out of action, is tensioned by means of the nuts 21 to exert a pressure sufficient to close the valve 18 against the boiler pressure in the supply pipe 11. The spring 23 (or in the case of large regulators the springs) is of such a strength as to balance the full engine load or any part of the load.

The operation of the invention is as follows:—Assuming that an engine with regulator attached thereto is to be started with half its load, the engineer opens the valve 13 and admits sufficient steam to give the engine the speed he desires. Immediately the steam is admitted into the regulator through the valve 13 the piston 4 rises sufficiently to open the valve 18 to half its capacity and the regulator is brought into action, that is to say, the cone valve 18 is balanced on the one side by the load on the engine and on the other by the spring 23. Should the engine load now increase to its maximum the piston 4 will continue to rise until the valve 18 is open to its full extent; the engine load and spring pressure still keeping the valve balanced, and the uniform speed at which the engine was started is maintained. The stop piece 22 is provided for the purpose of deter-

mining the maximum travel of the regulator piston. Should the engine load be suddenly removed the piston 4 will immediately fall until the valve 18 only admits sufficient steam to drive the engine at the speed at which it was started.

It is clear from the foregoing that the valve 13 determines the speed at which the engine will go and once the engine is started the regulator automatically maintains it at that speed no matter what variation may occur in the load.

It is advisable that the regulator should be placed as near as possible to the engine, but the inventor does not confine himself to any particular size or shape or modification of the regulator or governor as herein described but claims the means of directly and automatically governing a steam or other like class of engine by a spring controlled valve placed in the power supply pipe.

What I claim and desire to secure by Letters Patent is:—

1. A device for regulating the speed of engines by controlling the supply of motive fluid thereto comprising a cylinder, a regulator piston slidable in the cylinder, a fluid supply means connected with the cylinder head having a valve seat surrounding its inlet end, a valve carried by the regulator piston to engage the valve seat, a fluid supply pipe connected with the fluid supply means and the cylinder head, a valve to control the passage of the fluid through the fluid supply pipe, and a pressure spring to engage the regulator piston and balance it on one side while the load on the engine balances it on the other side.

2. A device for regulating the speed of engines by controlling the supply of motive fluid thereto comprising a cylinder, a regulator piston slidable in the cylinder, a fluid supply means connected with the cylinder head having a valve seat surrounding its inlet end, a valve carried by the regulator piston to engage the valve seat, a fluid supply pipe connected with the fluid supply means and the cylinder head, a valve to control the passage of the fluid through the fluid supply pipe, a pressure spring to engage the regulator piston and balance it on one side while the load on the engine balances it on the other side, and a plate adjustably connected to the cylinder to be engaged by the outer end of the spring.

3. A device for regulating the speed of engines by controlling the supply of motive fluid thereto comprising a cylinder, a regulator piston slidable in the cylinder, a fluid supply means connected with the cylinder head having a valve seat surrounding its inlet end, a valve carried by the regulator piston to engage the valve seat, a fluid supply pipe connected with the fluid supply means and the cylinder head, a valve to control the passage of the fluid through the fluid supply pipe, a pressure spring to engage the regulator piston and balance it on one side while the load on the engine balances it on the other side, a plate adjustably connected to the cylinder to be engaged by the outer end of the spring, and a stop to limit the movement of the regulator piston.

In testimony whereof, I affix my signature, in presence of two witnesses.

CARL LORENZ.

Witnesses:
T. O. ALLEN,
WALTER SIGMONT.