

H. L. THOMPSON.
STEAM ENGINE.
APPLICATION FILED NOV. 25, 1908.

960,438.

Patented June 7, 1910.

2 SHEETS—SHEET 1.

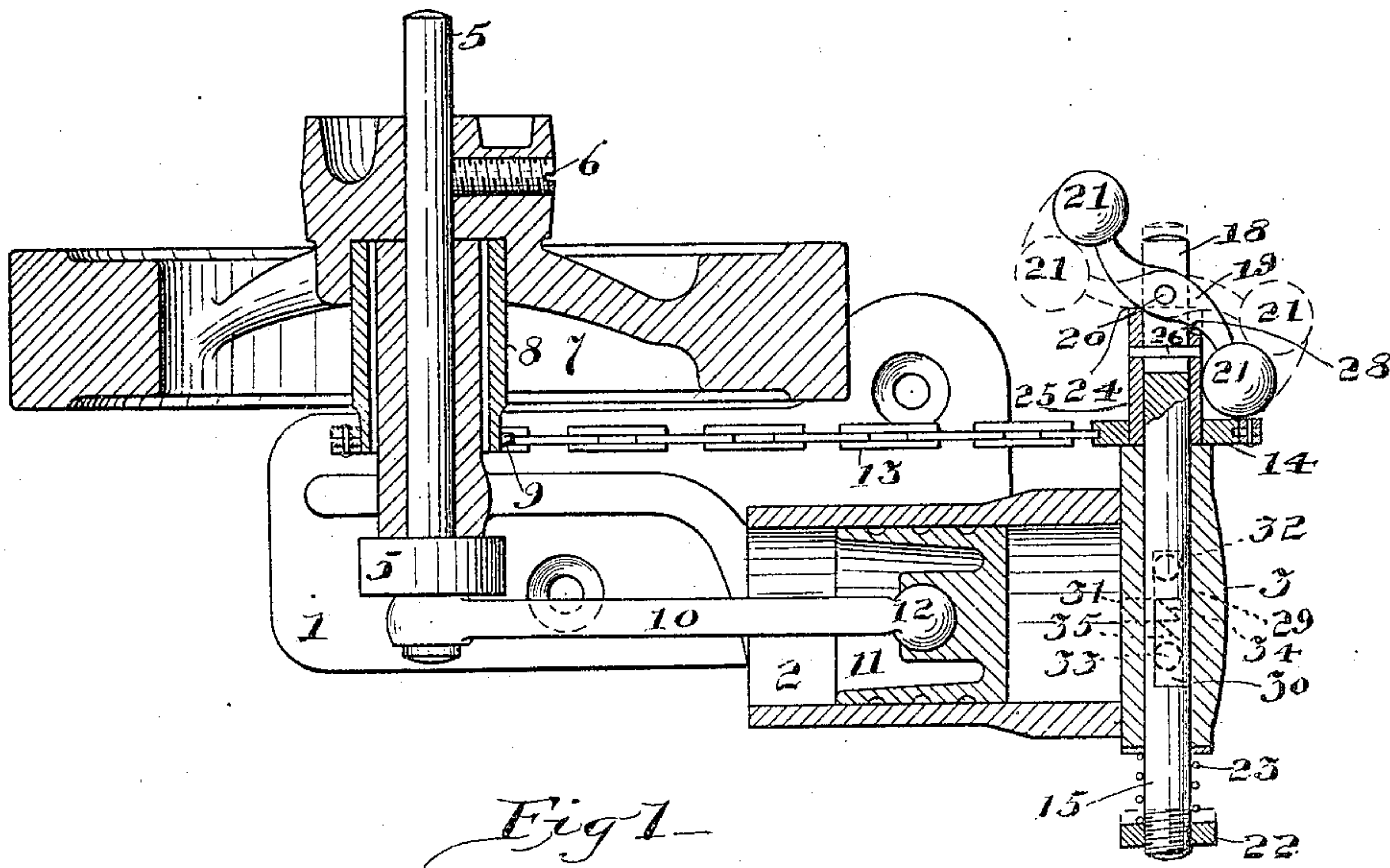


Fig. 1

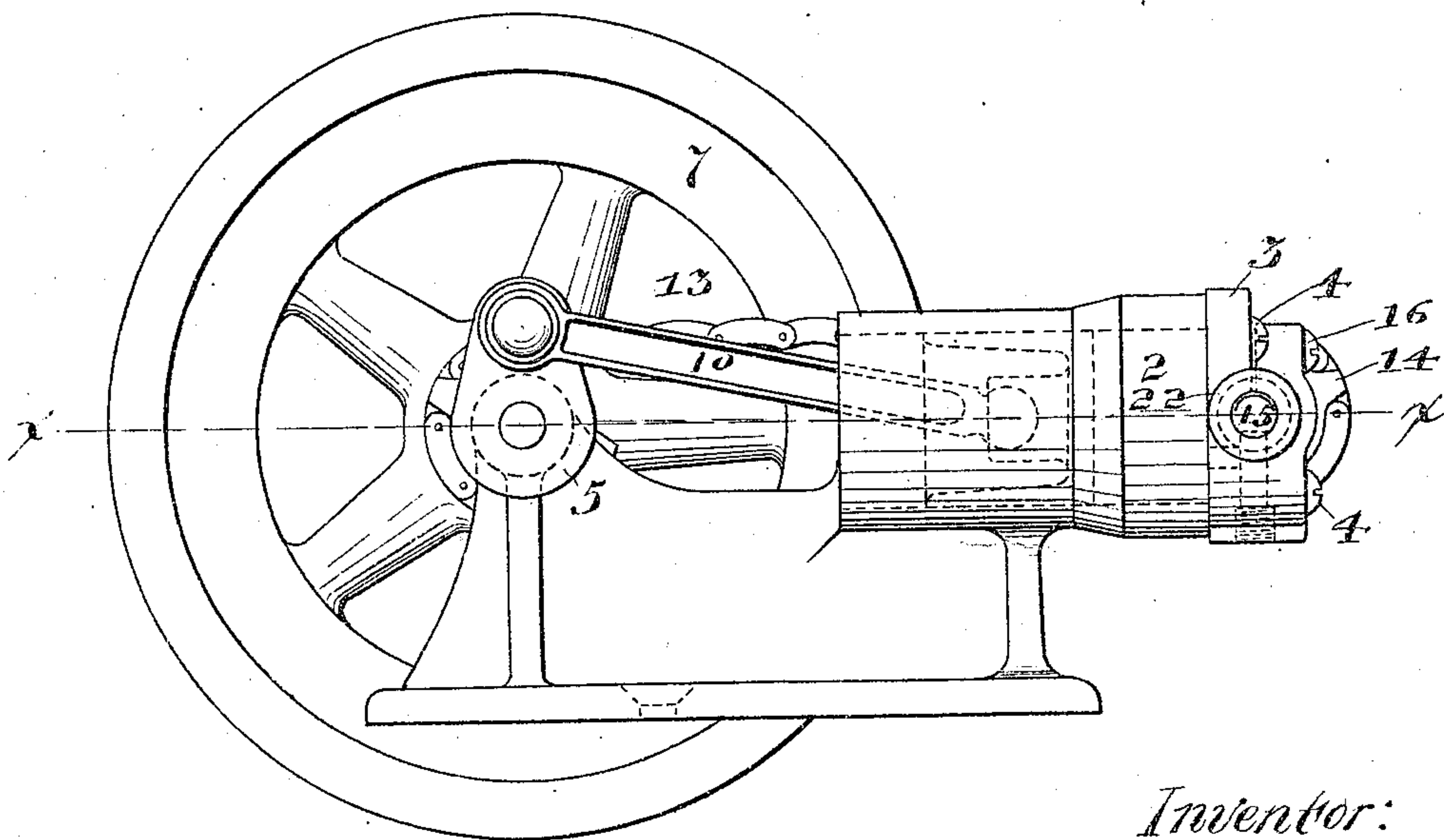


Fig. 2

Witnesses:
R. C. Fletcher
W. B. Smith

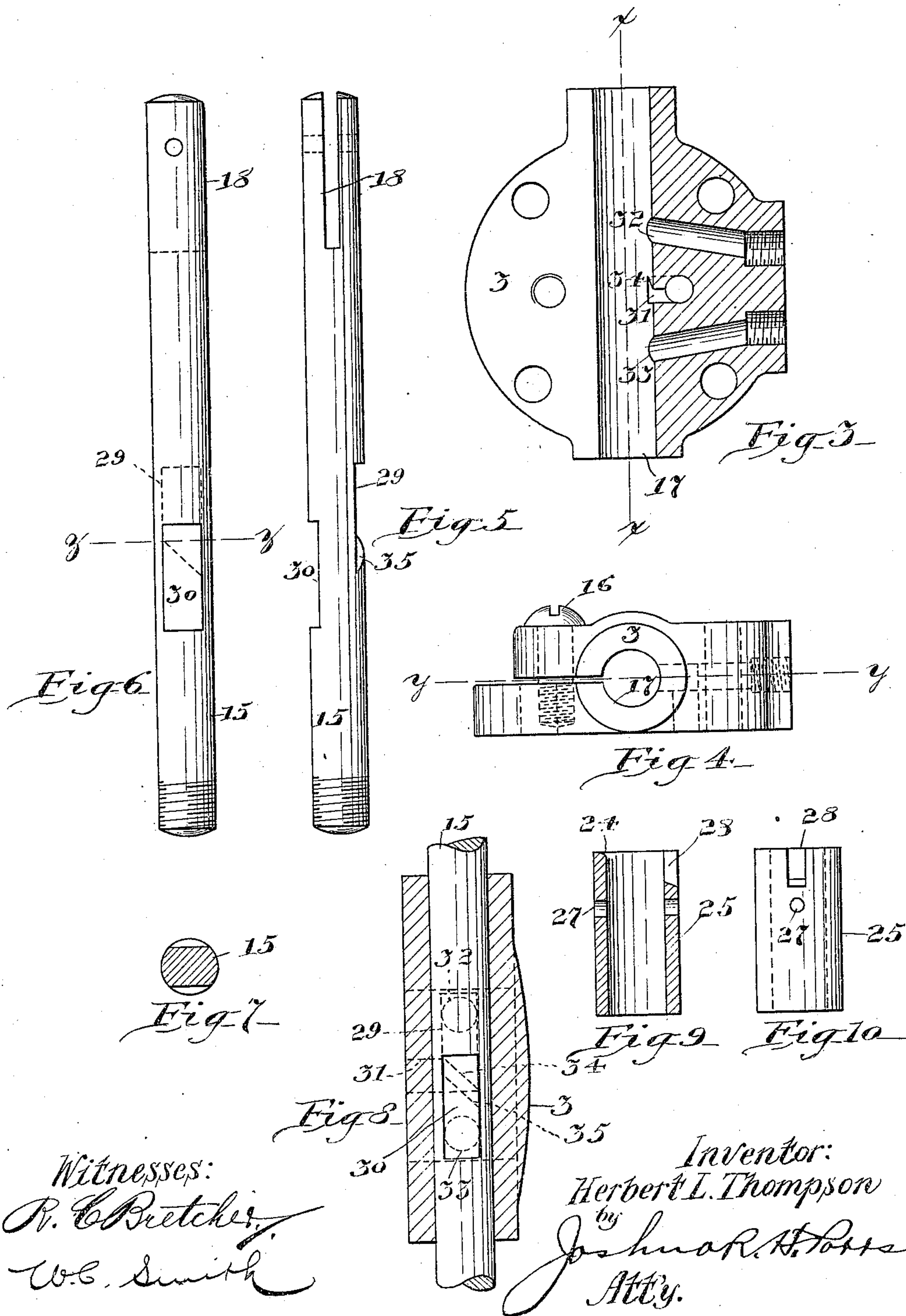
Inventor:
Herbert L. Thompson
by *Joshua R. Horne*
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UNITED STATES PATENT OFFICE.

HERBERT L. THOMPSON, OF ELGIN, ILLINOIS.

STEAM-ENGINE.

960,438.

Specification of Letters Patent.

Patented June 7, 1910.

Application filed November 25, 1908. Serial No. 464,402.

To all whom it may concern:

Be it known that I, HERBERT L. THOMPSON, a citizen of the United States, residing at 39 Commonwealth avenue, in the city of Elgin, county of Kane, and State of Illinois, have invented certain new and useful Improvements in Steam-Engines, of which the following is a specification.

My invention relates to improvements in steam engines, and more particularly to steam engine governors adapted to regulate the action of engine valves.

The object of my invention is to provide novel rotary inlet and exhaust valves arranged to produce an automatic cut-off in an engine. And a further object is to provide such an inlet valve arrangement that only a slight movement of the governing means is required to change from a small to a large steam admission to the engine's cylinder.

Other objects will appear hereinafter.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, and in which—

Figure 1 is a substantially horizontal section of my improved engine taken on the line $x-x$ of Fig. 2, Fig. 2 is a side elevation, Fig. 3 is a detailed vertical section of the cylinder head taken on the line $y-y$ of Fig. 4, Fig. 4 is a detailed side elevation of the cylinder head, Figs. 5 and 6 are detailed elevations of the valve shaft, Fig. 7 is a detailed transverse section taken on the line $z-z$ of Fig. 6, Fig. 8 is substantially a detail horizontal section taken on the line $x-x$, Figs. 2 or 3, showing the valve shaft, Fig. 9 is a detail section of the fulcrum sleeve arranged on the valve shaft, and Fig. 10 is a detail side elevation of the same.

Referring now to the drawings 1 indicates the engine base and 2 the engine cylinder integral therewith. The cylinder head 3 is secured to the cylinder 2 by means of the screws 4, and the crank shaft 5 is journaled in the base 1. Secured to the crank shaft 5 by means of the set-screw 6 is a fly-wheel 7 provided with an annular sleeve 8 pressed securely into the fly-wheel 7 and carrying a sprocket 9 at its outer extremity. The chain 13 is adapted to travel over the sprocket 9 and the sprocket 14 connected with the rotatable and slidable valve shaft 15 provided in the cylinder head 3. The cylinder head 3 is slotted at one end and is provided with an adjusting screw 16 to take up the wear

of the shaft 15 in its bearing 17. The valved shaft 15 is slotted at one end forming two arms 18 between which a rocking governor lever 19 is pivoted by means of the pivotal pin 20. Heavy governor balls 21 integral with the lever 19 tend to fly from the axis of the valve shaft 15 by centrifugal force when said shaft is rotated by means of the chain 13. The shaft 15 is provided with an adjusting nut 22 at one extremity thereof, adapted to regulate the tension of the helical spring 23 surrounding said shaft. The spring 23 tends to draw the valve shaft 15 in one direction and the governor lever 19 to draw the same in the other, said lever acting on the fulcrum 24 in the sprocket sleeve 25 which is slidably mounted on the valve shaft 15. The sprocket 14 is rigidly secured to the sleeve 25, and said sleeve is prevented from turning on the shaft 15 by means of the pin 26 secured in said sleeve and adapted to slide between the arms 18. Perforations 27 in the sleeve 25 are adapted to receive the pin 26, and the slot 28 also in said sleeve is adapted to afford clearance for the governor lever 19.

From the foregoing it is clearly seen that the shaft 15 will slide in the bearing 17 in one direction when the speed of the engine is such that the centrifugal force of the governor balls 21 overcomes the tension of the spring 23, and that said shaft will return to its normal position when the speed decreases. The inlet and exhaust channels 29 and 30 respectively are formed on diametrically opposite sides of the valve shaft 15 and are adapted to register alternately with a port 31 leading into the cylinder 2. When the inlet channel 29 registers with the port 31 it also registers with the inlet port 32, thus forming a clear passage for the steam admission, and when the exhaust channel 30 registers with the port 31 it registers also with the exhaust port 33. The exhaust passage comprising the port 31, exhaust channel 30 and the exhaust port 33 cannot be constricted, but the inlet passage is automatically throttled when the engine increases its speed by means of the slidable valve shaft 15 which is actuated by the centrifugal governor. To this end one side of the port 31 is obliquely disposed, as shown at 34, and one end of the intake channel 29 in the valve shaft 15 is also obliquely disposed as shown in 35. It is clear from this construction that a maximum of open-

ing is obtained from a minimum of movement of the valve shaft 15.

While I have shown what I deem to be the preferable form of my improved engine I do not wish to be limited thereto as there might be many changes made in the details of construction and arrangement of parts without departing from the spirit of my invention.

10 Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a steam engine a cylinder and cylinder head, in combination with a valve rotatably and slidably mounted in said head, said valve and said head being provided with ports, means for rotating said valve, parallel longitudinal extensions on said valve, a governor lever pivotally mounted between said extensions, and a fulcrum for said lever and means yieldingly opposing

the action of said lever, substantially as described.

2. In a steam engine a cylinder and cylinder head, in combination with a valve rotatably and slidably mounted in said head, said valve and said head being provided with ports, said valve extending beyond said head and being bifurcated, a governor lever pivotally mounted in the bifurcated end of said valve, a sleeve surrounding said valve and forming a fulcrum to said lever and means for rotating said valve, substantially as described.

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

HERBERT E. THOMPSON.

Witnesses:

JOHN W. McQUEEN,
NELS W. JOHNSON.