

No. 778,088.

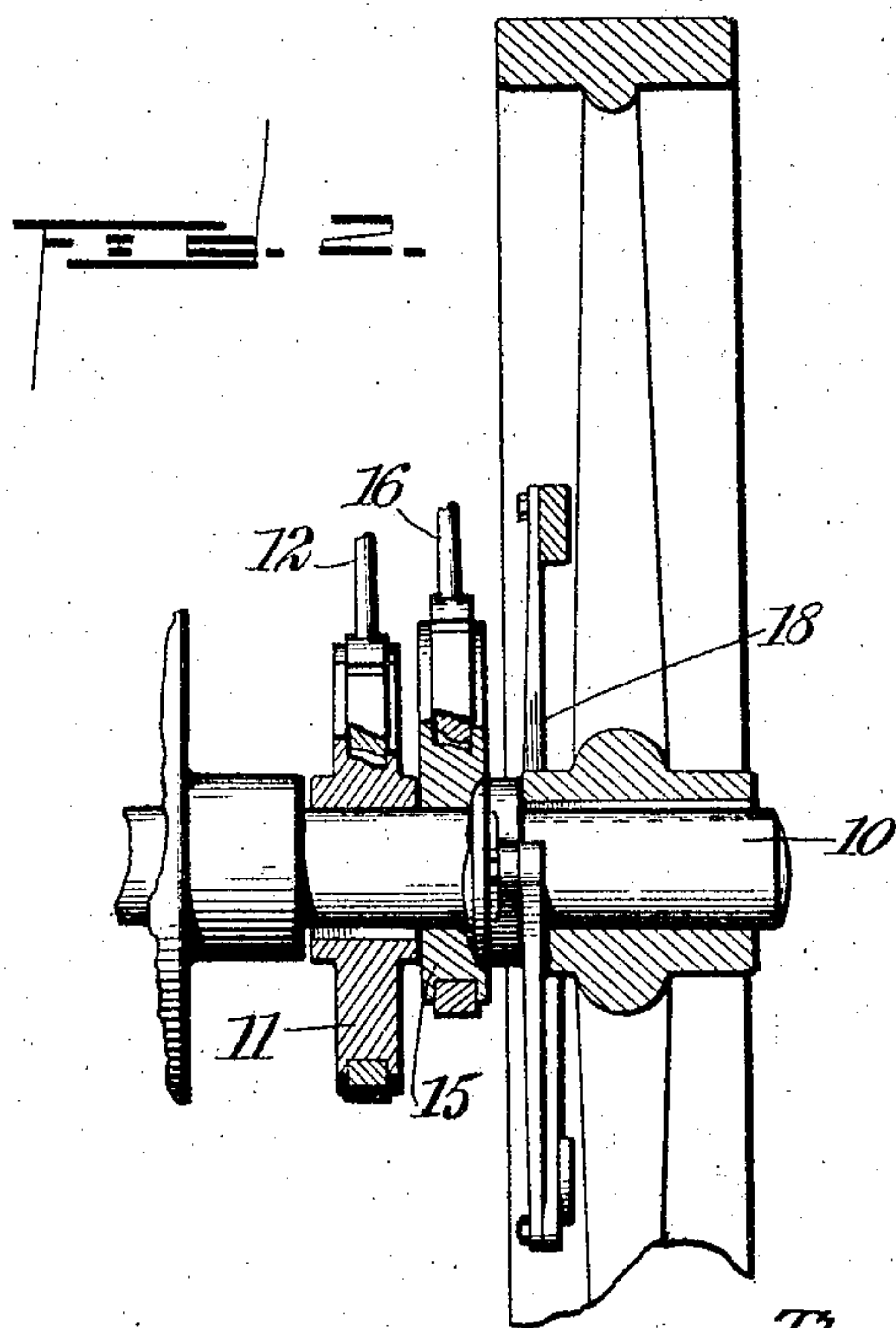
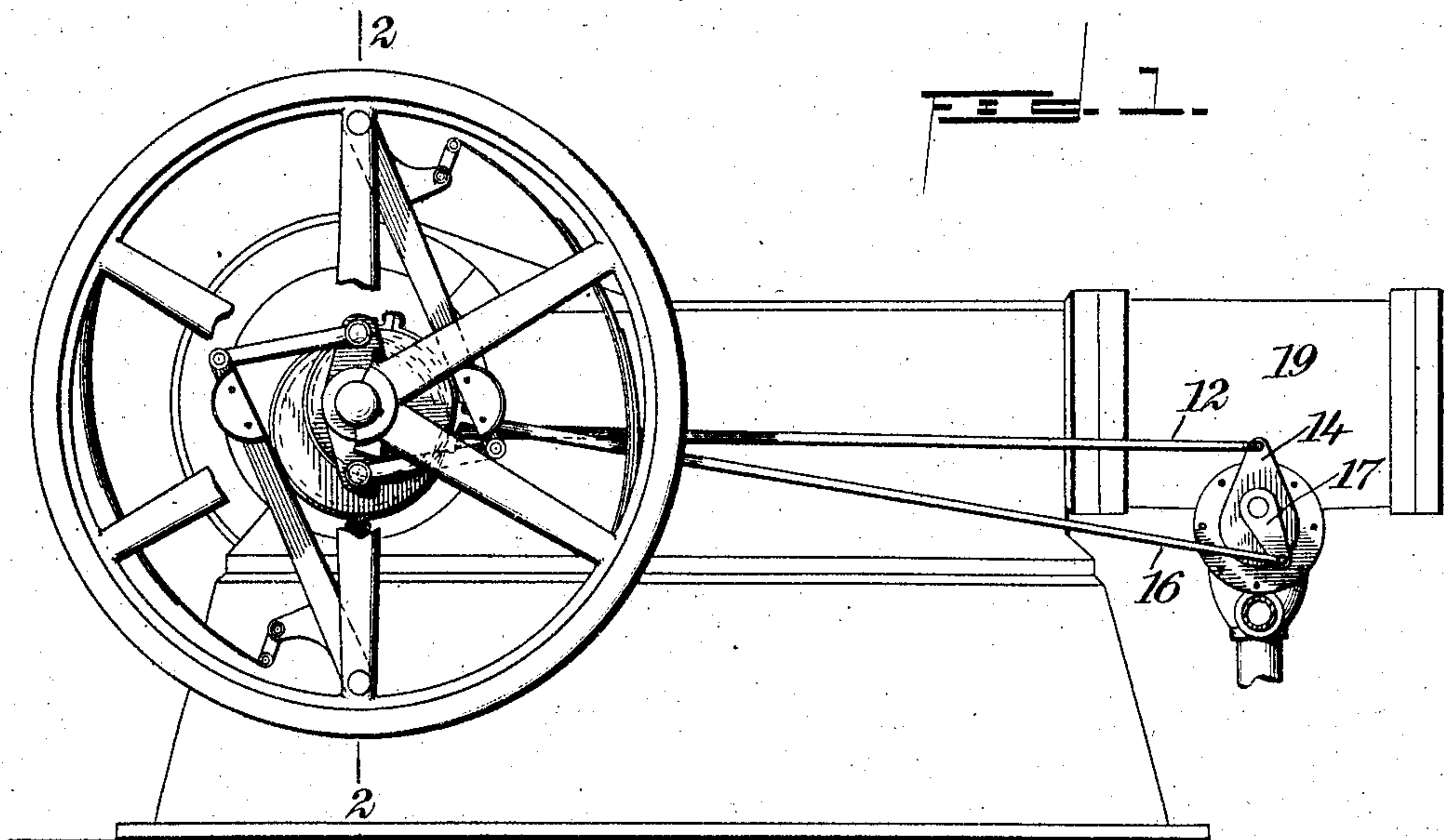
PATENTED DEC. 20, 1904.

T. G. VAN SANT.
VALVE MECHANISM.

APPLICATION FILED APR. 11, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

L. Sanford Handke

Haas & Owens.

INVENTOR

Thomas G. Van Sant

BY

Mumford

ATTORNEYS

No. 778,088.

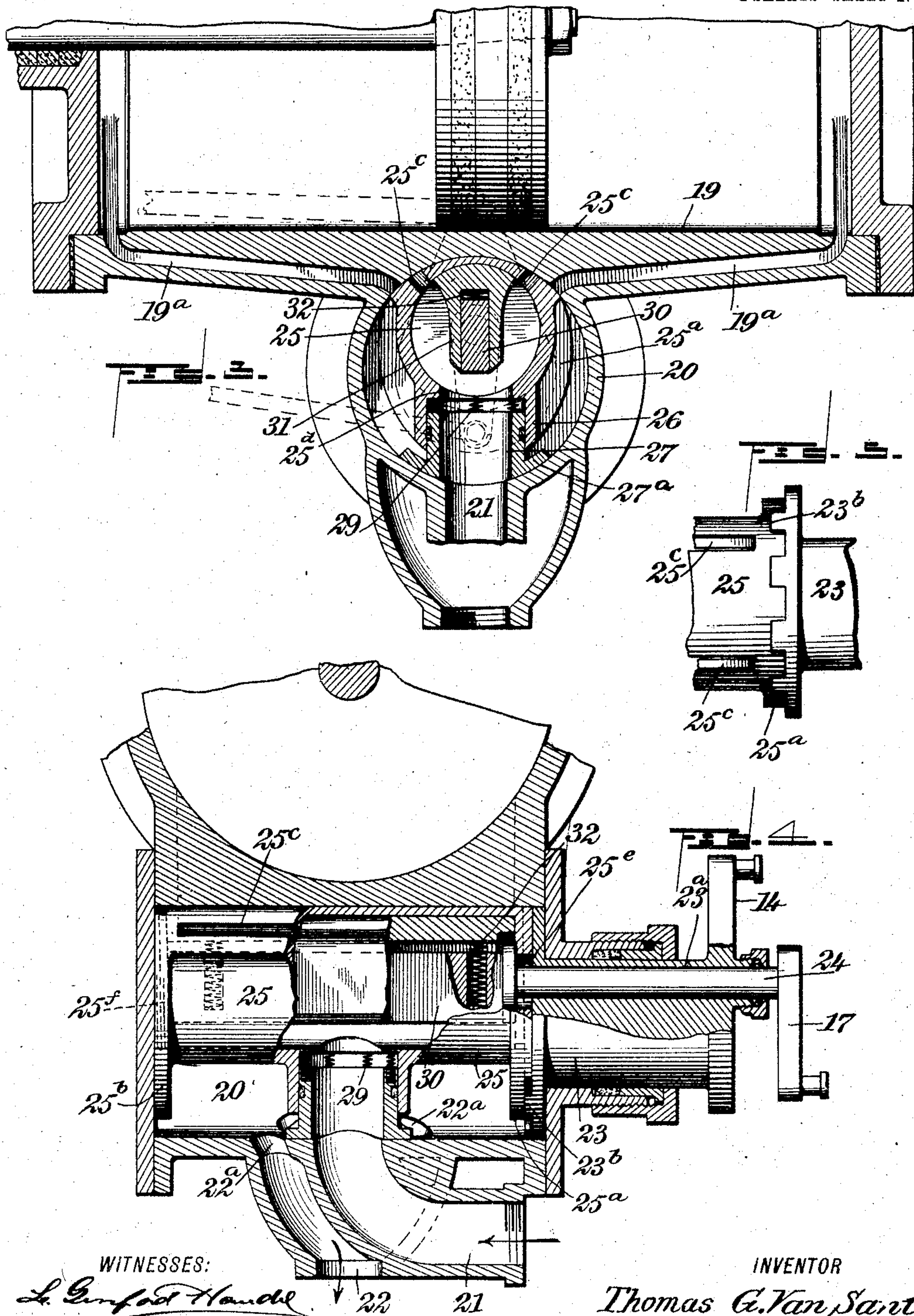
PATENTED DEC. 20, 1904.

T. G. VAN SANT.
VALVE MECHANISM.

APPLICATION FILED APR. 11, 1904.

NO MODEL.

2 SHEETS—SHEET 2.



WITNESSES:

L. Gurfad Handel

Isaac B. Owens.

INVENTOR

Thomas G. Van Sant

BY

Mumukshu
ATTORNEYS

ATTORNEYS

UNITED STATES PATENT OFFICE.

THOMAS GRIFFITH VAN SANT, OF PARAGOULD, ARKANSAS

VALVE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 778,088, dated December 20, 1904.

Application filed April 11, 1904. Serial No. 202,564.

To all whom it may concern:

Be it known that I, THOMAS GRIFFITH VAN SANT, a citizen of the United States, and a resident of Paragould, in the county of Greene and State of Arkansas, have invented a new and Improved Valve Mechanism, of which the following is a full, clear, and exact description.

This invention relates to a valve mechanism for steam-engines; and the principal object of the invention is to provide an improved cut-off enabling the period of cut-off to be automatically regulated without changing the lead, compression, and exhaust.

The invention involves various features of construction and arrangement of parts, which shall be fully set forth herewith.

This specification is a specific description of an example of the practical embodiment of my invention, while the claims are definitions of the actual scope thereof.

Reference is made to the accompanying drawings, forming part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side view of an engine having my improvement applied. Fig. 2 is a fragmentary section on line 2-2 of Fig. 1, showing particularly the eccentrics and centrifugal governor for controlling the cut-off eccentric. Fig. 3 is a longitudinal section of part of the cylinder and illustrating the valve in cross-section. Fig. 4 is a cross-section of part of the cylinder, showing the valve in longitudinal section; and Fig. 5 is a fragmentary elevation showing the connection between the main valve and its stem.

As shown in Figs. 1 and 2, the engine-shaft 10 carries a fixed eccentric 11, having its rod 12 in connection with the crank 14 of the main valve. The shaft 10 also carries loosely the cut-off eccentric 15, the rod 16 of which is in connection with the crank 17 of the cut-off. Said loose eccentric 15 is driven with the shaft 10 through the medium of a fly-wheel governor 18, which may be of any form desired and the arrangement of which is such that the position of the eccentric 15 with respect to the eccentric 11 is automatically regulated according to the speed of the shaft 10.

As shown best in Figs. 3 and 4, the engine-cylinder 19 has the usual ports 19^a leading to the ends thereof and communicating with a valve-chest 20. To the said valve-chest a live-steam connection 21 passes, and 22 indicates the exhaust-steam connection, this connection entering the valve-chest 20 by means of a number of ports 22^a, arranged at each side of the live-steam inlet 21.

The crank 14 is connected to the enlarged stem 23 of the main valve, and said stem is formed with a longitudinally-extending eccentric bore 23^a, in which is carried loosely the cut-off-valve stem 24, which stem 24 carries the cut-off crank 17. The main-valve stem 23 is connected to the main valve by means of interengaged ribs and grooves 23^b, formed on a flange at the inner end of the stem 23, and a corresponding flange 25^a, formed on the adjacent end of the main valve 25. Said valve lies within the chest 20 and has a flange 25^b at the end opposite the flange 25^a, the latter flange bearing against the adjacent end or head of the chest 20. The main valve 25 is hollow and is formed with two ports 25^c, extending longitudinally therein and adapted, respectively, to register with the ports 19^a. The valve 25 is also formed with a port 25^d, which is centrally located and surrounded by a boss 26, formed on or fastened to the valve and carrying loosely a sleeve 27. Said sleeve is adapted to register with the steam-inlet port 21 and is formed with a flange 27^a at its outer end, this flange matching with the inner surface of the valve-chest 20 to form a steam-tight joint and to allow the free rocking of the main valve, whereby to cause the ports 25^c alternately to register with the ports 19^a.

The valve 25 is kept yieldingly on its seat, and the flange 27^a is kept in proper contact with the inner surface of the valve-chest by means of expansive springs 29, which bear between the inner end of the sleeve 27 and the valve 25 at the base of the boss 26. It accordingly follows that steam passing through the connection 21 and sleeve 27 will enter the valve 25 and be distributed first to one side and then to the other of the piston by the alternate connection of the ports 25^c with the ports 19^a. At the end of the main valve ad-

jacent to the stem 23 thereof is formed an opening 25^e, registering with the passage 23^a, but larger than the same, so that the cut-off-valve stem 24 may project through the opening 25^e without interfering with the necessary movement of the valve 25 relative to its stem. At the end of the valve 25 opposite the opening 25^e a head or closure 25^f may be screwed or otherwise fitted thereon, as indicated by the broken lines in Fig. 4.

The cut-off valve comprises a bar 30, connected rigidly with the stem 24 and straddled by a saddle-like valve proper, 31, said valve proper being pressed upon the concentric inner side of the valve 25 by means of a spring or springs 32 acting between the bar 30 and the cut-off valve proper, 31. The cut-off valve when in inactive position lies intermediate the ports 25^e, and upon the operation of the cut-off it moves to one side or the other to cover one or the other of the ports 25^e.

On the operation of the valve mechanism when the cut-off valve is inactive the main valve 25 rocks from side to side, alternately connecting the ports 25^e with the ports 19^a. When one port 25^e is so connected, the valve 25 will have moved past the opposite port 19^a, and consequently live steam will be passing through the first-mentioned port and the exhaust-steam will be escaping from the second-mentioned port, the exhaust-steam passing by the side of the main valve and out through the orifices 22^a to the exhaust-steam connection 22. Upon the operation of the cut-off valve it moves to one side or the other of its inactive position, thus closing one or the other of the ports 25^e, and in this manner steam may be cut off before the main valve reaches its cut-off position. The proper movement of the valve is brought about by the eccentrics 11 and 15 and their coacting parts. The eccentric 11 being keyed to the shaft 10 gives the main valve 25 a uniform rocking movement, and therefore an unchanging lead, compression, and exhaust. As the speed of the engine increases or decreases the position of the eccentric 15 is shifted, and in this manner the operation of the cut-off valve is automatically started or modified according to the speed of the engine.

The location of the stem 24 eccentrically in the stem 23 causes the cut-off valve to move with the main valve when the cut-off valve is inactive, thus producing no change in the regular operation of the engine. The instant the cut-off valve becomes active, however, it moves in the main valve independently thereof and independently of the bodily movement of the cut-off valve, due to its eccentric connection with the main valve.

The movement of both eccentrics compounded through the large main-valve stem 23 and the eccentrically-located stem 24 produces an accelerating cut-off with an unchanged lead,

compression, and exhaust similar to that found in the commercial Corliss and Buckeye engines.

Various changes in the embodiment of my invention may be resorted to at will without departing from the essential part thereof. Hence I consider myself entitled to all such variations as may lie within the terms of my claims.

Having thus described the preferred embodiment of my invention, I claim as new and desire to secure by Letters Patent—

1. In combination, a main valve adapted to rock upon an axis, and a cut-off valve mounted in said main valve and adapted to rotate upon an axis eccentrically with respect to said first axis whereby said cut-off valve may remain inert when said main valve rotates upon its own axis.

2. The combination of a main valve, a rotary cut-off valve carried eccentrically thereby and movable therewith and independently thereof, means for imparting a regular movement to the main valve and means for imparting a variable movement to the cut-off valve.

3. The combination of a rocking main valve, a stem attached thereto, a cut-off valve carried by the main valve, a cut-off-valve stem eccentrically carried by the main-valve stem, and means for operating both valves through the medium of their stems.

4. The combination of a rocking main valve, a stem therefor, a cut-off valve carried by the main valve, a cut-off-valve stem eccentrically carried by the main-valve stem, means for imparting a constant rocking movement to the main-valve stem, and means for imparting a variable rocking movement to the cut-off-valve stem.

5. The combination of a rocking main valve, a cut-off valve carried thereby to rock around an axis eccentric of the rocking movement of the main valve, and means for operating the valves.

6. The combination of a rocking hollow main valve having two live-steam ports, a valve-stem attached to the main valve, a second valve-stem eccentrically mounted in the first stem, a cut-off valve connected with the second valve-stem and lying within the hollow main valve intermediate the ports thereof and means for operating the two valves through the medium of their stems.

7. The combination of a rocking main valve, a valve-stem having an interlocking connection therewith, permitting relative lateral movement of the valve and stem, a second stem mounted eccentrically in the first stem, a cut-off valve connected with the second stem and coacting with the main valve, and means for operating the valves through the medium of their stems.

8. The combination of a hollow main valve, a valve-stem connected thereto the valve-stem

and valve being capable of relative transverse movement, a valve-stem eccentrically mounted in the first-named stem, a cut-off valve having connection with the second-named valve-
5 stem, means of yieldingly pressing the two valves to their seats, and means for operating the valves.

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

THOMAS GRIFFITH VAN SANT.

Witnesses:

G. C. JOHNSTON,
R. J. DAVIS.