A. WINTON.

PRESSURE GOVERNOR FOR EXPLOSIVE ENGINES.

APPLICATION FILED AUG. 17, 1904.

924,301.

Patented June 8, 1909.

4 SHEETS—SHEET 1.

Fig. 4.

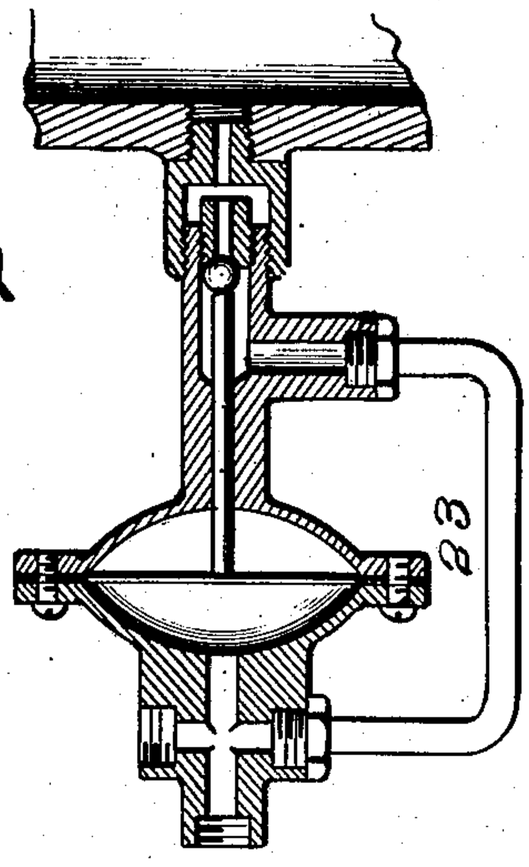


Fig. 5.

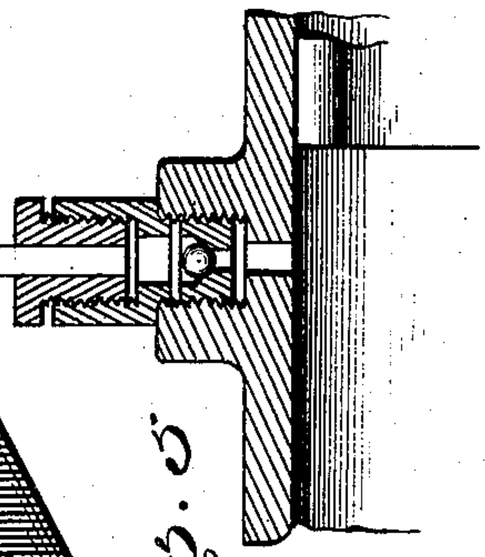
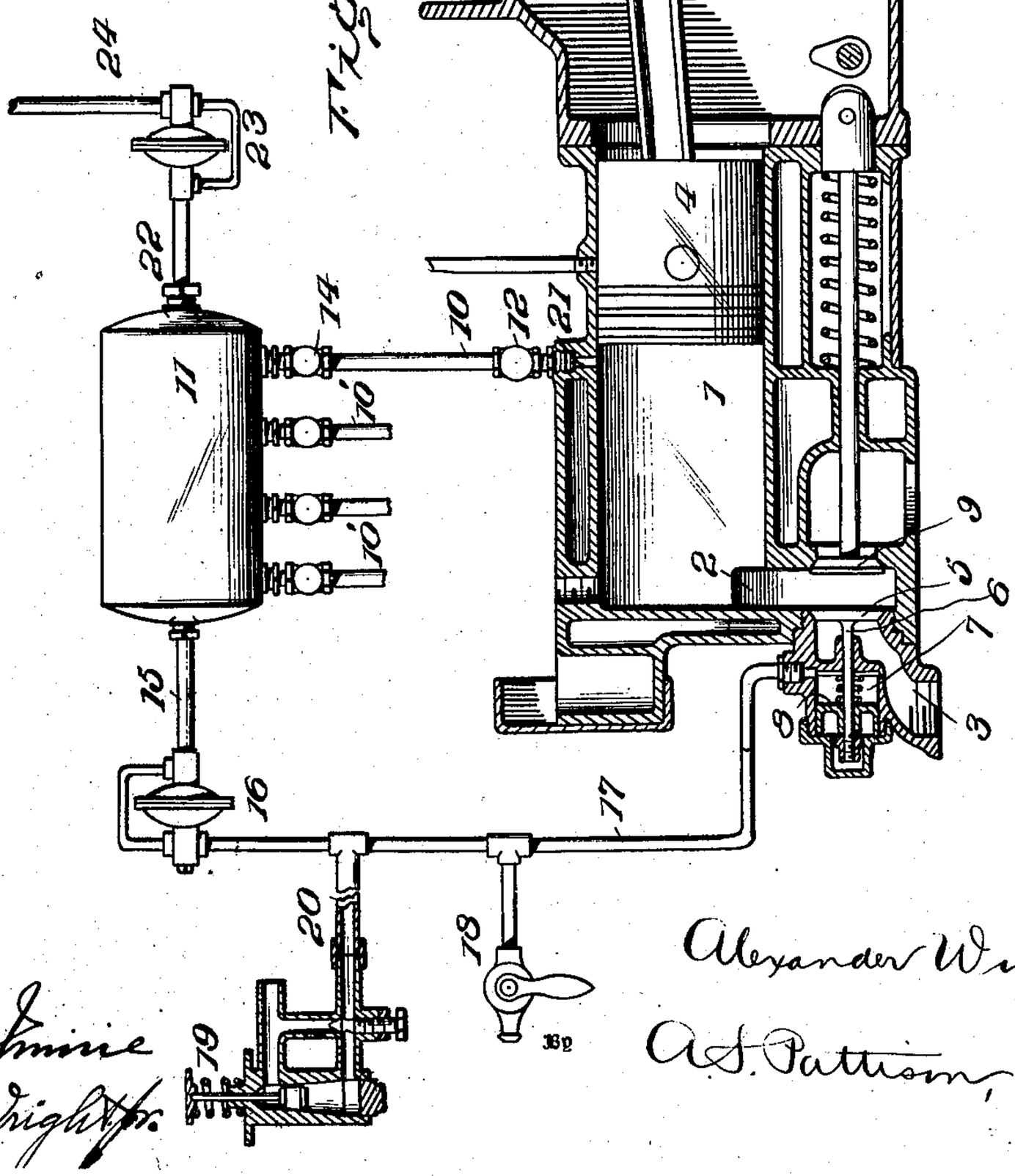


Fig. 1.



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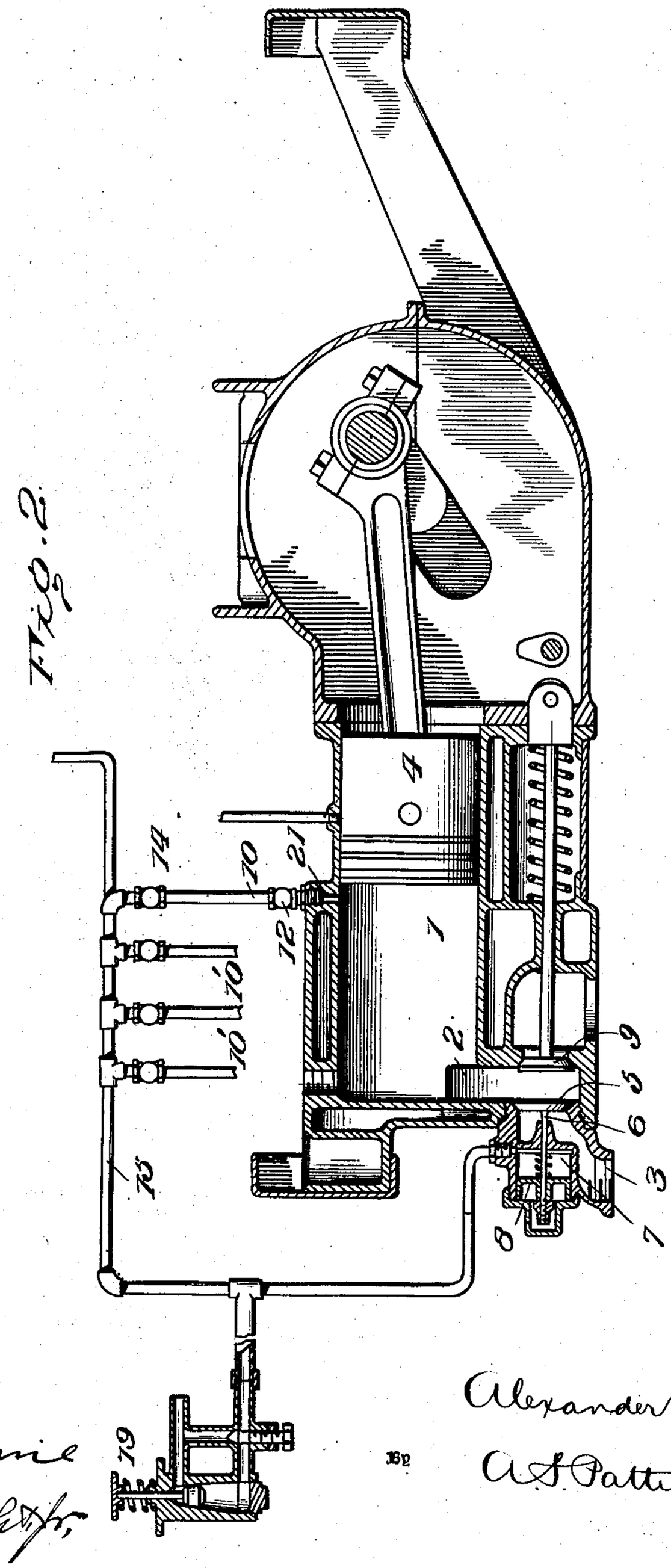
4 SHEETS—SHEET 2.

Fig. 2.



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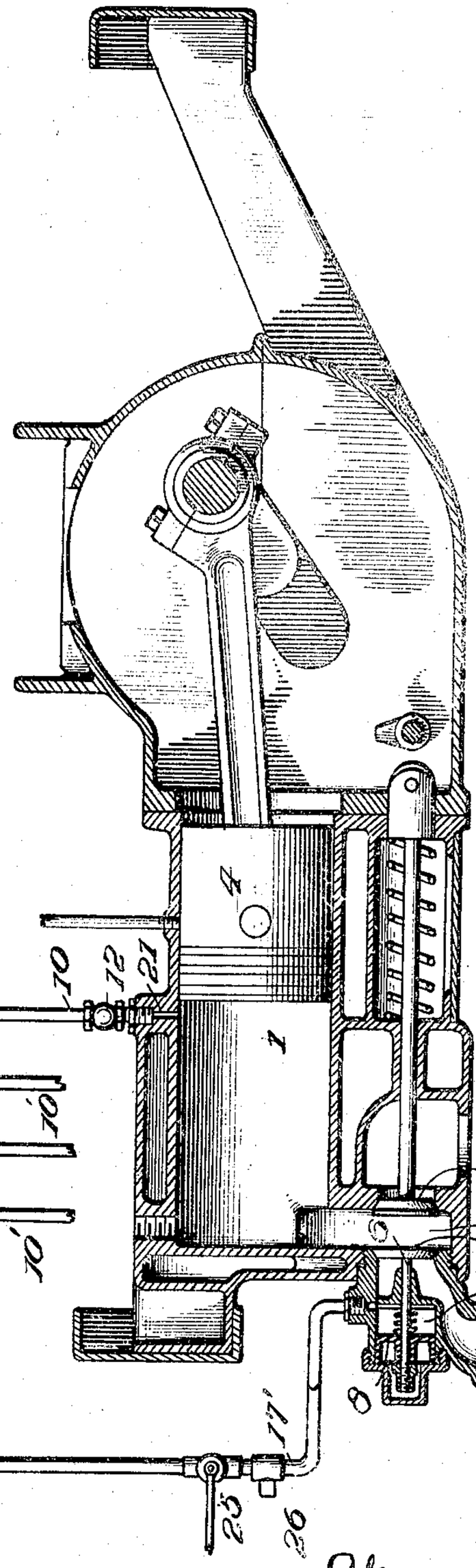
4 SHEETS—SHEET 3.

Fig. 3.



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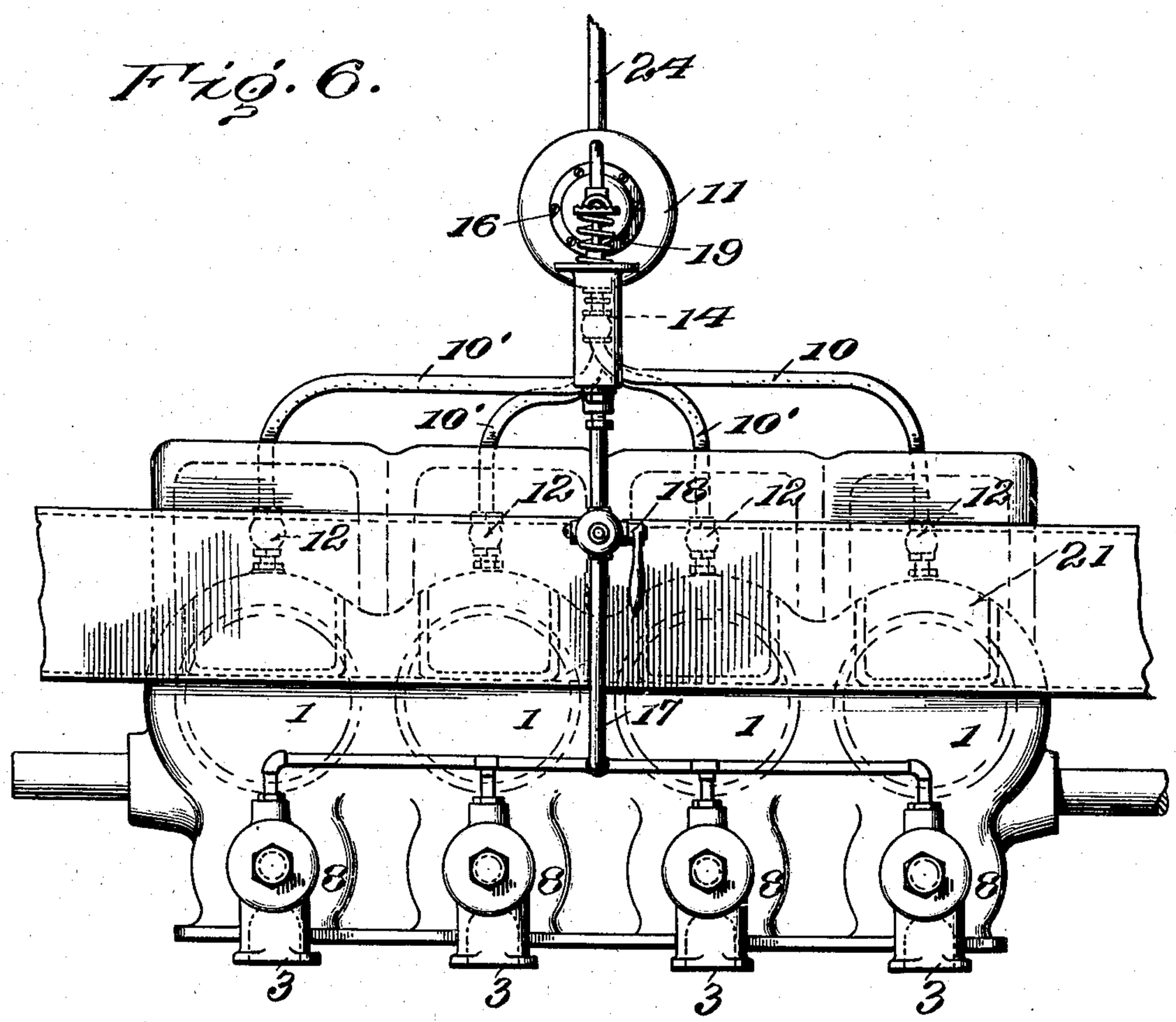
4 SHEETS—SHEET 4.

Fig. 6.



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UNITED STATES PATENT OFFICE.

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PRESSURE-GOVERNOR FOR EXPLOSIVE-ENGINES.

No. 924,301. Specification of Letters Patent. Patented June 8, 1909.

Application filed August 17, 1904. Serial No. 221,048.

To all whom it may concern:

Be it known that I, ALEXANDER WINTON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Pressure-Governors for Explosive-Engines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in pressure governors for explosive engines, and the object is to cause the governing pressure to be formed in and taken from the engine cylinder.

In the accompanying drawings, Figure 1, is a sectional view of an explosive engine showing the preferred form of this invention applied thereto. Fig. 2, is a similar view showing one modified form with which the generic invention may be embodied. Fig. 3, is a similar view of another modified form in which the generic invention may be embodied. Fig. 4, is an enlarged detached sectional view of the reducing and regulating valve shown in the preferred form illustrated in Fig. 1. Fig. 5, is an enlarged detailed view of the check valve used between the engine cylinder and the point at which the pressure from the cylinder performs its function in controlling the explosive inlet valve of the engine. Fig. 6 is an end elevation of a plurality of cylinders, showing my invention applied thereto.

In carrying out this invention, the engine cylinder 1 is provided with a suitable explosive inlet passage way or chamber 2 which communicates with the explosive inlet passage 3. The explosive mixture is drawn by the action of the engine piston 4 through the inlet passage-ways into the cylinder 1 and there compressed before its explosion, in a manner well understood by those skilled in the art, and which needs no further explanation.

An explosive inlet valve 5 controls the inlet passage-ways to the engine cylinder, and according to its amount of movement from its seat, controls the amount of explosive charge, and thereby the power and speed of the engine, which is also well understood by those skilled in the art. In the present invention, the movement of the inlet valve 5 to regulate the size of the charge to the engine cylinder, is controlled by means of pressure which is formed in the engine cylinder. In the form here shown, the inlet valve 5 has its stem 6 extending into a pressure-receiving chamber 7, and carries a piston or diaphragm 8, thus providing the explosive inlet valve 5 with a pressure-actuated member.

9 is an exhaust valve which may be operated in any desired manner, and as it forms no part of the present invention, need not be further described, as its function is well understood.

I will first describe the preferred construction which is shown in Fig. 1, and in which a pipe 10 is in communication with the interior of the engine cylinder 1 at a point preferably slightly inside of the outward limited movement of the piston 4. The pipe 10 also communicates with a suitable receiving chamber 11, and the pipe is provided with a check valve or valves. As here shown, two check valves 12 and 14 are used, one being located adjacent the engine cylinder, and the other adjacent the receiver. The receiver is in communication with the chamber 7, so that the pressure therein may act upon the pressure-actuated member 8 for controlling the movement of the inlet valve 5. As shown in Fig. 1, this communication consists of a pipe 15 which communicates with the receiver, and also with a reducing and regulating valve 16, and the said valve 16 is in communication with the chamber 7 which contains the pressure-actuated member 8. A relief valve 18 is in communication with the pipe 17 and a pressure relief button 19 is in communication with the pipe 17 through the medium of a suitable pipe 20.

This invention is especially intended for use in connection with explosion engines for automobiles. In operation, when the passage-way 21 is uncovered by the engine piston, pressure passes from the cylinder to the pressure-actuated member 8, and thereby tends to hold the explosive inlet valve 5 closed, and the pressure will be sufficiently great to prevent the operation of the motor unless some relief is provided. Through the

medium of the relief valve 18 the pressure can be so adjusted that the engine will normally run very slow, as for instance, when the vehicle is standing. Preferably, the relief button 19 is located in the vehicle at a convenient point to be operated by the foot of the driver, so that a downward pressure upon the button 19 will still further relieve the pressure from the pressure-actuated member 8, according to the amount of its downward movement, and thus regulate the speed and power of the motor, according to the requirements in driving the vehicle. The receiver 11 and the reducing and regulating valve 16 serve to make the pressure more uniform, though these are not absolutely essential to the working of the invention, and may be omitted as shown in Fig. 2. If desired, the pressure can also be utilized for effecting a forced lubrication by providing a communication with the tank containing lubricating oil and the pressure passageway. As shown in Fig. 1, a pipe 22 establishes communication between the receiver 11 and the reducing and regulating valve 23, and a pipe 24 will establish communication between the said valve 23 and a lubricating oil tank not here shown.

Where a multiple cylinder motor is used, there will be a plurality of pipes 10′, one of which will run to each engine cylinder, and the lower end of the pipe 17 will be provided with branches communicating respectively with the pressure chamber of the respective engines, and thus control the pressure-actuated member 8 of the respective engines. In this latter event, the pressure relief valves 18 and 19 will be common to each engine which constitutes the motor, so that they will control all the engines alike.

Fig. 2 operates in the same manner as Fig. 1, and differs therefrom only in the omission of the receiver and the regulating valves 16 and 23.

Fig. 3 omits the receiver and the regulating valves 16 and 23, and substitutes for the relief valve 19 a controlling valve 25 located directly in the pipe line 17′, and substitutes for the relief valve 18 a vent opening 26 located between the valve 25 and the pressure-actuated member 8. The operation of this modification is, that when the valve 25 is closed, the explosive inlet valve 5 has a free movement, because of the vent 26, and the engine will run its maximum speed and power. When the valve 25 is opened, pressure passes through the line 17′ to the pressure-actuated member 8 and controls the movement of the valve corresponding to the amount of pressure permitted to pass thereto. The two systems differ in that the first two speeds the motor when the relief valves are opened, and the latter speeds the motor when the air valve 25 is closed. In both systems, however, the motor is controlled through the medium of pressure produced in and taken from the motor or engine cylinder.

From the foregoing disclosure and description, it will be observed, that the piston suction exerts an opening pressure on the inlet valve 5, while a portion of the explosive expansion within the explosion cylinder acts to close the said inlet valve; in other words, the engine speed and power is controlled by utilizing the explosion expansion in opposition to the suction action.

The mechanism for carrying into effect the generic invention herein described, may be varied from that disclosed without departing from the spirit and scope of the invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:—

1. A controlling mechanism for explosion engines, comprising the combination of an explosion cylinder, a piston therein, the cylinder having an explosive inlet communication and a valve controlled exhaust opening, a valve for said inlet opening inwardly under the suction of the piston, a pressure actuated member connected with the inlet valve to keep it closed, a communication between the explosion cylinder and said pressure actuated member independent of the cylinder exhaust, whereby the explosion expansion exerts a pressure upon the inlet valve in opposition to the opening suction action thereon of the cylinder piston, and a pressure escape for said communication.

2. In an explosive engine, the combination with the working cylinder thereof having an explosive inlet, of a valve adapted to close said inlet, a pressure-actuated member connected with the valve for controlling its opening movement, a passage way having one end in communication with the working cylinder at a point just inside of the limit of the outward movement of the piston, said passage-way also communicating with the pressure-actuated member for the purpose described, a pressure-regulating valve within the said passage-way, and an adjustable escape for the passage way located between the pressure-regulating valve and the pressure-actuated member.

3. In an explosion engine, a pressure-actuated inlet valve, a communication between the engine cylinder and the pressure-actuated inlet valve, a pressure receiver for said communication, a check valve between the engine cylinder and the receiver, a reducing valve between the receiver and the said inlet valve, and a manually-operated pressure-controlling member for said communication between the reducing valve and the inlet valve.

4. An explosive motor including a plurality of engine cylinders, each cylinder hav-

ing a pressure-actuated inlet valve, a pressure communication between and common to the several pressure-actuated inlet valves and the said several engine cylinders, and a valve common to and controlling the pressure in all the communications to the explosive inlet valves.

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

ALEXANDER WINTON.

Witnesses:
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