No. 636,606. Patented Nov. 7, 1899.

A. WINTON.

EXPLOSIVE ENGINE.

(Application filed June 15, 1899.)

(No Model.)

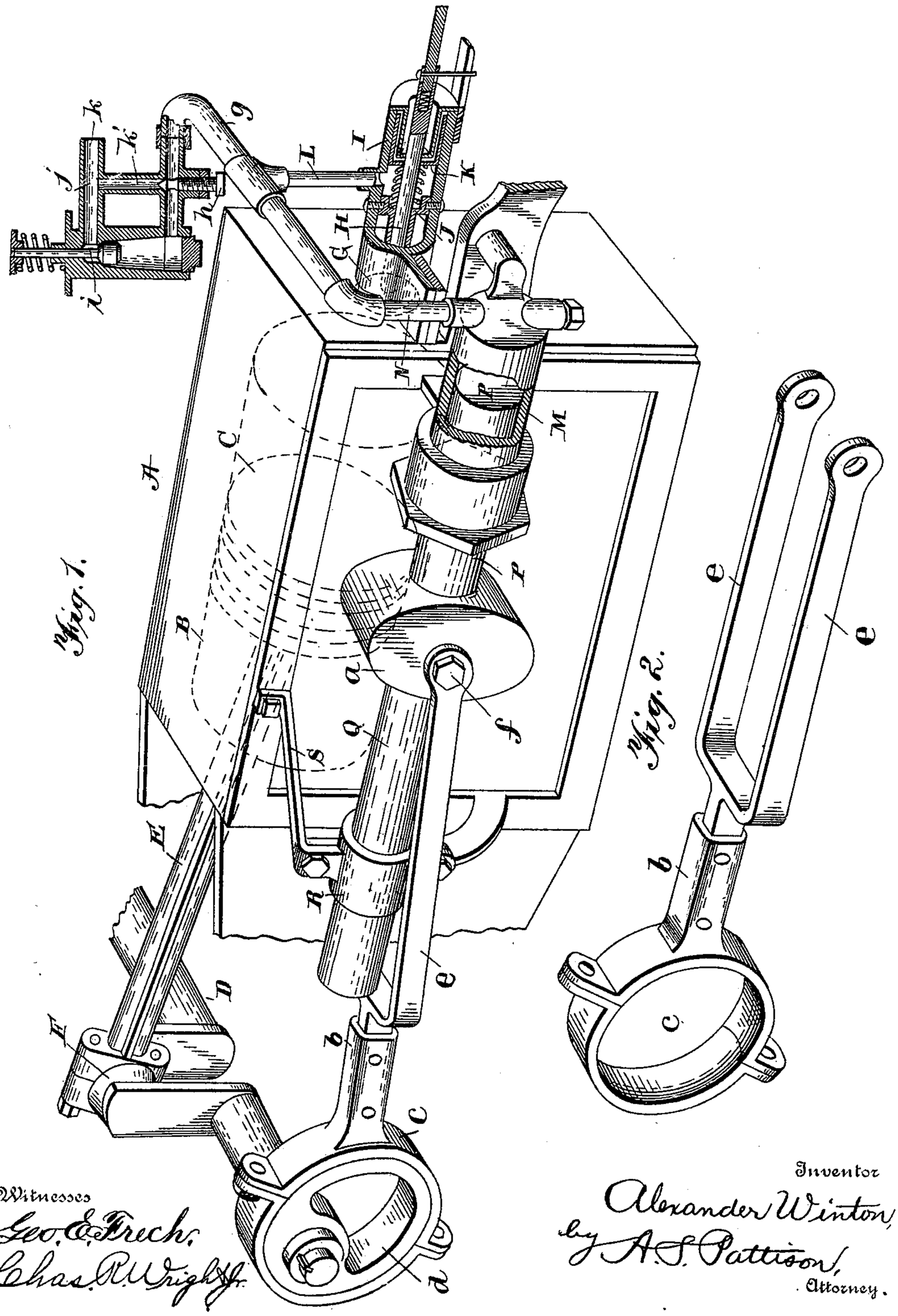

Fig. 1.

Fig. 2.

Witnesses
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UNITED STATES PATENT OFFICE.

ALEXANDER WINTON, OF CLEVELAND, OHIO.

EXPLOSIVE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 636,606, dated November 7, 1899.

Application filed June 15, 1899. Serial No. 720,716. (No model.)

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 new and useful Improvements in Explosive-Engines, of which the following is a specification.

My invention relates to improvements in explosive-engines, and pertains to an engine which is particularly adapted and intended for use in connection with a motor-carriage.

In motors for carriages it is exceedingly advantageous to have a smooth-running and well-balanced engine to prevent unpleasant jarring to the body of the vehicle and to decrease the wear and tear upon the machine, and consequently lessen the liability of injury thereto and increasing the life of the engine and its coöperating mechanism.

With these ends in view the primary object of my present invention is to provide a balance-weight for the piston and crank which moves in opposition to the said piston and crank, and to further increase the utility and effectiveness of the said balance-weight by connecting it with a pump.

In the accompanying drawings, Figure 1 is a perspective view of an engine embodying my invention, partly shown in section and partly in dotted lines. Fig. 2 is a detached view of the eccentric and balance-weight connecting-rod.

Referring now to the drawings, A indicates a casing inclosing an engine-cylinder B, which is of the usual construction or of other form as desired.

C is the piston, D the crank-shaft, and E the pitman, which is connected at one end with the piston C and at its opposite end with the crank wrist-pin F.

The explosive end of the cylinder is provided with an explosive-inlet closed by the explosive-inlet valve G, which is provided with a stem H, projecting through a cylinder I. This cylinder I is provided with a dividing web or plate J, and through which the stem H also passes. Secured to the outer end of the stem H is a piston or diaphragm K, and communicating with the space between the piston K and the dividing web or plate J is an air-pipe L. This pipe L is in communication with an air-pump cylinder M through the medium of a pipe N, whereby air is pumped into the cylinder I for holding the inlet-port valve G closed, and the amount of pressure within this cylinder regulates the amount of tension upon the inlet-port valve, and thereby the amount of charge admitted to the explosion-cylinder.

The pump-piston P has its end Q extended and passes through a bearing R, the said bearing being supported by the bracket S extending from the casing A, thus furnishing a space between the bearing R and the casing.

Secured to or formed as a part of the extension of the pump-piston P, and thereby practically upon the piston, is a balance-weight *a*. This balance-weight *a* is connected by means of the eccentric pitman *b* with the eccentric-strap *c*, which passes around an eccentric *d*, secured to the drive-shaft E. It will be noted that the eccentric *d* is positioned upon the drive-shaft E in opposition to the wrist-pin F, so that in the operation of the engine the pump-piston, and consequently the balance-weight *a*, are moving in the opposite direction of the movement of the engine-piston C and the engine-pitman E, and serves to balance these elements. The eccentric pitman *b* is bifurcated and provided with the two parallel arms *e*, which are connected to opposite sides of the balance-weight *a* for the purpose of preventing any lateral thrust upon the pump-piston and to cause a direct pull thereupon. The ends of these arms *e* are connected with the balance-weight *a* by means of suitable pins or bearings *f*, projecting from opposite sides of the said weight.

The advantage of having the weight connection with the pump-piston is twofold. First, the connection of the weight with the pump-piston enables the piston to furnish a yielding resistance to the movement of the weight, thus preventing the sudden stopping and starting of the weight, which would otherwise occur, and causes the pump to perform the double function of a pump and of a "dash-pot," so to speak, for effecting the movement of the weight. Another advantage of the said construction in connection with a motor-carriage is the saving in space and also a cheapness in construction in that the pump-piston serves as a support for the weight as well as a piston for the pump. Attention is

also directed to the fact that this weight is a vertically-disposed weight and extends transversely in respect to the said piston, and thereby parallel with the side of the casing A, which specific construction also is an economy in space.

For the purpose of regulating the amount of air-pressure against the inlet-port valve G, I provide an escape-regulating mechanism connected with the pipe L through the medium of a pipe *g*. This escape mechanism consists of an escape-valve *h*, which is set to regulate the pressure upon the inlet-port valve G to a fixed pressure, whereby the engine will run at a fixed rate of speed, and for the purpose of relieving the pressure upon the said inlet-port valve G, and thereby increasing the amount of charge and the speed of the engine, I provide a foot-valve *i*, having an escape *j*. The escapes of the valves *i* and *h* are in communication with a single escape-opening *k*, the escape of the valve *h* being connected with the said escape *k* through the medium of a pipe *k'*. The advantage of this construction is to provide only a single escape for the air, and thereby reducing the noise as compared with a single escape for each of the valves *h* and *i*.

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

1. An engine comprising a cylinder, an inlet-port therefor, an inlet-port valve, a pressure-regulating member connected with the inlet-port valve, a pump in communication with the pressure-regulating member, a drive-shaft, a pitman connected with the drive-shaft and with the engine-piston, a piston for said pump, a weight connected with the piston, the drive-shaft having a crank or eccentric arranged in opposition to the pitman, and the connection between the crank or eccentric and the pump-piston and thereby the balance-weight, substantially as described.

2. An engine comprising a cylinder, a piston, an inlet-port, an inlet-port valve, the pressure-regulating member connected with the inlet-port valve, a crank-shaft, a pitman connected with the crank-shaft and with the engine-piston, an eccentric upon the crank-shaft in opposition to the crank, a pump, a pump-piston having an extension, a balance-weight secured to said extension, and a connection between the eccentric and the piston and thereby the weight, substantially as described.

3. An engine comprising a cylinder having an inlet-port valve, a piston for said cylinder, a crank-shaft, a pitman connecting the crank-shaft and the piston, the crank-shaft having an eccentric arranged thereon in opposition to said crank an inlet-port valve for the inlet-port, a pressure-actuated member connected with the said inlet-port valve, a pump in communication with the pressure-regulated member, a piston for said pump having an extension, a bearing for the extension of said piston, a balance-weight connected with the pump-piston between the bearing and the pump, and a connection between the eccentric and the balance-weight, substantially as described.

4. An engine comprising a cylinder, a piston therein, a crank-shaft, a pitman connecting the piston and the crank, an eccentric upon the shaft in opposition to the said crank, the cylinder having an inlet-port valve, a valve for said port, a pressure-actuated member connected with said valve, a pump in communication with the pressure-actuated member, a piston for said pump having an extension and a vertically-disposed balance-weight secured to the pump-piston, and a connection between the weight and said eccentric, substantially as described.

5. An engine comprising a cylinder, a piston therein, a crank-shaft, a pitman connecting the crank of the shaft and the said engine-piston, an eccentric upon the shaft in opposition to said crank, an inlet-port for the cylinder, a valve for said port, a pressure-actuated member connected to the said valve, a pump in communication with the pressure-actuated member, an escape-pipe in communication with the pump and with the pressure-actuated member, the escape-pipe having the valves *h* and *i* provided with escape-openings communicating with a single escape-opening, substantially as and for the purpose described.

6. An engine comprising a casing, a cylinder within the casing, a piston within the cylinder, a crank-shaft, a pitman connected with the piston-cylinder and with the crank-shaft, an eccentric disposed upon the shaft in opposition to the crank, the cylinder having an inlet-port, a valve therefor, a pressure-actuated member connected with the valve, a pump in communication with the pressure-actuated member, a piston for said pump, a balance-weight secured to the piston and arranged parallel with the sides of the said casing, and a connection between the eccentric and the pump-piston, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALEXANDER WINTON.

Witnesses:
GEO. H. BROWN,
LYMAN A. REED.