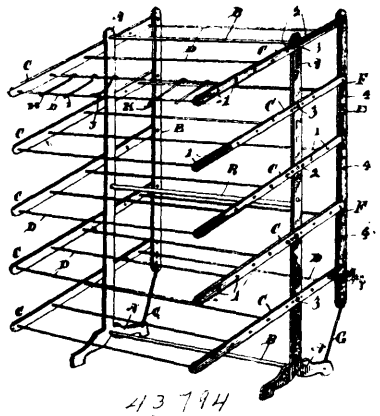
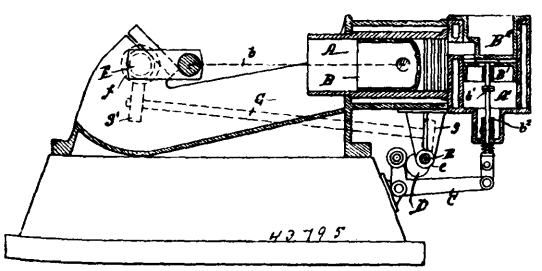
bar E, substantially as shown and for the purpose specified. 2nd. The combination, of the standards A, vertical series of arms C,



provided with openings 2, and pivoted through said openings to said standards, connecting bar E, pivoted directly to the upper and lower of said arms, and toggle F, pivotally connecting said bar E, and the intermediate arms C, substantially as shown and for the purpose described.

No. 43,795. Explosive Engine.

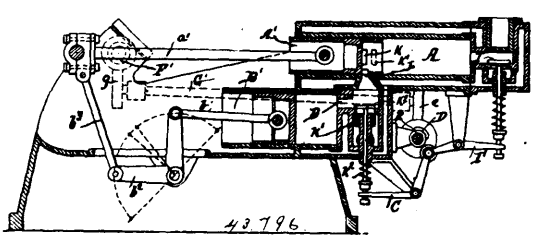
(*Machine explosive.*)



Hugh Webster Williams, of Victoria, British Columbia, Canada, 1st August, 1893; 6 years.

Claim.—1st. In an explosive engine, a secondary or supplementary piston, for expelling the products of combustion, substantially as herein described. 2nd. In an explosive engine having a cylinder, a power piston and a combustion chamber in communication with the cylinder, a reciprocating piston operating in the combustion chamber for expelling the products of combustion, substantially as herein described. 3rd. In an explosive engine, having a cylinder, a power piston and a combustion chamber, in communication with the cylinder, a reciprocating piston operating in the combustion chamber for expelling the products of combustion, and an exhaust valve in said piston, substantially as herein described. 4th. In an explosive engine, having a cylinder with power piston and a communicating combustion chamber at one end, a reciprocating piston in said chamber and operating at right angles to the power piston to expel the products of combustion, substantially as herein described. 5th. In an explosive engine, having a cylinder, with power piston and a communicating combustion chamber at one end, a reciprocating piston in said chamber and operating at right angles to the power piston to expel the products of combustion, and an exhaust valve in said piston, substantially as herein described. 6th. In an explosive engine, the combination of the cylinder having the combustion chamber at one end, the power piston in the cylinder. the products-expulsion piston in the combustion chamber, the exhaust valve in said expulsion piston, having a stem and the means for actuating said piston and valve consisting of the lever C, and power transmitting connections thereto from the engine shaft, and the stop collar on the valve stem, substantially as herein described. 7th. In an explosive engine, the combination of the cylinder having the combustion chamber at one end, the power piston in the cylinder, the products-expulsion piston in the combustion chamber, the exhaust valve in the expulsion piston, the gas and air inlet valves communicating with the combustion chamber, and the means for operating the several valves, consisting of the counter shaft deriving power from the engine shaft, and having cams and the elbow levers operated by said cams and connected with said valves, substantially as herein described. 8th. In an explosive engine, the oscillating throttle valve in the gas inlet and connections from a governor whereby it is operated, substantially as herein described. 9th. In an explosive engine, the combination of a gas admission valve to the cylinder, the throttle in the gas inlet in advance of the gas admission valve and connections with the throttle valve from a governor whereby it is operated, substantially as herein described. 10th. In an explosive engine, the combination of a gas admission valve and connections from the engine shaft whereby it is operated, a throttle valve in the gas inlet in advance of the admission valve, a governor and connections to operate the throttle valve, and suitable connections with the operating devices of the gas admission valve, whereby the latter is automatically thrown into and out of action by the governor simultaneously with the operation of the throttle valve, substantially as herein described. 11th. In an explosive engine, the combination of a gas admission valve, and connections from the engine shaft whereby it is operated, a throttle valve in the gas inlet in advance of the admission valve, a governor and connections to operate the throttle valve, and suitable connections with the operating devices of the gas admission valve, whereby the valve is automatically thrown into and out of action by the governor simultaneously with the operation of the throttle valve, said connections consisting of the lever of the throttle valve, the operating lever H, and the swinging finger carried by the lever H, and connected with the throttle valve lever and operating into and out of contact with the stem of the gas admission valve, substantially as herein described. 12th. In an explosive engine, the air admission valve, the gas admission valve and the throttle valve in the gas inlet, in combination, with the lever H, deriving power from the engine shaft and connected with the stem of the air admission valve, the swinging finger on said lever adapted to move into and out of contact with the stem of the gas admission valve, the lever of the throttle valve connected with the swinging finger, and the governor and connections therefrom to the throttle valve lever, substantially as and for the purpose herein described.

No. 43,796. Explosive Engine. (*Machine explosive.*)



Hugh Webster Williams, of Victoria, British Columbia, Canada, 1st August, 1893; 6 years.

Claim.—1st. In an explosive engine, the combination of a main or power cylinder, and a power piston therein, a supplementary cylinder with a products expulsion piston therein deriving its motion by connections from the engine shaft, a communicating passage between the two cylinders having a port controlled by the power piston, and an exhaust valve from said communicating passage, operated by connections from the engine shaft, substantially as herein described. 2nd. In an explosive engine, the combination of a main or power cylinder, and a power piston therein, a supplementary cylinder with a products expulsion piston therein, deriving its motion by connections from the engine shaft, a communicating passage between the two cylinders having a port controlled by the power piston, outlet passages to the outer air from the power cylinder and having ports in advance of the port of the communicating passage between the two cylinders, said outlet passage ports being controlled by the power piston, and an exhaust valve from said communicating passages and operated by connections from the engine shaft, substantially as herein described. 3rd. In an explosive engine, the combination of a main or power cylinder, and a power piston therein, a supplementary cylinder of greater capacity with a products expulsion piston therein, deriving its motion by connections from the engine shaft, a communicating passage between the two cylinders having a port controlled by the power piston, outlet passages to the outer air from the power cylinder and having ports in advance of the port of the communicating passage between the two cylinders, said outlet passage ports being controlled by the power piston, and an exhaust valve from said communicating passages into the outlet passages and operated by connections from the engine shaft, substantially as herein described.

No. 43,797. Explosive Compound.

(*Composé explosif.*)

Hugh Webster Williams, Victoria, British Columbia, Canada, 1st August, 1893; 6 years.

Claim.—1st. In an explosive engine, the combination of a power cylinder and an expansion cylinder, each having a piston connected with the engine shaft and operating in unison in the same directions, a communication valve between the adjacent ends of the two cylinders, valve controlling the admission of a combustible charge of gas and air to the power cylinder, an air admission valve to the expansion cylinder and an exhaust valve therefrom, and means for operating said valve, substantially as herein described. 2nd. In an explosive engine, the combination of a power cylinder and an ex-