

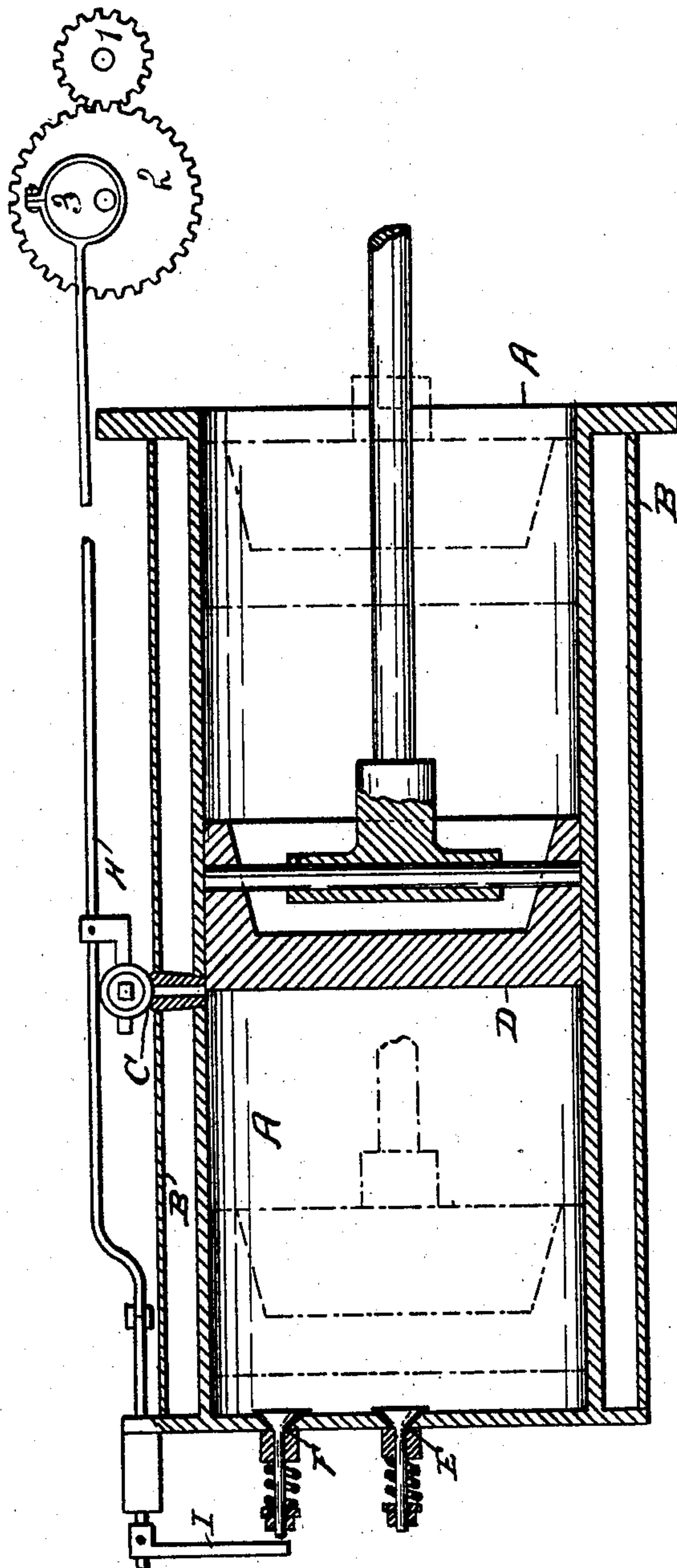
No. 711,628.

Patented Oct. 21, 1902.

J. F. HILL.
EXPLOSIVE ENGINE.

(Application filed June 12, 1901.)

(No Model.)



Witnesses
Florence Kelly
Katharine Kelly.

James F. Hill, Inventor

By Attorney *E. A. Kelly*

UNITED STATES PATENT OFFICE.

JAMES F. HILL, OF FLEETWOOD, PENNSYLVANIA.

EXPLOSIVE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 711,628, dated October 21, 1902.

Application filed June 12, 1901. Serial No. 64,227. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. HILL, a citizen of the United States, residing at Fleetwood, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Explosive-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in explosive-engines.

The invention illustrates an improvement in engines of this class, and has for its object to produce a maximum of power with a minimum of fuel.

To this end my invention consists of the details of construction and arrangement of the several parts, as more fully described in the following specification and as illustrated in the accompanying drawing, in which the figure is a longitudinal section of the cylinder of an engine embodying the features of my invention.

The cylinder A has the usual inlet and exhaust valves and means for operating them, is formed with a water-jacket B, and has the usual attachments for an explosive-engine. It is, however, somewhat longer than is usual for the purpose of permitting the unusually long stroke I attain. An air inlet or valve C of ordinary construction is located in the cylinder A near the center and at the point where the piston in the usual construction would stop at the end of the stroke. By this I mean that my cylinder is just twice the length of the ordinary cylinder used in this type of engines. This valve is operated by means of the bar or rod H, which is connected to an eccentric 3 in the ordinary manner, and said eccentric is provided with a gearing 2, which meshes with the gearing 1 on the ordinary crank-shaft. Said gearing 2 is just twice the diameter of the gearing on the crank-shaft, so that in order to make one complete revolution of the gearing 2 the crank-shaft to which the piston is connected will have to make two revolutions. By this

arrangement the valve C will be opened when the piston D arrives at that point every other time in its rearward trip and to close when it again reaches that point on its forward or return movement after the air thus admitted has escaped. The charge-inlet valve E is operated by suction, while the exhaust-valve F is operated through the arm I, which is connected to the bar H, so as to give it the proper movement.

When the explosion takes place, the piston D is forced the full stroke, and on its return the exhaust-valve F will open and the piston return for the next action of drawing the charge. The valve E will open by suction immediately on the start or initial movement of the piston and a charge will be drawn until the piston reaches the position in which it is shown in the drawing—that is, until it has traveled a distance equal to that usually traveled by the pistons in this class of engines during their full stroke, but which in my construction is just one-half of the stroke. At this point is located an air-inlet valve C, and said valve will open automatically, thus permitting an inlet of air to the cylinder and allowing the piston to travel, in addition, a distance equal to that already traveled. The inlet-valve E closes immediately on the opening of the valve C. The return of the piston will entirely exhaust the air thus taken in through the valve C, and with it all of the dead gas remaining after the prior explosion. The valve C will close automatically, and the continued movement of the piston will compress the gas for the next explosion.

It will be seen that with a given amount of fuel I secure twice the stroke and twice the crank movement.

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

In an explosive-gas engine, the combination with a cylinder and a piston, a charge-inlet valve, an exhaust-valve at one end, and an air-inlet valve in the cylinder located substantially midway of the length of said cylinder, said piston being adapted to slide in said cylinder and draw only an explosive

charge until the air-inlet valve is reached, and means for then opening said air-valve to admit only air, to allow the piston to travel a distance equal to that already traveled while receiving the charge and for closing said valve when the piston has reached the same point on its return stroke, and an arm connected to the said valve-operating means, and adapted to contact with the exhaust-valve for opening and closing the same. 10

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

JAMES F. HILL.

Witnesses:

CHAS. LEITHERSON,
ISAAC B. KLINE.