B. BRAZELLE.

INTERNAL COMBUSTION MOTOR.

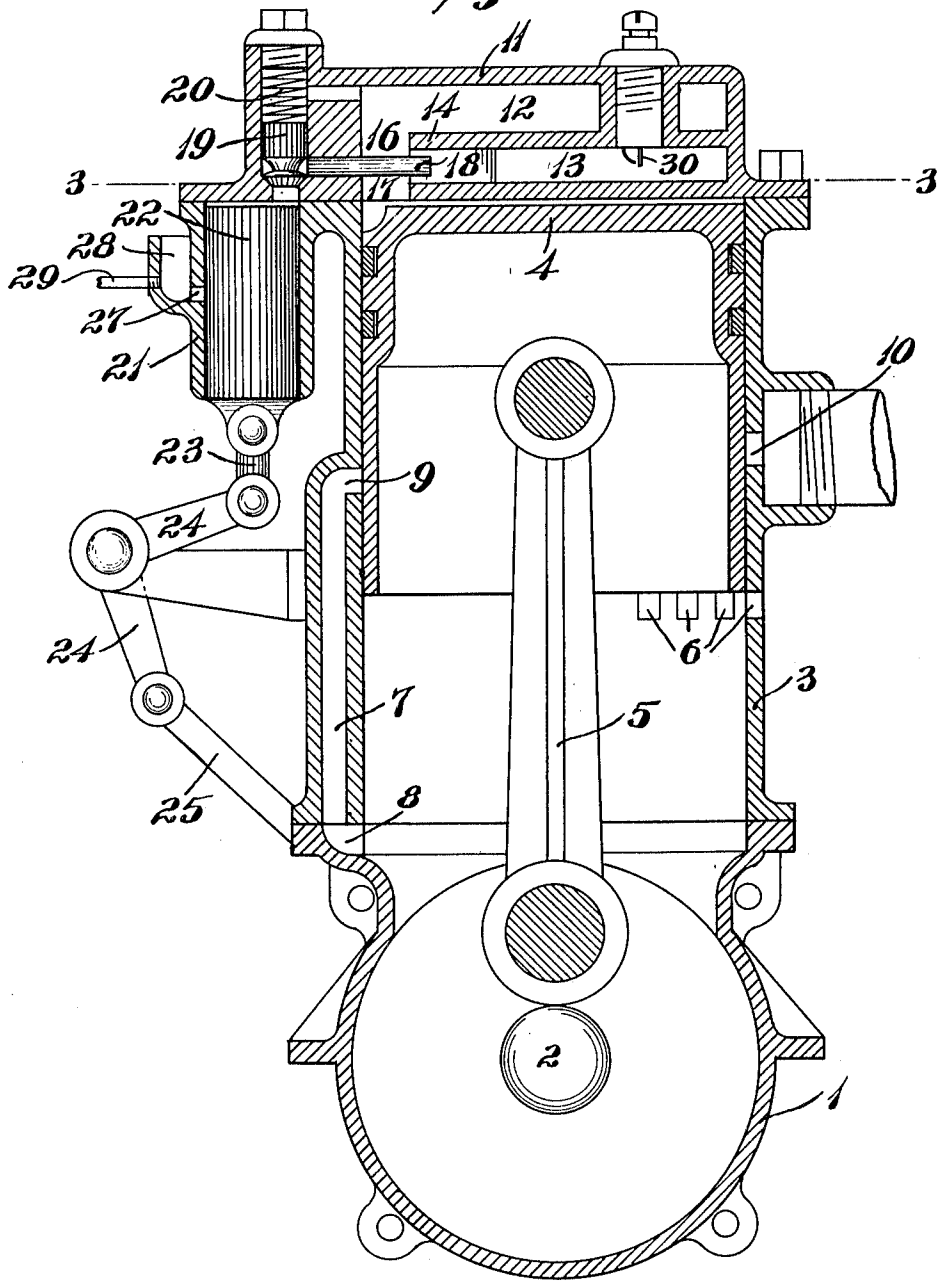
APPLICATION FILED JULY 16, 1910.

1,022,178.

Patented Apr. 2, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

Edgar T. Farmer.

G. A. Pennington.

Inventor:

Benjamin Brazelle,

By Cameron & Cameron,

Attys.

B. BRAZELLE.

INTERNAL COMBUSTION MOTOR.

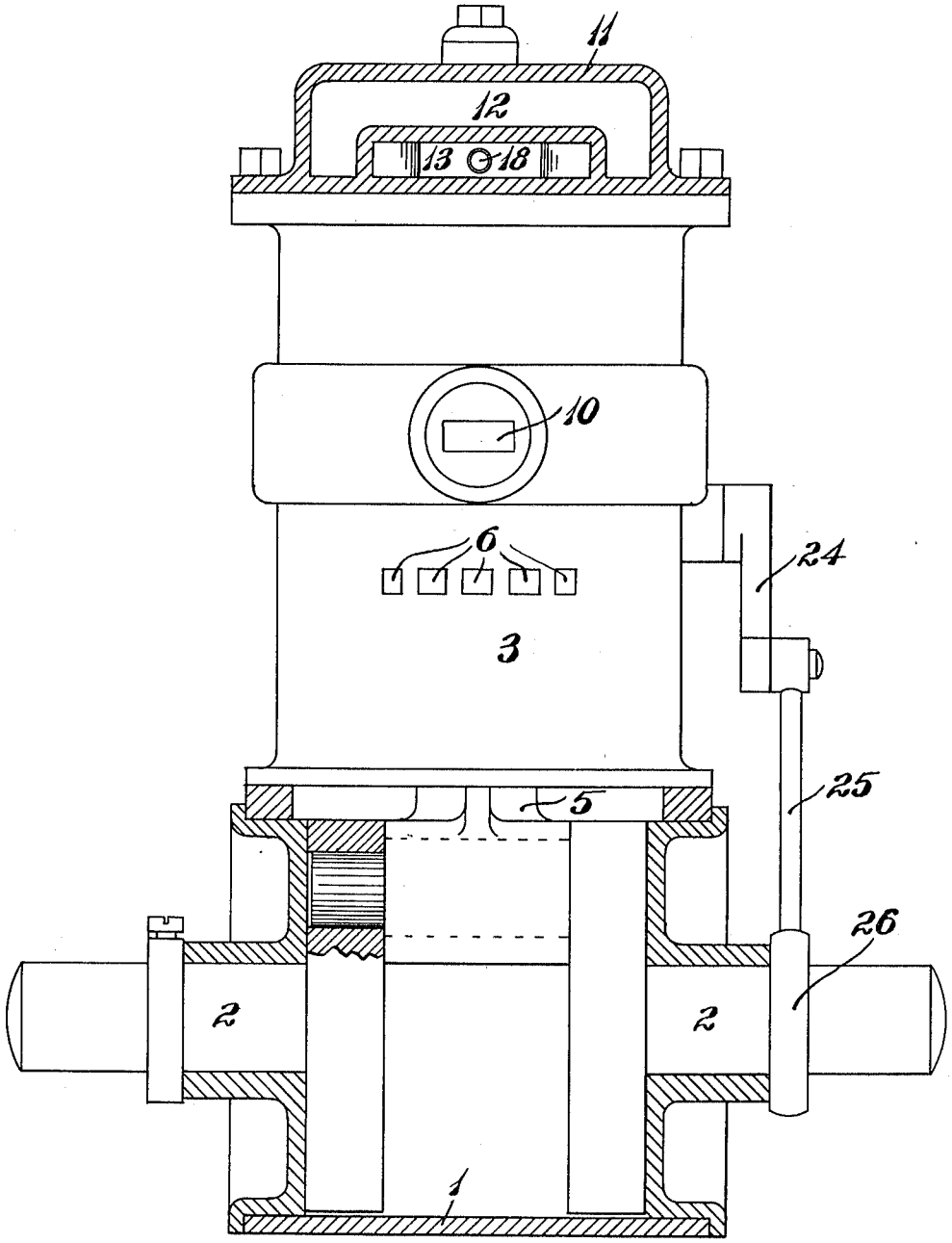
APPLICATION FILED JULY 16, 1910.

1,022,178.

Patented Apr. 2, 1912.

3 SHEETS-SHEET 2.

Fig. 2.



Witnesses:
Edgar J. Farmer
G. A. Pennington

Inventor:
Benjamin Brazelle
By Cane & Cane,
Attys.

B. BRAZELLE.

INTERNAL COMBUSTION MOTOR.

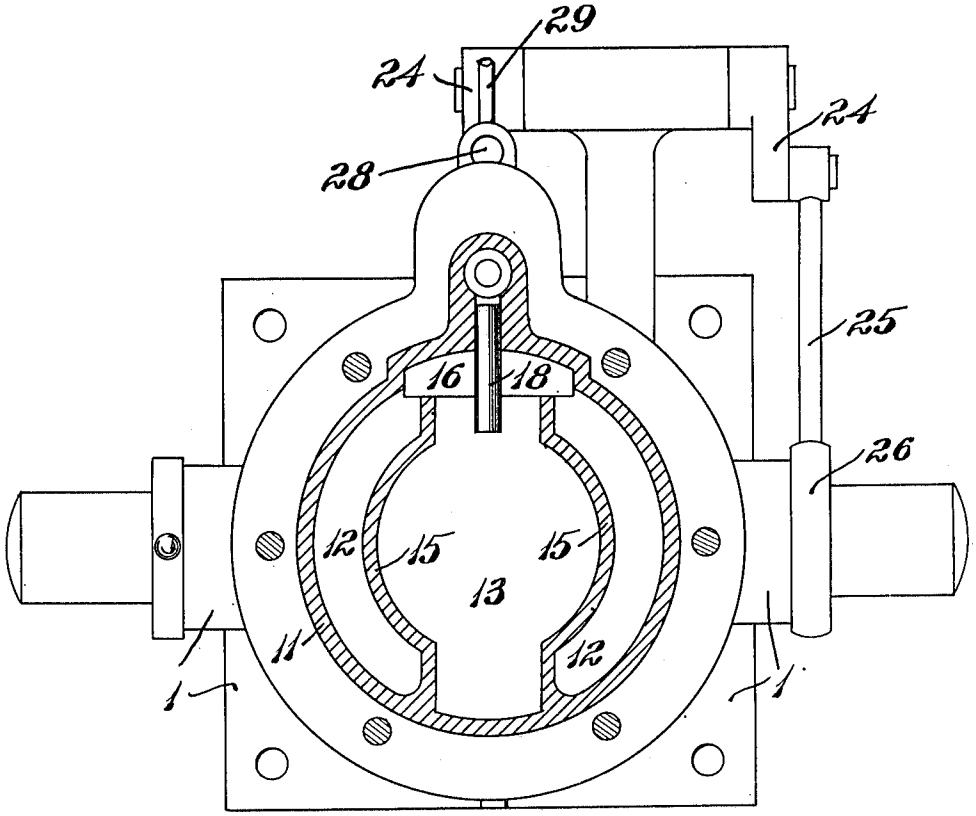
APPLICATION FILED JULY 16, 1910.

1,022,178.

Patented Apr. 2, 1912.

3 SHEETS-SHEET 3.

Fig. 3.



Witnesses:
Edgar J. Farmer
G. A. Pennington

Inventor:
Benjamin Brazelle,
By Connett & Connett,
Attys.

UNITED STATES PATENT OFFICE.

BENJAMIN BRAZELLE, OF KIRKWOOD, MISSOURI, ASSIGNOR TO BRAZELLE MOTOR COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

INTERNAL-COMBUSTION MOTOR.

1,022,178. Specification of Letters Patent. Patented Apr. 2, 1912.

Application filed July 16, 1910. Serial No. 572,235.

To all whom it may concern:

Be it known that I, BENJAMIN BRAZELLE, a citizen of the United States, and a resident of Kirkwood, St. Louis county, State of Missouri, have invented a new and useful Improvement in Internal-Combustion Motors, of which the following is a specification.

My invention relates to internal combustion motors.

It has for its principal objects to utilize a portion of the heat heretofore wasted in internal combustion motors of the common type, and to keep the temperature of the working parts lower than has heretofore been practicable.

The invention consists principally in providing for the commingling of the explosion gases with a volume of inclosed air practically simultaneously with the explosion, thereby cushioning the shock, reducing the temperature, and minimizing the waste of energy.

It also consists in the parts and in the arrangements of parts hereinafter described and claimed.

In the accompanying drawings which form part of this specification and wherein like symbols refer to like parts, wherever they occur, Figure 1 is a vertical sectional view of an internal combustion motor of the two cycle type embodying my invention, such section being taken transversely of the shaft; Fig. 2 is a vertical sectional view of said motor parallel with the shaft, the cylinder being shown in elevation; and Fig. 3 is a horizontal section of said motor on the line 3—3 of Fig. 1.

The frame of my motor comprises an inclosed crank casing 1 in which is mounted the crank shaft 2. The top of said crank casing is open and has a vertically arranged cylinder 3 mounted thereon. Inside of the cylinder is a piston 4 which is connected to the crank shaft by the connecting rod 5. The wall of the cylinder is provided with a number of ports 6 which are normally covered by the piston, but which are uncovered when the piston is in its uppermost position. The wall of the cylinder also contains a passageway 7 which has a port 8 communicating with the hollow interior of said cylinder at the lower end thereof; and at the upper end of said cylinder is a port 9 opening into the cylinder, which port is normally covered by the piston but is in position to be uncovered in the lowermost position thereof. The cylinder is also provided with an exhaust port 10 in position to be uncovered shortly before the piston reaches the lower limit of its stroke.

The top of the cylinder is closed by a hollow cylinder-head 11 which is divided into two chambers 12 and 13. Preferably, one of the chambers, which is hereinafter referred to as the air chamber 12, has a volume of approximately three times the volume of the other chamber, which is hereinafter referred to as the explosion chamber 13. In the construction illustrated, the air chamber incloses the explosion chamber on the top and sides, the walls of the explosion chamber consisting of a horizontal partition 14 and vertical walls 15, substantially parallel with the exterior of the cylinder-head. The explosion chamber and the air chamber have free communication through a large port or opening 16 near the margin of the cylinder-head; and both said chambers have free communication from the cylinder through a port 17 in the cylinder-head in vertical alinement with said last mentioned opening.

Extending horizontally through the wall of the cylinder into the explosion chamber is a pipe 18 which has communication through a check valve 19 with the fuel pump. As illustrated, the valve is an ordinary reciprocating valve 19 which is normally held against its seat by a spring 20. This valve 19 is located in a passageway which communicates with the end of the vertically arranged pump cylinder 21 whose piston 22 has a connecting rod 23 connected to a bell crank 24 mounted on the framework, and which in turn is connected to and actuated by a rod 25 which is connected to an eccentric 26 on the main shaft of the motor. In the wall of the pump cylinder is a port 27 in position to be uncovered by the piston 22 shortly before reaching the downward limit of its stroke. This port opens into the bottom portion of an oil cup or reservoir 28 whose upper end is open and which communicates to a pipe 29 with any suitable source of oil supply.

In the operation of the pump, the downward stroke thereof forms a partial vacuum in the cylinder; and when the piston uncovers the port, the air forces the oil into the

cylinder, thereby partially atomizing the same to form a mixture that is too rich in gas to be explosive. By the up stroke, the air charged with vapor is compressed and forced past the check valve into the explosion chamber, where it becomes diluted with air therein to the extent necessary to form the proper explosive mixture. The explosion chamber is provided with an igniter 30 of any suitable type. The drawing illustrates an electric igniter which may be connected up to any suitable source of electricity.

The operation of my motor is as follows: Assuming the parts to be in the position illustrated in Fig. 1 and properly charged, the explosion is effected by the igniter. The explosion is practically limited to the contents of the explosion chamber and produces an intense heat. As the explosion chamber is in communication with the compressed air chamber, the shock of the explosion is distributed through the compressed air and thereby relieved or cushioned. As the explosion chamber is surrounded by the compressed air chamber, a considerable portion of the heat of the explosion is utilized in heating and thereby increasing the pressure of the air. The explosion gases also commingle thoroughly with the compressed air, thereby communicating a considerable portion of their heat to such air, and thus reducing their own temperature to a practically workable degree. Thus, the unavoidably excessive temperature generated by the explosion is instantly reduced so as to bring about working conditions approximating those that prevail in steam engine practice; and at the same time, the energy arising from the explosion is utilized instead of being wasted as heretofore. The cycle of operation is the same as of the ordinary two cycle internal combustion motor. One of the advantages of my construction is that it permits the use of gases of high explosive power such as hydrogen and water gas.

Obviously, the construction admits of considerable modification without departing from my invention. Therefore, I do not wish to be restricted to the exact construction shown.

What I claim is:

1. An internal combustion motor comprising a cylinder and two chambers of unequal volume, permanently communicating with said cylinder and with each other, means for charging each of said chambers with air, means for subsequently charging the smaller chamber with fuel to form an explosive mixture with the air therein, and means for igniting said mixture.

2. An internal combustion motor comprising a cylinder and a hollow head therefor containing two chambers of unequal size communicating with said cylinder and with each other, the larger one of said chambers substantially inclosing the other, means for charging said chambers with air, means for charging the inner chamber with gaseous fuel to form an explosive mixture, and means for igniting said mixture.

3. An internal combustion motor comprising a cylinder and a hollow head therefor containing two chambers communicating with said cylinder and with each other, one of said chambers being larger and substantially inclosing the other, means for charging said chambers with air, means for charging the inner chamber with gaseous fuel, and means for igniting said charge, said fuel charging means comprising a pipe extending into said smaller chamber, a pump, a passageway extending from said pump to said pipe, a check valve in said passageway, and an oil reservoir open to the atmosphere and having a port opening into the pump cylinder.

BENJAMIN BRAZELLE.

Witnesses:
JAMES A. CARR,
JOSEPHINE VON REPPERT.