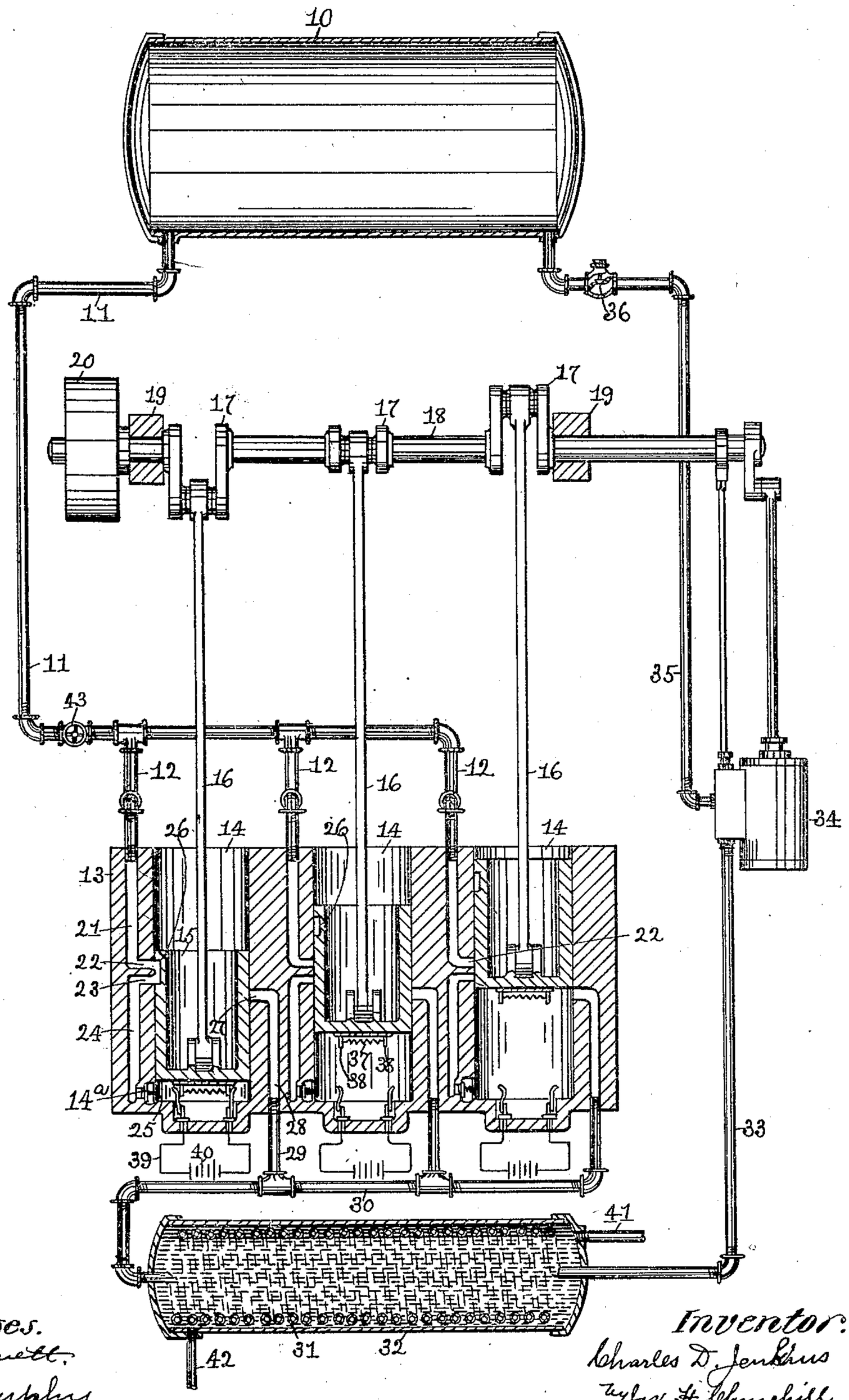
No. 868,441. PATENTED OCT. 15, 1907.

C. D. JENKINS.

COMPRESSED AIR MOTOR.

APPLICATION FILED MAY 6, 1907.



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UNITED STATES PATENT OFFICE.

CHARLES D. JENKINS, OF BOSTON, MASSACHUSETTS.

COMPRESSED-AIR MOTOR.

No. 868,441. Specification of Letters Patent. Patented Oct. 15, 1907.

Application filed May 6, 1907. Serial No. 372,117.

To all whom it may concern:

Be it known that I, CHARLES D. JENKINS, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Compressed-Air Motors, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to motors to be operated by compressed-air and has for its object the production of a motor in which heat is applied to the compressed-air at the point it is to act upon the piston thereby greatly increasing the efficiency thereof.

It consists in certain novel features of construction and arrangement of parts which will be understood readily by reference to the description of the drawings and to the claims to be hereinafter given.

The drawings represent a diagrammatic view of the various features which constitute this invention.

In the drawing 10 is a suitable tank or reservoir for the storage of compressed-air under suitable pressure, said tank being connected by a pipe 11 and branch pipes 12 to the cylinder casting 13, which is provided with a plurality of cylinders 14. In each cylinder is mounted a piston 15 connected by a piston rod 16 to a crank 17 on the shaft 18 mounted in bearings 19 and provided with a driving wheel 20, from which power may be transmitted to any desired point.

In the cylinder casting 13 are passages 21 connecting with the branch pipes 12 at one end and with the ports 22 at the other end communicating with the cylinders 14. Adjacent to the port 22 is another port 23 communicating by the passage 24 with a port 25 in the bottom of the cylinder 14. Each piston 15 is provided with a passage 26 so located that when the piston is at the extreme inner end of its movement, it will communicate with both the ports 22 and 23 and permit the passage of compressed-air through the pipes 12, passages 21 and 24 and ports 25 to the cylinder 14 back of the piston 15.

The piston 15 serves to close the ports 22, 23 and thereby prevent the passage of the compressed-air to the cylinder except when the piston is in the proper position to be acted upon by the expansion of the compressed-air. A check valve 14^a prevents the exit from the cylinder of the compressed air admitted thereto during the expansion thereof. An exhaust port 27 also communicates with each cylinder 14 and connects the same by passages 28 and pipes 29 and 30 with a coil 31 located in a tank 32, the opposite end of said coil being connected by a pipe 33 to a pump 34 arranged to pump the exhaust air through the pipe 35 into the main reservoir, a check valve 36 preventing the return thereof.

Each piston is provided upon its inner end with an electric coil 37 and two contact points 38, which, when the piston is at the inner end or chamber-forming portion of its stroke, make an electric connection with the circuit 39 in which is a battery or other generator of electricity, 40. When the circuit is made, by the movement of the piston 15, a current of electricity passes through the coil 37 or a similar heating device and causes an intense heat, which, acting upon the compressed-air being at this time admitted to the cylinder, greatly expands the same and increases its efficiency. This forms a very important feature of the invention as it provides a very convenient means for increasing the power of a compressed-air motor without the necessity of increasing the pressure in the storage tank. The tank 32 is used to cool the exhaust air passing from the cylinders 14, it being provided with an inlet pipe 41 and outlet pipe 42, which permits water or other cooling liquid to be admitted as desired and by contact with the coil 31 to cool the air passing through the same before it is pumped back into the reservoir 10.

The operation of the invention is as follows:—The tank 10 is supplied with compressed-air from any convenient source and under any desired pressure. When it is desired to start the engine, the valve 43 is opened and the compressed-air is allowed to pass through the pipes 12 to the ports 21. By turning the driving wheel by hand the air is admitted to the cylinders 14 and is then expanded by the heat in coils 37, so that the pistons will be driven to the opposite ends of their strokes. As soon as each piston begins to move, the heat is shut off and remains shut off until the piston again reaches the bottom of the cylinder when the operation is repeated. The cranks 17 are placed at equal distances about the shaft 18 so that the motor will be perfectly balanced. As soon as the motor has made a few revolutions by the aid of the operator it will continue to operate until the valve 43 is again closed. The exhaust from the engine is thoroughly cooled in the tank 32, thereby lowering the pressure thereof before being pumped back into the storage reservoir 10.

Claims.

1. The combination with a source of air under pressure, of an air engine comprising a cylinder and a piston reciprocating in said cylinder and coöperating therewith to form a substantially small chamber when the piston is at the end of its stroke in one direction, means to admit compressed-air into said chamber, an electric conductor located in said chamber when the piston is at the end of the stroke on which said chamber is formed and capable of being highly heated, an electric circuit in which said conductor is included when the piston is at the end of its chamber-forming stroke, and a circuit controller for said circuit operated to close the same and highly heat the con-

ductor when the piston is at or near the end of its chamber-forming stroke to thereby expand the compresed-air and propel the piston, substantially as described.

2. The combination with a cylinder and a piston reciprocating therein to form a substantially small chamber when the piston is at the end of its stroke in one direction, an electric conductor movable with said piston, an electric circuit having terminals extended within said cylinder and coöperating with said electric conductor to include the latter in a closed circuit and thereby highly heat the conductor when the piston is at the end of its stroke in one direction, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES D. JENKINS.

Witnesses:

JAS. H. CHURCHILL,

J. MURPHY.