

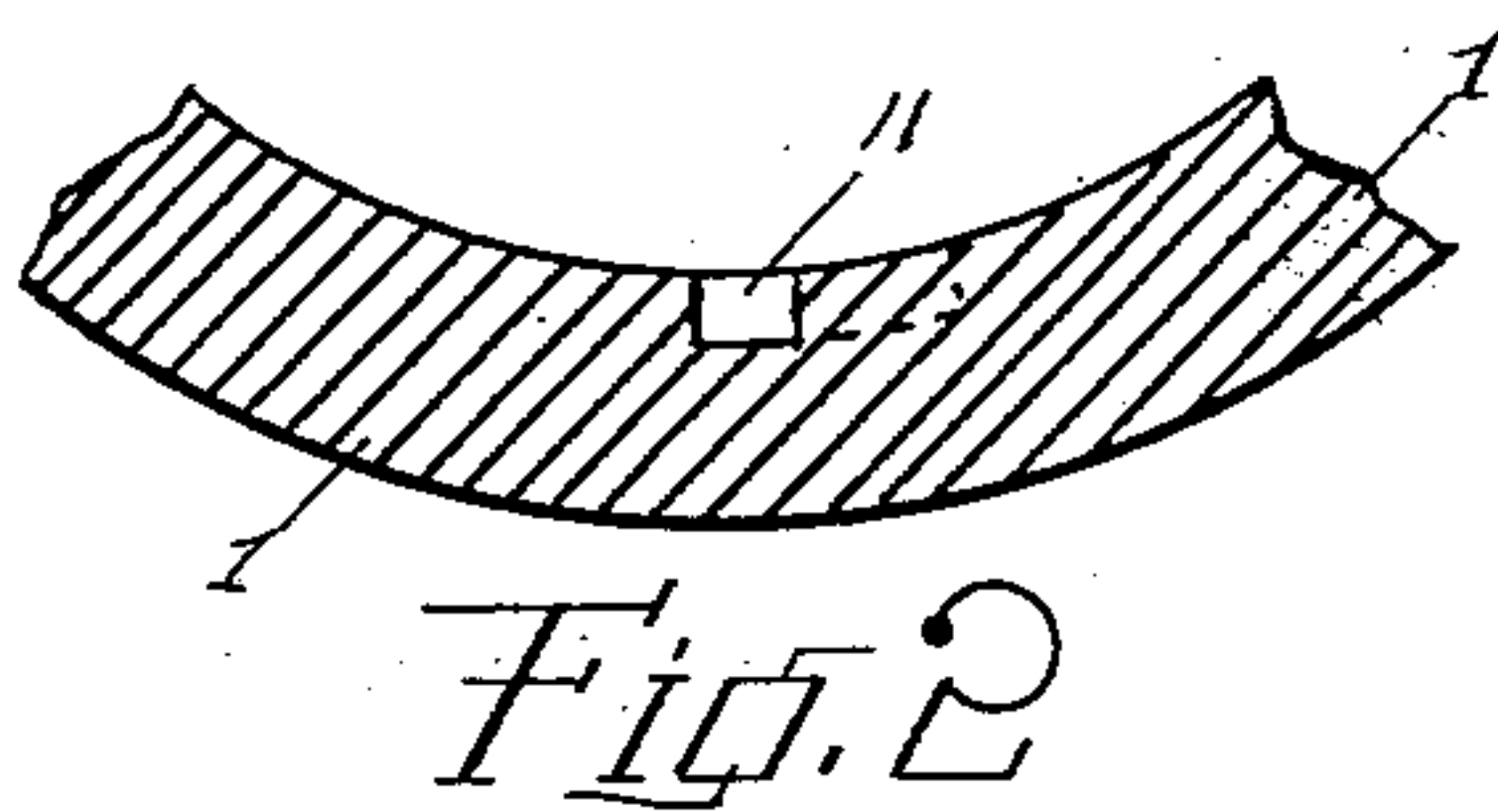
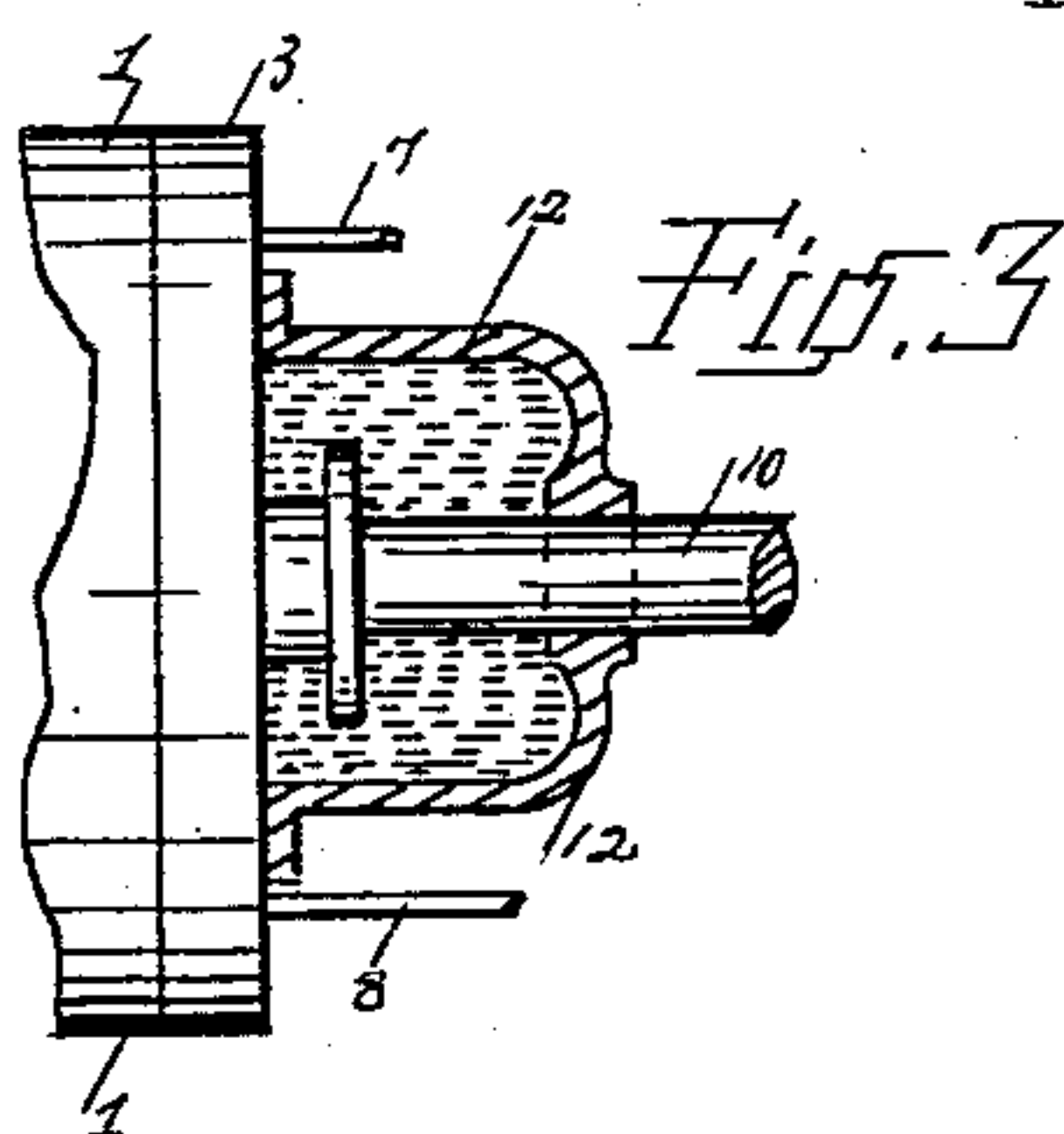
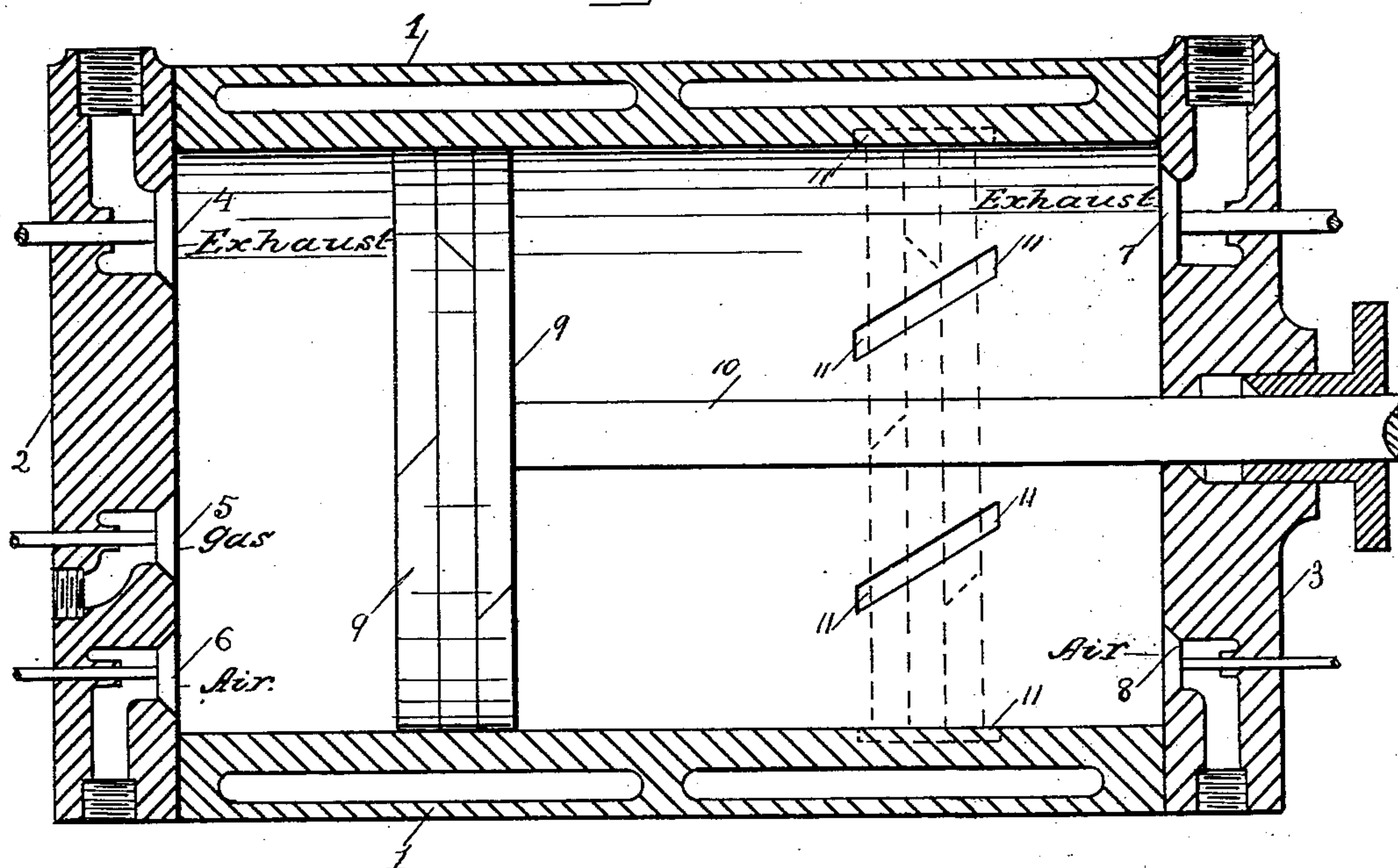
(No Model.)

M. BLAKEY.
OPERATION OF GAS ENGINES.

No. 571,966.

Patented Nov. 24, 1896.

Fig. 1



WITNESSES:

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INVENTOR

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ATTY.

UNITED STATES PATENT OFFICE.

MILDRED BLAKEY, OF PITTSBURG, PENNSYLVANIA.

OPERATION OF GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 571,966, dated November 24, 1896.

Application filed March 18, 1896. Serial No. 583,718. (No model.)

To all whom it may concern:

Be it known that I, MILDRED BLAKEY, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Operation of Gas-Engines; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in the operation of gas or other explosive engines, a description of which will be fully shown and described in the accompanying drawings and specification, in which—

Figure 1 is a sectional view through the cylinder and showing my improvement. Fig. 2 is an end view of a portion of the cylinder and also showing my improvement. Fig. 3 is a view of a water-jacket for keeping the piston-rod cool.

Similar figures refer to similar parts in views shown.

In applying my improvement I do not confine myself to any particular make or style of gas or other explosive engine cylinders. Therefore the one shown is sufficient to illustrate my improvements and the advantages derived therefrom.

The cylinder 1 and heads 2 and 3 form a complete cylinder, and is provided with the usual piston-rod 10 and piston-head 9, exhaust-valves 4 and 7, air-valves 6 and 8, and gas-valve 5. A suitable explosive device is assumed to be attached for exploding the gas at the proper moment, and also the valves to be operated at the proper time by suitable mechanism.

In my improvement I provide the port or ports 11 within the interior of the cylinder, the operation and use of which are as follows: The air-valve 6 and gas-valve 5 open and admit air and gas to the rear end of the cylinder. The piston-head 9 travels to the forward end of the cylinder on the first forward stroke, and on its stroke back to the rear end the gas and air within the rear end

are compressed and ignited and force the piston forward on its second stroke, and when the piston-head is over the port or ports 11 the expanded air and gas in the rear end of the cylinder escape through the port or ports 11 into the forward end. The said forward end being filled with compressed air and the gas and air in the rear end being greater in pressure the said gas and air escape into the forward end of the cylinder and force the piston back to the rear end, and the exhaust-valve 4 opens and exhausts the balance of expanded air and gas. The piston then travels forward on its next stroke, and the exhaust-valve 7 opens on the forward stroke and allows the escape of the expanded air and gas in that end of the cylinder, and the same operation is repeated in succession. This result is obtained in the double-stroke type of engines.

In the triple-stroke type of engine the operation is as follows: The piston-head is up over the port or ports 11, and air being admitted from the valve 8 on the forward end and on the backward stroke to the rear end of the cylinder the exhaust-valve 4 opens and exhausts. The gas-valve 5 and air-valve 6 then open and admit gas and air, and on the first forward stroke the piston compresses the air in the forward end, and when the said piston opens the port or ports 11 the compressed air escapes into the rear end and is still more compressed on the next backward stroke. It is then exploded and forces the piston on its next forward stroke, which opens the port or ports 11. The expanded gas and air escape into the forward end and force the piston on its backward stroke to the rear end of the cylinder and exhaust from the valve 4, and that which remains in the forward end escapes through the exhaust-valve 7. The operation is then repeated in succession.

A water-jacket 12 surrounds the piston-rod 10 and prevents the rod from overheating. The said jacket may be arranged to be continually supplied with water.

I do not confine myself to my particular shape or style of the ports or valves, as other arrangements may be used, but the method shown is simple in construction and operation and therefore is preferable. Neither do

I confine myself to the exact time or point at which the exhaust-valves close, as the same may be operated with slight variations.

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

In a gas-engine, the combination of the piston, and the cylinder having the gas-valve in one end, an air-supply valve and an air and
10 gas exhaust valve in each end, and the gas and air grooves formed in the cylinder, intermedi-

ately of its ends, and conducting the gas and air from one end of said cylinder to the other end, past said piston and within the chamber of said cylinder, substantially as set forth. 15

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

MILDRED BLAKEY.

Witnesses:

GEO. FOSTER,

GEORGE G. BLAKEY.