(No Model.)

C. A. MacDONALD.

GAS PUMP.

No. 421,414. Patented Feb. 18, 1890.

Fig. 1.

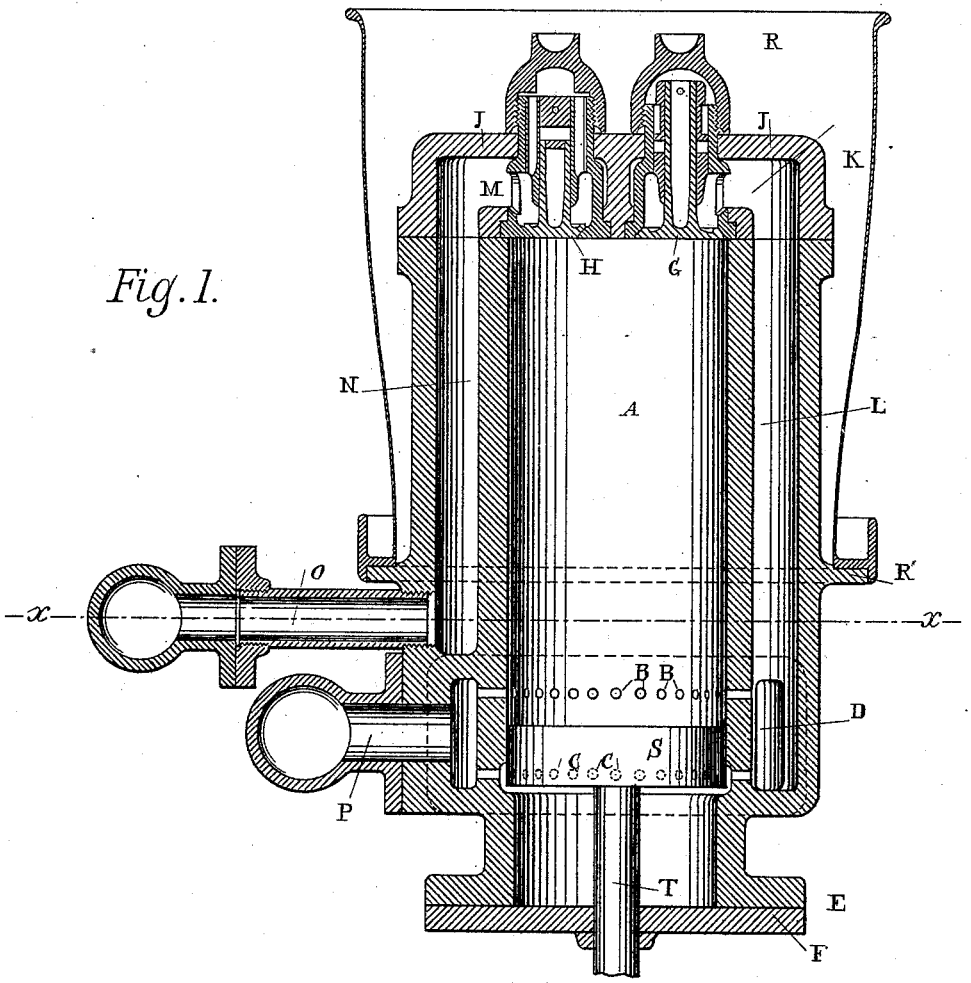
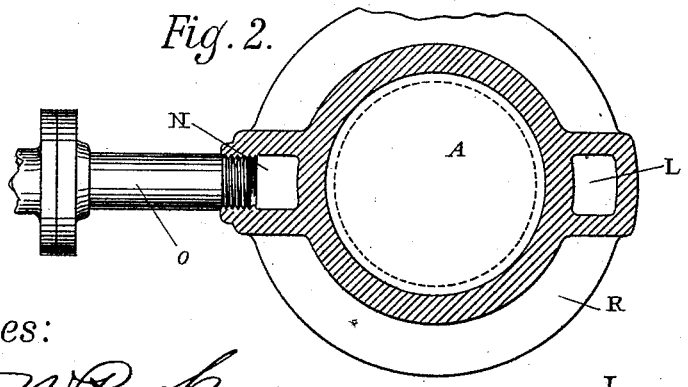


Fig. 2.



Witnesses:

Frances W. Parker

E. A. Burton

Inventor:

Charles A. MacDonald

UNITED STATES PATENT OFFICE.

CHARLES A. MACDONALD, OF CHICAGO, ILLINOIS.

GAS-PUMP.

SPECIFICATION forming part of Letters Patent No. 421,414, dated February 18, 1890.

Application filed January 28, 1888. Serial No. 262,286. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. MACDONALD, a subject of the Queen of Great Britain, and resident of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Gas-Pump, of which the following is a specification.

My invention relates to gas-gumps which are used in ice-machines and the like, and has for its object to provide a structure so shaped and arranged as that the parts may be easily kept cool and certain parts may be removed and changed without interfering with other parts. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical section through pump-cylinder valves and connecting-pipes. Fig. 2 is a cross-section through the cylinder on the line *x x*.

Like parts are indicated by the same letter in both the figures.

A is a cylinder having near its base the holes B B and the holes C C, which connect with the annular passage D in the base of said cylinder.

E is the base of said cylinder, which rests upon a suitable support F.

G is the induct-valve at the top of said cylinder, and H the educt-valve, each secured in the hollow removable head J of the cylinder.

K is a chamber in one side of the head, which opens into the valve-space surrounding and continuous in a chamber L to the annular space D.

M is a similar chamber in the opposite side of the head, which connects with the passage-way N, which opens into the discharge-pipe O.

P is a supply-pipe which opens into the annular chamber D.

R is a water-jacket resting upon the collar R′ and surrounding the entire upper part of the cylinder, together with its valve and removable tubular head.

S is a piston; T, a piston-rod. The cylinder A is cast in a piece, as shown in Fig. 4, containing the two vertical ways L and M.

The use and operation of my invention are as follows: When the piston is in the position indicated by Fig. 1, the cylinder A is full of gas, at the pressure of the gas in the pipe P, for its interior chamber is connected with the pipe P by means of the aperture B B and the annular way D. If now the piston begins its upward stroke, the gas in the cylinder A is immediately compressed until the valve H is elevated and the charge of gas contained in the cylinder A is discharged into the aperture M, way N, and pipe O. On the upward stroke, however, that portion of the cylinder beneath the piston S is filled with gas, and on the descending stroke this charge of gas is discharged through the apertures C and annular way D, way L, and aperture R, and valve G in the upper portion of the cylinder above the piston S. If at any time it is desired to alter or remove the pipes which connect the cylinder or pump with the discharge and supply chambers, these pipes O and P may be easily removed without interfering with the other operating parts of the cylinders. This is accomplished by the use of the ways L and M cast continuous with and forming part of the body of the cylinder. On the other hand, if it is desired to remove the valves or change or alter them, the hollow head J may be removed and such change or alteration made without disturbing the pipes O and B. This is an important feature of my device.

Having thus described my invention, what I claim, and desire to secure by means of Letters Patent, is as follows:

1. In a gas-pump, the combination of a cylinder having an annular way D, and the passages C C B B and the vertical passages L and N along the cylinder, with a removable head containing the valves, a long water-jacket which incloses the greater part of the cylinder and head, and supply and discharge pipes, both of which are connected below the jacket, respectively, with the passages L and N, and are attached to said cylinder at one side thereof and below the water-jacket.

2. In a gas-pump, the combination of a cylinder having a lower portion into which the piston does not proceed, a removable hollow head having valves therein, a piston movable in said cylinder proper, gas supply and discharge pipes, a discharge-way cast in and extending along said cylinder from one side of the hollow head to the discharge-pipe, a supply-way cast in and along said cylinder, ex-

tending from the opposite side of the hollow head down along the cylinder to the annulus, an annulus encircling said cylinder above its prolongation, two series of apertures opening into said cylinder, connecting said cylinder with said annulus, said enlargement of the cylinder below said annulus and apertures, the whole arranged so that the piston at the end of its excursion does not pass into the enlargement of the cylinder and so that the said enlargement is connected with the supply-passage and with the portion of the cylinder on the opposite side of the piston.

CHARLES A. MACDONALD.

Witnesses:
CORA L. CADWALLADER,
FRANCIS W. PARKER.