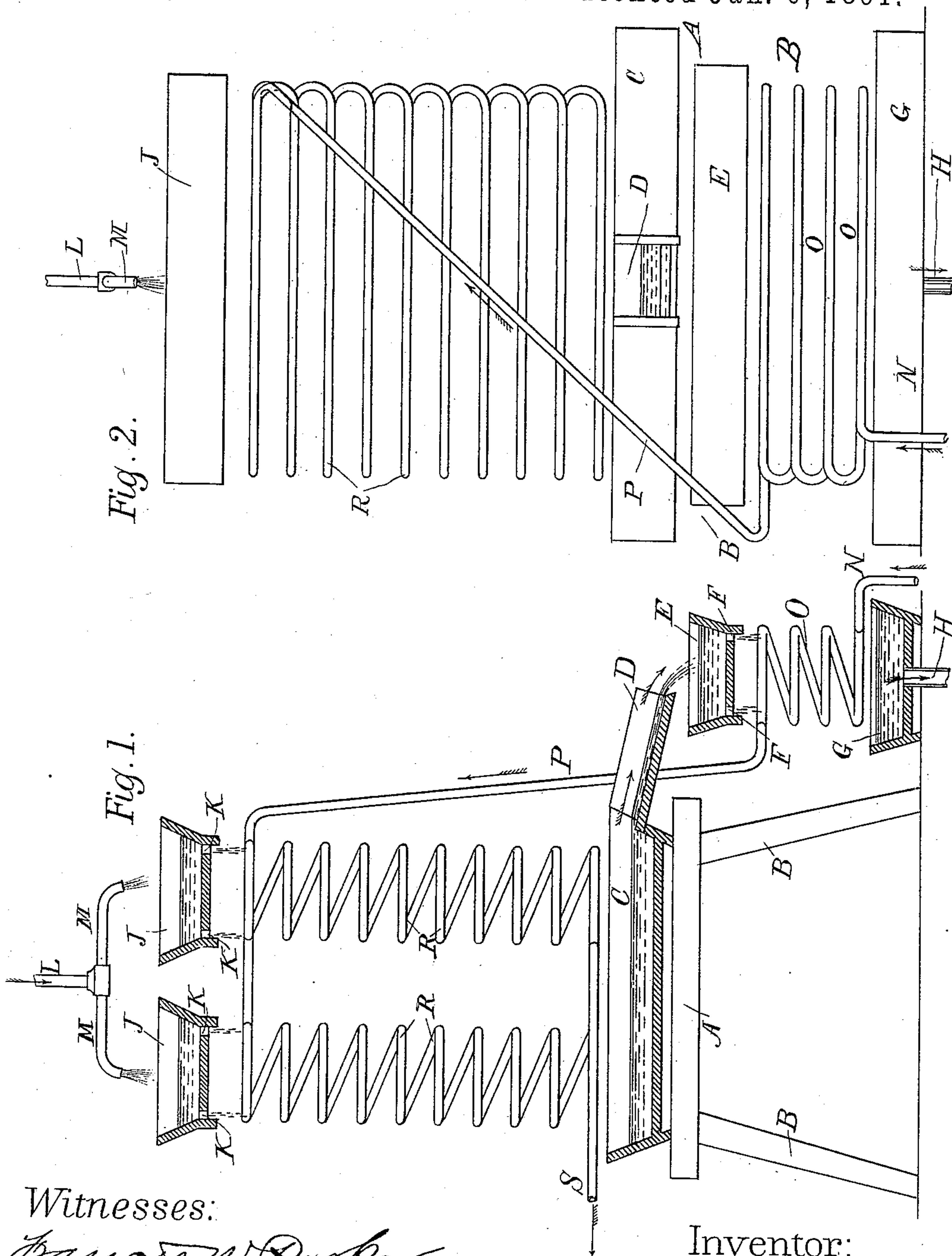


(No Model.)

C. A. MACDONALD.
CONDENSER FOR GAS PUMPS.

No. 444,385.

Patented Jan. 6, 1891.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES A. MACDONALD, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE HERCULES IRON WORKS, OF SAME PLACE.

CONDENSER FOR GAS-PUMPS.

SPECIFICATION forming part of Letters Patent No. 444,385, dated January 6, 1891.

Application filed January 28, 1888. Serial No. 262,287. (No model.)

To all whom it may concern:

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

My invention relates to devices for rapidly and economically condensing the gas which is heated by compression, and is designed for use particularly in ice-pumps. It is for this object to so arrange the parts that the cooling-fluid is brought into a position to cool the gas, and each time at a point where the gas is hotter than at the place where it is first applied.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a diagrammatic end view with certain parts in section. Fig. 2 is a diagrammatic side view.

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

A is a table, supported by the legs B B and supporting the fluid-reservoir C, from which proceeds the inclined trough D, the same discharging into the trough or fluid-reservoir E. In the bottom of this reservoir and at the sides thereof are the slots or holes F F, from which the fluid drops from the reservoir E into the reservoir G. This reservoir has the waste-conduit H.

J J are elevated fluid-reservoirs, each having at its side and in the bottom apertures or slots K K, similar to the slots or apertures F F.

L is a supply-pipe, having the branches M M opening, respectively, into the reservoirs J J.

N is a gas-supply pipe provided with the coil O O, longitudinal portions of said coil resting underneath the apertures or slots F F.

P is a pipe connecting the coil O with the coils R R. These coils are placed so that the longitudinal portions rest under the slots or apertures K K, and they terminate below in a discharge-pipe S. These parts may be greatly varied as to structure and size and method of support, &c.

The use and operation of my invention are as follows: The compressed gas which it is designed to employ at some stage of the operation to reduce the temperature by its expansion is introduced into the pipe N. Having been compressed, it is necessarily heated, and the immediate object of the device herein set forth is to cool, expanding the gas so as to

leave it free again. It is passed through the coil O, thence through the pipe P, thence through the coils R, and out through the pipe S through the chamber or part where it is to be made to expand for use. The cooling-fluid—as, for instance, water—is introduced through the pipe L and the branches M M into the reservoirs J J. Here it is permitted to trickle through the apertures K K onto the coils R R, where it envelops them in a spray of mist or cold water or other cooling-fluid, which gradually descends along such coils until it flows into the reservoir C. From this reservoir it is discharged through the trough D into the reservoir E, and from this reservoir it is permitted to pass in a spray or fine streams over the pipe of the coil O, along which it descends into the reservoir J. Here it is discharged through the pipe H, having performed its work. It will readily be seen that the gas is at its hottest degree as it enters the coil O, and the water is at its hottest degree as it enters the reservoir G, and the gas is at its coldest degree as it passes into the reservoirs J J. Thus the coldest water is precipitated upon the coils R R, so as to reduce the temperature of the gas whose temperature has already been to some extent reduced. The water is heated to a degree by this process, and it is then employed again to act upon the hotter gases in the coil O. Thus the gas is treated to a series of cooling processes each time with increasingly cold water or cooling-fluid, while the cooling-fluid is successively employed upon gases of increasing temperatures.

I claim—

In a gas-condenser, the combination of a series of coils, through the first of which the gas passes continuously upward, and through the last of which coils the gas passes from the top downwardly, said coils representing a continuous passage-way for the continuous progress of one and the same current of fluid, with water troughs and pipes disposed above the coils and arranged in series, so that the cooling-fluid therefrom passes over the last coils first and thence downward by gravity over the first coil.

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Witnesses:

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