

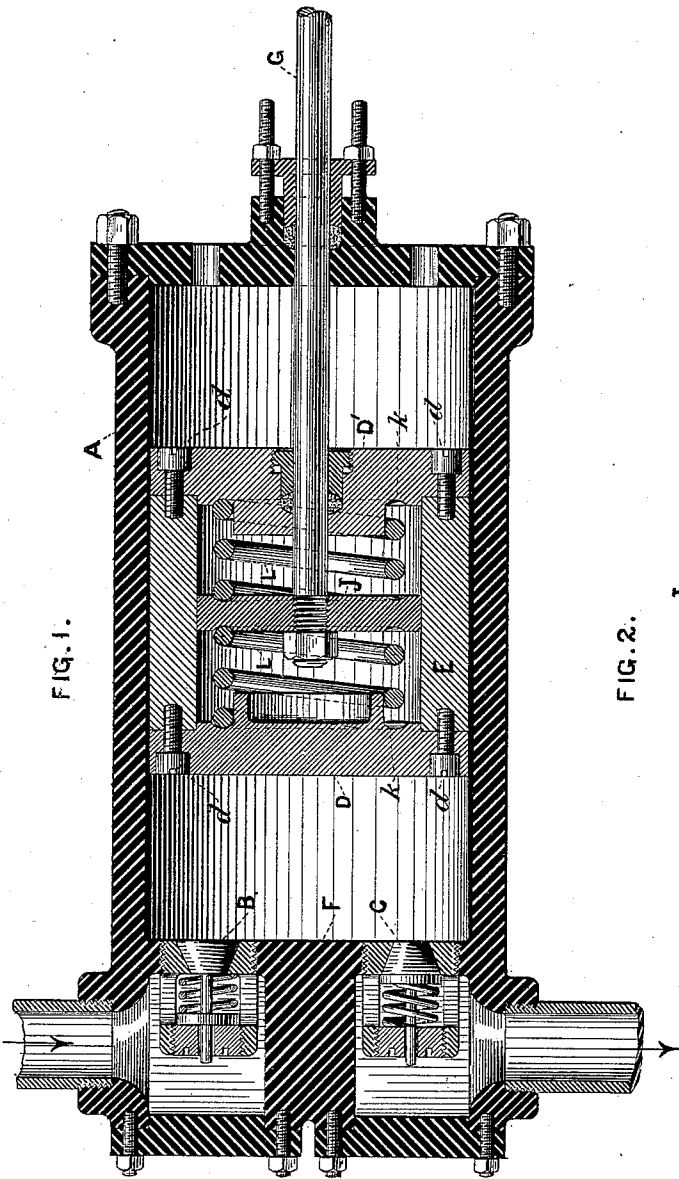
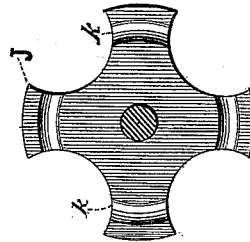
(No Model.)

A. H. HUTCHINSON.

COMPRESSION PUMP FOR ICE MACHINES.

No. 387,234.

Patented Aug. 7, 1888.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ARTHUR H. HUTCHINSON, OF PHILADELPHIA, PENNSYLVANIA.

COMPRESSION-PUMP FOR ICE-MACHINES.

SPECIFICATION forming part of Letters Patent No. 387,234, dated August 7, 1888.

Application filed December 2, 1885. Serial No. 184,399. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. HUTCHINSON, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Compressing-Pumps for Ice-Machines, whereof the following is a specification, reference being had to the accompanying drawings.

My improvements are intended for use in connection with that class of ice-machines which operate by the mechanical compression of a gas or vapor and its subsequent expansion; and the object of my invention is to provide a means for effecting a perfect clearance of the pump-cylinder, since, where a gas such as ammonia is used, if a small film be left unexpelled it will, on the return-stroke of the piston, expand so as to nearly fill the cylinder, and thus interfere with the rapid and efficient operation of the machine. To effect the clearance I construct and arrange the piston so that it shall strike squarely against the cylinder-head on its forward or compressing movement; and my invention is designed to permit this mode of operation without injury to the piston or cylinder-head.

In the accompanying drawings, Figure 1 represents a central longitudinal section through the pump-cylinder. Fig. 2 is a plan view of the sliding guide to which the piston-rod is attached within the piston. The pump shown is single-acting, but of course the improvements are adapted to double-acting pumps.

In said drawings, A represents the cylinder, constructed in the usual manner, having an inlet-valve, B, and an outlet-valve, C. The construction of said valves and the mode of operation of the ice-machine need not be described, as they are well understood. Within said cylinder is the hollow cylindrical piston, preferably constructed of circular heads D D', secured by means of bolts *d d'* to a cylindrical body, E. The periphery of the head D fits closely within the cylinder, and the exterior surface of the head is made true, so that it shall strike equally upon the head F of the cylinder.

G is the piston-rod, which extends into the hollow piston, as shown, where it is secured to a guide-piece, J, which may be described as a disk with portions of its periphery cut

away. (See Fig. 2.) This guide-piece J fits snugly within the hollow piston E, so as to be capable of longitudinal but not lateral movement therein. The normal position of the guide-piece J is at the longitudinal center of said hollow piston E, and on each side of said guide-piece is a spring, L, of sufficient strength to maintain the piston in position against any pressure which the gas, &c., can effect upon it, but to yield slightly when the piston strikes the cylinder-head F. Said guide-piece J is preferably grooved upon its flat surfaces, as shown at *k*, in order that the spring may seat itself properly thereon; and, if desired, two or more springs may be used, instead of the single spring indicated in the drawings.

The forward stroke of the piston-rod is so arranged as that it shall be very slightly in excess of the length of the cylinder, in order that the head D of the hollow piston may at each forward movement strike squarely, though lightly, upon the cylinder-head F, and may thus expel, substantially, every particle of the vapor in the cylinder, as well as the oil or other lubricant which is usually introduced within said cylinders, and which passes out together with said vapor at the outlet-valve C.

When the piston-head D strikes the cylinder-head F, the spring L yields a little, the guide-piece J sliding freely inside of the hollow piston in the necessary direction, and thus injury to either the cylinder or piston is prevented. On the return-stroke of the piston the spring L causes the guide-piece J to resume its normal position within the hollow piston, and thus at each stroke the operation is repeated.

I do not claim, broadly, the combination of a piston attached to its rod by means of an elastic connection.

Having thus described my invention, I claim—

The combination, with the cylinder A, of the hollow piston D D' E, the piston-rod G, guide-piece J, and spring L, arranged within said hollow piston and on each side of said guide-piece, the whole operating in the manner set forth.

ARTHUR H. HUTCHINSON.

Witnesses:

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