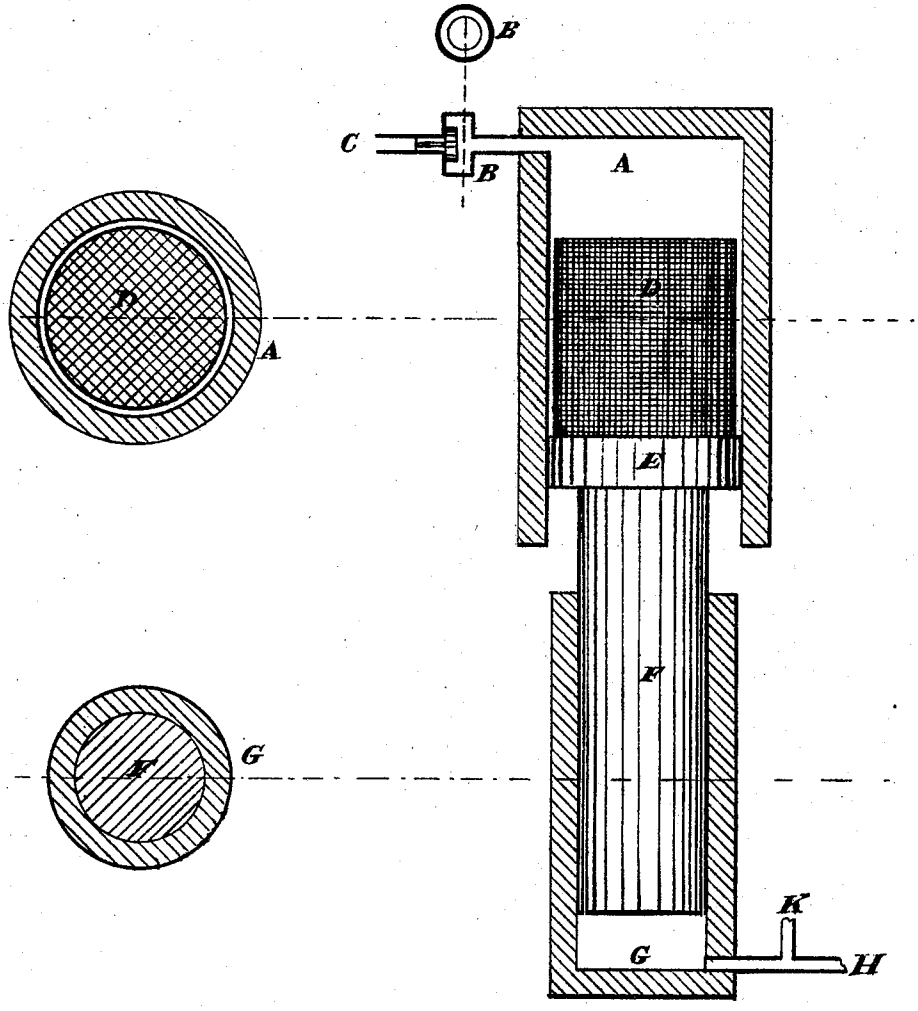
JAMES S. BALDWIN.

Improvement in Accumulators for Liquids under pressure.

No. 121,482. Patented Dec. 5, 1871.



Witnesses.

Thomas P. Lindsley

Chas. H. Skinner

Inventor.

James S. Baldwin

UNITED STATES PATENT OFFICE.

JAMES S. BALDWIN, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN APPARATUS FOR FORCING LIQUIDS BY THE EXPANSION AND CONDENSATION OF GASES.

Specification forming part of Letters Patent No. 121,482, dated December 5, 1871.

To all whom it may concern:

Be it known that I, JAMES S. BALDWIN, of Newark, in the county of Essex and State of New Jersey, have invented a new and Improved Accumulator for Liquids under Pressure, of which the following is a specification:

The means hitherto employed to store up a liquid under pressure, as well as to regulate its flow under the same, have depended for their action either upon the force of gravity or upon the elasticity of an atmosphere of compressed air. Examples of the former kind are found in the use of an elevated reservoir, and in the accumulator of Armstrong with its weighted plunger, while of the latter we have a familiar example in the air-chamber of a pump as well as in more complicated forms of apparatus in which a reservoir of compressed air is employed. My accumulator differs from these, and its novelty consists in the use, as a recipient of the power stored up, of a gas capable of being condensed to the liquid state. A well-known property of such gases is the uniform tension they maintain while the process of liquefaction is going on, the temperature remaining constant, while if the space in the containing vessel is increased by the withdrawal of a piston or in any other way the liquid gas will volatilize and follow up said piston with a uniform pressure.

The manner in which this property is employed can be best explained by direct reference to the drawing.

The gas, preferably carbonic-acid gas, is forced, by any suitable condensing-pump, through the pipe C and check-valve B to the cylinder A until the point of liquefaction has been reached and a certain amount of the liquid gas has accumulated—say one-fifth the total capacity of A. E is a piston suitably packed, the prolongation of which constitutes the plunger F, fitted to the cylinder G. H is a pipe, through which the liquid to be accumulated—assumed to be in this case an oil—is forced either by a pump or by any other apparatus capable of delivering it under pressure. Thus the entry of said oil will cause the plunger or ram F and its attached piston E to rise, condensing the gas in A, as already described, and consequently meeting a uniform resistance. K is a branch through which the oil passes to a crank, engine, or other point of application, and must necessarily be expelled from G with a uniform pressure.

It is obvious that the temperature of the gas must be maintained approximately the same during the above operations. This I effect by the use of a mass of wire-gauze, D, which, having a large aggregate capacity for heat and exposing a large amount of surface, will receive or impart the requisite amount of heat without any variation in temperature sufficient to affect the practical working of the machine.

The cylinders A and G in actual practice will have their proportionate capacities determined by the requirements of the case at hand, and will be rigidly connected with each other by a frame such as is usually employed for such purposes. This frame is omitted from the drawing for facility of illustration. When A has once received its full charge of gas it need not be again replenished until, through leakage, the supply is reduced below working requirements.

I claim as my invention—

The accumulator, constructed and operated, as described, by means of carbonic-acid or equivalent gas in both the gaseous and liquid state, substantially as set forth.

JAMES S. BALDWIN.

Witnesses:

MORRIS B. LINDSLEY,

CHAS. H. SKINNER.

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