No. 800,769. PATENTED OCT. 3, 1905.

A. STEINBART.

COMPRESSOR.

APPLICATION FILED FEB. 20, 1904.

Fig. 1,

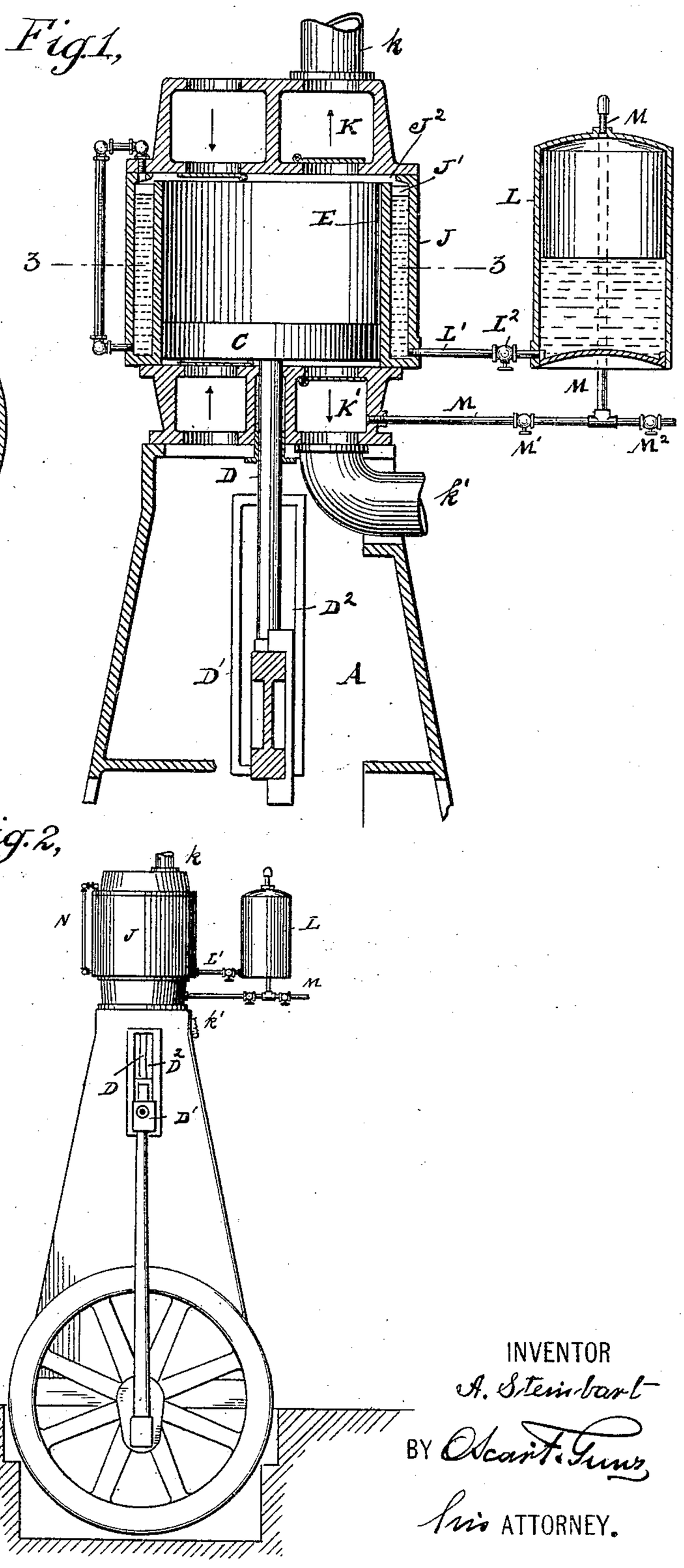


Fig. 3,

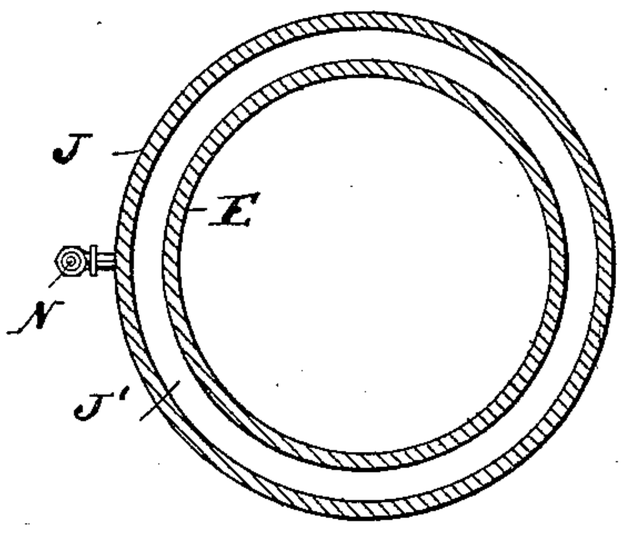
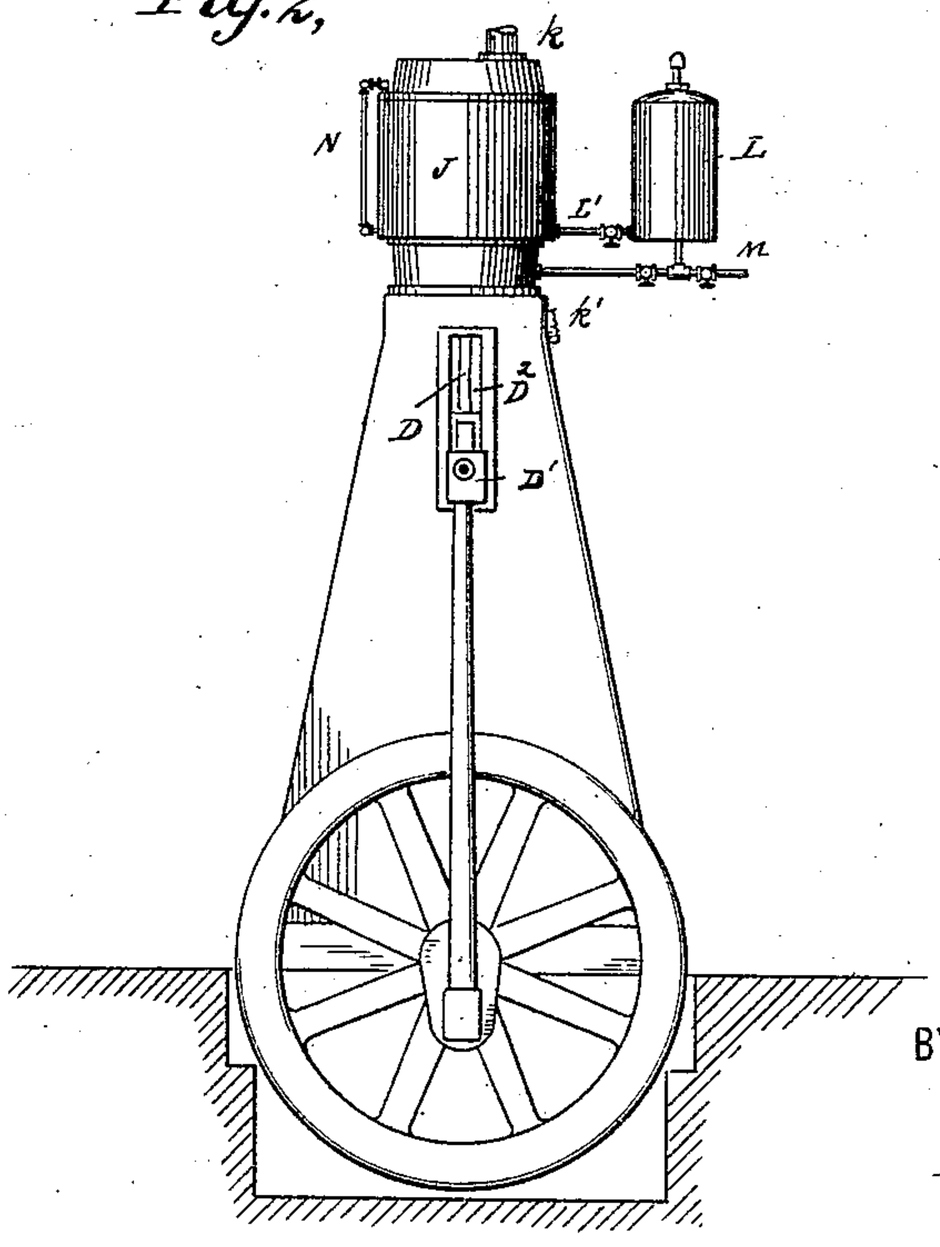


Fig. 2,



WITNESSES:

Chas. H. Shaw

H. G. Le Card

INVENTOR

A. Steinbart

BY Oscar F. Gunz

His ATTORNEY.

UNITED STATES PATENT OFFICE.

ALFRED STEINBART, OF CARLSTADT, NEW JERSEY.

COMPRESSOR.

No. 800,769. Specification of Letters Patent. Patented Oct. 3, 1905.

Application filed February 20, 1904. Serial No. 194,513.

To all whom it may concern:

Be it known that I, ALFRED STEINBART, a citizen of the United States, residing at Carlstadt, in the county of Bergen, State of New Jersey, have invented certain new and useful Improvements in Compressors, of which the following is a specification.

The object of my invention is to provide a new and improved air-compressor which is simple in construction, composed of few parts, and which can readily be so adjusted as to compress air to a higher or lower tension, as may be desired.

In the accompanying drawings, in which like letters of reference indicate like parts in all the figures, Figure 1 is a vertical sectional view of the upper part of my improved compressor. Fig. 2 is a general side view of the compressor on a smaller scale. Fig. 3 is a horizontal sectional view on the line 3 3 of Fig. 1.

The entire apparatus is mounted in a vertical frame A, preferably tapered toward its upper end in the conventional manner. The compressor-cylinder E contains a compressor-piston C, attached to a piston-rod D, secured to a cross-head D′, suitably guided in the vertical slot D^2 of the frame A. The compressor-cylinder E is surrounded by a jacket J, forming an annular space J′, which has one-third of the capacity of the compression-cylinder E, more or less, and this space J′ is brought in communication with the top of the compression-cylinder by means of the annular opening J^2 at the top of the cylinder E.

The compressed-air chamber K is located on the top of the compressor-cylinder E, and the compressed-air chamber K′ is located at the bottom, and both can communicate by means of ports controlled by suitable valves with the cylinder E and by means of suitable pipes or conduits *k k′* with the compressed-air tank of any well-known construction. (Not shown.) A liquid-tank L is connected at its bottom by a pipe L′, having a controlling-cock L^2, with the bottom of the space or chamber J′.

The compressed-air chamber K′ is connected by a pipe M with the top of the liquid-tank L, and said pipe M has a controlling-cock M′ and a petcock or outlet-cock M^2.

A gage-glass N is provided for the chamber J′.

When the compressor is to work at normal pressure, the space or chamber J′ is filled almost entirely with liquid. During the upstroke of the piston C the compressed air is forced from the cylinder E into the chamber K and at the downstroke into the chamber K′, and so on alternately.

When extra high pressure is required, the quantity of air compressed must be decreased correspondingly, as otherwise the machine would become overloaded, which is to be avoided.

The cock M′ is closed, the petcock M^2 is opened, and the cock L^2 in the pipe L′ is opened, so that the compressed air in the upper part of the cylinder E can force the liquid out of the space J′ into the tank L, the air escaping from said tank through the pipe M and petcock M^2, whereupon the cock L^2 is closed again.

During the upstroke of the piston in the compression-cylinder some of the air is compressed into the space J′, and during the downstroke this air expands back into the upper part of the cylinder and assists in forcing the piston downward. The compression produces less quantity of compressed air; but the quantity produced may be of much higher pressure. When the compressor is to work at normal pressure again, the cock M^2 is closed and the cocks L^2 and M′ are opened, so that compressed air from the chamber K′ can pass into the upper part of the tank L and can force the liquid from said tank into the space J′ to the desired height, whereupon the cocks M′ and L^2 are closed. As no air can now be compressed into the space J′, which is filled with liquid, all the compressed air produced at the upstroke passes into the chamber K and from the same to the compressed-air tank or reservoir. If the chamber is not to be increased to the maximum, the space is only partially emptied of liquid, according to the desired increase in pressure.

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

1. In a compressor, the combination with a vertical cylinder and a piston therein, of a chamber surrounding said compression-cylinder and in communication with the top of the same, and means for conducting a liquid into and out of said chamber, substantially as set forth.

2. In a compressor, the combination with a vertical compression-cylinder and a piston therein, of a chamber surrounding the com-

pressor-cylinder and communicating with the top of the same, and means for forcing a liquid into and out of said chamber by means of compressed air, substantially as set forth.

3. In a compressor, the combination with a vertical compression-cylinder, and a piston therein, of a chamber communicating with the upper end of said compression-cylinder, a liquid-tank connected with said chamber and means for forcing, by means of the air compressed in the compression-cylinder, liquid from the tank into said chamber or from said chamber into the tank, substantially as set forth.

4. A compressor having its vertical compression-cylinder connected at its upper end with a chamber, a liquid-tank connected with the bottom of said chamber and an air-pipe extending from a compressed-air outlet of said compression-cylinder to the liquid-tank, and a cock in said connections between the tank, the chamber, and said compressed-air outlet, substantially as set forth.

5. A compressor-cylinder having its compression-cylinder connected with a chamber, a liquid-tank connected with the bottom part of said chamber, an air-pipe extending from a compressed-air outlet of said compression-cylinder to said liquid-tank and cocks in said connections between the chamber, the liquid-tank and the compressed-air outlet to force, by means of air compressed in the compressor-cylinder, a liquid from the tank into said chamber or from said chamber into the tank, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED STEINBART.

Witnesses:

OSCAR F. GUNZ,

SOPHIE M. BAEDER.