(No Model.) 2 Sheets—Sheet 1.

T. COOK.

COMPRESSION PUMP.

No. 306,060. Patented Oct. 7, 1884.

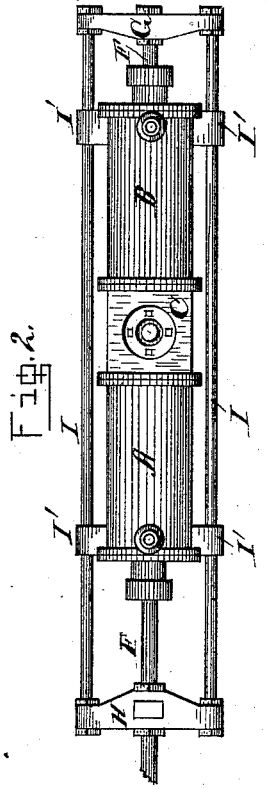

Fig. 2.

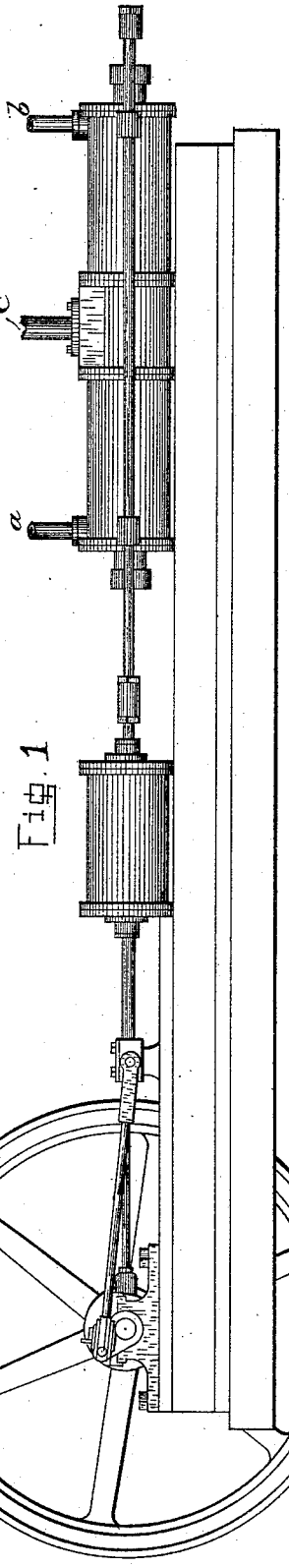

Fig. 1

WITNESSES.

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INVENTOR.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

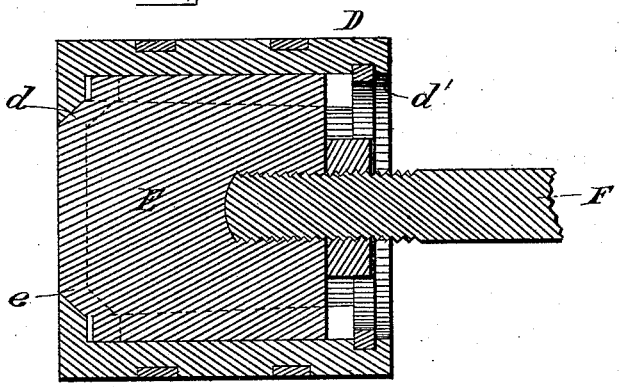


Fig. 4.

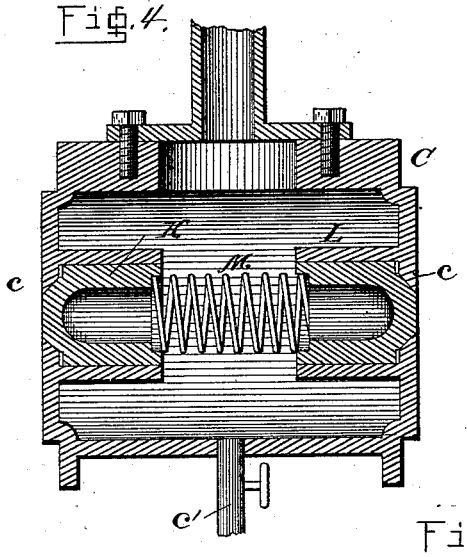


Fig. 5

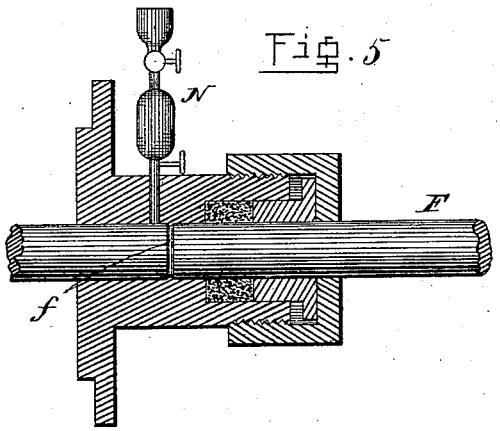
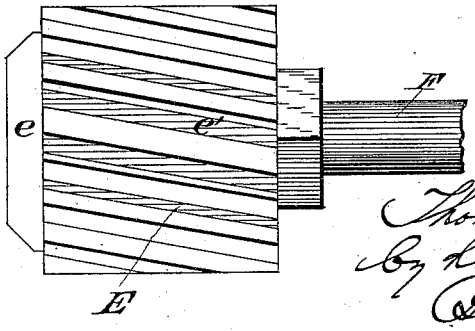


Fig 6



WITNESSES.

W. A. Jones

Edward Walker.

INVENTOR.

Thomas Cook

By his attorney

UNITED STATES PATENT OFFICE.

THOMAS COOK, OF COLUMBUS, MISSISSIPPI, ASSIGNOR OF ONE-HALF TO LEE M. TUCKER, OF SAME PLACE.

COMPRESSION-PUMP.

SPECIFICATION forming part of Letters Patent No. 306,060, dated October 7, 1884.

Application filed November 8, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS COOK, a citizen of the United States, residing at Columbus, in the county of Lowndes and State of Mississippi, have invented certain new and useful Improvements in Compression-Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

One part of my invention consists of a pump-piston composed of a sleeve containing a valve-seat at one end, and a valve which, being fitted in the sleeve so that it may move therein to a limited extent, is fixed to the piston-rod.

Another part of my invention consists of the combination of a valve-chest common to two pump-cylinders, two eduction-valves, and a single spring between said valves.

In order that my invention may be clearly understood, I have illustrated in the annexed drawings, and will proceed to describe, one form thereof.

Figure 1 is a side elevation of my improved double-acting pump, showing it as attached to a crank-engine for driving it. Fig. 2 is a plan view of the double-acting pump. Figs. 3 to 6 illustrate details of the pump.

The same letters of reference are used in all the figures in the designation of identical parts.

A and B refer to the two pump-cylinders, arranged in the same axial line and separated by the valve-chest C, which is common to both, and constructed with two heads containing each a valve-seat, *c*, as shown in Fig. 4. Each pump-cylinder contains a piston composed of a sleeve, D, and a valve, E. The valve E, which is the induction-valve of the pump, is in the form of a solid plug fitting snugly in the sleeve, and provided at one end with a valve-face, *e*, adapted to the valve-seat *d*, formed in one end of the sleeve D. Spiral grooves *e'* are cut or formed in the body of the valve for the passage of the gas. When seated, the end of the valve-face is flush with the end of the sleeve D, as shown in Fig. 3. In opening the valve its movement in the sleeve D is limited by a split ring, *d'*, sprung into a groove in the sleeve D. The valve E is secured to the piston-rod F. The pistons of the two pump-cylinders are precisely alike, but arranged reversely. The piston-rod F of pump-cylinder B is secured to a cross-head, G, while the piston-rod F of the pump-cylinder A is secured to a cross-head, H. The cross-heads G and H are connected together by parallel rods I I, outside of the pump-cylinders, and supported in fixed guides I', which may be formed on the pump-cylinders, as shown.

The eduction-valves K and L, constructed substantially as the induction-valve E—namely, with a valve-face and a spirally-grooved body—are arranged in suitable sleeve-guides on the valve-chest directly opposite each other, so that a single spring, M, may be used for seating them. The gas to be compressed enters pump-cylinder A through pipe *a* and pump-cylinder B through pipe *b*. These pipes *a b* may be connected to a common induction-pipe. The compressed gas passes from the valve-chest to a suitable condenser through a pipe, C'.

For the purpose of lubricating all the moving parts of the pump, I mount a lubricator, N, on the stuffing-box of each pump-cylinder, between the packing and the head of the cylinder, as shown in Fig. 5. Piston-rod F is provided with a groove, *f*, which at each outstroke passes just beyond the lubricator-duct in the stuffing-box, so as to take a little lubricant into the pump-cylinder at each instroke. The lubricant thus introduced will gradually work its way into the valve-chest C, which acts as a trap, and from which the spent lubricant may be drawn off from time to time through the waste-pipe *c'*. I prefer to arrange this double-acting pump horizontally and to drive it by a horizontal crank-engine, as shown in Fig. 1, the elongated rearwardly-projecting piston-rod of the engine being secured to the cross-head H of the pump.

In the operation of this double-acting pump the gas is compressed alternately in the respective pump-cylinders. At the beginning of the instroke the valve E moves in the seat until it seats itself, from which time it pushes the sleeve D along with it to the end of the instroke. At the beginning of the outstroke the valve E first unseats itself by moving in

the sleeve D, and then drags the sleeve along with it, remaining open to the termination of the outstroke. I prefer to confine the valve E in the sleeve by a split ring, because it dispenses with screws or other devices, which are liable to work loose and damage the pump. It will be observed that by constructing this double-acting pump in the manner described the stuffing-boxes are subjected to low pressure only, which is an important desideratum, because the stuffing-boxes can be kept tight without putting too much friction on the piston-rods by the packing; also, that only a single valve-chest for the eduction-valves is required.

My improved piston may be used in vacuum-pumps and lift and force pumps as well as in compressing-pumps.

I claim as my invention—

1. A pump-piston composed of a sleeve provided with a valve-seat, and a valve secured to the piston-rod and fitted to move to a limited extent in the said sleeve.

2. A pump-piston composed of a sleeve, a valve fitted therein, and a split ring for confining the valve in the sleeve.

3. The combination, substantially as before set forth, of the valve-chest, the two eduction-valves, and the spring between the valves.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS COOK.

Witnesses:
C. A. NEALE,
E. T. WALKER.