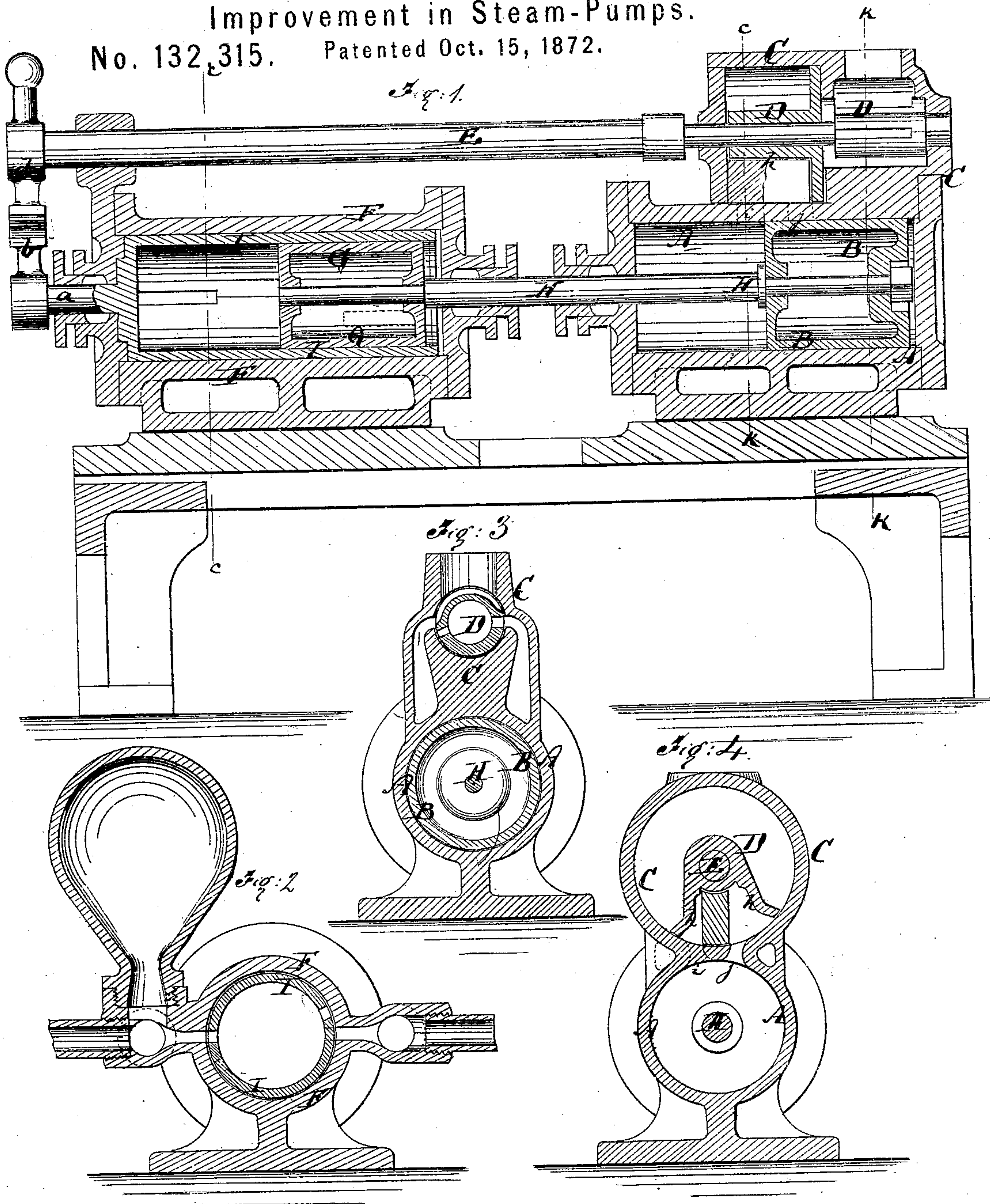


J. NORTH.
Improvement in Steam-Pumps.
No. 132,315. Patented Oct. 15, 1872.



Witnesses:

Chas. Nida
C. Brugwick

Inventor:

Jno. North

PER

Munroe

Attorneys.

UNITED STATES PATENT OFFICE.

JOHN NORTH, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM-PUMPS.

Specification forming part of Letters Patent No. 132,315, dated October 15, 1872.

To all whom it may concern:

Be it known that I, JOHN NORTH, of the city, county, and State of New York, have invented a new and Improved Pump and Engine, of which the following is a specification:

Figure 1 is a vertical longitudinal section of my improved pump and engine. Figs. 2, 3, and 4 are vertical transverse sections of the same taken respectively on the lines *c c*, *k k*, and *e k*, Fig. 1.

Similar letters of reference indicate corresponding parts.

This invention relates to the combination of two inventions—one an improvement in steam-valves, the other an improved pump—with each other, with the object of utilizing their advantages jointly, and thereby increasing their effectiveness and utility.

The first of the above-mentioned inventions is fully described in an application for a patent filed by me in the month of May, 1872, and which was allowed in June, 1872. The other invention—that in pumps—is described in a patent application which I have signed and executed on the 13th day of July, 1872, and filed on or about the twenty-first day of the same month.

My present invention consists in extending the stem of the rocking steam-valve toward the pump and in so connecting it with the stem projecting from the oscillating cylinder that is fitted into the pump-cylinder as to impart the necessary vibrating motion thereto. The action of the steam on the inlet-valve will thus also be brought to bear on the rocking pump-cylinder, thereby economizing complex link mechanism, and taking none of the power imparted to the piston from its for valve-setting purposes of any kind.

A in the drawing represents the steam-cylinder; B, the piston therein; C, the steam-chest thereto; and D, the steam-valve within the chest. This valve is arranged substantially as described in my first-mentioned application, to be oscillated by the steam entering its recess *h*, alternately, through the aper-

tures *j* and *l* that lead to the chest through the circumference of the cylinder. E is the stem of the valve D extending through the end of the steam-chest and oscillated with and by the valve. F is the pump-cylinder and G its plunger, which is connected by the rod H with the piston B, to receive its motion directly from the same. I is the oscillating cylinder fitted into the cylinder F and embracing the plunger G, as shown. It has four slots to communicate, alternately, with one each of the inlet and outlet ports, and operates in every respect substantially as described in my second above-named application. The projecting stem *a* of the cylinder I is, by toothed segments *b* and *d*, or by equivalent means, connected with the valve-stem E, as shown, so that the oscillations of the valve D and cylinder I will be simultaneous, as are the back and forward motions of the piston B and plunger G. The oscillations of B and I are, however, not necessarily equal in degree, as their relative motions can be easily varied by difference in sizes of the segments *b d*, or their equivalents.

This pumping mechanism has for its chief advantage its being absolute in effect and steady in operation. There is no dead-center to overcome, nor is any loss of power occasioned by any transmission of motion from the piston or plunger to the links or valves. Furthermore, an engine and pump of this kind can be made very strong and substantial and still operate with speed and promptness.

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

The oscillating stem E of the steam-valve D, when connected by toothed segments with the slotted cylinder I that embraces the pump-plunger, substantially as and for the purpose herein shown and described.

JOHN NORTH.

Witnesses:

C. SEDGWICK,
T. B. MOSHER.