J. TREGONING.

STEAM-VALVES FOR PUMPING-ENGINES.

No. 193,736. Patented July 31, 1877.

Fig. 1.

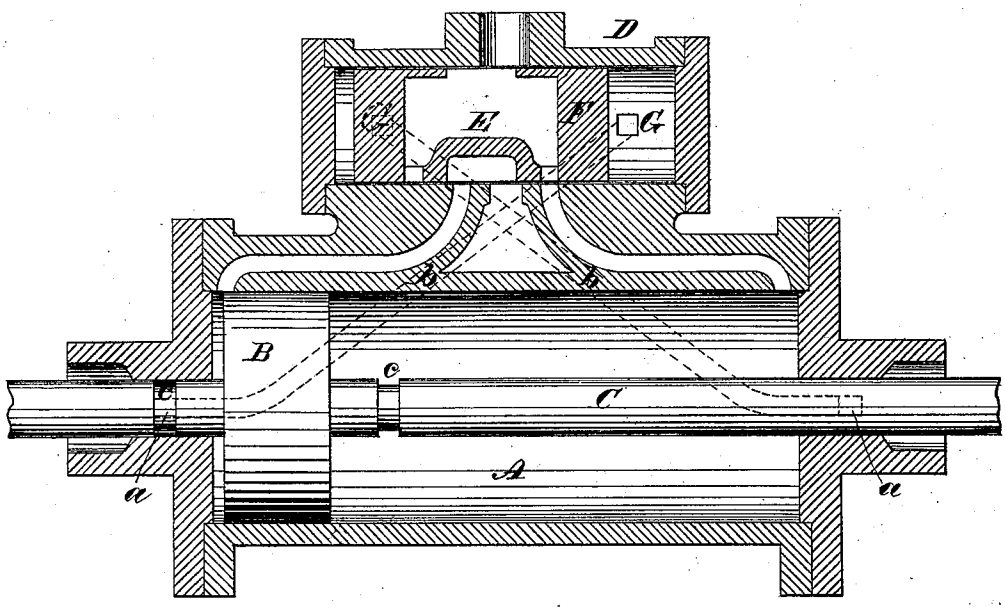
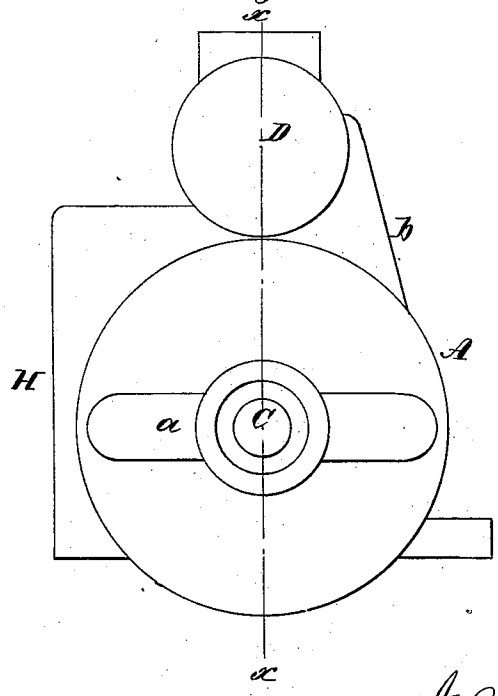


Fig. 2.



WITNESSES:

H. Sydnitt

J. H. Scarborough.

INVENTOR:

J. Tregoning.

BY

ATTORNEYS.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN TREGONING, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN STEAM-VALVES FOR PUMPING-ENGINES.

Specification forming part of Letters Patent No. **193,736**, dated July 31, 1877; application filed June 11, 1877.

To all whom it may concern:

Be it known that I, JOHN TREGONING, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Valve for Pumping-Engine, of which the following is a specification:

Figure 1 is a longitudinal section of a steam-cylinder of a pumping-engine containing my improvement. Fig. 2 is an end elevation.

Similar letters of reference indicate corresponding parts.

My invention relates to a novel method of operating the valves in steam pumping-engines; and it consists in a circumferentially-grooved piston-rod, which acts as a valve, and in passages that lead from the ends of the valve-chest to and across the cylinder-heads, and to the exhaust-receiver of the cylinder, the said passages being crossed between the valve-chest and cylinder-heads.

Referring to the drawing, A is a steam-cylinder, containing the piston B, which is secured to a piston-rod, C, that extends through both heads of the cylinder. At the top of this cylinder there is a cylindrical valve chest, D, containing the valve E, which is placed within and moved by the piston F.

The valve E is similar to an ordinary D-valve, and when moved back and forth in its chest it admits steam to and exhausts it from the cylinder A in the usual way.

Ports G are made in the side of the valve-chest, and connected with transverse passages *a* in the cylinder-heads by the crossed passages *b*, which are shown in dotted lines. The passages *a* lead through the opening in the cylinder-heads, through which the piston-rod slides, and into the exhaust-receiver H. In the piston-rod C there are circumferential grooves *c*, equally distant from the piston, and arranged to coincide with the passages *a* when the piston arrives at the end of its stroke. The cylinder-heads are provided with spring-packing, that surrounds the rod and prevents the escape of steam from the cylinder to the passage *a*.

The operation is as follows: Steam is admitted to the cylinder A through the piston F and over the valve E. When the piston arrives at the end of its stroke, the groove *c* in the piston-rod coincides with the passage *a* in the cylinder-head, and steam escapes, through the exposed port G, passage *b*, and passage *a*, to the exhaust-receiver H, when the steam that leaks by the piston F drives it, together with the valve E, to the opposite end of the valve-chest, and shifts the steam in the cylinder A, so that the piston B is propelled toward the opposite end of the cylinder, and the steam is exhausted from the valve-chest in the same manner as before described.

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

The combination of the circumferentially-grooved piston-rod C, and the cylinder having passages *a b*, with the steam-chest and the valve E, as and for the purpose set forth.

JOHN TREGONING.

Witnesses:

C. SEDGWICK,

ALEX. F. ROBERTS.