J. C. DEAN & E. H. DEAN.

Steam-Pumps.

No. 133,419. Patented Nov. 26, 1872.

Fig. 1.

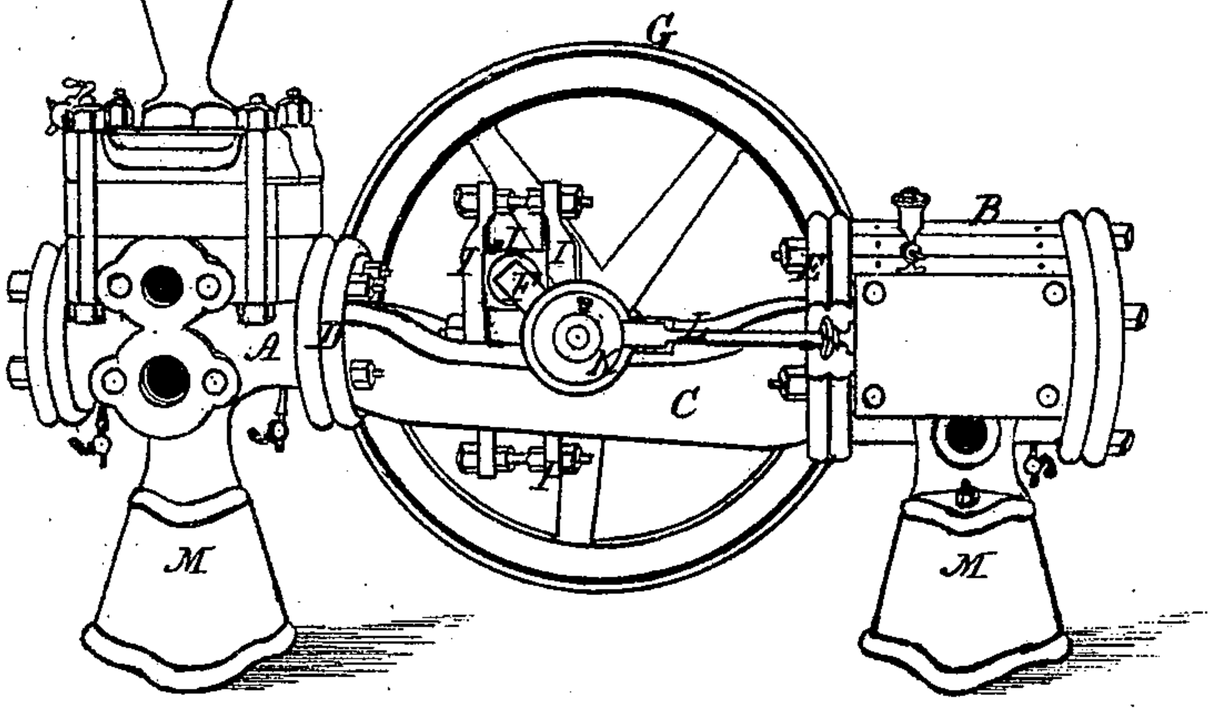


Fig. 2.

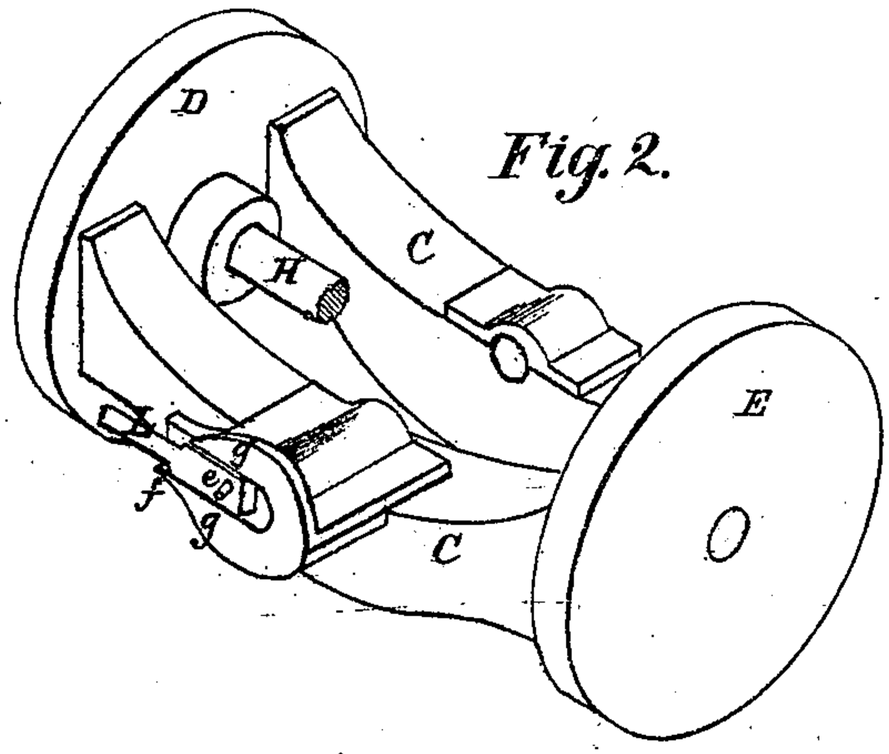
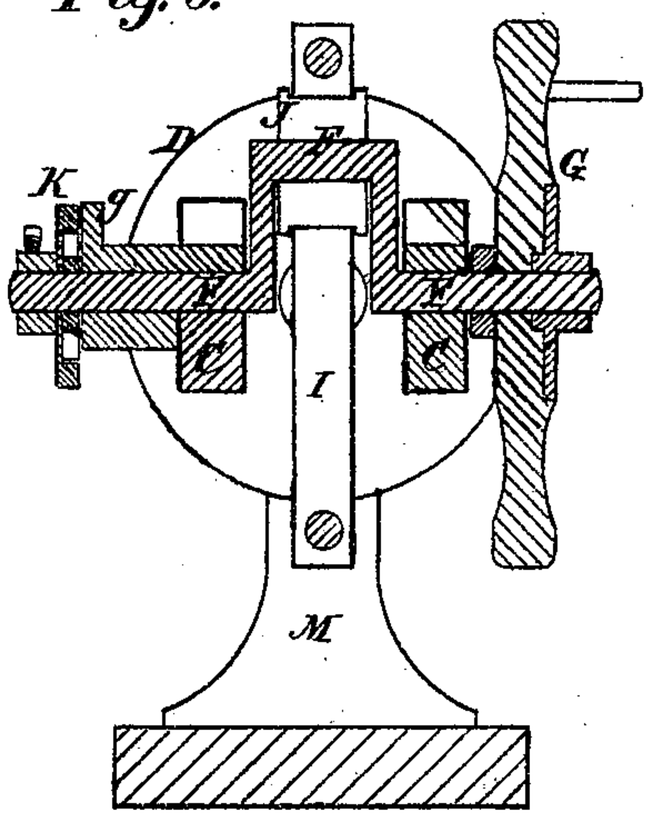


Fig. 3.



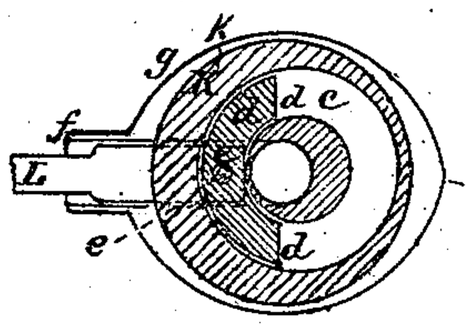
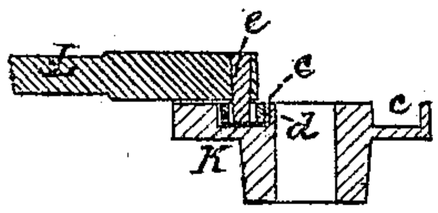


Fig. 4.



Witnesses:

Annie E. Dyer

Fredk. Artós.

Inventors:

John C. Dean

Edward H. Dean

By Johnson, Klauke & Co

their Attorneys.

UNITED STATES PATENT OFFICE.

JOHN C. DEAN AND EDWARD H. DEAN, OF INDIANAPOLIS, INDIANA.

IMPROVEMENT IN STEAM-PUMPS.

Specification forming part of Letters Patent No. **133,419**, dated November 26, 1872.

To all whom it may concern:

Be it known that we, JOHN C. DEAN and EDWARD H. DEAN, of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Steam-Pumps, of which the following is a specification:

Our invention relates to double-acting steam-pumps having a single slide-valve engine; and the improvement which we have made consists in the construction of the eccentric which actuates the valve-stem, said improvement consisting of a segment working on a pin on the valve-stem and within an eccentric groove in a disk on the crank-shaft, and in holding the segment and stem in their working positions for the purpose of obtaining a large and firm bearing for the valve-stem, and to render the turning of the centers more easy, and without noise or wearing gutters in the groove; and, also, in the combination and arrangement of the several parts, whereby we dispense with the usual intricate arrangement of steam-ports and piston-valves, which require great care and nice adjustment, and which soon become leaky under use, producing a defective action of the pump and varying the stroke, and in this way wearing the center of the cylinders and making both pistons leaky at mid-stroke.

In the accompanying drawing, Figure 1 represents a partial side perspective view of a steam-pump embracing our invention. Fig. 2 represents a view in perspective of the supporting cradle-frame for the crank-shaft, and showing the cylinder-heads of the pump and engine. Fig. 3 represents a cross-section at the line *x x* of Fig. 1; and Fig. 4, a view, showing the eccentric segment connecting the valve-stem, and the manner of holding the segment within the eccentric groove and the valve-stem to the segment.

The pump A and the steam-cylinder B are of the best style now in use, the engine, however, having a simple slide-valve instead of the three-port slide-valve engine now used in double-acting pumps. The pump and engine cylinder are connected to each other by means of a strong cradle-frame, consisting of two horizontal parallel bars, C C, and two heads or end disks, D E, which constitute the inner cylinder-heads of the pump and engine; while the cradle-bars C support the crank-shaft F and balance-wheel G, thus forming a single frame with two of the cylinder-heads, and a strong compact cradle for the operating parts, and in a very great degree reducing both the expense of the pump and engine, rendering the pump more durable and solid than if the cradle-bars were secured separately to the cylinder-heads. The piston-rods H H of the two cylinders are connected by a yoke, I, arranged between the cradle-bars and moving with the pistons. The crank-shaft F passes through this yoke, and the crank-box J slides vertically therein at each revolution of the crank-shaft, giving a reciprocating motion to the two pistons. The yoke I is made adjustable to the working of the crank-box J by means of screw-rods *a* and lock-nuts *b*. The crank-shaft is secured in suitable boxes upon the cradle-bars just midway between the pump and engine, and carries on one end a balance-wheel, G, and on the other an eccentric, *c*, which operates the stem of a simple slide-valve engine, thus making a very compact and economical arrangement of these parts with respect to each other. The eccentric consists of a groove, *c*, on the inner face of the disk K, and a segment-bearing piece, *d*, within said groove *c*, having a hole to receive a pin, *e*, on the end of the valve-rod L, as shown in Fig. 4. The segment-slide *d* and the valve-stem L, however, having no fixed connection with each other or the eccentric groove, must be held securely together and allow of their free movement, which is effected by forming on the journal-box a guide, *f*, and side bearing *g*, which holds these parts snugly together, and thus produces a simple, cheap, and easy eccentric movement, which may be readily separated, when desired, by simply removing the screws which hold the journal-box in place. This arrangement allows the parts to be easily put together and adjusted for work, and is a convenient and advantageous device. The balance-wheel and the eccentric are outside of the cradle-bars, and so compact and firm is the pump that it requires no expense for foundation of any kind, simply requiring a base or foot standard, M, cast with and forming a part of the steam and water cylinders, as the working parts of the pump are free from concussion or jar, turns the centers softly, and allows the water-valves to seat quietly. The strength and compact-

ness of the pump allow it to be run rapidly without injury; and so easy is its motion that it can be run by hand, and, therefore, can be run with much less steam than if it did not possess these advantages.

From the foregoing description it will be seen that our double-acting steam-pump is composed chiefly of three parts, viz., the pump, the engine, and the connecting-cradle with its cylinder-heads; and when these parts are put together the foot or base standards simply serve to support them at a proper height for the balance-wheel, and the usual expensive foundation-bed is dispensed with, allowing the pump to be easily removed from place to place by simply disconnecting the steam and water pipes.

Having described our invention, we claim—

1. The segment-bearing *d* of the eccentric groove *c*, connected and held to the valve-stem L by a pin, *e*, and in working condition with the eccentric-groove by the bearing guide-block *f g* of the crank-shaft journal-box, as described.

2. In a steam-pump in which the engine and pump cylinders A B are arranged as described, we claim the combination and arrangement therewith of the cradle-frame C, heads D E, crank-shaft F with its yoke I, balance-wheel G, and valve-stem and eccentric *k*, the several parts being constructed and arranged as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses this 13th day of May, A. D. 1872.

JOHN C. DEAN.
EDWARD H. DEAN.

Witnesses:
F. L. BIXBY,
J. M. BUTLER.