

(No Model.)

C. C. KNAUSS & J. E. KRAUSE.
ROTARY ENGINE OR PUMP.

No. 519,156.

Patented May 1, 1894.

FIG. 1.

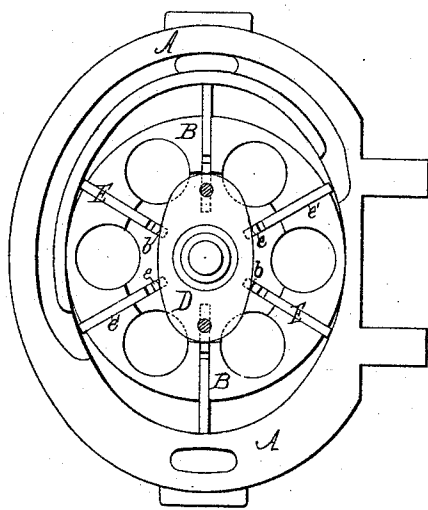


FIG. 2.

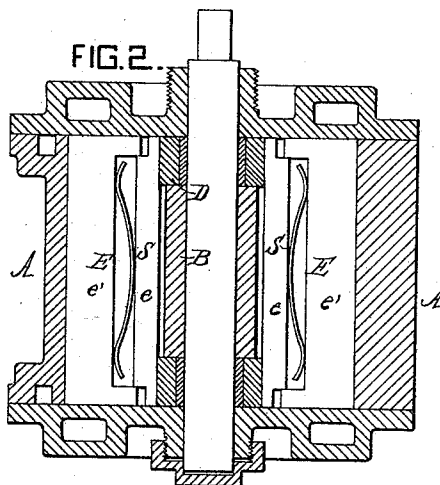
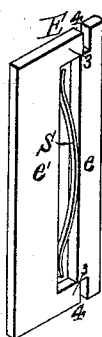


FIG. 3.



WITNESSES:

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INVENTORS

BY
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UNITED STATES PATENT OFFICE.

CHARLES C. KNAUSS AND JAMES E. KRAUSE, OF BETHLEHEM,
PENNSYLVANIA.

ROTARY ENGINE OR PUMP.

SPECIFICATION forming part of Letters Patent No. 519,156, dated May 1, 1894.

Application filed September 12, 1893. Serial No. 485,324. (No model.)

To all whom it may concern:

Be it known that we, CHARLES C. KNAUSS and JAMES E. KRAUSE, of Bethlehem, Northampton county, Pennsylvania, have invented Improvements in Rotary Engines or Pumps, of which the following is a specification.

Our invention is more particularly intended for application to rotary steam engines, but may also be applied to rotary engines operated by other motive fluid and also to rotary pumps. In rotary engines or pumps in which radially sliding blades carried by an internal rotating drum are employed, in connection with fixed cams to positively act upon the blades and determine their radial movement, difficulty is frequently encountered owing to scale or other extraneous matter getting into the cylinder and encountering the blades with the result of stopping the engine. To meet this difficulty we construct each blade of two parts with an intermediate yielding spring.

In the accompanying drawings Figure 1 is a plan or end view of a rotary engine provided with our improvement, the head of the cylinder being removed. Fig. 2 is a vertical section, and Fig. 3 is a perspective view of one of the blades.

Our improvement may be applied to various constructions of engines or pumps, and it will therefore be understood that while we describe our invention in connection with or as applied to one form of engine, we do not confine ourselves thereto.

In these drawings, A is the cylinder of oval or eccentric cross-section and within this is mounted to turn the rotary drum B, provided with suitable radial slots *b* for the reception of the sliding blades. Fixed to the two heads of the cylinder are cams D, D of an outline corresponding with the internal section of the cylinder. These cams are to act positively upon the blades, and in this case they are arranged to occupy spaces within the recessed

ends of the drum and to act upon the back edges of the blades.

As will be seen more clearly on reference to Figs. 2 and 3, each blade E is made in two parts *e e'* of substantially the same thickness and one part arranged in line with the other; one part forms in effect a continuation of the other, and between the two is arranged an elliptic spring S such that when the two-part blade is in place and the cams are acting on one part, while the opposite edge of the other part bears against the interior of the cylinder, the outer part can yield in the radial direction to let any scale or other obstruction which happens to get into the cylinder pass. The danger of stoppage of the engine is thereby overcome. To guide the two parts better and to confine the spring in place, we make them to overlap, and for this purpose cut one part *e'* out to leave ears 3, 3, which fit into notches 4, 4 formed in the edges of the other part *e*.

We claim as our invention—

The combination of the cylinder, rotating drum and fixed cams of a rotary engine or pump with a series of radial blades carried by the rotating drum, each blade being made in two parts of substantially the same thickness in line with each other, and one having ears 3, 3, adapted to notches in the other, an elliptic spring, S, between the said ears acting to press one part of the blade against the cams, and the other against the interior of the cylinder, all substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES C. KNAUSS.
JAMES E. KRAUSE.

Witnesses:

H. B. STERN,
T. O. FRADENECK.