

(No Model.)

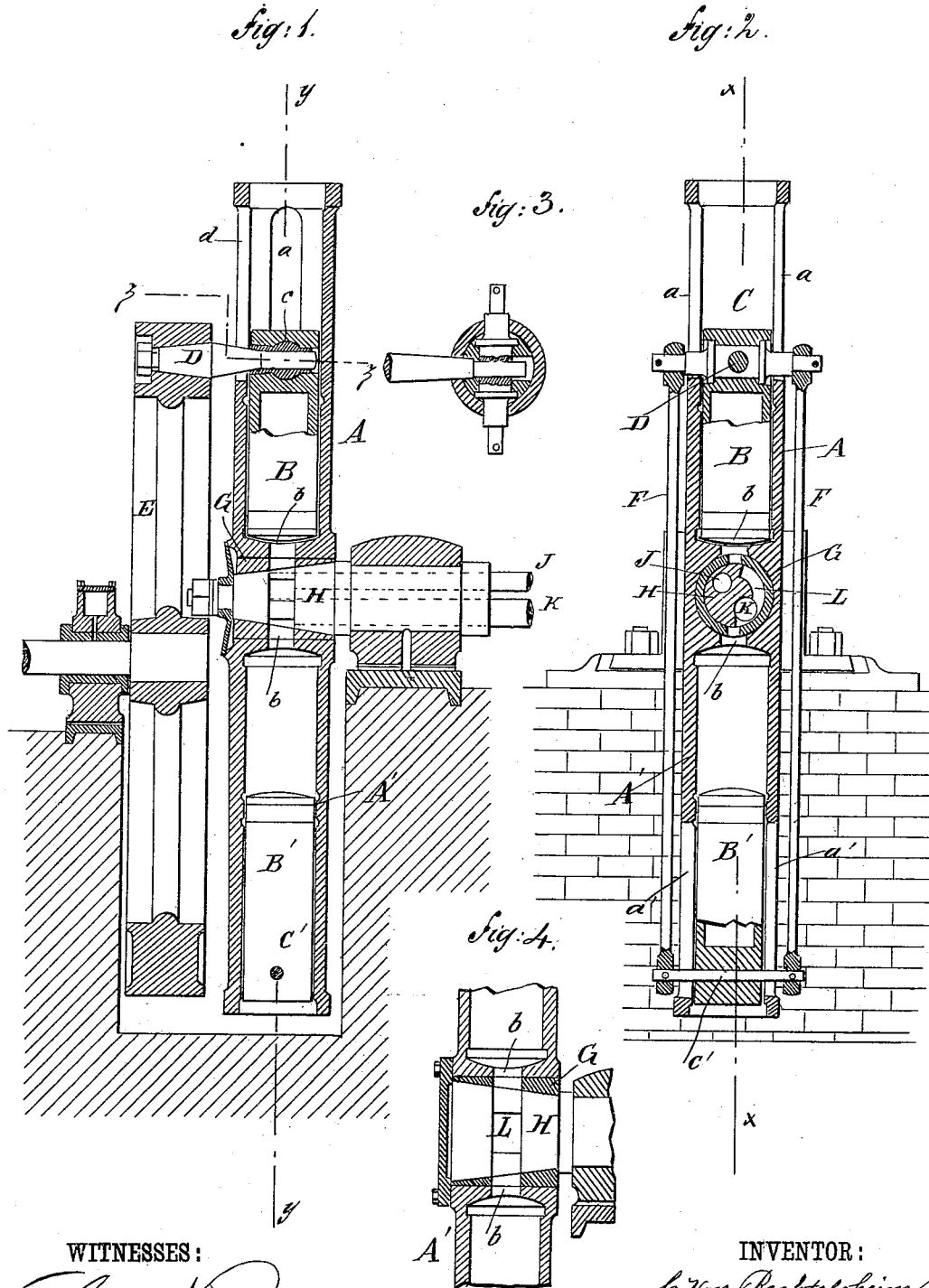
2 Sheets—Sheet 1.

C. VON BECHTOLSHEIM.

STEAM ENGINE.

No. 263,258.

Patented Aug. 22, 1882.



WITNESSES:

*Chas. Nida*  
*C. D. Dwyer*

INVENTOR:

*C. Von Bechtolsheim*  
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ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

C. VON BECHTOLSHEIM.

## STEAM ENGINE.

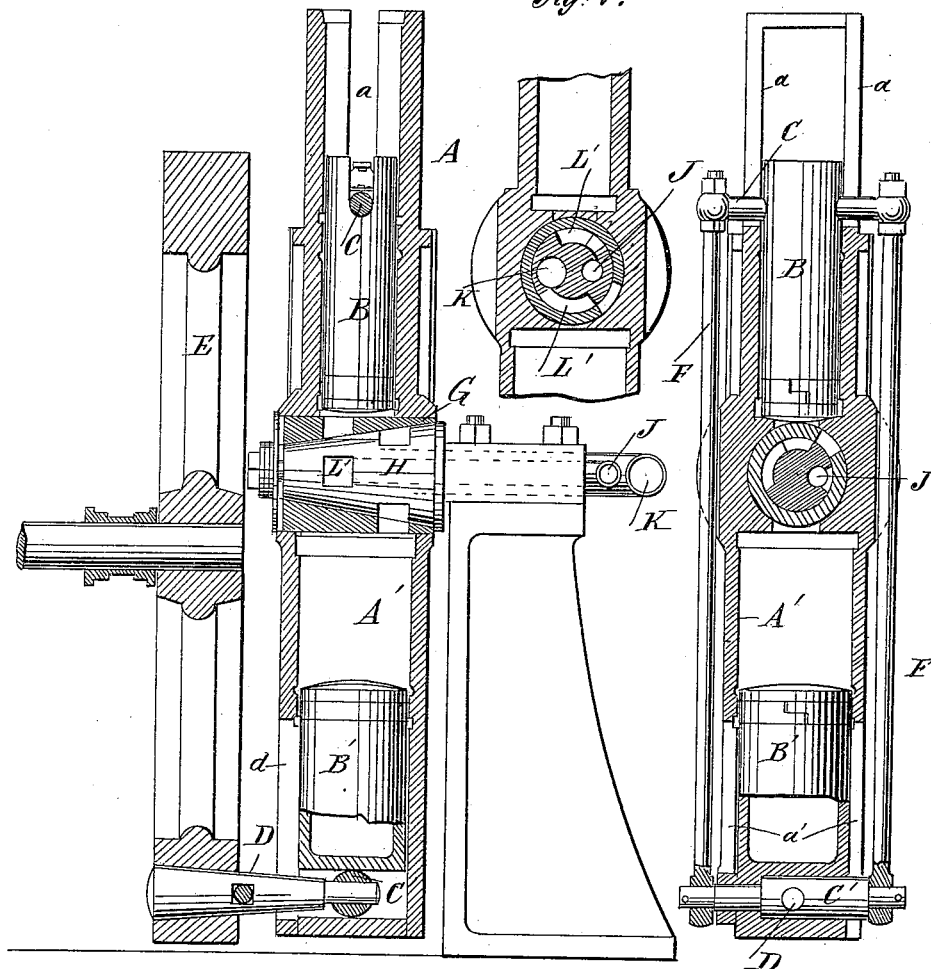
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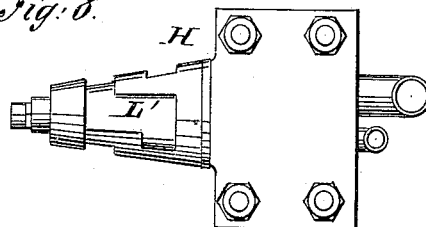
Fig: 5.

*Fig: 6.*

*Fig. 7.*



*Fig. 8.*



WITNESSES :

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# UNITED STATES PATENT OFFICE.

CLEMENS VON BECHTOLSHEIM, OF MUNICH, GERMANY.

## STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 263,258, dated August 22, 1882.

Application filed June 24, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, CLEMENS VON BECHTOLSHEIM, of Munich, Germany, have invented new and useful Improvements in Steam-Engines, of which the following is a specification.

The object of my invention is to provide a new and improved engine for steam, compressed air, water, &c., which is a direct-acting rotary engine, but is devoid of the defects of the usual rotary engines—for instance, leakage, undue friction, and subsequent overheating of the parts, jerking movements, &c.

The invention consists in an engine constructed with rotary cylinders having their inner ends resting against a valve trunnion or pivot, as will be fully described and set forth hereinafter.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of my improved engine on the line *xx*, Fig. 2. Fig. 2 is a cross-sectional elevation of the same on the line *yy*, Fig. 1. Fig. 3 is a sectional plan view of the same on the line *zz*, Fig. 1. Fig. 4 is a detail sectional elevation of the regulating-valve pivot, showing a modified construction of the same. Fig. 5 is a longitudinal sectional elevation of a compound engine constructed on my improved plan. Fig. 6 is a cross-sectional elevation of the same. Fig. 7 is a cross-sectional elevation of the regulating-valve pivot of the same. Fig. 8 is a plan view of the same.

The cylinders *A A'* contain plunger-pistons *B B'*, in the outer ends of which short transverse shafts *C C'* are held, so as to be adapted to turn slightly, the ends of these shafts projecting through longitudinal guide-slots *a a'* in the cylinders. In one of these transverse shafts one end of a pintle, *D*, is journaled, the opposite end of which is secured on the spokes or rim of a fly-wheel, *E*, which also serves as a belt-pulley, or is mounted on the same shaft with the belt-pulley. The pintle *D* passes through a longitudinal guide-slot, *d*, in the cylinder, to the piston of which it is attached. The ends of the short shafts *C C'* are connected by rods *F*, so that both pistons will operate together, and when one moves inward the other moves outward. The inner end of each cyl-

inder is provided with an aperture, *b*, for the ingress and egress of steam. The inner ends of the cylinders rest against a funnel-shaped sleeve, *G*, held thereto and having apertures corresponding with the apertures *b* in the ends of the cylinders. A tapering trunnion or pivot, *H*, fits within the sleeve *G*, which turns on it, so that the two cylinders turn on this trunnion or pivot. This pivot or trunnion *H* is provided with a longitudinal steam-inlet aperture, *J*, and a larger steam-outlet aperture, *K*, which communicate with segmental grooves *L* in the surface of the trunnion. The center of the pivot or trunnion *G* is out of the center of the wheel *E* a distance equal to half the stroke of the pistons. In the compound engine shown in Figs. 5, 6, 7, and 8 one cylinder is larger than the other, and the grooves *L'* in the trunnion or pivot *G* are so constructed that the steam can pass from the high-pressure to the low-pressure cylinder, and can then pass off from the latter cylinder through the outlet pipe or aperture *K*. The live steam enters the high-pressure or smaller cylinder.

In the modification shown in Fig. 4 the trunnion or pivot is made flaring instead of tapering.

The speed is regulated by a throttle-valve of suitable construction, or by means of a worm which moves the trunnion or pivot, the steam-conducting pipes being arranged accordingly. The condensation-water in the cylinders can be removed by means of a valve in the piston or by a transverse groove provided in the cylinder, into which this water flows when the plunger or piston is in the outer position, from which groove it flows through a longitudinal groove in the plunger when the plunger or piston is in the inner position.

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

1. In a rotary cylindered engine, the combination, with the radial cylinders *A A'* and pistons *B B'*, of the connecting-yoke consisting of the short shafts or studs *C C'* and the parallel bars *F*, lying in the plane of revolution of the cylinders, as shown and described.

2. The combination, with the cylinders *A A'*, the pistons *B B'*, the connecting-bars *F*, and the shafts or studs *C C'* in the pistons *B*

B', of the slots *a a'* through the two cylinders to admit and serve as slideways to said studs or shafts C C', as shown and described.

3. The combination, with the two cylinders  
5 A A', pistons B B', shafts or studs C C', and connecting-bars F, of the eccentric fly-wheel E, crank or pintle D, and the slot *d* through the side of one cylinder, A', to permit said  
10 crank to connect with the piston and to serve as a sliding guide to the crank, as shown and described.

4. The combination, with the two cylinders  
A A', pistons B B', shafts C C', connecting-  
bars F, slot *d* in the cylinder A', and the ec-  
15 centric fly-wheel E, of the pintle D, secured at one end in the fly-wheel E and journaled at the other end in the shaft C' within the piston B', as shown and described.

5. The combination, with the trunnion H, the sleeve G, the cylinders A A', abutting 20 thereon, the pistons B B', the shafts C C', and the connecting-bars F, of the steam-port L' and exhaust-pipe K, so arranged as to conduct the exhaust-steam of one cylinder, A, to the other cylinder, A', and thence out through the ex- 25 haust-pipe K to produce a compound engine, as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CLEMENS VON BECHTOLSHEIM.

Witnesses:

R. MARTIN,  
PAUL BECK.