(No Model.) 3 Sheets—Sheet 1.

H. T. NICCUM.

ROTARY ENGINE.

No. 263,662. Patented Aug. 29, 1882.

Fig 1.

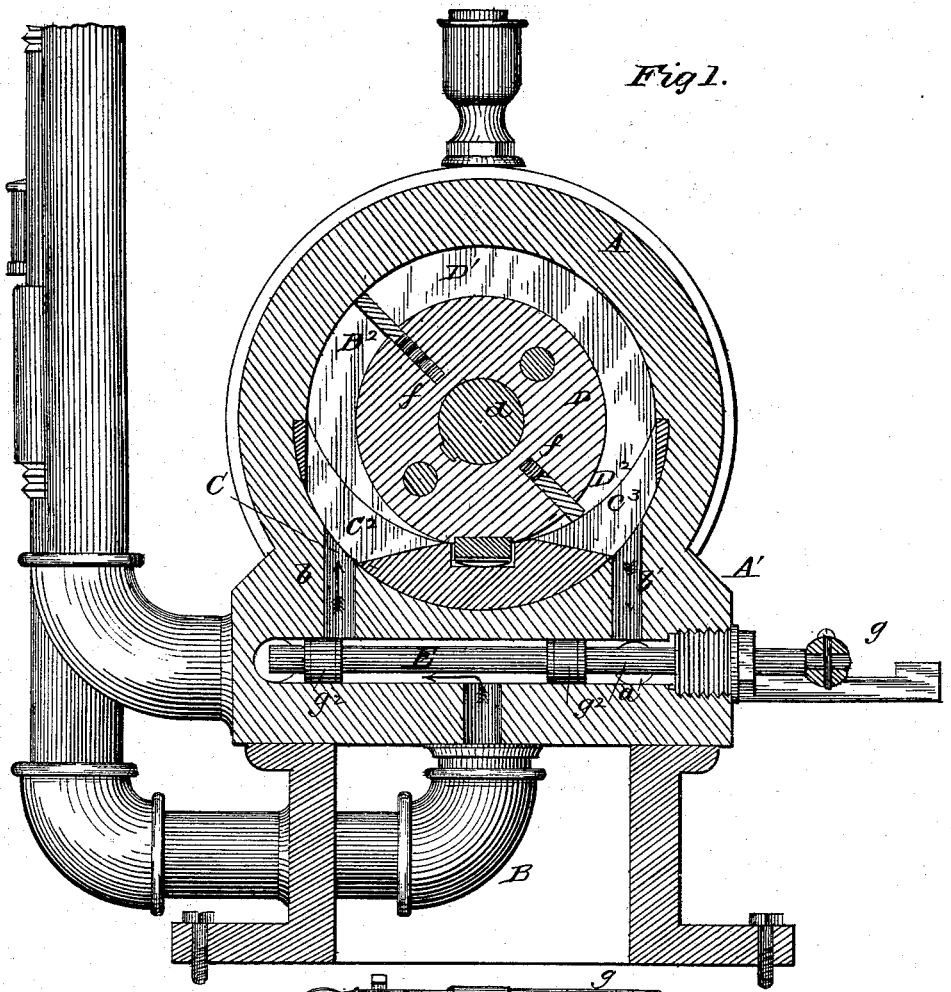
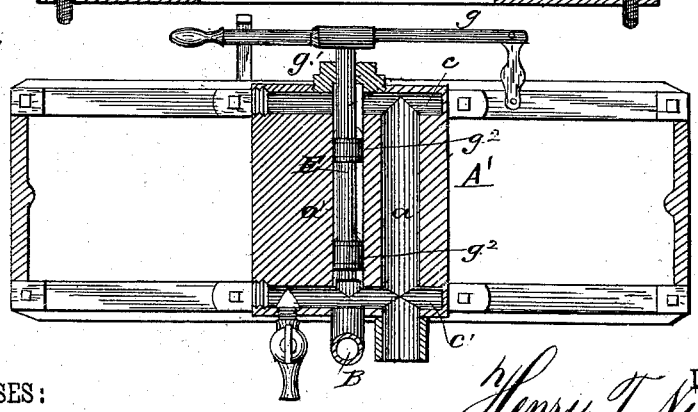


Fig 3



WITNESSES:

Fred. L. Dieterich

Mrs A. Madigan

INVENTOR.

Henry T. Niccum

by Louis Bagger & Co.

ATTORNEYS.

(No Model.) 3 Sheets—Sheet 2.

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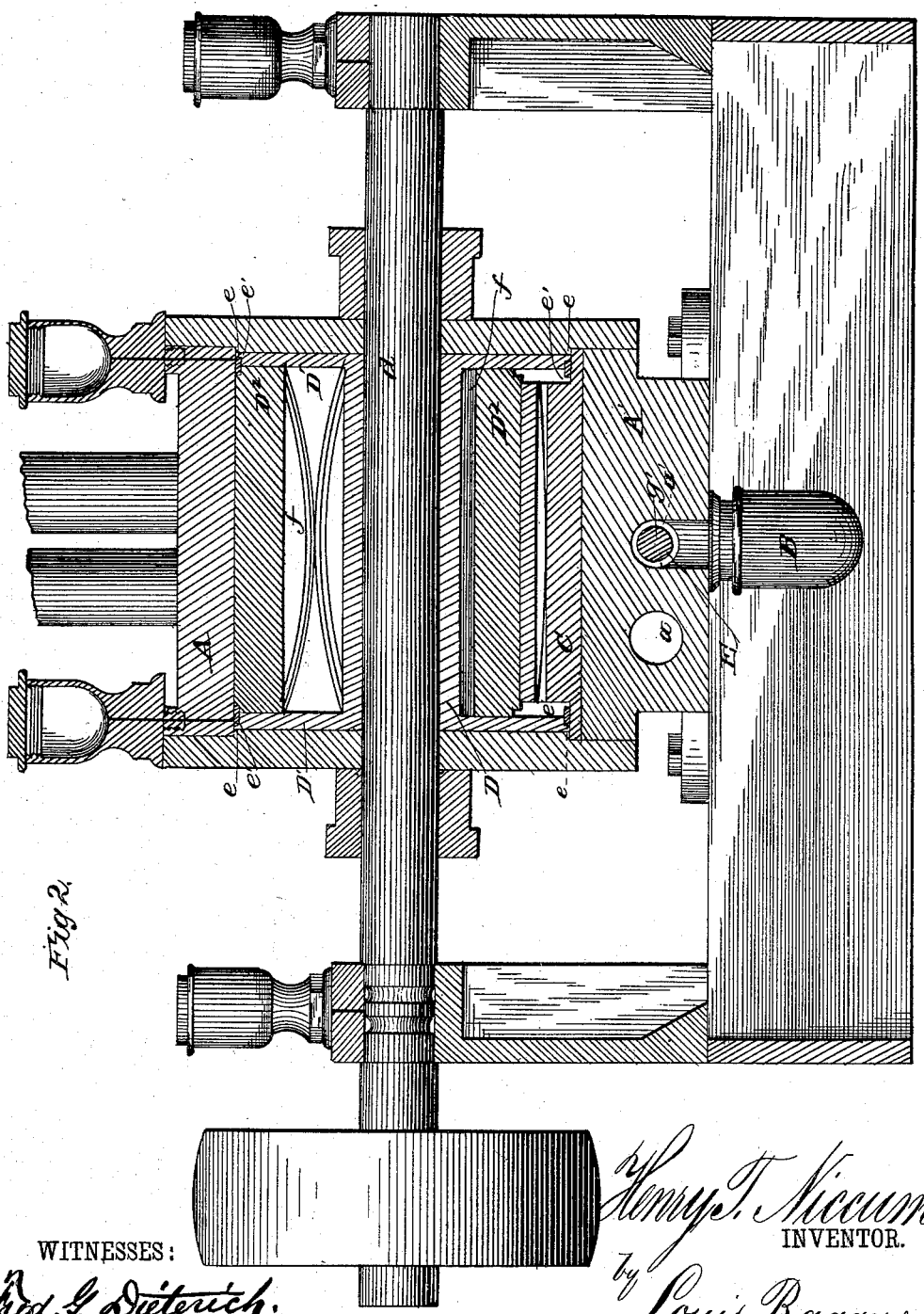


Fig 2.

WITNESSES:

Fred. L. Dieterich.

Wm a. Madigan

Henry T. Niccum
INVENTOR.

by Louis Bagger & Co.
ATTORNEYS.

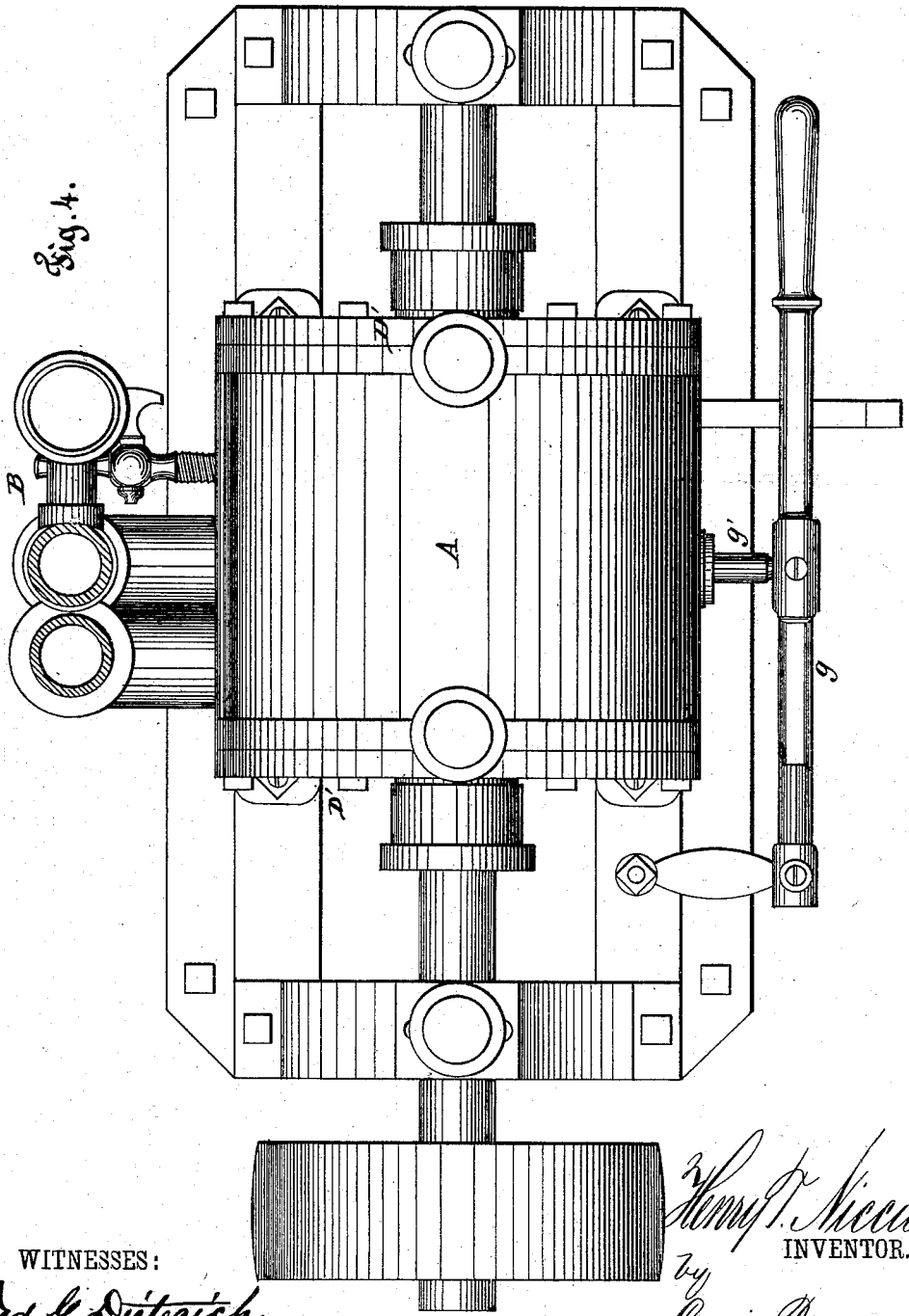
(No Model.) 3 Sheets—Sheet 3.

H. T. NICCUM.

ROTARY ENGINE.

No. 263,662. Patented Aug. 29, 1882.

Fig. 4.



WITNESSES:

Fred. L. Dieterich

Jno. A. Madigan

Henry T. Niccum
INVENTOR.

by Louis Bagger & Co
ATTORNEYS.

UNITED STATES PATENT OFFICE.

HENRY T. NICCUM, OF FINDLAY, OHIO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO SAMUEL D. HOUPT AND CHANCEY D. HUMPHREY, BOTH OF SAME PLACE.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 263,662, dated August 29, 1882.

Application filed June 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY T. NICCUM, of Findlay, in the county of Hancock and State of Ohio, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a transverse section, and Fig. 2 is a vertical longitudinal section, of my improved rotary engine. Fig. 3 is a horizontal section taken through its base, and Fig. 4 is a plan view of the same.

This invention has relation to an improved rotary engine, having for its object, among other things, to simplify construction, while promoting durability, and to economize steam without loss of power; and it consists in the combination and arrangement of parts, substantially as hereinafter more fully set forth and claimed.

In carrying out my invention I employ the usual form of external cylinder or casing, A, having heads, as is common. The cylinder A is cast or otherwise mounted upon a base, A′, provided with two horizontal passages, *a a′*, which communicate by vertical passages *b b′* with the chamber of the case or cylinder A. The passages *a a′* are connected by passages *c c′* with each other.

B is the steam-supply pipe, connnecting about centrally of the bottom of the base A′ with the upper passage, *a′*; and B′ is the exhaust-steam pipe, connecting with the lower passage, *a*. The arrows indicate the course of the live steam and the exhaust-steam.

C is a cam of a concavo-convex shape, arranged in the bottom of the cylinder A, giving its chamber an eccentric form. The cam C has two vertical passages, c^2 c^3, through it, forming continuations of the steam and exhaust passages or ports *b b′* for the supply of steam to and exhaust of steam from the cylinder-chamber. The passages c^2 c^3 are extended laterally through the cam C and out at its ends, as clearly shown in one of the views of the drawings. This construction permits the ingress and egress of the steam in a manner that will not cause the crowding or forcing of the steam into a narrow space at the surface of the piston-cylinder, which would produce an inequality of pressure upon said cylinder, and thus interfere with its easy movement.

D is the piston-cylinder secured within the cylinder A upon the driving-shaft *d*, preferably by a feather upon said shaft fitting in a longitudinal slot in the cylinder D. The heads D′ of the cylinder D are adapted to fit the chamber of cylinder A at points beyond the cam C, and have set in grooves in their peripheries rings *e*, each ring being confined between a flange, *e′*, at each end of the cylinder, and a disk thereat bolted in place. These rings are cushioned upon springs to enable them to serve as means for packing the cylinder-heads and to compensate wear to render the chamber of the cylinder A steam-tight. The cylinder D has two pistons or abutments, D^2, arranged diametrically opposite each other, and adapted to move inward and outward, they being held under the action of springs *f* as they move in contact with and away from the cam C.

E is the throttle-valve, having a handle or lever, *g*, pivoted suitably in position, and connected to a rod, *g′*, extending into the steam-supply passage *a′*, and having affixed thereto two valves, g^2 g^2, arranged in said passage. The cylinder A and the supply-pipe may have lubricating-cups affixed thereto.

This engine, it is obvious, is simple in construction, and at the same time durable. It is capable of economizing steam without loss of power, and its operation can be readily reversed.

It is apparent that by moving the throttle-valve so as to allow one of its valves g^2 to uncover the ingress-opening of the supply-pipe the steam will be fed into the chamber of the cylinder A and strike one of the pistons or abutments of the cylinder D. The impingement of the steam upon said piston or abutment will carry the cylinder D around, and thus drive its shaft, which is provided with a

band-pulley, to permit the transmission of its motion to the machinery to be operated or put in motion. As the cylinder D continues to revolve, the piston or abutment, receiving the impact of steam, will ride upon the cam C, allowing the escape of this steam through the exhaust-passage in that side of the cam and to pass out of the chamber of the cylinder A, as indicated by the arrows, and be carried off through the exhaust-pipe. In the meantime the other piston or abutment of the cylinder D, disposed, as before stated, about half the circumference of the said cylinder from the former piston or abutment, will receive also an impact of steam as it passes from the exhaust side or chamber of the cylinder past the supply-port and into the live-steam chamber of said cylinder, when it will in like manner act upon the cylinder D and drive its shaft. This action of the steam upon the pistons being kept up, a continuous rotary motion will be imparted to the piston-cylinder and its shaft.

It is obvious that by moving the throttle-valve so as to bring the valve g^2 g^2 in the same relation with what is now the exhaust-port of the chamber of the cylinder A the operation or motion of the cylinder D and its shaft can be readily reversed.

I claim and desire to secure by Letters Patent of the United States—

In a rotary engine, the combination of the cylinder A, base A′, horizontal passages a a', vertical passages b b', passages c c', cylinder D, having abutments D^2, passages c^2 c^3, throttle-valve E, handle g, rod g', valves g^2 g^2, cam C, and supply and exhaust pipes B and B′, all constructed and arranged as herein described, and for the purpose set forth.

In testimony that I claim the foregiong as my own I have hereunto affixed my signature in presence of two witnesses.

HENRY T. NICCUM.

Witnesses:
J. G. HULL,
JOHN POE.