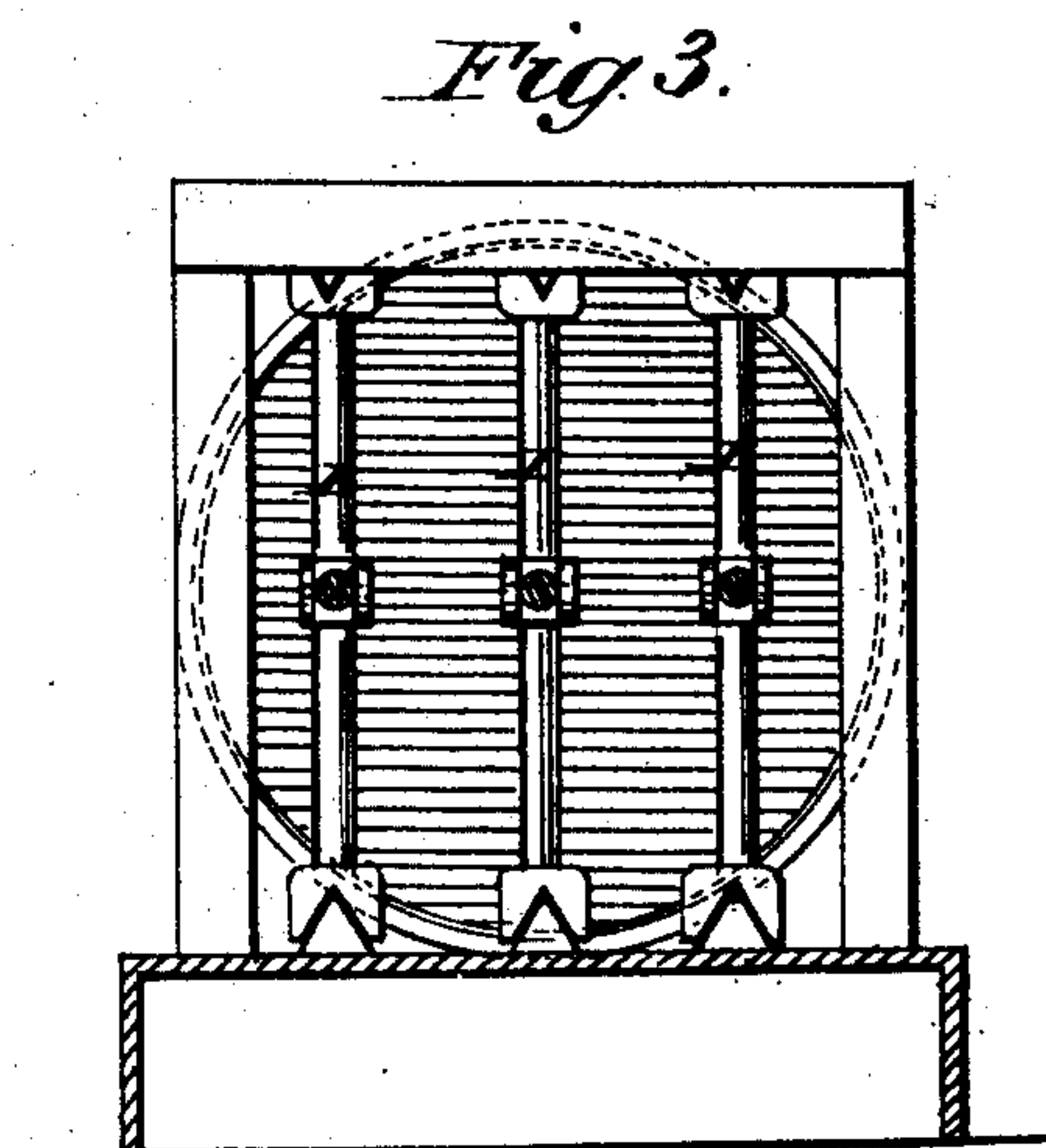
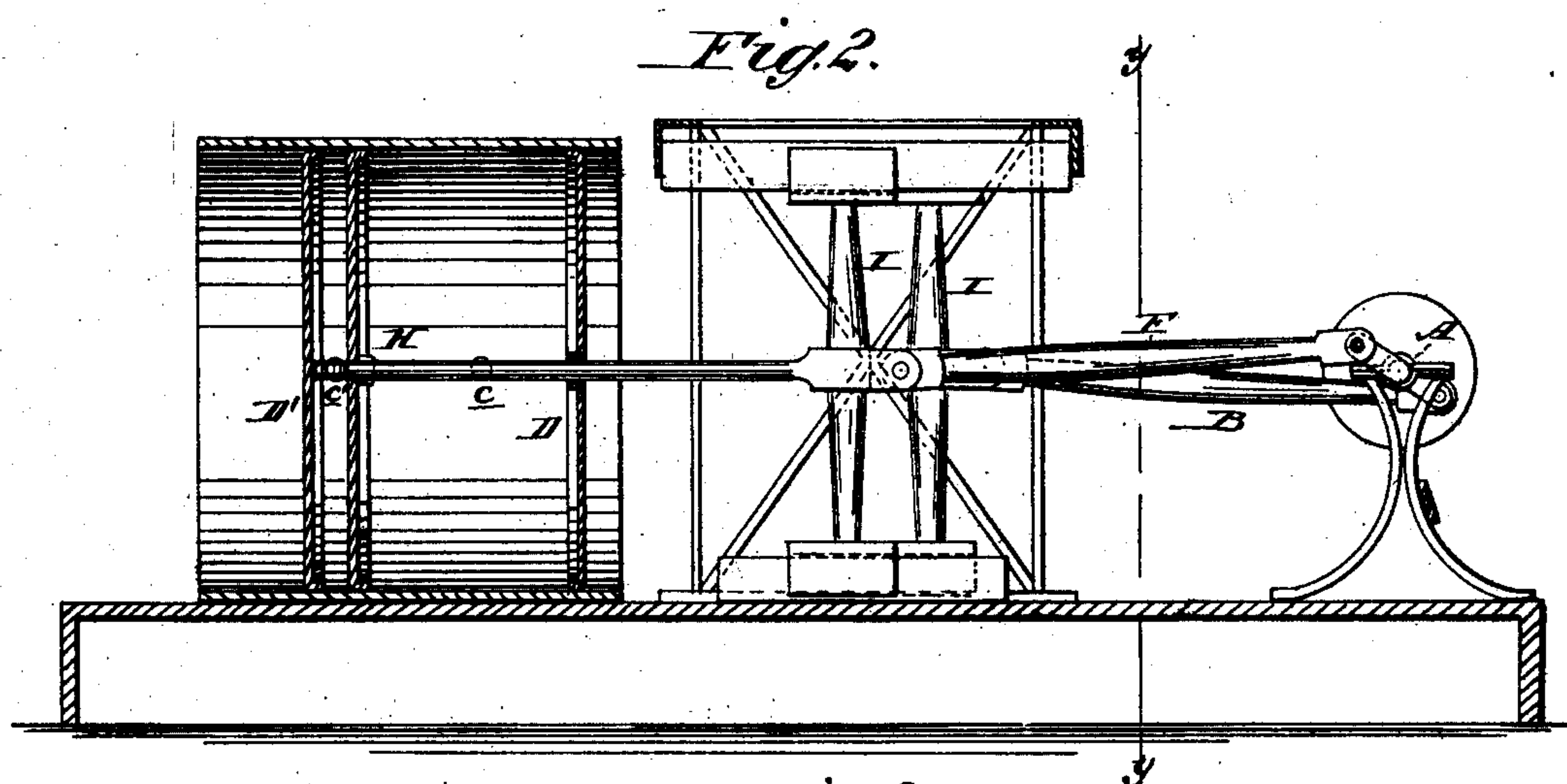
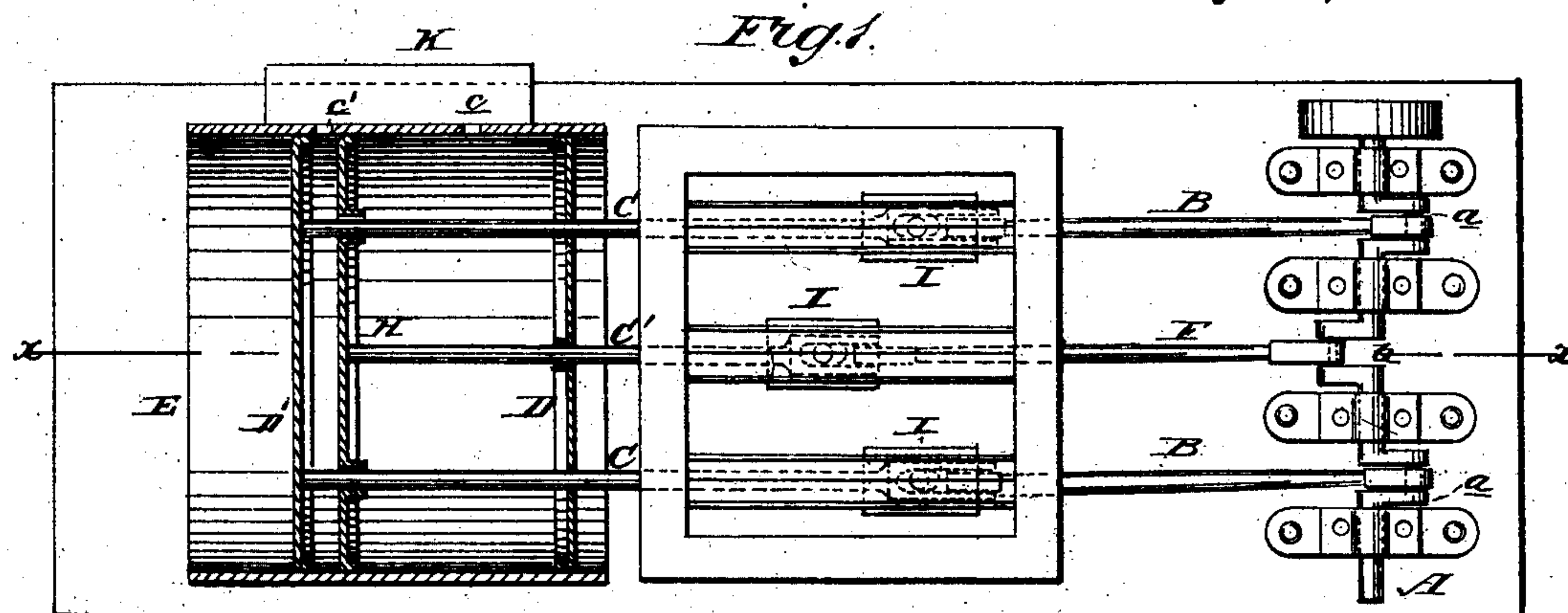


D. W. SHAW & P. W. BROWN.  
STEAM ENGINE.

No. 244,826.

Patented July 26, 1881.



WITNESSES:

*Thomas McArthur.*  
*C. Seagwick*

INVENTOR:

*D. W. Shaw*  
*P. W. Brown*  
*Munn & Co.*  
ATTORNEYS.

BY

# UNITED STATES PATENT OFFICE.

DANIEL W. SHAW AND PLEASANT W. BROWN, OF MURFREESBOROUGH,  
TENNESSEE.

## STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 244,826, dated July 26, 1881.

Application filed February 5, 1880.

*To all whom it may concern:*

Be it known that we, DANIEL W. SHAW and PLEASANT W. BROWN, of Murfreesborough, in the county of Rutherford and State of Tennessee, have invented a new and useful Improvement in Steam-Engines, of which the following is a specification.

Figure 1 is a plan of the device, partly in section. Fig. 2 is a longitudinal sectional elevation on line *xx*, Fig. 1. Fig. 3 is a sectional end elevation on line *yy*, Fig. 2.

Similar letters of reference indicate corresponding parts.

The object of this invention is to economize steam and to cause a constant equal pressure or strain upon the driving-shaft of the engine.

The invention is an improvement in the class of steam-engines having more than one movable piston working in the same cylinder, each of which is separately connected with the crank-shaft. The improvement is embodied in features of construction and the combination of parts hereinafter described and claimed.

In the drawings, A represents the crank-shaft of the engine.

*a a* represent the cranks, to which are attached the pitmen B, that connect with the rods C of the end pistons, D D', which are placed within the cylinder E.

*b* represents the crank that carries the pitman F, which is attached to the piston-rod G of the central piston, H.

It will be seen that the piston-rod G passes through the center of the outer piston, D, and is secured to the center of the central piston, H, and that the piston-rods C C pass through the piston D, and are secured thereto on either side of the rod G, and at equal distances therefrom, and also through the piston H, and have their ends secured in the piston D', and by this construction and arrangement the central piston, H, is steadied in its movement, and the movement of the pistons D D' made synchronous.

I I are the cross-heads, moving in suitable bearings.

*c c'* are the steam-supply ports, and K the steam-chest, of the cylinder E. When the parts are in the position shown in Fig. 1 the steam entering the port *c'* between the pistons H and D' will force said pistons apart in opposite directions. The pistons D D', moving toward one end of the cylinder while the central piston, H, is moved toward the opposite end thereof, as the central piston, H, and the piston D approach from opposite directions near to the port *c*, the steam, in turn, entering port *c*, forces the said pistons H and D apart again in opposite directions, and the cranks *a a*, to which the pistons D D' are connected, being set opposite the crank C, to which the piston H is connected, it will be seen that by the simultaneous movement of the three pistons the crank-shaft A is at the same moment pushed and pulled in opposite directions, so that the strain upon the crank-shaft A (the pistons being all of the same diameter) is equal at every point of its revolution.

It is designed that the cylinder E shall be provided with proper valves and exhaust-ports for regulating the supply and exhaust of steam.

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

In a steam-engine, the combination, with pitman cranks and rods, of a frame attached to bed-plate, and provided with a groove at top and bottom, and three slides connected by vertical cross-heads working side by side in said frame, as shown and described, whereby a positive movement transmits the power directly from the piston-heads to the pitman-cranks.

DANIEL WEBSTER SHAW.  
PLEASANT W. BROWN.

Witnesses:

FRANK HOWARD,  
H. C. CHAPMAN.