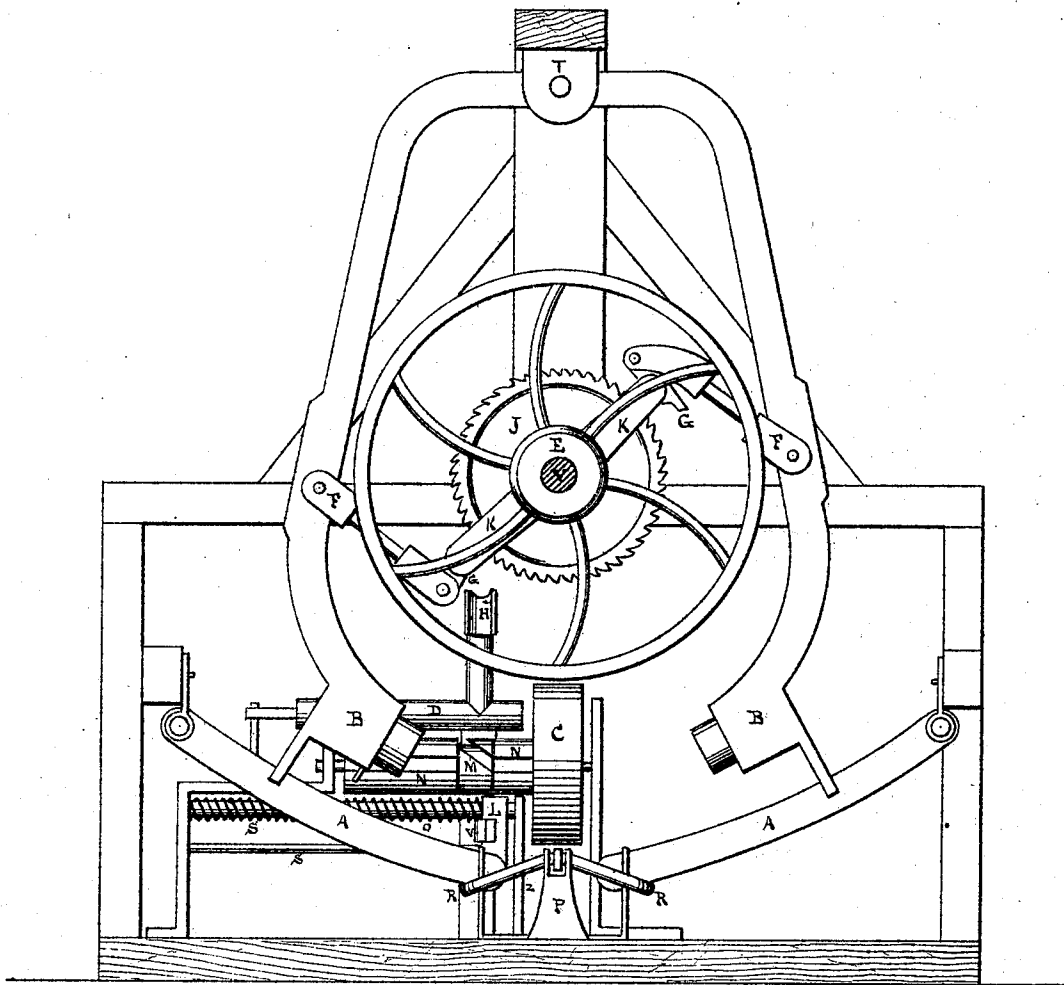


# J. S. Foster Gunpowder Engine.

No. 123,095.

Patented Jan. 30, 1872.

*Fig. 1.*



Witnesses.

*J. H. Keith*  
*Nathan Farnum*

Inventor.

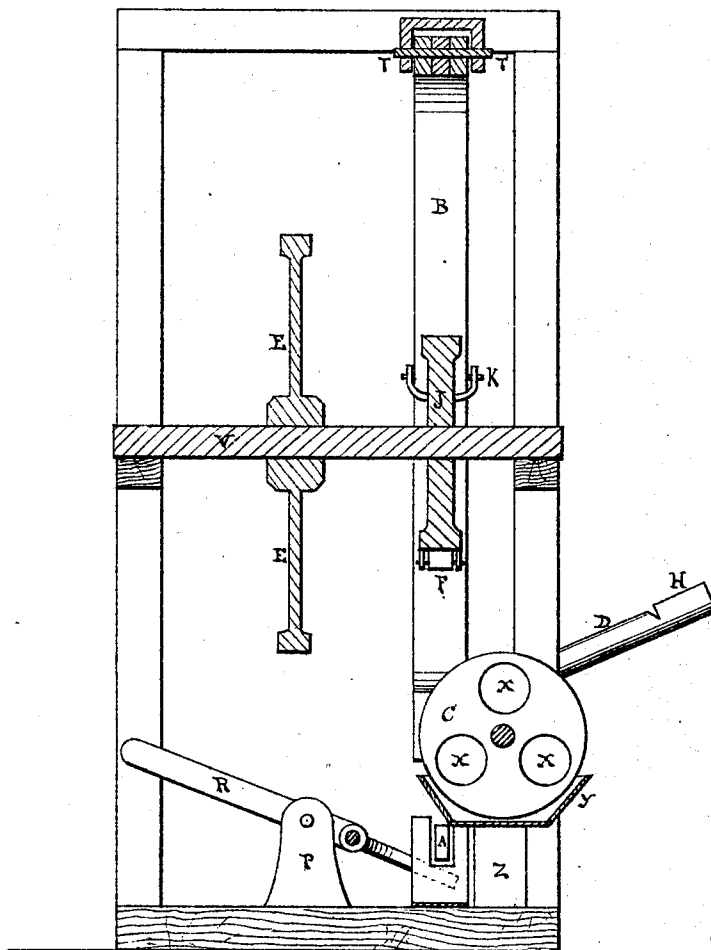
*Joseph S. Foster.*

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Fig. 2.



Witnesses.

*J. H. Keith*  
*Nathan Farnum*

Inventor.

*Joseph S. Foster*

# UNITED STATES PATENT OFFICE.

JOSEPH S. FOSTER, OF SALEM, MASSACHUSETTS.

## IMPROVEMENT IN GUNPOWDER-ENGINES.

Specification forming part of Letters Patent No. 123,095, dated January 30, 1872; antedated January 14, 1872.

I, JOSEPH S. FOSTER, of Salem, in the county of Essex and State of Massachusetts, have invented an Improved Gunpowder-Engine, of which the following is a specification:

This invention consists of an engine to be operated by the gases produced or liberated by the combustion of gunpowder or its constituent materials.

Figure 1 is a side elevation of a machine embodying my invention, and Fig. 2 is an end sectional view of the same.

The invention consists principally of two swinging arms or hammers, B B, a ratchet-wheel, J, a fly-wheel, E, and a cylinder-wheel, C. The arms are fastened to the top of the frame of the machine by the pin T, and hang one on each side of the ratchet-wheel, which is fastened to the shaft V, to which is attached the fly-wheel E. The pieces K K are placed one on each side of the ratchet-wheel, and have holes in the center, through which passes the shaft, and upon which they turn. The ends of the pieces extend beyond the circumference of the ratchet-wheel, and to these ends are attached the dogs G G. The ends of the dogs are connected to the arms by the connecting-rods F F, one on the top and one on the bottom of the ratchet-wheel. A line drawn from the two points to which the rods are attached to the arms passes through the center of the shaft. By this arrangement of connecting the arms to the shaft the arms open and close simultaneously, and operate to turn the shaft only when opening, and slip round the ratchet-wheel when closing. The cylinder-wheel C contains three cylinders or chambers, X X X, Fig. 2, one of which the ends of the hammers B B enter every time they come together. The shaft N of the cylinder-wheel has three grooves running lengthwise of the shaft and equidistant from each other. The collar M contains three straight grooves and three running spirally across, connecting the end of one groove with the opposite end of the next. A small spring keeps the spiral grooves of the collar in line with the grooves of the shaft, except when pressed. The bolt L sliding upon the

rods S S has a boss upon the end, which fits into one of the grooves of the shaft N and keeps the cylinder-wheel in such a position that the ends of the hammers enter one of the chambers. The bolt L also has a sliding catch, V, upon its side, against which a projection on one of the hammers strikes. The hopper H, into which the cartridges are placed, leads into the tube D, which has a plunger connected to the bolt L. The hammers B B have grooves, which slide on the guides A A. The lever R, when pressed, acts on the guides and holds the hammers in any desired position.

The action of the engine is as follows: A cartridge is placed in the chamber above the one in which are the hammers. The hammers are raised by hand or otherwise. As they are raised the projection on one of them strikes against the catch V in the bolt L and slides it along the rods S S, the boss on the end of the bolt passing into the spiral groove turning the cylinder-wheel, so that the next chamber is in position for the hammers to enter. When the hammers are raised sufficiently the projection slips from the catch on the bolt and the spiral spring O throws the bolt back, the spring on the collar M allowing the bolt to fly back in the straight groove. As the bolt flies back the plunger in the tube D throws a cartridge into the chamber. When the hammers are allowed to drop they compress the air in the chamber sufficiently to ignite the powder. The explosion of the powder elevates the hammers, which, acting on the ratchet-wheel, turn the shaft V. The lower part of this cylinder-wheel revolves in the water-tank Y, which prevents all heating and extinguishes any fire which may remain in the chambers.

Having thus described my invention, I claim—

The combination of the hammers B B, the ratchet-wheel J, the fly-wheel E, and the cylinder-wheel C, or their equivalents, constructed and arranged substantially as described.

Witnesses: JOS. S. FOSTER.

J. H. KEITH,  
NATHAN FARNUM.