

J. R. Armstrong,
Reciprocating Steam Engine,
No 32,039,
Patented Apr. 16, 1861.

Fig. 3.

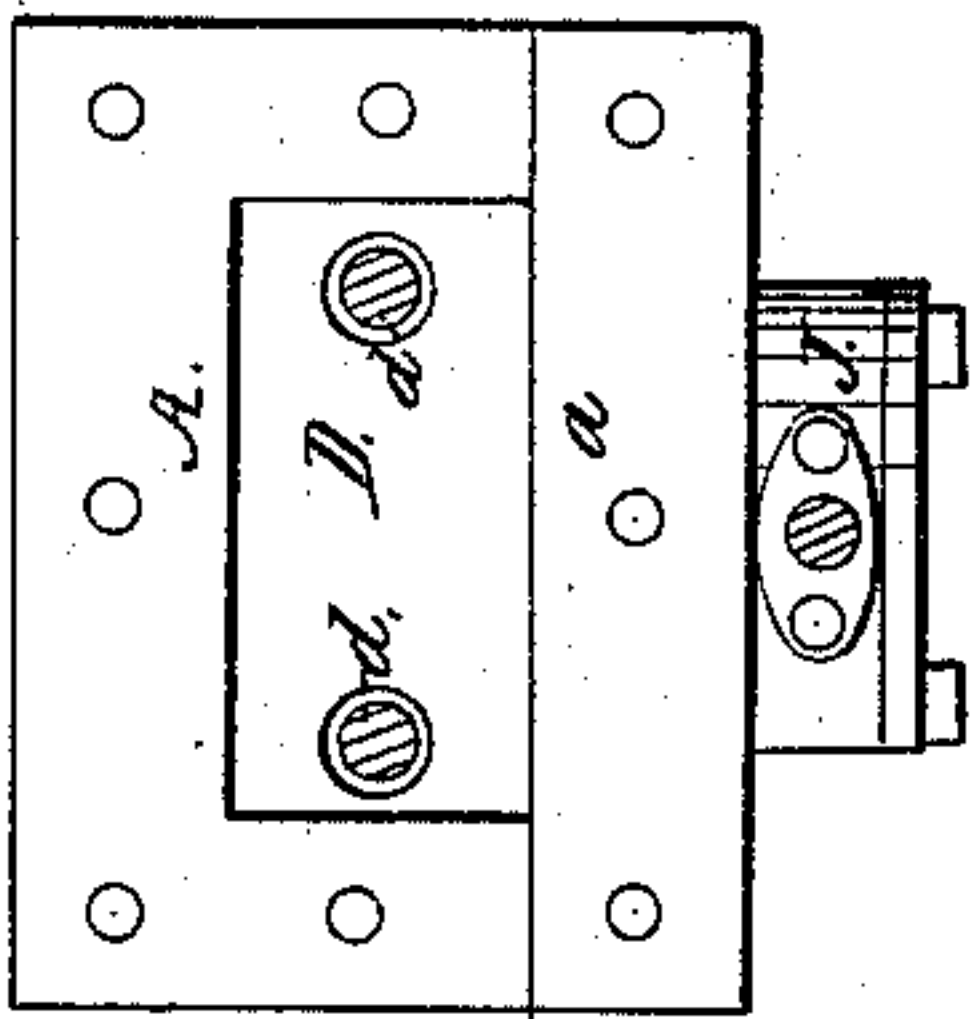


Fig. 2.

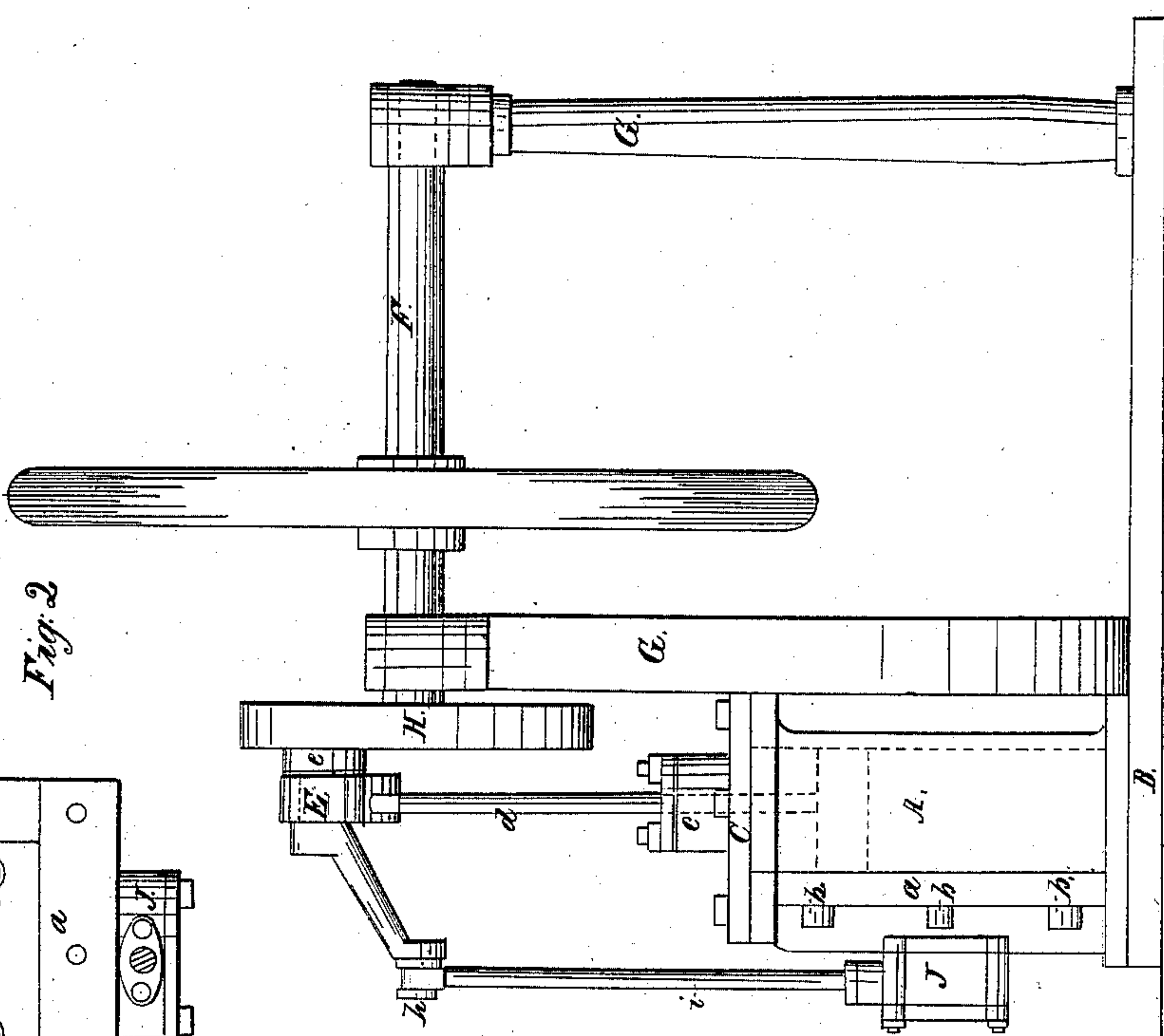
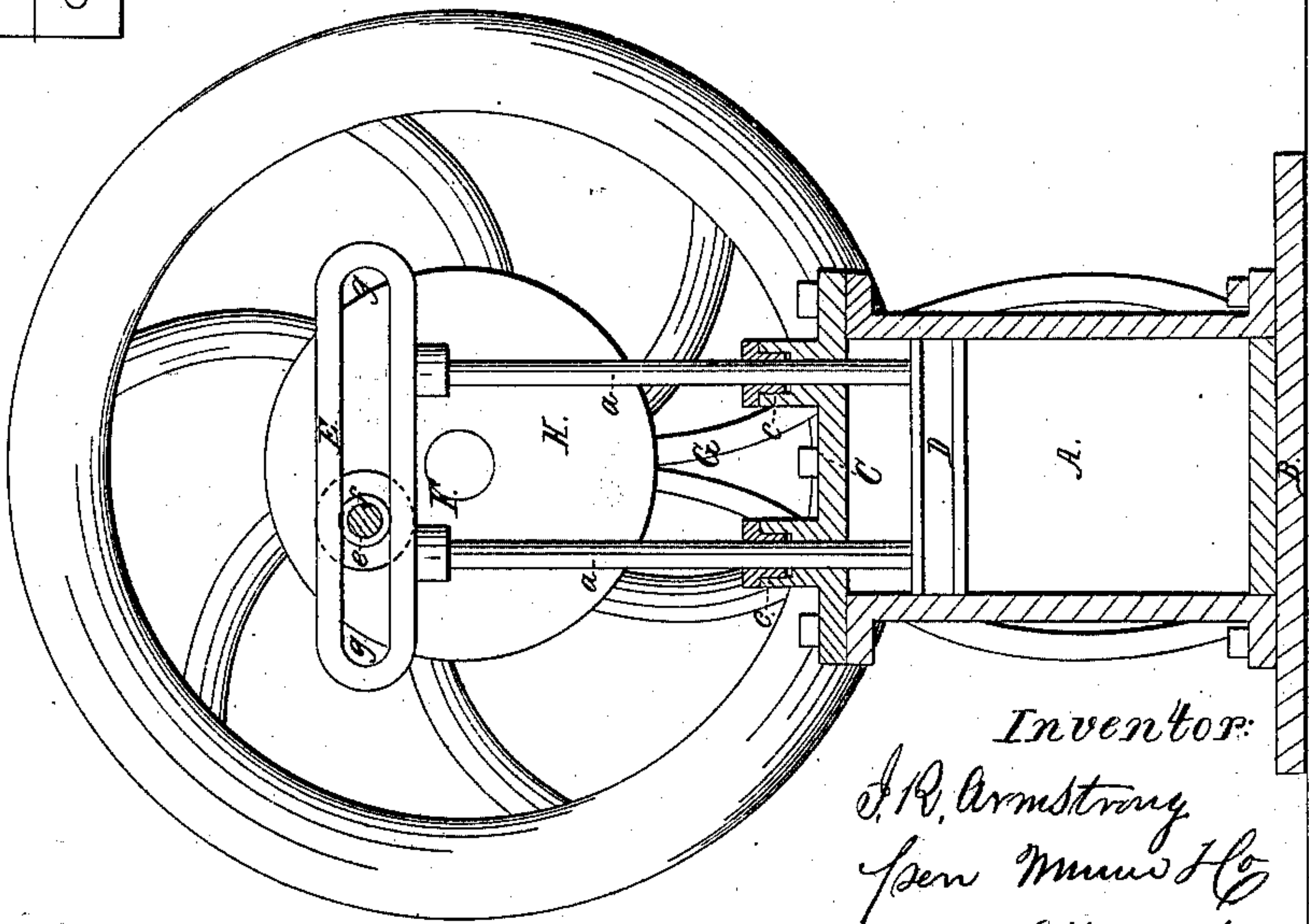


Fig. 1.



Witnesses:
J. W. Cooley
R. S. Spencer.

Inventor:
J. R. Armstrong
per Wm. H. Co.
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN R. ARMSTRONG, OF KENDALLVILLE, INDIANA.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. 32,039, dated April 16, 1861.

To all whom it may concern:

Be it known that I, JOHN R. ARMSTRONG, of Kendallville, in the county of Noble and State of Indiana, have invented a new and useful Improvement in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1 and 2 are elevations at right angles to each other of an engine constructed according to my invention, Fig. 1 being in section. Fig. 3 is a horizontal section of the cylinder.

Similar letters of reference indicate corresponding parts in the several figures.

To enable others skilled in the art to apply my invention to practice, I will proceed to describe it with reference to the drawings.

B is the bed-plate of the engine.

A *a* is the cylinder, of oblong quadrangular form in its transverse section, having three sides of its body made of a single casting, A, and the fourth of a plate, *a*, bolted to A by bolts *b b*. The interior faces of the sides of this cylinder are planed so that they are perfectly parallel in a longitudinal direction.

C is the movable head or cover of the cylinder provided with two stuffing-boxes, *cc*, for the two piston-rods *d d*, which are attached rigidly to the piston D, which is fitted to the cylinder and may be packed in any suitable manner. The piston-rods are arranged one near each of the two narrower sides of the cylinder and piston, and both in a plane parallel with the wider sides thereof and midway between the latter sides, and have rigidly secured to them the slotted cross head E.

F is the crank-shaft arranged at right angles to the wider sides of the cylinder and piston and to the cross-head E, in bearings on standards G G, bolted to the bed-plate.

H is a wrist-plate secured to the shaft F and carrying the crank-wrist *e*, which is fitted with a roller, *f*, to work in the slot *g* of the cross-head.

h is an eccentric-wrist carried by the crank-wrist *e* for the purpose of working the slide-valve, the said valve being arranged in a chest, J, attached to the cylinder, and the connection of its stem with the wrist *h* being made

by a rod, *i*, which gives the valve the necessary movement to admit steam to the cylinder above and below the piston alternately, thereby causing the piston, piston-rods, and cross-head to have a reciprocating rectilinear motion, which is caused by the direct action of the cross-head upon the crank-wrist to produce a revolution of the crank-wrist and a rotary motion of the shaft.

I prefer to make the wider sides of the cylinder and piston of a width about equal to twice that of the narrower sides, in order to admit of the piston-rods *d d* being arranged sufficiently near to the ends of the slotted cross-head to give stability to the whole of the piston-connections and to dispense with the necessity of any other guides for the piston-rods than the stuffing-boxes *cc*. By permitting the rods *d d* to be set so far apart the oblong form of the cylinder and piston enables the slotted cross-head connections, which is the simplest form of crank-connection that can be made in steam-engines with stationary cylinders, to be made sufficiently unyielding without making the cylinder of such enormous area in proportion to its stroke as is necessary to obtain this result in engines with circular cylinders. Besides this advantage of the oblong cylinder, its quadrangular form enables it to be cast without cores and in two or more pieces, thereby obviating the common occurrence of losing cylinders by blowing, and greatly reducing the expense of casting cylinders; and the planing out and bolting together of a cylinder of this kind can be effected at less expense than the boring of a cylinder of circular form.

I do not claim of itself the invention of a polygonal steam engine cylinder; neither do I claim the invention of the slotted cross-head crank-connection; but

What I claim as my invention, and desire to secure by Letters Patent, is—

The arrangement of the piston-rods *d d* and piston D with the slotted cross-head E, wrist-plate H, wrists *e h*, valve-rod *i*, and oblong steam-cylinder A, all as herein shown and described, for the purposes set forth.

JOHN R. ARMSTRONG.

Witnesses:

EBENEZER DANIELS,

WILLIAM W. HILDRETH.