

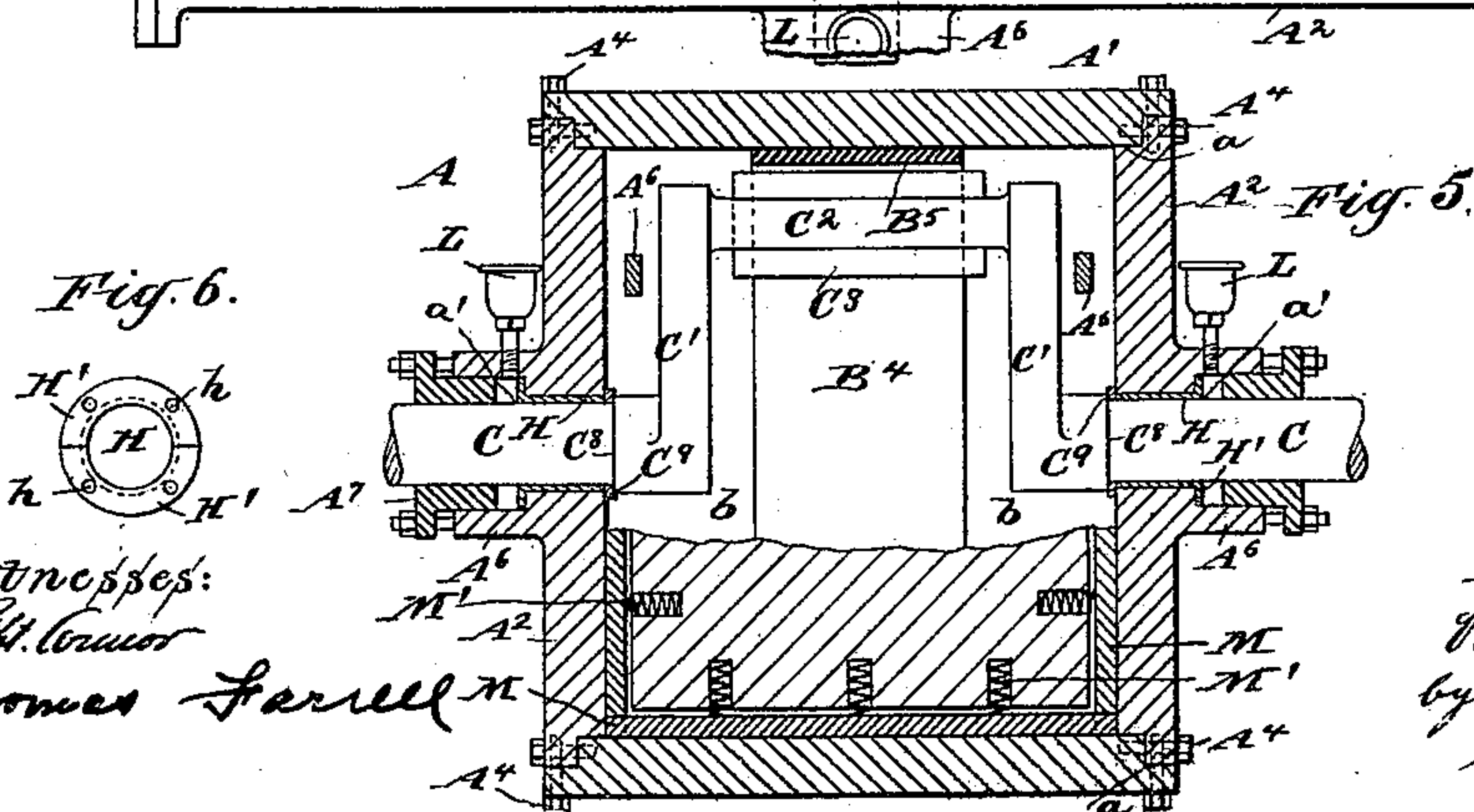
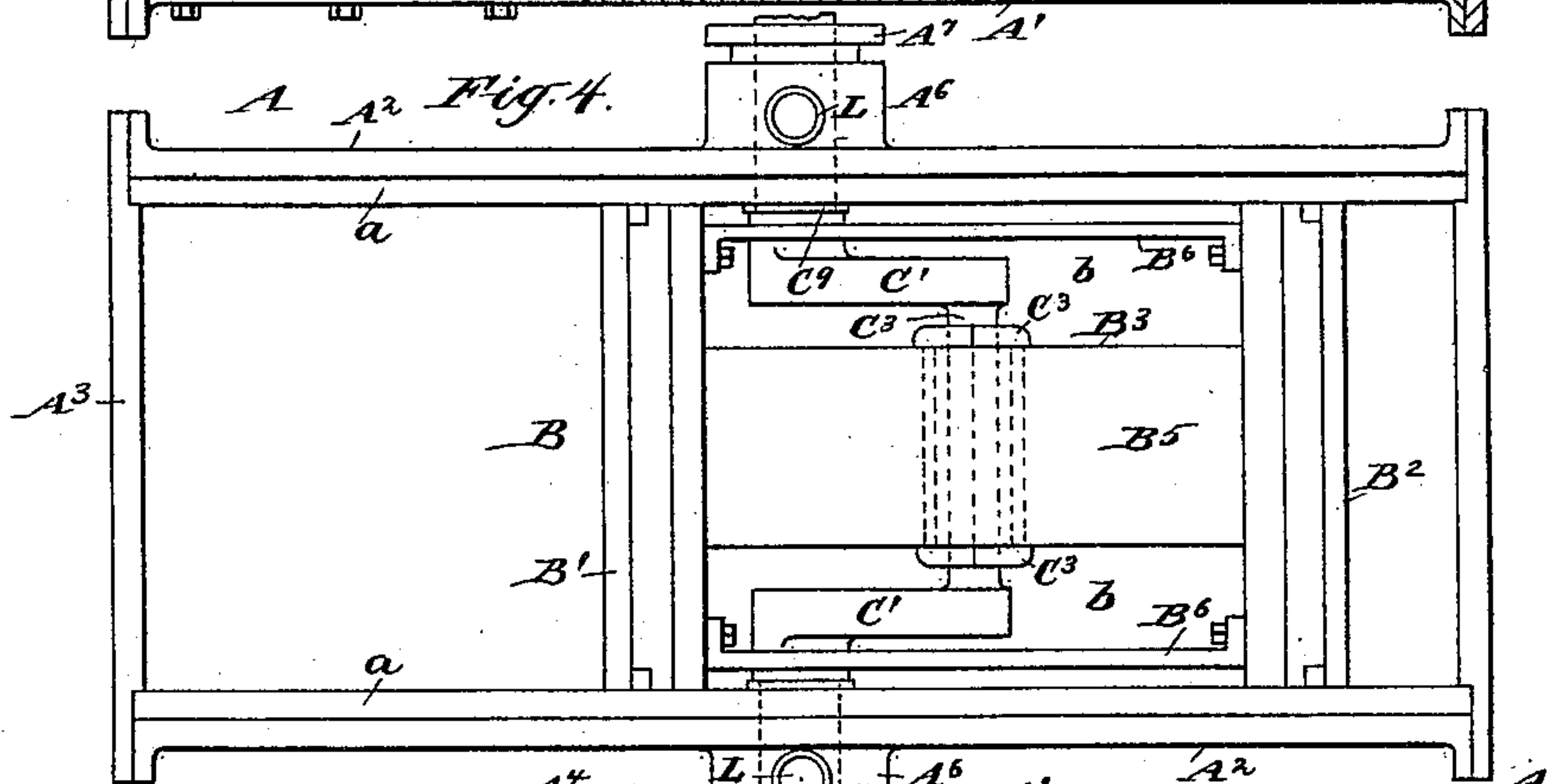
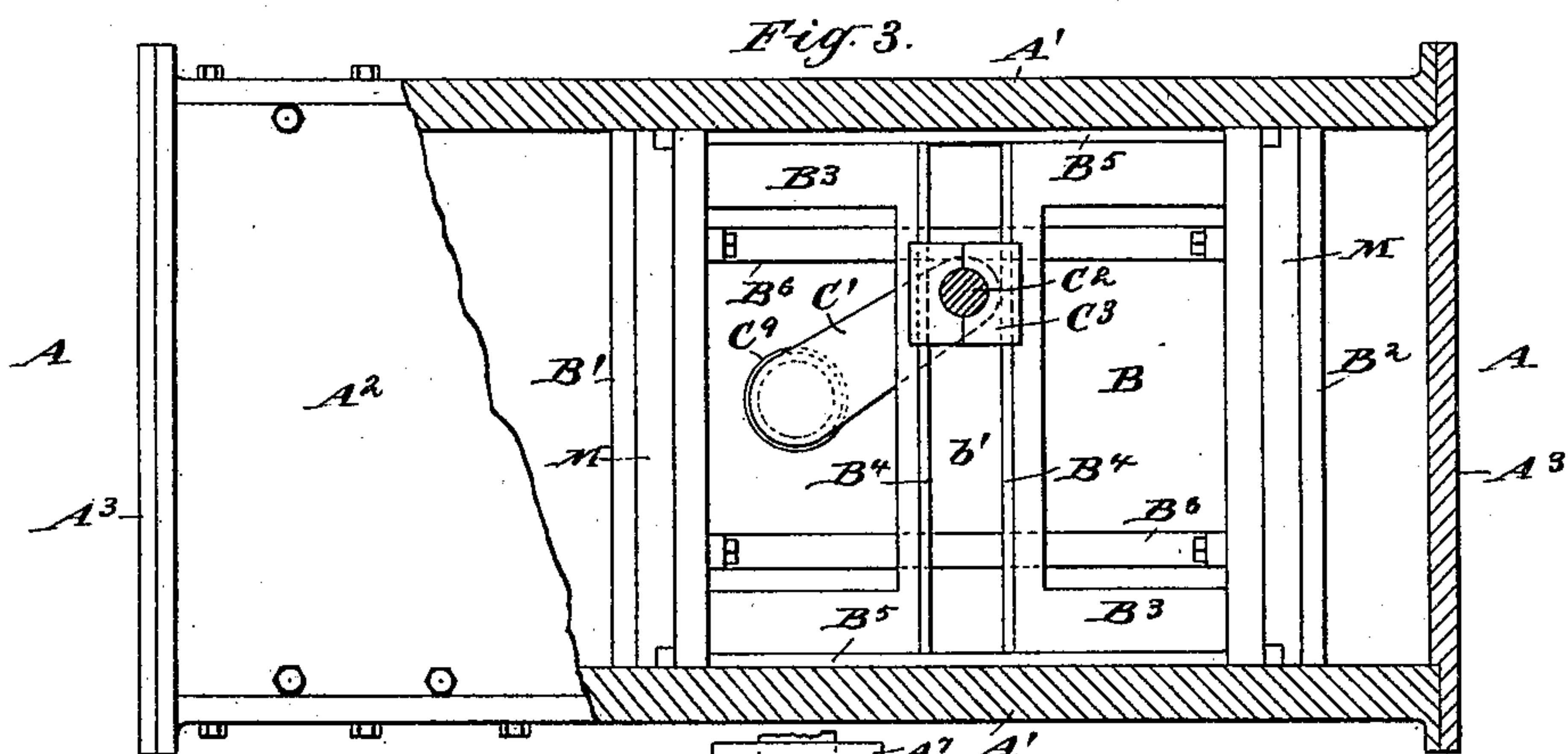
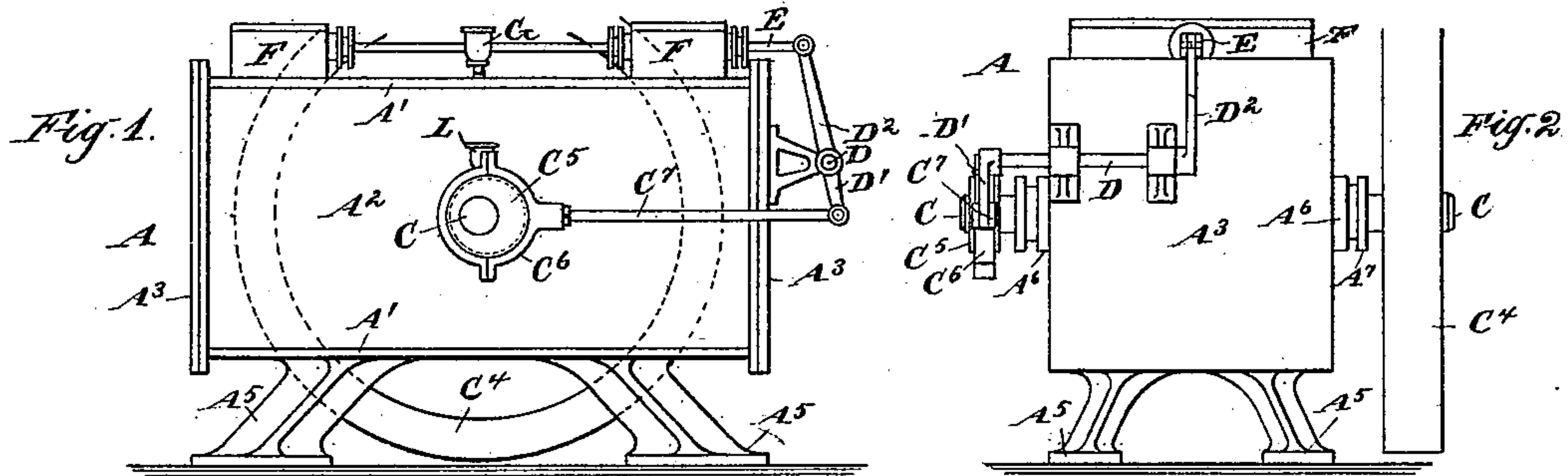
No. 621,916.

Patented Mar. 28, 1899.

P. GATELY.
ENGINE.

(Application filed Feb. 21, 1898.)

(No Model.)



Witnesses:

Wm. G. Gower

Thomas Farrell

Inventor:
Patrick Gately,
by his attorney,
Charles R. Seale.

UNITED STATES PATENT OFFICE.

PATRICK GATELY, OF NEW YORK, N. Y.

ENGINE.

SPECIFICATION forming part of Letters Patent No. 621,916, dated March 28, 1899.

Application filed February 21, 1898. Serial No. 671,003. (No model.)

To all whom it may concern:

Be it known that I, PATRICK GATELY, a citizen of the United States, residing in New York city, in the county and State of New York, have invented a certain new and useful Improvement in Engines, of which the following is a specification.

The invention relates to that class of engines or motors in which a piston is reciprocated in a cylinder by fluid-pressure, as steam or water, and the reciprocating motion transformed into rotary through the medium of a crank.

The object of this invention is to simplify and reduce the mechanism and provide a self-contained motor occupying but little floor-space, easily operated, and not expensive in construction.

The invention consists in certain details of construction and arrangement of parts to be hereinafter described.

The accompanying drawings form a part of this specification and show the manner in which I have carried out the invention.

Figure 1 is a side elevation, and Fig. 2 a corresponding end view, of the engine. The remaining figures are on a larger scale. Fig. 3 is a side view, partly in vertical section. Fig. 4 is a top or plan view of the piston with the upper portion of the casing removed. Fig. 5 is a vertical section. Fig. 6 is a face view of a portion alone.

Similar letters of reference indicate the same parts in all the figures.

A is a rectangular casing comprising the upper and lower plates $A^1 A^1$, the side plates $A^2 A^2$, and the heads $A^3 A^3$. The joints at the angles of the sides and the top and bottom plates are rabbeted, as at a , and secured by the bolts A^4 .

A^5 are feet cast in one with or joined to the bottom plate for supporting the whole.

B is a rectangular piston matching the interior of the casing A. It is made up of two separated piston-heads $B^1 B^2$, joined by a thinner or narrower portion or neck B^3 , thus providing a space b on each side. The neck is divided vertically by a transverse central slot b' , the interior faces of which are provided with smoothly-finished plates B^4 , serving

as ways. The two portions of the piston and neck thus formed are united by the thin but strong upper and lower plates B^5 , aided by the braces B^6 , extending between the heads $B^1 B^2$. Within the slot b' is received a block C^3 , made in two similar halves and adapted to slide vertically on the ways B^4 and having a central opening.

On the outer face of each side plate is cast a centrally-located hub or boss A^6 , surrounding a central opening a' , serving as a bearing for its shaft end C, received therein and projecting into the interior of the casing between the piston-heads. The inner ends carry the crank-arms C^1 , joined by the crank-pin C^2 , extending through the opening in the block C^3 , above described. Each boss A^6 is counterbored and is provided with a gland A^7 to serve as a stuffing-box.

The outer end of the shaft on one side carries a pulley or fly-wheel C^4 , and the other is provided with an eccentric C^5 , inclosed within an eccentric-strap C^6 , which through the rod C^7 and arm D^1 communicates motion to a rock-shaft D, mounted in suitable bearings on one of the cylinder-heads and connected by the arm D^2 to a valve-stem E, reciprocating the latter and any suitable valves within the steam-chests F in controlling the admission and release of the steam or other fluid pressure received in the casing from a boiler or other source. (Not shown.)

The space between the piston-heads may be partially filled with oil fed through the oil-cup G, which as the piston reciprocates lubricates the whole interior of the casing and also supplies the sliding block C^3 and its ways B^4 . The remainder of the space may fill with steam leaking past the heads and imprisoned. Such pressure acting against the inner face of each head is neutralized and produces no effect. The stuffing-boxes A^6 prevent its escape and also that of the contained oil.

Washers C^9 , of metal, placed between the shoulders C^8 on the shaft and the inner face of each side plate A^2 , receive any end thrust of the shaft and may be removed and new ones supplied when worn. I also provide removable bushings H, inclosing the shaft and lying in the openings a' , secured by screws passing

through the holes *h* in the flanges II'. The bushings are for convenience in applying them made in halves, as shown in Fig. 6.

L L are oil-cups supplying oil to the bearings when required.

M and M are packing-strips of any suitable metal notched together at the ends and lying in grooves provided for the purpose in the piston-heads. The strips are held outward in rubbing contact with the interior surfaces of the casing by spiral springs M', received in suitable recesses in the bottoms of the grooves.

The reciprocating motion of the piston is converted into rotary motion of the shaft by the sliding block C³ rising and sinking in the neck B³ and acting upon the crank-pin C², as will be readily understood.

The several plates and heads constituting the casing A may be shaped and finished separately, thus avoiding the labor and expense of truly boring and finishing a single hollow casting, and the whole, by dispensing with the usual piston-rod and connections, offers a simple and efficient motor at little cost and occupying but little floor-space.

Modifications may be made in the forms and proportions within wide limits without departing from the principle of the invention or sacrificing its advantages.

Although I have shown and described the motor as using steam, it will be understood that it may be driven by air or other gas under pressure or by water.

Other forms of valve-gear may be substituted and the piston and casing may be otherwise constructed.

I prefer the whole as shown.

I claim—

1. The casing A serving as a cylinder and comprising the top and bottom plates A' and side plates A² and heads A³, shaft ends C mounted in bearings in said side plates and extending therethrough into the interior of said casing, the crank-arms C' and pin C² connecting said arms, in combination with the piston B comprising the heads B', B², neck B³, plates B⁵ and braces B⁶ connecting said heads, ways B⁴ formed in said neck, and the sliding block C³ mounted in said ways and receiving said pin, all substantially as and for the purposes herein specified.

2. The casing A comprising the top and bottom plates A' and side plates A² having the rabbets *a* and bolted together, the heads A³, the boss A⁶ on each side plate, and the bushing II therein serving as bearings, the shaft C having its ends received in said bearings and extending within said casing, the shoulders C⁸ and washers C⁹ on each shaft end, the crank-arms C' and connecting-pin C², in combination with the piston B comprising the separated heads B', B², plates B⁵ uniting the two portions of the piston at top and bottom and neck B³ joining the separated piston-heads and leaving a space on each side, the ways B⁴ in the latter, and the sliding block C³ mounted in said ways and receiving said pin, all substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

PATRICK GATELY.

Witnesses:

ROBT. CONNOR,

CHARLES R. SEARLE.