(No Model.)

A. THOMSON.

DIRECT ACTING ENGINE.

No. 252,913. Patented Jan. 31, 1882.

FIG. I.

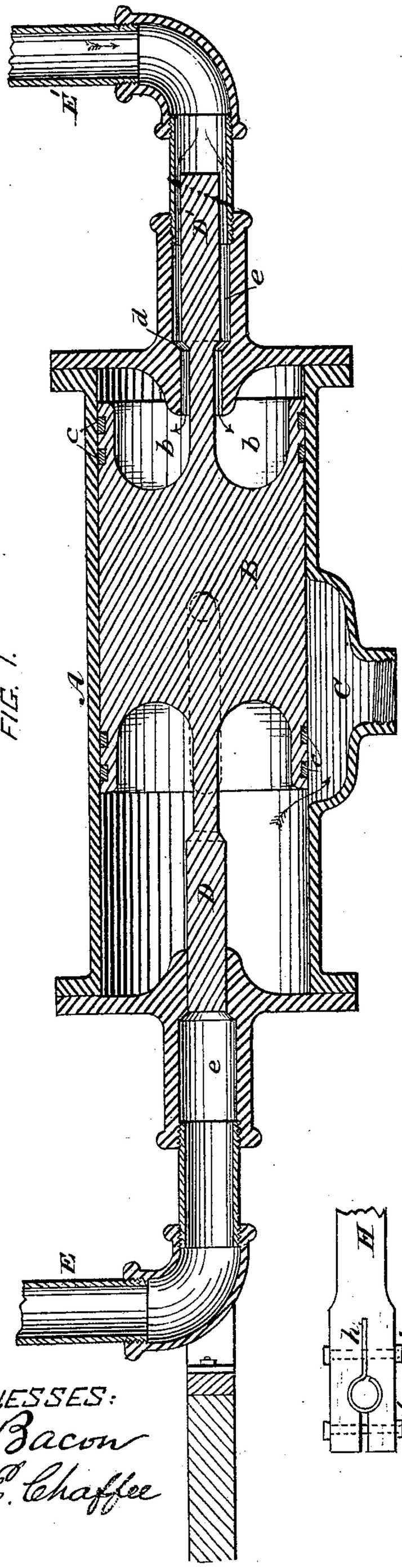

FIG. II.

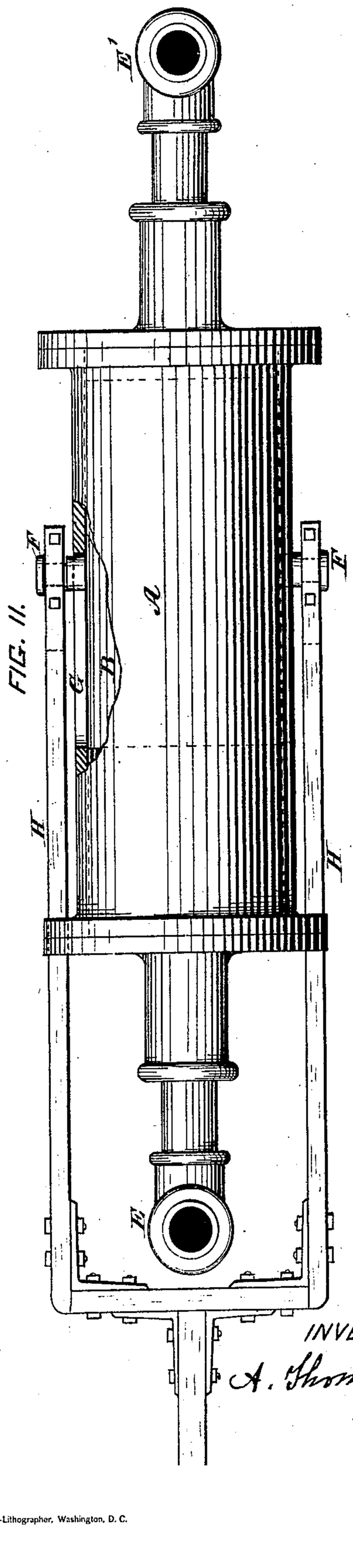

FIG. III.

WITNESSES:
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UNITED STATES PATENT OFFICE.

ALEXANDER THOMSON, OF AMES, IOWA.

DIRECT-ACTING ENGINE.

SPECIFICATION forming part of Letters Patent No. 252,913, dated January 31, 1882.

Application filed January 28, 1881. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER THOMSON, of Ames, in the county of Story and State of Iowa, have invented certain new and useful Improvements in Direct-Acting 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, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to direct-acting steam-engines; and the object is to construct an engine that is simple, not liable to get out of order, easily operated, and can be furnished at a very small cost, and can be run at a very small expense of fuel.

The invention consists in the construction and arrangement of parts, as will be more fully described hereinafter, reference being had to the accompanying drawings and the letters of reference marked thereon.

In the accompanying drawings, Figure I is a longitudinal section of my engine. Fig. II is a plan view of the same. Fig. III is a detail view of the stub end of the connecting-rod.

In the drawings, A is the cylinder, in which is arranged the piston B. This piston is provided with recessed ends, which form steam-chambers *b*, and is made much longer than the ordinary pistons.

The length of the piston should be such that it will cover a slot hereinafter referred to, and at the same time allow the exhaust-steam to escape through the central opening, C.

To each end of the piston is attached an elongated valve, D D′, passing through openings in the head. The valve is arranged in such manner that it will cut off the steam at the moment it arrives at the point *d* of the recess *e*, into which the steam is admitted at each end through the pipes E E′. The steam that has passed into the chambers *b* acts upon the piston by its expansive force, while the exhaust passes out through the exhaust-opening C.

The piston is provided with suitable packing-rings, *c*, and has a projecting wrist-pin, F, on each side, which passes through slots G in the cylinder, and said slots are covered by the piston as it moves to and fro.

To the pins F is attached the forked connecting-rod H, and the stub ends of this rod are split in the end, and have a removable lining, *h*, inserted in them, which is held by one of the bolts, *i*. By screwing down the other bolt, *i′*, the lining can be adjusted to fit the wrist-pin F. In case this lining becomes worn it can be thus readily removed and replaced by a new one. The other end of the connecting-rod is connected to the crank-pin of the machinery to be operated.

The steam chambers can be placed outside of the cylinders, if desired, although I prefer to form them in the ends of the piston. Instead of the elongated valves shown, puppet, or clack, or other kinds of valves may be substituted and operated by projecting studs.

Instead of one central exhaust, separate exhaust-openings may be arranged in the ends of the cylinders, and separate exhaust-valves operated by tappets or other suitable means.

The great advantages of my construction of engine, especially when used for operating sewing-machines and other small machinery, will be readily understood, and will be appreciated by those skilled in the art, and they are that it is very simple in its construction; it is not liable to get out of order; it can be very easily operated and at very small cost of fuel; it wastes no steam, as only sufficient is admitted to make a stroke of the engine by the expansive force of the steam; there is no complicated valve mechanism; it consists of very few parts; it can be readily applied to any machinery and placed in any position desired; it can be furnished at very moderate cost; and it forms an engine with very short rapid stroke with any desired area of piston, and is reversible.

Having thus described my invention, what I claim is—

1. In an engine, the piston B, having steam-chambers *b*, in combination with valves D D′, working in the recesses *e*, arranged in the cylinder-heads, substantially as shown and described.

2. In an engine, the piston B, having steam-chambers *b*, in combination with the cylinder

A, provided with slots G for the passage of the pins F, substantially as shown and specified.

3. In an engine constructed substantially as shown, the forked connecting-rod provided with stub ends having removable lining-pieces *h* inserted in them, substantially as and for the purpose specified.

4. An engine consisting of a cylinder, A, piston B, provided with steam-chambers *b*, and elongated valves D D′ moving in recessed heads, and the forked connecting-rod H, all constructed and arranged as shown and described.

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

ALEXANDER THOMSON.

Witnesses:
L. BACON,
W. E. CHAFFEE.