

(No Model.)

2 Sheets—Sheet 1.

M. GEARY.

RECIPROCATING STEAM ENGINE.

No. 347,104.

Patented Aug. 10, 1886.

Fig. 1.

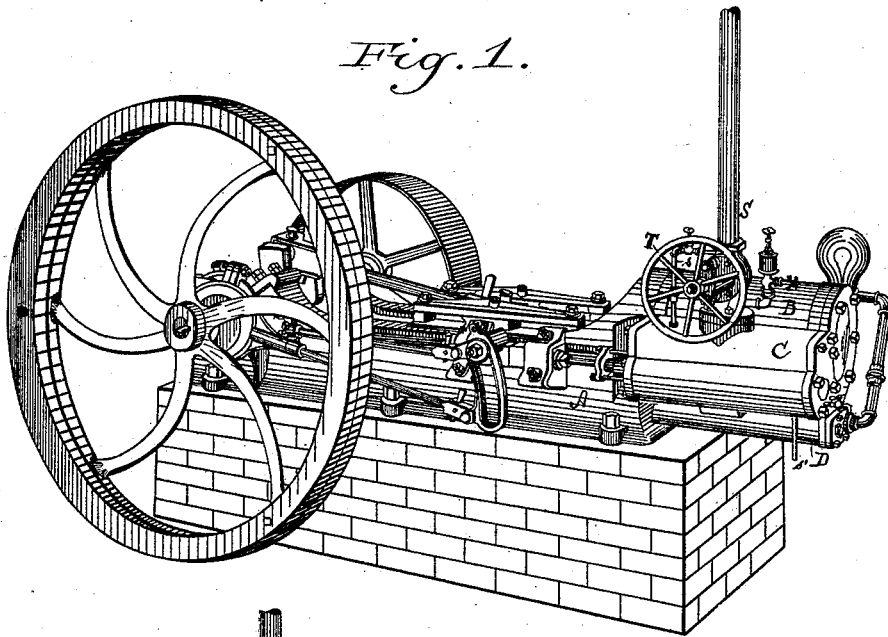
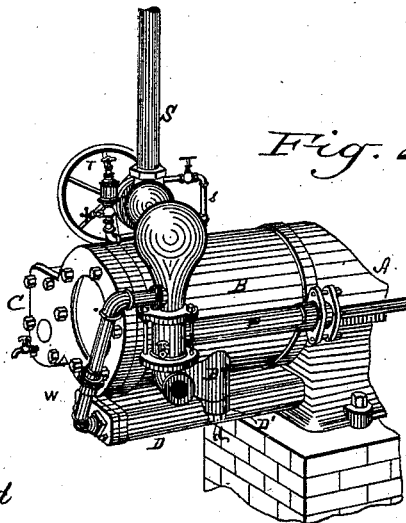


Fig. 2.



Attest.

L. D. Hanford

Robt. H. Porter.

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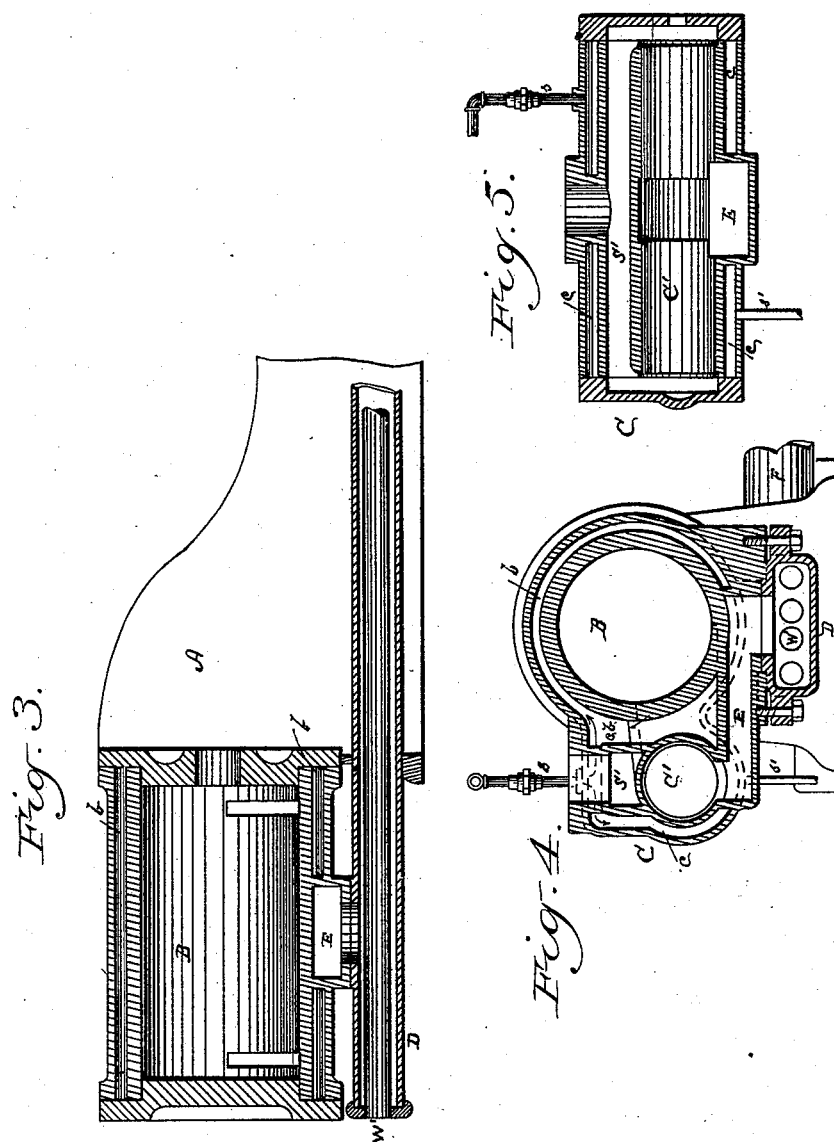
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UNITED STATES PATENT OFFICE.

MICHAEL GEARY, OF OIL CITY, PENNSYLVANIA.

RECIPROCATING STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 347,104, dated August 10, 1886.

Application filed January 26, 1886. Serial No. 189,841. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL GEARY, a citizen of the United States, residing at Oil City, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Reciprocating Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to steam-engines; and it consists in certain improvements in the construction thereof, as will be hereinafter fully described, and pointed out in the claims.

My invention is illustrated in the accompanying drawings as follows:

Figure 1 is a perspective view of my improved steam-engine. Fig. 2 is a similar view of the cylinder and connections and a fragment of the bed or frame, taken from the opposite side from that shown in Fig. 1. Fig. 3 is a vertical longitudinal sectional view of the cylinder and heater-chamber. Fig. 4 is a transverse vertical sectional view of the cylinder, steam-chest, and heater-chamber. Fig. 5 is a longitudinal vertical sectional view of the steam-chest.

A marks the frame or bed.

B marks the cylinder.

C marks the steam-chest.

D marks the exhaust or heater chamber.

S marks the steam-supply pipe.

F marks the exhaust-pipe.

S' marks the live-steam passage in the steam-chest.

C' marks the valve-chamber.

E marks the exhaust-steam passage in the steam-chest.

c and b mark the jacket-spaces around the steam-chest and cylinder, respectively.

s marks a live-steam pipe, which connects the pipe S with the jacket-spaces, and s' the waste-pipe or exit from said jacket-spaces.

P marks the pump.

W marks the feed-water pipe leading from the pump.

W' marks the feed-water pipes in the heater-chamber.

Other letters of reference will be referred to in proper connection herein.

The construction is as follows: The cylinder and steam-chest, with the necessary ports and passages, the valve-chamber, and the jacket-spaces are formed in one piece of metal at one operation of casting, and this is attached to the frame A so as to overhang. The heater-chamber is arranged below the cylinder and extends into the frame, and is secured to the cylinder by bolts d, which pass through lugs on the side of the heater and into bosses B' on the under side of the cylinder. The steam-chest consists of a cylinder valve-chamber, C', a live-steam passage, S', an exhaust-steam passage, E, and a surrounding jacket-space, c. The cylinder is of ordinary construction, and is provided with a jacket-space, b, which opens into the jacket-space c around the steam-chest. These jacket-spaces entirely surround the steam-chest and cylinder. A pipe, s, connects these jacket-spaces with the steam-supply pipe S, and a hand-valve is placed in this pipe s. A waste-pipe, s', which is always open, leads from these jacket-spaces. Before the engine is started the valve in the pipe s is opened, and live steam fills the jacket-spaces and heats up the cylinder and valve-chamber, after which the steam is cut off and the engine is started. When the engine is running, the jacket-spaces are filled with air, or whatever air will remain therein, and steam is used then only before starting the engine. It is not at all essential that the jacket-space b around the cylinder be in connection with the jacket-space c, for it is not as desirable to heat up the cylinder before starting as it is the valve-chamber.

Piston-valves require to be very closely fitted, and when fitted so there will be no leakage when the chamber is hot they will stick when the chamber is cold.

Heretofore it has been common to jacket the valve-chamber with live steam, and sometimes with exhaust-steam. The first construction is objectionable, and it is wasteful of steam; and the second is objectionable, first, because the exhaust-steam cannot be used to warm up the chamber before starting, and, second, because the exhaust-steam is an absorbent of heat and chills the live steam when it enters the valve-chamber.

It will be at once observed that my construction is subject to none of the foregoing

objections, for before starting the valve-chamber can be perfectly heated, and after starting the live steam in its passage to the valve chamber is perfectly jacketed by a dead-air space,
 5 (or, perhaps, it is nearly a vacuum-space,) and is not in contact with large radiating surfaces.

It is not essential that the cylinder and steam-chest be cast in one piece, for they may be cast separately and bolted together, and therefore
 10 I do not wish to be limited to such a construction.

I am aware that it is common to arrange the heater-chamber in the bottom of the frame of the engine; but I am not aware that it has ever
 15 before been so arranged in a frame with an overhanging cylinder, and projecting out underneath the cylinder and attached thereto so as to connect with the mouth of the exhaust-passage.

20 The construction shown is very neat and compact.

What I claim as new is—

1. In a steam-engine, the combination, substantially as set forth, of the cylinder B, steam-chest C, with live-steam passage S', valve-chamber C' parallel with said steam-passage,
 25 jacket-spaces *c* and *b* around said passage S', valve-chamber C', and cylinder B, and the pipe *s* and *s'*, connecting said jacket-spaces with the
 30 steam-supply pipe and the open air in a manner substantially as and for the purposes set forth.

2. In a steam-engine, the combination, substantially as set forth, of a main steam-cylinder chamber, a piston-valve chamber parallel
 35 with said piston-chamber, a live-steam passage parallel with said valve-chamber, a jacket-space surrounding said valve-chamber and said live-steam passage, a steam-passage from the steam-supply pipe to the said jacket-space,
 40 a passage to the open air from said jacket-space, and proper ports or passages for live and exhaust steam.

3. In a steam-engine, the combination, substantially as set forth, of a main steam-cylinder chamber, a piston-valve chamber parallel
 45 with said piston-chamber, a live-steam passage parallel with said valve-chamber, a jacket-space surrounding said valve-chamber and steam-passage, a steam-passage from the steam-supply pipe to the jacket-space, provided with
 50 a shut-off valve, a free passage from said jacket-space to the open air, an exhaust-passage from the middle and under side of the valve-chamber to a point below the main steam-cylinder chamber, and a heater-chamber below
 55 and parallel with the piston-chamber, connected with the mouth of the said exhaust-chamber.

In testimony whereof I affix my signature in presence of two witnesses.

MICHAEL GEARY.

Witnesses:

JNO. K. HALLOCK,
 ROBT. H. PORTER.