

(No Model.)

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HYDROCARBON FURNACE.

No. 246,321.

Patented Aug. 30, 1881.

Fig. 1.

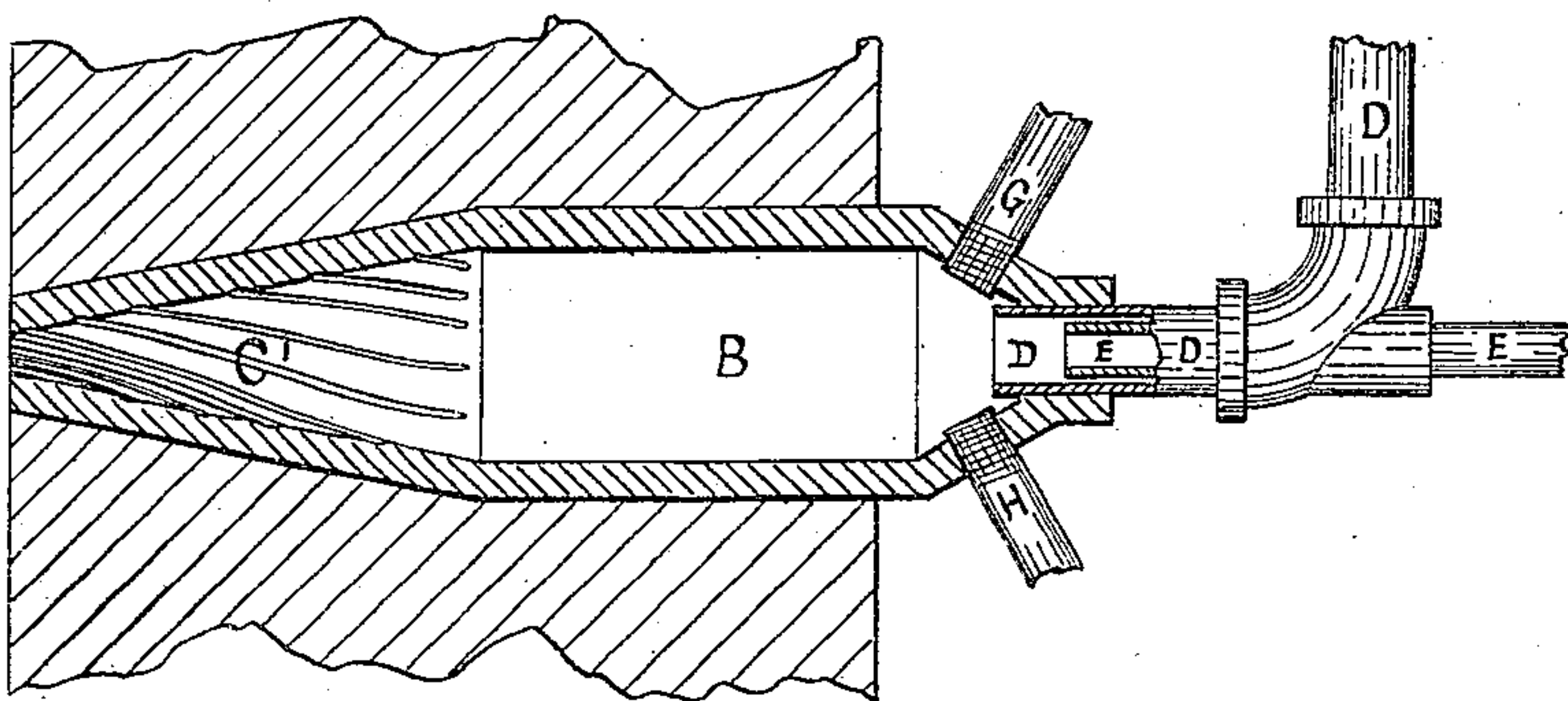
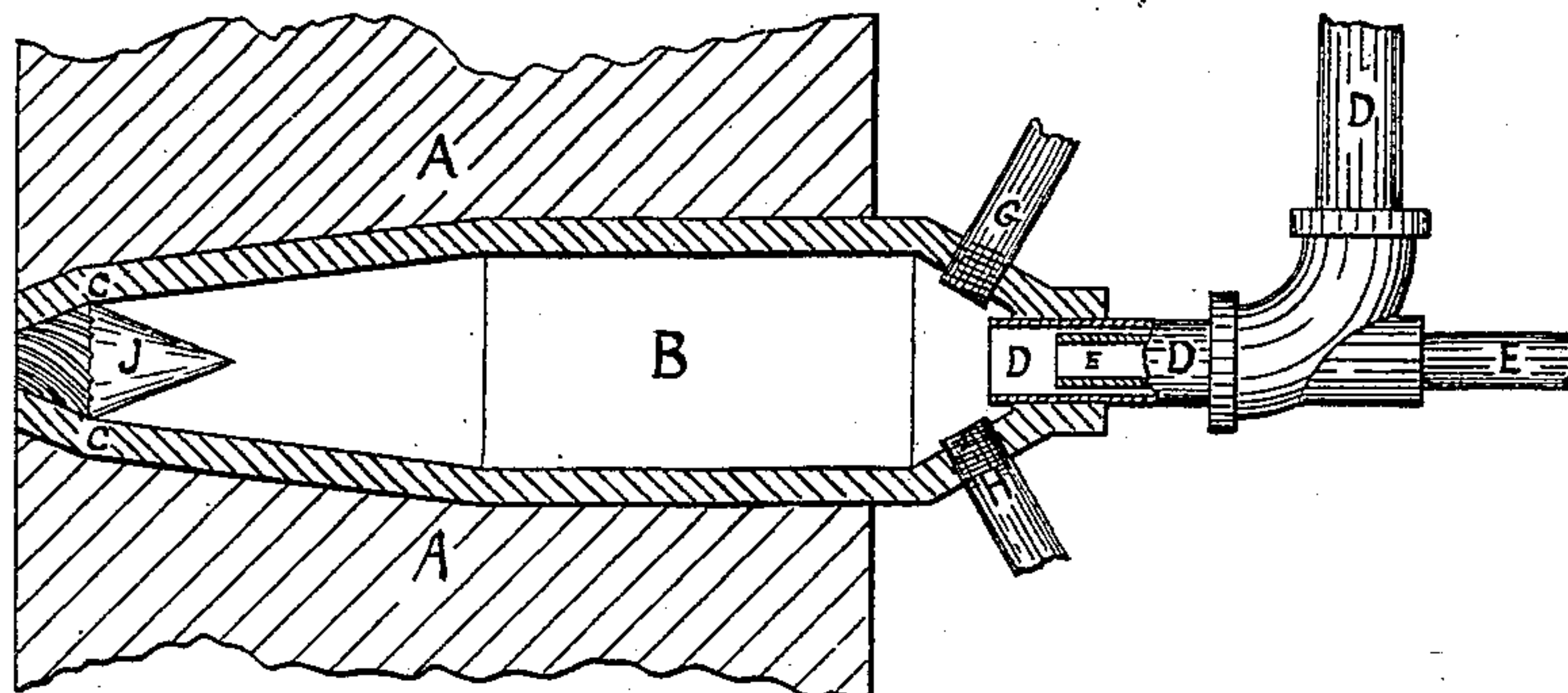


Fig. 2.

Witnesses.

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UNITED STATES PATENT OFFICE.

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HYDROCARBON-FURNACE.

SPECIFICATION forming part of Letters Patent No. 246,321, dated August 30, 1881.

Application filed March 14, 1881. (No model.)

To all whom it may concern:

Be it known that we, HARVEY T. LITCHFIELD, a citizen of the United States, residing at Hull, in the county of Plymouth and State of Massachusetts, and DAVID RENSHAW, a citizen of the United States, residing at Cohasset, in the county of Norfolk and State aforesaid, have invented certain new and useful Improvements in Hydrocarbon-Furnaces; and we 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.

The principal feature of our invention consists in mixing hydrocarbons with steam, or steam and air, in a suitable chamber, and forcing them, when so mixed, through a stationary nozzle into a combustion-chamber, said nozzle being so contrived as to deliver the mixed fluids in a whirling and converging stream, in order that their atoms may be focalized and forced against each other in the best manner to insure combustion.

In the drawings we have shown, in Figure 1, a nozzle through which the fluids enter the combustion-chamber in a number of separate streams, and in Fig. 2 a nozzle through which they pass in a body.

A shows the wall of the combustion-chamber, B the mixing-chamber, and C C' the nozzle. D is a steam-pipe entering the rear of the chamber B, and surrounding a pipe, E, which pipe supplies the hydrocarbons. G and H are pipes to admit air or other fluids when desired.

In Fig. 1 the nozzle is fitted with a plug, J, conical at one end and frusto-conical at the other, the frusto-conical end having spiral

grooves on its surface, as shown. The steam, entering the chamber B through the pipe D, draws the fluid from the pipe E and mixes with it, and then forces its way into the combustion-chamber through the spiral grooves in the frusto-conical portion of the plug J in streams, which receive a whirling motion from the grooves and focalize at a short distance from the end of the nozzle.

In Fig. 2—a modification of Fig. 1—there is no plug in the nozzle C'; but its frusto-conical sides are spirally grooved, so that the mixed fluids may impinge upon them and pass to the combustion-chamber in a single whirling stream, which focalizes near the nozzle. The plug J may be made without grooves and inserted in the nozzle C', (shown in Fig. 2,) and the operation of the device would be the same as that shown in Fig. 1. These focalized whirling streams of mixed hydrocarbons and steam present the requisite conditions to produce complete and intense combustion; and the steam should be superheated or not, and mixed with air or not, according to the nature of the hydrocarbons employed and the heat required to be attained.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

In combination, the steam-pipe D, hydrocarbon-pipe E, mixing-chamber B, tapering nozzle C, and spirally-grooved tapering plug J, the whole adapted to focalize said fluids as they enter the combustion-chamber, as and for the purpose specified.

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Witnesses:

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