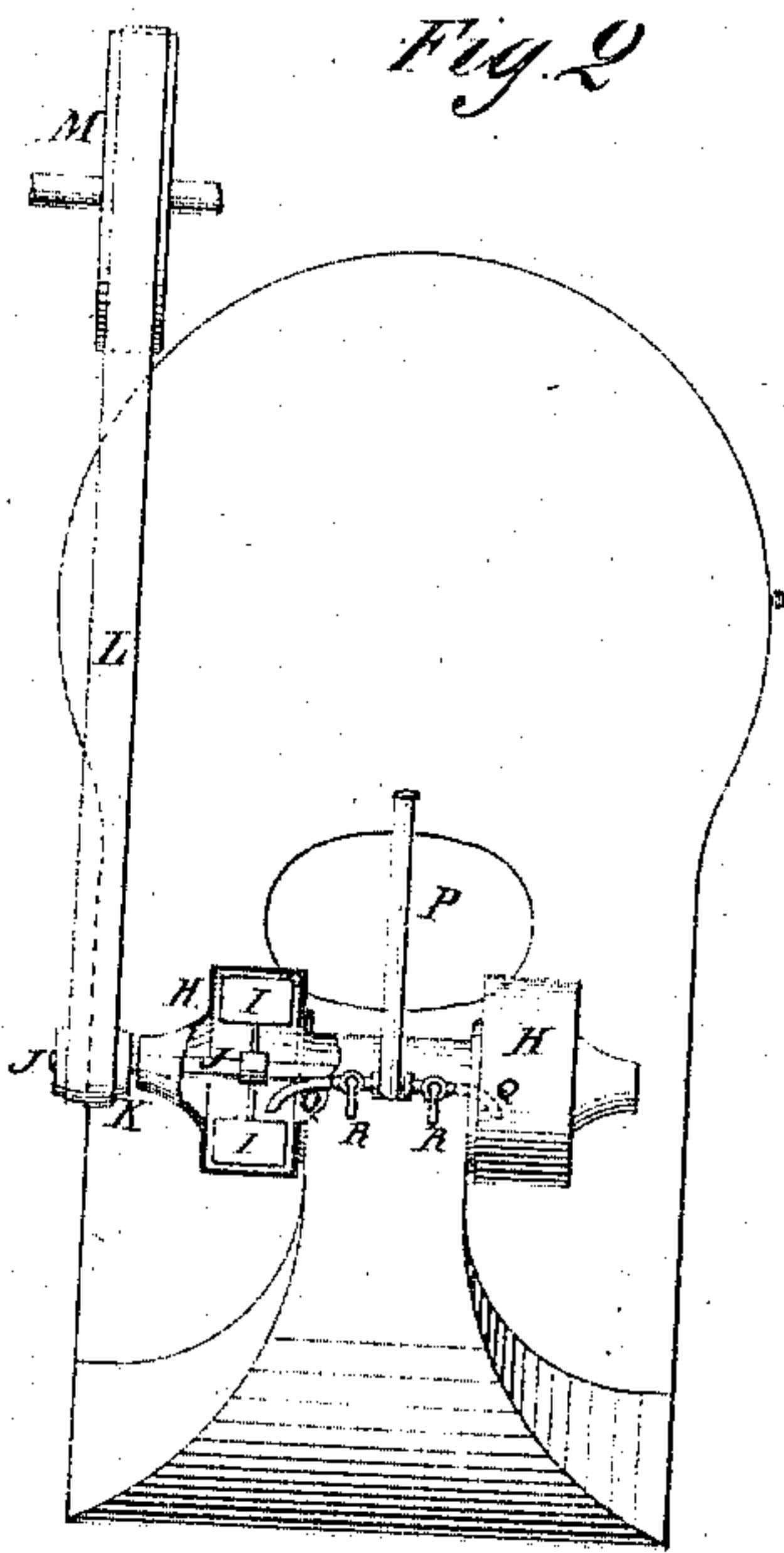
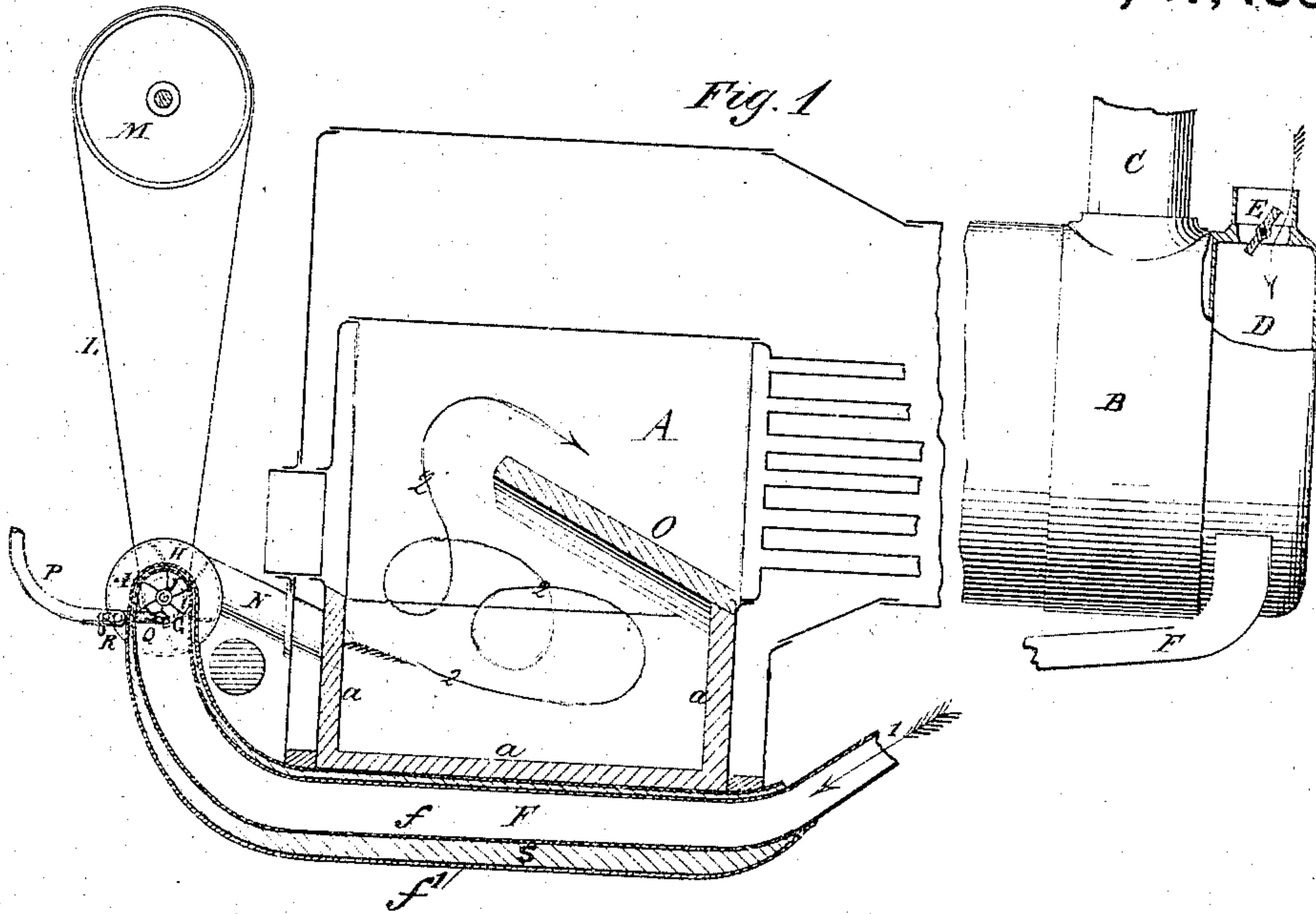


(No Model.)

J. W. & J. R. HOUCHIN.
Hydrocarbon Burner.

No. 241,662.

Patented May 17, 1881.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOSHUA W. HOUCHIN AND JOSHUA R. HOUCHIN, OF BROOKLYN, ASSIGN-
ORS TO THE HYDROCARBON FURNACE COMPANY, OF NEW YORK, N. Y.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 241,662, dated May 17, 1881.

Application filed September 18, 1880. (No model.)

To all whom it may concern:

Be it known that we, JOSHUA W. HOUCHIN and JOSHUA R. HOUCHIN, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Hydrocarbon-Burners, of which the following is a specification.

The object of our present invention is to provide a simple and effective device for supplying atomized hydrocarbon liquid as fuel in furnaces in a manner calculated to insure complete combustion (thus not attendant with smoke and cinders) and without necessitating the use of exhaust-steam to promote the draft in the chimney.

In the accompanying drawings, Figure 1 represents our invention as applied to a locomotive-boiler, the furnace being shown in longitudinal vertical central section. Fig. 2 is an end view of the boiler, furnace, and apparatus, the latter being partly broken out.

Similar letters of reference indicate corresponding parts.

A designates the furnace, B the smoke-box, and C the smoke stack or chimney, of an ordinary locomotive-boiler.

D is an air-drum arranged in front of the smoke-box B, so as to receive heat from the latter.

E is a valve for regulating the air-supply to the drum D.

F is an air-flue leading from the drum D down between the cylinders, along and underneath the boiler and furnace A, extending throughout the whole width of the latter, and terminating in the rear thereof with an upwardly-contracting bend closed at its upper end. Those walls of the flue F which are exposed to the outer air should be made double and filled with "slag-wool" or other non-conducting material, as indicated in the portion thereof which is below the furnace in Fig. 1, where *f* designates the inner and *f'* the outer plate, which form the double wall, and *s* the filling between them.

In the upper rear end of the flue F are laterally-opposite openings, G, which constitute the central inlets to the casings H of two fans, I, fastened upon the same shaft J, which latter is revolved by pulley K and belt L from a larger pulley, M, driven by a small separate engine

or other suitable power. The ordinary tangential outlet-pipes N of the fans I H are arranged to enter the rear end of the furnace A, as seen in the drawings. The furnace A, or the lower portion (or actual fire-pot) thereof, is lined with fire-brick *a*, and partly covered with an arched fire-bridge, O, also made of fire-brick and inclining forward toward the lower edge of the boiler-tube plate in about the manner shown in the drawings.

P is a central pipe leading to the upper rear end of the flue F and connected to convey petroleum or other liquid hydrocarbon from a suitable tank to two branch pipes, Q, leading, one to each of the fans I through the central opening, G, and ending within the casing H. Each of the pipes Q is provided with a stop-cock, K.

The operation is simply as follows: The air, entering the valve E on top of the drum D and heated (from the box B, the boiler, and the furnace A) along its passage through the air-flue F, is drawn in by the fans I in direction of arrow 1, and discharged through the outlets N into the furnace. The liquid hydrocarbon, entering the casings H through the pipes P R, is beaten into atoms by the rapidly-revolving fans I, and, vaporized by the warm air from the flue F, unites with the said air in the shape of a highly-inflammable fog whirling around, in about the manner indicated by arrow 2, before passing the fire-bridge O, and is thoroughly combusted, imparting its heat to the boiler, the air-current being free from smoke when reaching the chimney C.

To counteract the cooling effect of the reactionary circulation of the air in the flue F, due to the rapid forward motion of the locomotive, the air-supply-regulating valve E is arranged on the drum D, as shown; but for a stationary furnace the said valve E may be applied in any other suitable part of the flue F, though we prefer the arrangement shown.

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

1. The combination, with a furnace, A, of one or more revolving fans, I, discharging into the said furnace, and one or more pipes, R, supplying liquid hydrocarbon into the casing of

the said fan or fans, substantially as and for the purpose set forth.

2. The air-flue F, continuous from the front of the boiler to the rear of and in proximity to the furnace, in combination with the laterally-opposite fans I, secured upon a common shaft, J, revolving in the said flue F, and having their outlets N into the furnace, the liquid-fuel-supply pipes P R, discharging into the casings H of the said fans I, and the inclined fire-bridge O, substantially as and for the purpose set forth.

3. The valve E, arranged upon the inlet-drum D in front of the boiler, in combination with the flue F, fans I, pipes R, discharging into fan-casing, and furnace A, substantially as specified.

JOSHUA W. HOUCHIN.
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Witnesses:

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