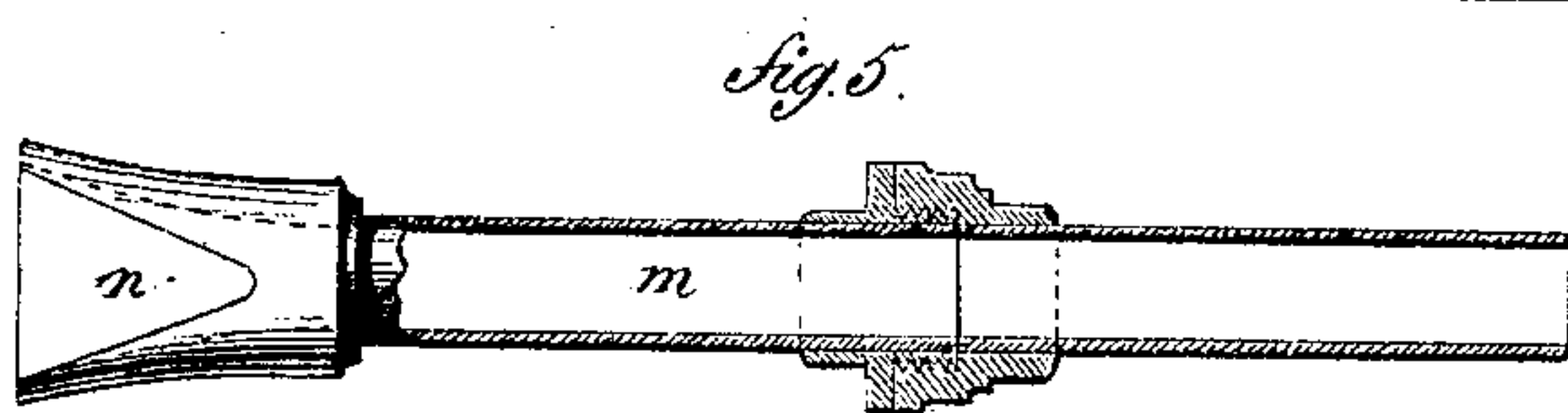
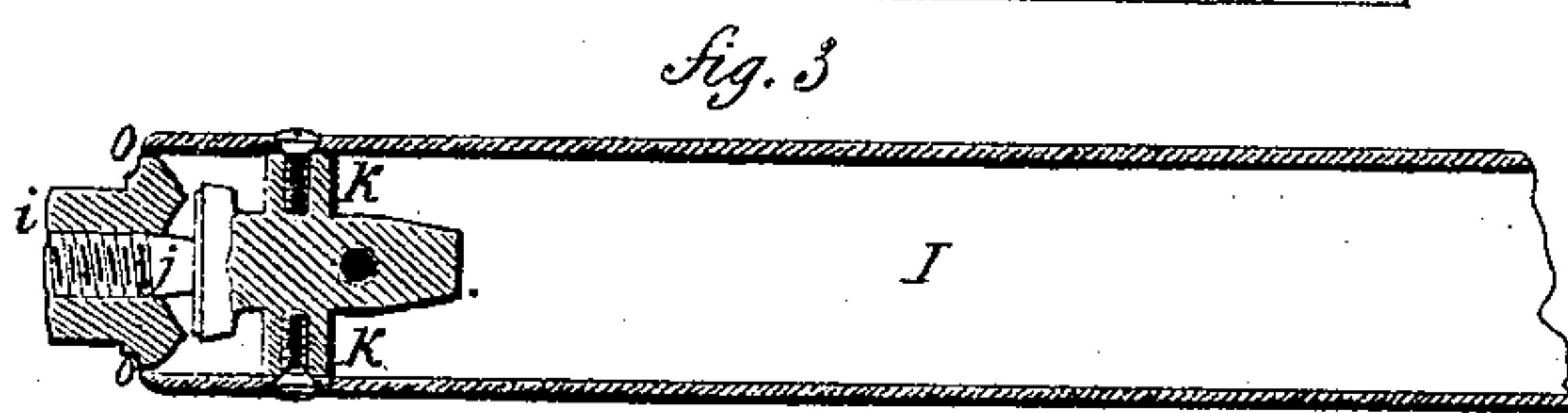
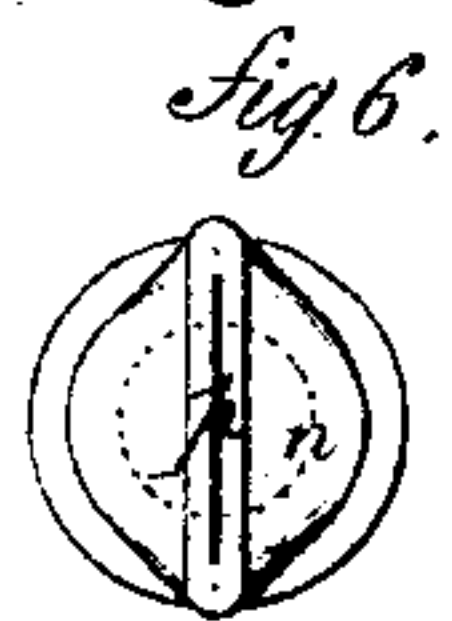
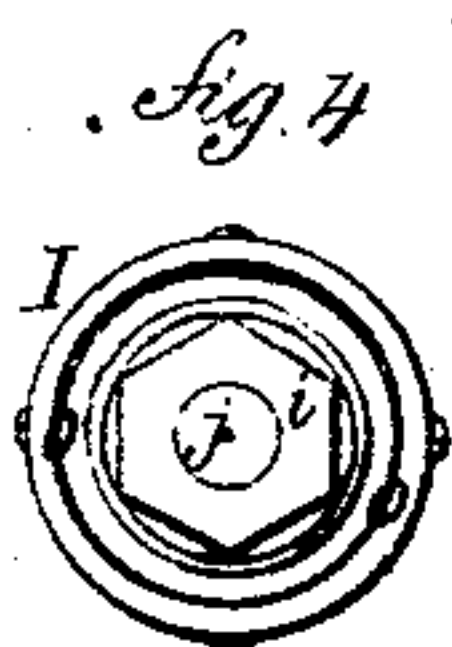
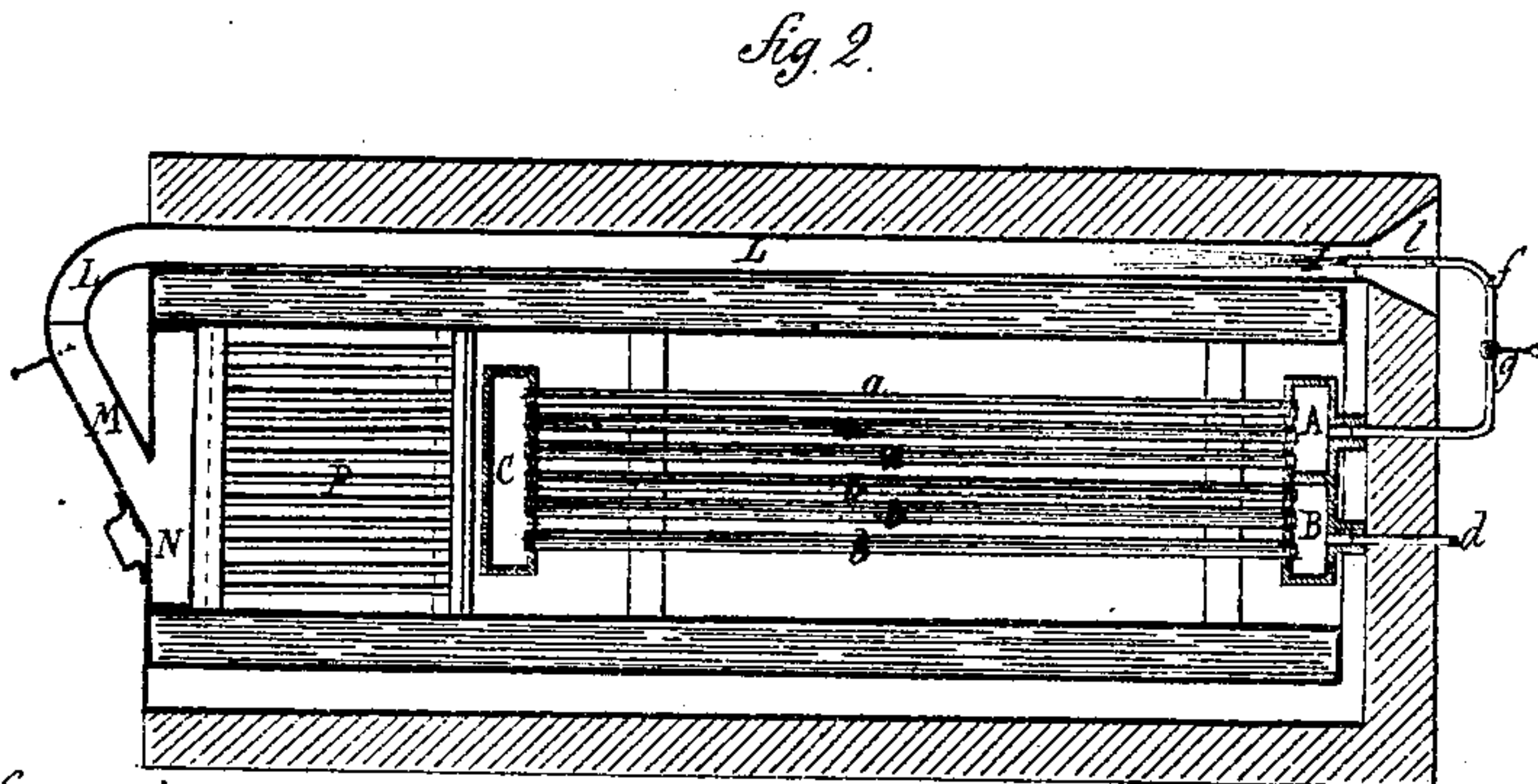
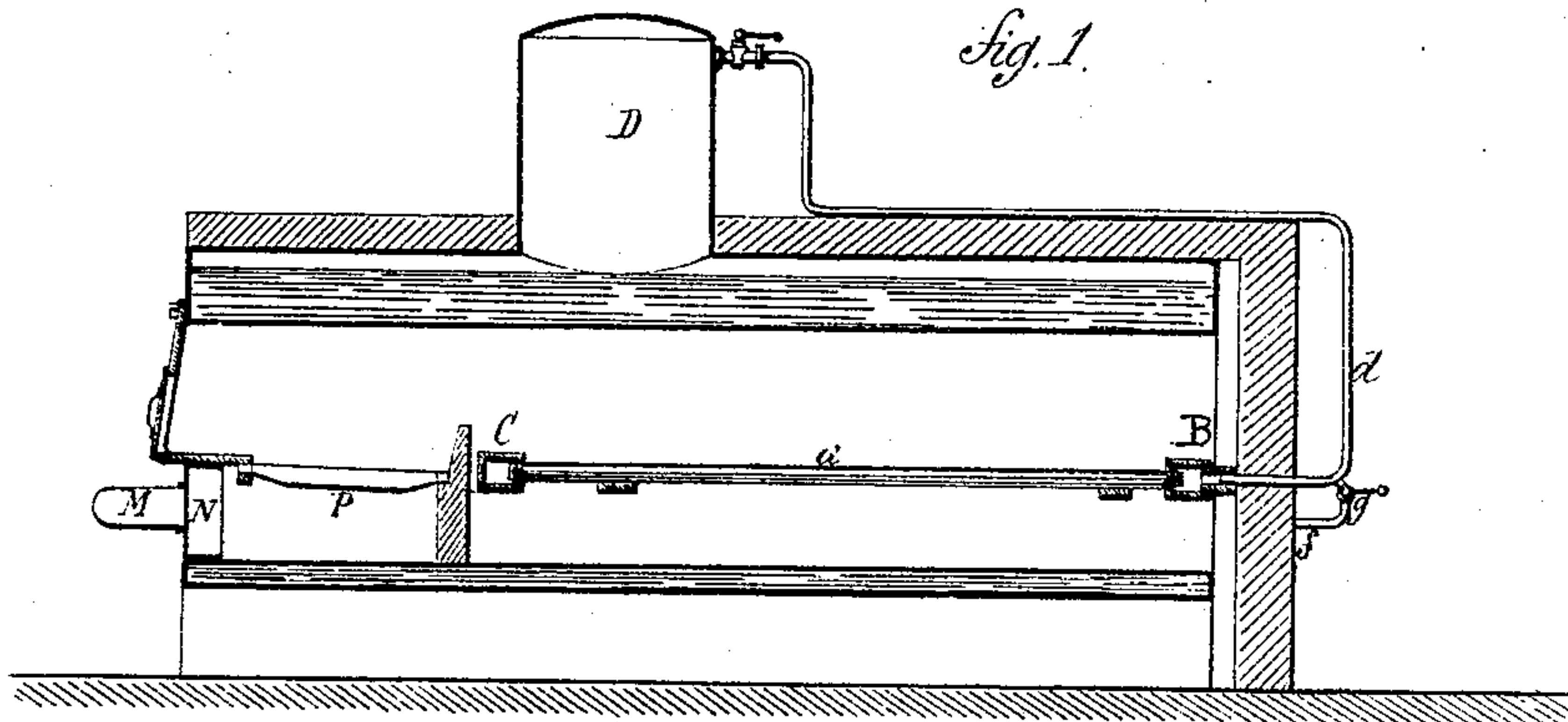


R. GIGODOT.

Blasts for Furnaces of Steam-Boilers.

No. 144,757.

Patented Nov. 18, 1873.



Witnesses.

W. H. Shumway
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Inventor

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UNITED STATES PATENT OFFICE.

RENÉ GIGODOT, OF LYONS, FRANCE.

IMPROVEMENT IN BLASTS FOR FURNACES OF STEAM-BOILERS.

Specification forming part of Letters Patent No. **144,757**, dated November 18, 1873; application filed August 27, 1873.

To all whom it may concern:

Be it known that I, RENÉ GIGODOT, of Lyons, France, have invented an Improvement in Blasts for Furnaces of Steam-Boilers, of which the following is a specification:

This system of blast by injection is founded upon the employment of a mixture of air and superheated steam, in order to render the combustion in the furnaces of steam-boilers more perfect, thus adding greatly to the production of steam without increasing the consumption of fuel.

Steam taken in the saturated state from the boiler is superheated by passing it through a vessel in or to which a series of tubes are arranged in a flue or smokeway of the furnace, preferably at a short distance from the fire-bars. From thence it is conveyed by one or more pipes into an air-injector or suction-tube, whence it proceeds through a very narrow annular opening, which puts it into the form of a hollow jet, capable of drawing with it a considerable body of air, which becomes mingled with its steam. The mixture is thus raised to a very high temperature, which facilitates the decomposition of the steam; and it is in the condition most favorable to combustion when it arrives into the tuyere, which distributes it into the fire-space or ash-pit of the furnace.

I will describe the arrangement I have adopted for a boiler of the Cornish stamp, with an interior furnace, in reference to the annexed drawing.

Figure 1 is a longitudinal section. Fig. 2 is a horizontal section. In Figs. 3, 4, 5, and 6 I have shown the two arrangements I have adopted for the injector.

The superheater which I apply to my system is composed of two collections of tubes, *a a a b b b*, united at one end by two distinct collectors, A and B, and at the other end by another collector common, C, to both. Upon the entrance-collector, B, is keyed a pipe, *d*, which brings the saturated steam drawn from the dome D of the boiler. The exit-collector, A, carries the ajutage, upon which is fixed a curved tube, *f*, which is united by a cock, *g*, socket with the injector I. The injector (see

Figs. 3 and 4) consists of a cylindrical tube, I, closed by a little plug, *i*, which is formed like a conical valve, with a nut-head at its top. It is pierced with a threaded hole, which permits of its being screwed upon a screw, *j*, fixed in the axis of the tube I, by means of two arms, K K. By screwing the plug *i*, the section of the annular opening *o* of the tube can be regulated with the greatest precision. The injector may be performed as shown in Figs. 5 and 6. In this case it consists of a pipe, *m*, provided at its end with a whistle-shaped ajutage, *n*, in which the steam-opening is a very slight split, *p*. The injector-tube debouches in the center of a funnel-shaped opening, *l*, which terminates in a conduit, L, placed in a flue or a passage arranged along the length of the boiler, outside. This conduit is curved in front of the furnace, and its branch M, forming a tuyere, is united to the partition N of the ash-pit, beneath the bars P.

Thus air is drawn by the jet of superheated steam proceeding from the tube *i*, and the mixture of air and steam passed through the conduit and into the tuyere M, which draws it under the fire.

It will be understood that the form and position of the superheater and injector may be varied, according to the sort of boiler and the space available.

In order to avoid length in the apparatus, several jets may be employed, each in a shorter conduit of smaller diameter.

The jets, in certain cases, may be full. When they are annular the injectors can be arranged so as to provoke a draft of the exterior air; and the injector may be continuous or intermittent, at will, according to the nature of the fuel consumed in the furnace to which the system may be applied.

This system of blast by injection of superheated steam by means either of the two before-described injectors may be applied at all the metallurgic and industrial furnaces for all purposes; or at the blast of the mines, for replacing the exhausters, ventilators, and blast-engines at present in use.

I do not wish to be understood as broadly claiming the introduction into a furnace of su-

perheated steam and air, as such I am aware is not new.

I claim as my invention—

The combination of the tubes *a b*, collectors A B, collector C, induction-pipe *d*, ejection-tube *f*, open conduit L, terminating in a tuyere beneath the grate-bars, all substantially as set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

R. GIGODOT.

Witnesses:

T. HUOT,

J. ARMENGAUD, Jeune.