

**No. 713,421.**

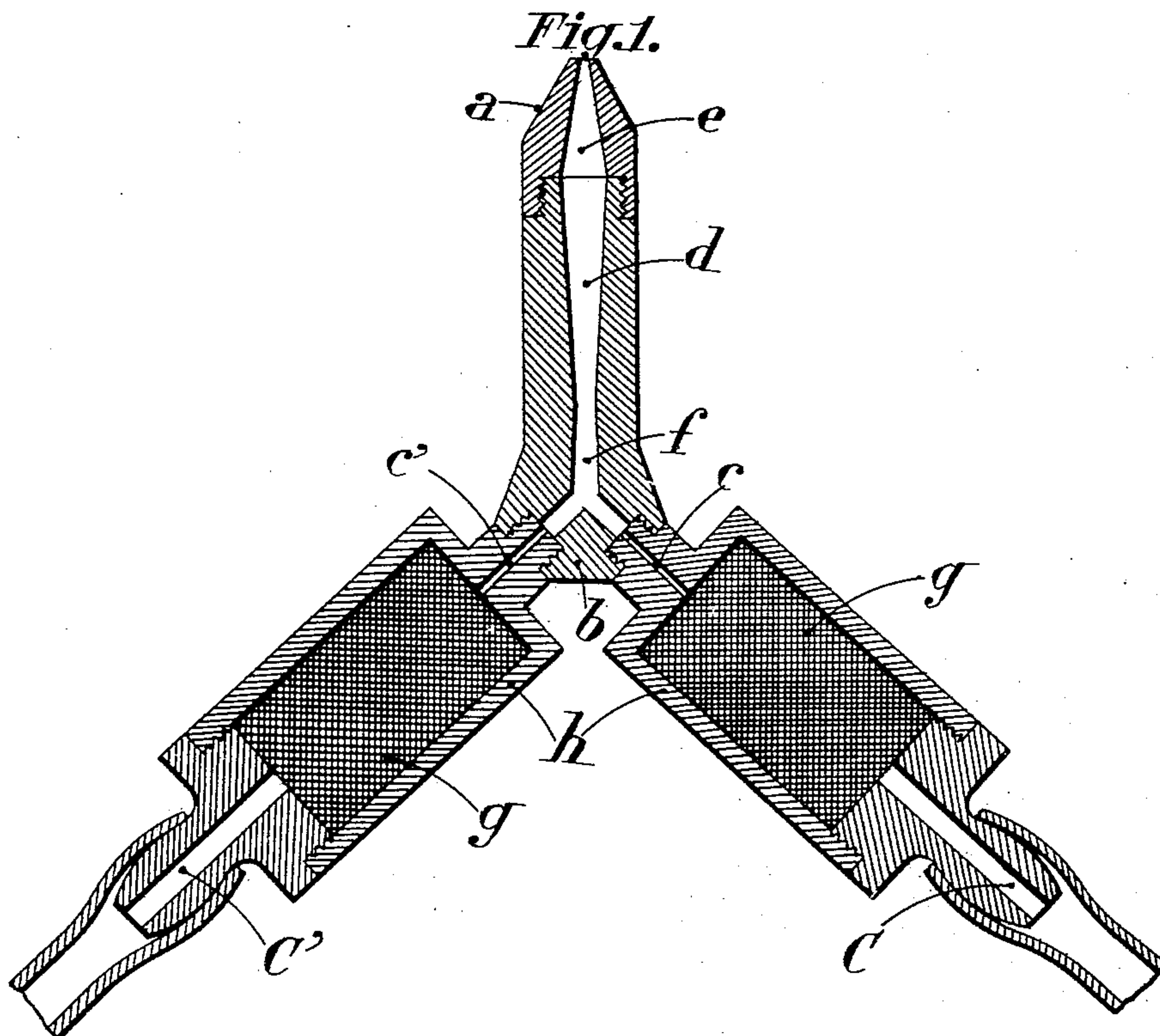
**Patented Nov. 11, 1902.**

**E. FOUCHÉ.  
BLOWPIPE.**

(Application filed Mar. 19, 1902.)

(No Model.)

**2 Sheets—Sheet 1.**



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2 Sheets—Sheet 2.

Fig. 4.

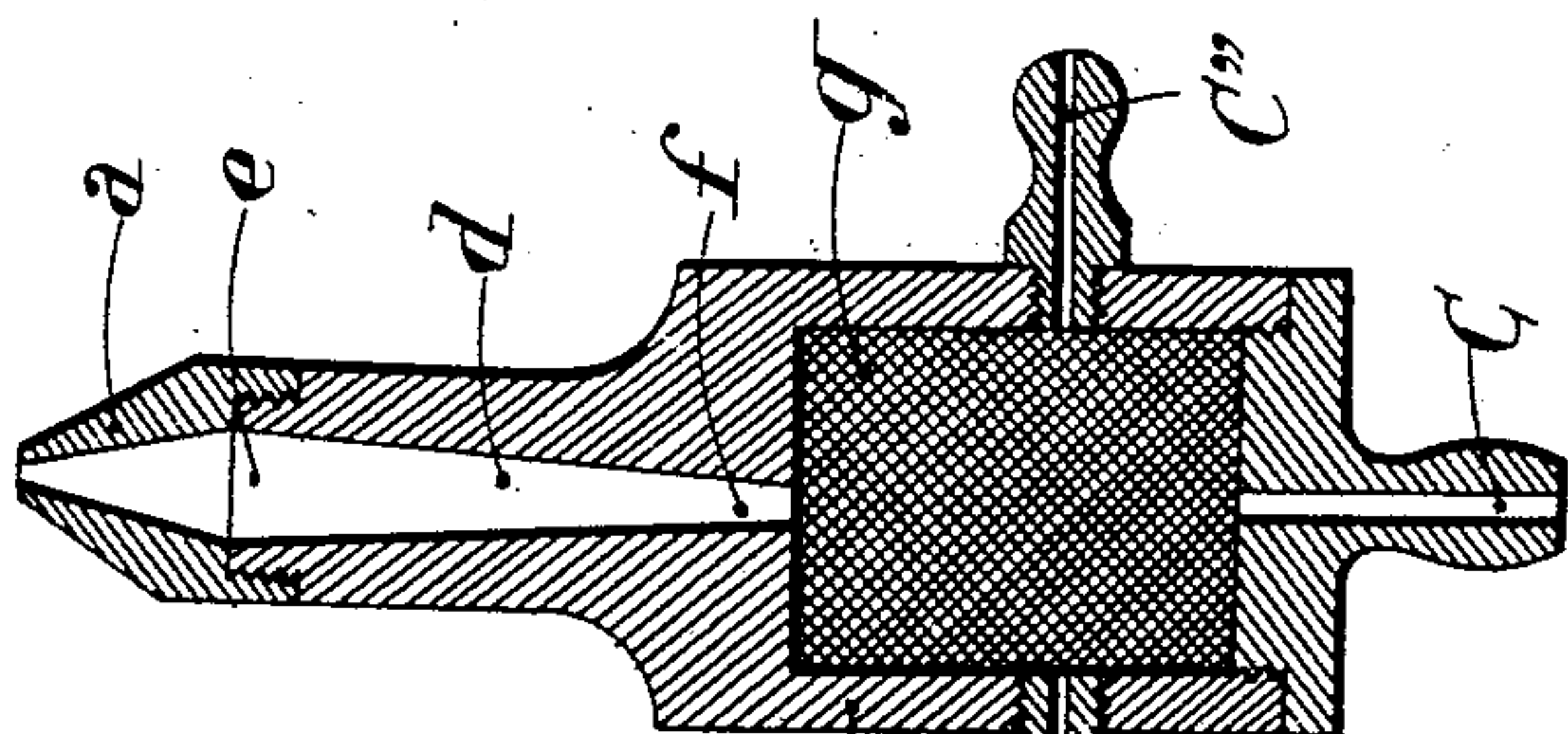


Fig. 3.

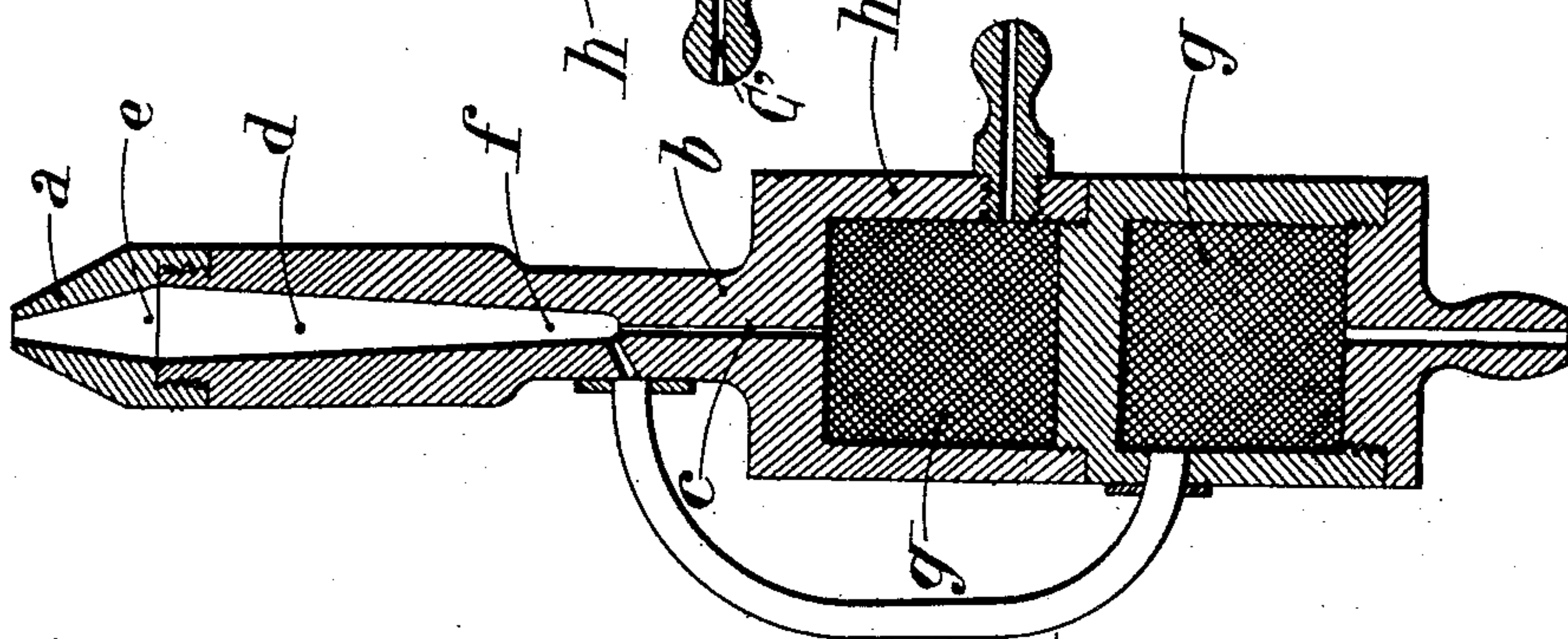
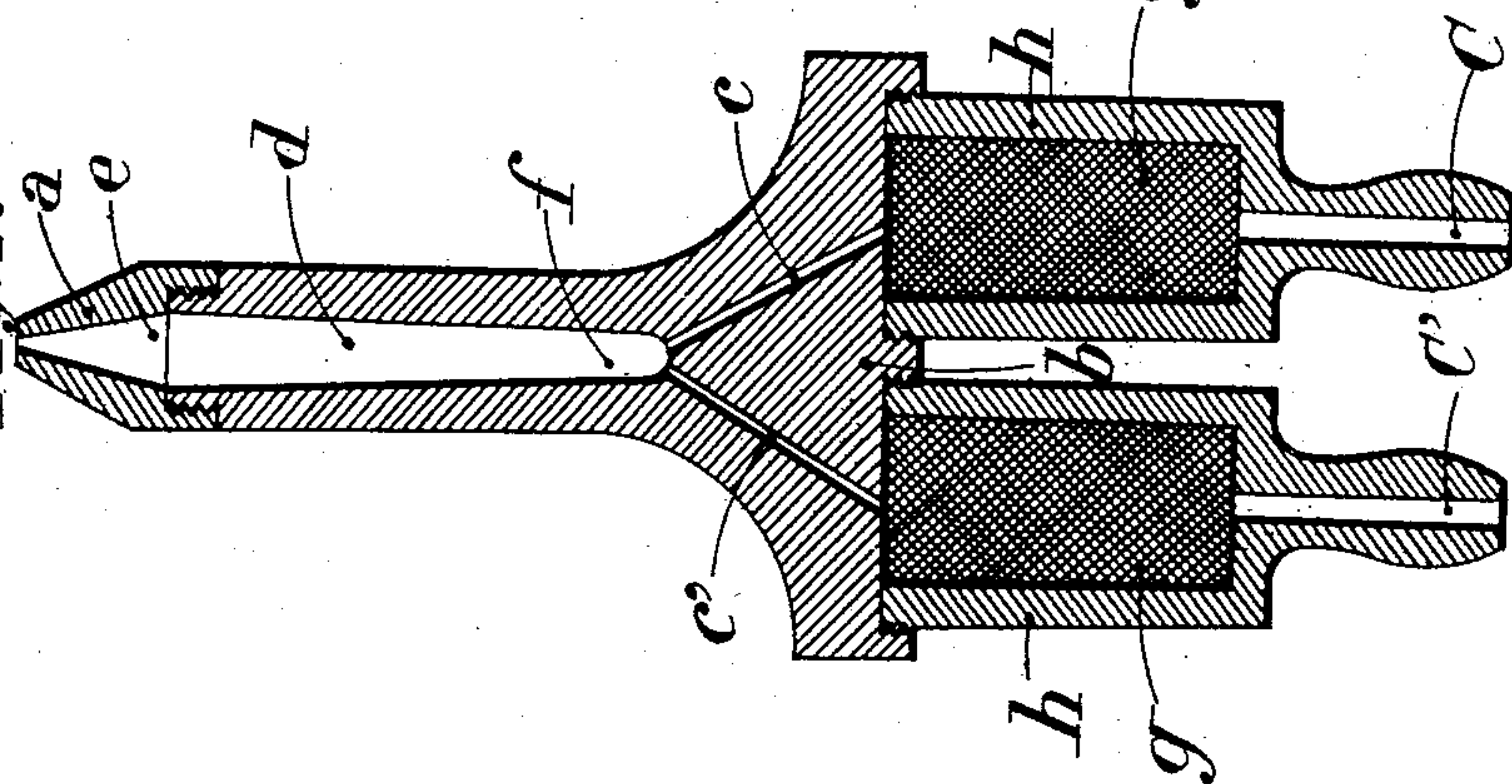


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## BLOWPIPE.

SPECIFICATION forming part of Letters Patent No. 713,421, dated November 11, 1902.

Application filed March 19, 1902. Serial No. 99,012. (No model.)

*To all whom it may concern:*

Be it known that I, EDMOND FOUCHÉ, engineer, a citizen of the French Republic, residing at Paris, France, (and having post-office address 28 Rue St. Lazare, IX arrondissement,) have invented certain new and useful Improvements in Blowpipes, of which the following is a specification.

This invention relates to blowpipes which are intended to burn explosive gaseous mixtures, and has for its object to prevent danger in the use of such apparatus as hitherto constructed, which danger arises from, first, the somewhat voluminous chamber usually employed to insure an intimate mixing of the gases, in which chamber when the flame propagates in this considerable mass of explosive mixture causes violent explosions to take place; second, the flames entering the said chamber cause ignition to take place in the gas-supply pipes.

The invention will be clearly understood from the following description, with reference to the accompanying drawings, of which—

Figures 1, 2, 3, 4 are vertical sections of various constructional forms of the blowpipe.

The blowpipe comprises a nozzle *a b*, with a central passage, the lower part of which communicates by branch passages *c c'* with chambers through which the gases pass to the said nozzle. It is advantageous to make the passages *c c'* of considerably less area than the central passage in the nozzle, so as to cause during the entrance of the gases into the said internal passage (wherein the gases get mixed) a perceptible fall of pressure which prevents the gases or gaseous mixture from passing back from one passage into another passage while the apparatus is working under normal conditions.

The central passage *f* in the nozzle *a b* at the forward end *e* is of conical form, the smaller end of which is at the point of nozzle, and an adjoining portion of the said central passage is coned in a reverse direction for a certain part of its length, so that the angle of the cone is small enough to avoid a prejudicial discontinuity of the stream of gases passing into it. The minimum diameter of the conical portion *e* of the central passage

will depend upon the amount of gas to be consumed.

The employment of the nozzle with the internally-reversed conical passage causes a thorough mixing of the gases without the use of the ordinary mixing-chamber generally employed in apparatus of this character. The stirring action may be increased by the superposition in the nozzle of several cones, such as *d e*.

The blowpipe may be constructed of any suitable metal or other material. The end *a* of the nozzle is best made of steatite, so as to be capable of better withstanding the intense heat, while at the same time the heating of the main portion of the nozzle is thereby decreased. Several blowpipes of this kind may be coupled together and used simultaneously.

To prevent the entrance of the flame into the gas-supply pipes, porous bodies *g* are provided, through which the gases pass to the nozzle, which porous bodies may consist of bricks, pressed coals, charcoal, or the like contained in receptacles *h*. Any interstices between the bricks, blocks, or pieces of porous material may be filled with plaster or asbestos packing or the like. These receptacles *h* may be fitted at any suitable point in the gas-passage; but it is advantageous to make the distance between them and the point where the gases are mixed as short as possible, and it is preferable to adopt such an arrangement that the receptacles *h* will more or less form part of the blowpipe. In Fig. 1 the receptacles *h* form branches converging toward the point where the gases are mixed. In the arrangements shown in Figs. 2 and 3 the receptacles *h*, containing the porous bodies, are more intimately connected to the body of the blowpipe. In Fig. 2 they are arranged side by side, and in Fig. 3 they are superposed. Fig. 4 shows an alternative arrangement of great simplicity involving the use of only one receptacle *h* for the porous substances and into which open the gas-inlets *C C' C''*. This arrangement is specially suitable in cases where it is desired to burn a gaseous mixture previously prepared in one reservoir only. If the gases have been previously mixed before entering the receptacle *h*, containing the



porous material, only one gas-inlet would be required in lieu of the three shown in Fig. 4. The arrangement shown in Fig. 4 is likewise suitable for blowpipes whose small dimensions would render the adoption of the herebefore-described biconical passage in the nozzle useless, the mixture of the gases being effected in the interstices of the porous mass.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is—

1. In blowpipes intended for burning explosive gaseous mixtures, a nozzle having a central passage in form of two cones  $d e$  connected at their bases, gas-supply pipes  $C C'$  leading to the said nozzle, and chambers  $h$  containing and closely filled with porous substances  $g$ , interposed between each gas-supply pipe and the nozzle, said chambers opening in the central passage of the nozzle by small branch pipes  $c c'$ , substantially as described.

2. In blowpipes intended for burning explosive gaseous mixtures a nozzle having a central passage in form of two cones  $d e$  connected at their bases, small branch pipes  $c c'$  opening in the said central passage and in chambers  $h$  containing and closely filled with porous substances  $g$ , each chamber being con-

nected with a respective gas-supply pipe  $C C'$ , substantially as described.

3. In blowpipes intended for burning explosive gaseous mixtures a nozzle having a central passage in form of two cones  $d e$  connected at their bases small branch pipes  $c c'$  opening in the said central passage each branch pipe being connected with separate chambers  $h$  containing or closely filled with porous substances  $g$ , said chambers being in one piece with the nozzle, and gas-supply pipes leading to each of these chambers, substantially as described.

4. In blowpipes intended for burning explosive gaseous mixtures a nozzle having a central passage in form of two cones  $d e$  connected at their bases a chamber  $h$  containing or closely filled with porous substances  $g$ , in one piece with the nozzle and opening in the central passage thereof, and gas-supply pipes  $C C' C''$  leading to the said chamber, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDMOND FOUCHÉ.

Witnesses:

EDWARD P. MACLEAN,  
HENRY SCHWAB.