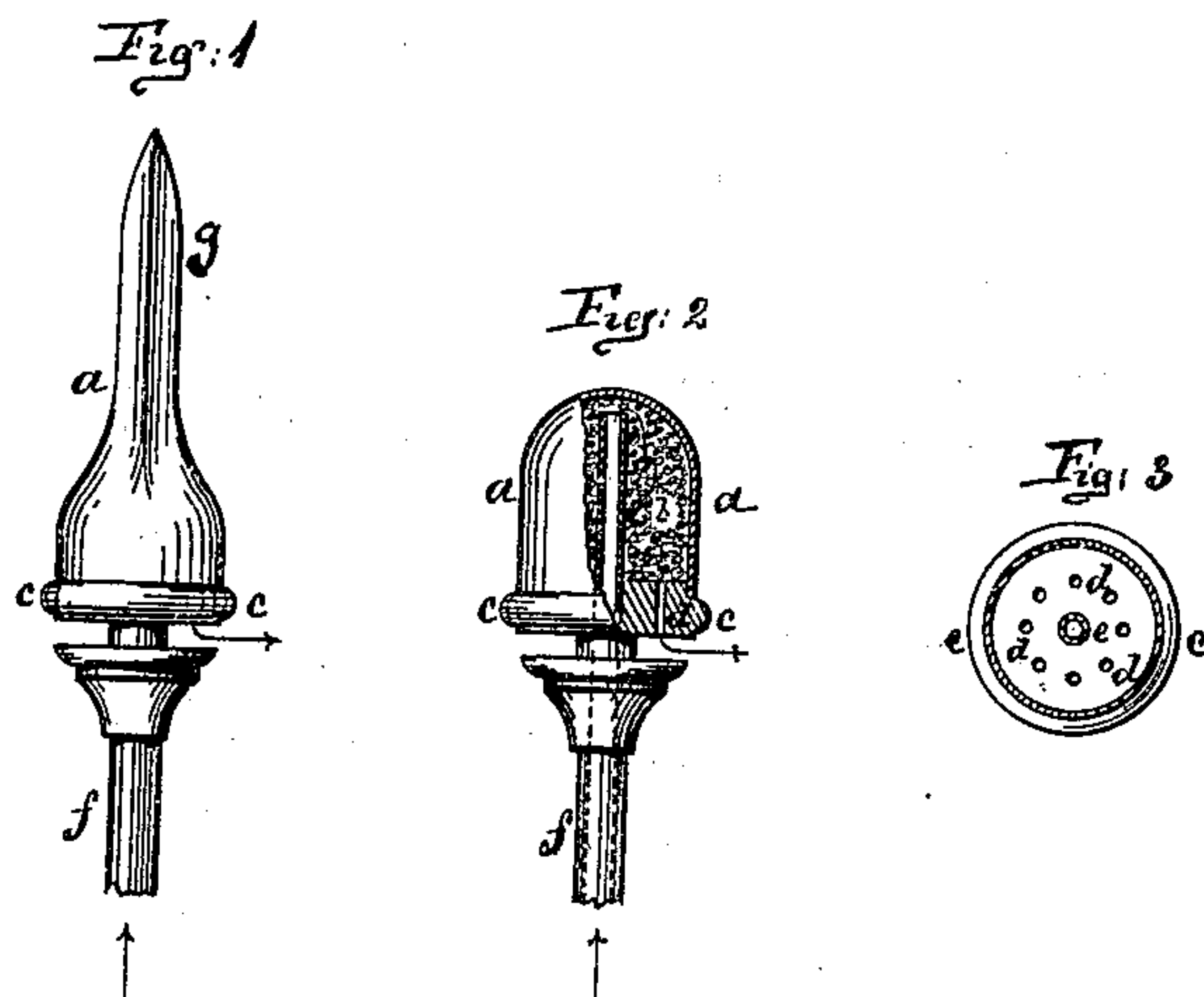


C. A. PAQUELIN.
COMBINED BURNER AND SURGICAL INSTRUMENT.
No. 180,155. Patented July 25, 1876.



Witnesses:
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UNITED STATES PATENT OFFICE.

CLAUDE ANDRÉ PAQUELIN, OF PARIS, FRANCE.

IMPROVEMENT IN COMBINED BURNERS AND SURGICAL INSTRUMENTS.

Specification forming part of Letters Patent No. **180,155**, dated July 25, 1876; application filed March 14, 1876.

To all whom it may concern:

Be it known that I, CLAUDE ANDRÉ PAQUELIN, of Paris, France, have invented an Improved Gas and Vapor Burner and Surgical Instrument Combined; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed sheet of drawings, making a part of the same.

This invention relates to an improved means for producing combustion, for the obtainment, separately or simultaneously, of heat and light, and it also relates to the application thereof to surgical purposes, hereinafter described.

The invention consists in effecting the combustion, with or without flame, of a mixture of combustibles and supporters of combustion in a metal or other chamber, arranged or constructed so as to afford, in the smallest compass, as large a heating-surface as possible, which, among other means used, is packed or closely fitted with wire or metal, or both combined.

The chamber may be of any suitable form and dimensions, according to the purpose to which it is applied, and either filled with metal wire or fragments, or otherwise, or its sides may be so arranged as to produce a maximum heating-surface, and it is also provided with orifices at one or more points. Into this chamber, which is preferably made of platinum or other metal having similar properties, is introduced under pressure a mixture of combustible matters, and matters which are supporters of combustion in the form of gases or vapors, and in proper proportions, which matters are caused to percolate through the wires or metallic or other particles contained in said chamber, and thereby become consumed, this result being produced either by previously raising the chamber and its contents to a state of incandescence, or by igniting the gases or vapors on their introduction into the chamber in order to produce the incandescence which is to maintain their combustion.

The gaseous mixture may be made to burn with or without flame, according to the arrangement of the chamber and to whether the combustion is or is not complete, and to

the nature and proportions of the combustible matters and supporters of combustion. The mixture may also consist of solid or liquid substances instead of gases or vapors, and the combustible and combustion-supporting matters in the form of gases or vapors may be employed for burning liquid or solid matters, and even substances not generally used for producing light and heat, or both, simultaneously.

The invention may be employed either alone or in combination with existing apparatus either for lighting or heating purposes, or both combined, for effecting the fusion of metals in chemical analysis and synthesis, for motive power, and for other purposes and applications which result from the use of light and heat, or the action of both combined.

The invention is illustrated in the accompanying drawing as applied to and combined with a surgical instrument termed a "thermo-cauter," in which the operative part itself constitutes the combustion-chamber.

a, Figures 1 and 2, is the combustion-chamber or receiver, made of platinum, and either tubular and combined with a surgical lancet or knife, *g*, as seen in the side view, Fig. 1; or in the form of a thimble or cap, as in the partial section, Fig. 2; or it may be otherwise formed as desired. *b b* is a filling of platinum wires or particles, or equivalent filling, more or less firmly packed in the chamber *a*. *c* is a perforated disk of platinum or other metal shown in plan in Fig. 3. This disk forms the base of the receiver to which it is secured. *d d* are the escape-orifices in the disk *c*. *e* is a small platinum tube passing through the center of the disk *c* into the interior of the chamber *a* to within a short distance of the closed end of said chamber. *f* is a tube forming a continuation of the tube *e*, and communicating by a rubber or other pipe with a gas-retort bellows, or other suitable apparatus, for maintaining a continuous supply of the mixture of combustible and combustion-supporting matters.

The advantages of this instrument are that it may be instantly heated to the required degree, and maintained permanently at that heat, however long the operation, and that no assistance is required by the operator, as the

apparatus may be carried in the pocket. There is also no danger of accidents in using the instrument, nor smell, owing to the perfect combustion obtained. Lastly, by its use surgical operations may be more quickly performed than with other instruments of the kind.

I claim—

1. The burner composed of the chamber *a*, perforated bottom *c*, tube *e*, and filling *b*, to

operate substantially as herein shown and described.

2. The combination of the burner *a* with the knife, lancet, or device *g*, to constitute a surgical instrument, substantially as specified.

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