

No. 754,129.

PATENTED MAR. 8, 1904.

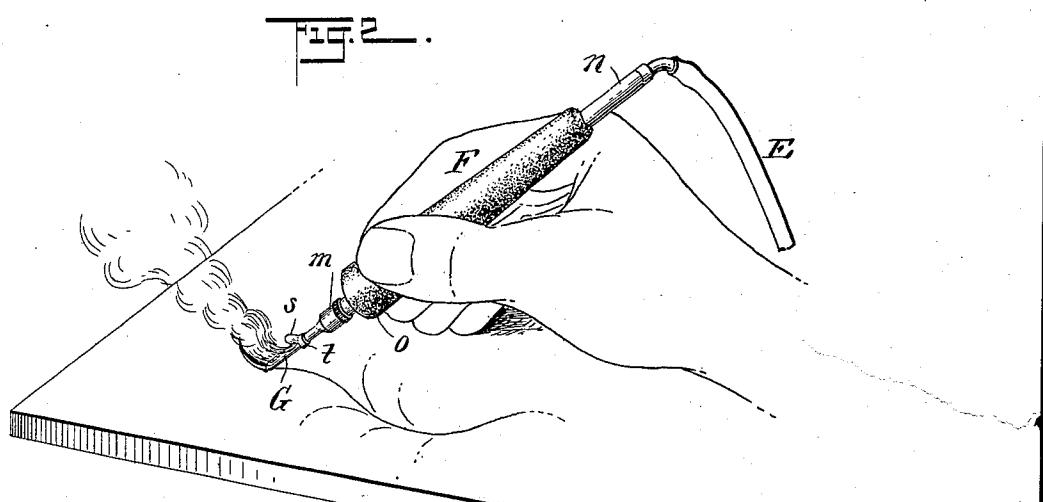
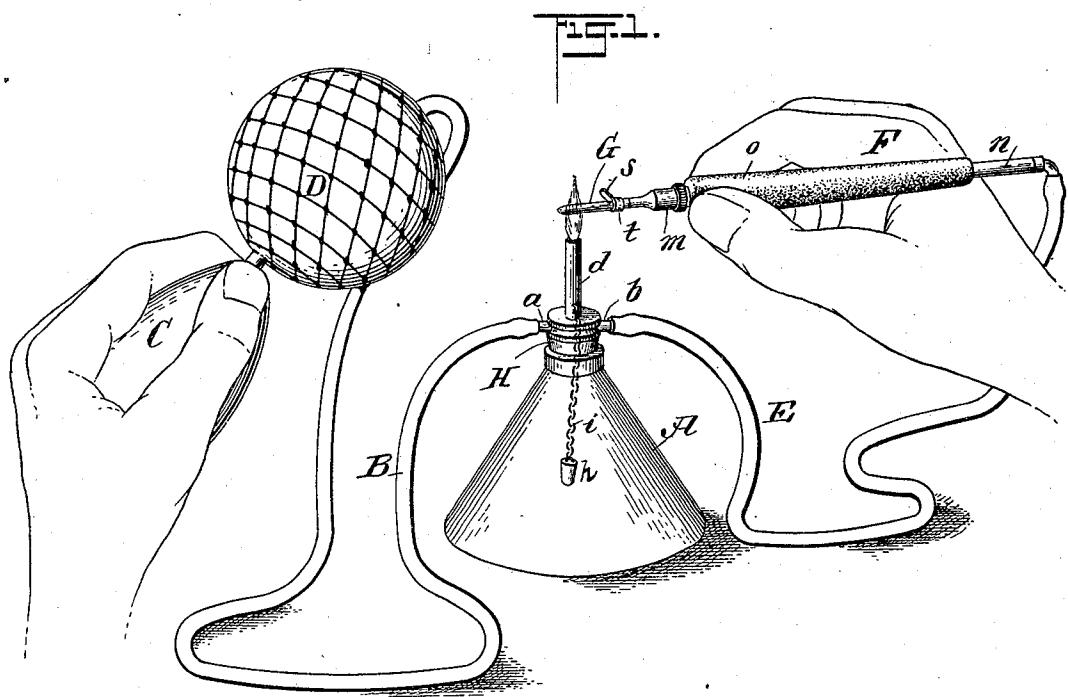
A. S. DIETZ.

PYROGRAPHIC APPARATUS.

APPLICATION FILED JUNE 1, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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INVENTOR

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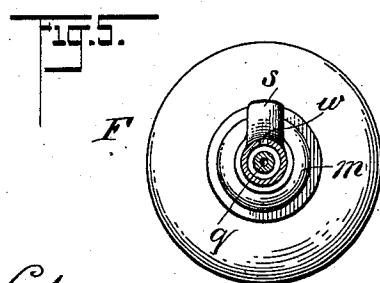
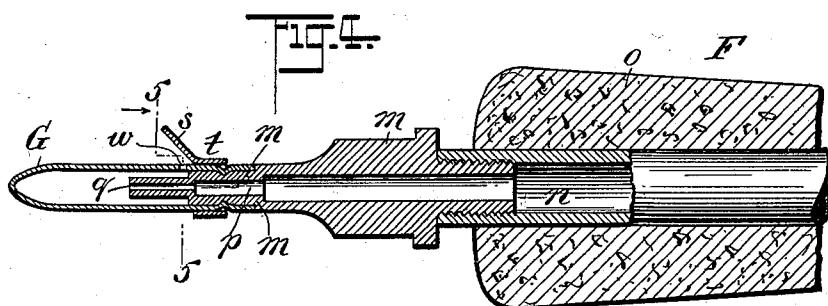
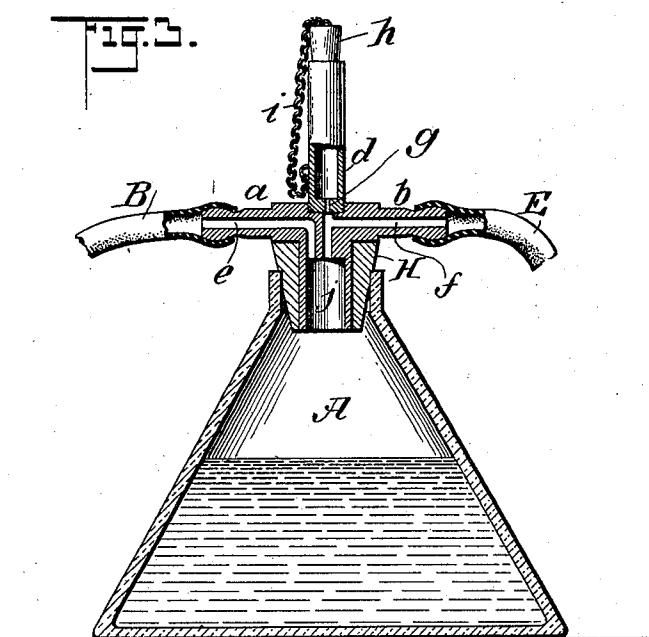
A. S. DIETZ.

## PYROGRAPHIC APPARATUS.

APPLICATION FILED JUNE 1, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



**WITNESSES:**

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## UNITED STATES PATENT OFFICE.

AUGUST SIEGMUND DIETZ, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO FREDERICK TOLHURST.

## PYROGRAPHIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 754,129, dated March 8, 1904.

Application filed June 1, 1903. Serial No. 159,479. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST SIEGMUND DIETZ, a subject of the German Emperor, residing in the borough of the Bronx, city of New York, county and State of New York, (post-office address No. 805 Caldwell avenue, borough of the Bronx,) have invented a new and Improved Pyrographic Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

Figure 1 represents a perspective view of my improved apparatus when the parts are in position for preheating the hollow stylus. Fig. 2 is a perspective view of a part of the same apparatus, showing it in use making a design on a board. Fig. 3 is a vertical central section of the fluid-reservoir and its attachments. Fig. 4 is a longitudinal central section, on an enlarged scale, of the stylus, its deflector, and the parts carrying the same. Fig. 5 is a cross-section on the line 5-5, Fig. 4.

This invention relates to improvements on apparatus used for burning designs upon wood, leather, and the like, which apparatus can, however, also be used for cauterizing and other purposes.

The invention consists of the various combinations and features of construction that are hereinafter more fully pointed out.

In apparatus for burning designs upon wood, leather, and the like and also for cauterizing it is and always has been customary to employ a fluid-reservoir A which contains benzine or other like burning fluid and which is connected by pipe B with a compressible air-bulb C, frequently also with an intermediate air-reservoir D, while another pipe E connects the fluid-reservoir A with the instrument F, that carries the stylus G. All this is clearly shown in Fig. 1. With apparatus, however, as usually constructed for this purpose I have found several difficulties. In the first place the stylus G before it can be used must be preheated. A special lamp has been heretofore supplied for that purpose, and in some places instead of a special lamp a rotatable valve capable of making sundry connections, and therefore unreliable in un-

skilful hands, has been applied directly to the fluid-reservoir.

One part of my invention consists in supplying the reservoir A with a cork or stopper H, (see Fig. 3,) from which cork or stopper three branches emanate or extend—to wit, the branch a, which connects with the air-supply pipe B, the branch b, which connects with the pipe E, that is coupled to the instrument F, and another branch d, which extends upward, as clearly shown in Fig. 3. The cork or stopper H has three passages—to wit, the passage e, which extends through the nipple a and then downward, so as to produce open connection between the pipe B and the reservoir A, the passage f through the nipple b, also extending downward within the cork or stopper H, so as to establish connection between the vessel A and the pipe E. From the passage f another small passage g extends into the burner-tube d. This burner-tube can be closed at the outer or upper end by a cap, cover, or stopper h, which preferably is united by chain i to the outer part of the burner-tube d or to any other suitable part of the apparatus.

As far as described the organization operates as follows: When the tool G is to be preheated, as in Fig. 1, it is only necessary to remove the stopper h from the burner-tube d, compress the bulb C, so as to force air into the reservoir A, and then ignite the escaping vapors at the upper end of the burner-tube d, all as clearly shown in Fig. 1. The tool G or stylus can then be put into the flame, as in Fig. 1, and properly preheated. The cap or stopper h is thereupon placed over the top of the tube d and the action of the bellows or bulb C continued, so as now to force the fumes into the stylus, where they will come in contact with the preheated inner surface thereof, thereby becoming ignited, thus keeping the stylus in the proper glowing condition, which enables it to be used for burning wood or other substances. It will be observed (with reference once more to Fig. 3 of the drawings) that when the burner is used for preheating the stylus and the bulb C compressed to

force air into the vessel *a* and thence into the burner, so as to produce the flame shown in Fig. 1, some of the gases or fumes will also at the same time be forced into the tube *E*, so that as quickly as the stylus is preheated externally the contact of these fumes with its inner walls will at once begin to heat it up internally.

Referring once more to Fig. 3 of the drawings, it will be observed that the cork or stopper *H* has a hollow or chamber *j* formed in its lower portion and that the passages *e* and *f* enter this hollow or chamber, while the lower end of the said hollow or chamber connects with the contents of the vessel *A*. I find that in practice this hollow or chamber *j* assists materially in keeping the stylus *G* properly heated internally during its use on wood or the like, while great difficulties have occurred in that direction with an ordinary stopper, in which the passages *e* and *f* extended down to its lower end. It appears that the fumes produced by the impact of the air from the bulb *C* upon the surface of the volatile fluid in the vessel *A* will enter the hollow or chamber *j* and be ready for absorbing newly-ascending fumes more readily than if there were no such chamber in the stopper. Instruments that would not continue to keep the stylus properly heated will at once become useful and free from difficulty if a stopper having this chamber *j* is used.

The stylus *G*, which is shown in enlarged form, is a hollow shell made of platinum or the like, closed at its outer end and slipped with its open inner end over a tube *m*, to which it is properly secured. This tube *m* at its rear end is screwed or otherwise united to another tube *n*, which connects with the pipe *E*. The tube *n* is incased in a non-heat-conducting sheath *o*. All these parts *G*, *m*, *n*, and *o* constitute the tool *F*. It will be observed by reference to Fig. 4 of the drawings that the bore of the tube *m* where it joins the tube *n* is of less diameter than the bore of *n* and that this diameter is still further reduced at *p* nearer the outer end of the tube *m* and still further at *q* at the outer end, being the burner end within the stylus, so that the fumes coming to the burner first pass through the comparatively large tube *n*, then through the largest diameter of *m*, then through the reduced diameter at *p*, and finally into the smallest diameter at *q*. This gradual contraction of passages causes the vapors that are to furnish the flame within the stylus to become properly compressed and condensed to give out the required flame within the stylus. If the tube leading to the burner *q* were all of the same diameter as the burner, the operation would be insufficient from insufficient pressure, nor would such pressure be gradually applied.

In apparatus of the kind referred to it has frequently occurred that ladies and other delicate persons using pyrographic instruments suffer seriously from the smoke which arises from the burning wood, leather, or the like and enters their eyes. Many people have been ordered by their physicians to abstain from following their inclination in this regard because of the before-mentioned difficulty. In order to overcome this difficulty I have supplied the stylus with a shield or deflector *s*, which is attached to its outside by suitable means, but preferably by means of a ring *t*, from which said deflector projects, and the ring is slipped over the stylus. It will be observed from Fig. 4 that the deflector extends from the outer surface of the stylus forwardly and upwardly and that it is located directly above the hole *w*, which is made through the body of the stylus to permit the escape therefrom of the products of combustion. The result of this deflector in this particular location is that any smoke which may arise at the place of contact between the stylus and the wood or other substance to be burned will by the escaping products of combustion which are forced out of the stylus through the hole *w* by the compression of the bulb *C* be blown forward and away from the eyes of the operator, so that such smoke can no longer injuriously affect the eyes nor interfere with the proper observation of the work in hand.

What I claim as new, and desire to secure by Letters Patent, is—

1. In pyrographic apparatus the combination of the air-forcing bulb *C*, pipe *B*, the cork or stopper *H*, having air-supply passage *e*, vapor-discharge passage *f*, and a hollow or chamber *j* in its lower part, which hollow or chamber connects with both passages *e* and *f*, the pipe *E*, and pyrographic instrument *F*, substantially as and for the purposes described.

2. The combination in a pyrographic apparatus of the stylus *G*, a tubular support for the same, air-compressing apparatus *C*, fluid-reservoir *A* and fume-carrying conduit *E*, with the deflector *s* placed on the stylus over the aperture *w* therein, all arranged so that the products of combustion forced through the aperture *w* will be deflected to carry the smoke generated at the point of the stylus away from the eyes of the operator, as and for the purposes specified.

3. In a pyrographic apparatus, the combination of a fluid-reservoir and means for supplying air thereto, a stopper having an air-supply passage and a vapor-discharge passage and also having in its lower part a hollow or chamber open to said reservoir and to the air-supply and vapor-discharge passages, and a pyrographic instrument connected with the vapor-discharge passage.

4. In a pyrographic instrument, a stylus

having a channel for supplying vapor thereto and provided with a lateral aperture for the escape of the products of combustion, in combination with a deflector placed upon the stylus 5 and extending over the said aperture to carry the smoke generated at the point of the stylus away from the eyes of the operator.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AUGUST SIEGMUND DIETZ.

Witnesses:

JOHN A. KEHLENBECK,  
EUGENE EBLE.