F. M. LASERSON.

PATTERN PERFORATING.

APPLICATION FILED NOV. 5, 1912.

1,140,170.

Patented May 18, 1915.

6 SHEETS—SHEET 1.

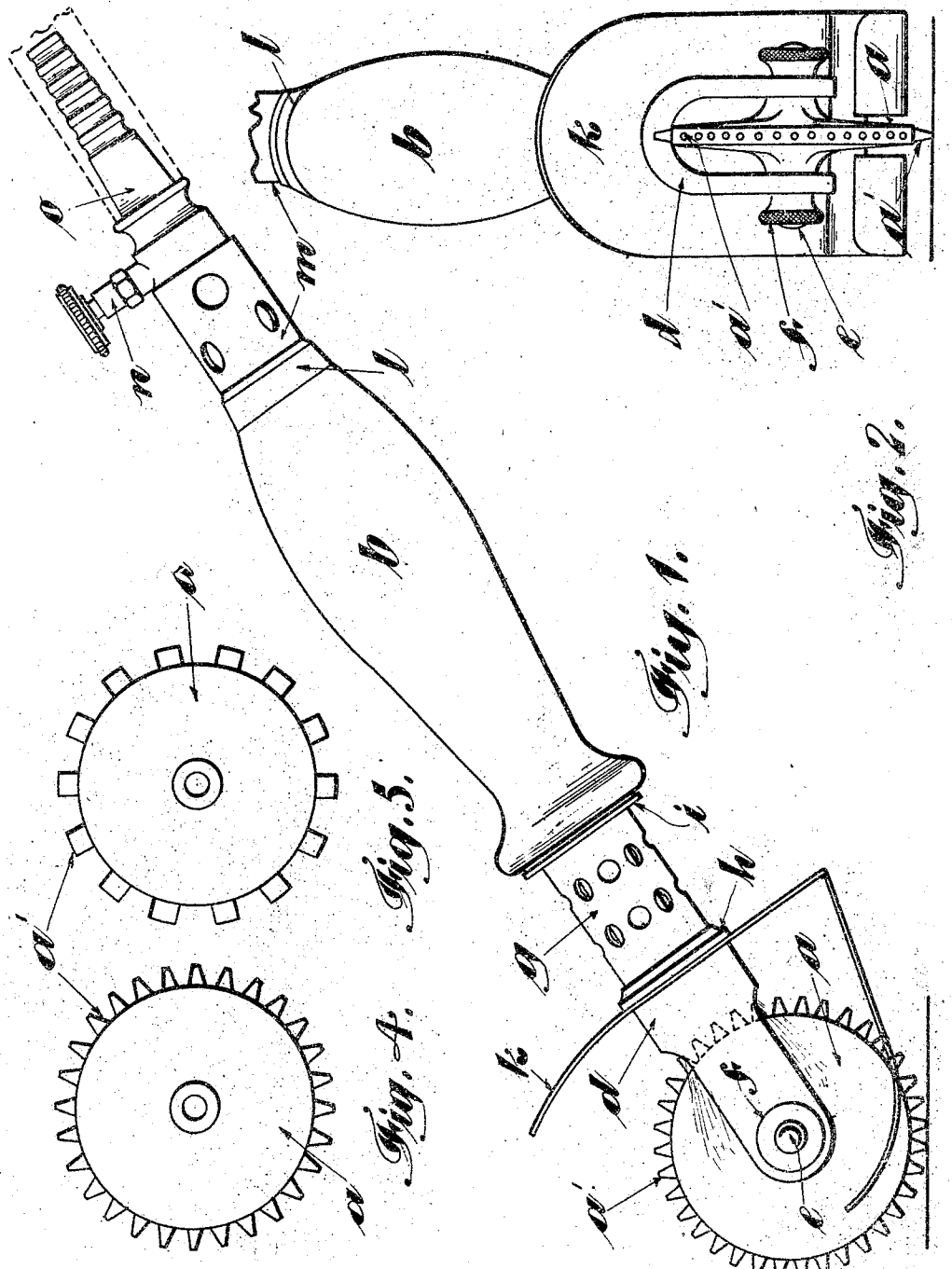


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Witnesses.

John C. Sanders

Albert F. Heiman

Inventor.

Frederick Maurice Laserson

By his Attorneys. Wm Wallace White

F. M. LASERSON.

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6 SHEETS—SHEET 2.

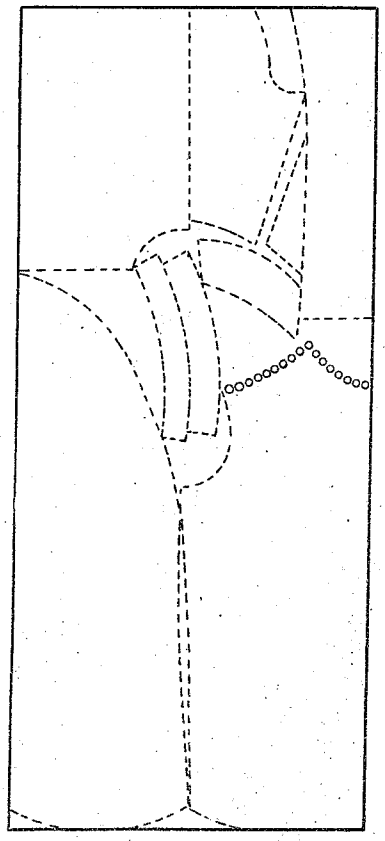


Fig. 6.

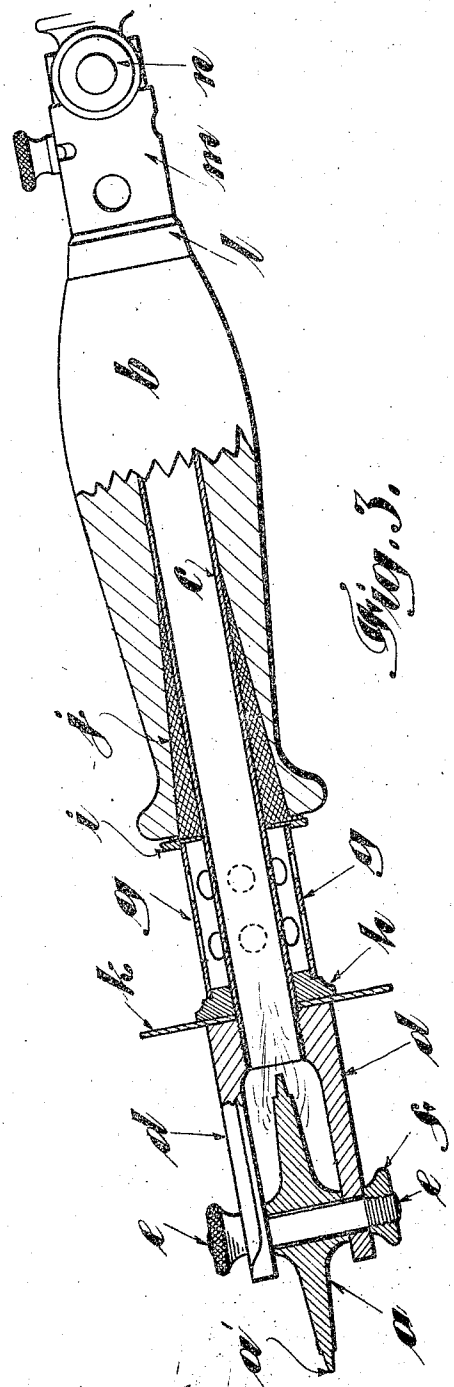


Fig. 5.

Witnesses.

John C. Sanders

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Inventor.

Frederick Maurice Laserson

By his Attorney Wm. Wallace White

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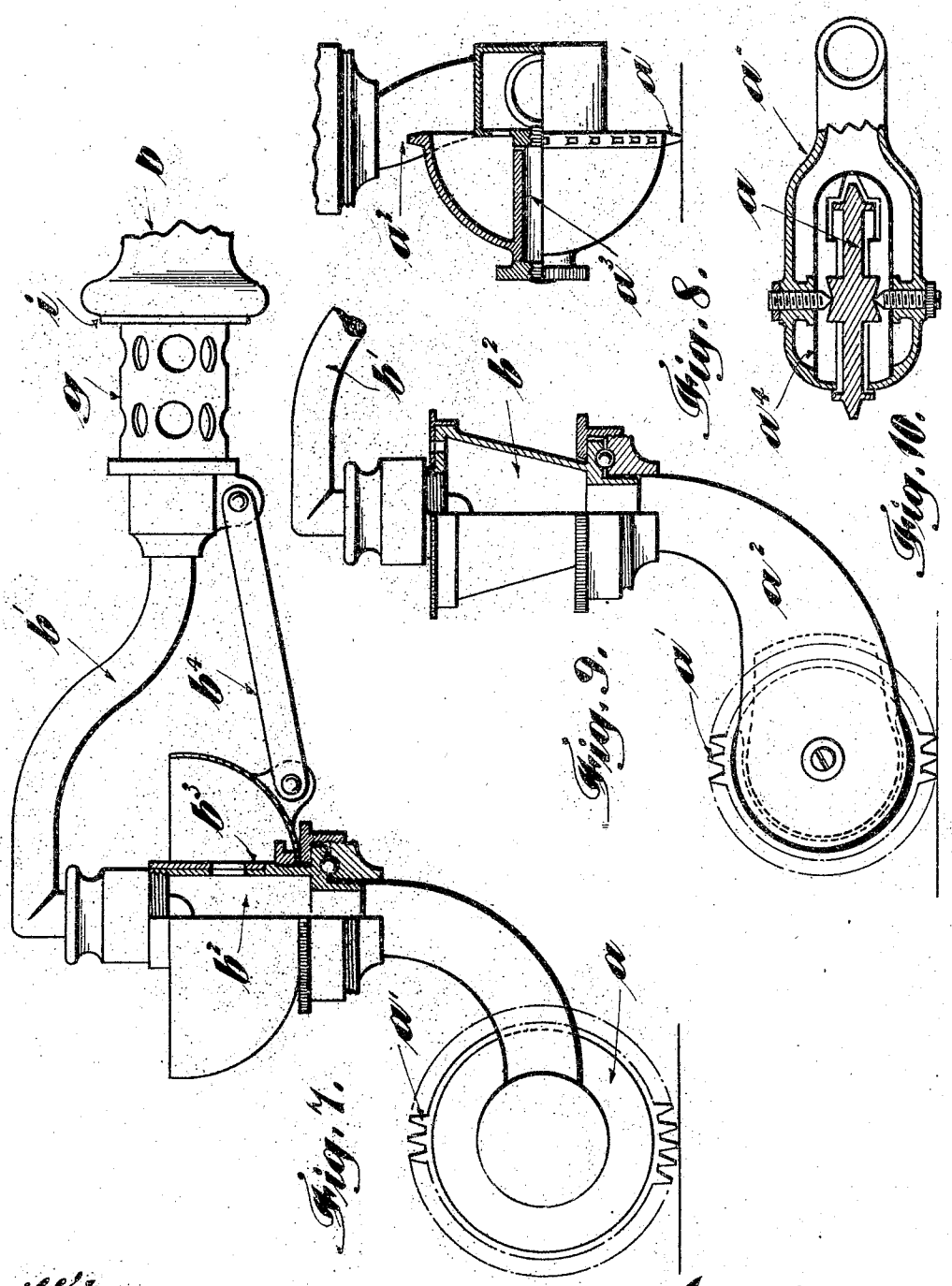
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6 SHEETS—SHEET 3.



Witnesses.
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6 SHEETS—SHEET 4.

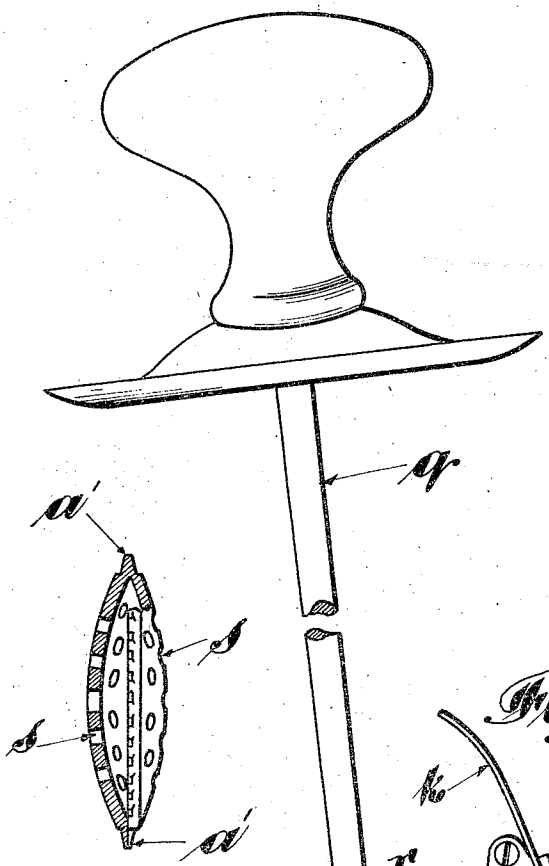


Fig. 13.

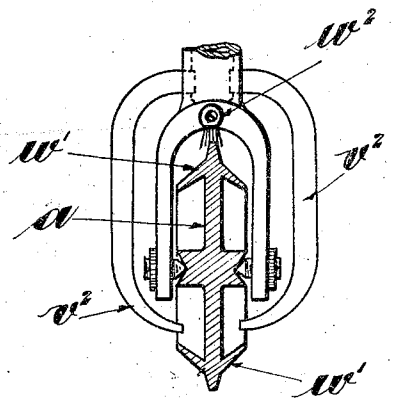
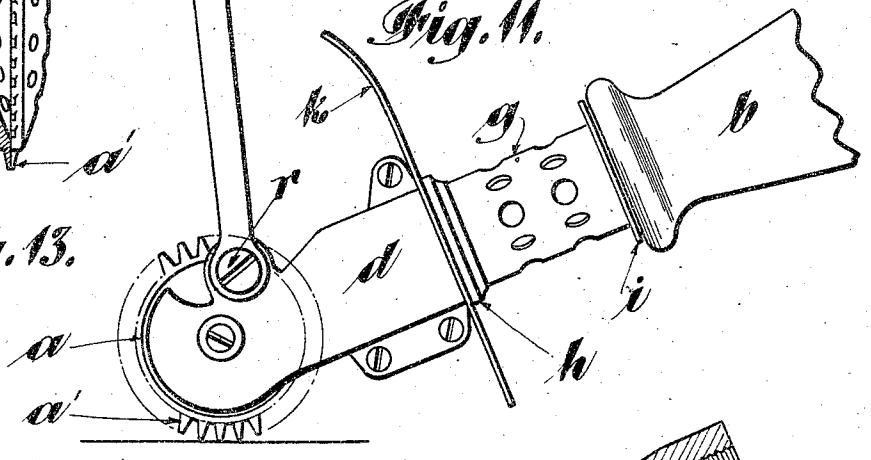


Fig. 15.

Fig. 11.



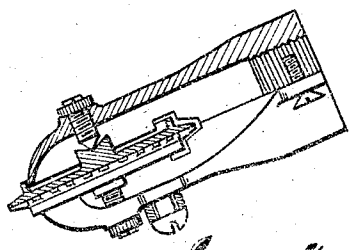


Fig. 12.

Witnesses.

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6 SHEETS—SHEET 5.

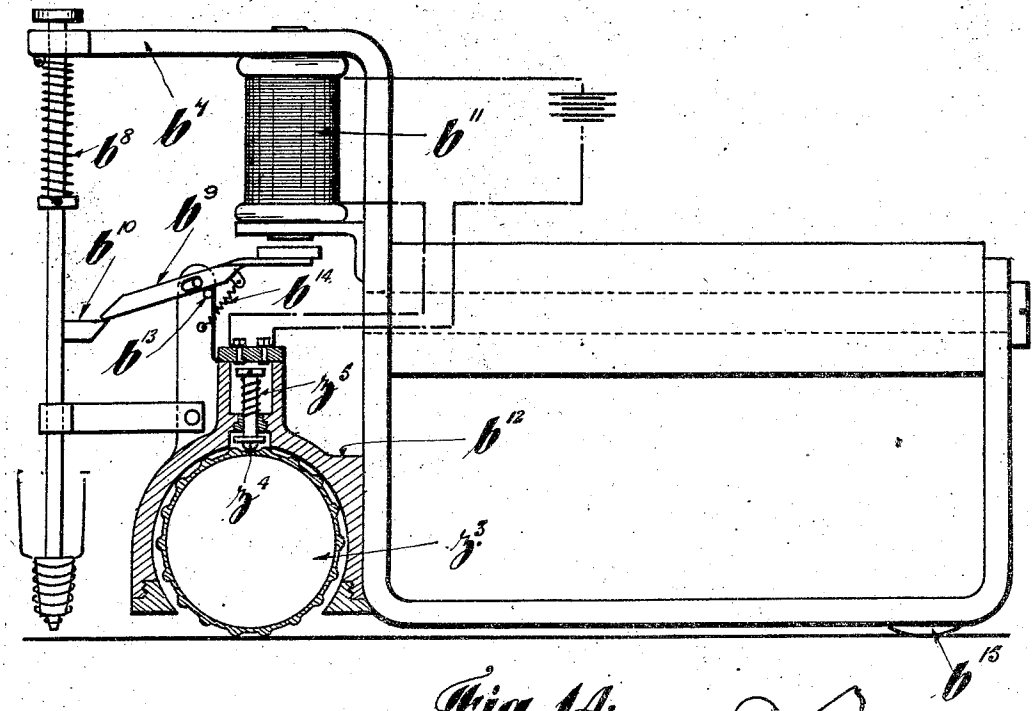


Fig. 14.

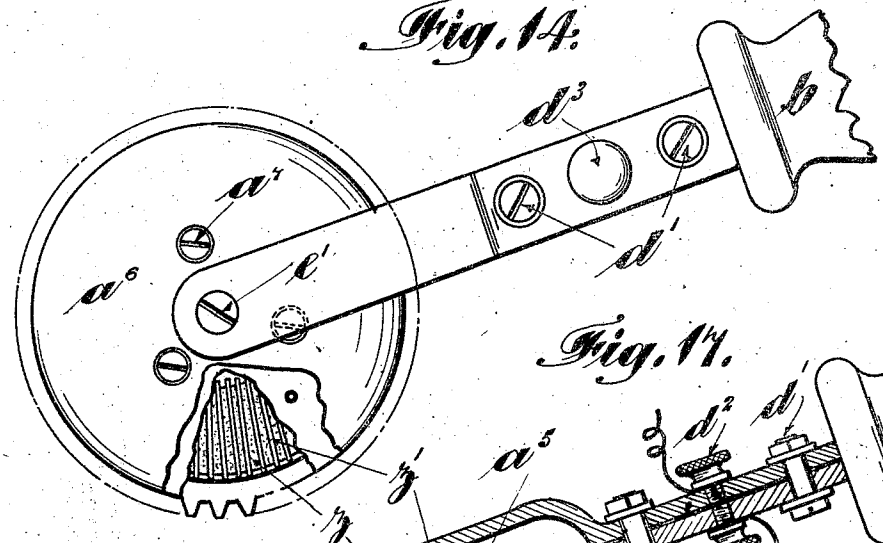


Fig. 17.

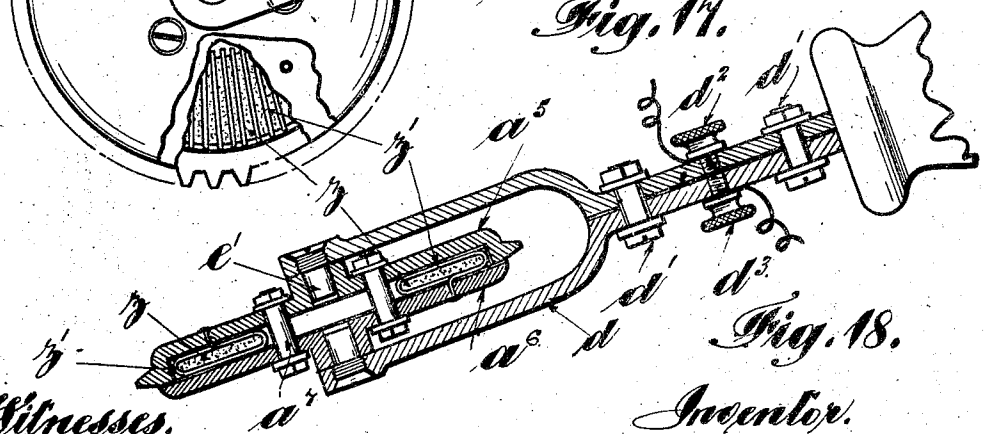


Fig. 18.

Witnesses.

John C. Sanders

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PATTERN PERFORATING.

APPLICATION FILED NOV. 5, 1912.

1,140,170.

Patented May 18, 1915.

6 SHEETS—SHEET 6.

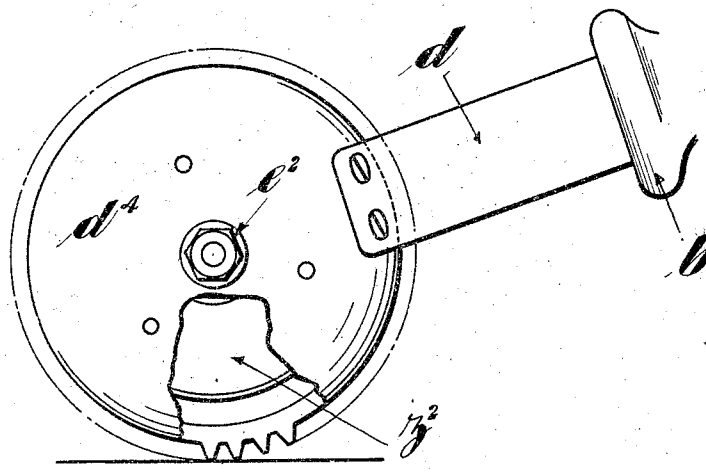


Fig. 19.

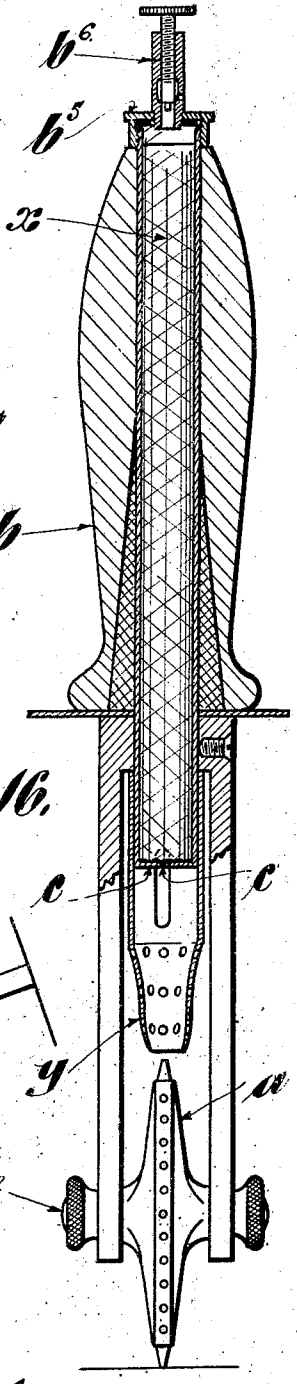


Fig. 16.

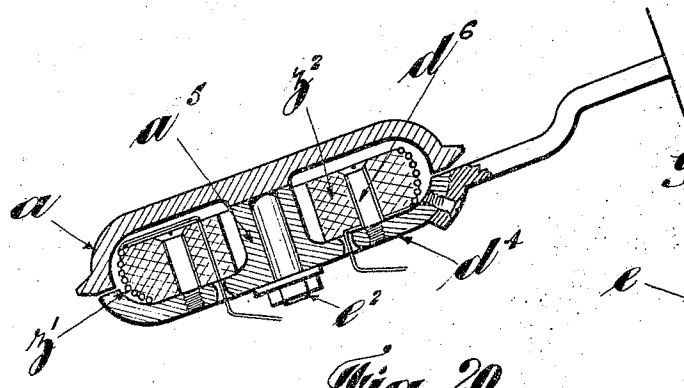


Fig. 20.

Witnesses.

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By his Attorney. Wm Wallace White

UNITED STATES PATENT OFFICE.

FREDERICK MAURICE LASERSON, OF MANCHESTER, ENGLAND.

PATTERN-PERFORATING.

1,140,170. Specification of Letters Patent. Patented May 18, 1915

Application filed November 5, 1912. Serial No. 729,589.

To all whom it may concern:

Be it known that I, FREDERICK MAURICE LASERSON, a subject of the King of Great Britain and Ireland, and resident of Cheetham Hill Road, Manchester, England, have invented certain new and useful Improvements in Pattern-Perforating, of which the following is a specification.

This invention refers to and consists of a "self-heated" perforating hand tool for use in the production of stencils as used by clothing and other garment manufacturers in the marking of cloth preparatory to cutting up the cloth to form the parts of garments, or as used by embroiderers in marking designs on fabrics.

A special feature of the invention is that the perforator, which is heated to incandescence and which produces the perforations by burning, is capable of being moved freely in all directions and the pattern thus infinitely varied at the will of the operator.

According to the preferred arrangement, the improved tool comprises a wheel on which are projections or teeth, the wheel and its teeth resembling an ordinary pattern tracing wheel. The teeth correspond at their extremity to the shape and size of the intended perforations. The tool also comprises a handle by which the wheel is axially supported and by which it may be traveled over the material to be perforated. Forming part of or fitted to the handle are means for connecting it to a gas supply pipe, and also means for producing a Bunsen burner, the burner tube extending through the handle, and the ignition end lying at a point adjacent to the periphery of the wheel. On gas being supplied and ignited the flame plays on to and heats the wheel to incandescence. In using the tool the teeth of the wheel are traveled over and simultaneously gently pressed upon the paper, when, owing to the heat, perforations are formed in the paper. In lieu of being heated by gas, the perforator may be heated by spirit, or electricity.

Upon the accompanying drawing, Figure 1 illustrates a side elevation of the improved tool. Fig. 2 illustrates a front or end view. Fig. 3 illustrates a plan partly in section. Figs. 4 and 5 illustrate wheels with various forms of teeth that may be used. Fig. 6 illustrates a plan of a stencil for the production of which this invention is more particularly designed. Fig. 7 illustrates a side elevation (partly sectional) and Fig. 8 a front or end view (also partly sectional) of another form of the improved tool. Fig. 9 illustrates a side view, and Fig. 10 a sectional plan of another form of the wheel end of the tool. Figs. 11 and 12 illustrate a side elevation and sectional plan respectively of a further form of the wheel end of the tool. Fig. 13 illustrates in section a modification of the wheel. Fig. 14 illustrates a side elevation of an arrangement whereby the perforations are formed by the reciprocations of a single tooth. Fig. 15 illustrates a cross section of a further modification. Fig. 16 illustrates a longitudinal section of the improved tool when heated by spirit, such as benzin. Fig. 17 illustrates a side elevation (partly broken away) and Fig. 18 a transverse section of the improved tool adapted to be heated by electricity. Fig. 19 illustrates a side elevation (partly broken away) and Fig. 20 a transverse section of an alternative arrangement of the electrically heated tool.

As shown, *a* is the wheel, which is preferably made of steel or bronze. Its teeth *a'* correspond, as aforesaid, in size and shape to the intended perforations. By the substitution of wheels with teeth of other sizes and shapes the perforations will vary.

b is the tool handle preferably made of wood or other light and suitable material and shaped to allow of being easily grasped in the hand. The handle is hollow and through it passes a metal tube *c*, hereinafter termed the burner tube. This tube extends beyond the end of the handle, and on to its end is secured a forked metal part *d*. In the extremities of the forks of such part are holes for the reception of a spindle *e* forming an axis for the wheel *a* about which it freely rotates, the spindle being preferably held rigidly relatively to the part *d* by nuts *f*, *f*. Between the part *d* and the handle *b* is a metal sleeve *g* in which are perforations, the ends of the sleeve being held concentric by means of a metal end collar *h*, and recessed metal disk *i*.

The interior of the handle *b* is made larger at the end next the sleeve *g*, and the space thus formed is filled with asbestos *j*. The purpose of the sleeve *g* and asbestos is to isolate the handle from the heat of the wheel *a* and thus keep it cool. For a similar purpose there may be a sheet metal guard or shield *k*. At the other end of the handle

is a metal mount l with perforated sleeve m and gas-regulating valve n. Forming part of, or connected to the mount l is a tapered connecting nipple o, these parts being similar to an ordinary gas-supply fitting. By means of the nipple o, an india-rubber or other flexible tube may be connected to the tool, the other end of the tube being connected to any convenient gas supply.

The burner tube c extends from the metal mount l to the part d, and thus, on screwing up the part d against the shield k or collar h, the sleeve, collar, disk and shield are all held tightly together. As shown in Fig. 3, the burner tube ends immediately behind the wheel a, therefore, on the tool being supplied with gas and air and a light being applied at the wheel end of the tube a flame is projected on the wheel, see Fig. 3. With the wheel fully heated and rendered incandescent, which takes place in a few minutes, the tool is taken hold of by the handle b and the wheel a is placed teeth downward on the paper to be perforated. The wheel is then traveled at a moderate speed over the paper, a slight pressure being applied to insure of the proper contact of the teeth with the paper. Owing to the heat of the wheel the paper is rapidly burnt through at each point touched by the teeth, each of which forms a sharp well-defined perforation without bur or raggedness on the edge.

While the guard or shield k serves for shielding the handle from the heat of the wheel, it also serves as a rest or stand by which the tool may be supported with the wheel clear of the table on which the tool is placed. To protect the paper from the flame as the tool is being traveled over it, the guard k may be extended as shown in Fig. 1 on each side of the wheel. For a like purpose, the wheel may be inclosed on each side by a side shield composed of sheet metal or wire gauze. In traveling the wheel over the lines marked on the paper which often lie at sharp angles to each other or comprise small curves, it is desirable that the wheel a be free to readily follow the angles or curves or change the direction of movement without the handle b of the tool being of necessity held in line with the plane of the wheel. To allow of this the wheel is carried by a swivel carrier a^2, see Figs. 7 and 8, the carrier being tubular to convey the gas, etc., to the wheel and the handle b being preferably arranged horizontally and connected by a tube b' to a vertical tube or gas mixing chamber b^2, the lower end of which forms part of the swivel joint. In such tube b' are holes for the ingress of auxiliary air and surrounding such tube is a perforated sleeve b^3 for regulating the admission of the air to the burner tube.

For the purpose of inclosing the flame as much as possible and thus reduce the risk of fire, the wheel may be made to the section shown in Fig. 8, and the gas may issue from openings in that side of the enlarged end of the carrier a^2 next the wheel. The wheel in this case will be provided with a long hub part and be free to rotate about a spindle or axis a^3 rigidly secured to the carrier. For the purpose of strengthening the connection between the tube b' and handle b a short bar or link b^4 may be provided. Instead of being arranged horizontally the handle b may be arranged vertically and in such case may be connected directly to the tube b'.

Fig. 9 shows a slight modification of the gas mixing chamber which is formed conical and provided with air holes and a regulator for such holes at the top end. This same figure, in conjunction with Fig. 10, also shows how the carrier a^2 may close in the two sides of the wheel a, the teeth of the wheel alone protruding and the flame being entirely screened from view. The gas mixture, which issues through holes a^4, is supplied under pressure.

In Figs. 11 and 12 the wheel a is inclosed by the carrier on both sides. The carrier, which is made in two parts, is shaped to extend into the recesses on the sides of the wheel, see Fig. 12, and except for the space for the wheel is closed in on the under side. On the top side the carrier is open to allow the gas to burn. To facilitate the manipulation or guidance of the tool when passing over the sharp curves, or when suddenly changing the direction of movement, the tool may be provided with an attachment such as q shown in Fig. 11, and consisting of a rod with forked end detachably connected by screws r to the carrier and provided with a wooden handle at its upper end. By means of this attachment the user may use both hands, one for grasping the tool and the other for guiding it along the lines.

As shown in Fig. 13 the wheel a may be made hollow and the gas mixture (under pressure) be conducted into it through a hollow axis, holes s being provided for the escape of the products of combustion.

Fig. 16 illustrates the tool as adapted to be heated by spirit, such as benzin. In the handle b or tube c is a filling of cotton wick x and the end of the burner tube c is closed except for a small hole c'. Over such end may be a cap or nozzle y by the heat of which, after starting the tool, the spirit will constantly vaporize. At the other end of the handle is a cap b^5 and valve b^6, this latter being for relieving pressure. By removing the cap b^5 and pouring spirit into the handle, it is readily absorbed and held by the wick. When the wick is fully charged the cap b^5 is replaced. The burner end of the tube is then heated in a flame until the

spirit issues through the hole c' in the form of vapor. With the vapor ignited a hot flame is delivered on to the wheel a which rapidly becomes incandescent. While showing the tool a adapted to be heated by gas or spirit, it will be understood that it may be heated electrically. In this, as in other connections, the wheel may be other than metal.

Figs. 17 and 18 illustrate one example of the electrically heated tool, the arrangement consisting of a hollow wheel made in two parts a^5, a^6 and held together by insulated cross bolts a^7. The two parts of the wheel are also insulated from each other where they meet by sheet mica.

Within the wheel (the interior of which is lined with thin sheet mica) is a ring of mica z, see Fig. 18, while around such ring is wound platinoid or other suitable wire z'. One end of this wire passes through the mica lining of the wheel and is connected to one half of the wheel, while the other end also passes through the mica lining and is connected to the other half of the wheel. By means of a divided axle e', the wheel is rotatably connected between the forks of the carrier d, which is also in two parts insulated from each other and held together by bolts d'. Upon the carrier are terminal screws d^2, d^3, one for each part by which flexible conducting wires from an electric generator may be connected to the carrier. With the current turned on, the wire z' becomes incandescent, and the wheel heated to incandescence.

Figs. 19 and 20 illustrate another example of the electrically heated tool. The carrier d is made with a disk-like part d^4 of similar diameter to that of the wheel and near its center is provided with a boss d^5. In this boss is rotatably mounted the axis of the wheel e^2 which is held to the carrier by washer and nut. Encircling the boss d^5 and fixed to the carrier d^4 by screws d^6 is a ring of quartz or compressed asbestos z^2. Coiled around this ring is a platinoid or other suitable wire z', the ring being of such a width and diameter as to cause the wire to lie close to (but not touching) the interior of the wheel. The ends of the wire pass through holes in the ring and carrier and are respectively connected to the positive and negative conducting wires of a generator. With the current turned on, the wire z' becomes incandescent and the wheel is heated to incandescence.

In Fig. 14 the perforator is in the form of a needle or single tooth, and the action of the perforator is regulated electrically. That is to say, the perforator is supported in a frame b^7, a spring b^8 serving to hold its lower end normally just clear of the paper. By means of a bevel-ended lever b^9 engaging a beveled projection b^{10} on the perforator, and also an armature carried by the lever and an electro-magnet b^{11} carried by the frame, the perforator is adapted to be rapidly lowered into contact with the paper and raised again by the spring. This is brought about by the rapid "making" and "breaking" of the electric circuit of the magnet windings, and is preferably effected by means of a ball z^3 provided with small protuberances upon its surface and free to roll in a housing b^{12} secured to the frame b^7. It is also effected by a spindle z^4 insulated from the housing, and designed on a protuberance on the ball pressing it upward (against the resistance of a spring z^5) to bridge across the terminals of the two conducting wires of the magnet b^{11} and thus complete the circuit by which the magnet is energized, the armature attracted, and the perforator rapidly lowered into contact with the paper, the circuit being broken as soon as the protuberance passes the spindle z^4, and the perforator rapidly rising under the action of the spring b^8. Immediately after the perforator meets the paper the lever b^9 slips off the projection b^{10} and allows the perforator to quickly rise. To allow of the slipping, the lever b^9 is capable of sliding on its axis, being provided with a slot, which slot also allows the lever, on moving back, to slip over the projection b^{10} and thus resume a position above the projection. A stop pin b^{13} serves to limit the downward movement of the armature, while a spring b^{14} returns the lever after the armature leaves the magnet poles. The perforator will be heated electrically, or by gas, or spirit in like manner to the wheel.

As shown in Fig. 15, the wheel a may be heated by branch jets a^2 from the carrier, and for the purpose of preventing the flame reaching the paper the wheel may be formed with flanges w'. For keeping the teeth or projections of the wheel free from ash, a small metal brush or scraper w^2 may be provided which will bear on the teeth of the wheel, see Fig. 15.

What I claim is:—

1. A hand pattern perforating tool comprising a wheel formed with teeth corresponding to the required perforations, a frame in which such wheel is rotatable, a handle for the same by which the said wheel is guided in the required directions to follow lines marked on the material to be perforated and means associated with the handle frame and wheel for continually heating the latter to incandescence.

2. A hand tool for perforating stencil material by burning, comprising a perforator, means for holding and guiding the perforator, and means integral with the tool for enabling the perforator to be continually heated to incandescence and a handle for the complete tool, such as to permit of

the perforator readily following lines marked on the stencil material and producing, by contact with the material, a consecutive series of perforations along such lines.

3. A hand pattern perforating tool comprising a wheel formed with teeth corresponding to the required perforations, a frame in which such wheel is rotatable, a handle for the same by which the said wheel is guided in the required direction to follow lines marked on the material to be perforated and means spaced from said wheel to heat the teeth thereof to incandescence, whereby as the wheel travels over the material so marked, sharp and clear-cut perforations will be produced therethrough.

4. A hand perforating tool for perforating stencil materials by burning, comprising a rotatable perforator movable along a line marked on the stencil material and contacting with the said material at points in the said line to rapidly produce a consecutive series of perforations, means for enabling the perforator to be continually heated to incandescence and a handle capable of angular movement at any one of said points of contact, and thereby to vary the direction of movement of the perforator to permit the same to be accurately moved along said marked lines.

5. A perforating hand tool for perforating stencil materials along lines marked on the material, comprising a perforator adapted to rapidly and intermittently make contact with and burn perforations without bur in the material as it is traveled along the lines marked on the material, means for holding and guiding the perforator and means carried by the tool for heating the perforator to and maintaining it at incandescence whereby the material will be perforated by contact, thereby avoiding the exertion of undue pressure.

6. A hand perforating tool for perforating stencil materials by burning, comprising a wheel formed with teeth corresponding to the required perforations, a tubular handle and a forked carrier for such wheel, the wheel being axially mounted between the forks of the carrier, and means within the handle for enabling the wheel to be continually heated to incandescence, whereby the material will be perforated by contact.

7. A hand perforating tool for perforating stencil materials by burning, comprising a wheel formed with teeth corresponding to the required perforations, a tubular handle and forked carrier for such wheel, the wheel being axially mounted between the forks of the carrier, and means associated with the handle and carrier for heating the teeth of the wheel to incandescence whereby the material will be perforated by the guiding of the wheel thereover.

8. A hand perforating tool for perforating stencil materials by burning, comprising a wheel formed with teeth corresponding to the required perforations, a handle for directing the movements of the wheel in the required direction, and a carrier for such wheel, said carrier inclosing the sides of the wheel and means carried by the tool for enabling the wheel to be continually heated to incandescence at the peripheral portion thereof.

9. A hand perforating tool for perforating stencil materials by burning, comprising a wheel formed with teeth corresponding to the required perforations, a hollow handle and a forked carrier for such wheel, a tube extending through the handle and lying near to the wheel at one end, said tube having means to admit air thereto and fuel supply means to supply fuel to mix with said air to cause a flame to issue from the tube against the teeth of the wheel for heating the same to a state of incandescence.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

FREDERICK MAURICE LASERSON.

Witnesses:
FRED. J. MEREDITH,
F. C. PENNINGTON.