R. F. RUSSELL.

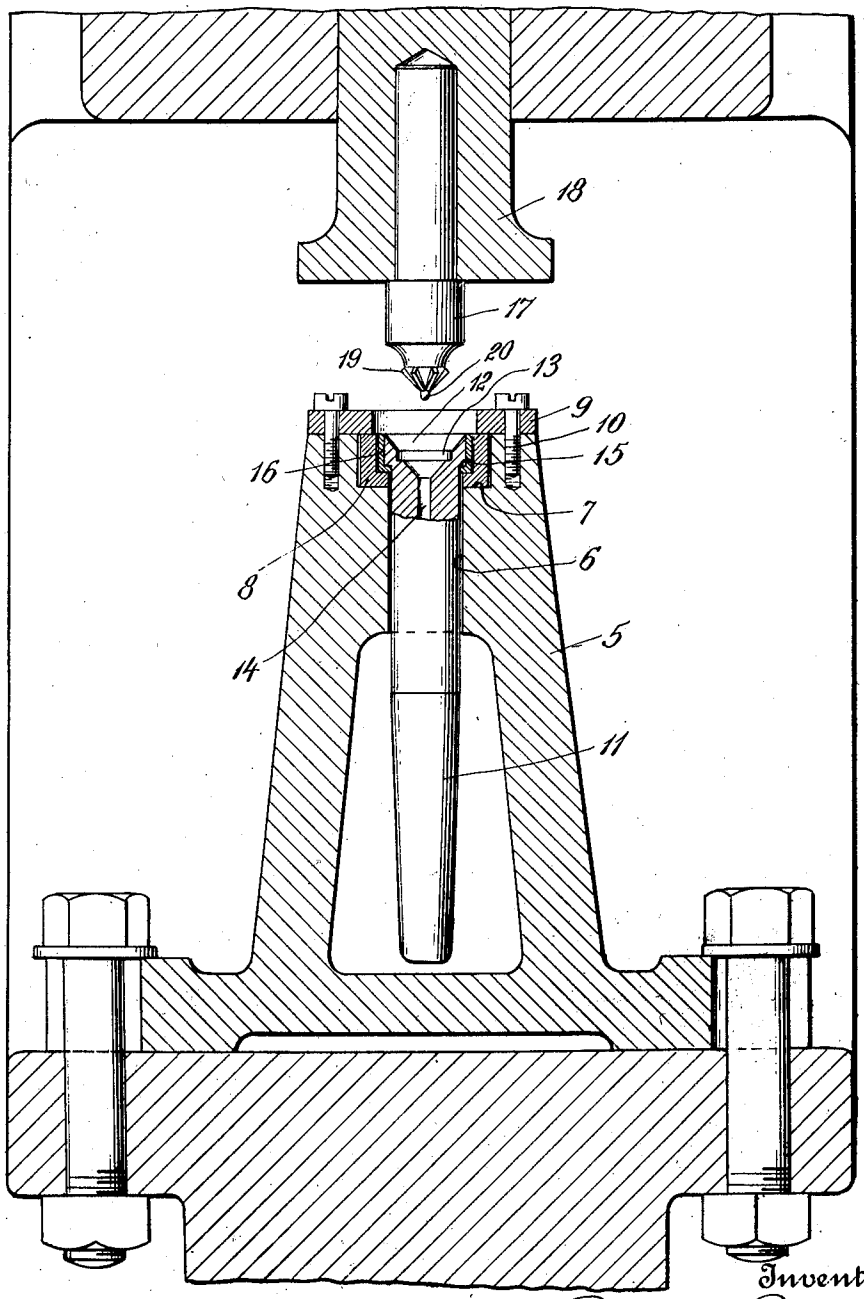
METHOD OF MAKING BLOWPIPE TIPS.

APPLICATION FILED JULY 14, 1919.

1,344,964. **Patented June 29, 1920.**

2 SHEETS—SHEET 1.

Fig. 1,



Inventor

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By his Attorneys

Pennie Davis Marvin & Edmonds

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2 SHEETS—SHEET 2.

Fig. 2,

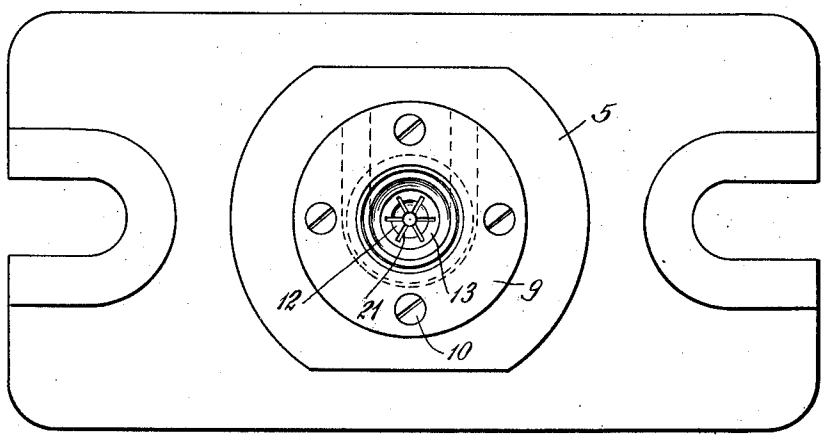


Fig. 3,

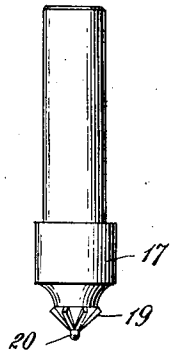


Fig. 5,

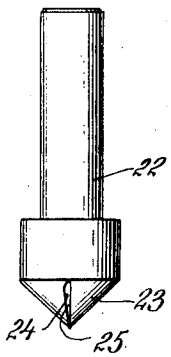


Fig. 4,

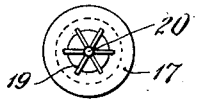


Fig. 6,

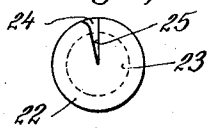


Fig. 7,

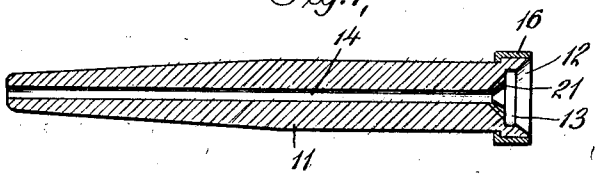
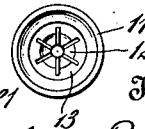


Fig. 8,



Inventor

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UNITED STATES PATENT OFFICE.

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METHOD OF MAKING BLOWPIPE-TIPS.

1,344,964. Specification of Letters Patent. **Patented June 29, 1920.**

Application filed July 14, 1919. Serial No. 310,695.

To all whom it may concern:

Be it known that I, RICHARD F. RUSSELL, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Methods of Making Blowpipe-Tips; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to blowpipes employed with mixtures of combustible and combustion supporting gases, and has for its object the economical and efficient production of tips employed in such blowpipes.

Blowpipes as commonly constructed consist essentially of a head and a removable and interchangeable tip, associated with the head in such a manner that leakage of gas at the joint is effectively prevented. My invention particularly relates to a blowpipe structure in which, the head is provided with a projecting conical seat, and the tip has a coöperating recessed surface with grooves or depressions in the surface intersecting the discharge passage of the tip, whereby one of the gases is conveyed from a passage therefor in the head to, and is mixed with gas issuing from another passage in the head.

The grooves or depressions in the recessed surface of the tip are of relatively small cross sectional area, and must be carefully proportioned to deliver the correct volume of gas to the discharge passage of the tip. It is necessary in the commercial production of blowpipes, that the grooves or depressions in the recessed surface of the tips be always of predetermined dimensions, in order that successful results may be assured. The grooves or depressions may be milled in the recessed surfaces, but this method does not lend itself readily to efficient and accurate production. Furthermore, grooves in the relatively soft metal, of which the tips are usually constructed, may be distorted by the application of pressure, and it has been found desirable therefore to support the metal of the tip, adjacent the rear end thereof, with a band or hoop of metal less liable to distortion than the metal of the tip.

I have discovered an effective method of forming the grooves or depressions in the recessed surface of tips, of the character described, and of simultaneously forcing the metal into the band or hoop, which thereafter supports it and prevents distortion of the grooves when pressure is applied to the tip, in fastening the same by the usual nut to the head. My invention embodies the application of a suitable punch to the recessed surface while the tip is rigidly supported in a die with its rear end disposed within the confining band or hoop. The grooves or depressions are thus formed in a single operation and the metal is at the same time forced into close engagement with the band or hoop so that the latter becomes substantially an integral part of the tip. Subsequently the recessed surface is burnished and the tip is ready for use.

While the structure employed in carrying out the invention may be varied, I have in the accompanying drawing illustrated means best adapted to the accomplishment of the purpose. In the drawing,

Figure 1 is a transverse section through a portion of a suitable press showing the punch and die in place;

Fig. 2 is a plan view of the die;

Fig. 3 is a view in elevation of the punch;

Fig. 4 is an end view thereof;

Fig. 5 is a view in elevation of the burnisher;

Fig. 6 is an end view thereof;

Fig. 7 is a sectional view of the completed tip; and

Fig. 8 is a rear end view thereof.

It is to be understood that in carrying out my invention a press of suitable construction is employed, upon the bed of which the support 5 for the tip is fastened. The support is provided with a central opening 6 to receive the tip and a shoulder 7 upon which the die 8 rests. The die is held in place preferably by a ring 9 fastened by screws 10 to the support 5. The tip 11 is previously formed from metal stock and is provided with a conically recessed end 12, a rabbet 13 and a discharge passage 14. The tip is mounted in the support 5 with a shoulder 15 thereon resting on the band or hoop 16 which in turn rests on the die 8. The band or hoop 16 may be of any suitable metal which is more resistant to distortion than the metal of the tip.

A punch 17 is mounted in a suitable movable head 18 above the support 5 and is pro-

vided at its end with a number of ribs 19 converging to a projection 20, which is adapted to enter the discharge passage 14 of the tip when the punch is forced into engagement with the recessed surface 12. By applying suitable pressure to the punch 17, the ribs are pressed into the surface 12 to form the grooves or depressions 21 (Figs. 7 and 8), and at the same time to cause the metal to flow into close engagement with the band or hoop 16. The punch is then withdrawn and a burnisher 22, having a conical end 23 of the desired angularity and a recess 24 in its conical end forming a sharpened lip 25 is rotated through suitable means (not shown) in engagement with the recessed surface 12 to remove surplus metal and finish the surface.

From the foregoing it will be apparent that I have perfected a method of manufacturing tips for blowpipes in an efficient and satisfactory manner. The grooves or depressions are formed in a single operation and are, therefore, necessarily uniform in each tip, so that the tips are interchangeable and always adapted to produce the most successful results. The band or hoop is fastened to the tip in the same operation, which is very rapid especially as compared with a milling operation and is extremely accurate and therefore highly desirable. The band may, of course, be omitted, but is preferably employed to insure against distortion of the grooves.

The apparatus employed may obviously be varied, without departing from the invention and the form therein illustrated is intended merely as illustrating the best mode of applying my invention with which I am now familiar. Various changes may be, therefore, made in the method and the mode of applying the same without departing from the invention or sacrificing any of its material advantages.

I claim:

1. A method of making blowpipe tips which comprises, forming the tip with a discharge passage and a conical recess at its rear end, rigidly supporting said tip, and pressing one or more grooves in the surface of said recess intersecting said discharge passage.

2. A method of making blowpipe tips which comprises, forming the tip with a discharge passage and a recessed surface at its rear end, rigidly supporting said tip and pressing a plurality of grooves in said surface of said tip in a single operation.

3. A method of making blowpipe tips which comprises, forming the tip with a surface at its rear end, rigidly supporting said tip, pressing one or more grooves in said surface and finally burnishing said surface to remove surplus metal.

4. A method of making blowpipe tips which comprises, forming the tip with a surface at its rear end, rigidly supporting the tip with its rear end disposed within a strengthening band, pressing one or more grooves in said surface and simultaneously causing the metal to flow toward said band whereby said band is secured to the tip.

5. A method of making blowpipe tips which comprises forming the tip with a recessed surface at its rear end, rigidly supporting the tip with its rear end disposed within a strengthening band, pressing a plurality of grooves in said surface and simultaneously causing the metal to flow toward said band, whereby said band is secured to the tip.

In testimony whereof I affix my signature.

RICHARD F. RUSSELL.