

A. DEBUS & E. MENNE.
 PROCESS OF PERFORATING METALS.
 APPLICATION FILED MAY 11, 1910.

999,099.

Patented July 25, 1911.

Fig.1.

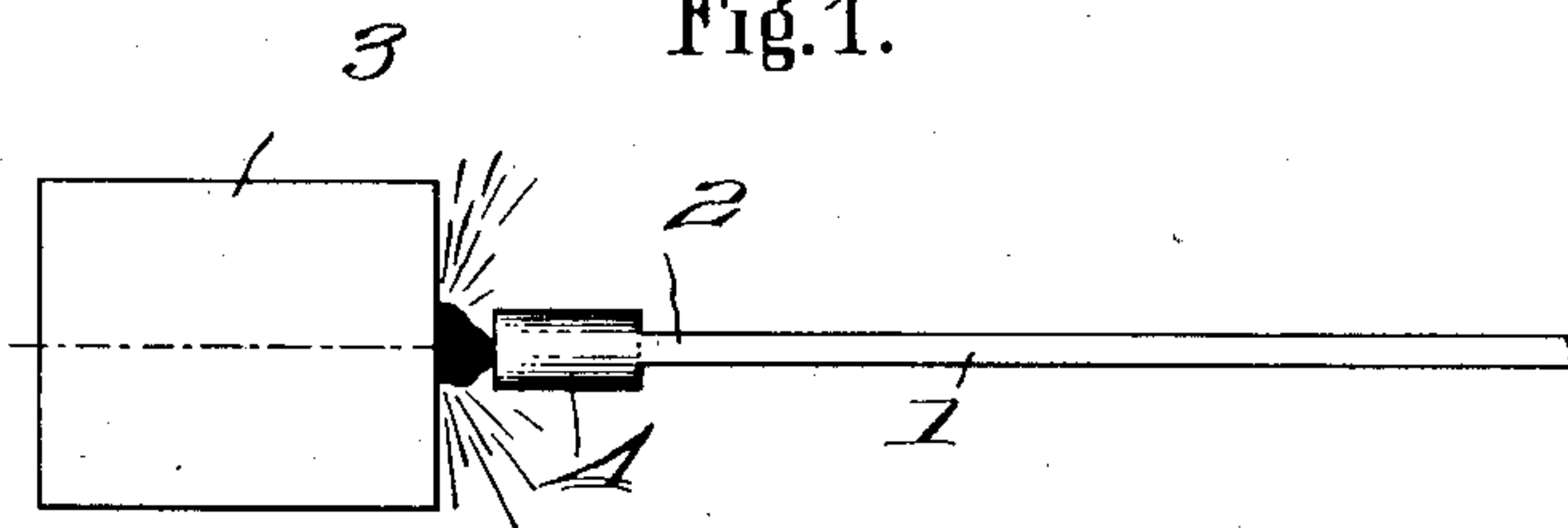
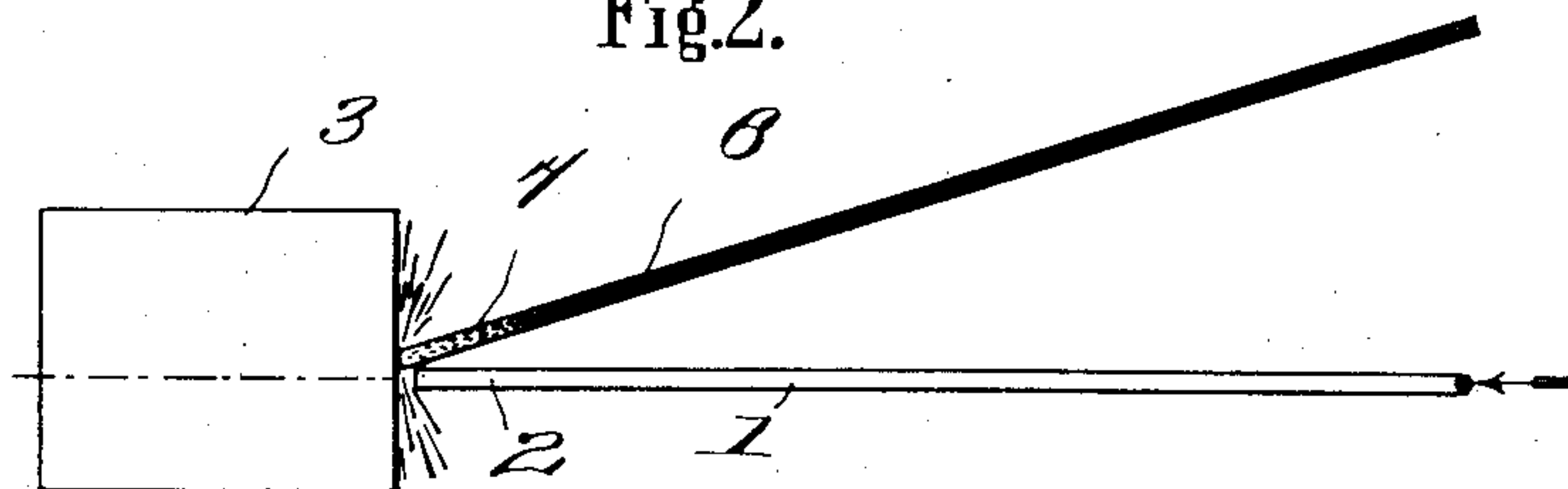


Fig.2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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To all whom it may concern:

Be it known that we, ALBERT DEBUS, engineer, and ERNST MENNE, chemist, both subjects of the German Emperor, and residents, respectively, of Hattingen, and Creuzthal, Germany, have invented a new and useful Process of Perforating Metals, of which the following is a specification.

Our invention relates to a process of boring or cutting through cold cast iron, pig iron and the like, oxygen being employed.

As is well known, it has been hitherto impossible to utilize the oxygen melting process which is generally used for perforating and cutting wrought iron, steel, etc., and in which oxygen is forced under pressure against ignited material, for cutting or perforating cold cast iron or cold pig iron. For reasons hitherto quite unknown, this process has failed.

The present invention consists of a process embodying the ignition of the oxygen carrying tube or its equivalent and by means of which it is possible to perforate and also to cut cold pig iron, cast iron or mixtures of pig iron with other substances, all as will appear more fully below. The present invention, is therefore, of special importance in all those cases where large quantities of pig iron have to be removed quickly, as it is for instance in removing the pigs from the sow. This removal has sometimes been effected heretofore by blasting, necessitating suitably perforated holes, and the drilling of the said holes often required many hours or days. According to this invention, however, the necessary blasting holes can be produced in a few minutes. By this process salamanders also can be readily and quickly removed from furnaces, twyers bored out, or any other like perforation readily accomplished.

Referring to the accompanying drawing forming a part of this specification:—Figure 1 is a diagrammatic view illustrating one means of carrying out our process; and Fig. 2 is a like view showing a slightly modified form of procedure.

The process mainly consists in inserting, constantly or intermittently, as the drilling or cutting proceeds, combustible metal or generally material which, by burning with oxygen, can maintain the molten state.

The simplest method of carrying out the process is to use for the purpose an iron pipe

1 which is ignited at its end 2 by a current of oxygen passed through said pipe, and which is pushed on into the hole as it becomes deeper. Although the pipe melts continuously at its bottom end 2, yet in this way it is possible to produce in a few minutes deep holes in cold pig iron or the like.

The heating of the pig iron 3 for the purpose of starting the melting, can be effected in various ways, but the ordinary oxyhydrogen gas flame is usually insufficient for the purpose. A heavy electric short-circuit, however, suffices, the pipe supplying oxygen preferably forming one pole of said circuit. The process is rendered very simple indeed when the end 2 of the pipe to be ignited is thickened by placing thereon a sleeve 4 or the like of wrought iron or other combustible material. This end may be made red hot while oxygen is blown through the pipe, and by placing a piece of wood-charcoal or coke between the pipe and the iron to be perforated, when the charcoal ignites it makes the end of the tube white hot and causes it to develop a very intense heat. Then if this white hot end be placed against the metal to be perforated it ignites this latter which is also subjected to the current of oxygen, and the melting is started.

In Fig. 2 the burning pipe 1, incandescent at the end 2 in connection with the bar 6 is used for starting the process, and when once started said bar 6, with its white hot end 7 could be used for carrying on the process to cut holes of great depths.

This process is also eminently adapted for the treatment of steel, wrought iron, and of course also of hot pig-iron and mixtures of pig-iron with other materials, and can thus be used, for example, for removing furnace deposits during working, melting out the tapping hole, the blast twyers, etc.

It is obvious that those skilled in the art may vary the details of the process above disclosed without departing from the spirit of our invention, and therefore we do not wish to be limited to such disclosure except as may be required by the claims.

What we claim is:—

1. The process of perforating metals of a ferrous nature, which consists in heating a metal to its ignition point in the presence of oxygen; supplying oxygen to said metal to maintain the combustion thereof; and in causing the already ignited metal thus ob-

tained to contact with the metal to be removed from the perforation being made, substantially as described.

2. The process of perforating metals of a ferrous nature, which consists in heating iron to its ignition point in oxygen; in continuously supplying oxygen to said iron to maintain its combustion; in heating the metal at the place to be perforated to its melting point; and in causing the already ignited iron to contact with said heated metal at the said place to be perforated, substantially as described.

3. The process of perforating metals of a ferrous nature, which consists in heating iron to its ignition point in oxygen; in continuously supplying oxygen to said iron to

maintain its combustion; in heating the metal at the place to be perforated to its melting point; in supplying the already ignited iron to the said heated metal at the said place to be perforated; and in continuously feeding said ignited iron into the perforation thus made until the operation is completed, substantially as described.

In testimony, that we claim the foregoing as our invention, we have signed our names in presence of two witnesses, this second (2nd) day of May 1910.

ALBERT DEBUS. [L. S.]

ERNST MENNE. [L. S.]

Witnesses:

OTTO KÖNIG,

CHAS. J. WRIGHT.