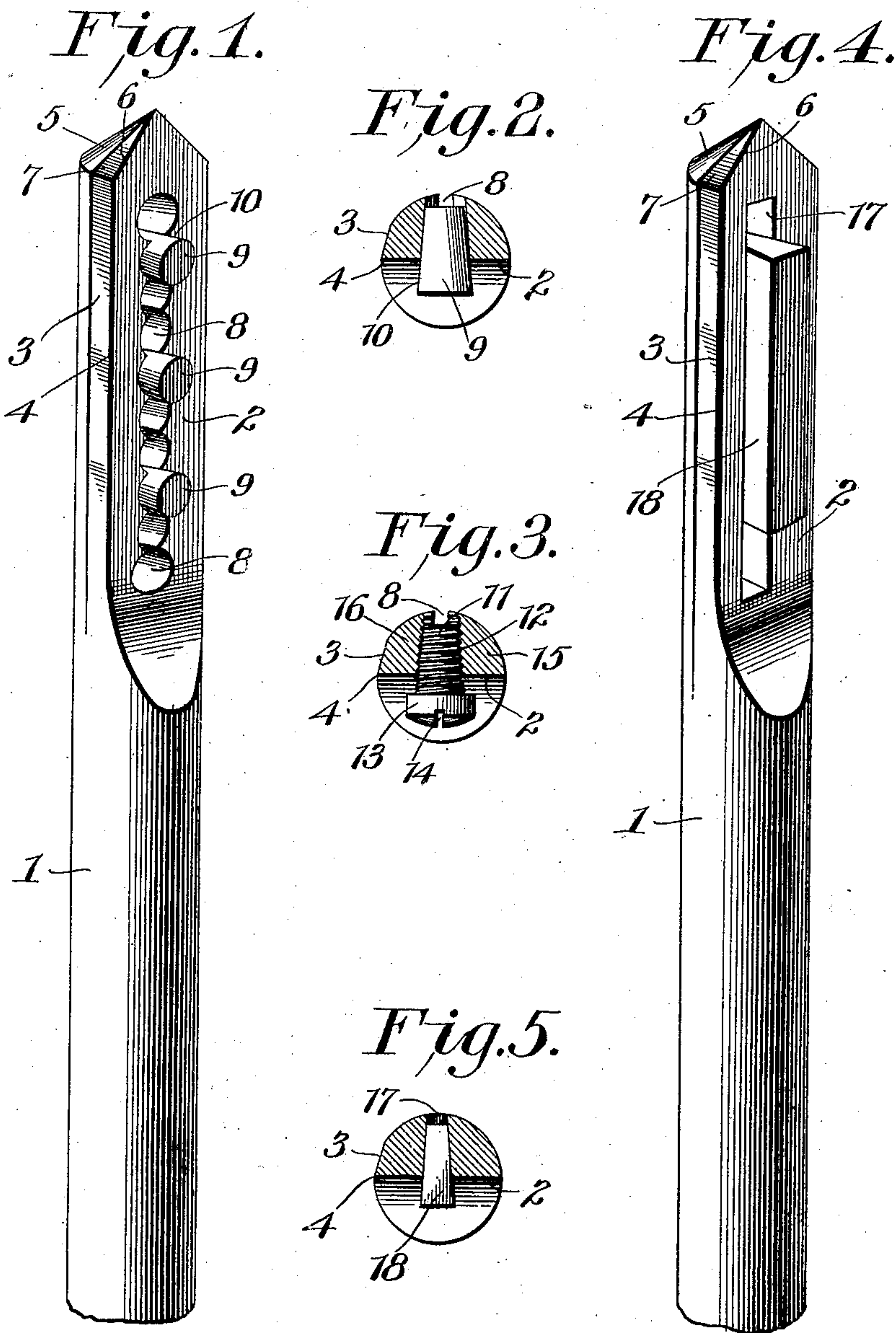


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O. LANGE.
EXPANSIBLE REAMER.
APPLICATION FILED MAR. 5, 1907.



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UNITED STATES PATENT OFFICE.

OTTO LANGE, OF CAMDEN, NEW JERSEY.

EXPANSIBLE REAMER.

No. 865,784.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, OTTO LANGE, a citizen of the United States, residing in the city and county of Camden, State of New Jersey, have invented a new and useful Expansible Reamer, of which the following is a specification.

My present invention consists of a novel construction of an expansion reamer by the employment of which holes of different sizes may be reamed and which may be readily and accurately adjusted to different sizes according to requirements.

It further consists of a novel construction of a reamer having a longitudinal recess therethrough in which is adapted to be seated suitable tapered devices for expanding the sides of the reamer.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention I have shown one form of a device, since this embodiment best illustrates the principle thereof and has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that it is not limited to the precise arrangement and organization herein shown.

Figure 1 represents a plan view of a reamer embodying my invention. Fig. 2 represents a sectional view of Fig. 1. Fig. 3 represents a sectional view of a reamer showing another embodiment thereof. Fig. 4 represents a plan view of a reamer in which a different form of wedge shaped expanding member is employed. Fig. 5 represents a sectional view of Fig. 4.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—1 designates the shank or socket of the reamer, which may be given any desired contour such as is well known in the art, in order that it may be inserted in a drill chuck or other actuating device. The forward or operative end of the shank is flattened or cut away as indicated at 2, and one side contiguous this flattened portion is beveled or faced off, as indicated at 3 in order to form a cutting edge 4. The forward end of the reamer is beveled as indicated at 5, it being seen that a cutting edge 6 is formed at the point of the reamer owing to the beveled face 7 adjacent thereto. In this embodiment I have made a series of tapered apertures 8 which open into each other, as is clearly indicated in Fig. 1, said apertures being preferably in the same longitudinal plane and terminating a sufficient distance from the point of the reamer in order that the same will not be unduly weakened by such series of apertures.

9 designates an expansion device which is shown as having cylindrical tapered walls 10 which closely engage the apertures 8. In this embodiment when it is

desired to expand the reamer the tapered or wedge shaped expansion devices, such as 9, are driven into the openings 8 which will cause the sides of the reamer to be pressed outwardly, thereby enlarging the outside diameter of the reamer, as will be clearly understood by those skilled in the art.

In the embodiment shown in Fig. 3 the tapered cylindrical slots 8 are provided with an internal tapered thread 11 with which engages the tapered threaded portion 12 of a screw or equivalent device 13, said screw in the present instance being provided with a slot 14 or equivalent means, whereby the same may be suitably actuated. It is apparent that in the embodiment seen in Fig. 3 when the tapered screw 13 is screwed into the aperture 8, the walls 15 and 16 thereof will be pressed outwardly depending upon the distance to which the screw 13 is inserted.

In Figs. 4 and 5 I have shown another embodiment of my invention, the reaming portion of the device having a tapered longitudinal extending slot 17 therethrough with which the sides of the wedge shaped key or expansion member 18 coact, it being understood that my invention in its broad scope comprises a reamer having a series of communicating apertures or a tapered slot therethrough with which tapered expansion devices coact to vary the size thereof.

When it is desired to increase the diameter of the reaming portion it will be apparent that it is simply necessary to place the wedge shaped members in the apertures at the desired place and drive or screw in these expansion members until the desired diameter is attained. The forward portion of the reamer will preferably be slightly smaller than the rest of the reamer in order that the same may readily pass into the aperture which is to be reamed.

In prior devices with which I am familiar not only is the cost of production comparatively large but the cost of employing such expansion device is greatly increased owing to the liability of the splitting or breaking of the reamer, and in my present construction I have avoided this feature by having a preferably longitudinally extending aperture therethrough in which a tapered fastening member or series of such members are driven or inserted so that the maximum strength of the device is retained. Owing to the employment of a tapered key and seat therefor having a tapered bearing, the liability of the diameter of the reamer changing during the operation is reduced to a minimum. It will of course be apparent that owing to the employment of the cutting edge 6 at the point of the reamer, that reamers embodying my invention may be employed in apertures of much smaller size than has heretofore been possible.

It will now be apparent from the foregoing that I have produced a novel and useful construction of an expansion reamer which embodies the features of advantage enumerated as desirable in the statement of invention

and the above description and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that it is susceptible of modification in various particulars without departing from the spirit and scope of the invention or sacrificing any of its advantages.

It will be understood from Fig. 1 that the end apertures through the drill are of larger diameter than the others in order that when the two sides of the reamer are sprung out, a reamer having a more uniform diameter will be produced.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A reamer having a plurality of conical shaped apertures therethrough in the same longitudinal plane and merging directly one into the other, and a plurality of conical shaped members engaging said apertures at right angles to the length of the reamer for varying the diameter of the latter.

2. A reamer having a plurality of conical shaped aper-

tures therethrough in the same longitudinal plane and directly merging one into the other and a plurality of conical shaped members engaging said apertures at right angles to the length of the reamer for varying the diameter of the latter, the end apertures being of greater diameter than the others.

3. A reamer having a flattened face and a contiguous cutting edge and a plurality of conical shaped apertures therethrough in the same longitudinal plane and directly merging one into the other, and a plurality of conical shaped members engaging said apertures at right angles to the length of the reamer for varying the diameter of the latter.

4. A reamer having a plurality of conical shaped apertures therethrough in the same longitudinal plane and directly merging one into the other at a distance from the point, and a plurality of conical shaped members engaging said apertures at right angles to the length of the reamer and confined within the circumference of the same, for varying the diameter of the latter.

OTTO LANGE.

Witnesses:

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