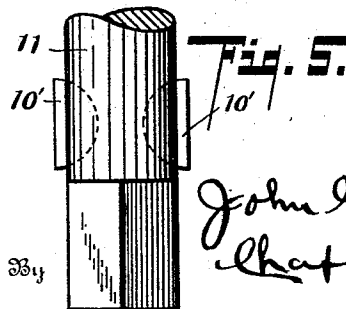
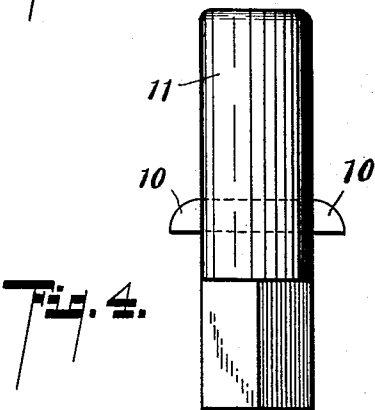
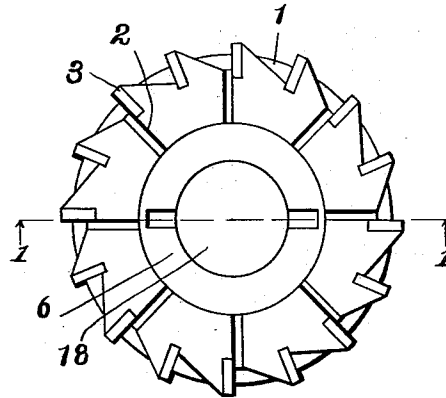
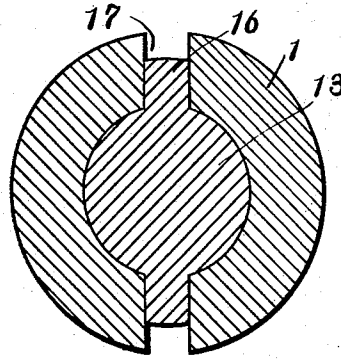
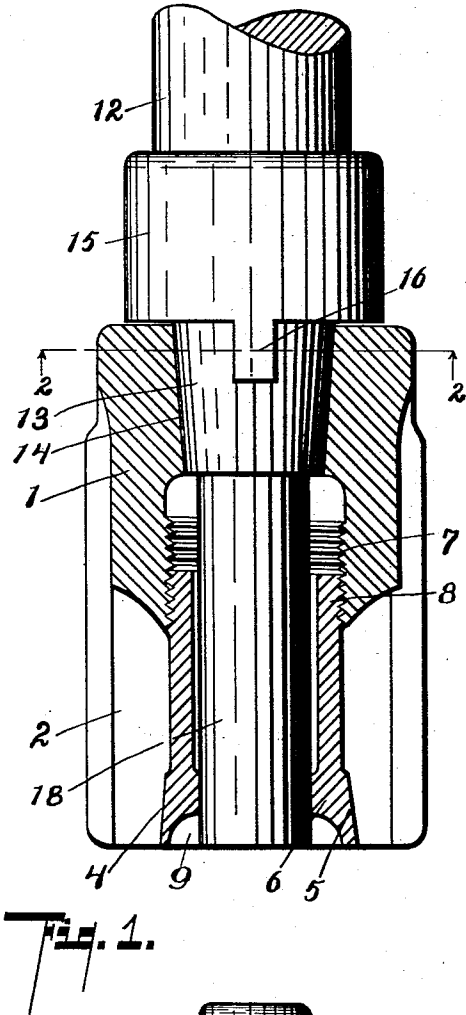


J. G. MATTHEWS.  
EXPANDING REAMER.  
APPLICATION FILED NOV. 23, 1908.

946,384.

Patented Jan. 11, 1910.



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# UNITED STATES PATENT OFFICE.

JOHN G. MATTHEWS, OF OBERLIN, OHIO.

## EXPANDING REAMER.

946,384.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed November 23, 1908. Serial No. 464,108.

*To all whom it may concern:*

Be it known that I, JOHN G. MATTHEWS, a citizen of the United States, residing at Oberlin, Ohio, have invented certain new and useful Improvements in Expanding Reamers, of which the following is a specification.

This invention relates to improvements in expandible reamers.

The main objects of this invention are: First, to provide an improved expandible reamer of large dimensions which is conveniently and easily adjusted, and, at the same time, one which is very strong and capable of doing very heavy work. Second, to provide an improved expandible reamer which it is impossible to adjust while in the machine. Third, to provide an improved expandible reamer which may be used to ream to the bottom of a hole. Fourth, to provide an improved expandible reamer having blades of high-grade steel, which is capable of expansion so that the size of the tool may be maintained, and one which is, at the same time, simple and economical to manufacture.

Further objects, and objects relating to structural details, definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a detail view of a structure embodying the features of my improvement, the body or shell of the reamer and the expanding plug thereof being shown in longitudinal sections. Fig. 2 is a cross section, taken on a line corresponding to line 2-2 of Fig. 1. Fig. 3 is an end view of Fig. 1. Fig. 4 is a side elevation of the key for adjusting the expanding plug. Fig. 5 is a side elevation of a modified form of key.

In the drawings, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, the body or shell 1 in my improved reamer is preferably formed of soft or machinery steel, and is

provided with a plurality of longitudinal slits 2 at its outer end, dividing the body into sections. The cutting blades 3, which are preferably of "high speed" or air-hardening steel, are preferably inserted and secured according to the process described in Letters Patent No. 848,112, issued to me on the 26th day of March, 1907. The body or shell is tubular and is provided with a conical or tapered bore 4 at its outer end, adapted to receive the tapered or conical portion 5 of the expanding plug 6. The body or shell is provided with internal threads 7, the threads being preferably in the unslitted portion of the body and the plug is provided with threads 8 at its inner end so that it may be adjusted to expand the reamer.

The expanding plug has a notch 9 at its outer end adapted to receive the tangs 10 of the key or adjusting tool 11. This key or adjusting tool is preferably in the form of a plug adapted to be inserted in the expanding plug, the tangs 10 preferably being formed by inserting a pin through the plug, as at 10, Fig. 4, or inserting keys, as at 10', Fig. 5, so that the key may be inserted in the expanding plug and the expanding plug adjusted thereby. Obviously, one tang only need be used, if desired. The end of the key is preferably squared to receive a wrench, although it may be provided with a suitable fixed handle.

The arbor 12 is provided with a tapered portion 13 to receive the tapered portion 14 of the bore of the reamer body. The arbor is provided with a collar 15, having driving lugs 16 thereon to engage the notches 17 in the reamer body. The arbor is also preferably provided with a reduced portion 18 adapted to fit into the bore of the expanding plug 6, preferably fitting the same closely so that the reamer will be alined true with the arbor. When thus arranged, the arbor also prevents the adjustment of the reamer while in the machine, which is of advantage as workmen sometimes wish to adjust reamers when it is desirable that they should not. This arrangement of the parts enables the making of satisfactory expanding shell reamers of large size. As the expanding screw does not project beyond the end of the reamer, it permits the reaming of a hole to its bottom. The cutting blades, by this arrangement of parts, are supported as sol-

idly as though the reamer had a solid body. It will be appreciated that this is a great advantage, inasmuch as even the slightest variation, such as is occasioned by the  
 5 springing of a blade mechanically held in a shell reamer, particularly one of large size, is a serious objection.

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

1. A reaming tool comprising a tubular body having longitudinal slits in its outer end, said slits dividing the outer end of said body into sections and the unslitted  
 15 portion of said body being internally threaded; cutting blades carried by said body; a hollow expanding plug for said body having a tapered portion at its outer end and a threaded portion at its inner end, said  
 20 plug having a notch at its outer end adapted to receive the tang of an adjusting key; and an arbor adapted to receive said body, said arbor having a reduced portion adapted to fit the bore of said expanding plug  
 25 whereby the same is supported in alignment and the adjustment of said expanding plug prevented while said body is arranged upon the arbor.

2. A reaming tool comprising a tubular  
 30 body having longitudinal slits in its outer end, said slits dividing the outer end of said body into sections and said body being internally threaded; cutting blades carried by said body; and a hollow expanding plug  
 35 for said body having a tapered portion at its outer end and a threaded portion at its inner end, said plug having an internal notch at its outer end adapted to receive the tang of an adjusting key.

40 3. A reaming tool comprising a tubular body having longitudinal slits therein; cutting blades carried by said body; a screw threaded hollow expanding plug for said body having a tapered portion adapted to  
 45 engage the slitted portion of said body, said plug having an internal notch at its outer end adapted to receive the tang of an adjusting key; and an arbor adapted to receive said body, said arbor having a re-

duced portion adapted to receive said ex- 50  
 panding plug, whereby the same is supported and the adjustment of said expanding plug prevented while said body is arranged upon the arbor.

4. A reaming tool comprising a tubular  
 55 body having longitudinal slits therein; cutting blades carried by said body; and a threaded hollow expanding plug for said body having a tapered portion adapted to engage the slitted portion of said body, said  
 60 plug being adapted to receive an adjusting key.

5. A reaming tool comprising a tubular body having longitudinal slits therein, said  
 65 body having a tapered hole at its rear end and driving notches; cutting blades carried by said body; a hollow expanding plug for said body having a tapered portion adapted to engage the slitted portion of  
 70 said body threaded into said body the bore of which is centrally located; an arbor having a tapered portion to receive the tapered hole of said body; and driving lugs adapted to engage the notches of said body, said  
 75 arbor being also provided with a forwardly-projecting reduced portion tapered to fit the said hollow expanding plug, all coacting for the purpose specified.

6. A reaming tool comprising a tubular body having longitudinal slits therein, said  
 80 body having a tapered hole at its rear end; cutting blades carried by said body; a hollow expanding plug for said body having a tapered portion adapted to engage the slitted portion of said body threaded into said  
 85 body, the bore of which is centrally located; an arbor having a tapered portion to receive the tapered hole of said body, and engage the same, and adapted to fit the bore of said expanding plug, as specified. 90

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

JOHN G. MATTHEWS. [L. S.]

Witnesses:

HAYDEN BINFORD,  
 B. O. DURAND.