





# UNITED STATES PATENT OFFICE.

JOHN G. MATTHEWS, OF THREE RIVERS, MICHIGAN.

## REAMER.

No. 848,113.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed December 7, 1904. Serial No. 235,878.

*To all whom it may concern:*

Be it known that I, JOHN G. MATTHEWS, a citizen of the United States, residing at the city of Three Rivers, county of St. Joseph, State of Michigan, have invented certain new and useful Improvements in Reamers, of which the following is a specification.

This invention relates to improvements in adjustable reamers.

The objects of this invention are, first, to provide an improved adjustable reamer which may be readily adjusted to slightly increase or diminish its diameter and to compensate for wear; second, to provide an improved adjustable reamer utilizing my invention for which I made application for Letters Patent, filed June 22, 1904, Serial No. 213,718, in which blades of high-speed steel are made use of and supported in a body of inferior metal.

Further objects and objects relating to structural details will 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 transverse sectional view through the body of a reamer embodying my improvements, taken on a line corresponding to line 1 1 of Fig. 2. Fig. 2 is a longitudinal sectional view taken on a line corresponding to line 2 2 of Fig. 1, the shank A and head A' being shown in full lines.

In the drawing the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines, and similar letters of reference refer to similar parts in both views.

Referring to the drawing, A is the shank of my improved adjustable reamer, which is provided with a tapered or conical head A'. Screw-threads are cut at each end of the head A'. The head A' is provided with longitudinally-arranged key-seats *a'* to receive the keys *a*, by means of which the shell is secured to the head to insure its rotation therewith.

The shell B is preferably of soft steel and

preferably made up of half-sections, each section being suitably keyed to the head. This shell B is conformed to fit the tapered or conical head, so that as it is moved up and down thereon its diameter is increased or diminished. The shell may be formed of a single piece, if desired, having a single longitudinal split or kerf therethrough. I prefer, however, to form it in sections, as it is simpler to manufacture.

The shell B is provided with a plurality of internal longitudinal kerfs *b*, which partially sever the same at intervals. These kerfs extend to substantially the same distance from the outer surface of the shell and form substantially a thin cylinder of metal with inwardly-projecting parts. This is of advantage, because when the shell is expanded the sides open out evenly like a cylinder, as distinguished from the development of a cone, and the blades consequently are not disarranged in their parallel relation, but remain parallel with the longitudinal axis of the tool. By this particular development of the shell the segments of the same bear evenly on the conical center A' and are effectively supported thereby, and the end collars also bear evenly against the beveled ends of the shell. This would not be true if the kerfs were not cut to secure this even cylindrical shell of metal. This makes the shell quite flexible, so that it may be readily adjusted on the head to increase or diminish its diameter. Blades B', of self-hardening or other high-grade steel, are secured in position, preferably in the manner described in my application for a patent heretofore mentioned. Other means for securing the blades, however, will be found desirable for use in this relation. The blades B' are preferably located at points between the kerfs *b* and alternating successively therewith.

By providing the kerfs *b* the shell is made very flexible and at the same time the cutting-blades are supported by a substantially solid rim of metal. The ends of the shell are beveled or tapered, and nuts C C', which are concaved or cupped to fit the beveled ends of the shell, are provided. These nuts adjustably secure the shell upon the head. By adjusting the nuts back and forth the shell is carried back and forth to vary its diameter or compensate for wear. The internal kerfs *b* insure the even expansion of the shell—that



is, it expands like a cylinder. This maintains the perfect bearing of the nuts on the ends of the shell no matter how it may be adjusted.

5 For light work and for small sizes no special connection other than the friction of the parts will be required between the head and shell.

10 While I have described my improved adjustable reamer as made up of a shell of soft metal with high-speed steel blades secured therein, I wish to remark that my invention is applicable to reamers in which the shell and blades are made integral, although of 15 course in such circumstances the shell is necessarily of the same grade of steel as the blades and will not possess the same degree of adjustability as the structure I have illustrated and described, which is preferred by 20 me. I have described the device as provided with a shank A; but it is obvious that the principles of constructions are also applicable to shell-reamers of any description.

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

1. In an adjustable reamer, the combina-

tion of a tapered or conical head; a shell, split at one point at least conformed to embrace said head, having internal longitudinal 30 kerfs therein partially severing the same at intervals; suitable cutting-blades; and means for adjustably securing said shell upon said head, for the purpose specified.

2. In an adjustable reamer, the combina- 35 tion of a tapered or conical head; a shell of soft metal, open at one side at least, adjustable on said head, to expand or contract to different sizes; and blades of high-grade steel inserted into said shell, for the purpose 40 specified.

3. In an adjustable reamer, a shell of soft metal, open at one side at least; cutting- 45 blades of high-grade steel carried by said soft-metal shell; and an adjustable means for expanding or contracting said shell, for the purpose specified.

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

JOHN G. MATTHEWS. [L. S.]

Witnesses:

J. W. SUELL,  
L. O. MILLER.