A. HOYLE.

Shell Cutters for Metal-Turning Lathes.

No. 166,462. Patented Aug. 10, 1875.

Fig. 1.

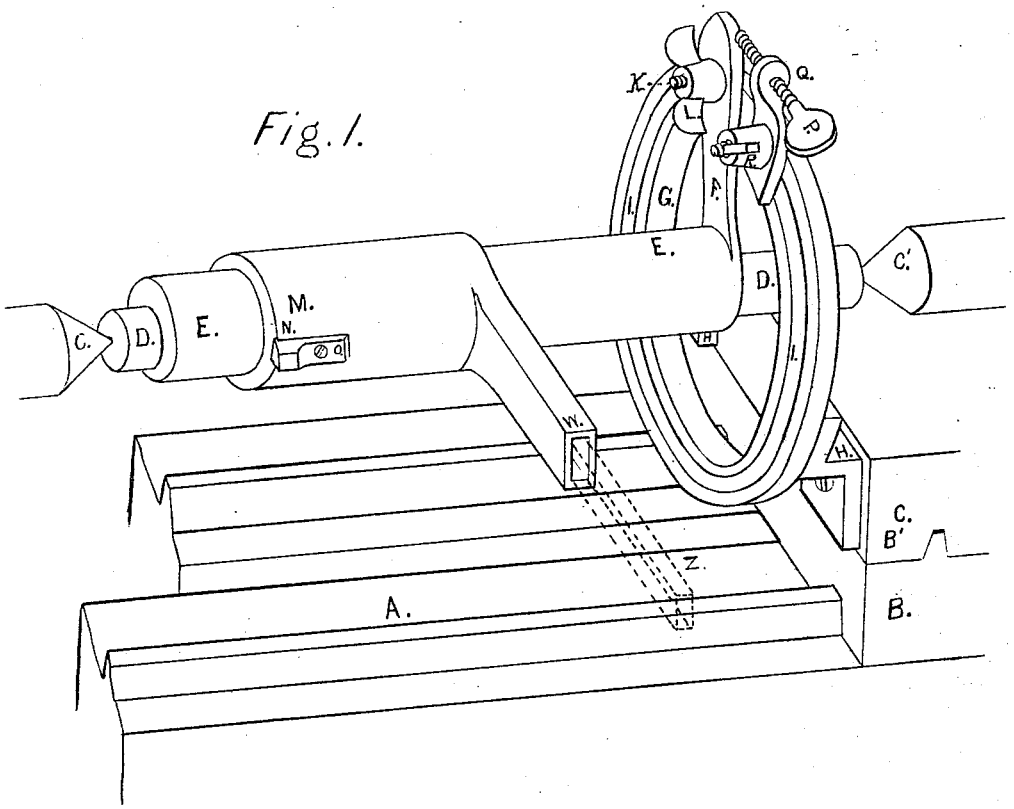
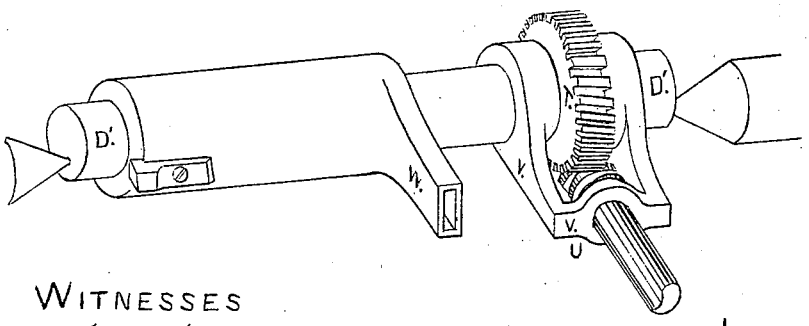


Fig. 2.



WITNESSES

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ABRAHAM HOYLE, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN SHELL-CUTTERS FOR METAL-TURNING LATHES.

Specification forming part of Letters Patent No. **166,462**, dated August 10, 1875; application filed March 24, 1873.

To all whom it may concern:

Be it known that I, ABRAHAM HOYLE, of Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain Improvements in Shell-Cutters for Machinists' Lathes, of which the following is a specification:

My invention relates to certain means of adjusting the eccentric shell-arbor hereinafter described, said means consisting of the combination of a radial arm on said shell-arbor with a grooved circle, a screw, and a nut, as hereinafter described; also, to certain means of securing the shell-cutter from revolving, said means consisting of a radial arm attached to said shell-cutter, said arm having in its end a slot, into which a flat bar is inserted, one end of said bar being secured to the tool-post of the lathe; also, to the combination of an eccentric solid arbor with an eccentric shell-arbor, for the purpose of enabling the tool of the shell-cutter to be thrown out horizontally from the line of lathe-centers; and, also, to the combination of an eccentric shell-arbor, a shell-cutter, and a tool, as hereinafter described, by means of which the tool may be withdrawn from the work after each cut.

The accompanying drawings represent my invention.

Figure 1 shows an eccentric shell-arbor secured to the tail-stock of a lathe, a shell-cutter sliding on said arbor, the lathe-centers, and part of the lathe-bed. The dotted lines indicate a flat bar secured to the tool-post. Fig. 2 is an eccentric solid arbor, and a shell-cutter thereon, with a worm-gear on the arbor and a worm.

In Fig. 1, A represents a part of a lathe-bed. B is the lower part of the tail-stock. B′ is the upper part of the same. C C′ are the lathe-centers. On these centers is suspended the arbor D, which is not eccentric. Surrounding the arbor D is the eccentric shell-arbor E, which has at one end the radial arm F. A flat ring or circle, G, perpendicular to the lathe-bed A, is fastened to the upper part of the tail-stock by the legs H H. Into the groove I, which is circular and concentric with the circle G, is dovetailed the head of the screw K. The screw K passes through the arm F, and, with the nut L, holds said arm in any required position on the ring G. Over the eccentric arbor E, and sliding on it, is the shell-cutter, consisting of the shell M and the tool N, dovetailed into said shell M, and secured by a flat-headed screw *o*. The shell M has a radial arm, W, in the end of which is a slot, in which slot is inserted one end of a flat bar, *z*, the other end of said bar being held in the tool-post of the slide-rest, whereby the shell-cutter is prevented from revolving and caused to travel with the slide-rest. The slot in the end of the arm W should be such as to allow a little play lengthwise of said slot, but not sidewise.

Ordinarily the shell-cutter is prevented from revolving by a bar secured to the tool-post and resting against a pin in the top of the shell-cutter, or by a dog; and its rear end has a tendency to lift up or spring the arbor on which it slides, but the arm W and the flat bar *z*, secured to the tool-post, resist this tendency.

In Fig. 2 the shell-cutter is the same as in Fig. 1; but the solid arbor D′ is eccentric, and the shell-arbor E is not used.

A worm-gear, T, is attached to the arbor D′, and operated by the worm U, said worm being supported by the yoke V. The worm-gear is concentric with the arbor D′, or, in other words, is equally eccentric with said arbor. Turning the worm revolves the eccentric arbor.

In Fig. 1 the piece Q, sliding on the circle G, and secured in place by the screw R, in the same way the arm F is held in place, carries a gage-screw, P, by means of which the arm F may, when the screw K is loosened, receive a very slight adjustment.

It is obvious that the arm F may be attached to a solid eccentric arbor, D′, as well as to an eccentric shell-arbor.

Both the solid arbor D′ and the shell-arbor E may be eccentric. The advantage of making both arbors eccentric is, that the tool can be carried out horizontally from the line of centers of the lathe—that is, without lifting or lowering the cutting-tool—so that said tool will be adjusted in a straight line, and not in a curved line. This is accomplished by turning the eccentrics in opposite directions, and is important in splining pulleys or gears, and in boring.

Where the shell-arbor is eccentric, and the

solid arbor is hung on its true centers, especially in cutting inside screw-threads, the work is held to the bed-piece of the lathe, and the cutter is revolved by a dog fastened to the shell-cutter and carried around by the face-plate. By turning the shell-arbor the tool is drawn back from the work. This saves the trouble of releasing the dog after each cut.

I claim as my invention—

1. The combination of the arm F on the shell-arbor E, the grooved circle G, the screw K, and nut L, as and for the purpose herein described.

2. The combination, with the shell M and tool N, of the arm W and the bar Z, fixed in the tool-post of a lathe, as and for the purpose herein described.

3. The combination of the eccentric shell-arbor E with the eccentric solid arbor D′, as and for the purpose herein described.

4. The combination of the eccentric shell-arbor E, the shell M, and the tool N, as and for the purpose herein described.

ABRAHAM HOYLE.

Witnesses:

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