T. LUMSDEN.

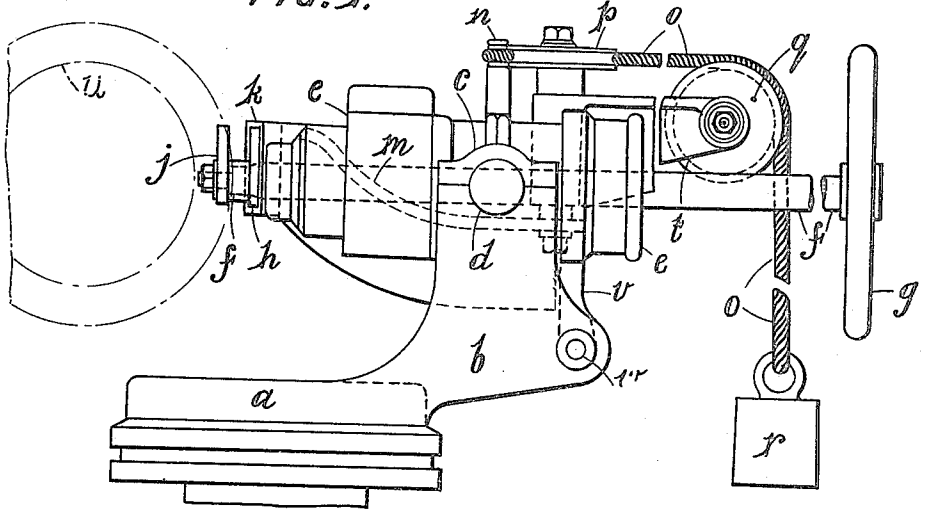
TOOL HOLDER FOR GRINDING MACHINES.

APPLICATION FILED JUNE 7, 1916.

1,231,920.

Patented July 3, 1917.

FIG. 1.



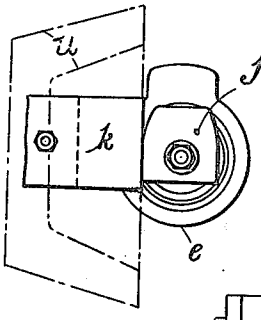
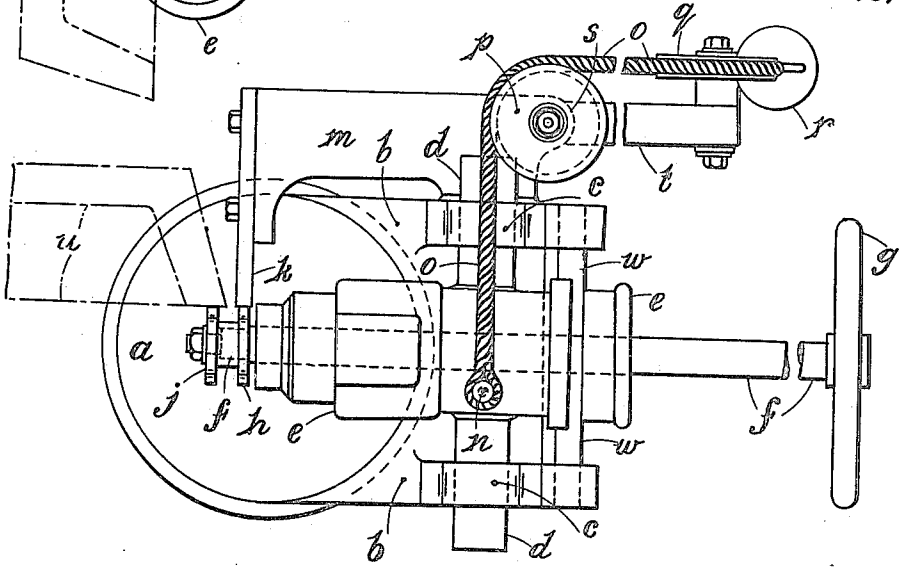


FIG. 3.

FIG. 2.



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TOOL-HOLDER FOR GRINDING-MACHINES.

1,231,920. Specification of Letters Patent. Patented July 3, 1917.

Application filed June 7, 1916. Serial No. 102,167.

To all whom it may concern:

Be it known that I, THOMAS LUMSDEN, a subject of the King of Great Britain and Ireland, residing at Gateshead, in the county of Durham, England, have invented new and useful Improvements in Tool-Holders for Grinding-Machines, of which the following is a specification.

This invention relates to tool holders for grinding machines of the type comprising a turntable carrying the tool to be ground and wherein the turntable and tool to be ground can be moved up to the grinding wheel, or, alternatively, the grinding wheel can be moved up to the tool to be ground.

The object of this invention is to provide a simple and compact device embodying the copying principle whereby tools in the form of non-circular disks can be ground in a machine of the type indicated.

According to this invention, for producing tools having cutting edges of curved or irregular contour, I use a pattern or former adapted to co-act with a guide, the motion of said pattern or former controlling the application of the edge of the tool to be ground to the surface of the grinding wheel of the machine.

I will fully describe my invention with reference to the accompanying drawings which illustrate one construction of a device in accordance therewith. In the drawings—

Figure 1 is a side elevation;

Fig. 2 is a plan; and

Fig. 3 is a part elevation looking on the left-hand end of Fig. 1.

Referring to the drawings, *a* is the turntable of a grinding machine provided with lugs *b*, *b* supporting bearings *c*, *c* wherein are carried the trunnions *d*, *d* of a barrel *e*, said barrel and trunnions being free to slide laterally in said bearings. Passing through and supported by the barrel *e* is a normally horizontal shaft *f* provided with a hand-wheel *g* whereby it can be rotated. Suitably secured on the forward end of the shaft *f* are a pattern or former *h* and the tool *j* to be ground. The pattern *h* co-acts with the vertical edge of a guide *k* carried by a bracket *m* suitably secured to the side of one of the lugs *b*. *n* is a pin fixed on the barrel *e* having attached to it the end of a cord *o* which passes around guide pulleys *p*, *q* and is attached to a weight *r* the effect of which is to resiliently press the edge of the pattern *h* against the edge of the guide *k*. A spring may be used instead of a weight. The pulleys *p*, *q* are carried by extensions *s*, *t* of the bracket *m*. The dot-and-dash lines *u* indicate the position of the grinding wheel of the machine. A tail-piece *v* on the barrel *e* co-acts with a shaft *w* carried by the lugs *b*, *b* and retains the barrel *e* and shaft *f* in the horizontal position while not preventing lateral movement of said barrel and shaft.

It will now be seen that, as the tool *j* to be ground and the pattern *h* are both mounted on the shaft *f* and the vertical edge of the guide *k* is in line with the face of the grinding wheel *u*, if the shaft *f* be rotated, the co-action of the edge of the pattern *h* and the edge of the guide *k* will give a lateral movement to the barrel *e* and shaft *f* and hence the tool *j* according to the contour of the edge of the pattern *h*, and thus the edge of the tool *j* will be applied to the face of the grinding wheel *u* under the control of the pattern *h*, and the edge of the tool will be ground to the same contour as that of the pattern.

In the drawings, the edge of the pattern *h* is of course of the same contour as that of the tool *j* which, in the example illustrated, is intended for use for cutting out the interiors of shell bases.

The angle of the cutting edge to the face of the tool is controlled by the turntable *a*. When the turntable is in such a position that the axis of the shaft *f* is parallel with the face of the grinding wheel *u* (the position illustrated in the drawings), the angle of the cutting edge to the face of the tool will be 90°. By suitably rotating the turntable, this angle can be varied as desired. A scale around the edge of the turntable co-acting with a fixed mark will accurately indicate the angle of the cutting edge of the tool.

The bolts attaching the guide *k* to the bracket *m* may also pass through a slot or slots so that the position of said guide can be adjusted when desired.

By combining the shaft *f*, pattern *h* and guide *k* with the means for reciprocating the tool to be ground diagonally across the cutting edge of the grinding wheel described in the specification accompanying my application for Letters Patent filed 30th October 1915, Serial No. 58787, the tool may be hollow ground (*i. e.* ground so as to produce a concave surface in the face of the tool).

What I claim and desire to secure by Letters Patent is:—

1. A tool holder for grinding machines comprising a turntable, bearings on said turntable, a barrel mounted on said bearings and adapted to be moved angularly in planes at right angles to the plane of the turntable, said barrel being also adapted to be moved laterally, means for automatically pressing said barrel laterally, a shaft in said barrel, means for turning said shaft on its axis, and means for securing a pattern and a tool on said shaft.

2. A tool holder for grinding machines comprising a turntable, bearings on said turntable, a barrel mounted on said bearings and adapted to be moved angularly in planes at right angles to the plane of the turntable, said barrel being also adapted to be moved laterally, means for automatically pressing said barrel laterally, a shaft in said barrel, means for turning said shaft on its axis, means for securing a pattern and a tool on said shaft, and means for keeping the barrel in a horizontal position while permitting lateral movements of the barrel and shaft.

3. A tool holder for grinding machines comprising a turntable, bearings on said turntable, a barrel mounted on said bearings and adapted to be moved angularly in planes at right angles to the plane of the turntable, a bracket on said turntable, a guide mounted on said bracket, guide wheels on said bracket, a guide rope connected to said barrel and passing over said guide wheels, a weight attached to said rope, a shaft in said barrel, means for turning said shaft on its axis, and means for holding a pattern and a tool on said shaft, said pattern co-acting with said guides.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS LUMSDEN.

Witnesses:

JOHN HENLY WALES,

HERBERT HOWARD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."