

R. A. SCHRAG.
HOLLOW TOOL.
APPLICATION FILED FEB. 1, 1909.

961,540.

Patented June 14, 1910.

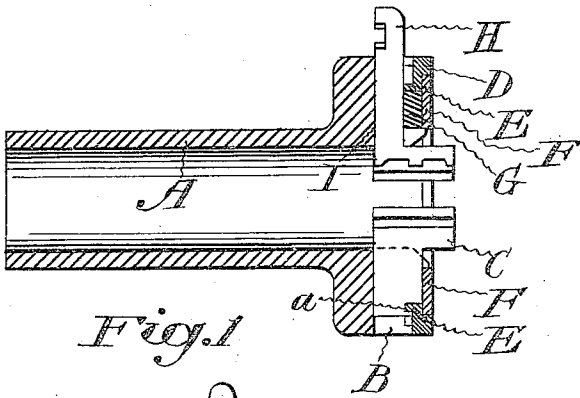


Fig. 1

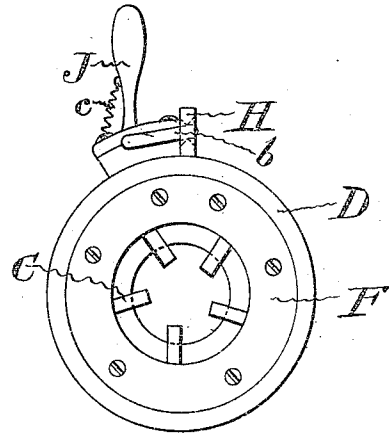


Fig. 2.

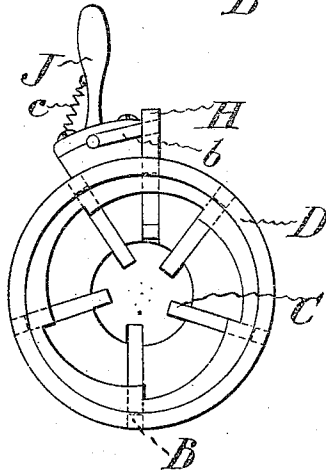


Fig. 3.

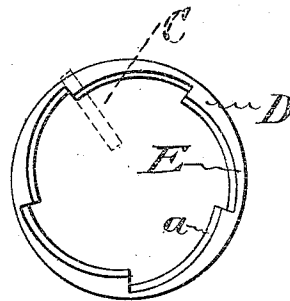


Fig. 4.

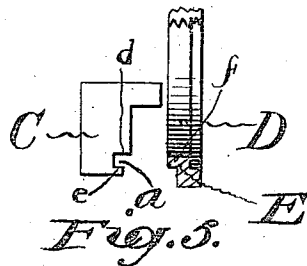


Fig. 5.

WITNESSES:

James M. (Signature)
Wm. (Signature)

INVENTOR

Roland A. Schrag
BY *Edouard (Signature)*
ATTORNEYS

UNITED STATES PATENT OFFICE.

ROLAND A. SCHRAG, OF TORONTO, ONTARIO, CANADA.

HOLLOW TOOL.

961,540.

Specification of Letters Patent. Patented June 14, 1910.

Application filed February 1, 1909. Serial No. 475,447.

To all whom it may concern:

Be it known that I, ROLAND A. SCHRAG, of the city of Toronto, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Hollow Tools, of which the following is a specification.

This invention relates particularly to hollow tools for use with lathes or other means for rotating the work or the tool and my object is to devise means whereby certain classes of work may be turned out with one tool which heretofore have required the use of two or more tools with the consequent trouble and loss of time in changing.

I attain my object by providing the cutter head with means for projecting and retracting the ordinary cutters and with a special radial cutter and means for projecting and retracting the same independent of the ordinary cutters.

Figure 1 is a longitudinal section of my improved tool. Fig. 2 is a face view of the same. Fig. 3 is a similar view with the cutter retaining ring removed. Fig. 4 is a sectional detail showing part of the cam ring and a cutter slightly separated. Fig. 5 is a detail of a cutter and revoluble ring.

In the drawings like letters of reference indicate corresponding parts in the different figures.

A is the cutter head which is hollow and at its end is provided with radial slots B in which the ordinary cutters C are radially movable. On the cutter head is fitted a revoluble ring D which is provided with cam faces E at its inner periphery which engage the shoulders *d* formed on the cutters C. This cam ring is held in place by the stationary ring F secured to the cutter head A by suitable screws. This cam ring also bears against the outer sides of the stems of the cutter. It will be noticed that a notch *a* is formed in the stem of each cutter outside the shoulder *d* and that the metal of the stem outside of the notch forms a shoulder *e* extending only part way toward the outer end of the shoulder *d*. The cam faces are provided with laterally extended flanges *f* fitting into the notches *a*.

By the above construction I obtain wide bearing surfaces on the cutters and cam ring which minimize wear. Also after the cam ring has been turned to obtain the maximum inward radial movement of the cutters pos-

sible, while the cam faces are in engagement with the shoulders *d* continued rotation of the cam ring will cause the cam faces to engage the shoulders *e* and a further range of adjustment of the cutters obtained. The cutters may also be removed through the opening in the head when in the position relative to the cam ring just described.

In addition to the ordinary cutters I provide a special cutter H radially movable in a slot I behind the cam ring D. It is evident that by rotating this cam ring that the cutters C may be projected into cutting position or retracted. The filling piece G is fitted over the cutter H to form a backing for this ring. This cutter is not engaged in any way by the cam ring but is independently operated by a bell crank lever J suitably fulcrumed on the head. One arm of this bell crank lever engages a notch *b* formed in the cutter H and the other is preferably shaped as a handle. A coil spring *c* connected to the lever and to a suitable part of the cutter head tends to retain the bell crank lever in the position it occupies when the cutter is retracted.

With the above construction I attain the objects hereinbefore set forth. The cutters C will be of such shape as will be necessary for the part of the work they are called upon to perform. After their work is accomplished by rotating the cam ring they may be retracted or left stationary and the cutter H advanced to perform its special work. Of course cutters will be of different shapes according to the work they are called upon to do. For example, the ordinary cutters might be employed to turn down the shaft to a given diameter and a groove may then be cut in the turned down portion or any other portion of the shaft as may be desired by means of the special tool. The tool will also be useful when one of the operations performed by it is cutting a screw thread.

What I claim as my invention is:—

A hollow cutter head having radial slots formed therein in combination with a plurality of cutters radially movable in said slots and each having a shoulder formed thereon adjacent to its outer end and a second shoulder farther from the axis of the tool separated by a notch from the first shoulder and extending part way only

toward the outer end of the first shoulder;
a cam ring having a plurality of interrupted
cam faces formed on its inner periphery and
arranged in close succession, and ribs form-
5 ing lateral extensions of the cam faces en-
tering the aforesaid notches; and a flat-sided
stationary ring secured to the head engaging

the outer face of the cam ring and also the
outer faces of the radial cutters.

Toronto this 25th day of January 1909.

ROLAND A. SCHRAG.

Signed in the presence of—

JOHN G. RIDOUT,

EDGAR M. SHEPPARD.