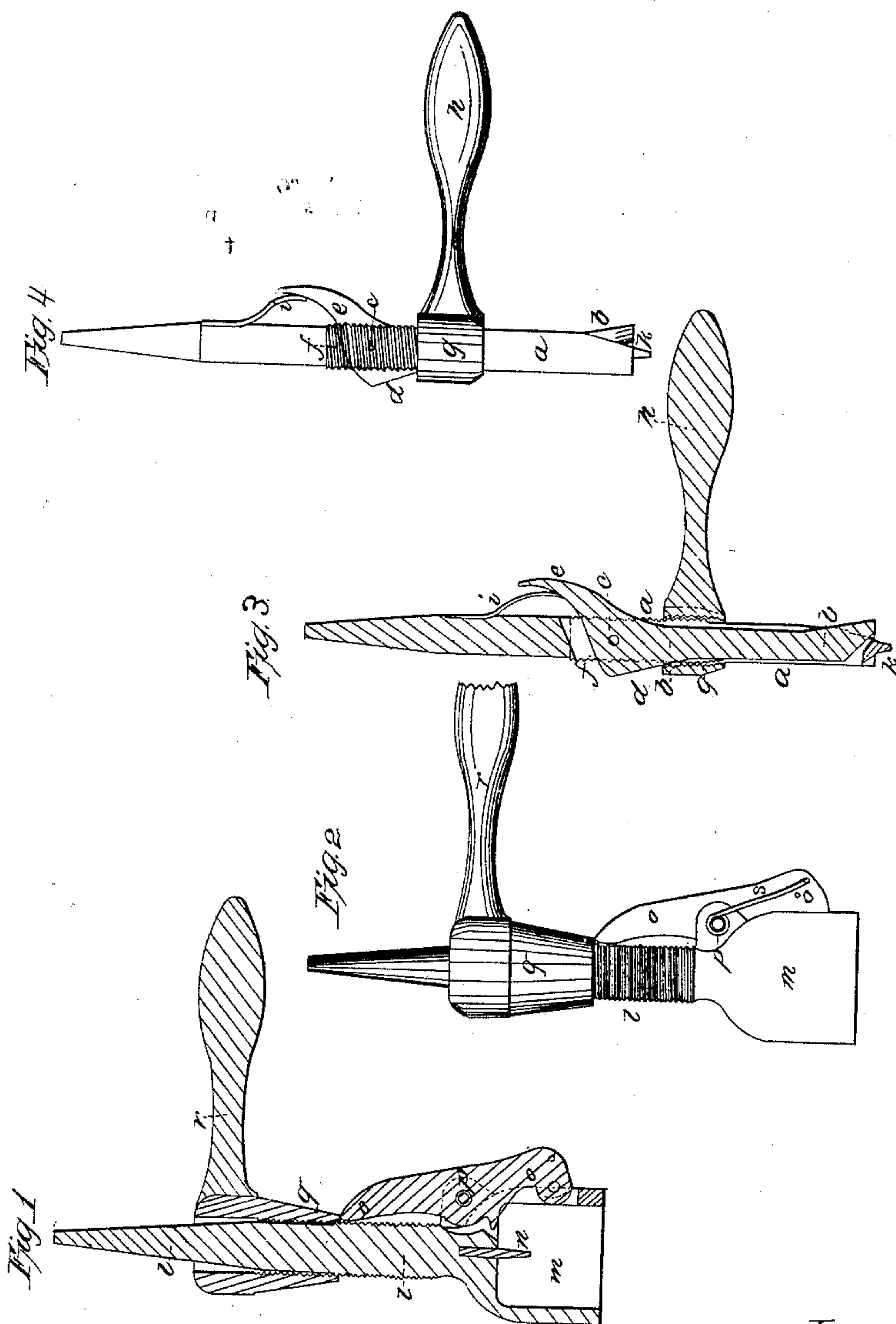


A. ELIAERS.  
TOOL FOR BORING HOLES.

No. 45,483.

Patented Dec. 20, 1864.



Inventor.

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Witnesses  
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# UNITED STATES PATENT OFFICE.

AUGUSTUS ELIAERS, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN TOOLS FOR BORING HOLES.

Specification forming part of Letters Patent No. 45,483, dated December 20, 1864.

*To all whom it may concern:*

Be it known that I, AUGUSTUS ELIAERS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Tools for Forming Apertures, &c.; and I do hereby declare that the following description, taken in connection with the accompanying plate of drawing hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements whereby my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The object of my invention is to so construct a cutting-tool that apertures of greater diameter at the bottom than at the top, or "undercuts," can be formed, and yet allow the cutter to be withdrawn. To form such undercut holes is especially desirable for the insertion of rubber or other elastic studs or buttons, which are firmly held therein.

My improved cutting-tool is represented in the accompanying drawings, of which Figure 1 is a central vertical section of a cutter adapted to the forming of grooves or undercuts on the exterior of any surface, and Fig. 2 a side elevation of the same. Figs. 3 and 4 are similar views showing my improved lever-cutter as adapted to the forming undercut apertures within a body of wood or other material.

*a a* in Figs. 3 and 4 represent a hollow or s'otted shaft or rod having inserted within it a lever-cutter, *b b*, turning upon a pivot at *c*, its upper end forming two cams, *d* and *e*. Upon the periphery of the shaft *a a* is cut a small screw, *f*, upon which works a nut, *g*, attached to or forming a part of an arm or handle, *h*. A bent screw, *i*, presses against the cam *e* of the lever-cutter *b b*. The screw-shaft *a a* turns upon a center, *k*.

From the foregoing description it will be seen that the cutting scope of the lever-cutter *b b*, as it turns upon a pivot, *c*, can be increased or diminished at pleasure by turning the arm or handle *h* up or down, the nut *g* of the said arm acting upon the cam *d* of the

lever-cutter *b b*, so as to throw its cutting-edge farther from its center *k*, while the arm or handle *h* is being turned up and the spring *i* retracting or throwing the cutter in, when the nut *g* is relieved from the cam *d*. Thus the length of radius of the cutting-edge of the lever *b b* can be continuously increased, so as to form an undercut while operating by screwing the nut *g* upward upon the screw-shaft *a a*, and then the tool withdrawn by simply unscrewing the said nut, the bent spring *i* drawing the lever-cutter in, as will readily be understood.

In Figs. 1 and 2 my improvements are represented as applied to the purpose of forming grooves or undercuts upon exterior surfaces. *l l* is the screw-shaft, having a hollow socket, *m*, at one end to fit over the material to be cut and turning upon a center, *n*. *o o* is the lever-cutter turning upon a pivot, *p*, and operated upon at one end by a cam-shaped nut, *q*, that can be screwed up and down upon the screw-shaft *l l* by means of a handle, *r*. *s* is a bent spring that throws the lever-cutter out when it is to be withdrawn.

It will be seen that by turning the nut *q* downward the cutting-edge of the lever-cutter will be pressed inward, and by turning it upward, so as to relieve its bearing upon the lever-cutter, the bent spring *s* will draw it away from its center, the whole operation of the tool being substantially the same as that represented in Figs. 3 and 4.

Having thus described my improvements, what I claim as my invention, and desire to have secured to me by Letters Patent, is—

A lever-cutter attached to or working within a screw-shaft, and so operated upon by a nut and spring, or their equivalents, that the length of its radius from the center of said screw-shaft can be increased or diminished at pleasure while being revolved, for the purpose of forming undercuts, substantially as described.

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Witnesses:

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