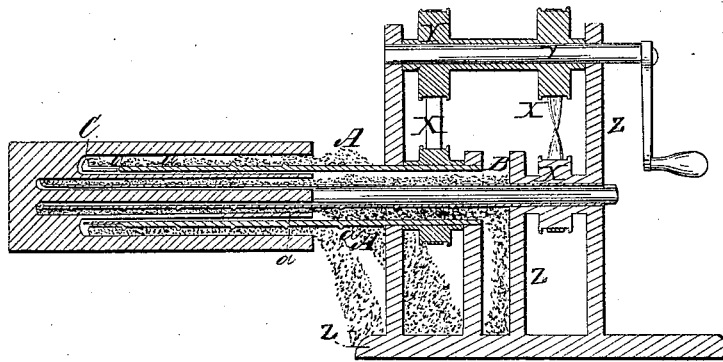
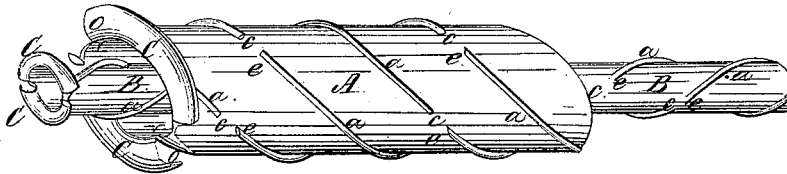


*R. Stewart,*  
*Hollow Auger,*  
*No. 53,896,* *Patented Apr. 10, 1866.*

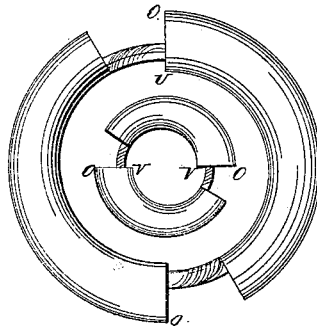
*Fig: 1.*



*Fig: 2.*



*Fig: 3.*



*Witnesses:*  
*Wm. C. Cutcheon*  
*Wm. C. Cutcheon*

*Inventor:*  
*Robert Stewart*  
*by atty*  
*J. C. Clayton*

# UNITED STATES PATENT OFFICE.

ROBERT STEWART, OF ELMIRA, NEW YORK.

## IMPROVEMENT IN ANNULAR AUGERS.

Specification forming part of Letters Patent No. 53,896, dated April 10, 1866.

*To all whom it may concern:*

Be it known that I, ROBERT STEWART, of Elmira, in Chemung county, in the State of New York, have invented certain new and useful Improvements in Hollow Augers for Boring Tubes, Kegs, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon marked.

In the drawings, Figure 1 is a vertical section through a pair of concentric hollow augers, showing the log out of which two tubes or kegs are cut. Fig. 2 is a perspective view, showing the pair of augers. Fig. 3 is an end view, showing the inward-projecting lip.

My invention is related to that class of augers which are made hollow, so as to bore a solid core instead of cutting up the whole core into chips, and is intended to be used principally in a gang or series, for the purpose of boring out a nest of tubes, kegs, &c.

The nature of my invention principally consists in the manner of constructing the thread or screw around the barrel of the auger; in revolving each outer auger in a reverse direction from its fellow inner auger; in constructing a gang of hollow augers so that each auger shall discharge its own chips at its rear end; in constructing a gang of augers so that each auger shall have its rear end to project enough beyond its next larger auger so as to turn in an independent journal, all of which will more fully hereinafter appear.

In the drawings, Z represents the framework of the machine; Y, the power-shaft and pulleys; X, the belts and pulleys which revolve the augers.

A shows the outer hollow auger, and B the inner hollow auger. When desired, a much larger number—from four to twelve or more augers—can be similarly arranged.

a represents the broken thread or screw of the auger. A small part of the thread is cut away at about each third of a turn, as shown at c, leaving a sharp cutting-edge at the end of the cut thread, as seen at c.

The drawings represent the auger as provided with a double thread, so arranged that the openings c shall not be opposite to each other. In practice the double thread is preferable, though the single thread answers a

good purpose. The effect of having these openings is to effectually break up the chips and facilitate their discharge. As the chip is cut it is forced downward, following closely the spiral of the thread or worm, occasioning considerable friction and choking if the wood be tough. With my auger the chip follows the spiral in the same manner until it reaches the opening c, through which it is forced, and is cut by the edge c, so that the continuity of the chip is destroyed; and instead of one long spiral chip there are many small chips, which move more like a fluid and are more easily discharged. Every time that the chips are forced through an opening, c, they become more comminuted and flow forward more easily. The use of two or more threads thus constructed will more thoroughly break up the chips; but I find that practically two threads, as shown in the drawings, operate most satisfactorily. This thread can easily be made of a piece of about one-eighth-inch iron wire soldered spirally to the barrel of the auger.

C is the cutting-bit, secured to the cutting end of the barrel. These bits are made rights and lefts when used in pairs, acting reversely, so that one bit cuts by turning to the right, while the other cuts by turning to the left.

The outer lip, o, of the bit projects beyond the circle of the barrel of the auger far enough to take a cut just sufficient to allow of the free passage of the auger-thread. The inner edge, v, of this lip projects inward a very little, so as to cut the core or inner tube small enough to permit a free passage through the hollow auger A. The inner diameter of the bit at its cutting-edges should be somewhat less than its diameter at the point where it is secured to the barrel, for the same reason.

It will be noted that the inner auger, B, is longer than the outer auger, A, projecting through it both at the front and rear ends. It projects in front for the purpose of first touching and boring an inch or more into the log, so as to center and steady both the log and the augers more easily and better than if the augers all began to bore at the same instant; and it projects to the rear of the outer auger, so that a portion of its own barrel shall be the shaft to revolve in its own journals and to be provided with its own driving-pulley.

It will also be noted that the rear end of each auger-barrel passes through its respective journal-boxes and has its own driving-pulley, the smallest auger extending farthest to the rear and front. By this arrangement the chips are discharged at points more or less in the rear, according to the smallness of the auger cutting them, and power can be applied so as to turn the augers of a pair in opposite directions.

In operating my invention, power being applied, the log to be bored is fed forward to the machine. The smallest and most projecting auger, B, strikes the log first and bores into it a short space, so as to center and steady the gang. The next larger auger, A, then strikes into the wood, boring in the opposite direction. The chips, as they are cut, are fed downward by the spiral threads *a* and broken up by means of openings *c* and edges *e*, so as to flow easily. The chips cut by the larger auger are discharged at the end of the log, as shown in drawings. The chips cut by the inner auger are discharged at the end of the outer auger, while the solid core is discharged at the end of the inner auger. In this same manner the chips and core are discharged from a gang of any number of augers.

By my invention I have produced the first machine known to me capable of boring a se-

ries or nest of concentric tubes easily, rapidly, and cheaply for any reasonable length—say twelve feet—without withdrawing the augers. Its cheapness of construction and steadiness of operation give it great advantages over other similar machines.

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

1. Making the thread of a hollow auger with openings *c*, substantially as and for the purposes set forth.

2. Revolving each outer hollow auger in a reverse direction from its next inner hollow auger, substantially as and for the purposes set forth.

3. Arranging a series of hollow augers so that the rear end of each auger shall project sufficiently beyond the next larger auger to turn as its own shaft in independent journal-boxes, substantially as and for the purposes set forth.

In testimony that I claim the above I have hereunto set my hand this 10th day of February, 1866.

ROBERT STEWART.

In presence of—

JO. C. CLAYTON,  
V. O. CLAYTON.