

A. STONER & F. M. PENNEBAKER.  
WOOD TURNING MACHINE.

No. 476,696.

Patented June 7, 1892.

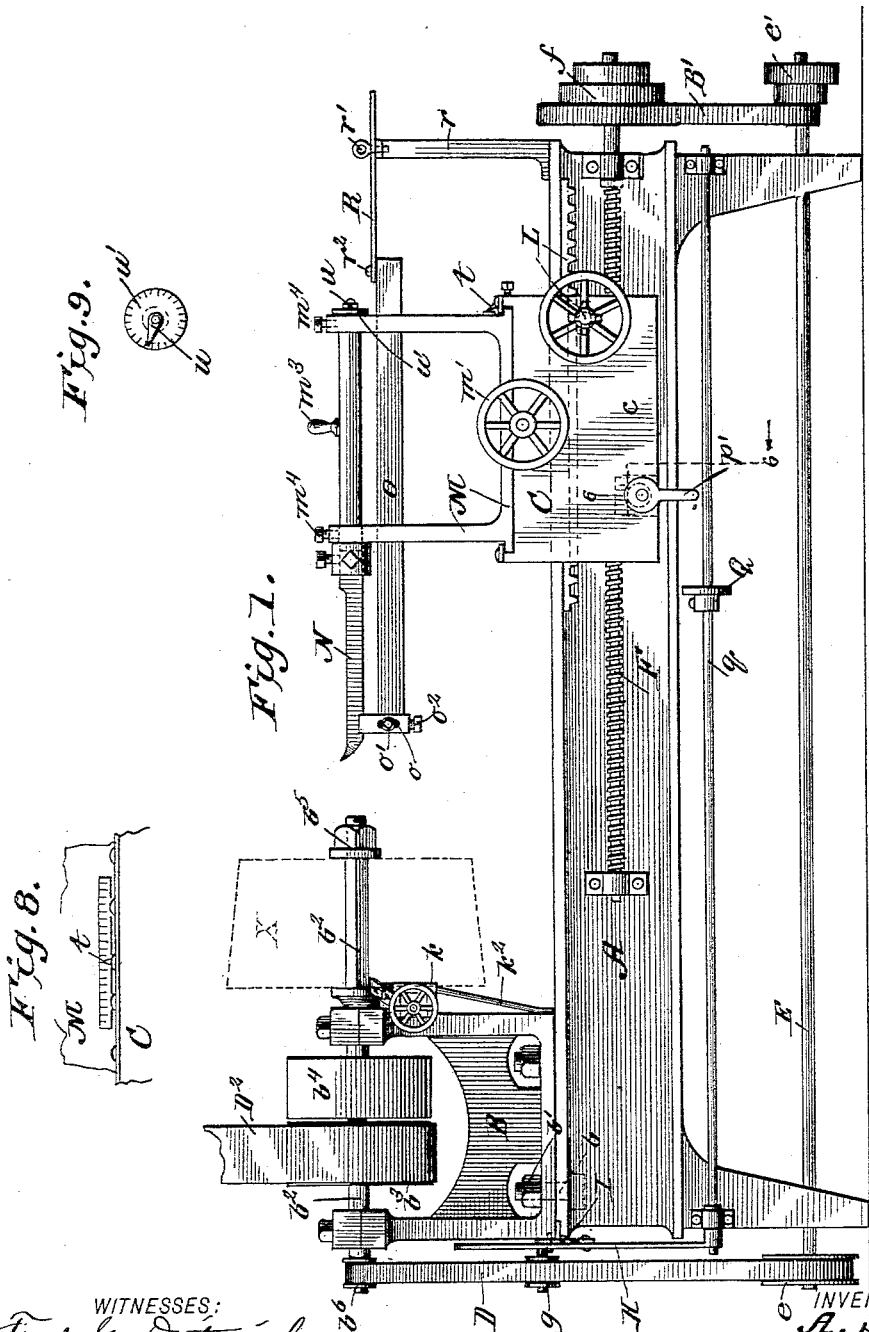


Fig. 8.

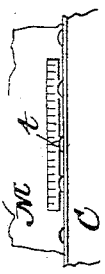


Fig. 9.

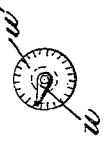


Fig. 1.

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*A. Stoner,*  
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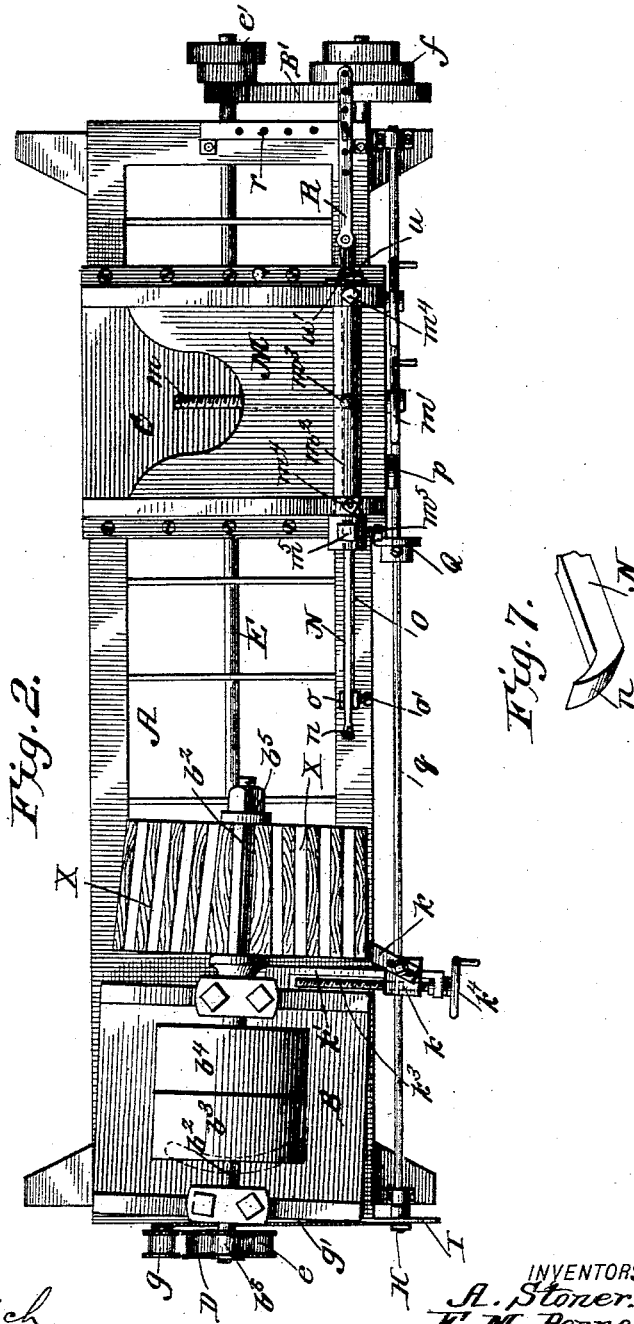


Fig. 2.

Fig. 7.

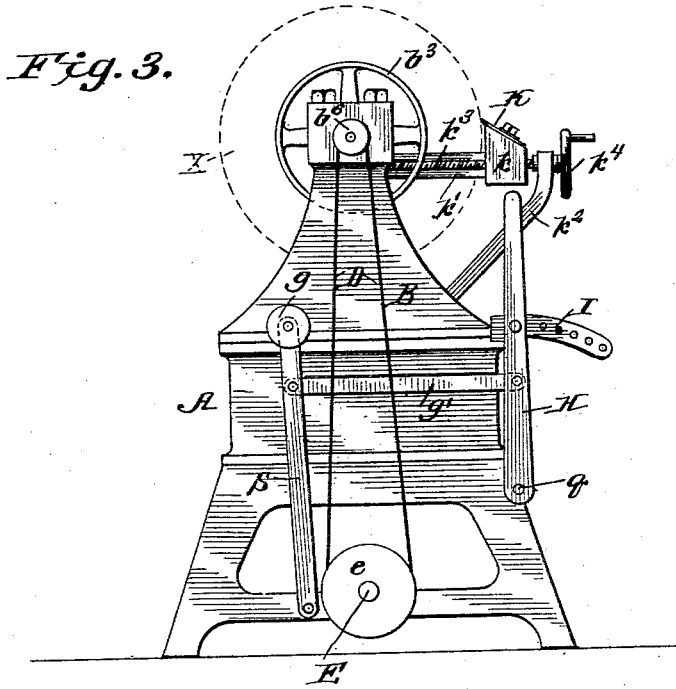
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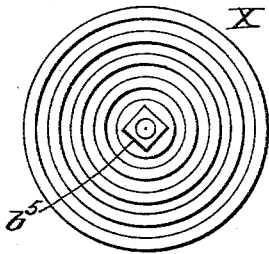
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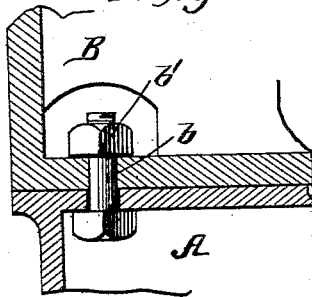
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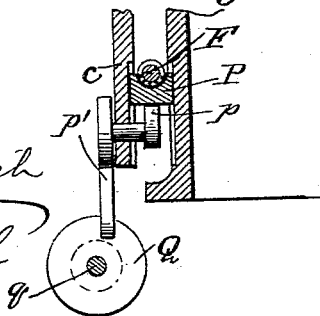
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

ABRAHAM STONER, OF STONY POINT, LOUISIANA, AND FRANCIS M. PENNEBAKER, OF PLEASANT HILL, KENTUCKY.

## WOOD-TURNING MACHINE.

SPECIFICATION forming part of Letters Patent No. 476,696, dated June 7, 1892.

Application filed August 14, 1891. Serial No. 402,680. (No model.)

*To all whom it may concern:*

Be it known that we, ABRAHAM STONER, of Stony Point, East Baton Rouge parish, State of Louisiana, and FRANCIS M. PENNEBAKER, of Pleasant Hill, Mercer county, State of Kentucky, have invented a new and useful Improvement in Wood-Turning Machines, of which the following is a specification.

Our invention is an improved machine for turning solid staveless hulls or bodies of tubs, buckets, or analogous wooden ware from a solid block. It is more particularly a practical improvement upon the machine for the same purpose which was designed by one of the above-named inventors—namely, Abraham Stoner—and for which he has received Letters Patent of the United States No. 341,182, dated May 4, 1886.

Some of the chief objects aimed at and attained (as proven by actual work with this machine) are increased simplicity and strength of parts, greater accuracy of adjustment and reliability of operation, and especially greater compactness and adaptation for convenient manipulation and control of the machine by the operator, whereby the work is not only done better, but more expeditiously and economically.

In the accompanying drawings, (three sheets,) Figure 1 is a side view of the machine. Fig. 2 is a plan view of the same, and Fig. 3 is an end view. Fig. 4 is an end view of a wooden block which has been cut as required to form a series of tapered hulls or bodies for buckets. Fig. 5 is an enlarged longitudinal section of a portion of the bed-frame and adjustable work-holder. Fig. 6 is a vertical enlarged section on line 6 6 of Fig. 1. Fig. 7 is a perspective view of the cutting-tool. Figs. 8 and 9 are views representing the gages for determining the adjustment of the tool-holder.

All the movable or operative parts of our machine are attached to a stationary frame A, which is practically an ordinary lathe-bed. On one end of this frame are arranged the adjustable work-holder B and its attachments, and on the other end of the same is mounted the sliding carriage C, which carries the cutting-tool N, while the means for automatically stopping the carriage in its forward movement are applied to the front side of the frame A, as

shown. The work-holder B is pivoted on the said frame, so that its outer end may be adjusted laterally, as required, to set the work or wooden block X at the proper angle to the cutting-tool for the purpose of giving taper to the vessel. For the purpose of fastening the work-holder B when thus adjusted we employ the clamp-bolt *b*, which works in an arc slot in the bed A and is provided with a flanged head that works in frictional contact with the under side of the plate on which the work-holder is pivoted. By turning the nut *b'* on the upper end of said bolt *b* the work-holder B is clamped and held in any required adjustment. An arbor *b<sup>2</sup>* is mounted in the work-holder B and provided with the fast and loose pulleys *b<sup>3</sup>* and *b<sup>4</sup>*.

The wooden block X, from which the buckets are to be cut, is mounted on the inner end of the arbor *b<sup>2</sup>*—that is to say, the squared portion of such arbor passes axially through the block, which is clamped in place between the fixed collar and a nut *b<sup>5</sup>*, screwed on the end of the arbor. The other or outer end of the arbor carries a fixed pulley *b<sup>6</sup>*, provided with lateral flanges for holding in place the belt D, that runs on it, and the larger pulley *e*, fixed on a shaft E, arranged longitudinally in the lower portion of the frame A. A cone-pulley *e'* is mounted on the other end of said shaft, and from it a belt B' runs to the cone-pulley *f* on the outer end of the feed-screw shaft F, which feeds the tool-carriage C. The arbor *b<sup>2</sup>*, carrying the work X, is rotated by a belt D<sup>2</sup>, running on its fast-pulley *b<sup>3</sup>* from any suitable motor. The said belt runs normally loose or free on pulley *b<sup>4</sup>*, and to put it under tension for the purpose of operating the feed-screw F and advancing the tool-carriage C we employ the tightening mechanism shown in elevation in Fig. 3. A loose pulley *g* is carried on the free end of a rocker-arm S, which is connected by a horizontal bar *g'* with a vertical hand-lever H, pivoted to the end of the frame A. This lever is secured in any adjustment to an arc bar I, Fig. 3, for the purpose of holding the pulley *g* pressed against the belt D for tightening it, as required to drive the shafts E and F and operate the tool-carriage C.

Figs. 2 and 3 show an attachment of the work-holder B, which serves to turn the butt-

end of the wooden block X, and also to bevel the end of the block while the cutting-tool is feeding into the latter. It likewise serves to cut off the hull or vessel last formed in case the cutting-tool does not cut clear through the block. It consists of a slotted bit or flat cutter K, secured adjustably by means of a screw-bolt on a horizontal bar  $k'$ , fixed on the work-holder B and supported at its outer end by means of a brace  $k^2$ . A feed-screw  $k^3$ , having a hand-wheel  $k^4$  on its outer end, passes through the stock  $k$  and is arranged parallel to the aforesaid bar  $k'$ , in whose bent outer end it is suitably journaled. It will be noted that this work-turning attachment, being carried by the work-holder B, is adapted to be operated in any position the latter may be placed.

The tool-carriage proper C, which is advanced on the ways of bed A by the screw-shaft F, is moved back by means of a rack, pinion, and hand-wheel L.

A tool-stock  $m^2$  is journaled in the uprights of the tool-holder M and provided with a lateral handle  $m^3$  for turning it on its axis, and it may be clamped in any adjustment by screws  $m^4$  passing through the heads of uprights and bearing on its journals. The inner end of the tool-stock  $m^2$  has a socket to receive the shank of the cutter N, which is adapted to be turned therein on its axis, and is clamped in any adjustment by screws  $m^5$  passing through the walls of the socket, as shown. Directly beneath and parallel to the tool-stock  $m^2$  and tool N is arranged a rest O for the latter, the same consisting of a straight bar adapted to slide longitudinally and having attached to its inner end an adjustable tool-support  $o$ . The latter is a slotted piece clamped to the bar O by the lateral screw  $o'$ , its vertical adjustment being governed by a set-screw  $o^2$ , applied underneath the bar O.

The form or construction of the cutting-tool N is shown best in Fig. 7. It is curved or convex on the outer side and correspondingly concave on the inner side, and the somewhat enlarged head  $n$  is beveled backward and downward, thus forming a chisel-like point or cutting portion. This shape adapts the cutter to its work so that it will make straight cuts, and to adjustment about its axis, as required to make circular cuts of different radius in the block X, features which are indispensable to a practically-successful result in this class of machines.

The screw F, which feeds the carriage and thus advances the tool N to its work, passes through and rotates free in an unthreaded bore in the apron or pendent portion  $c$  of said carriage. In order to lock them together, so that the screw will operate the carriage, we employ the means shown in Figs. 1 and 6.

A half-nut P—*i. e.*, a small block having a semicircular threaded notch in one side—is adapted to slide vertically in the apron  $c$ , and is raised and lowered by an eccentric  $p$ , operated by an arm  $p'$ , fixed on its horizontal ex-

tended axis. When the arm  $p'$  is pendent or vertical, as shown in Fig. 6, the nut P is held engaged with the feed-screw F, and the carriage C is thereby locked with the latter, so that the rotation of said screw advances the carriage until the arm  $p'$  of the eccentric  $p$  strikes an adjustable stop Q on the rod  $q$ , whereby the eccentric is rotated backward and the nut P thrown out of contact with the feed-screw F, thus arresting the movement of the carriage C.

It is necessary that the tool-rest O shall not come in contact with the block X as the latter revolves. To this end we employ the stop R, Fig. 2, which is a narrow plate or thin bar having a series of holes in one end. The said stop R is supported on a post  $r$  and secured adjustably thereon by means of a removable pin  $r'$ , which passes through one of its holes. The other end of the stop R is loosely attached to the outer end of the tool-rest O by means of a headed stud  $r^2$ . It will be readily understood that the stop R arrests and limits the forward movement of the rest O independently of the operation of the carriage C.

The general operation of the machine is as follows: A block X of suitable dimensions having a polygonal axial bore is secured on the arbor  $b^2$ , and the driving-belt D being shifted from the loose to the fast pulley  $b^3$  the hand-wheel  $k^4$  is rotated to advance the turning bit or cutter K, whereby the butt portion of the block X is quickly trimmed flat and smooth. The work-holder B is set at the required angle and clamped by the bolt  $b$  and its nut  $b'$ . This angle is determined by the taper required to be given to the several tubs or buckets, &c., cut from the block, the greater the taper the greater the angle, and the less the taper the less the angle. The tool-stock  $m^2$  having been rotated to place the tool N in the required position—that is to say, to turn the tool on its axis so that its convex outer side shall bear proper relation with the circle to be cut in the block X (without which the tool will not make a straight cut)—said stock is clamped by the screws  $m^4$ , so as to be held immovable. The eccentric lever or arm  $p'$  is then turned down to engage the nut P with the feed-screw F, and the belt-tightener  $g$  H is operated to apply the required tension to the belt D, whereby the feed-screw F is put in motion and the carriage C caused to advance, so that the tool N begins its cut. The slotted stop R arrests the tool-rest O, so as to prevent contact with the block. When the tool N has made a circular cut of the required depth, the stop O throws the half-nut P out of engagement with the feed-screw F, and thus arrests the forward movement of the carriage C, which is then moved back by the rack and pinion L. The wheel  $m'$  on the outer end of the transverse feed-screw  $m$  of the tool-holder M is next rotated to slide the latter laterally the distance required to place the tool N for the second cut. This distance

is indicated on a graduated plate, Fig. 1, af-  
 fixed to the lower edge of the tool-holder M  
 by means of a pointer or index *t*, secured to  
 the bed of the carriage proper. The tool-  
 5 stock *m*<sup>2</sup> is also turned slightly to suit the  
 greater convexity of the narrower circle to  
 be made by the tool making its next cut. As  
 a means for conveniently ascertaining the  
 degree of rotation of the tool, a pointer or in-  
 10 dex *u* is attached radially to the rear end of  
 the tool-stock *m*<sup>2</sup>, Fig. 1, and moves over a  
 radially-graduated plate or disk *u'*, fixed in  
 position on the rear upright of the tool-holder  
 M. The above operations are repeated for  
 15 every cut made. The block is then removed,  
 and another being substituted the operation  
 begins *de novo* and proceeds as before de-  
 scribed.

It will be noted that the holes in stop-bar  
 20 permit its longitudinal adjustment as re-  
 quired for blocks X of different lengths; also,  
 the pivotal connection of said stop-bar with  
 its fixed support adapts it to swing laterally,  
 corresponding to the lateral shifting of the  
 25 tool-holder, as required for the successively  
 smaller circular cuts made by the tool.

Having thus described our invention, what  
 we claim as new, and desire to secure by Let-  
 ters Patent, is—

30 1. In a turning-machine, the combination,  
 with the bed-frame, the tool-carriage sliding  
 on the latter, and mechanism for feeding it,  
 of the work-holder pivoted at its inner end,  
 and the headed bolt *b*, working in an arc slot  
 35 of said bed-frame and provided with a nut *b'*  
 for clamping the work-holder at any required  
 inclination to the tool or cutter, a rotatable  
 arbor mounted in the work-holder and adapted  
 to carry a block on its inner end, and means  
 40 for connecting the said arbor and the carriage-  
 feed mechanism, as shown and described.

2. In a turning-machine, the combination,  
 with the bed-frame, the tool-carriage sliding  
 on the latter, a screw-shaft, and means for  
 temporarily locking it with the carriage, of  
 45 the work-holder having an arbor, as specified,  
 the shaft arranged longitudinally on the lower  
 portion of the frame, a belt-and-pulley con-  
 nection between said arbor and shaft, a simi-

lar connection between the latter and the feed- 50  
 screw shaft, the half-nut adapted to engage  
 the screw-shaft, an eccentric for raising and  
 lowering the nut and having a lever-arm, as  
 specified, and a stop which engages the said  
 arm, and thus automatically breaks the con- 55  
 nection between the feed-shaft and carriage,  
 as shown and described.

3. In a turning-machine, the combination,  
 with the work-holder pivoted and adapted for 50  
 lateral adjustment, as set forth, of the block-  
 turning attachment rigidly secured to and  
 thus movable with the work-holder, consisting  
 of a cutting-tool, a stock therefor, a bar ar-  
 ranged and supported rigidly at a right angle  
 to the arbor of the work-holder, and a rotat- 65  
 able screw-shaft journaled alongside said bar  
 and serving to adjust the tool-stock along the  
 latter, as shown and described.

4. In a turning-machine, the combination,  
 with the work-holder and a carriage adapted 70  
 to slide toward and from the same, of a cut-  
 ting-tool and a stock for holding it, the tool  
 and stock being aligned horizontally and the  
 stock adapted for rotation on its axis to adjust  
 the tool, as specified. 75

5. In a turning-lathe, the combination, with  
 the cutting-tool N and its holder or stock ar-  
 ranged horizontally and aligned, as specified,  
 of the tool-rest consisting of a bar O, carrying  
 a tool-supporting piece at its free end and ar- 80  
 ranged beneath and parallel to said tool and  
 stock, and also adapted to slide lengthwise in  
 its supports, whereby it may be adjusted in-  
 dependently of the tool, as and for the pur-  
 pose specified. 85

6. In a turning-machine, the combination,  
 with the work-holder, the carriage adapted to  
 slide toward and from the latter, the tool-  
 holder sliding transversely on said carriage,  
 the tool and sliding tool-rest, of the stop-bar 90  
 adapted for adjustment lengthwise and piv-  
 oted on a fixed support and loosely connected  
 with the rest, as shown and described.

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Witnesses:

JOHN G. HOWELL,  
 N. RHODES.