(No Model.) 2 Sheets—Sheet 1.

A. STONER.

TURNING MACHINE.

No. 341,182. Patented May 4, 1886.

Fig. 1.

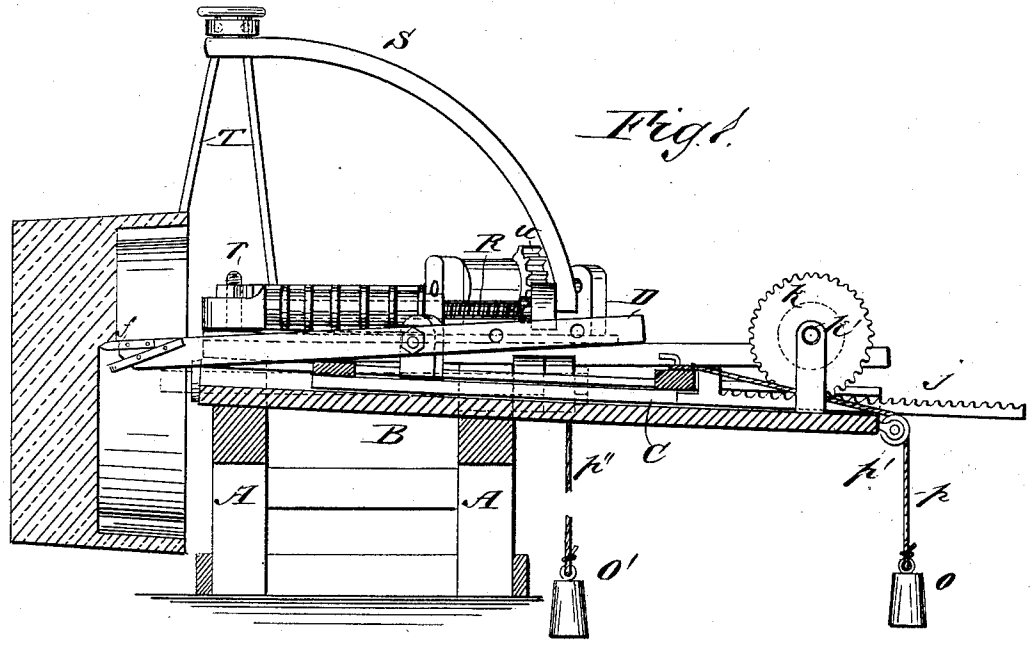


Fig. 2

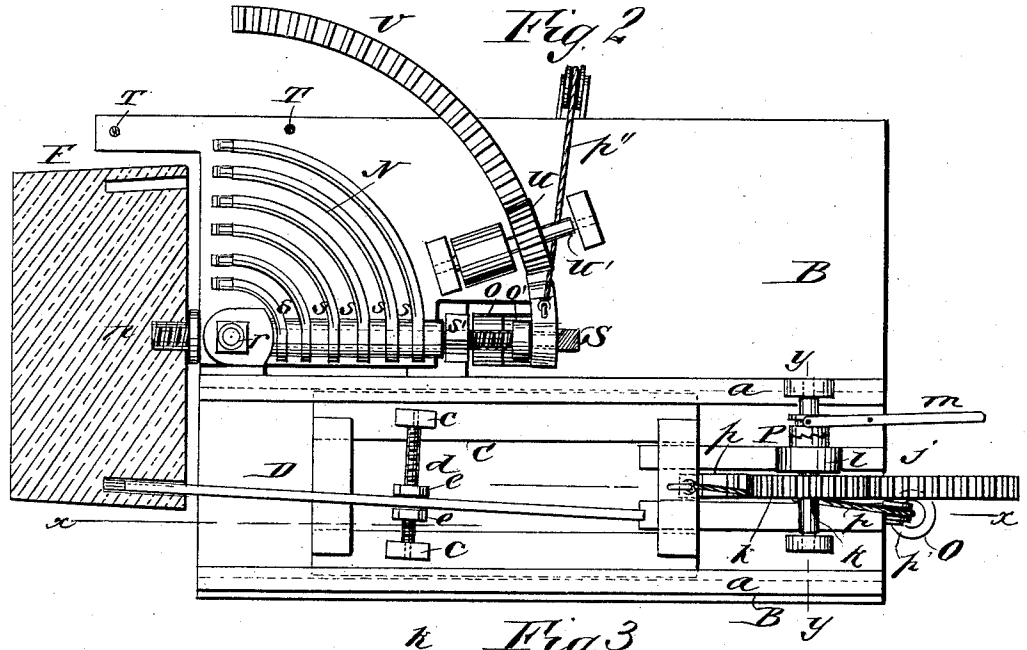
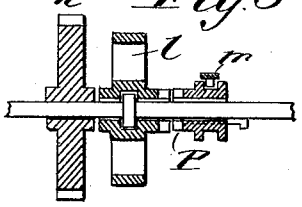


Fig. 3



WITNESSES:

F. McArdle

C. Sedgwick

INVENTOR:

A. Stoner

BY Munn & Co.

ATTORNEYS.

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4

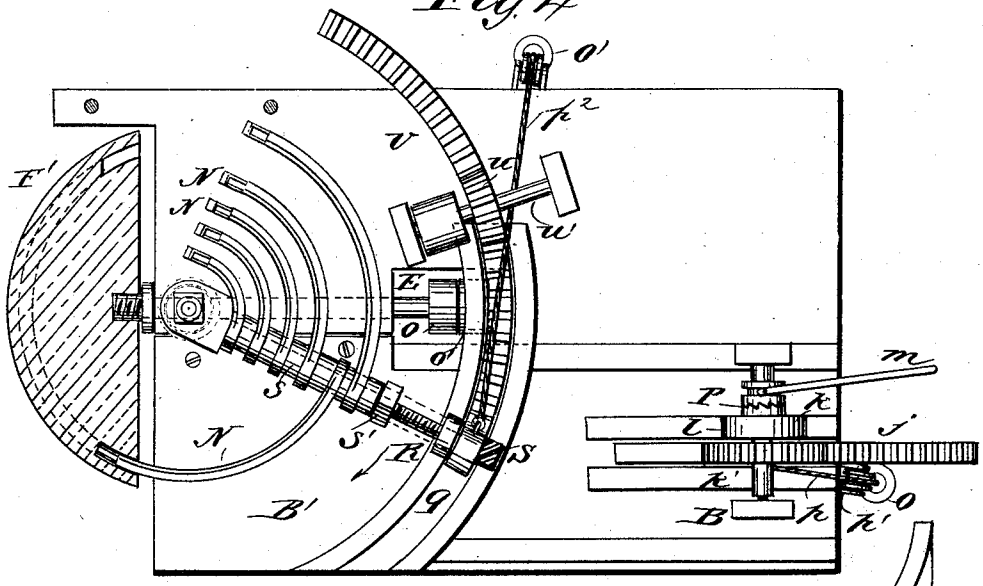


Fig. 6

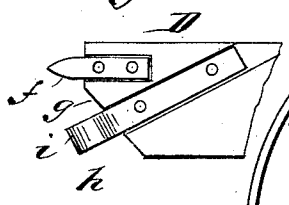


Fig. 7

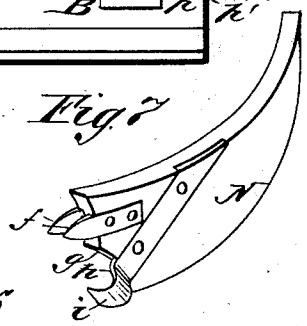
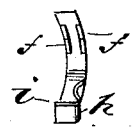


Fig. 5

Fig. 8



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UNITED STATES PATENT OFFICE.

ABRAHAM STONER, OF STONY POINT, LOUISIANA.

TURNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 341,182, dated May 4, 1886.

Application filed December 31, 1885. Serial No. 187,267. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM STONER, of Stony Point, in the parish of East Baton Rouge and State of Louisiana, have invented a new and Improved Turning-Machine, adapted more particularly for use in forming vessels or tubs from blocks of the tupelo-gum tree, which is a wood that, when dried, is very white, almost as light as cork, and which it is almost impossible to split by any mechanical means.

The following is a full, clear, and exact description of my improved turning-machine.

The object of my invention is to provide a machine which shall be practically automatic in its action, and by means of which vessels of varying sizes and shapes may be produced.

The invention consists of certain novel constructions and combinations, which will be hereinafter fully explained, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side view of my improved turning-machine, a portion of the machine being shown in longitudinal vertical section, and a block of the wood to be operated upon being shown in circular section, and partly cut. Fig. 2 is a plan view of the machine. Fig. 3 is a sectional detailed view of the clutch upon the shaft which drives the main cutting-arm forward. Fig. 4 is a plan view of the machine as arranged to cut circular or bowl-shaped vessels. Fig. 5 is a view of the front of machine, the circular cutting-arms being shown in section. Fig. 6 is a side view of one end of the straight cutting-arm. Fig. 7 is a perspective view of the end and side of one of the circular cutting-arms. Fig. 8 is a view of the end of either form of cutting-arm.

In constructing such a machine as is illustrated in the drawings I provide a heavy supporting frame-work—such as that shown at A—and upon this frame-work I place a top piece or bed-plate, B, formed with grooves or ways *a a*, in which ride the flanges *b* of a reciprocating carriage, C. This carriage C consists of a frame carrying two standards, *c c*, which are placed in a position so that the threaded shaft *d*, which they support, shall be at a slight angle to the main line of the carriage. This threaded shaft *d* carries a cutter-arm, D, which is mounted between two nuts, *e e*, that are threaded to engage with the shaft *d*, so that the cutter-arm can be adjusted to or from either end of the shaft *d*, and locked in the position to which it is moved. The projecting end of the cutter-arm carries two cutter-heads or knives, *f f*, one of such knives being arranged on either side of the cutter D, and both arms being mounted in recesses formed in said arm, so that their outer faces will project only slightly beyond the faces of the arm.

Below the knives or cutters *f* the cutter-arm is beveled off, as shown at *g*, and from this beveled edge there projects a clearer, *h*, which is firmly bolted to the cutter-arm, and formed with a very sharp upper edge, *i*. The arm D is slightly concave on the side toward the center of the machine, while it is convex upon the outer side.

The carriage C is provided with a rack, *j*, which projects from the rear of the carriage, to be engaged by a gear-wheel, *k*, which is mounted on the shaft *k'*, that is fixed in bearings projecting upward from the bed-plate B. This shaft *k* is provided with a normally-loose pulley, *l*, which is formed with one half of a clutch, P, the other half of the clutch being formed with a groove and riding on a feather which projects from the shaft *k'*, the movable half of the clutch being operated by a lever, *m*, so that when desired the movable portion of the clutch may be thrown up against that portion of the clutch carried by the pulley *l*. This construction is best shown in Fig. 3. A longitudinal shaft, E, is mounted in bearings carried by the frame A, beneath the bed B, one end of said shaft projecting outward in front of the frame A, as shown at *n*, this portion of the shaft being provided with a heavy screw-thread. The shaft E carries a fast and loose pulley—such as those shown at *o o'*—and when it is desired to rotate the shaft the belt running in connection with the pulley, as is usual, is shifted to the fast pulley; but when it is desired to stop the machine the belt is shifted to the loose pulley.

Such, in general, is the construction of that portion of the machine designed more par-

ticularly to produce tub-shaped vessels having tapering sides; and to form such vessels a large block of the wood from which the vessels are to be made is screwed onto the projecting end *n* of the shaft E. These blocks of wood, before being operated upon, are preferably selected so as to be over thirty-six inches in diameter. After the block, which is shown at F, has been secured to the shaft E in the manner described, the cutter-arm D is adjusted upon the shaft *d* so as to strike against the inner face of the block and just within its circumference, the carriage C being drawn back toward the rear of the machine, so that the knives *f* will just clear the surface of the block. When the parts are in this position, the two halves of the clutch P are brought together, so that the shaft *k'* will be revolved, and the carriage advanced toward the block, the belt by which the pulley *l* is driven being loosely mounted on said pulley, so that while the knives *f* will be advanced with a constant pressure against the block the pressure will not be so great as to cause the knives to jam. As the shaft *k* is started forward, the shaft E is also started forward in the direction of the arrow shown in Fig. 5, so that the block F receives a rotary motion, and as the knives *f* are advanced they will cut into the face of the block, and the circular strip between the cuts so formed will be removed by the sharp edge *i* of the knife *h*. The carriage C is advanced in the manner described until the knives *f* have cut entirely through the block, which, after the first operation, will be left in the form of the frustum of a cone. When the knives *f* have penetrated the block F, the clutch P is thrown out of action, when a weight, O, which is connected to the carriage C by a rope, *p*, that runs over a sheave, *p'*, will act to draw the carriage back to the rear of the machine.

The circular surface of the block F, formed as just described, constitutes the outer surface of the first and largest tub to be cut from the block F. When the next cut is to be formed, the cutter-arm is moved toward the center of the machine by turning the adjusting and holding nuts *e e*, so that they will be moved in the desired direction, the arm being so adjusted that when its knives *f* strike against the inner face of the block F their position will be such as to produce a cut far enough within the first cut to form a vessel with substantial side walls, it being understood that the second cut produces the cylindrical shell from which the first vessel is formed and the outer face of the second vessel, the cutter-arm being moved toward the center of the machine as each vessel is cut from the block. After the side walls of the vessel have been formed as described their bottoms are driven in from the top, being forced to position by a heavy pressure.

When it is desired to cut vessels having a circular form in cross-section—that is to say, vessels formed from a single piece, and which shall be complete when they leave the machine—I use such an apparatus as is best shown in Fig. 4, and when such vessels are to be cut I slightly modify the arrangement of the machine by removing therefrom the carriage C and placing an auxiliary bed, B', upon the main bed B. This auxiliary bed is formed with a circular groove or way, *q*, the purpose of which will be presently explained, the bed B' being secured to the main bed by screws or in any other manner desired.

One of the bearings of the shaft E is provided with an upwardly-projecting nipple or pivotal point, *r*, and upon this nipple or pivotal point there is mounted a shaft, R, which carries a number of circular cutter-arms—such as those shown at N N—said cutter-arms being concentric, and being formed on arcs having the nipple or pivot *r* as a common center. Each of the arms N is formed with a boss, *s*, through which the shaft R passes, the idea being to prevent any side or lateral play of the arms upon their connection with the shaft, while any longitudinal motion upon said shaft is prevented by a tightening-nut, *s'*. The projecting end of the shaft R is supported by a curved arm, S, which is held by a rigid standard, T, and from said projecting arms of the shaft R there projects a circular rack, U, which is concentric with the cutter-arms N N, and arranged to slide in the curved way *q* of the auxiliary bed B'. The shaft R is normally held in the position shown in Fig. 2 by the action of a weight, O', which is arranged as shown, and connected to the shaft R by a cord, *p''*.

A forward motion is imparted to the rack U by means of a gear-wheel or pinion, *u*, carried by a shaft, *u'*, and operated by a pulley and clutch similar to that shown in connection with the gear *k*, although such arrangement is not illustrated in the drawings.

The operation of this form of the machine is best understood from an inspection of Fig. 4. In this case, as in the other, a block of the wood, F', is screwed onto the end of the shaft E, and the cutter-arm nearest the projecting end of the shaft R is folded over, so as to be in the same plane with the arms upon the shaft, but so as to lie upon the opposite side of the shaft. When the parts are in this position, the shaft E is started forward, and the shaft *u'* is also started, which movement will carry forward the rack U and force the cutters *f* into the block F, the first cut leaving the block substantially in the form indicated in Fig. 4. After the first cut has been made the clutch controlling the movement of the gear *u* is thrown out of engagement, leaving the weight O' free to act to draw the shaft R and its arms N N to the position shown in Fig. 2. The larger arm N is then folded back to its original position, and the arm next toward the center is folded down, so that the parts will be in the position shown in Fig. 4, when the shafts E and *u'* are again

started forward and the first dish or bowl cut from the block.

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

1. In a wood-turning machine, the combination, with the frame and a rotary block-holder mounted thereon, of the cutter-arm set at an incline to the longitudinal plane of the block-holder and mechanism for moving the cutter-arm longitudinally, whereby tub-shaped bottomless vessels having inclined sides may be produced, substantially as set forth.

2. In a wood-turning machine, the combination, with the frame and the rotary block-holding shaft journaled thereon, of the sliding carriage on the frame in a plane parallel with the said shaft, a transverse screw-shaft mounted in bearings on the carriage, set at an incline to the length thereof, and a cutter-arm mounted on the said inclined shaft and extending at an incline to the said rotary block-holding shaft, substantially as set forth.

3. In a wood-turning machine, the combination, with the main shaft, of a cutter-arm provided with knives *f f* and a clearer, *h*, said cutter-arm being adjustably mounted on a shaft, *d*, carried by a reciprocating carriage, C, substantially as described.

4. In a wood-turning machine, the combination, with the main shaft, of a cutter-arm mounted on a threaded shaft between adjusting-nuts, a reciprocating carriage upon which the shaft carrying the cutter-arm is mounted, a rack, *j*, connected to the reciprocating carriage, a shaft, *k'*, carrying a pulley, *l*, a gear, *k*, that engages with the rack *j*, and a clutch, P, substantially as described.

5. In a wood-turning machine, the combination, with the main shaft E, of a cutter-arm, D, carrying knives *f f* and a clearer, *h*, a shaft, *d*, upon which the cutter-arm is mounted, a reciprocating carriage, C, which carries the shaft *d*, a rack, *j*, fixed to the carriage C and engaged by a gear, *k*, carried by a shaft, *k'*, mounted in bearings held by the stationary frame of the machine, said shaft *k'* being provided with a pulley, *l*, and a clutch, P, a weight, O, being connected to the carriage C by a cord, *p*, and all parts being arranged substantially as described.

6. In a wood-turning machine, the combination, with the frame and the rotary block-holding shaft journaled thereon, of a swinging shaft journaled on the frame in a plane parallel with the length of the block-holding shaft, and a series of separate and independent curved cutter-arms of different sizes journaled on said swinging shaft, and means for clamping said cutter-arms firmly to their shaft, whereby the said cutter-arms may successively be turned upon the shaft back out of the way, substantially as set forth.

7. In a wood-turning machine, the combination, with the main shaft, of a shaft, R, pivotally connected at one end to the main frame of the machine, the extending end of the shaft R being supported by a standard, T, having an arm, S, a curved rack, U, carried by the shaft R and sliding in a correspondingly-curved way, *q*, a gear, *u*, engaging with the rack U, and carried by a shaft mounted in bearings fixed to the stationary frame, an operating mechanism, by which the shaft carrying gear *u* is driven, and cutter-arms N N, arranged, as shown, upon the shaft R, all substantially as described.

8. In a wood-turning machine, the combination, with the main shaft, of a shaft, R, pivotally mounted on the main frame of the machine, and having its extending end supported by an arm, S, held by a standard, T, a shaft-operating mechanism, substantially as described, and cutter-arms N N, mounted to turn upon the shaft R, said cutter-arms being formed with one concave and one convex surface, substantially as described.

ABRAHAM STONER.

Witnesses:
E. J. STILLMAN,
F. M. BROWNIN.