No. 875,328. PATENTED DEC. 31, 1907.

D. S. COURTNEY.

WOODWORKING MACHINE.

APPLICATION FILED JUNE 14, 1907.

2 SHEETS—SHEET 1.

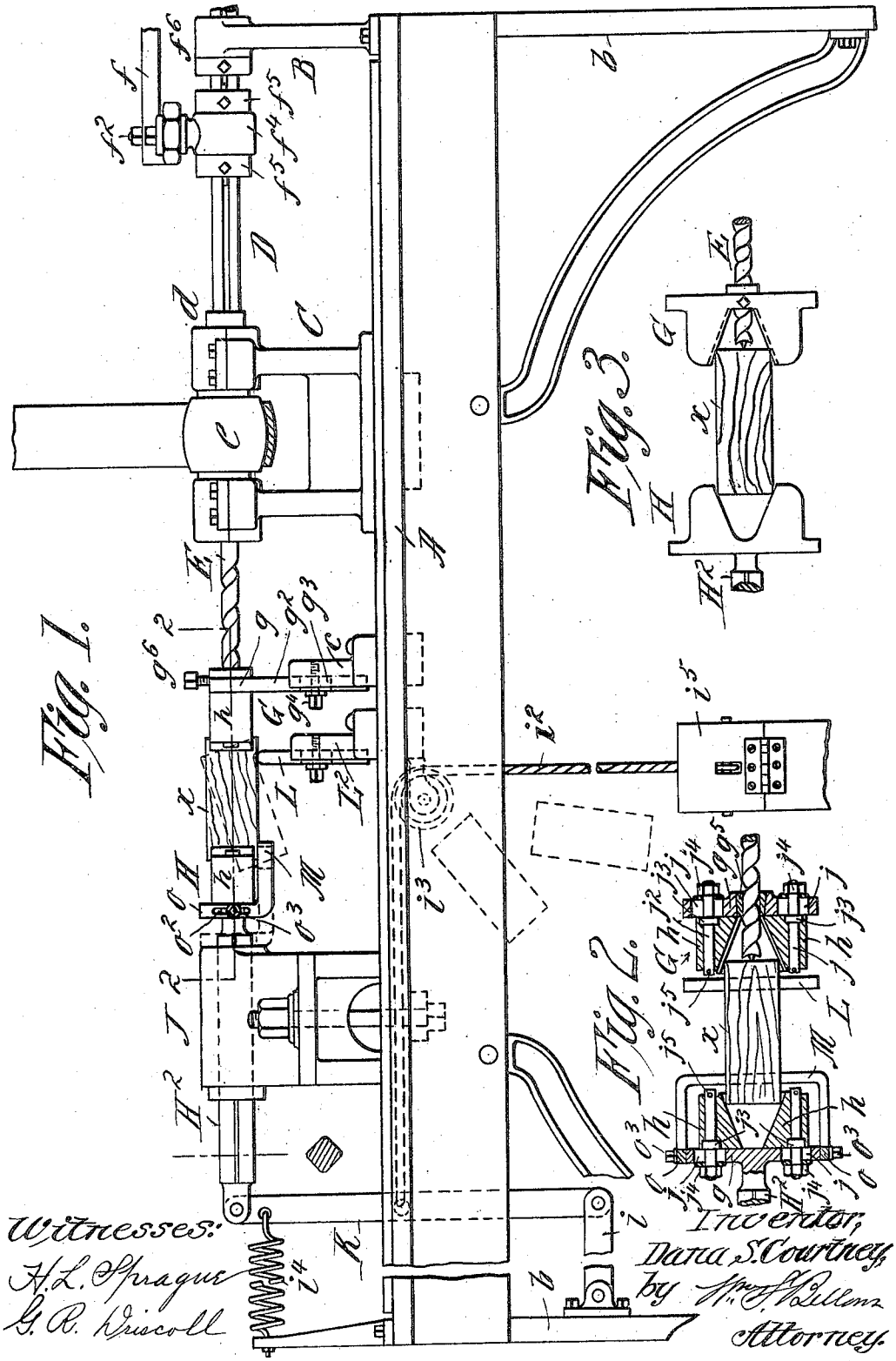


Fig. 1.

Fig. 3.

Fig. 2.

Witnesses:
H. L. Sprague
G. R. Driscoll

Inventor,
Dana S. Courtney,
by Wm. J. Williams
Attorney.

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 875,328. PATENTED DEC. 31, 1907.

D. S. COURTNEY.

WOODWORKING MACHINE.

APPLICATION FILED JUNE 14, 1907.

2 SHEETS—SHEET 2.

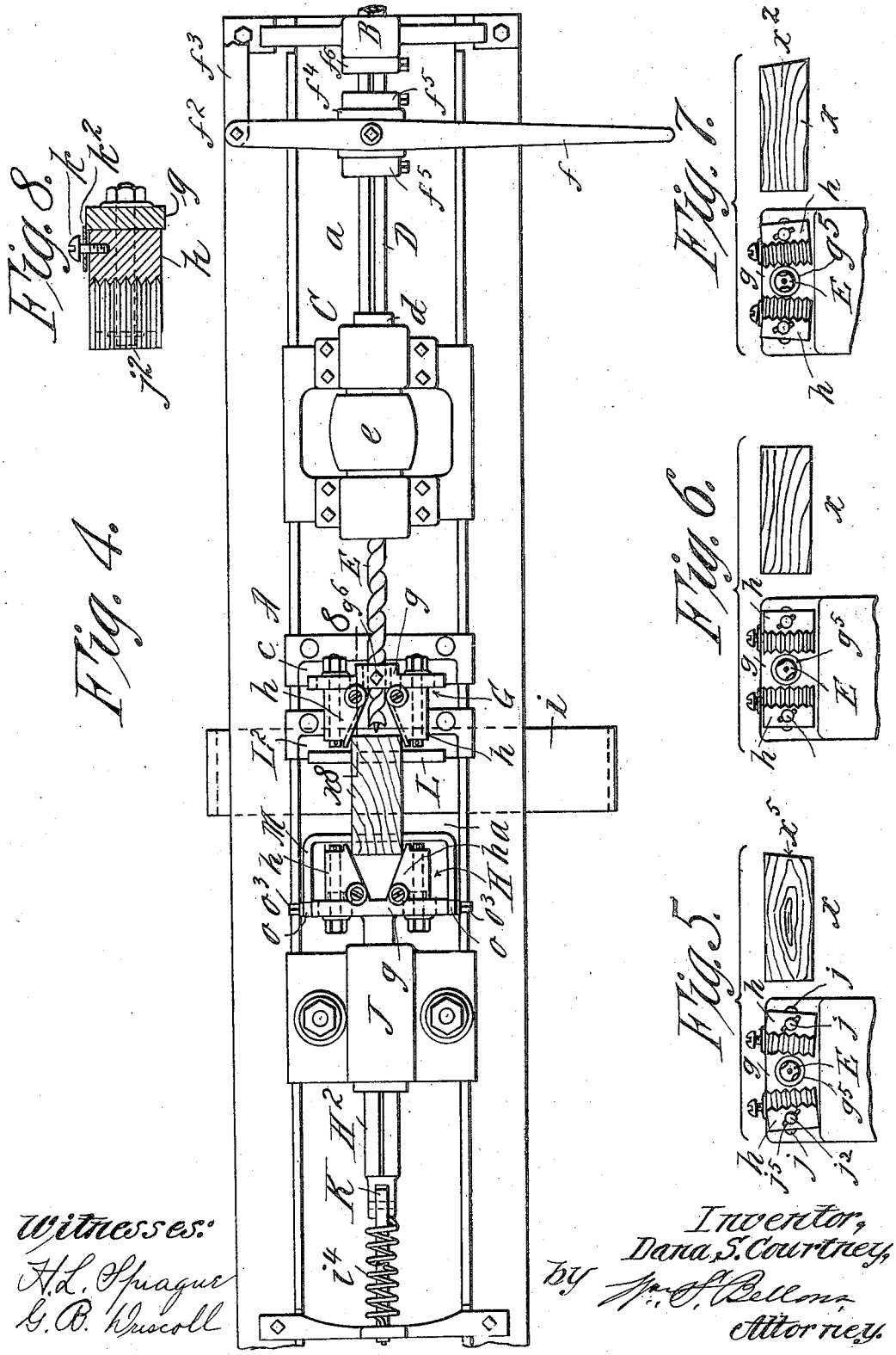


Fig. 4.

Fig. 8.

Fig. 7.

Fig. 6.

Fig. 5.

Witnesses:
H. L. Sprague
G. B. Driscoll

Inventor,
Dana S. Courtney,
by Jno. F. Bellows.
Attorney.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DANA S. COURTNEY, OF CHICOPEE, MASSACHUSETTS.

WOODWORKING-MACHINE.

No. 875,328. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed June 14, 1907. Serial No. 378,928.

To all whom it may concern:

Be it known that I, DANA S. COURTNEY, a citizen of the United States of America, and resident of Chicopee, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Woodworking-Machines, of which the following is a full, clear, and exact description.

This invention relates to the production of a special machine for longitudinally or axially boring approximately cross-sectionally square blocks or billets of wood, which after the boring are turned to make bobbins or spools.

In the production of the blocks or billets, planks or boards are sawed from the log, and because of the tendency of the circular saw to "run" they may come out thicker at one end than at the other. The plank or board is then, by a rip-saw, cut into full length strips having widths about equal to the thickness of the stock, the last sawed sides being usually brought out practically parallel. The full length strips are then with great rapidity by a cross cut saw cut into bobbin lengths, with no particular gaging or care that one or both ends shall be absolutely perpendicular to the axial line of the block. And the most especial object of this invention is to produce a machine for receiving and chucking the blocks or billets with the capability of securely holding them at both of their ends, irrespective of whether such ends are truly perpendicular or more or less oblique to the general axial line and for centrally longitudinally boring the blocks and then quickly discharging them from the machine leaving the latter in readiness for further work,—the aim being to render the machine adaptable for receiving and operating on pieces which may be more rapidly and cheaply prepared for boring than heretofore and for enabling the performance of a much greater quantity of the boring work in a given time.

Another object is to render the machine adaptable for working on blocks or billets of different cross sectional sizes and also of different lengths, as well also as to render the machine convenient and not fatiguing to the operator.

The invention consists in combinations or arrangements of parts and the constructions of certain of the parts all substantially as hereinafter fully described and set forth in the claims.

The improved machine is illustrated in the accompanying drawings, in which,—

Figure 1 is a side elevation; Fig. 2 is a horizontal longitudinal sectional view of the portion of the machine comprising the two chucks and the working extremity of the boring bit, as taken on line 2—2, Fig. 1, and also showing in plan view the rests or support for the billet to be bored. Fig. 3 is a plan view of the chucks of a somewhat simpler construction and to be hereinafter referred to. Fig. 4 is a plan view of the machine; Figs. 5, 6 and 7 are views of one of the chucks showing the movable jaws thereof in the positions which they adapt themselves to for the accommodation of billets having ends as represented variously in conjunction with the respective views. Fig. 8 is a vertical sectional view showing a detail of construction appurtenant to one of the chuck jaws, as taken on line 8—8, Fig. 4.

Similar letters of reference indicate corresponding parts in all of the views.

In the drawings,—a suitable machine frame is represented comprising a bed or table A having a long opening *a* therein and supported by legs *b b;* at and towards the right hand end of the machine are stands B and C mounted in which is a shaft D which carries at its left hand end the boring bit E. The bit carrying shaft D is splined through a sleeve *d* journaled in the stand C, said sleeve having the driving pulley *e* thereon. The bit carrying shaft is moved endwise to the leftward for forcing the bit through the work, and retired to the rightward, by means of a hand lever *f* pivotally mounted at f^2 on a link f^3 provided on the frame, said lever intermediately carrying a collar f^4 which is loose about the shaft D and which is confined between a pair of collars f^5, f^5, fastened to and rotatable in unison with the shaft.

f^6 represents a stop collar secured on the shaft to the right of the hand lever and for limiting the retiring movement of the bit carrying shaft by its abutment against the stand B; and the said shaft D is understood as having a suitable extension to the rightward beyond the end of the machine frame.

G and H represent respectively fixed and horizontally and longitudinally movable chucks for the billets *x*. Each chuck comprises a back or body *g*, and a pair of sepa-

rated horizontal jaws *h h*, those of the fixed chuck G having their inner faces rearwardly divergent, that is, towards the other and movable chuck while the jaws of the movable chuck H have their inner faces forwardly divergent, all as represented in Figs. 2 and 4 of the drawings. The back or body *g* of the movable chuck H is carried at the forward end of a non circular bar H^2 which is horizontally slidable in the axial line of the bit and its carrying shaft through the stand J which has its location towards the left hand end of the machine, while the back or body *g* of the fixed chuck G is made as a vertically adjustable slide member supported by the stand *c*,—the depending extension g^2 of the chuck body having a slot g^3, represented by dotted lines in Fig. 1 through which is passed the shank of a headed set screw g^4 which is also entered with a screw engagement into the upright stand *c*. The back or body *g* of the fixed chuck has a tapered bit hole centrally and horizontally therethrough fitted in which is an externally tapered hardened bushing g^5, the same being detachably confined by the set screw g^6. Interchangeable bushings may be provided to the situation stated, and as particularly shown in Fig. 2, different bushings having different cylindrical openings being used to correspond with different sized bits which at various times may be employed.

The nonrotatable bar H^2 which carries the movable chuck H has its advancing movement imparted to it to endwise close against and confine the billet between its jaws and those of the other chuck G by means as follows: K represents a lever having its upper end pivotally connected to the left hand end of the chuck carrying bar H and having its lower end pivoted to a link *i* which is also pivoted to the left hand leg or suitably low portion of the machine frame; to an intermediate portion of the said lever K is secured the end of a cord or like flexible connection i^2, a portion of which extends horizontally to and partially around the sheave i^3 while its depending end is secured to a treadle lever i^5 on the floor,—the depression and holding down of the treadle by the foot moving to closed position, and keeping closed, the chuck H, while the retracting spring i^4, exerting substantially a force to the leftward on the chuck carrying bar, will cause the retiring and opening of the chuck from its relation to the fixed chuck G most quickly upon the release of the pressure on the treadle.

The pairs of jaws, preferably of both of the chucks are pivotally mounted on their backs or bodies for oscillation on parallel axes which are horizontal and longitudinal relatively to the length of the machine; and as particularly shown in Fig. 2, each chuck back has transverse horizontal slots *j* therethrough through which are passed the shanks of horizontal studs j^2 having intermediate shoulders j^3 and receiving clamping nuts j^4 at their extremities which protrude beyond the outer side of the chuck backs; and the shanks of the said studs inwardly beyond the shoulders are passed with a loose fit through circular parallel horizontal round holes therefor in the chuck jaws. j^5 represents a transverse cotter or stop pin for holding each chuck jaw against displacement from its carrying stud j^2. By loosening the clamping nuts j^4, the studs and jaws carried thereon may be adjusted towards or from each other to render narrow or widened the convergent clutch throat for the accommodation of pieces of different sizes.

When the end of the billet is oblique on an inclination as indicated by x^5 in Fig. 5, the jaws of the chuck brought to confining engagement, or having a clutching relation to such end will, by self conforming thereto, assume the position, by deriving slight oscillatory movements as represented in the left half portion of Fig. 5. For the accommodation of a billet which is endwise obliquely inclined as shown at x^2 in Fig. 7 the chuck jaws will have a self conforming oscillation to the relative positions represented by the left portion of Fig. 7; while if the engaged end of the billet is perpendicular to the axis, as represented in Fig. 6, the clutch jaws will have their engaging faces in vertical planes, oblique to each other, as indicated by the left portion of Fig. 6.

In order that the degree of the oscillations of the paired pivotally supported jaws of each chuck may be limited so that the jaws may never become unduly turned by having downwardly swinging movements from positions suitable for the engagement of the work therebetween, stops are provided of a character which, for example, may be such as represented in Fig. 8, consisting of a headed screw *k* which by its shank is vertically thread engaged into the top of the chuck jaw at a point transversely offset from the line of the stud j^2 and adjacent the upper edge of the chuck back *g;* there is, comparatively, considerable space between the top of the chuck jaw and the head of the screw, and a washer k^2 having a thickness less than the last-mentioned space quite loosely encircles the shank of the screw, with capability of relative play between the chuck jaw top and screw head, the washer marginally overlapping the chuck back. It will be here explained that there will be no tendency of the jaws to have upwardly swinging movements, for instance to the positions shown in Fig. 5, excepting as the jaws are positively forced to such positions by the engagement therewith of a billet having an end inclined as shown at x^5.

Rests, L and M, are provided for leveling and supporting the billets preparatory to being chucked and bored,—the one L being sta-

tionary and having its location adjacent and slightly below the level of the jaws of the chuck G while the other rest M having its supporting surface at the same level as the top of the one L is supported by and is bodily movable in unison with the chuck H. The rest L is made in the form of a block or plate adjustably held by slot and set screw provisions in an upright position on the small stand L^2 therefor. The rest M as shown in Figs. 1, 2 and 4 is made in the form of a U-shaped frame, disposed in a horizontal plane and provided with vertical end extensions *o*, *o*, which embrace the opposite sides of the body or back *g* of the chuck H, such extension being formed with vertical slots o^2 through which the shanks of headed set screws o^3 are passed, the latter entering tapped holes therefor in the chuck back; and thus the rest M is rendered vertically adjustable so that its supporting surface may always be at the same level with the top of the rest L, for the general run of work, or it may be at a slightly different height for some possible uses of the machine.

In the employment of the machine for boring, while the bit is rightward, its working end never being withdrawn out from the bushing g^5 fitted in the bit hole in the body of the chuck G, and while the left hand chuck H is withdrawn to the leftward the billet is brought to place with one end portion resting on the rest L the movable chuck is bodily moved to the rightward, the rest M, provided as an appurtenance of the movable chuck coming to a supporting position under the left hand end of the billet which latter is level on both of the rests preparatory to the endwise engagements of the piece by the divergent pairs of jaws of both chucks, such jaws adapting themselves by more or less degrees of oscillations to accord with any obliqueness at one or both of the ends of the billet.

The hand lever *f*, while the treadle pressure is maintained to keep the pairs of chucks in the billet confining relations, is forced to the left carrying the bit for its boring action through the entire length of the billet, the rightward movement of the hand lever withdrawing the bit out from the bored piece whereupon on the release of the treadle pressure, the movable chuck opening from the other one, the bored piece is permitted to fall out from between the chucks and down through the central opening in the machine bed or table,—into a receptacle therefor,—and all without any care, or special performance for the discharge of the bored piece on the part of the operator.

In practice the engaging divergent faces of the jaws of one of the chucks is made serrated, as shown in Figs. 2 and 5 to 8, so that the piece after being bored will have a slight tendency to cling to the jaws of the one chuck, assuring that the other chuck will be retired entirely therefrom, whereupon by gravity the bored piece will fall from the machine.

While the provision of the chucks having jaws constructed for both oscillations and for transverse adjustments has been especially indicated in the description hereinbefore contained, and illustrated in the drawing as of importance, such features and capabilities under an aspect of the invention are not to be regarded in all cases as essential; and in Fig. 3 a pair of chucks for use in the situation already described are represented as having the jaws, made with relatively angular faces, constructed integrally with, and non adjustable and non-movable relatively to, the chuck backs.

I claim:—

1. In a wood boring machine, the combination with a pair of chucks, each having two members, those of each chuck having faces which are divergent towards the relatively opposite chuck, one of said chucks having a bit hole centrally therethrough, and one of said chucks being movable towards and away from the other, of an endwise movable bit, means for rotating it, and means for moving it endwise, forward and back, means for moving one of the chucks towards and away from the other, and rests,—for supporting the pieces to be bored,—having their upper surfaces in a common plane suitably below, and adjacent, the chucks, one of said rests being supported by and movable in unison with the movable chuck.

2. In a wood boring machine, the combination with a pair of chucks, each having two members, those of each chuck having faces which are divergent towards the relatively opposite chuck, one of said chucks having a bit hole centrally therethrough, one of said chucks being movable towards and away from the other, and one of said chucks comprising a back and separately formed jaw members, both pivotally mounted on the chuck back and horizontally and transversely adjustable relatively to the length of the machine, of an endwise movable bit, means for rotating it, and means for moving it, endwise, forward and back, means for moving the one chuck tow ards and from the other, and rests,—for supporting the pieces to be bored,—having their upper surfaces in a common plane suitably below and adjacent the chucks.

3. In a wood boring machine, the combination with a pair of chucks, each having two members, those of each chuck having faces which are divergent towards the relatively opposite chuck, the so formed jaws of each chuck being pivotally mounted for individual oscillation on studs which are provided therefor, and which studs are adjustable transversely and horizontally towards and from each other, one of said chucks having a horizontal bit hole centrally therethrough, and

one of said chucks being bodily movable towards and away from the other, of an axially horizontally movable bit, means for rotating it, and means for moving it longitudinally forward and back, means for moving the one chuck towards and from the other, and rests,—for supporting the pieces to be bored,—having their upper surfaces in a common plane suitably below, and adjacent, the chucks.

4. In a wood boring machine, the combination with a pair of chucks, each having two members, those of each chuck having faces which are divergent towards the relatively opposite chuck, one of said chucks having a bit hole centrally therethrough, one of said chucks being movable towards and away from the other, said chucks comprising backs, and separately formed pairs of jaw members, pivotally mounted on the chuck backs and also horizontally adjustable thereon transversely relatively to the length of the machine, and means for limiting the oscillatory movements of the chuck jaws, of an endwise movable bit, means for rotating it, and means for moving it endwise, forward and back, means for moving the one chuck towards and from the other, and rests,—for supporting the pieces to be bored,—having their upper surfaces in a common plane suitably below and adjacent the chucks.

5. In a wood boring machine, the combination with a pair of chucks, each comprising a back, and two jaws,—the jaws of each chuck having faces which are divergent towards the relatively opposite chuck, one of said chucks having a bit hole centrally therethrough, one of said chucks being movable towards and away from the other, and one of said chucks having its jaws individually pivotally hung on the chuck back and each jaw provided with an upstanding headed stud, and washers loosely encircling said studs below their heads, and overlapping the upper surface of the chuck-back, of an endwise movable bit, means for rotating it, and means for reciprocating it, and means for moving one of the chucks towards and away from the other.

6. In a wood boring machine the combination with a bed or table having a stand thereon comprising a vertically adjustable upright member provided with a chuck constituted by forwardly divergent jaws having a bit hole through the chuck body in a horizontal line between the jaws and a second chuck having rearwardly divergent jaws mounted for movements towards and away from the first named chuck, and means for moving it, of a horizontal bit in the line of said bit hole and horizonatlly reciprocatory means for imparting forward and retiring movements thereto, and bit rotating means, a rest adjacent and having its upper surface below the first named chuck, supported by and vertically adjustable relatively to the table, another rest carried by, movable in unison with and adjustable vertically relatively to the second named chuck.

7. In a wood boring machine the combination with a bed or table having a stand thereon comprising a vertically adjustable upright member provided with a chuck constituted by forwardly divergent jaws having a bit hole through the chuck body in a horizontal line between the jaws and a second chuck having rearwardly divergent jaws mounted for movements towards and away from the first named chuck, and means for moving it, of a horizontal bit in the line of said bit hole and horizontally reciprocatory means for imparting forward and retiring movements thereto, and bit rotating means, a rest adjacent and having its upper surface below the first named chuck, another rest having the form of a horizontal U-shaped frame provided with vertical slotted end extensions which embrace the opposite sides of the body of the movable chuck, and headed set screws which by their shanks are passed through the slots in said extensions, and have thread engagements in the embraced chuck-body.

8. In a wood boring machine, in combination, a bed or table having a bit horizontally and longitudinally mounted thereon, means for rotating the bit, means for imparting longitudinal reciprocatory movements thereto, a stand on the table supporting a chuck comprising rearwardly divergent jaws and having a bit hole therethrough, and an upright mounted on the table adjacent, under, and in advance of, said chuck and provided with a rest vertically adjustable thereon, another stand on the table still further in advance of said chuck, a nonrotatable bar supported by and horizontally slidable through the latter named stand having at one end thereof a chuck comprising a pair of rearwardly divergent jaws, and a rest supported by said bar, having its position below, and being vertically adjustable relatively to, the second named chuck, a lever link-connected to the machine frame and pivoted to the said bar, a treadle and a sheave guided flexible connection secured to the treadle and to said lever, and a spring exerting a retiring reaction against the said bar.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

DANA S. COURTNEY.

Witnesses:
WM. S. BELLOWS,
G. R. DRISCOLL.