No. 807,323. PATENTED DEC. 12, 1905.

E. S. & G. S. SHIMER.

GRINDING MACHINE.

APPLICATION FILED DEC. 28, 1904.

4 SHEETS--SHEET 1.

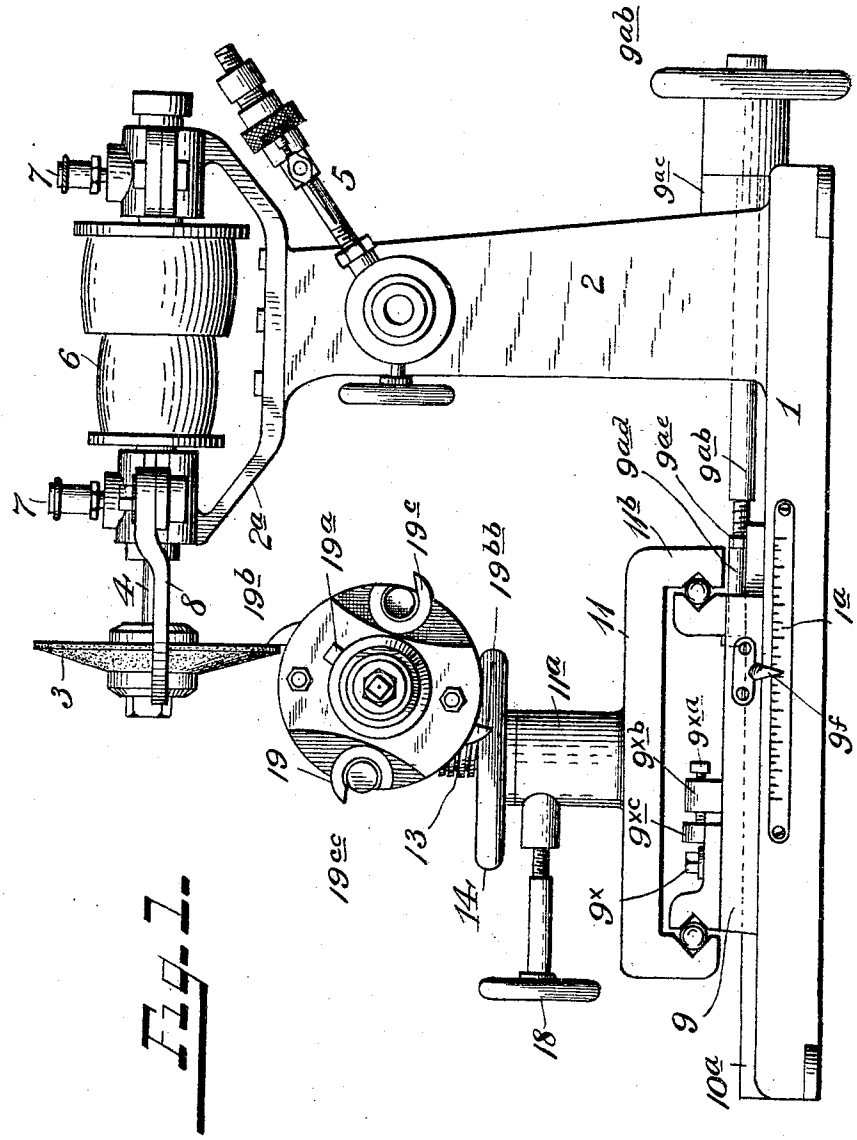


Fig. 1.

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4 SHEETS—SHEET 2.

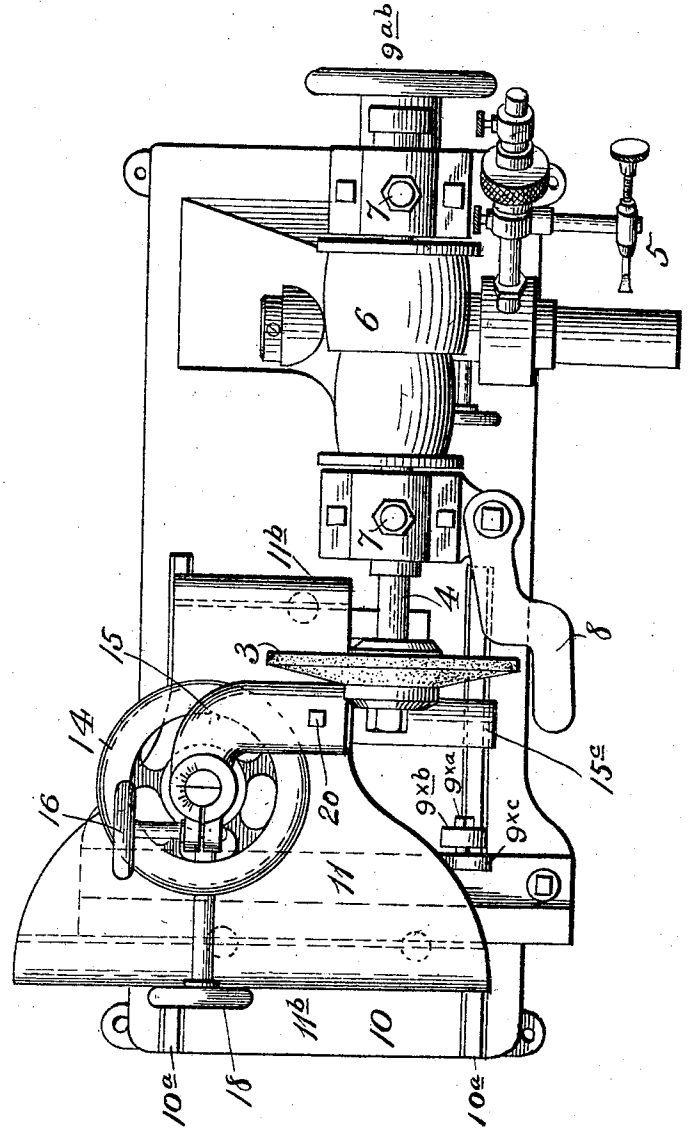


Fig. 2.

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4 SHEETS—SHEET 3.

Fig. 3.

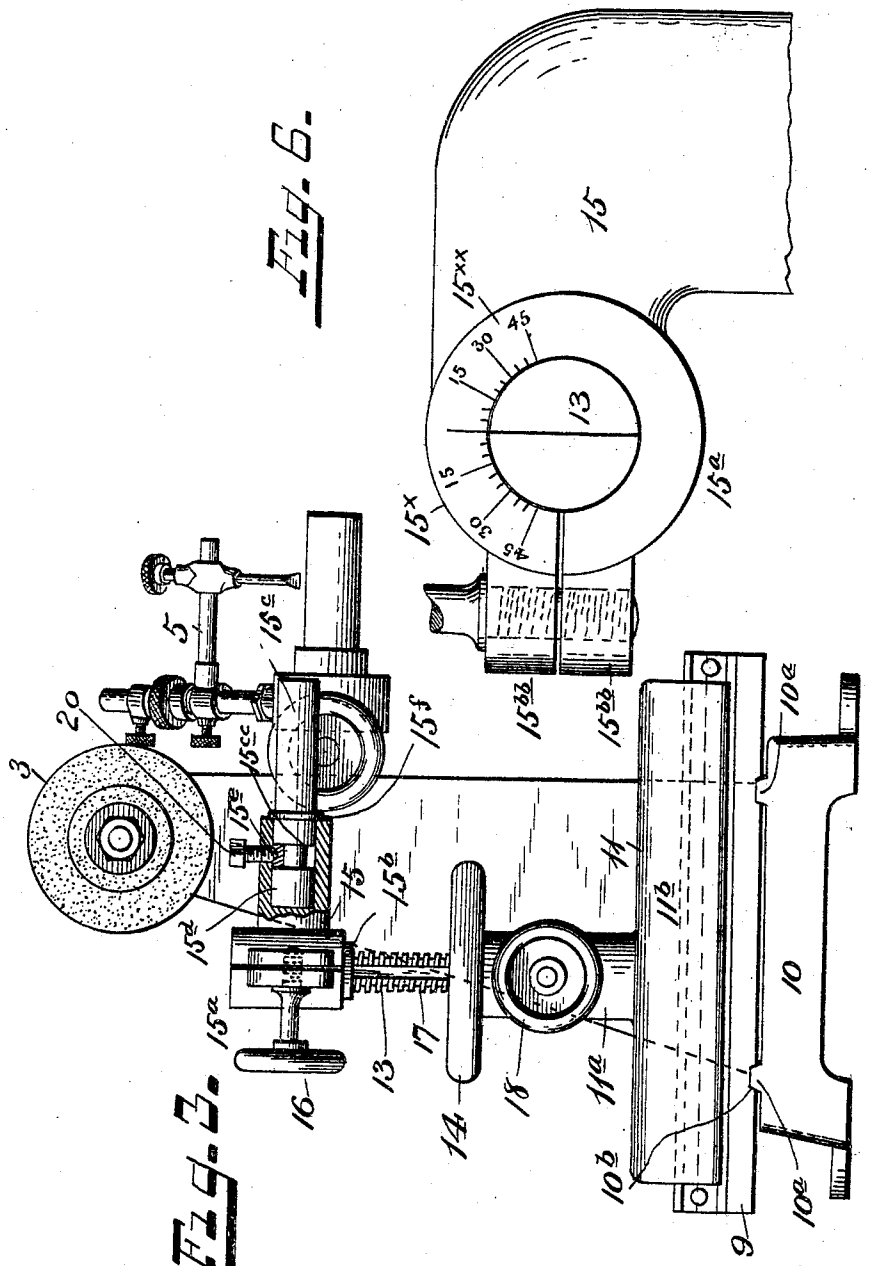


Fig. 6.

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4 SHEETS—SHEET 4.

Fig. 4.

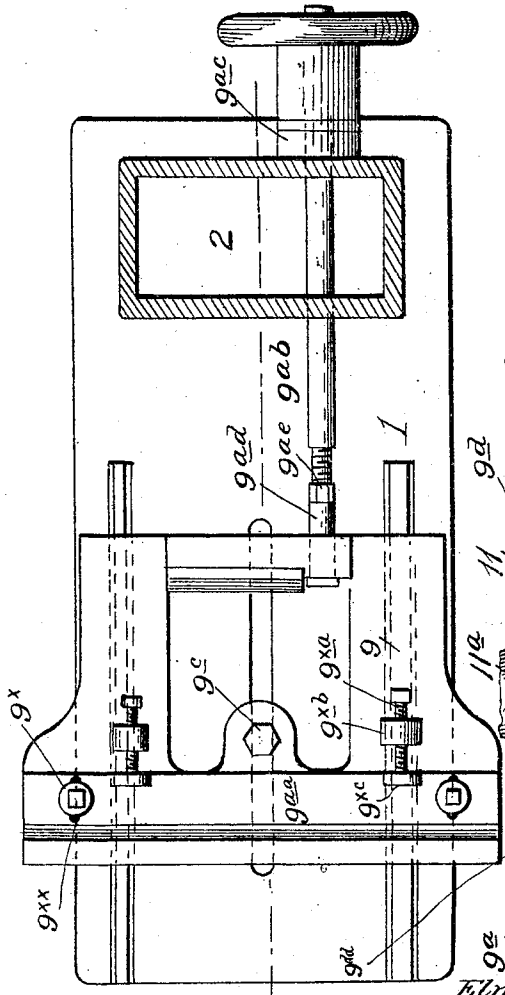


Fig. 5.

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UNITED STATES PATENT OFFICE.

ELMER S. SHIMER AND GEORGE S. SHIMER, OF MILTON, PENNSYLVANIA, ASSIGNORS TO SAMUEL J. SHIMER AND SONS, INCORPORATED, OF MILTON, PENNSYLVANIA.

GRINDING-MACHINE.

No. 807,323. Specification of Letters Patent. Patented Dec. 12, 1905.

Application filed December 28, 1904. Serial No. 238,647.

To all whom it may concern:

Be it known that we, ELMER S. SHIMER and GEORGE S. SHIMER, citizens of the United States, residing at Milton, in the county of Northumberland and State of Pennsylvania, have invented new and useful Improvements in Grinding-Machines, of which the following is a specification.

Our invention relates to improvements in grinding-machines particularly adapted to grind or sharpen the bits of rotary cutters, more especially to that class of such machines adapted to grind or sharpen the circular cutters or bits of what may be styled the "Shimer" type of "matcher" or cutter heads for cutting, for instance, the tongues and grooves in boards or material for flooring and ceiling and the like.

The object of said invention is to provide principally for effecting with facility and expedition the manipulation or adjustment of the parts in positioning the cutter-head to the sharpener and in conducting the grinding or sharpening operation, and to secure these ends with simplicity and effectiveness.

The nature of our invention consists of certain structural features, substantially as hereinafter fully disclosed and particularly pointed out by the claims.

In the accompanying drawings, illustrating the preferred embodiment of our invention, Figure 1 is a front elevation thereof with a cutter-head in position for grinding. Fig. 2 is a plan view of the machine. Fig. 3 is a left-hand elevation thereof, partly broken away. Fig. 4 is a horizontal section produced through the grinding-wheel supporting or carrying standards at a point above and viewing the other parts in plan view, excepting the cutter-head-supporting means, which has been removed. Fig. 5 is a longitudinal section taken on the broken line of Fig. 4 with the base portion or member of the cutter-head-supporting means in position. Fig. 6 is an enlarged broken-away detailed view in plan, showing more particularly the dial-like or graduated formation of the bracket member of the cutter-head-supporting means.

In the disclosure or carrying out of our present invention we have shown certain features or parts only to aid in the practice thereof—as, for instance, a base 1, with an integral standard or upright casting 2, equipped with a grinding-wheel 3, whose shaft or mandrel 4 is suitably journaled or supported in arms or bearings 2^a, secured upon the upper end of said standard. A "tracker" 5, applied to said standard, the purpose of which is readily appreciated by those familiar with this class of machines, need not be further referred to herein. The shaft or mandrel 4 is provided with a cone of pulleys 6 for the driving of the same by suitable means at different rates of speed, as may be required, and its bearings with lubricant-applying cups or means 7, as usual. A suitable support or leaf 8 is suitably pivoted in position contiguously to the grinding-wheel 3 upon which to conveniently rest a dressing-tool (not shown) when necessary to re-dress or true said wheel for effectiveness.

A carriage 9 is suitably mounted so as to be slid or moved upon a base or casting 10, parallel with the longitudinal axis of the grinding-wheel mandrel or shaft 4. Said carriage is guided by a track whose parallel rails 10^a, preferably integral with said base or casting, are let into corresponding grooves or guides 10^b, said grooves or guides and rails being preferably planed with upward and inward inclined lateral walls or surfaces, as shown particularly by Fig. 3. Said carriage 9 has projecting from a lower transverse member or bar 9^{aa} thereof a central rearward-extending lug 9^{aaa}, receiving or having connected thereto a bolt 9^b, also received within a longitudinal slot 10^b of the base or casting 10 for the retention of said carriage 9 in position as against possible accidental derailment, said bolt being equipped with a nut 9^c above said lug and headed below said slot, as at 9^{cc}. The member or part 9^a has adjustable connection with the part 9^{aa} by means of screw-bolts $9^{\times}$, passing through slots $9^{\times\times}$ in said first-referred-to part and into the latter part, and adjusting-screws $9^{\times a}$, working in studs $9^{\times b}$ of the part 9^a and engaging lugs $9^{\times c}$ of the part 9^{aa} to permit the ready assembling of said parts, together with the ball-bearings 12. A hand-wheel-equipped screw-shaft 9^{ab}, suitably supported or bearing in a collar or boss-like formation 9^{ac} upon the standard 2 and preferably passing through the latter, has its screw-threaded portion extended into a tubular member or sleeve 9^{ad}, secured to the carriage 9 and engaging or working in a

nut 9^{ae}, held upon the entrance end of said member or sleeve, as seen in Figs. 1 and 4. The purpose of the aforesaid screw-shaft is to effect the adjustment or movement of the carriage 9 in a parallel plane or line to the longitudinal axis of the shaft of the grinding-wheel 3, thus providing for initially positioning the cutter-head with relation to said wheel preliminary to the sharpening of the bits of said cutter-head. Mounted upon said carriage and adapted to travel at right angles to its movement is a second carriage 11, bearing a preferably cylindric hollow standard or post 11^a, the purpose of which will be stated later. Said second carriage has downward-extended lateral portions 11^b, opposed to an upstanding lateral portion 9^d of the carriage 9 and a bar 9^{dd}, preferably removably held to the upper surface of the part 9^a at the opposite side of said carriage. Interposed between the downward-extended lateral portions 11^b of said second carriage 11 and said parts 9^{dd} 9^d of the carriage 9 are ball-bearings 12, received within opposed longitudinal recesses 12^a, formed in said parts 9^{dd}, 9^d, and 11^b, as more particularly disclosed by Fig. 5, to lessen, as is obvious, frictional contact at those points and render more sensitive than would otherwise be the case the movement of said carriage 11.

A screw 13, having its lower end housed within the hollow post 11^a and having effective connection with a manually-actuated or hand-wheel-equipped nut 14, suitably seated upon said post, carries at its upper end a practically right-angled bracket or arm 15, having at one end a split-collar formation 15^a, embracing a plane or unthreaded cylindric terminal 15^b of said end of said screw. Said split-collar formation 15^a has extended laterally therefrom two parallel lugs 15^{bb}, arranged at opposite sides of a line passing through the split of said collar or formation. A binding-screw 16 engages said lugs 15^{bb} to clamp the split collar upon the terminal 15^b when it is required to fix the arm or bracket 15 in position.

The screw 13 has a vertical or longitudinal groove or way 17, receiving a pin (not shown) projecting thereinto from the interior of the post 11^a to hold said screw from turning as it is actuated or vertically adjusted by turning the nut 14, as in effecting the corresponding adjustment of the cutter-head-supporting bracket 15. A set-screw 18, having a hand-wheel for its convenient manipulation and working in the post 11^a, engages the screw 13, its inner end entering the groove or way 17 thereof for the retention of the latter screw in fixed position as against accidental vertical movement.

The arm or bracket 15 is provided with a cylindric spindle member 15^c, upon which is directly slipped or placed the cutter-head 19, suitably held thereto, as seen in Fig. 1. Said spindle member is inserted at one end into a socket or bore 15^d of the arm or bracket 15, having its thus housed or inclosed end portion provided with an annular recess or groove 15^{cc}, fitted with a saddle or bearing 15^e for the inner end of a holding or adjusting screw 20, working in said arm, to permit of the ready turning of said spindle member with the cutter-head by the application of the hand to the latter in presenting or adjusting the different bits or cutters thereof to the grinding-wheel or sharpener and accordingly holding the same when thus presented or adjusted. A shoulder or stop 15^f, integral with the spindle member 15, limits the insertion of the latter into the socket or bore of the arm 15, as is obvious, said shoulder contacting with the outer end of said arm, as seen particularly in Fig. 3.

Inscribed or marked, as at $15^{\times}$ $15^{\times\times}$, upon the upper surface of the split-collar formation 15^a are certain indicia or graduations suitably designated to indicate degrees of a circle, the radii being produced with reference to opposite sides of a central right line produced upon the upper end of the screw 13, the purpose of which will be apparent later.

A cutter-head 19 being secured in position upon the mandrel or spindle member 15^c by a binding-screw 19^a, the screw 16 is suitably manipulated to loosen the collar formation 15^a to allow the arm or bracket to be moved to the right or left in adjusting the cutter-head 19 at the required angle for grinding, as determined by following either the indicia or graduations $15^{\times}$ or $15^{\times\times}$, as the judgment will dictate. In order to furnish the cutter or bit 19^b of said cutter-head with the proper angling surface or "hook," the carriage 9 is moved to the right or left, as may be indicated by the index or pointer 9^f thereon registering with a scale or graduations 1^a upon the base 1. Said cutter-head is adjusted vertically with relation to the grinding-wheel 3 to present for the action of the latter only that portion of the bit or cutter actually dulled by use. Said adjustment is effected by suitably turning, as to the right or left, the hand-wheel of the screw 14, the set-screw 18 then being presumably previously loosened. The cutter-head is now bodily moved toward the grinding-wheel 3 by slowly moving the part 11 in the required direction, said cutter-head being turned until said bit or cutter has been moved against the face of the grinding-wheel. The slightest impingement of said wheel upon said cutter or bit is effective to sharpen the latter. The cutter-head is then again turned so as to engage in like manner the cutter or bit 19^{bb}, belonging to a common series of said cutters or bits, accordingly effecting its sharpening. In order to effect the sharpening or grinding of the other cutters or bits 19^e 19^{ee} of the cutter-head, a like adjustment of the parts 9 and at $15^{\times}$ or $15^{\times\times}$, as previously described, is pursued, as will be readily understood. After making the foregoing adjustments they may be readily noted for facility

in the subsequent treatment or sharpening of the cutter-heads, as will be appreciated. For testing or truing the correctness of the grinding operation the tracker 5 is brought into use, as well understood by those conversant with this class of machines, and as it constitutes no part of the present invention such use need not be further referred to herein.

Latitude is allowed as to details herein, as they may be made as circumstances suggest without departing from the spirit of our invention.

We claim—

1. A machine of the character described, employing a grinding-tool, two carriages mounted one upon the other and traveling in directions at right angles to each other, one of said carriages having lateral recessed portions opposed to upstanding recessed parts adjunctive of the other carriage, and ball-bearings arranged intermediately of said recessed parts, and support bearing the object operated upon by said grinding-tool and carried by one of said carriages.

2. A machine of the character described, comprising a grinding-tool, a carriage adapted to travel in a direction at right angles to the axial plane of the shaft of said grinding-tool, a second carriage mounted upon the aforesaid carriage to travel in a direction parallel to said axial plane and bearing a post, an adjusting-screw arranged in connection with said post, a bracket or arm having a collar-like formation embracing said screw at its upper end and having indicia thereon arranged with relation to a central right line produced upon said end of said screw for guidance in adjusting said bracket to the right or left, said bracket adapted to carry the object to be operated upon by said grinding-tool.

3. A machine of the character described, comprising a grinding-wheel, a bracket, an adjustable means of support for said bracket, means for carrying said bracket-support, adapted to be moved in a direction at right angles to the axial plane of the shaft of said grinding-wheel, said bracket having a mandrel or spindle member for carrying the object to be operated upon by said grinding-wheel and held by a bearing let into an annular groove of said spindle, within a tubular portion of said bracket, and a holding-screw working in said tubular portion and engaging said bearing and means adapted to bear said bracket-support-carrying means, traveling in a line parallel to said axial plane.

4. A machine of the character described, comprising a grinding-tool, a carriage for supporting the object to be operated upon by said grinding-tool, a second carriage bearing the aforesaid carriage, and itself suitably supported in position and having upstanding longitudinally-recessed members opposed to correspondingly-recessed members of the first-referred-to carriage, between which members are arranged ball-bearings, one of said members being adjustable or movable toward and away from its opposite or companion member.

5. A machine of the character described, comprising a grinding-tool, a carriage for supporting the object to be operated upon by said tool, adapted to travel in a line at right angles to the axial plane of the shaft of said tool, a second carriage bearing the aforesaid carriage and adapted to travel in a line parallel to said axial plane, and having upstanding longitudinally-recessed members opposed to correspondingly-recessed members of the first-referred-to carriage, one of said members being adjustable or movable toward and away from its opposite or companion member, and ball-bearings arranged in the opposite recesses in said members.

6. A machine of the character described, comprising a grinding-tool, a carriage adapted to travel in a line at right angles to the axial plane of the shaft of said tool, a second carriage bearing the aforesaid carriage and adapted to travel in a line parallel to said axial plane, a post adapted to be borne by the aforesaid carriage, a vertically-adjustable screw working in said post, and a bracket carried by said screw, equipped with a spindle or mandrel for carrying the object to be operated upon by said grinding-wheel and angularly adjustable in said bracket.

In testimony whereof we affix our signatures in presence of two subscribing witnesses.

ELMER S. SHIMER.
GEORGE S. SHIMER.

Witnesses:
H. A. KERR,
JOHN A. KURTZ.