

No. 751,198.

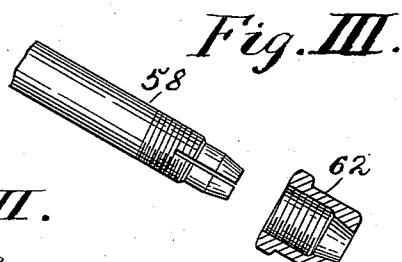
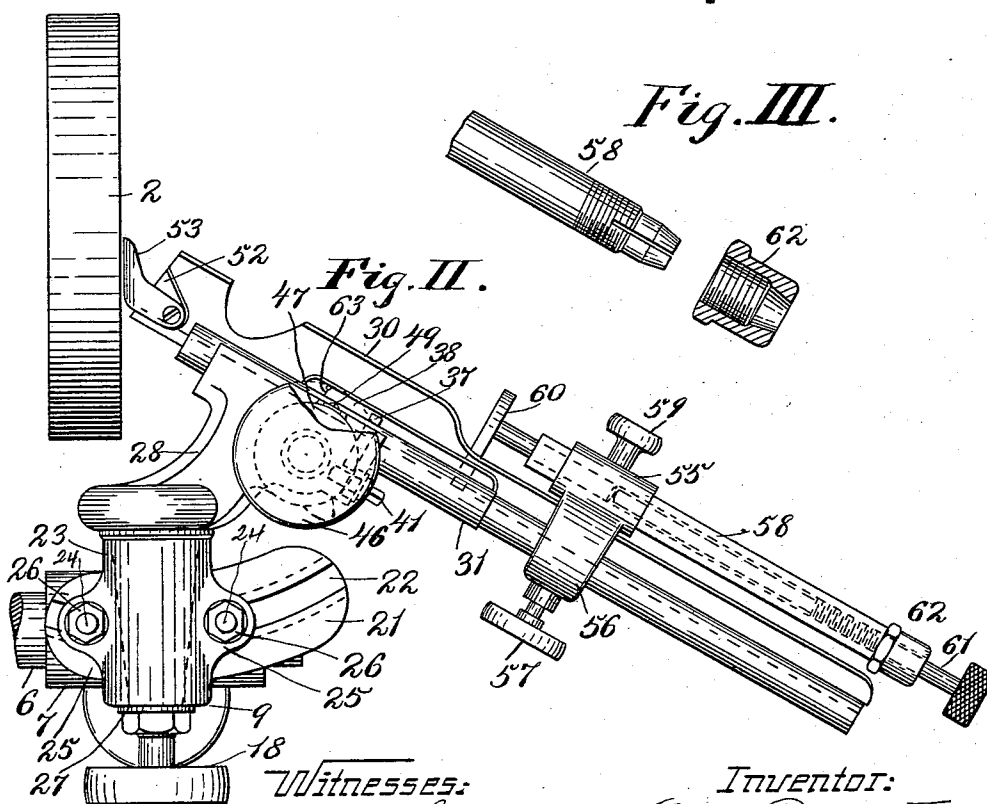
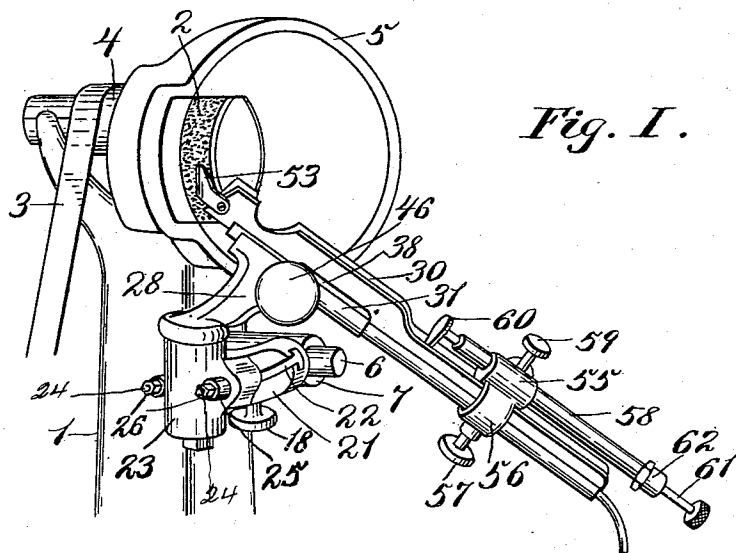
PATENTED FEB. 2, 1904.

O. PARPART.
DRILL GRINDING MACHINE.

APPLICATION FILED DEC. 26, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
A. L. Lord.
H. Smith

Inventor:
Otto Parpart,
by J. H. Seckler
Attorney.

No. 751,198.

PATENTED FEB. 2, 1904.

O. PARPART.
DRILL GRINDING MACHINE.
APPLICATION FILED DEC. 26, 1902.

NO MODEL.

3 SHEETS—SHEET 2.

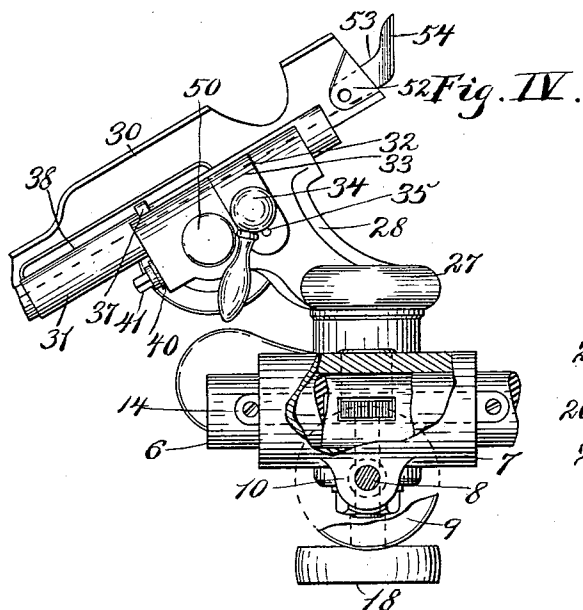


Fig. V.

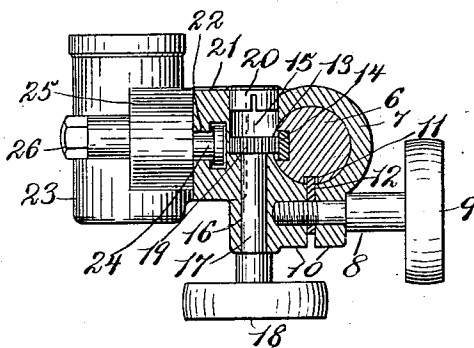


Fig. VI.

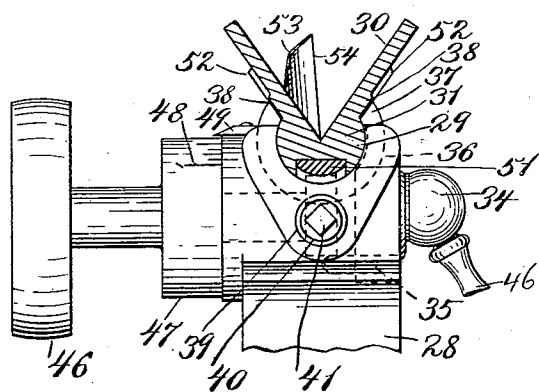
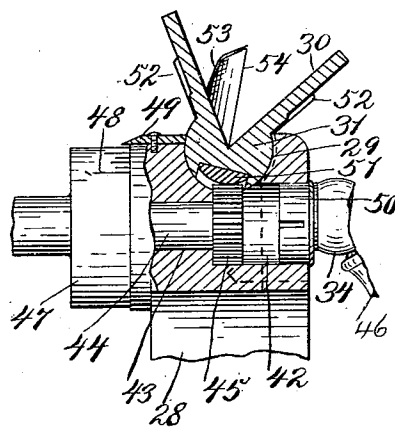


Fig. VII.



Witnesses:

A. L. Lord
H. Smith

Inventor:
Otto Parpart,
by *Wm. J. Fisher*
Attorney.

No. 751,198.

PATENTED FEB. 2, 1904.

O. PARPART.
DRILL GRINDING MACHINE.

APPLICATION FILED DEC. 26, 1902.

NO MODEL.

3 SHEETS—SHEET 3.

Fig. IX.

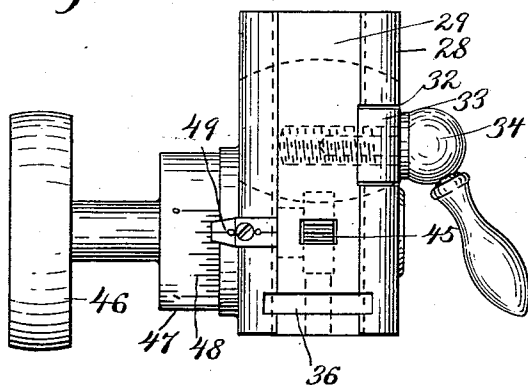


Fig. VIII.

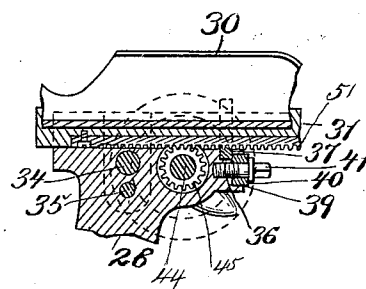
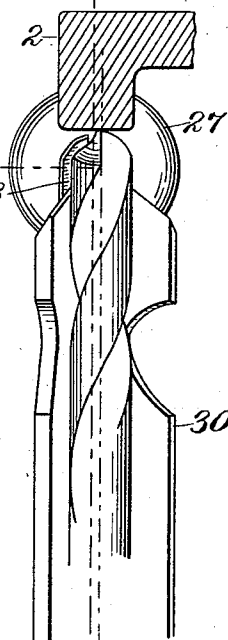
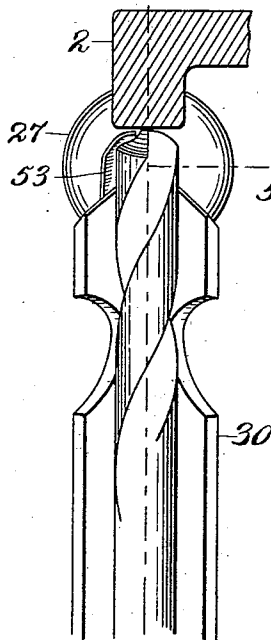


Fig. X

Fig. XI



Witnesses:

A. L. Lord.
H. Smith

Inventor:

Otto Parpart,
by *G. W. Lecher*
Attorney.

UNITED STATES PATENT OFFICE.

OTTO PARPART, OF CLEVELAND, OHIO, ASSIGNOR TO THE STANDARD TOOL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

DRILL-GRINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 751,198, dated February 2, 1904.

Application filed December 26, 1902. Serial No. 136,729. (No model.)

To all whom it may concern:

Be it known that I, OTTO PARPART, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Drill-Grinding Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a perspective view of the upper portion of my improved twist-drill-grinding machine; Fig. II, a side view of the parts of the machine embodying my invention; Fig. III, a detail view of the split sleeve and thimble for securing the tail-stock adjustment; Fig. IV, a side view of the clamping and adjusting elements for the drill-holder seen from the opposite side to Fig. II; Fig. V, a transverse section of the device for adjusting the drill-support toward and from the grinding-disk; Fig. VI, a transverse section of the drill-holder, illustrating it in its normal position and showing the means for holding it in the same; Fig. VII, a transverse section of the drill-holder and its support, illustrating the holder tilted and showing the adjusting mechanism for the holder; Fig. VIII, a longitudinal sectional detail view of a portion of the drill-holder and its support; Fig. IX, a top plan view of the support for the drill-holder; and Figs. X and XI, top plan views of the drill-holder, a drill therein, and a portion of the grinding-disk in section, respectively, illustrating the holder in normally centered position and tilted to grind the lips of the drill with an increased clearance.

The machine has a frame-upright 1, in the upper end of which is horizontally journaled the shaft for a grinding-disk 2, driven by a belt 3 around a pulley 4 upon said shaft and

preferably covered by a hood 5. A stud 6 projects from the frame-upright below the disk, and a split sleeve 7 slides upon said stud and has a clamping-screw 8, provided with a handle 9, fitted through ears 10 at the split. The stud has a longitudinal groove 11 in its under side, into which groove a spline 12, held in the split of the sleeve, engages and prevents the sleeve from turning on the stud. The stud has a longitudinal groove 13 in one side, in which groove a rack-bar 14 is secured. The side of the sleeve has a large vertical bore 15, extending from the upper side and continued in a smaller bore 16, extending from the large bore and through the under side. A shaft 17 fits to turn in the small bore and has a handle 18 for turning it at its lower end and a pinion 19 at its upper end in the large bore and engaging the rack. The upper end of the large bore is closed by a cap 20. The split sleeve may be moved forward and back upon the stud by turning the handle of the pinion-shaft, and the sleeve may be held in its adjusted position by the clamping-screw. A flat-faced segment 21 is on the side of the split sleeve and has a segmental T-groove 22 in its face. A cone-bearing 23 has a flat face bearing against the face of the segment and has two headed screw-bolts 24 through ears 25 at the sides of the bearing. The heads of said screw-bolts slide in the T-groove, and nuts 26 upon the bolts serve to draw the heads against the overhanging edges of the groove, so as to secure the bearing at the desired angle to the vertical by the bolts in the segmental groove. A pintle 27 fits to turn in the cone-bearing and has a bracket 28 at its upper end. The outer edge of this bracket is oblique to the axis of the pintle and has a cylindrical groove 29 longitudinally formed in it, forming a slideway. A V-shaped trough 30, which forms the drill-holder, has a cylindrical slide 31 formed at its bottom, and said slide fits to slide and rock in the slideway. The bottom line of the V-shaped trough coincides with the axial line of the slide. A recess 32 is formed in one side of the bracket, entering the slideway, and a block 33 is fitted in said recess and has a screw 34 through it, which screw

may draw the block to bear against and clamp the cylindrical slide in its adjusted position in the slideway. A dowel-pin 35 projects from the block into a hole in the recess to prevent the block from being dislocated. A segmental recess 36 is formed in the slide-way near the lower end of the same, and a ring-segment 37 fits in said recess and around the cylindrical slide, having its ends bearing against flat surfaces 38 upon the outer sides of the trough. The slide may longitudinally slide in the ring, but the ring will rock with the slide when the latter is transversely rocked. A circular recess 39 is formed in the lower end of the bracket edge, and a washer 40 fits in said recess and bears against the ring-segment. A screw 41 serves to draw the washer against the segment to clamp the same and the drill-holder with it in its proper adjusted position. A large transverse bore 42 is formed through the bracket edge, intersecting the bottom of the slideway, and a small bore 43 forms a continuation of the same. A shaft 44 turns in the small bore and has a pinion 45 upon its end, fitting in the inner end of the large bore. A handle 46 is secured upon the outer end of the shaft and has a dial-disk 47 upon it, bearing against the side of the bracket and having graduated marks 48 upon its periphery registering with an index 49 upon the bracket edge. The open end of the large bore is closed by a plug 50. A rack-bar 51 is secured in a longitudinal groove in the under side of the cylindrical slide and is engaged by the above-referred-to pinion, so that the drill-holder may be moved obliquely up or down in its support by turning the handle of the pinion-shaft. The ends of the sides of the drill-holder trough presenting to the grinding-disk have seats 52, to one of which a gage-stop 53, having a straight lip 54, is secured. The lip of the drill rests with its edge against this stop when the drill is in position to be ground. A sleeve 55 has a stirrup 56, which fits and slides upon the shank of the drill-holder, and a set-screw 57 in said stirrup serves to adjust the sleeve and stirrup upon the shank. A hollow bar 58 slides in the sleeve and may be adjusted in the same by a clamp-screw 59. A tail-stock 60 has its shank sliding in the upper portion of the hollow bar 58, and a feeding and adjusting screw 61 is threaded in the hollow bar to bear against the shank of the tail-stock and may be held in its adjusted position by an inwardly-tapered screw-cap 62, fitted upon the tapered and split screw-threaded end of the hollow bar. The mark on the index 49 extends inward, and a mark 63 upon the flat surface 38 of the drill-holder may be brought to register with the same when the gage-lip 54 is in line with the axis of the tapering pintle upon which the drill-support swings.

In grinding drills the size of the drill is first ascertained. If the grinding is done in the

factory, a number of drills of the same diameter are usually ground in one lot and one adjustment of the machine answers for the lot, the diameter being known. In grinding drills in the machine-shop, adjustment is necessary for each different drill; but the diameter of a drill is usually marked on it, and the necessary adjustment is thus known. The clamping-block 33 is loosened and the handle and dial-disk turned to move the drill-holder toward or from the face of the grinding-disk, the register of the index and the proper size mark on the dial-disk indicating the proper position, whereupon the holder is clamped by the block and its screw. The entire support is preferably moved outward upon the stud of the frame-upright by means of its rack-and-pinion device, so as to admit of the free adjustment of the drill-holder. The edge of one lip of the drill to be ground is placed against the lip of the gage-stop and the tail-stock is moved up or down according to the length of the drill to present the lip to be ground to the grinding-disk when the support is moved up to the disk. The drill-support may be swung upon the pintle as the disk revolves, and the lip will be ground at the angle and clearance to which the support has been adjusted. The angle of the cutting edge of the drill-lip is controlled by the angle at which the drill-holder is adjusted in its relation to the face of the grinding-disk. Normally such angle is about fifty-nine degrees; but the angle may be changed in accordance with the metal to be drilled or for other reason. Such change is effected by different adjustment of the drill-support upon the segment by the headed bolts in the segmental T-groove. When the V-shaped drill-holder is so secured in its clamp that the axis of the drill is vertically over the axis of the cylindrical slide, and consequently over the center of the conical pivot-pintle upon which the holder turns, the drill-lip is ground with the ordinary and normal clearance for twist-drills. When, however, it is desired to either decrease or increase such clearance, the segmental ring, the washer, and the screw at the lower end of the slideway in the bracket will admit of the holder being loosened to rock in the slideway and to be either tilted to throw the edge of the lip to be ground over this center line, in which case the radius of eccentricity of the clearance-arc will be greater and the clearance less or tilted to throw the edge of the lip to be ground away from the center line, as illustrated in Figs. VII and XI, in which case the radius of eccentricity of the clearance will be smaller and the clearance greater. The indexed rack-and-pinion adjustment of the drill-holder for drills of different diameter is based upon the variation of the arc on which the point of the drill is required to swing according to the diameter of the drill. With a drill of small diameter the clearance-arc is of small radius and the point

justable in a line at right angles to the disk-face, a drill-supporting bracket having a pivot-pintle in said bearing and formed with a slide-way oblique to the face of the grinding-disk,
5 a drill-holder longitudinally slidable in said way and formed with a rack, a shaft in the bracket and having a pinion engaging said rack and a handle for turning it, a graduated dial-disk upon said pinion-shaft, and an index
10 upon the bracket and pointing to the graduations on the disk, substantially as set forth.

11. In a drill-grinding machine, the combination of a grinding-disk, a rigid stud projecting at right angles to the face of said disk and
15 having a rack, a sleeve sliding upon the stud

and provided with means for clamping it upon the same, a pinion-shaft in said sleeve and having a pinion engaging the rack and a handle for turning it, and a drill-support pivoted upon the sleeve to swing before the grinding-disk and having a longitudinally and transversely rocking adjustable drill-holder, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 22d day of August, A. D. 1901.

OTTO PARPART.

Witnesses:

WM. SECHER,
H. SMITH.