J. DE KONING.

GRINDING MACHINE.

APPLICATION FILED FEB. 25, 1918.

1,324,497.

Patented Dec. 9, 1919.

4 SHEETS—SHEET 1.

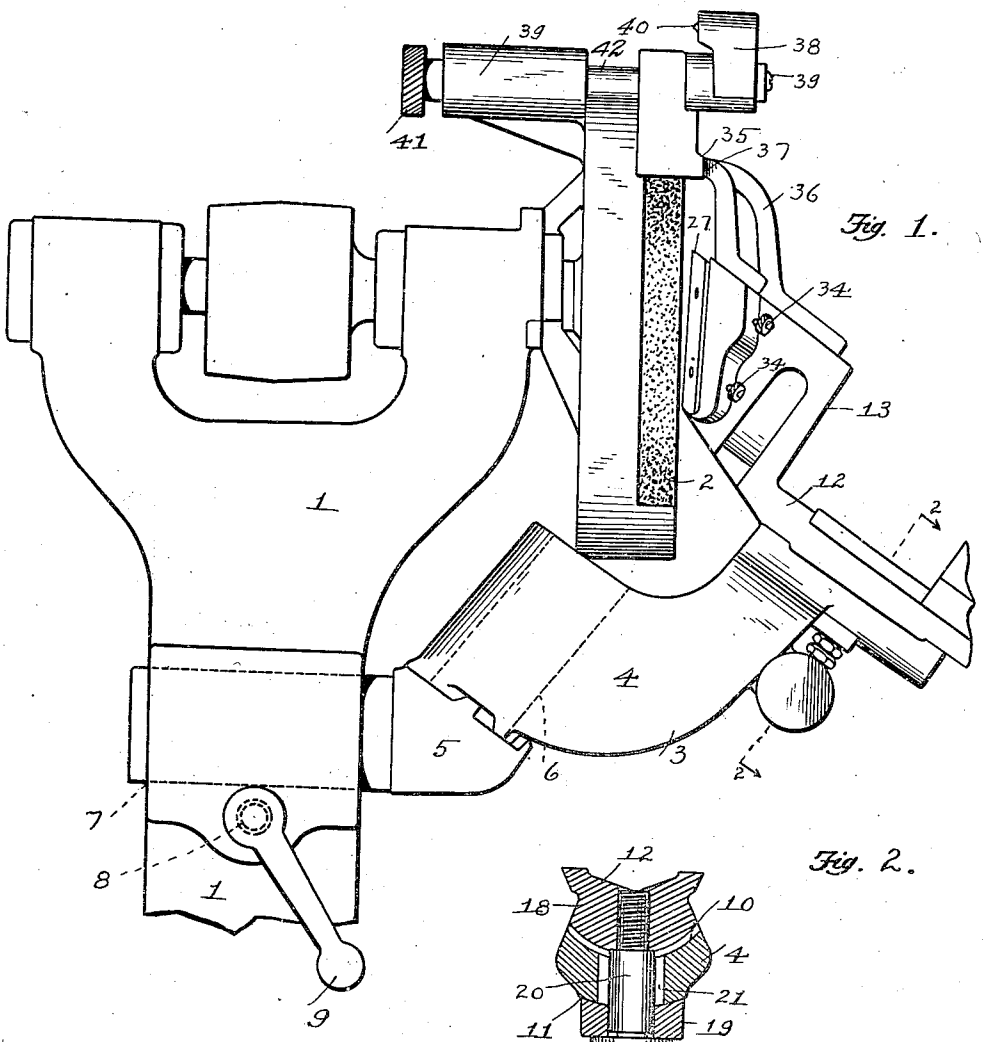


Fig. 1.

Fig. 2.

Witnesses

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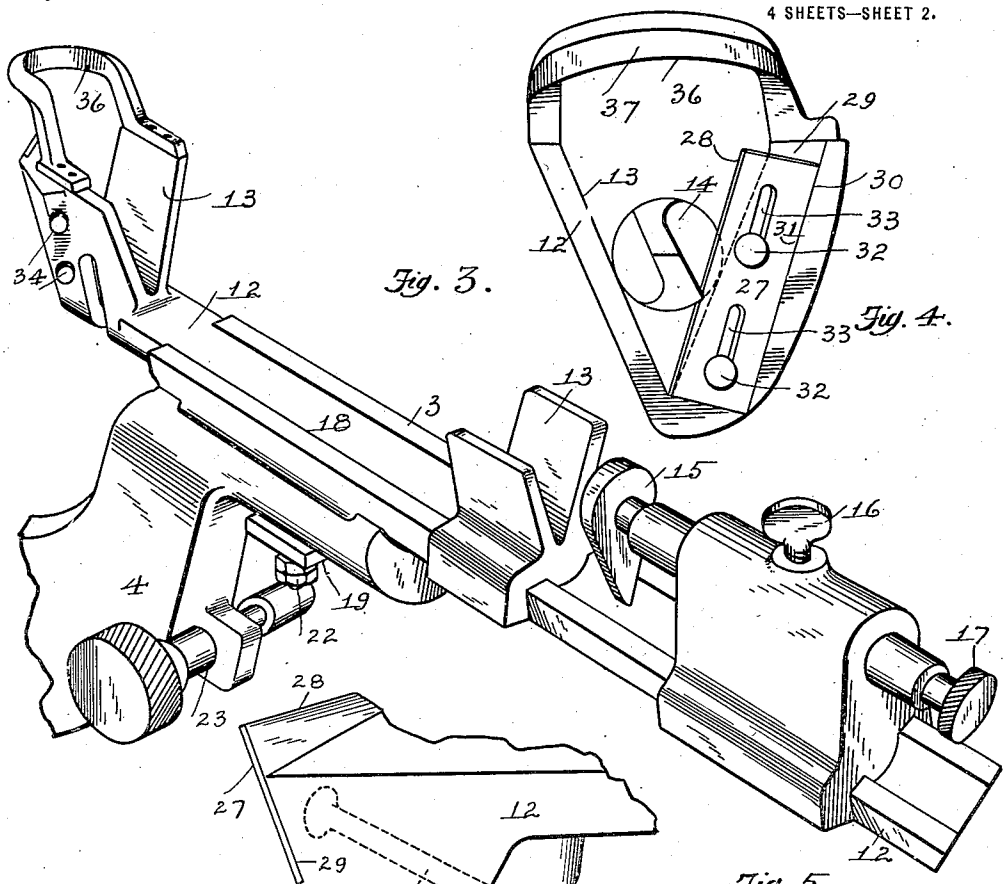


Fig. 3.

Fig. 4.

Fig. 5.

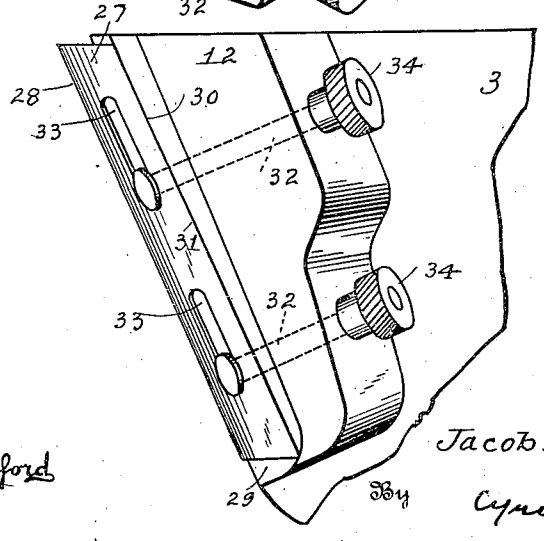


Fig. 6.

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4 SHEETS—SHEET 3.

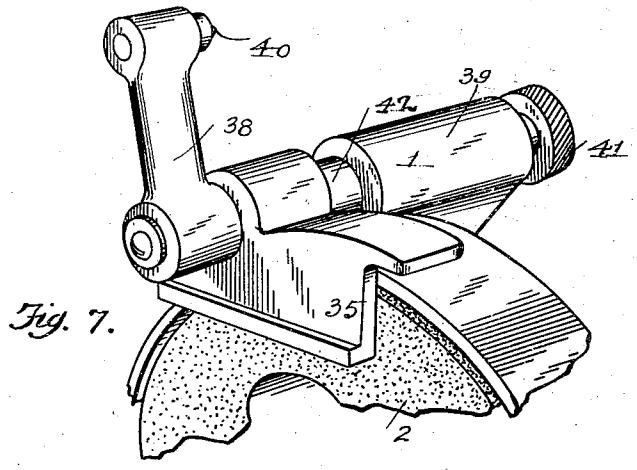


Fig. 7.

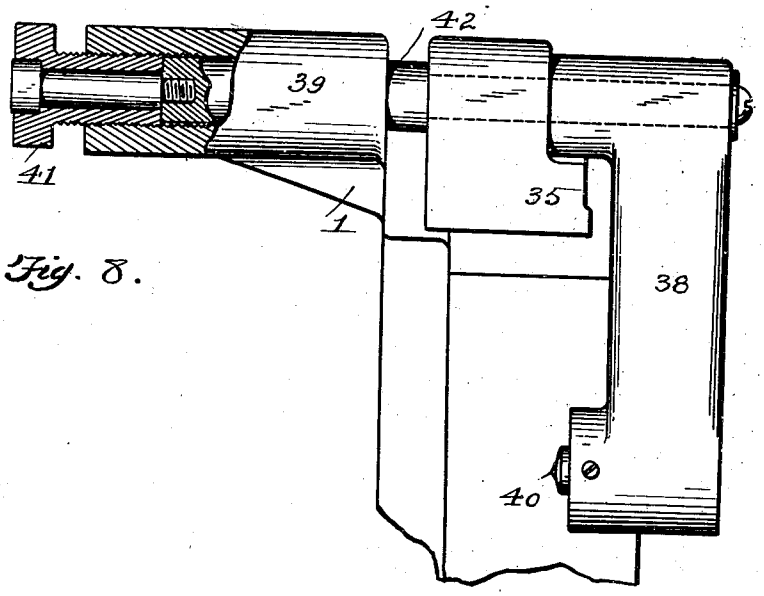


Fig. 8.

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4 SHEETS—SHEET 4.

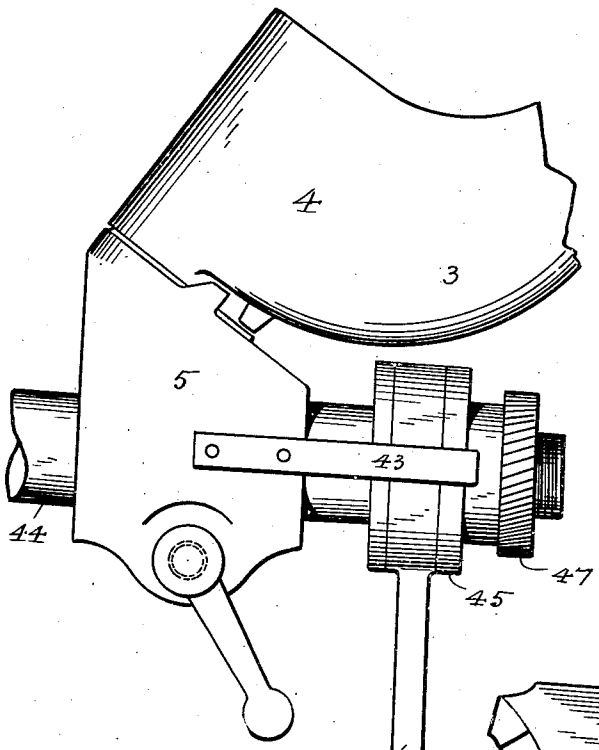
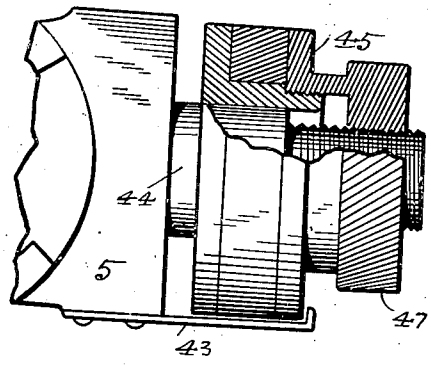


Fig. 9.

Fig. 10.



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UNITED STATES PATENT OFFICE.

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GRINDING-MACHINE.

1,324,497. Specification of Letters Patent. Patented Dec. 9, 1919.

Application filed February 25, 1918. Serial No. 219,002.

To all whom it may concern:

Be it known that I, JACOB DE KONING, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Grinding-Machines, of which the following is a specification.

The present invention relates to grinding machines, and particularly to such as are employed for grinding or sharpening drills and the like; and its object is, generally, to provide an improved machine of that character; and more particularly, to provide means for preventing the accidental grinding of the movable work-holder or drill-holder or drill lip-rest carried thereon by the grinding wheel; and further, to provide a wheel-dresser for resurfacing the grinding wheel in combination with said means; and further, to provide an improved rock bearing wherein the drill-holder may rock, and means for nicely adjusting and securely holding such drill-holder in rocked position; and further, to provide an improved lip-rest or stop for positioning the drill, while being ground, against rotation; and further, to provide improved means for securely holding such a lip-rest in adjusted position.

These and any other objects appearing hereinafter are attained by, and the invention finds preferable embodiment in, the structure hereinafter described and illustrated by the accompanying drawings, in which:—

Figure 1 is a side view of a drill grinding machine;

Fig. 2 is a section of a portion thereof taken on a plane corresponding to line 2—2 of Fig. 1;

Fig. 3 is a view in perspective of the drill-holder, the supporting part thereof being partly broken away;

Fig. 4 is an end view of the drill-holder;

Fig. 5 is a top plan view of a portion of the same;

Fig. 6 is a side view of said portion;

Fig. 7 is a view in perspective of a wheel-dresser for resurfacing the grinding wheel, and a stop for limiting the movement of the drill-holder;

Fig. 8 is a side view of the same;

Fig. 9 is a side view of a modified construction of such a stop and wheel-dresser; and

Fig. 10 is a fragmentary top plan view of the same.

In the embodiment of the invention chosen for illustration by the drawings and for detailed description in the body of this specification, the drill grinding machine has a suitable frame 1 on which is journaled a grinding wheel 2. A drill-holder or work-holder, (indicated generally 3) comprises a member 4 and a supporting block 5 on whose inclined spindle 6 the member 4 is swingable and which block is slidable horizontally on the frame as in a split slide bearing indicated at 7 in which it may be adjustably clamped as by a screw 8 turnable by the handle 9. This particular type of grinding machine illustrated in the drawings is adapted to grind drills of different diameters without the necessity of moving the axis 6 on which the work-holder swings. The swingable member 4 has concentric arcuate bearings, one, 10, of which is concave and the other, 11, is convex as particularly shown in Fig. 2. The drill-holder or work-holder also comprises a member 12 provided with a V-shaped trough 13 in which the drill 14 or work is held by hand while being ground. A stop 15 adjustable to drills, etc., of different lengths, as by the screws 16, 17 holds the work against the grinding wheel. The member 12 has the convex-faced body portion 18 rockable in the bearing 10 and the relatively movable concave-faced clamp portion 19 rockable on the bearing 11 with the body portion 18. These portions are connected by a bolt 20 passing through a slot 21 in the member 4 and threaded for the nuts 22 whereby the tightness of the rock bearing may be adjusted. The member 12 is rocked to a nicely adjusted position and securely held in such adjustment by a screw axially transverse to the axis of said rocking. As shown, this screw 23 is externally threaded at 24 on the member 4 and is provided with internal threads of a pitch different from its external threads, in which internal threads turns the screw 25 non-rotatably connected at 26 to the bolt 20.

The member 12 of the work-holder is provided on its end adjacent the grinding wheel with a drill lip-rest 27 against whose edge 28 a flute of the drill 14 lying in the trough is turned by hand to properly position the drill for grinding. This lip-rest is slidable

longitudinally in a slide bearing having sides 29, 30 angularly disposed toward each other. This lip-rest has its opposite edges 28, 31 parallel so that when the lip-rest becomes marred at its flute-engaging edge, it may be reversed, by turning it end for end, side for side or edge for edge, the lip-rest being slidable in the bearing in a direction parallel with either edge. By reason of the longitudinally slidable mounting of the lip-rest, it may, if nicked or marred at a point on its edge, be slid up or down in said bearing to present a new point of contact for the flute, and without otherwise adjusting the lip-rest by reversing the same in any of the ways above mentioned. It will be seen that the usefulness of the lip-rest may be greatly prolonged by reason of these various adjustments. The lip-rest is thus slidably held in the bearing by headed threaded bolts 32 passing through slots 33 in the lip-rest elongated in the direction of its sliding movement, the bolts extending through the member 12 in a direction angular to the sides 29, 30 of the bearing. Nuts 34 on these bolts draw and removably clamp the lip-rest in the internal corner formed by the meeting of the sides of said bearing.

To prevent the marring or grinding of the end of the member 12, and particularly of the lip-rest by the careless or accidental moving of the drill-holder on the horizontal bearing 7 into contact with the wheel, a stop is provided to limit such movement. Preferably this stop is of the form shown at 35, and on it is adapted to abut and rock with the swinging movement of the drill-holder, the member 36 carried by the drill-holder and having an arcuate face 37 engaging said stop. A wheel-dresser 38 swingably mounted at 39 on the frame axially parallel with the axis of the wheel, carries a dressing tool, as the diamond point 40 which may be swung back and forth across the grinding surface of the wheel to resurface the same. As the wheel's surface is cut away, the wheel-dresser may be moved axially, as by the screw 41. The stop 35 is movable in connection with the axial movement of the wheel-dresser, (both being carried on the spindle 42), the wheel-dresser abutting against the stop as shown in Fig. 8. The result is that as the grinding face of the wheel is cut down, the stop retreats and always occupies the same position relatively to said face, so that the lip-rest or the drill-holder itself is always limited in its movement toward the wheel to the same position relatively to said face, no matter to what degree the wheel is cut down by the dressing process.

A modified form of the stop and wheel-dresser is shown in Figs. 9 and 10. In these views, the stop 43 carried by the block 5 slidable horizontally on the fixed stud 44 engage the collar 45 in whose annular groove the arm 46 of the wheel-dresser is swingably mounted. As the wheel-dresser is moved axially along the stud, as by the nut 47 threaded thereon, the stop 43 limits the movement of the drill-holder toward the wheel to a certain position, no matter to what degree the wheel may be dressed down.

It will be seen that the wheel-dresser not only dresses the grinding surface of the wheel, but independently of its dressing or cutting operation acts as a means for positioning the stop relatively to the wheel's grinding surface.

The invention being intended to be pointed out by the claims severally, is not to be limited to or by details of construction shown or described.

What is claimed is:

1. In a machine of the character described; a frame; a grinding wheel journaled thereon; a drill-holder swingable on the frame and movable toward and away from the wheel, and having a drill lip-rest and adapted to hold in position to be operated on drills of different diameters in the same position of its swingable axis; a stop intermediate the frame and the drill-holder adapted to limit the movement of the drill-holder toward the wheel.

2. In a machine of the character described; a frame having a stop; a grinding wheel journaled on the frame; a drill-holder swingable on the frame and movable toward and away from the wheel, and having a drill lip-rest; an arcuate-faced member carried by the drill-holder and adapted to abut and rock on said stop to limit the movement of the drill-holder toward the wheel.

3. In a grinding machine; a frame; a grinding wheel journaled thereon; a work-holder movable toward and away from the wheel's grinding surface; a wheel-dresser mounted on the frame and movable in the direction of the wheel's axis; a stop intermediate the frame and the work-holder and movable in connection with the wheel-dresser's said movement and adapted to limit the movement of the work-holder toward the wheel to the same position relatively to its grinding surface whatever may be the position of said grinding surface relatively to the frame.

4. In a grinding machine; a frame; a grinding wheel journaled thereon; a work-holder swingable on the frame and movable toward and away from the wheel's grinding surface; a wheel-dresser swingably mounted on the frame and axially movable in the direction of the wheel's axis; a stop intermediate the frame and the work-holder and movable in connection with the wheel-dresser's axial movement; an arcuate-faced member carried by the work-holder and

adapted to abut and rock on said stop; the stop being adapted, by its said axial movement with the wheel-dresser and by the abutting of said member thereon, to limit the movement of the work-holder toward the wheel to the same position relatively to its grinding surface whatever may be the position of said grinding surface relatively to the frame.

5. In a machine of the character described; a frame; a grinding wheel journaled thereon; a drill-holder swingable on the frame and comprising a member having a rock bearing and also comprising a member carried by the first-mentioned member and rockable in said bearing; means connected to the second-mentioned member for tightening said bearing; means connected to said first-mentioned means and adapted to adjustably move and hold the second-mentioned member in rocked position.

6. In a machine of the character described; a frame; a grinding wheel journaled thereon; a drill-holder swingable on the frame and comprising a member having arcuate bearings concentrically concave and convex respectively, and also comprising a member carried by the first-mentioned member and having relatively adjustable portions, one of which rocks in the concave and the other in the convex bearing; means connected to the second-mentioned member for adjustably holding said portions interrelatively; means connected to said first-mentioned means and adapted to adjustably move and hold the second-mentioned member in rocked position.

7. In a machine of the character described; a frame; a grinding wheel journaled thereon; a drill-holder swingable on the frame and comprising a member having arcuate bearings concentrically concave and convex respectively, and also comprising a member carried by the first-mentioned member and rockable in said bearings; a screw threaded in the first-mentioned member; a screw of different pitch threaded in the first mentioned screw and operatively connected non-rotatably with the second-mentioned member for adjustably moving and holding the second-mentioned member in rocked position.

8. In a machine of the character described; a frame; a grinding wheel journaled thereon; a drill-holder movable toward and away from the wheel's grinding surface; a drill lip-rest slidably mounted on the drill-holder and having a drill flute-engaging edge fixedly parallel with the lip-rests's slidable movement; means for securing the lip-rest in adjusted position.

9. In a machine of the character described; a frame; a grinding wheel journaled thereon; a drill-holder movable toward and away from the wheel's grinding surface and having a slide bearing; a reversible drill lip-rest removably slidable in said bearing and having edges both of which are fixedly parallel with the lip-rest's slidable movement and either of which in operative position is adapted to engage a drill flute; means for securing the lip-rest in adjusted position.

10. In a machine of the character described; a frame; a grinding wheel journaled thereon; a drill-holder movable toward and away from the wheel's grinding surface and having a slide bearing with angularly disposed sides; a reversible drill lip-rest having a slot elongated in the direction of said bearing; a headed threaded bolt extending through said slot and extending through the drill-holder angularly to the sides of the bearing; a nut on the bolt for drawing the lip-rest against said sides in adjusted position.

11. In a grinding machine; a frame; a grinding wheel journaled thereon; a drill-holder movable toward and away from the wheel's grinding surface and having a drill lip-rest; a movable stop intermediate the frame and the drill-holder and adapted to limit the movement of the work-holder toward the wheel; means for positioning the stop relatively to the wheel's grinding surface.

12. In a grinding machine; a frame; a grinding wheel journaled thereon; a wheel-dresser mounted on the frame and movable toward the wheel's grinding surface; a stop member movable in connection with the wheel-dresser's said movement, and adapted to be maintained in operative position during the operation of the wheel-dresser.

13. In a grinding machine; a frame; a grinding wheel journaled thereon; a work-holder movable toward and away from the wheel's grinding surface; a wheel dresser mounted on the frame and movable toward the wheel's grinding surface; a stop intermediate the frame and the work-holder and movable in connection with the wheel-dresser's said movement and adapted to limit the movement of the work-holder toward the wheel to the same position relatively to its grinding surface whatever may be the position of said grinding surface relatively to the frame.

In testimony whereof I have hereunto set my hand at Grand Rapids, Michigan, this 22nd day of February, 1918.

JACOB DE KONING.