A. K. RIDER.
Drill Grinder.

No. 201,449. Patented March 19, 1878.

Fig. 1.

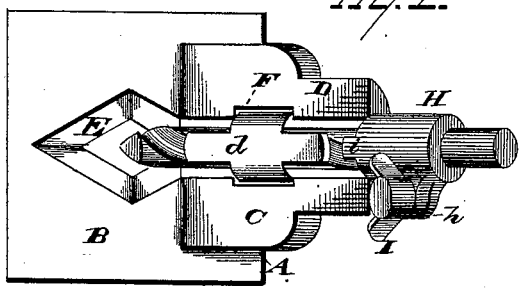


Fig. 2.

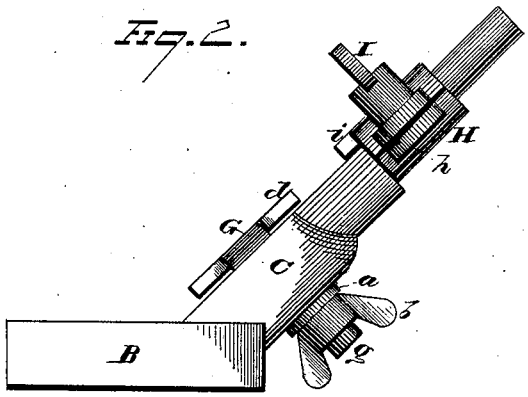


Fig. 3.

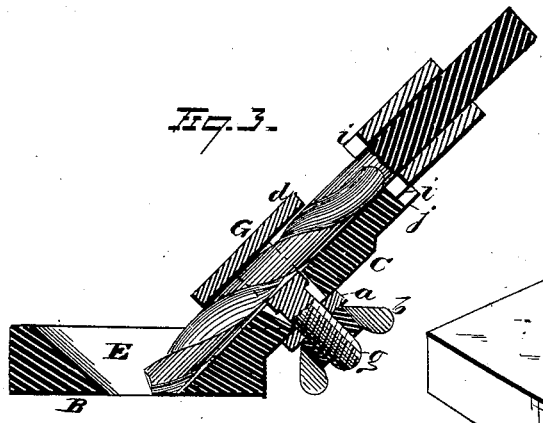


Fig. 4.

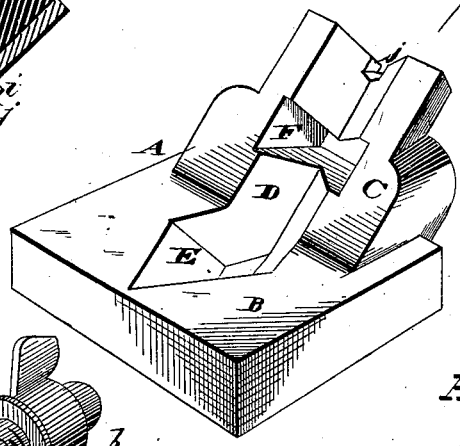


Fig. 6.

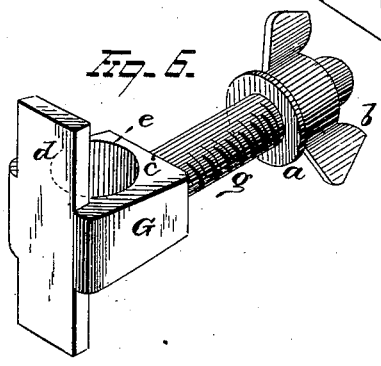
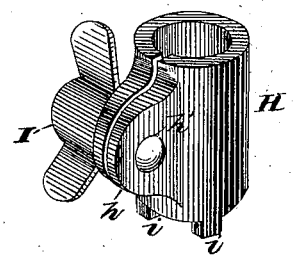


Fig. 5.



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ALEXANDER K. RIDER, OF WALDEN, NEW YORK.

IMPROVEMENT IN DRILL-GRINDERS.

Specification forming part of Letters Patent No. **201,449**, dated March 19, 1878; application filed December 13, 1877.

To all whom it may concern:

Be it known that I, ALEXANDER K. RIDER, of Walden, in the county of Orange and State of New York, have invented certain new and useful Improvements in Devices for Sharpening Drills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in devices for grinding or sharpening twist or other drills.

The object of the invention is to provide simple, cheap, and efficient means for grinding or sharpening twist or other drills, whereby the operation can be performed with the greatest facility and accuracy, and always insure the most perfect form of cutting-edge, without the employment of skilled and costly labor for such purpose; and to that end my invention consists, first, in a device for grinding and sharpening drills, a stock for supporting the drill, consisting, preferably, of a perforated grinding-gage provided with a grooved shank angularly disposed in relation to said perforated grinding-gage, and means for holding the drill within the groove formed in the shank, whereby the body of the drill may be firmly secured to the shank, and the cutting end of the drill caused to extend any desired length through the gage of the stock, and thus allow of the ready and accurate grinding of the drill.

My invention further consists in a device for grinding and sharpening twist or other drills, consisting of a perforated grinding-gage provided with a grooved shank angularly disposed in relation to said perforated grinding-gage, and means for securing a drill within said shank, in such a manner that the drill shall be prevented from any lateral movement, while it will admit of a predetermined axial movement, in order that the edges or lips of the drill may be ground in an equal degree, and always at the same relative angle to each other.

My invention further consists in a device for grinding and sharpening twist or other drills, a perforated grinding-gage provided with a grooved shank angularly disposed to said perforated gage, a clamp for securing the drill firmly within the grooved shank, and a collet adapted to be removably secured to the drill, and also to the shank, whereby the drill may be adjustably secured within said collet, and the latter adjustably locked to the shank.

My invention further consists in certain details of construction and combinations of parts, as will more fully appear from the following description and claims.

In the accompanying drawings, Figure 1 is a plan view of my improvement. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical section through the stock, drill, clamp, and collet. Fig. 4 is a detached view of the stock. Fig. 5 is an enlarged view of the collet, and Fig. 6 is a detached view of the clamp.

A represents the stock, formed of the grinding-gage B and a shank, C, which parts may be cast or forged solid in one piece, or may be made separate and secured to each other at their points of juncture, either in a rigid or in an adjustable manner. The shank C is provided with a groove, D, preferably of V shape in cross-section, which extends throughout its length, and merges into the diamond or other shaped opening E, formed in the gage B. Opening E extends completely through said gage B, and is gradually contracted in size from the upper to the lower surface of the gage.

The V-shaped groove formed in the shank and the diamond-shaped opening in the gage together constitute a continuous V-shaped groove for supporting different-sized drills, and the number of different-sized drills that can be accommodated by a single device will depend on the capacity of said groove. Shank C, about midway its length, is provided with a through slot or opening, F, within which is placed the head of a clamp, G, while its screw-threaded shank or stem *g* projects through or beyond the lower surface of the shank, to allow of the attachment of a suitable washer, *a*, and nut *b*.

Clamp G consists of a perforated head, *c*, upon the upper portion of which is formed an elongated bearing-surface, *d*, which is of suffi-

cient length to overlap one of the spiral cuts or grooves of the drill to be ground or sharpened, and thus operate to secure the drill firmly in place, and prevent any tendency of the drill to revolve. The eye *e* of clamp G is of sufficient size to admit the largest-sized drill, and it is obvious that the smaller-sized drills can be firmly secured by the single clamp, owing to the fact that it is adapted to be adjusted at right angles to the drill. In the present instance I have illustrated a clamp wherein the eye *e* is circular in form; but it is evident that said eye may be of diamond or any other desired shape.

H represents a collet. In the present instance it is shown as being made of a single piece, and split on one side through ears or lugs *h*, each of which has an opening, *h'*, for the reception of a thumb-screw, I. As the drill requires to be held firmly against axial movement, in order that the cutting-lips may be ground or sharpened in an accurate manner, a collet is provided for each size of drill. When the screw I is outwardly turned, the ears *h* separate sufficiently to allow of the adjustment of the drill within the collet, and by tightening said thumb-screw the drill is securely held in place. Collet H is provided with two rectangular projections, *i*, formed on one end thereof, and located diametrically opposite each other.

The end of the shank is provided with a corresponding recess, *j*, within which one of said projections *i* of the collet is received when the device is to be used. The collet serves to admit of the reversal of the drill just one-half of a circle or revolution, and prevent the axial movement of the drill, in order that the opposite lips or cutting-edges of a drill may be subjected to the same grinding action, and the same angle of each lip or cutting-edge always be secured. It will be observed that the collet is adapted and arranged to have a movement at right angles to the shank, in order that different-sized drills may be firmly seated within the groove; but the endwise or axial movement of the drill, when the latter is being sharpened or ground, is effectually prevented by said collet and clamp.

The operation of my improved device is as follows: The drill to be ground or sharpened is inserted in the V-shaped groove and through the eye of the clamp, the cutting end caused to project the desired distance below the lower surface of the gage B. The cutting angle of the entering edge is made more or less acute, according to the relative radial position of the surfaces which meet to form the cutting edge or lip of the drill to the plane of gage B. Should the end of the edge or lip coincide with the bottom of the groove—that is to say, should the lip be centrally disposed within the V-shaped groove—a cutting-edge of ninety degrees would be formed; and if placed at right angles to this plane, it would result in securing the most acute cutting angle the device is capable of producing. It is therefore easy to impart any desired angle to the cutting-edges, as this matter depends solely on the relative radial position of the edge of the drill to the plane of the gage. The amount to be ground off, and the angle of cutting-edge being determined, the drill is securely fastened in its proper position by means of the clamp, the nut of which is turned down snugly against the washer or surface of the shank. The collet is then slid over the drill, and one of its projections entered into the rectangular recess in the end of the shank, when the thumb-screw is turned down, and the collet thus firmly secured to the drill, preventing an axial movement of the same. The gage B is then applied to an ordinary grindstone, and the projecting end of the drill is ground off on a plane with the under surface of said gage. The clamp is now released sufficiently to allow the collet and drill to be withdrawn, to release the projection from the recess in the shank, when the collet is given a half-revolution, and the opposite projection is entered into said recess. The clamp is then secured in place, and the opposite side of the drill is then ground off to a plane with gage B. This operation causes the cutting-edges of the drill to be ground to identically the same form, angle, and length, and gives the advantage of a straight entering edge, which causes the drill to enter easily, particularly at its center or neutral axis.

It is evident that slight changes in construction and arrangement of parts may be adopted without departing from the spirit of my invention—as, for instance, the stock may be constructed of two parts, and the same be hinged together, whereby the relative angle formed by the shank and gage could be varied, as desired. The shank might be formed of a tube, or of side bars with the outer end provided with a head having a V-shaped groove. Again, instead of using a clamp of the construction shown and described, a latch might be hinged or pivoted to the upper face of the shank, and operate to hold the drill in place; or the thumb-screw may be placed above and at one side of the drill, which is the preferred arrangement when it is required to grind or sharpen very small drills.

The collet may be of angular form, and fit within a corresponding angular recess in the end of the shank; or projections may be formed on the shank, and recess for their reception be made in the collet.

If it is desired to grind or sharpen ordinary drills, the collet may be dispensed with, and the shank is lengthened out to afford the necessary support for the end of the drill.

The device may also be used to grind up end drills, in which case the shank is set at nearly right angles with the face.

I do not limit myself to the exact construction shown and described, as the form of any of the several parts may be modified to a certain extent without impairing the utility of

the device, the general construction and operation of the device being substantially as above described.

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

1. In a device for grinding and sharpening drills, a stock for holding the drills, said stock consisting of a perforated grinding-gage provided with a grooved shank angularly disposed relatively to said perforated gage, and suitable means for holding the drill within said grooved shank, substantially as set forth.

2. In a device for grinding and sharpening drills, a stock for holding the drills, consisting of a perforated grinding-gage provided with a shank having a V-shaped groove, said shank constructed with a through-slot at right angles to said groove, in connection with a clamp which is adapted to fit within said through-slot, said clamp serving to hold the drill firmly in place, substantially as set forth.

3. In a device for grinding and sharpening drills, the perforated face and grooved shank, in combination with means for holding the drill in place, and also with means to regulate the end and axial adjustment of the drill, substantially as set forth.

4. The combination, with a stock consisting of a perforated grinding-gage provided with a shank having a V-shaped groove, of a collet adapted to be adjustably secured to the drill and to said shank, substantially as set forth.

5. The combination, with a stock consisting of a perforated grinding-gage provided with a shank having a V-shaped groove and a recessed end, of a collet having two projections arranged diametrically opposite each other, substantially as set forth.

6. The combination, with a stock consisting of a perforated grinding-gage provided with a shank having a V-shaped groove and a recessed end, of a collet having two projections, which engage with the recessed end of said shank, said collet also provided with an adjusting-screw for securing the same to the drill, substantially as set forth.

7. In a device for grinding and sharpening drills, the stock consisting of a grinding-gage and a grooved shank, said face being provided with a diamond or other shaped opening, into which merges the V-groove formed in the shank, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 8th day of December, 1877.

ALEXANDER K. RIDER. [L. S.]

Witnesses:
GEO. W. STODDARD,
W. G. RUTHERFORD.