(No Model.)

E. G. HOFFMANN.

DEVICE FOR GRINDING TWIST DRILLS.

No. 521,615. Patented June 19, 1894.

Fig. 1.

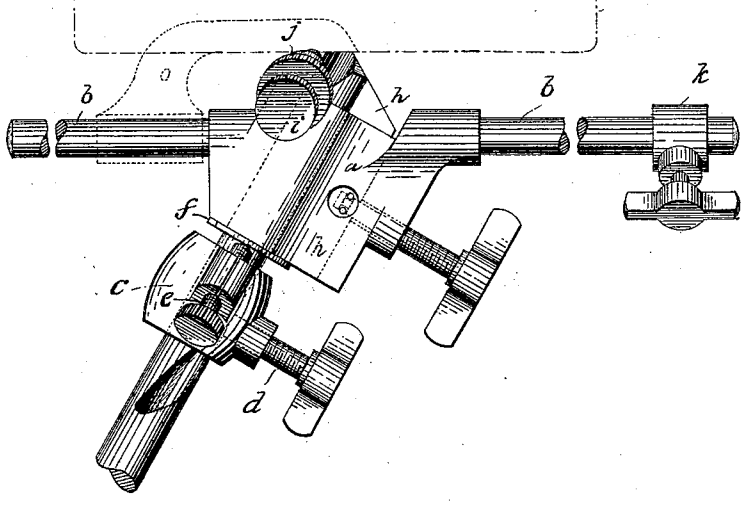


Fig. 3.

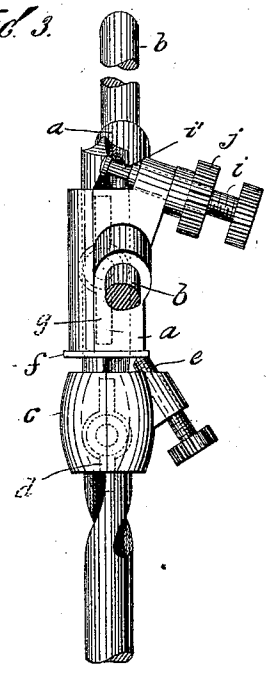


Fig. 2.

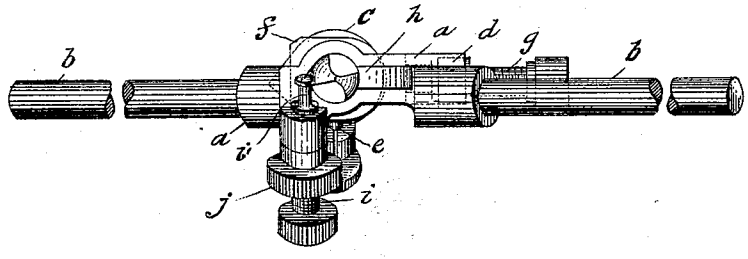
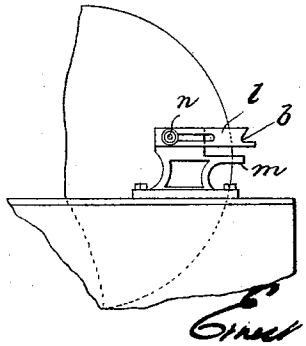


Fig. 4.



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DEVICE FOR GRINDING TWIST-DRILLS.

SPECIFICATION forming part of Letters Patent No. 521,615, dated June 19, 1894.

Application filed June 26, 1893. Serial No. 478,806. (No model.) Patented in England December 11, 1890, No. 20,237.

To all whom it may concern:

Be it known that I, ERNEST GUSTAV HOFFMANN, a subject of the Emperor of Germany, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Holders or Devices for Grinding Twist-Drills and the Like, (for which I have obtained a patent in Great Britain, No. 20,237, bearing date December 11, 1890,) of which the following is a specification.

My invention relates to an improved holder or device for grinding twist and the like drills, the object of my invention being to provide a simple and effective holding device which may be used in connection with an ordinary grindstone, emery wheel or the like in place of the more expensive apparatus frequently employed.

The holder or device embodying my invention is provided with means for securing the drill therein, and I provide rests and stops for engaging with said holder so arranged that when the holder is held against said rest it is guided thereby and eventually comes in contact with the stops whereby it is stopped at a definite distance from the grindstone or other grinding device. In order to insure that an equal amount will be taken off each face of the drill in the different positions of the drill, I provide a stop device mounted upon the drill and abutting against the holder, and I secure a fine adjustment of said stop device by constructing it with a bushing and a screw stop carried by said bushing, said screw stop abutting against the holder. To insure that each face of the drill will be accurately turned to the proper place and held from turning when in place, I provide an adjusting device for engaging with the groove of the drill. After the drill has been presented to the grinding device and sufficiently ground at one face, the drill is withdrawn, turned round and again fixed in the holder, the stop device and the device for engaging with the groove of the drill insuring that the other face of the drill will be presented to the grinding device on the same plane as the former so that a perfect point is obtained.

In the accompanying drawings forming a part hereof,—Figure 1 is a plan view of a device embodying my invention looking down upon the top of the grindstone. Fig. 2 is a view looking down upon the point of the drill which is in a vertical line below. Fig. 3 is an end view with the drill in a vertical position; and Fig. 4 is an elevation of a part of a grindstone showing the manner of employing the holder when grinding a drill or the like.

The holder consists of a metal block *a* through which the drill is passed, its point being allowed to project a sufficient distance through the holder to permit of one edge being presented to the stone. The block carries guide spindles or rods *b b* which to render the device or tool more portable may be screwed into it if desired. These rods are adapted to be carried by rests attached to the grindstone frame as hereinafter described.

It will be seen on reference to Fig. 2 that the center of the drill is not in line with the center of the rods *b b*, this being necessitated by the angle to which the drill is required to be ground to obtain the proper clearance of the cutting edge. Upon the drill when in the block *a* is slid a stop device consisting of a bushing *c* which is secured to the drill by a set screw *d*. This bushing alone will answer the purpose but I prefer to employ for a finer adjustment a further set screw *e* which works in a boss on the bushing *c* and bears against the block *a* or preferably against a hard metal plate *f* interposed between them. The drill is held in the block *a* by a screw *g* which may be attached to a key block *h* by letting its end into a recess in the said key block and securing the screw end from longitudinal movement in the key block by pins which embrace an annular groove formed in the screw end, as shown in Fig. 1, so that the screw may be turned and thus move the key block in or out of the groove provided for its reception in block *a* or the screw may be a simple pressure screw, the key block being retracted by a spring. This key block will bear upon and hold in the block any drill of the diameter of the opening or of a smaller diameter. A further set screw *i* is provided which passes through another boss in the block *a*, the end *i'* of this, engaging with one of the grooves of the drill so that the faces of said drill may be adjusted for grinding. The screw is provided with a set nut *j* as shown.

When one face of the drill has been ground,

as illustrated in Fig. 1, the drill is withdrawn by loosening the key block *h*, turned around and again fixed in the block, the bushing *c* (or the adjusting screw *e*) insuring its being passed through the block exactly the same distance as for the other face while the end *i'* of the set screw *i* by engaging with the groove insures the second face being presented to the grindstone at exactly the same plane as the first, so that two identical faces are produced on the drill.

When using the device the rods *b b* are placed in the notched portion of a rest *l* as shown in Fig. 4 of which there is one on each side of the grindstone, and the inclined face of said rest forms a stop and stops and holds the drill holder at a predetermined distance from the stone. The rest may form an addition to the usual tool rest *m* and be adjustable by means of a slot through which passes a screw, a nut *n* on which will hold the rest *l* when in the desired position. When the rods are on the rest the drill may be traversed to and fro across the face of the grindstone within the limits of the rods, but in order to finish the grinding of each face upon the same portion of the stone which is important in view of the irregularities of a stone when at all worn I employ the bushing *k* (which is affixed upon one of the rods *b* by its set screw) by causing it to abut against one of the rests *l* after a suitable portion of the stone has been selected, the grinding being always finished with the bushing held up to this rest. In place of a single notch the rest may be provided with two, three, or more arranged in step form so as to be at increasing distances from the stone. These notches will be adapted for the different sized holders which may be made. For instance the notch nearest the stone will be used for a holding device adapted to take drills up to one-half inch which may all be ground to the same radius. The next notch will take a holding device adapted for drills from one-half to one inch which require to be ground to a different radius and so on, these steps obviating the necessity for shifting the rest for each size of holder.

During grinding, the drill while being held up to the stone is worked up and down or rocked as indicated by the dotted lines in Fig. 4.

For the purpose of enabling smaller size drills to be conveniently held I form the opening in the block *a* and in the bushing *c* of the shape shown in Fig. 2.

To enable the person using the device to ascertain how far the drill should be pushed through the block *a* when first setting same I may use a gage *o* indicated by dotted lines Fig. 1 which gage is slid upon one of the rods *b* so that its end forms a stop for the drill when it is pushed through the block. This gage is not required after the first face has been set and may be turned around out of the way or removed.

Without limiting myself to the precise details of construction shown, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In grinding twist drills and the like, a drill holder having means for securing the drill therein and provided with guide rods, a stop device for regulating the amount to be taken off each face in the different positions of the drill, and rests adapted to support said rods of the holder and provided with stops adapted to engage with and stop the holder at a definite distance from the grinding device, substantially as set forth.

2. In grinding twist drills and the like, a drill holder having means for securing the drill therein and provided with an adjusting device for engaging with a groove of the drill and a stop device for regulating the amount to be taken off each face in the different positions of the drill, and rests adapted to support said holder and provided with stops adapted to engage with and stop said holder at a definite distance from the grinding device, substantially as set forth.

3. In grinding twist drills and the like, a detached drill holder having means for securing the drill in appropriate position therein, in combination with rests adapted to support said holder and stops adapted to engage with and stop the holder at a definite distance from the grindstone, said rests and stops and holder being shaped so as to permit the holder to be rocked in grinding the drill, substantially as set forth.

4. In grinding twist drills and the like a detached drill holder having means for securing the drill in appropriate position therein and having guide rods, and a bushing on one of said rods, in combination with rests adapted to support said rods, and stops adapted to engage with said rods and also with said bushing to stop the holder at a definite distance from the grinding device and in a definite lateral position relatively thereto, substantially as set forth.

5. In grinding twist drills and the like a drill holder having means for securing the drill therein, a stop device mounted upon the drill and abutting against the holder for regulating the amount to be taken off each face in the different positions of the drill, an adjusting device for engaging with a groove of the drill, and means for setting the holder at a definite distance from the grinding device, substantially as set forth.

6. In grinding twist drills and the like a drill holder having means for securing the drill therein, a stop device mounted upon the drill and abutting against the holder for regulating the amount to be taken off each face, an adjusting screw carried by the holder for engaging with a groove of the drill, and rods carried by the drill holder, and means for setting the holder at a definite distance from the grinding device, substantially as set forth.

7. In grinding twist drills and the like a drill holder having means for securing the

drill therein, a stop bushing upon the drill and means for setting the same thereon, and a screw stop carried by the said stop bushing and abutting against the drill holder, and means for setting the holder at a definite distance from the grinding device, substantially as set forth.

8. In grinding twist drills and the like, a drill holder having an adjustable key block for clamping the drill therein, a stop bushing upon the drill and means for setting the same thereon and a screw stop carried by the said stop bushing and abutting against the drill holder, an adjusting device carried by the holder for engaging with a groove of the drill, and rods carried by the drill holder, and rests and stops for engaging with said rods and guiding and stopping the holder at a definite distance from the grinding device, substantially as set forth.

This specification signed and witnessed this 13th day of June, A. D. 1893.

ERNEST GUSTAV HOFFMANN.

In presence of—

E. M. TAYLOR,

ALFRED W. KIDDLE.