

BABBITT ANTI-FRICTION METAL.

The metal is made of 1 part copper, 3 parts tin, 2 parts antimony, and 3 parts more tin are added after the composition is in the molten state. This composition is called hardening, and when the metal is used for filling boxes, 2 parts tin are used to 1 of hardening. The above alloy constitutes the best anti-attrition metal in use, but on account of its expense it is very little used. The anti-attrition metals commonly used are principally composed of lead, antimony, and a little tin, but they are not nearly so good as the above.

GRINDING TWIST DRILLS.

(See page 182)

What is described as a "simple, cheap, and efficient" means for grinding or sharpening twist or other drills, has been patented by Mr. A. K. Rider, of Walden, New York. The object of the invention is to ensure the most perfect form of cutting edge without the employment of skilled labour. The invention consists first in a device composed of a stock, A, for supporting the drill, consisting of grinding perforated face, B, provided with a grooved shank, C, angularly disposed in relation to the perforated face, B, 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 face, B, of the stock, and thus allow of the ready and accurate grinding of the drill. The invention further consists in a 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.

A perforated grinding plate or face is also provided with a grooved shank, angularly disposed to perforated face, a clamp, G, for securing the drill firmly within the grooved shank, and a collet, H, adapted to be removably secured to the drill and also to the shank, whereby the drill may be adjustably secured within collet, H, and the latter adjustably locked to the shank. Fig. 1 is a plan view of the improvement; Fig. 2 is a side elevation of the same, and Fig. 3 is a side elevation of the tool for grinding tapered shank drills. The stock is formed of the grinding face, 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, preferably of V-shape, which extends throughout its length and merges into the diamond or other shaped opening, E, formed in the face, B. Opening E extends completely through face, B, and is gradually contracted in size from the upper to the lower surface of the face. The V-shaped groove formed in the shank, and the diamond-shaped opening in the face, together constitute a continuous V-shaped groove for supporting different sized drills. Shank C, about midway between its length, is provided with a through slot or opening, within which is placed the head of a clamp, G, while its screw-threaded shank or stem projects through or beyond the lower surface of the shank to allow of the attachment of a suitable washer and nut. Clamp G consists of a perforated head upon the upper portion of which is formed an elongated bearing surface, which is of sufficient 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 of clamp, G, is of sufficient size to admit the largest size 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 the eye is circular, but it is evident that it 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, each of which has a thumb-screw, J, 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, J, is outwardly turned the ears separate sufficiently to allow of the adjustment of the drill within the collet, and by tightening the thumb-screw the drill is securely held in place. Collet H is provided with two rectangular projections formed on one end thereof, and located diametrically opposite each other. The end of the shank is provided with a corresponding rectangular recess within which one of the projections of the collet is received when the device is to be used. The collet serves to admit of the me-

versal of the drill just one-half of a circle or revolution, and prevent the endwise 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 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 size 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 the collet. The operation of the 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, Fig. 2, the cutting end caused to project the desired distance below the lower surface of the face or plate, B. The cutting angle of the entering edge made more or less acute according to the relative radical position of the edge or lip of the drill relative to the plane of face, B, should the lip coincide with the bottom of the groove a cutting edge of 90° 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 procuring. It is, therefore, easy to impart any desired angle to the cutting edges, as this matter depends solely on the relative radical position of the edge of the drill to the plane of the face.

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 face, B, is then applied to an ordinary grindstone, and the projecting end of the drill is ground off plane with the under surface of face. The clamp is then 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 the recess. The clamp is then secured in place, and the opposite side of the drill is then ground off to a plane with face, 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 centre or neutral axis. The groove is usually made V-shaped for receiving the drill, and extends the whole length of the shank, C, while in other cases, as represented in Fig. 3, for grinding tapered shank drills, only a portion of the shank is provided with the V-groove. The shank, C, in this case is provided with a slot in which the stopper, P, moves for regulating the axial or longitudinal movement of the drill by engaging with the collet, H. The clamp, G, in this case for holding the drill to the stock, is acted on by a thumb-screw from the top of the tool, as represented in Fig. 3. If it is desired to grind or sharpen ordinary drills the collet may be dispensed with, and the shank 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.

A CHANCE FOR INVENTORS.

The Secretary of the Treasury has constituted a board, consisting of Captain Forbes, manager of the Massachusetts Humane Society, Captain Moore and Lieut. Sparrow, of the Revenue Marine Service; together with Mr. B. C. Sparrow and Captain Patterson, of the Life Saving Service, to investigate all plans, devices, and inventions for the improvement of apparatus for use at life saving stations, which may appear meritorious and available, and to examine and test as far as practicable all such as may be submitted by the general superintendent, and to make detailed reports of the results of the investigations and tests for his information. The scope of the board embraces action upon all devices for the improvement of life saving apparatus intended to be used at the life saving stations, except wreck ordnance and its immediate appurtenances, which will be referred to a board composed of experts in gunnery, and two practical surfmen to give them aid upon points connected with the actual wreck service. Devices intended to be carried on board ship do not fall within the scope of the action of the board, as this class of life saving apparatus is taken cognizance of by the steamboat inspector's service. Capt. Forbes has been designated president, and has been directed to call a meeting of the board as early as practicable, as there are already on hand several inventions to be examined.