

**IMPROVED TWIST DRILL AND TOOL-GRINDING MACHINE.**

Great difficulty has always been encountered in grinding threading tools to an accurate angle and center. The same is true of drills, and, in fact, of any tools whose edges are made up of straight lines, in which symmetry of shape is a necessity, in order that they may produce true and correct work. Makers of taps, among others, meeting this difficulty, have been obliged to try many devices to obviate it, and often, to obtain uniformity, employ rotary cutters or other and hitherto ineffectual substitutes; but as a rule most machinists rely on their manipulative skill and accuracy of eye to grind their implements to exact shape.

The new machine, which is illustrated herewith, is another instance of that tendency, which is everywhere manifest, to substitute the absolute certainty of mechanism for the doubtful results depending on the judgment; and it is so constructed that the correct grinding of the tool is simply a matter of easy adjustment. Tools may be ground to any given angle, from zero to ninety degrees; any desired clearance may be given to them, and the grinding is done

in an improved manner by using a wheel which has an annular recess in each of its sides. This allows the edge of the implement to pass entirely across the grinding face on the side of the wheel, and thus be made perfectly straight and flat, instead of concave, as must be the case when the periphery of the wheel constitutes the abrading surface.

Fig. 1 represents the machine in use, grinding tools. The tool is fastened to the top of a circular graduated and pivoted tool block, and held the same as when in use in the lathe or planer, being adjusted by the index on the edge of the block to any desired angle and clearance with the grinding face of the wheel; and when brought in contact with and passed across the wheel by means of feed screws, the edge is made perfect. Then (without unfastening the tool) passing it to the other side of the wheel by means of the feed screws, the operation is repeated. This machine has a steel spindle, with adjustable taper bearings, of gun metal. A wheel for general use can be mounted on the other end of the spindle as shown. The machine is furnished with patent corundum wheels, which are made specially for tool grinding, and which will do the work rapidly and effectually without drawing the temper. Fig. 2 shows a drill-grinding attachment, by means of which twist drills or flat drills may be ground with accuracy. The shank of the drill is held in a socket, the same as when in use. The point is held in jaws adjusted with right and left hand screw. By means of the graduated and pivoted tool block, the point of the drill may be placed at any angle and clearance with the grinding face of the wheel and ground the same as a tool, using only one side of the wheel. After grinding one lip, it is turned exactly half round by means of an index on the end of the spindle holding the drill, and the other lip is ground. Then, by passing the point just inside the grinding face and drawing out the index pin, and turning the spindle forward, clearance is given to the back corner without making the edge too thin, and the drill is put in the best condition for use. Twist or flat drills, of any length or size up to two inches, can be ground on the machine.

This machine has been patented by John P. Fay, of Worcester, Mass., and when exhibited at the American Institute Fair of 1874 received their silver medal and commendatory report, as "the first completely successful machine for the purpose." It has also received the same notice at the Centennial Exposition, where it has been on exhibition. It is being rapidly introduced in some of the largest and best shops in the country. For further particulars, address the makers, the Wood and Light Machine Company, Worcester, Mass.

**IMPROVED COMBINATION DESK AND BOOK CASE.**

We live in an age of condensation, and combination furniture accords with the spirit of the times. Hence inventors of the same find a ready sale for their productions, and make money. At the present Fair of the American Institute, there is a table which transforms itself into a bed, a bed which turns into a bureau, a combined washstand, wardrobe, and dressing case, a mixed blacking box and shaving case, sofa beds uncounted, and so on through a long category of articles, which are always surrounded by a curious crowd. The exhibitors tell us that such inventions pay excellently, and point to the fact that large numbers of regular furniture dealers are now keeping the newest combined appliances in stock, in response to popular demand. On Broadway there are two or three stores, in the large windows of which active individuals constantly display iron chairs, which can be adjusted to form lounges or to suit any position of the body. The throng of gazers renders the sidewalk almost impassable; and if we may judge from the rapid extension of the proprietor's business from one store to several,

scattered about the city, his device also has paid. The invention illustrated in Figs. 1 and 2 of the annexed engravings offers a still more striking instance. It is a combined writing desk and book case, adapted to the uses of offices, libraries, hotels, etc., and was patented September 7, 1875. The inventor has exhibited it at local fairs and has displayed it at the Centennial in a very prominent locality. The result is that a number of clerks are employed to show the article, explain its operation, and to fill orders. The desk is an excellent article of furniture, handsomely designed, as our engravings show, and combining improvements in the shape of an ingenious inkstand and paper file, which are the subjects of separate patents, and which are illustrated more

It is constructed double or single. In the one case it has desk, book shelf, and other conveniences below enumerated, on both sides, and is intended to stand in the center of the room, occupying an area of only 6 x 2 feet; in the other, the conveniences are on one side, occupying even less space, and it may be placed against a wall of the room. The floor space occupied is then but 15 inches in depth.

In Fig. 1 the desk is represented opened, in Fig. 2 closed. The various portions will be understood from Fig. 1. At A are hinged frames, whereon are mounted brackets to receive paper files of the pattern shown in Fig. 4. These files consist of a bent tin back, in which are a number of wires, the ends slipping into sockets at one extremity, and being

secured by a locking hinged cap at the other. Newspapers are held by passing the wires through them and then fastening the latter in place, as already described. In the book case, B, a secretary, C, is provided. The folding desk, D, is hinged and supported as shown, and provided with a swinging inkstand, which always remains perpendicular with out regard to the position of the leaf. The inkstand is hung on

gimbals, and is protected by a cap when the leaf is closed. A similar arrangement of swinging ink wells, designed for use on shipboard, is represented in Fig. 3. In order to afford greater writing facilities, sliding desks, which may be drawn out when desired, are provided at E, and be-

Fig. 1.

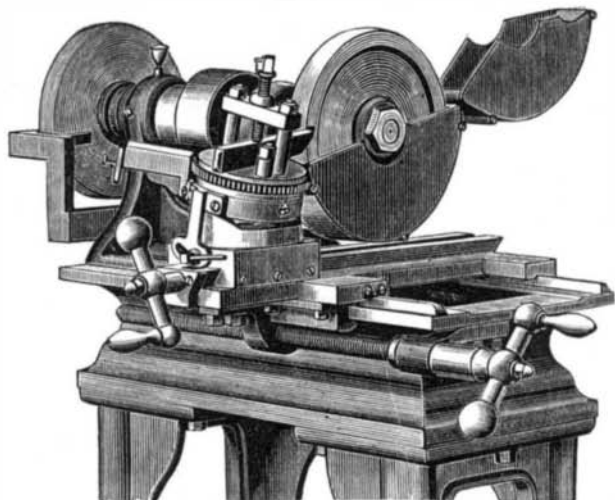
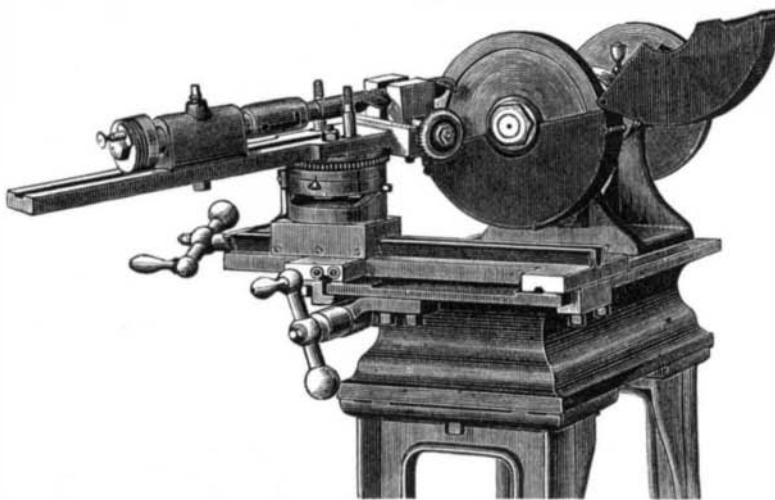


Fig. 2.



**FAY'S TWIST DRILL AND TOOL-GRINDING MACHINE.**

fully in Figs. 3 and 4. All were devised by the same inventor, who "didn't know he was inventing," but merely wanted some conveniences of the kind to answer his own requirements, and exercised his ingenuity to make them.

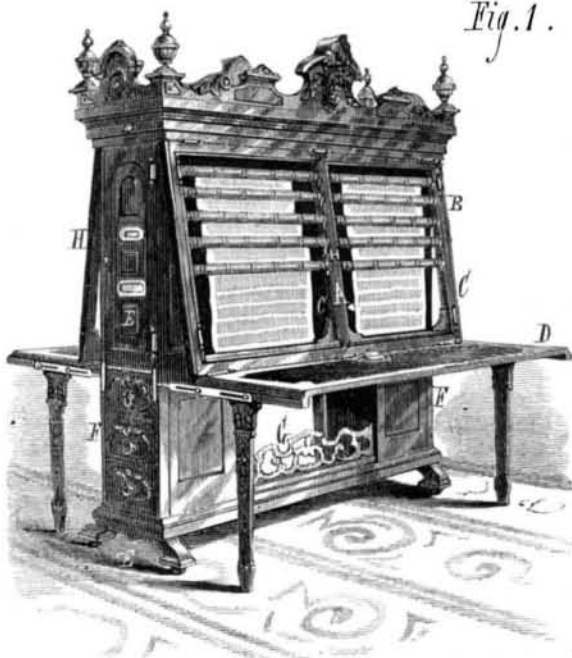


Fig. 1.

This suggests the idea that a process of self examination by every one, to determine whether or not he is an inventor, might result to the profit of a great many people. The pro-



Fig. 2.

bilities are strongly in favor of any original idea, which will prove lucrative, as in this case, however trivial the invention may seem at first. But to return to the desk.



Fig. 3.

neath, at F, there is a case of drawers. Into the receptacle at G, waste paper may be placed, and at H, attached to the doors, there are boxes for letters and newspapers for the mail, and in rear, in the body of the desk, are alphabetic pigeon holes for filing printed documents, etc. A set of ingeniously contrived secret drawers are provided, the location of which we leave the reader to determine if he can.

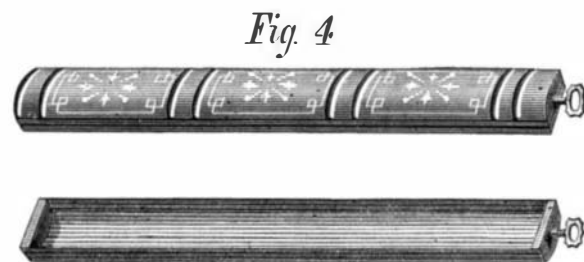


Fig. 4.

The desk received a medal at the American Institute Fair of 1875, and the Centennial judges have awarded it an excellent report. Further particulars may be had by addressing the inventor and manufacturer, E. W. Stiles, 1,020 Arch street, Philadelphia, Pa.

**Sulphur Tamping.**

Sulphur tamping for iron in stonework ought never to have been substituted for lead tamping, since the presence of the least moisture between the surfaces of the iron and sulphur sets up chemical action, and, in a few years, the sulphur has been converted into a true hydrated sulphide of iron. During this conversion, the tamping swells greatly, and is either forced out of its place, and consequently its utility destroyed, or else it cracks the stone in lines radiating from the tamping, if this is used in a single spot; or, if there is a row of holes so tamped, the stone will be cracked longitudinally. To be sure, it may take fifteen or twenty years to actually break the stone apart; but in that time granite stones measuring eighteen inches by eighteen inches by nine inches have been so broken.

A CORRESPONDENT, writing from Japan, says that one of the practical results of Japanese traffic with this country is the extensive introduction into Japan of kerosene lamps and gas works, which the natives are commencing to manufacture themselves.