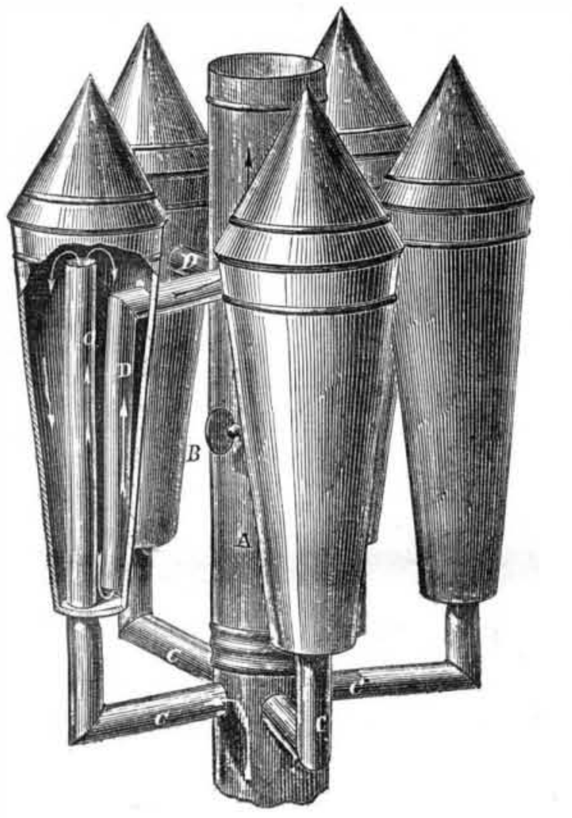
LAKIN'S PATENT HEAT RADIATOR.

For the purposes of radiating heat, ordinary stoves, furnaces, and heaters present too small an area of the outer surface to properly warm the surrounding atmosphere, the heated gases being confined and compelled to climb the chimney, instead of loitering by the way and giving out their superabundant heat. Appliances for delivering this wasted carbon can be made useful and at the same time ornamental. Such is that seen in the accompanying engraving. A series of upright inverted cones of sheet metal, capped with cones, are arranged around the draft pipe and connected to it by tubes.

A is the central pipe, with an ordinary damper, B, which, when open, permits the gases of combustion to pass unimpeded to the chimney flue. Branch pipes, C, extend in angles or curves from the central draftpipe up into the inverted cones to near their tops. The heated air, being light, passes through these tubes and impinges upon the cone-like caps, from which it is deflected down and passes out through the tubes, D, open at the bottom, to pass into the central draft tube to the chimney, through apertures above the damper. The arrows show the direction of the heat currents. The heat gases impinge upon every side of the cone, and thus greatly enlarge the heating surfaces. If no additional heat beyond that of the usual direct draft is required, the damper, B, may be opened, when the course of the gases will be as in an ordinary stove pipe without any appliances, and the draft will be direct.

For base burning and slow combustion stoves, for offices,



stores, and for upper floors in private dwellings, and, in short, for all circumstances where the utilization of heat is a desideratum, this device is intended. It is constructed on scientific principles, and calculated for saving fuel and trouble. It was patented June 11, 1868, by J. A. Lakin, who may be addressed for state rights or for additional information at Thompsonville, Conn.

BRIODAY'S IMPROVED ARTIFICIAL LEG.

The results of the late war have made unusual demands on the resources of surgical art in providing substitutes for natural limbs, and mechanical talent has been largely employed in manufacturing and improving these appliances. Yet with the best mechanical skill, we fall short of providing a perfect substitute for the natural limb. Every improvement, however, in these necessary aids to mutilated humanity should be welcomed and encouraged. That shown in the accompanying engravings claims to be superior to others now manufactured for the same purpose. It is the invention of B. Brioday of Detroit, Mich., to whom patents were granted, May 19th and 27th, 1868.

The device is intended as a substitute for the human foot and leg below the knee, and is believed to be simpler in construction, less in cost, and easier in operation than others in use. Fig. 1, is a sectional elevation, and Fig. 2, a plan view, of the foot with the leg portion removed at the ankle joint, and the foot partially broken away to show the mechanism of the toe joint. The pintle or centre of the joint is secured to the foot by means of two bolts, A, the nuts of which are seated in a recess, and with washers bear against rubber glands or flanges, B, or washers of some other yielding substance. From the same centre or pintle, rods, C, extend upward through the solid part of the leg, and are secured by nut, washer, and yielding cushion as are the bolts, A. Between the lower end of the leg and the bottom of the receiving recess in the foot are thick rubber springs, D, on either side of the hinge joint.

The part representing the toes is joined to the foot in a similar manner, except that the rubber spring or buffer, E, is placed above the joint. The nature of the connections is plainly shown in the engravings. The contiguous parts of the joints are curved to permit free movement. The bottom of the foot may be covered with canvas, leather, or any other tough elastic substance, and the opening of the toe joint may be similarly defended, the coating serving to prevent the ingress of dirt and the too free action of the joint, which might throw the toe of the foot beyond the horizontal line, as it is raised from the ground in the act of walking. The rubber springs between the leg and foot are arranged to hold the two parts together at about right angles, but to yield in

Fig. 1

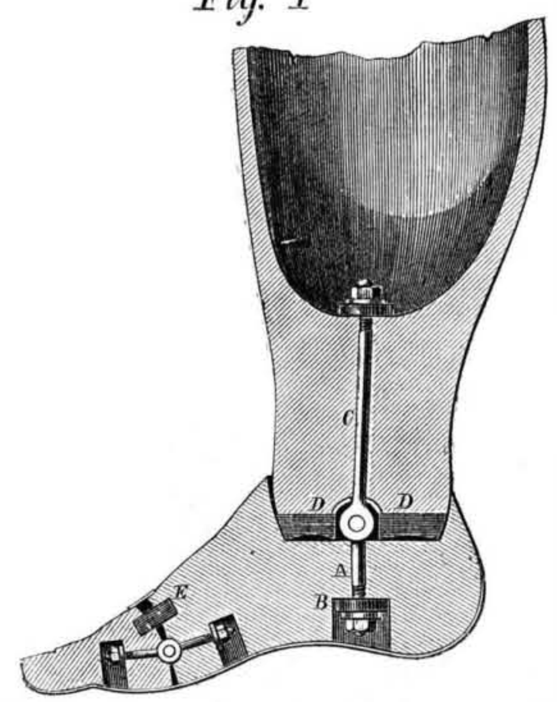
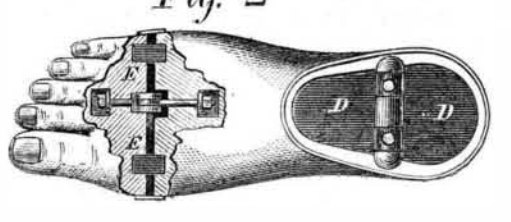


Fig. 2



either direction in the act of walking. A semicircular steel spring is interposed between the ankle joint and the lower end of the ankle, the ends of which bear upon the upper faces of the rubber to overcome and compensate for any wear or looseness in the joints of the straps or bolts, so that when the foot is taken up or set down no shock shall be felt, the spring pressing the parts away from each other when raised, and yielding when the foot comes in contact with the ground. The yielding washers or packings of rubber allow a slight lateral motion when walking over rough ground.

The whole patent, or State rights, may be obtained by addressing the patentee, B. Brioday, at Detroit, Mich.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents

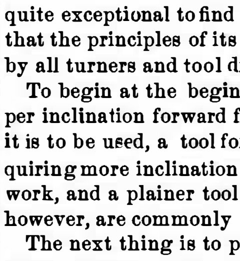
The Diamond Point Tool.

MESSRS. EDITORS:—No apology is deemed necessary for offering an article on this important tool. When properly made there is no tool more satisfactory, but in practice it is quite exceptional to find a good one. Hence it is to be inferred that the principles of its action are not completely understood by all turners and tool dressers.

To begin at the beginning, the tool should have the proper inclination forward for the lathe, and the work on which it is to be used, a tool for a light lathe and for small work requiring more inclination than one for a heavy lathe and large work, and a plainer tool but little inclination. These points, however, are commonly observed.

The next thing is to put the cutting side in its proper angular position. Fig. 1, is a horizontal section near the point of a good tool in cutting position, and Fig. 2, likewise of a bad one. The tools are supposed to be for feeding to the left, in the ordinary way. The corner 1, is the leading corner; 2, is the cutting corner; 3, the following corner; and 4, the back corner. 1, 2, is the cutting side.

Fig. 1 Fig. 2



Now in forging the tool the cutting side should be made to stand at a small angle with a horizontal line in the direction of the crossfeed, as in Fig. 1, not a large one as in Fig. 2. In other words, its position must be a little removed from that of the edge of a straight side tool, but there must be some angle, otherwise the tool ceases to be a diamond point, and becomes a half diamond, and must be inclined to the left to give it clearance. A true diamond point should not be so inclined, but only forward. Thus, it appears, that the cross section of the part drawn out to form the tool, should be a rhombus or diamond, and not a rectangle or square, in order that the cutting side may not form too great an angle with the tranverse line.

The reason why a small instead of a great angle is required, becomes obvious thus: In setting the tool, the point must be elevated to such a height as will give it the proper clearance. The clearance of the pointed and the clearance of the cutting side are two things, and the tool must be so formed that the cutting side will have its proper clearance when the point is elevated to the right height.

The shape must be such that the clearance of side and point will coincide in one position. When the angle of the cutting side is too great, the elevation of the tool affects too much the clearance of the cutting side. If it was made with no angle, but straight like a side tool, it is plain the elevation would not affect the clearance of the side at all, but only that of the point. The final adjustment is made by turning the tool in the tool-post to the right or left from a straight position.

The tool being forged it must be properly ground. The diamond point is a wedge for separating two portions of metal. Of course a thin wedge operates easier than a thick or blunt one. There is less disturbance of the molecules of the metal removed in the chip, consequently less heat, and the tool is not thereby burned away. It is not uncommon for a good tool to stand a whole day in turning wrought iron with a heavy chip and fast speed, without sharpening, except with an oil stone, in position, and making continuous spiral chips to the last.

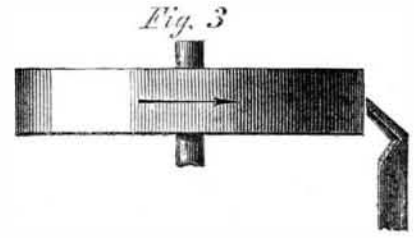
As this wedge is a powerful one, there a tendency of the tool to move forward in the direction of the feed, which is performed with little power, so that the tool is liable, with improper management, to spring into the work and break. This is what frightens many workmen from using thin tools, but if properly made and handled, there is no danger in using very thin tools. Some men in attempting to grind a tool thin, grind the back corner low, but this does not make a tool thin, at least, not thin to any useful purpose. It makes the point slender and weak, so that it breaks off; then they are disgusted.

It is the following corner (marked 3 in the cut) which must be ground low to make a good thin tool.

In a planer tool, the back corner and necessarily the leading corner, should be left high compared with the cutting corner, to prevent the tool springing down into the work, and also to strengthen the point. In a lathe tool the leading and back corners may be ground somewhat lower. If left sufficiently high, the tool will make left hand spiral chips. It is best to grind these corners low enough to make straight or right hand spiral chips. In all cases the following corner should be ground low.

To grind a diamond point properly and easily, it is well to know the best place on the grind stone to apply it. The place recommended for grinding a tool according to these principles is shown by the cut. This is for a right hand tool, or one to feed to the left. The tool is to be held in nearly a horizontal position. To grind the back corner higher, of course the back end of the tool is held more to the right

Fig. 3



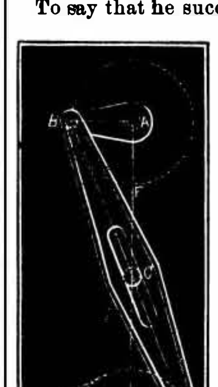
I think any one who tries it will agree that this part of the grindstone peculiarly facilitates giving the form to the tool which has been recommended. The ugliest ground tool is here speedily brought into comely form. H. W. P.

Newark, N. J.

Connecting Shafts by Pitmans.

MESSRS. EDITORS:—The learned Mr. Caxton, upon returning to his home and finding that his wife had given the name of Pisistratus to his son, exclaimed in tones of horror, "Good heavens, madam, you have made me a father of an anach ronism!" Your correspondent from Delaware City, Del, whose communication appears on page 20, current volume, will probably find himself struck with similar horror when he finds himself the father of an absurdity.

To say that he succeeded in making a device work which could not by any possibility work, certainly entitles him to the credit of doing more than lies within the power of ordinary mortals. His device involves the absurdity that the hypothenuse of a right-angled triangle is equal to the altitude. To prove this I subjoin his drawing, having placed thereon the figure, A B C D E F G. The distance from A to D is equal to the distance from G to F. When the cranks have made a quarter revolution they would stand at the points, G and F, the pitman would then be on the line, A G, and its length, measuring from the centers of the crank pins, would be equal to G F. Its half, B C, would then be equal to the half of G F, which is equal to A C. Hence, to suppose rotation possible in such a contrivance is to suppose the absurdity that the hypothenuse, B C, of the right-angled triangle, A B C, is equal to its altitude, A C. All the motion that such a contrivance could possess would be the play consequent upon imperfect fitting. ABERDEEN.



Providence, R. I.

The Planchette.

MESSRS. EDITORS:—In your article on this interesting little instrument, it is stated that "makers claim that the wood