

THE FOOT LATHE.

There are two distinct kinds of work done in foot lathes—the useful and the merely ornamental. Both afford enjoyment and profit to those who practice them. The mechanic who earns his living by working ten hours a day in a workshop, does not care to go home and pursue the same calling in the evening; but he can institute an agreeable change in his life, beautify his dwelling, and cultivate his taste by the use of the lathe, and thus obtain ornaments that would cost large sums if purchased at the stores; or he may, indeed, make the lathe a source of revenue, and sell the product of his skill and ingenuity at high prices to those who admire but have not the ability to construct.

To many mechanics, even, the lathe is merely a machine for turning cylinders or disks, or executing beads, ogees, scrolls, or curves of various radii, so that, after all, the work is pretty much alike, and ceases to be attractive. This is quite a mistaken view. There are no such goods in market as those made on lathes and peculiar tools used in connection with them—by lathes with traversing mandrels, with geometric chucks, with dome chucks, and compound slide rests. There are lathes that while one could chase up a five-eighth bolt in them as well as on the simple pulley and treadle machine, are also capable of executing all sorts of beautiful things—vases with bases nearly square, or exactly square, with round tops and hexagonal bodies, with gracefully curved angular sides and bases fluted vertically; boxes with curious patterns, resembling basket work; in fact, any combination of straight and curved lines cut in the sides it is possible for an ingenious man to invent. Strictly speaking these are not lathes, for in order to do the things beforementioned it is necessary to use other attachments in connection with them, so that the combination of them produces the results spoken of. There is, absolutely, an unlimited field for the genius of workmen to exert itself in designing patterns and executing work of an ornamental character.

All ornamental work resolves itself into movements of three kinds—angular, circular, and straight. From the combination of these with each other, the times where they merge and emerge, where a movement of one kind changes into any other, where an ellipse becomes part of a circle, where circles are generated across the circumferences of other circles, where these patterns are drawn over and upon each other without destroying the character of either—we say, by such movements, and many others which it would be confusing to follow, the most beautiful forms are made.

Or if the taste of the workman runs upon mechanical instead of artistic things, there are steam engines to be made, steam boilers to be spun up, of small size; in fact any piece or machine that can be thought of.

It is almost unnecessary to specify the innumerable kinds of work that can be done in a hand lathe, but the amateur who delights in metal turning may make trinkets of all kinds for his friends that shall vie in beauty with the best efforts of jewelers and goldsmiths. This, of course is dependent on the material used, the taste of the workman, and his originality of conception. Pins for ladies' wear can be made of boxwood and ebony glued together in sections, of all designs, and afterwards turned in beads and moldings, or otherwise ornamented in a chuck, as will be shown hereafter. Sleeve buttons can be made of ebony and silver, ivory and silver, pearl and gold, or any combination that is desired. Chess and checker men also afford a chance to display skill. And besides these, special work of any nature is within the capacity of the machine.

There is no family in this country that would not find it economy to have a foot lathe in the house where the members have mechanical tastes—not necessarily the male members, for ladies use tool lathes in Europe with the greatest dexterity. Some of the most beautiful work ever made was by Miss Holtzapfel, a relative of the celebrated mechanist of

the same name. If there are shovels to be mended, the lathe will drill the holes and turn the rivets. If the handle of the saucepan is loose, it will do the same. If scissors or knives want grinding, there is the lathe; if the casters on the sofa break down, there is the lathe; if skates need repairs, either of grinding or of any other kind, there is the lathe. In short, it ought to be as much a part of domestic economy as the sewing machine, for it takes the odd stitches in the mechanical department that save money.

Let not the inexperienced reader, who hears of a lathe for the first time, be frightened at this array of terms, or diverted from the use of it, by the recital. In its simple form, as shown at the head of this article, it is readily understood, and, after a little practice, easily managed by any one, and after the

amateurs, etc.; men who do not work a lathe constantly, but are called off to braze or solder, or, perhaps, to fit some detail with a file. For these uses the foot lathe is one of the cheapest tools; for the same person that does the work furnishes the power also, so that a man working on a foot or hand lathe, as it is often called, ought to have first-class wages. Moreover, a first-rate foot-lathe turner is always a good mechanic, for it takes no small degree of dexterity to perform the several jobs with ease and dispatch and certainty. To always get hold of the right tool, to use the same properly so that it will last a reasonable time without being ground or tempered, to rough turn hollow places with a square edge, to chase a true thread to the right size every time without making a drunken one, or a slanting one, to make a true thread inside of an oil cup or a box—all these several tasks require good judgment, dexterity, and a steady hand. Of course where a slide rest is used the case is different. We allude specially to a cutting tool managed by the hand.

To do all these things, however, it is necessary to have tools and good ones, or none. It is an old saying that a bad workman quarrels with his tools, but a good workman has a right to quarrel with bad tools if he is furnished with them, through chance or design. It is impossible to execute good work with a dull tool, one badly shaped, or unsuited to the purpose, and, therefore, it is important to set out right at the beginning.

There is no tool more efficient in the hands of a good workman than the diamond point, Fig. 1, here shown. For roughing off a piece of metal, for squaring up the end, for facing a piece held in the chuck, for running out a curve, or rounding up a globe, it is equally well adapted. It may be truly called the turner's friend.

[To be Continued.]

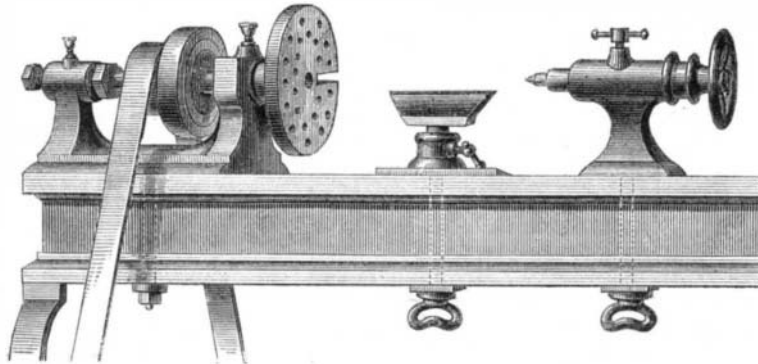
RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Steam Pump.—This invention relates to a steam pump in which the ordinary piston pump is replaced by two plunger pumps arranged on the opposite ends of the steam cylinder, and by this means all the difficulties now experienced with the pistons of the piston pumps, and with their cylinders, is avoided, the plunger or plungers in this improved pump being so arranged that the packing can be readily tightened, and the pump can be made to operate for a long time without requiring any repairs. The steam in the steam cylinder is changed by a valve motion of peculiar construction, said motion being composed of a spring hook which slides on the surface of a double toe, which is secured to the rock shaft governing the position of the steam valve, and the ends of which rest on stair-shaped spring catches in such a manner that, by the action of the sliding spring hook, which reciprocates with the piston rod, the stair-shaped spring pawls are disengaged, and the double toe is caused to change its position, thereby changing the steam valve instantaneously whenever the steam piston approaches either end of its stroke. Felix Brown, of Nos. 57, 59, and 61 Lewis street, New York, is the inventor.

Horse Rake.—This invention consists in a novel construction of the teeth of the rake and springs for the same, as well as in a novel manner of mounting the rake, whereby the device may be managed or operated with the greatest facility by the driver, rendered capable of working perfectly on rough or uneven ground, and capable of being constructed at a very moderate expense. Solon Bingham, of Troy, N. Y., is the inventor.

Machine for Bending Saw Frames.—This invention relates to a machine for bending wooden saw frames, such as are used for saws designed for sawing fire-wood, and which frames do not form a complete semicircle, the central portion being flattened. The invention, although more especially designed for bending saw frames, is applicable for bending wood for other purposes. T. D. Roberts, Middletown, N. Y.



first few weeks the amateur will realize the fruits of his application.

At first it had not even a continuous rotary motion, but the spindle was driven by a belt worked by a spring pole or its equivalent. The belt was rolled round the spindle, and the pole allowed to spring up; the spindle then revolved the length of the belt, or rope, for belts were not thought of, and the operation was repeated, the work being done only when the force of the spring pole revolved the spindle and the job the right way.

Foot lathes have, prior to the introduction of the engine lathe, been used on very heavy work. It is but a few years, comparatively speaking—not twenty—since cast-iron shafts, six, eight, and ten inches in diameter, were turned in such lathes. For all that we know to the contrary, many jobs, far exceeding this in size, have been thus executed.

In some shops there are still standing heavy oaken shears, made of timber twenty inches deep and four or six inches wide, faced with boiler iron, and in the racks above there are long-shanked tools with which the men of old were wont to do the work.

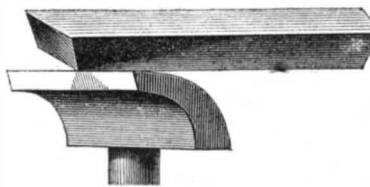


FIG. 1.

These lathes are never used now except for drilling holes, or for apprentices to practice on, but they serve to show what machinists had to do in olden times when there were no vise benches to sit on and watch the chips curling off the tool, as men do now.

Hand lathes are not in great favor in large machine shops. They are not used, or should not be, for any purpose except drilling, and then they are no longer hand lathes, but horizontal drilling machines. There is no simple work to be done on a hand lathe that could not be performed to better advantage and more cheaply on a machine constructed for the purpose.

Some large machine shops keep a hand lathe going continually cutting off stud bolts, facing and rounding up nuts and similar work. This does not seem profitable. A machine to do this work would do more of a better quality than hand labor could.

The foot lathe—the terms hand and foot lathe are synonymous—is principally used at the present time by small machinists, manufacturers of gas fixtures,