THE FOOT LATHE.

Number 4.

It is not always an easy task to chase a true thread on a piece of work, and even "the boldest holds his breath for a time," if he has a nice piece of work all done but the thread, and that in a critical part. It is so easy to make a drunken thread, or one in which the spirals are not true, but diverge or waver in their path around the shaft, that many are made. That they are more common than true threads, is well known to mechanics. To start a thread true is quite easy with an inside chaser; for, strange as it may seem, it is seldom that drunken thread is made on inside work; only have the bore itself true and the chaser will run in properly. The case is different when a bolt or shaft is to be cut. With fine threads, the slightest obstruction on the rest will cause the chaser to catch and stop slightly. No matter how slight the stoppage, it is certain to damage the thread. The injury is more perceptible on fine threads than on coarse, for in the former, if the threads do not fit (as they will not if they are drunken, one crossing the other, when both parts are put together), the drunken thread will not come fair with the other. In coarse threads, however, it will not be so apparent, for, by making the drunken thread smaller, it will have play and accommodate itself to its place. This is not workmanship, it is "make-shift."

To chase a true thread the rest must be smooth and free from burrs or depressions. Nice workmen keep a special rest with a hard, polished steel edge expressly for this purpose.

If the chasers themselves are smoothly finished at the bottom, on an emery wheel, they are all the better. With these precautions, and others noted below, success is certain. When a thread is to be started, take a fine diamond-pointed tool and hold it on the end of the shaft to be chased. Set the lathe going, and give the tool a quick twist with the wrist, so that a spiral will be traced on the work, like this figure.

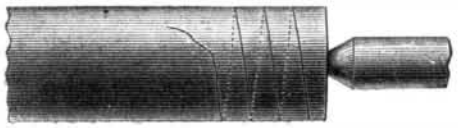


Fig. 16.

Some part of this will correspond with the pitch of the thread to be cut, and there is less liability of making it drunken. By a little practice one is able to hit the pitch of the chaser exactly in making a start.

"There is no trouble, after you once know how." We have chased quantities of small screws with 48 threads to the inch, and not a sixteenth of one inch in diameter. If the chaser once hesitates on such screws, they are spoiled. For heavy threads—seven and eight to the inch, which is about as hard work as any man wants to do, it is the custom of some turners to use a tool with only two teeth, and some use only a sharp-edged cutter, like this—

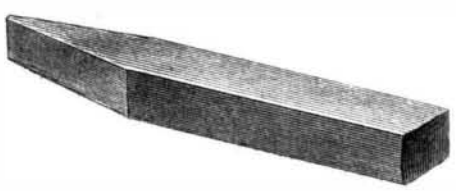


Fig. 17.

to deepen the thread, the chaser being used afterward to rectify the job. There is danger with this tool, unless it is used by an expert, of digging out the thread, so that the last end of it will be worse than the first.

Another tool used in chasing heavy threads is a doctor. This consists in having a fac-simile of the thread to be cut on the back of the chaser and in applying a short set screw behind, so that as the iron is cut away the chaser may be followed up behind. This is the doctor, but the follower opposite the chaser is too narrow, and should be made nearly half a circle to avoid slipping; with this exception it is all right.

These tools, and the screws made by them, are all inferior to those made by lathes with traversing mandrels; that is, a mandrel which slides in and out of the head rest, as in a Holtzapfel lathe.

This lathe has a series of hubs, unlike the one shown previously, slipped over the back end of the

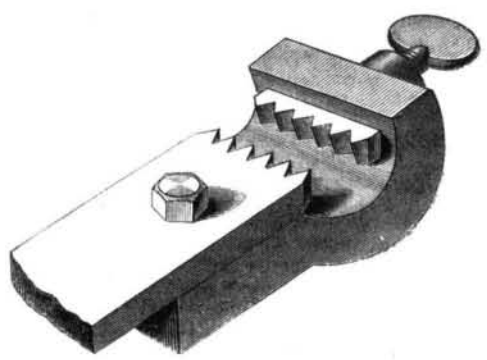


Fig. 18.

lathe spindle (furthest from the workman) and a fixed nut on the head-stock, which being put in communication with the hub on the mandrel, drives the same in and out according to the direction the coue pulleys are turned. Of course, with such an attachment as this, there is no danger of making drunken threads, for the hubs which start the threads are cut with a train of gears in an engine lathe, so that it is impossible for them to be incorrect. Moreover, a square thread, or a V-shaped thread can be made with them, which is not the case with common chasers.

In lathes that have traversing mandrels to cut screws, the tool itself remains stationary, but as this is obviously a disadvantage in many kinds of work, it is far better to have the tool advance and the mandrel revolve as usual. By this plan much time is saved, a greater range of work is possible with the same gear, and a piece that is chucked, or one that is between the centers can be cut with equal facility.

Any common lathe can be rigged to do this by putting a shell on the back end of the mandrel between the pulley and the set screw, and slipping the hub over the shell, with a feather, to keep it from turning. To take a thread from this hub, a round bar must be set parallel with the shears in easy working guides. The bar must have an arm at one end to reach over to the hub, said arm to be fitted with a piece of hard wood to match the thread on the hub. The other end of the bar has the cutting tool in it; of course at right angles, so as to run in to the work and bear on the tool rest. The tool is held in the bar by a set screw, so that it can be lengthened or shortened.

By this arrangement a true thread can be rapidly generated on any rod, hollow cylinder, or other kind of work—the pitch depending on the pitch of the hub.

It is necessary to have as many different hubs, varying in pitch as there are different kinds of work to be done, and although the thread on the hub is only an inch or half an inch long, perhaps, a screw of any length may be cut on a rod by simply shifting the cutter on the rest. This same bar is also useful for turning, as with a slide rest, for, by sliding it along gradually it acts in a measure like a fixed tool in a slide rest.

From these hints the amateur who takes a lathe in hand for the first time, or is at best a neophyte, may learn much to his advantage. Persons of a mechanical turn only need a hint, when the mind springs to the conclusion with surprising rapidity.

Fig. 19.

This little tool is very handy in many instances, particularly for running under the necks of screws when the thread is cut up to the head. By so making them the head comes fair down upon its bed and holds much better.

THE POTTERS' WHEEL.—In the archæological investigations in France, remains have been found of pottery so uneven and rude as to show clearly that it was made by hand without the aid of the potter's wheel; but in Egyptian tombs, which were built more than 2,000 years before the Christian era, there are paintings representing men at work with this ancient implement.

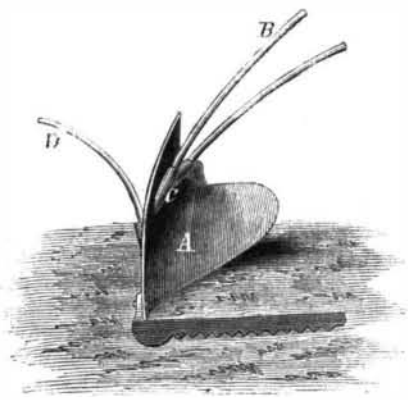
MARKET FOR THE MONTH.

The expected collapse in the great Chicago grain speculation has occurred, with the failure of many heavy operators. The price of cotton is, however, maintained, notwithstanding there is said to be a larger stock in this city and other markets, in bales and pounds, than ever before. Gold remains steady in spite of the continued inflation of our paper currency by the issue of notes to new National banks. The following table gives the prices of leading staples at the close of November and of December:—

	Price Dec. 27.	Price Nov. 29.
Coal (Anth.) ₩ 2,000 lb.	$13 00 @13 50	$13 00 @13 50
Coffee (Java) ₩ lb.	27 @ 28½	28 @ 29
Copper (Am. Ingot) ₩ lb.	41½@ 43	42 @ 45
Cotton (middling) ₩ lb.	51 @ 53	52 @ 54
Flour (State) ₩ bbl.	$7 20 @ 8 75	7 90 @ 9 00
Wheat ₩ bush.	2 25 @ 2 80	2 25 @ 2 85
Hay ₩ 100 lb.	75 @ 80	60 @ 65
Hemp (Am. drs'd) ₩ tun.	325 00@345 00	320 00@350 00
Hides (city slaughter) ₩ lb.	13	13
India-rubber ₩ lb.	43 @ 95	37½@ 90
Iron (American pig)	51 00 @52 00	50 00 @51 00
Iron (English and American refined bar)	110 00@115 00	125 00@130 00
Lead (Am.) ₩ 100 lb.	10 00	10 50
Nails ₩ 100 lb.	8 00 @ 8 25	8 00 @ 8 50
Petroleum (crude) ₩ gal.	40½ @ 41	40 @ 41
Beef (mess) ₩ bbl.	11 00 @24 00	11 00 @17 00
Saltpeter ₩ lb.	22	22
Spelter (plates)	10⅛@ 10¾	10½
Steel (Am. cast) ₩ lb.	13 @ 22	13 @ 22
Sugar (brown) ₩ lb.	11½@ 17½	12 @ 17¾
Wool (American Saxony fleece) ₩ lb.	75 @ 77	75 @ 77
Zinc ₩ lb.	15 @ 15½	16
Gold	1 45¼	1 48½
Interest (loans on call)	6 @ 7	7

FRAILEY'S MOWING MACHINE ATTACHMENT.

This improvement in mowing machines consists mainly in the combination of adjustable rods and a curved dividing board. The dividing board, A, has the shape of the mold board of a plow, which aids



greatly in turning the grass inwards as it is cut, and assists the ordinary rods, B, in their office. These rods are made adjustable, however, in fixed sockets, C, in the manner shown, and held by a set screw.

In addition to these details, there is an outside rod, D, made adjustable in like manner; this performs the important office of turning back the overhanging grass from the swath cut by the machine and throwing it upon the standing grass, thereby bringing the stems open at the bottom, so that in going the next round the machine can again cut to its full capacity, instead of losing six or more inches or cutting the overhanging tops only, as is the case when the grass is heavy or tangled.

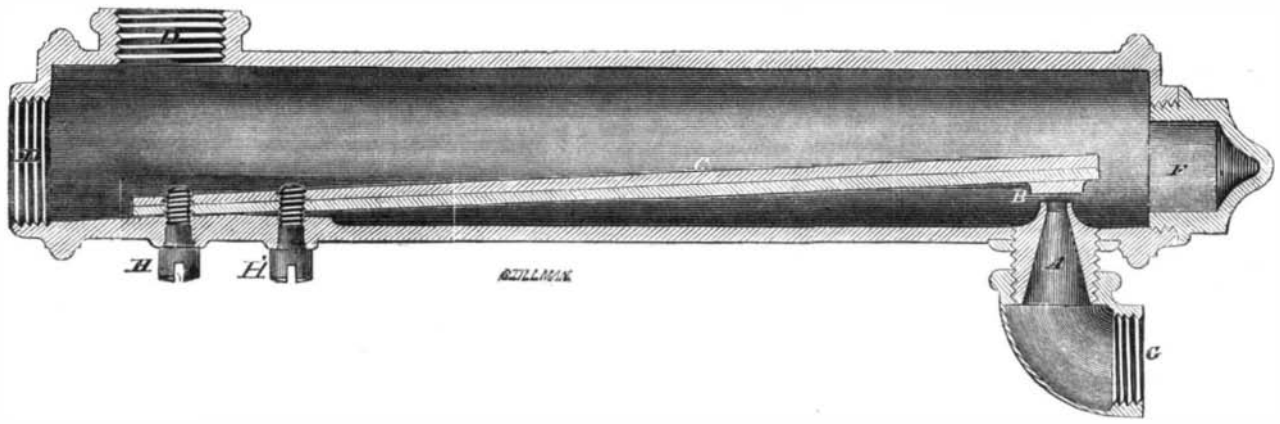
By the use of this track-clearer more work can be done, and done much better, in mowing grass, than without it. Experience and a fair trial, says the inventor, will secure its favorable reception every where as a desirable and useful improvement.

For particulars as to rights to sell or manufacture, apply to Frailey & Rohrer, Lancaster, P. O., Pa. Patented by H. L. Frailey, Dec. 5, 1865.

A PNEUMATIC DISPATCH IN BERLIN.—A pneumatic communication has just been set up between the Bourse and the central telegraph office at Berlin. Between the two there have been placed two parallel iron pipes 2,835 feet in length and 3½ inches in diameter. By one of them telegraphic dispatches deposited at the Bourse are carried to the central office, and by the other the reverse takes place in the space of from one minute to a minute and a half.

Improved Steam Trap.

The object of this invention is to remove air and condensed water from all kinds of steam apparatus, for which purpose it is claimed to be invaluable. This trap is self-acting, the valve remaining open for the escape of air and water as long as any remains, and closing, by a simple and beautiful device, on the approach of steam. The details are as follows:—D D are inlets, tapped to receive one-inch gas pipe; either may be used at pleasure; the one not used to be closed with a plug. A is a brass nipple or cone screwed into the body of the trap; the inner end is faced and forms the valve seat; the outside is screwed to receive the elbow, G, to which a pipe is connected to conduct the condensed water wherever desired. C is the spring, the upper leaf brass, and the lower steel; the two are closely riveted together. B, the valve, is a plate of common solder, raised on the under side of the steel leaf of the spring. H and H′ are screws for securing the spring and adjusting the valve to a proper hight above its seat.



WILSON'S STEAM TRAP.

The operation is as follows:—The air or condensed water enters through the inlet, D, from the steam pipe or apparatus, and readily escapes through the outlet, A. The steam follows, and its high temperature closes the valve, B, by means of the differential expansion of the two metals of which the spring is constructed. Thus: brass expands at a lower temperature and to a greater degree than steel; the upper leaf of the spring is brass—when the steam comes in contact with it, it raises its temperature and causes it to expand. Being secured at H and H′ by the screws, it can only expand in the direction of B; the steel leaf not being so sensitive, holds back against the expansion of the brass. The result of the opposite direction of these forces is to cause the valve end of the spring to describe a curve, until the the valve, B, is forced and firmly held on its seat, preventing the escape of any steam. Any condensed water afterwards collecting in the trap, cools and contracts the brass leaf, and opens the valve until the water has escaped, when the steam following at a higher temperature again closes it.

The seat of the spring from H to H′ is slightly rounded, enabling the valve end of the spring to be elevated or depressed, which is accomplished as follows:—By unscrewing H and screwing up H′ the valve, B, will be depressed, and by unscrewing H′ and screwing up H the valve will be raised. Where there is a large quantity of condensed water, or a very high pressure of steam used, the valve should be adjusted higher than when there is less condensation or less pressure of steam. The traps are all tested and adjusted, for any ordinary use, at the factory. They will very seldom require any re-adjusting. The cap, F, may be unscrewed for the purpose of removing any obstruction that may lodge in the chamber of the trap, or for taking the valve out for repairs, which may be made by any one who can use a soldering iron.

These traps have been in operation for six years, and have required no attention since they were put up. For further information address Greenwood Pipe Company, sole manufacturers for the United States, corner of Walnut and Canal streets, Cincinnati, Ohio, proprietors of the patent.

An object in motion will appear to be at rest when its motion in a second is to its distance as 1 is to 1,400.

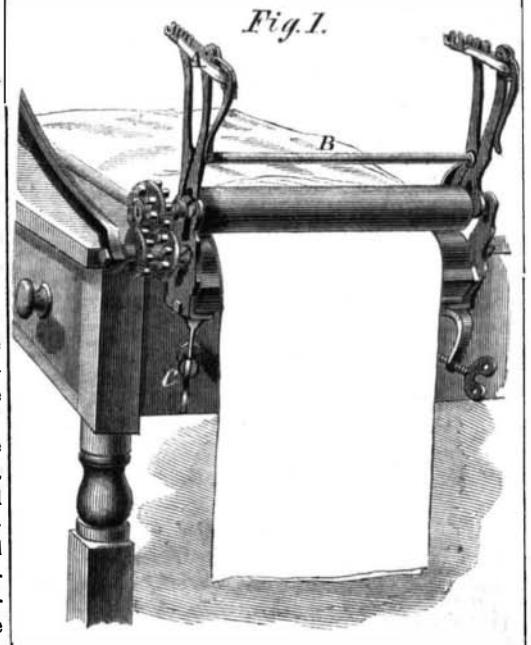
Tank Engines.

Tank engines will, no doubt, some day claim a page in history. The earliest steam carriages, however, carried their own water and fuel, and the first tramway and railway engines would have been equally independent of a "tender" but for the weakness of the trams and rails originally laid down, and over which it was therefore necessary to distribute the weight as much as possible. The *Novelty*, of 1829, was a tank engine; and so was Dr. Church's engine, the *Eclipse*, of 1837. An impression exists, however, that tank engines are of modern origin, and they have been widely attributed to Mr. W. Bridges Adams. He employed them, to some extent, where the whole weight did not exceed 10 tuns, but he publicly recorded his objections against their use for heavy trains. Tank engines came into extended use between 1847 and 1850 for branch traffic, and for service about stations, and there is reason for believing that they will be much more generally employed in future practice than they have yet been.—*Colborn's History of the Locomotive Engine.*

PALMER'S COMBINED WRINGER AND MANGLE.

During the last few years much progress has been made in lessening the labor and vexation of washing. Many good washing machines have been introduced, and the wringer is one of the most popular household utensils. But in the matter of ironing little advance has been made.

Fig. 1.



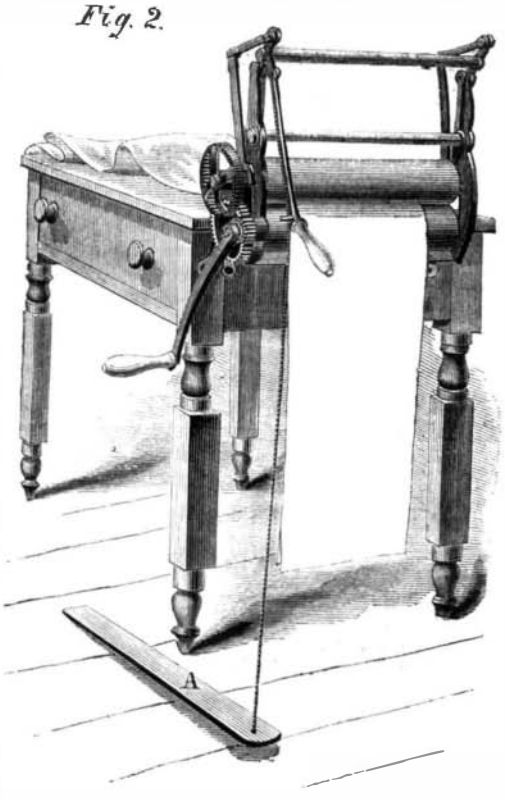
The machines shown in the engraving are very simple, and seem well designed for family use. Mangles, or machines for ironing without heat, or by pressure solely, are not new, but owing to their great cost, size and weight, their use has been confined to large hotels, laundries, etc., where they are considered indispensable. The economy of this method of ironing, both in time and fuel, is very considerable, as no heat is required, and the articles are ironed as quickly as they would be run through a wringing machine. The object of the inventors of these mangles is to place this method within the reach of all by furnishing effective machines occupying but little space at a low price.

Fig. 1 shows a machine which can be used either for wringing or ironing clothes. To this end it is provided with two sets of rolls—one of hard non-elastic rubber,, or wood for ironing, and one of soft rubber for wringing. The change is made in a moment by simply removing the bands, A, when the levers, B, are removed, and the rods can be taken out to put in. For ironing the machine is fastened to the ironing table by means of the removable clamps, C, Fig. 1. For wringing it is fastened to the tub or any similarly shaped vessel, by the swivel clamp.

Fig. 2 is a larger machine made to attach to any table for families, hotels, laundries, etc. The pressure is given through powerful compound levers, by placing the foot on the treadle.

These machines do the work in the most perfect manner, giving a brilliancy of luster and prominence of figure to table and towel linens not obtainable by the ordinary method. The hard rubber is perfectly

Fig. 2.



adapted to this purpose, and does away with the only serious obstacle to the general use of small sized mangles; wood dents and gets rough, while metal rolls cut the fabric or get rusty. These have the required hardness combined with the necessary elasticity. Application for a patent on this roll is now pending. Patented Nov. 14, 1864. For further information address the sole proprietors, S. W. Palmer & Co., Auburn, N. Y.

Varnishes for oil Paintings and Lithographs.—1. Dextrine 2 parts, alcohol 1 part, water 6 parts. 2. Varnish for drawings and lithographs—dextrine 2 parts, alcohol ½ part, water 2 parts. These should be prepared previously with two or three coats of thin starch or rice boiled and strained through a cloth.

Siphons were used in Egypt at least as early as 1450 B. C.