

## FRictional GEARING.

The following extract was lately published in the *New York Times*—

"Frictional gearing is coming into successful use in Great Britain for all purposes, from small machinery up to the driving of the screws of steamships. Instead of one wheel driving another by the intersection or 'mashing' of the 'cogs' or teeth of their rims, the adjacent surfaces or faces of the wheels are grooved lengthwise, or in the direction of their motion, like the rolls of a rolling mill. The grooves are V shaped, and the friction of the V's of one wheel against the sides of the V's of the other wheel is so great that the one drives the other, as in the case of cogs. The friction of the journals of the shafts is somewhat greater than in the case of toothed gearing, but in other respects the frictional wheels seem to work most smoothly. The 'back-lash' or rattle of teeth, especially when worn, is prevented. The chief economy is in first cost. The cutting of the teeth of gearing involves the application of abstruse mathematical principles: each side of each tooth is shaped to an epicycloidal curve, varying with the diameters of the wheels. The machines and processes required are extensive and numerous, especially in cases of beveled gearing. But the preparation of frictional gearing is the most simple and straight-forward work of the turning-lathe."

Regarding the exclusive use of this system of driving machinery in England, the accompanying letter throws some new light on the subject:—

Messrs. Editors:—In regard to an article on "Frictional Gearing" which recently appeared in the *New York Times*, and which has been copied into other papers, it is liable to lead many persons to suppose such gearing had never been introduced into this country. It was first used in this section, however, by Mr. William Nichols, who put it up to drive the feed works in a saw-mill which he was building. He first tried flat surfaces, but they did not satisfy him, so he took the same wheels and had a V-groove turned in one and the other with a rim to fit it. I think it was entirely original with him, and he considered it an experiment at the time he tried it. The gearing answered admirably and has been in use in Messrs. Bartles & Readin's mill ever since, up to this day. For smoothness of action and the ease with which it is thrown in and out of gear, it is vastly superior to the toothed gear usually in use in sawmills; as a sawyer can, with one hand and very little effort, throw the "feed" out and the "gig-back" in, and *vice versa*. It would also make an excellent arrangement for "jacking" the logs into the mill; in fact, it is superior in any place in which the clutch is now employed. I think that if all your sawmill readers will only try it, they will agree with me in regard to the superiority of the frictional gearing in any situation where it can be used.

H. F. S.

Williamsport, Pa., Jan. 3, 1860.

[Our correspondent does not state when Mr. Nichols first introduced frictional gearing into the mill in question, but we suppose it was several years ago.—Eds.]

## FALL OF A FACTORY--SAD AFFAIR.

One of the most heart-rending events which have ever taken place in this country occurred at Lawrence, Mass., on the 10th inst., by the falling of the Pemberton Mills, an immense cotton factory, by which 115 persons were killed and 165 wounded. The building was 280 feet long, 70 wide, and 5 stories high. It contained 2,700 spindles or spinning frames, several hundred looms, carding machines, any other machinery, and 960 operatives were employed in it. About 600 persons were in the mill when it fell, and that all were not killed appears miraculous. Some extraordinary cases of escape are related, and more persons would have been rescued from under the ruins, but a fire broke out when the walls fell, and many of the poor creatures, who were only covered up under fallen beams and the flooring, were consumed in the flames, and perished in great agony. It is said that the structure was deficient in strength from the first day it was erected. There is no country in the world where life is so insecure, from defective buildings, as the United States. We feel and acknowledge the disgrace.

TO RE-JAPAN OLD TRAYS.—First clean them thoroughly with soap and water and a little rotten-stone; then dry them by wiping and exposure at the fire. Next get some good copal varnish, mix it with some bronze powder, and apply with a brush to the denuded parts. After which set the tea-tray in an oven at a heat of 212° or 300° until the varnish is dry. Two coats will make it equal to new.

## WEEKLY SUMMARY OF INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

## BOOTS AND SHOES.

The object of this invention is to enable the manufacturer to perform the work, which is now done by hand, and to make the entire boot or shoe by any ordinary sewing mechanism for carrying waxed thread, with the exception of putting on the heel, which is a very simple and comparatively easy operation when the sole has been properly attached. This improvement enables the manufacturer of boots or shoes to put together his work with great facility and a great saving of time is accomplished, there will be less expense attending the manufacture of sewed shoes, and they may be furnished below the present market value of pegged shoes. Another great advantage in this invention is that the entire work of sewing about a boot or shoe can be performed in a neat and perfect manner by ordinary workmen, and those unskilled in the present art of making boots and shoes, therefore the expense of workmen will be much reduced, while the work can be made equal if not superior in strength and durability to those at present furnished to the market. For this purpose the invention consists in sewing the welt or strip of leather to the leather upper, which is previously fitted as near the edge of the same as may be found necessary, before the upper is lasted. The patentee of this invention is Francis D. Ballou, of Abington, Mass.

## MANUFACTURE OF STEARIC ACID.

In the manufacture of stearic acid, by what is known as the distilling process, the oil, tallow or other crude fatty matter after being washed or otherwise purified, is put into what is called the acidifying pan and therein subjected to the action of sulphuric acid and heat, and when thoroughly acidified, as it is termed, the fat is drawn off from the pan to be distilled, leaving therein the black residuum known as "acid bottoms." This residuum has been known to contain a considerable quantity of fatty matter, and attempts have been made to extract it by various means, but none have been found to pay. Attempts have been made to convert the said residuum to various useful purposes but it has never been successfully used otherwise than as a fuel. This invention consists in subjecting the said residuum to a distilling process in which it is exposed to the action of the superheated steam, by which means fatty matter (stearic acid &c.) to the amount of from 20 to 25 per cent by weight of the whole of the residuum may be obtained from it. This invention has been patented to David Thain and William Jackson, of Philadelphia, Pa.

## COTTON GIN.

This invention relates to an improved feeding device by which the cotton is presented to the rollers in such a way as to permit of the free escape or discharge of the seed as they are detached and ripped from the staple without permitting any valuable portion of the staple to escape with the seed, and also presented in a layer or bat equal in width to the length of the rollers, whereby the latter are enabled to operate in the most efficient manner. It consists firstly in combining a guard with a feed board substantially as hereafter shown, whereby the feeding device is simplified and rendered more efficacious than hitherto. It consists secondly in the employment or use of a corrugated roller in connection with an auxiliary smooth roller in addition to a roller furnished with a smooth yielding surface, against which the two first mentioned rollers bear, whereby the process of ginning by rollers is greatly expedited without in the least deteriorating the staple. It consists thirdly in the employment or use of a discharging device composed of rollers so arranged that the ginned cotton is discharged in a loose light and untangled state. This improvement was designed by Lewis S. Chichester, of this city.

## SEWING MACHINES.

This invention consists in a novel mode of applying two dogs, the one to move, and the other to prevent the backward movement of the feed wheel, whereby the necessity of the application of a friction brake to the said wheel is dispensed with, and the said wheel, though secured against any tendency to turn it the wrong way, is permitted to turn in the right direction with very little friction. It also consists in certain novel and very convenient means of regulating the feed movement, whereby

it may be adjusted before commencing to operate the machine, to produce any lengths of stitch that may be desired. The inventor of this improvement is John Dick, of this city.

## CANDLES.

This invention consists in providing a candle with a tubular wick which forms an air channel right through it for the admission of air through the center of the flame, such wick having a lining of sized, starched or glazed paper or other substance sufficiently impervious to the material of which the candle is composed, applied within it, for the purpose of excluding the melted material from its air channel during the burning of the candle and preserving a free passage for the air to the center of the flame till the candle is all burned. The credit of this contrivance is due to Halvor Halvorson, of Cambridge, Mass.

## SPINNING FRAMES.

This invention consists in constructing the ring employed in the spinning frame with a narrow upwardly projecting rim arranged midway or thereabout between the inner and outer margins of the face of the ring. The object of this construction of the ring is to provide a better bearing for the traveler to keep it in a horizontal or nearly horizontal position than the ordinary flat topped ring, and thereby to cause a more uniform draft upon the yarn in the spinning process. The patentee of this invention is M. P. Wilmarth, of Pawtucket, R. I.

## COTTON-SCRAPER.

Among the various implements for the purpose of scraping and weeding young crops, such as cotton, sugar cane, corn, &c., the cotton-scraper of Messrs. Newcomb & Bird is one of the most novel and effective tools which has lately come to our notice. It consists in the employment of a vibrating double acting hoc, that is operated by a vertical rockshaft in such a manner that it cuts both ways in a direction across the row of cotton, corn, or other drill plant, in which the machine runs forward, leaving the weed in bunches the size of which may be varied according to the size of the box. The inventors of this device reside at Smith's Fork, Tenn., and it was patented last week.

## HOP FRAMES.

This invention relates to a device for lowering the vines and bringing them within reach, for the facility of gathering the hops, and then for elevating them again to their original position, keeping the horizontal cords or wires, upon which the vines are entwined, under tension all the time. This invention consists in attaching to the posts a vertical strip with a small grooved pulley in its top over which passes a cord, which is attached to a sliding box for elevating and depressing this box, and to this sliding box is connected a yoke provided with a hook which hooks into an eye or loop on the end of the wires forming the frame upon which wires the vines are entwined; the object being to tighten up these wires, and to keep them under tension while raising and lowering them. L. A. Beardsley, of Edmeston, N. Y., is the patentee.

## ARTIFICIAL LEGS

D. De Forrest Douglas, of Springfield, Mass., has what appears to be a very excellent improvement in Artificial legs, the principal object of which is to enable the knee and ankle to be made with morise and tenon joints. These joints have been generally admitted to be the best for the purpose, but some practical difficulties which have been overcome by Mr. D. have prevented their being hitherto generally used. This invention is one that cannot well be explained without illustrations, which we hope soon to give.

## BORING BRUSH BLOCKS.

This invention consists in the use of a polygonal drum having the brush blocks attached to it, and so arranged as to have an intermittent longitudinal sliding movement, an intermittent rotary movement, and a reciprocating feed movement, said drum being used in connection with drills whereby the blocks may be bored very expeditiously, and a considerable number operated upon simultaneously. The credit of this contrivance is due to Thos. Mitchell, of Lansingburgh, N. Y.

## ALARM LOCK.

This invention consists in a novel arrangement of levers and stops with the knob-arbor and an alarm placed within a suitable case and applied to a drawer or till, whereby the drawer or till cannot be illegitimately opened, or an effort made to thus open it, without an