

THE RETAILER AND Wood-Worker

ELECTRICALLY EQUIPPING A WOOD-WORKING FACTORY.

HAVING decided to put in electrical transmission, the first thing is to estimate the horse power required by the machines in the factory, writes James F. Hobart, M. E., in the Wood-Worker. I will begin with a small shop, to have a pony planer, a cutting-up saw, a pattern makers' saw (reversible, with two saws), a band saw, a shaper or irregular molder, three speed lathes, a mortising machine, a sticker, a tenoning machine, grindstone and several little special home-made machines. We will set down the several machines for power, as follows:

Pony planer	5 h.p.	speed 1,000 revolutions
Cutting-up saw	2 "	" 2,500 "
Pattern saw	2 "	" 2,500 "
Band saw	1 "	" 600 "
Shaper	3 "	" 800 "
Speed lathes	3 "	" 900 "
Mortiser	1/2 "	" 200 "
Tenoner	2 "	" 800 "
Grindstone	1/2 "	" 100 "
Special machines	2 "	500 to 1,000 "

20 1/2 h.p.

Here is over 20 h.p. required at the several machines. There is one point, however, that may be considered. In a small shop it is seldom or never the case that all the machines are in operation at the same time. If there are only two or three men in the shop, only a like number of machines can be operated at the same time, and the motive power may be put in accordingly. If, however, all the machines are to be run at the same time, more power will be necessary than when otherwise is the case. In this instance it will be figured that all the machines may be operated at the same time, and power enough provided to run them continually. From the natural arrangement of most wood-working shops, the cut-off saw, the planer, one of the speed lathes (the heavy one), and one of the special machines may be driven in one group and called the "heavy tools" of the shop. A 10-horse motor may be put in to run this group and another 10-horse motor used for driving the remainder of the machinery in another group.

It is a peculiarity of electric motors that they may be operated for short periods of time—say from 15 minutes to an hour—at a capacity far above that at which they are rated. For instance, the 10 horse motor may be made to yield 15 or 20 h.p. for nearly half an hour at a time without damage to the motor, although it will heat up considerably during the period of overwork. It is this principle which allows the putting in of a comparatively small motor when only one or two men are to work in a shop. In that case, two five-horse motors would run the shop here described, as for the short periods of time the greater amount of power would be required, the motors could be called upon to furnish it without damage. If but one man ever expected to work in the shop, a single five-horse motor would be sufficient and all the tools could be belted direct from a single shaft. This is not practicable when the engine is used to drive the shaft direct, as owing to the slow speed of the motive power machine, the shaft must be driven at a speed ranging from 200 to 300 revolutions per minute. With the electric motor arrangement the shaft can be speeded up to 600 revolutions per minute and driven direct from the motor, or with only a single reduction of speed.

With two motors of 10 h.p. each, let there be two shafts, each with its own group of machines, both shafts running at 600, and the machines connected to the shafts by means of friction clutches. The several speeds given in the table above are for the pulleys of the several machines to which the belts must lead from the motor or shaft. The saw speeds are the speeds of the mandrels.

Of the planer and sticker the speed of the shaft in the machine is given. In case the planer does not belt from an internal counter, then a different speed will be required than in the table. The lathe speeds are those of the shafts on which the step pulleys are placed. The mortising machine speed is that of the pulley on machine, etc.

Having only 10 h.p. to transmit, a quite light shaft may be employed at the speed named. A pretty good formula for the diameter of the shaft required, is to divide the horse power to be transmitted by the speed per minute, take the fourth root and multiply by a constant ranging from 5.26 to 3.03, according as an iron or steel shaft is to be used, and it is to be very stiff, or well supported. A 1 1/2-inch steel shaft will be ample to run either group of machines at the speed mentioned, viz., 600 revolutions per minute. Such a shaft will run easily, consume very little power, and is large enough to hold the friction clutches securely if they are placed close to the hangers.

The motor which drives each shaft should be hung from the roof or placed on a sort of shelf made by bolting a couple of plank brackets to a convenient post, up above the heads of the workmen. There the motor will be out of the way and there will be less temptation to "monkey" with it. A hood or box should be built over it which will keep out all dirt and dust that may settle there. Do not box the motor up tight, for it is necessary that the machine be well ventilated at all times, to carry off the heat generated in the wire coils. If it is boxed tight there is no circulation of air, and the motor will heat badly.

The next consideration is the current. If the mill is an isolated concern, a dynamo must be put in the engine room and the engine coupled direct thereto. If the shop is in a city, it may be cheaper to purchase current from the lighting or the street railway company. Sometimes, when only two or three miles from town, and there is a high tension service, the power may be transmitted at 6,000 volts with but little loss, and then changed to a low tension current at the shop, by means of "step down" transformers. The low tension currents are also of the alternating variety, and to operate ordinary motors with this current, it must be transformed to a continuous current by passing it through a sort of dynamo called a "rotary transformer." This machine changes the low pressure alternating current into a low pressure continuous current, which passes directly to the motors. All these appliances consume some of the energy, and it is better to use the direct low pressure, or low tension (110 volts) current when it can be obtained cheaper than by making it on the premises, or by transforming the high pressure current brought from a distance. Here all the details must be known in order to make a profitable decision in the matter.

White maple is being successfully used in the manufacture of bicycle rims.

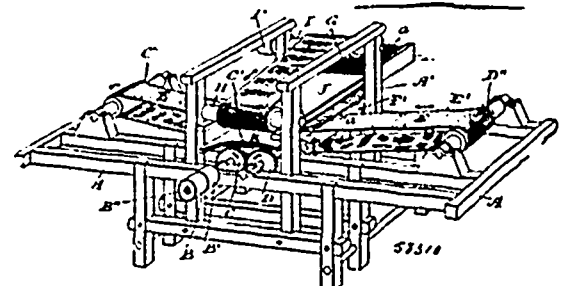
The Commercial says that one of the growing industries of Winnipeg is the wood working establishment of La Londe & Millord. The factory is supplied with planer, moulder, scroll saws, jointer, mortising machine, rip and cross cut saws, turning lathes, shaper, boring machine, spindle chuck, etc., all from the works of Macgregor, Gourlay & Co., of Galt.

A wise man of Philadelphia has invented a combined sawing and planing device especially applicable for sawing thin boards into strips, such as are used for cigar boxes, etc. On the outside of the circular saw are separating discs, which prevent the sawed edges from closing together, and on the outside of the separators are cutting or planing discs, which plane the insides as fast as the saw cut is made.

RECENT CANADIAN PATENTS.

THE Patent Office Record contains descriptions of several devices of interest to woodworkers, for which patents have been granted in Canada.

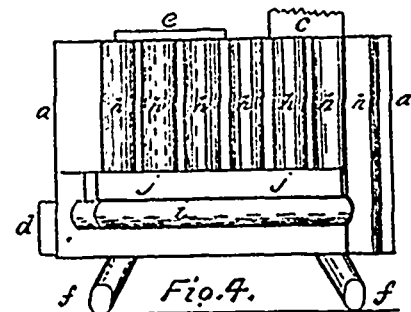
George McKenzie, of Wingham, Ont., has been granted a patent for an apparatus for sharpening skewers, which is illustrated herewith. It consists of the combination of two endless sand belts mounted on rollers journaled on the frame so as to have a certain pitch from the horizontal, a skewer table and a transverse endless belt so located as to bear on the series of skewer rods projecting over the sides of the skewer table so as to be in contact



MACHINE FOR SHARPENING SKEWERS.

with the said belts and pass them transversely across the sand belts through the machine. E and E' are the sand belts, C and D the gear wheels, C', D', C'' and D'' the rollers, F and F' the taper rollers, G the endless transverse belt, H and I the rollers, J the guide piece, K the skewer table, C the feed piece, and I the grooves.

A method of and apparatus for producing coal from wood, sawdust, etc., numbered 57,953, has been patented in Canada by W. A. G. V. Heidenstam, of Skowiek, Medelpad, Sweden. The claim is for a method of producing charcoal from wood, peat, or other suitable material, which consists in feeding or pressing the prepared raw material in and through heated charring-tubes or channels in such a manner that the material is charred and compressed while moving through, leading off the different bye-products where they are formed, and finally cooling off the charcoal.



HEATER FOR BURNING SAWDUST.

A heater for the purpose of burning sawdust, patented by Frederick Sheppard and John Alexander, of Peterboro', Ont., is illustrated above. It consists of the combination in a metal heater having an outside casing, a, a, a, a, fuel opening e, smoke pipe c, damper opening d, legs f, f, f, vertical air flues h, h, h, h, horizontal air flues i, i, i, i, rim j, j, and fire clay filling K, K, K, K, with the perforated grate O, O.

Two patents, Nos. 58,219 and 58,220, have been granted to George Glass, of Port Huron, Michigan, for slab gauges or indicators for saw mill carriages. Wm. J. Ellis, of Winnsboro, Louisiana, has patented a saw gummer, and Henry McDermott, of Marinette, Wis., saw mill set works.

The Mississippi Wood and Iron Works Co. has been organized at Carleton Place, Ont., to start a new industry.

There was never a time when so much attention was paid to improving machinery for making boxes and other forms of packages as at present. Nearly all the larger makers of woodworking machines include some special box-making machines in their lines, while a number of very good concerns make a specialty of this line of machinery. Machines for making lock-corner boxes have been given special attention during the past two or three years, and the man who wants to make these boxes can take his pick of a number of good makes of machines.