THE TOOL MAKER.

The tool maker has within the past few years (says the *American Machinist*) come to be a permanent fixture in most machine shops. The machinist twenty-five years ago was of all mechanics, except, perhaps, the blacksmith, the one who made his own tools. Now, as a natural result of the subdivision of the trade, the tool maker makes them for him. Notwithstanding a great proportion of the small tools, such as taps and reamers, that were formerly made in the machine shops are now had from the manufacturers who make a specialty of such work, there are still many for peculiar uses that must be made in the shop, while special appliances and fixtures for different jobs are made and used where their use would never have been thought of a few years ago. One advantage of having a skilled man — that is, speacially skilled in this kind of work — to make these tools and appliances, is that they are much better made than they were formerly. Not only does the tool maker acquire special skill in designing and making tools for expediting work, but his tools are a record of his efficiency as a mechanic, and his reputation in this respect stands or falls by their quality. When such tools are made indiscriminately by anyone of a shop full of men, no one has much interest in them ; their making is looked upon in the sense of a drudgery, to be done without much preparation, and got through with as easily as possible. Tools made and got together in this way in a shop lacked character, so to speak. Nobody was much interested in studying principles. Making the tools was a secondary matter, for which no one assumed any particular responsibility. The end at which the machinist aimed, and upon which his reputation as a mechanic rested, was something quite different from tool making. Many shops that before the advent of the tool maker could count up time equal to that of two or three men constantly engaged in making tools, find upon employing a skilled tool maker, and giving him the necessary machinery to work with, that he not only makes all the tools, but devises special ones for lessening time on many classes of work. In other than machine shops the tool maker is of still greater importance ; in such businesses as button making and kindred branches of manufacture, where new designs are constantly demanding new tools, and where the operations must be quickly performed the wages he is able to command are frequently three times as much as those of an ordinary mechanic. But he must be a highly skilled man. While in one sense the work is not hard, it is exacting, calls for a good deal of thinking, and the ability to think correctly and quickly. If a machinist — a young man — has a decided talent in the direction of devising and making tools, it is worth cultivating ; mere copying does not amount to much, but the ability to originate is valuable.

Miscellaneous Notes.

The tin deposits of New South Wales are estimated by the colonial geologist to cover an area of 5,440,000 acres, but it is supposed that the area is realy much greater than that, as new fields of tin are continually reported.

A good many miles are offered for sale in sections of the country where the wheat crop was nearly or quite a failure, this year. Without doubt, some of them are offered for sale solely on that account. We believe that in many instances parties with capital could make money by purchasing the property of the despondents, where the crop failure is the real cause of selling. Parts of the country have little or no wheat this year, where for years a failure has been unknown. Another year will doubtless see plenty of wheat in such sections, and with a cheap mill on his hands prosperity may come his way. Wheat-raising will not be abondoned in such States as Illinois and Missouri on account of one failure.—*American Miller.*

"Midget locomotives" for plantation use are said to be superseding mules. One of them weighs only 3 tons, and they are used on rails which weigh 12 pounds to the yard. The cylinders are only 10 inches long. These little engines are not confined to wood for fuel. As lumbermen, they burn wood. As plantation engines, they frequently burn refuse sugar-cane. In a different form, but with the same diminutive cylinders, they are used in coal mines for hauling cars, and burn either soft or hard coal or coke. In their smallest sizes they are only 10 feet long over all, 4½ feet high and 5 feet wide. A few bushels of coal and a few pails of water keep them running all day. One of these mules in a coal mine at Brookfield, Ohio, pulls 20 cars, weighing nearly theree-quarters of a tone each, up a grade 1,360 yards long that rises at the rate of 105 feet to the mile.—*Railway Age.*

THE making of celluloid is an interesting process. A roll of paper is slowly unwound, and at the same time saturated with a mixture of five parts of sulphuric acid, and two parts of nitric, which falls on the paper in a nice spray. This changes the cellulose of the paper into a fine pyroxyline (gun cotton). The excess of acid having been expelled by pressure, the paper is washed with plenty of water, until all traces of the acid have been removed ; it is then reduced to pulp, and passed to the bleaching trough. Most of the water having been got rid of by means of a strainer, the pulp is mixed with from twenty to forty per cent. of its weight of camphor, and the mixture thoroughly triturated under mill stones. The necessary coloring matter having been added in the form of powder, a second mixture and grinding follows. The finely divided pulp is then spread out in thin layers on slabs, and from twenty to twenty-five of these layers are placed in a hydraulic press, separated from one another by sheets of blotting paper, and are subjected to a pressure of 140 atmospheres, until all traces of moisture have been got rid of. The plates thus obtained are broken up and soaked for twenty-four hours in alcohol. The matter is then passed between rollers heated to 140 or 150 degrees Fahrenheit, when it issues in the form of elastic sheets.

THE operation of sharpening band saws is both slow and tedious, and demands considerable skill on the part of the workman. It has therefore been an object with inventors to produce a machine which should supersede hand labor in this respect, and the perspective view on the present page illustrates an arrangement invented in Denmark by the owner of a saw-mill, and afterwards modified, as shown in Figs. 1, 2, and 3, by Mr. Edward Rasmussen, of the firm of Rasmussen and Sons, of Slagelse, Denmark, for this purpose. The patents are in the hands of Mr. Carl Mortensen, of the same place.

The machine consists of a cast-iron bed-plate upon and below which the working parts are arranged. The cutting tool is a 5½ in. or 6 in. taper saw file carried in the support L (Fig. 1), which is moved backwards and forwards in the guide C by means of the connecting rod K and a crank, the whole being set in motion by the pulley T. A is a vice in which the band saw blace is held by means of a horseshoe spring P. During the operation the saw rests upon two steel stops Q, which by a mechanism clearly shown in Figs. 1 and 2, can be so adjusted that the blade has only its teeth above the vice. The up-and-down movement of the saw file, bombined with the feeding of the saw blade by the pawl G, is effected by means of a two armed lever S, placed below the bedplate in the following manner: The eccentric disc O, driven through the pulley T and the mitre wheel U, produces a pressure upon the friction roller M resting in the bearing N. This pressure is transmitted to the end of the lever S, and produces in the adjustable support F resting on the other end of the lever, a reverse motion. Now, upon the head of F there rests the guide C, which is pivotted at I, and which, therefore, follows F in its up-and-down motions. Supposing the movement to begin when the file commences its advancing stroke, then the disk O has its shortest radius turned toward the roller M ; this being at its highest point, the support F, with the guide and the file, are consequently in their lowest position, *i.e.*, the file is touching the saw blade. The file stroke being ended the eccentric disc O assumes the position in which it has its largest radius against the roller, and the motion of the lever S, and consequently of the guide, the file, and its carrier, is reversed, the file being kept raised above the saw blade during its back motioh. Just before the file touches the saw blade the pawl G commences to retire, but when the file has made its stroke and is returning above the saw blade the pawl pushes this latter one tooth forward. The length of the movement of the pawl is adjustable by the index attached to disc O. The spring B is applied when the file is nearly worn out to increase the pressure of the saw blade. By means of the screws X X the steel springs Y Y can be pressed more or less against the guide, and thus a very exact sideway adjustment of the file upon the saw blade can be obtained.

The machine takes very little power and is so extremely simple to manipulate that a boy can work it. It is designed to run about 80 revolutions per minute, and will sharpen band saw blades from 2¼ in. broad down to the slenderest blades.—*Eng.*