face of which there is attached a shaving tool, the edge of which at the face of the supporting disc, touches the centre pin, tapering outwards to the other end, which is out a depth equal to the tube wall thickness. The tube safe end piece, held in the bolt machine vise, is forced over the centre pin, and on the shaving tool, which chamfers the edge as desired. We are indebted to E. Glavin, foreman machine shop, for this information.

Drilling Speeds.

In a machine shop there are always a number of mechanics who have drilling to do but who possess little or no idea of the proper speeds to employ. In many cases it depends entirely upon the operator's judgment whether or not the machine is run at the highest speed that is consistent with good work. If the mechanic's judgment is poor-mere guesswork-a satisfactory rate of production combined with good work can-Not be reasonably expected. When such a mechanic is given a table of drilling speeds expressed in revolutions per minute, it frequently happens that he does not know how tc use it, and the average foreman does not have much time to explain details of this kind. A table of the form given herewith represents a simple means of conveying the required information in regard to suitable drill speeds. It can be made on tracing cloth so that blueprints may be made from time to time. These prints should be pasted

| and the second s | SIZE OF DRILLS | CARBON STEEL DRILLS | | | | | | | | HIGH SPEED STEEL DRILLS | | | | | | | |
|--|-------------------|---------------------|-------|------|-------|-------|---|----|------|-------------------------|-------|------|-------|-------|-----|---|------|
| | | C. I. | M. S. | T.S. | C. S. | BRASS | | | See. | c. t. | M. S. | T.S. | c. s. | BRASS | | | |
| | | | | 1 | | | R | 1 | | | | | | | | | 1000 |
| | | | | | 10 | | | | 50 | | | | - | 1115 | | | |
| 5 6 7 8 | | 2 | | | | | | 10 | | | | | | | | | |
| BACK GEARS | | - | | - | | | | - | | _ | | - | | | | 1 | |
| | | | - | - | | | | | | | - | | - | | No. | | |
| | | | | | | | 1 | | | | | - | - | - | | - | - |

Diagram and Table of Drilling Speeds.

a piece of board and given a coat of They can be hung near the drilling ma-chines for ready reference.

The diagram at the left of the table shows the belt positions with and without the back gears, these positions being numbered 1, 2, 3 and 4 for the direct drive, and 5, 6, 7 and 8 when the drive is through the back. back gears. It will be obvious that each one of these belt positions corresponds to a Certain number of revolutions per minute of data taken from a machinists' handbook, the table at the right hand side may be filled in with the numbers of the belt posi-tion. tions, giving the speeds nearest the correct With this the mechanic only has to know the size and kind of drill he is using and material he is drilling, in order to determine the correct drilling speed to employ. The preceding information refers to the application of a table of this sort to drilling machines, but similar tables could be combiled for lathes, milling machines, boring mills and any other machines that make use of cone pulleys and back gears to provide the necessary speed variations. The table cculd be made to include the proper feed to employ with each speed and material, but $t_0 \text{ employ}$ with each speed and material, but great great care must be used or the entire object of the scheme will be lost. machinist has difficulty in using any but the simplest of tables, and his judgment in regard regard to the feeds is generally more accurate than his ideas of the correct cutting speeds.—Machinery, New York.

Superheater Tube Sheet Borer on Canadian Northern Railway.

The Canadian Northern Ry. has adopted boring tool. standard the tube sheet 28 shown in the accompanying illustration. It consists of a cross bar of steel, on the upper face of which there is a no. 5 Morse taper



Superheater Tube Sheet Borer.

shank, and concentric with it on the other side, a 7/8 x 11/4 in. guiding tip. Through the cross bar there are two rectangular holes, of a size to take a cutting tool and key, and held in position by 1/2 in. steel set screws. The keys are collared on the upper end, to prevent them from falling through while adjusting. This key feature makes it possible to use the same tool for both tube sheets, the larger holes being cut with the keys inside the cutting tools, and the smaller holes with the positions of the cutting tools and keys reversed. The tube sheet is laid out for all the holes, which are drilled 15-16 in. diam. These holes form guides for the tool tip, which has a 1-16 in. working clearance. The cutter forms a hole 1/8 in. smaller in diameter than the finished size, this remaining 1/8 in. being finally reamed out the same as the usual practice with the smaller tubes.

A Substitute for Files for Triple Valve Work.

When triple valves have been in service for a considerable time and are removed from cars or locomotives to be cleaned and repaired, a good many of them have leaky slide valves, on account of elevations and depressions at the face of the slide valve and the slide seat, due to uneven wear between the two surfaces. When repairing them, it is necessary to first file the face When repairing of the slide valves as well as the slide valve seat perfectly straight before the work of grinding in the slide valve is commenced. Common, flat, smooth files are not suitable for this work, and it therefore has become



Device for Triple Valve Repair Work.

a practice in many shops to use special cut square files at an average cost of about \$1.50 each.

G. L. Van Doren, Superintendent of the Central Rd. of New Jersey shops at Elizabethport, N.J., has designed a simple device, as shown in the accompanying illustration, which does away with the expense of purchasing special files, and the results are in every way just as satisfactory as if the work had been done with a special file. A is a piece of T iron planed off on the under side to receive a strip of emery cloth of the proper width. The ends of the T iron are finished to receive a file handle.

B is a piece of emery cloth and C is a little clamp to hold the emery cloth stretched to the T iron. The expense of the emery cloth in comparison with a special file is insignificant. Special grades of emery cloth may be used. The device is useful for different kinds of jobs besides triple valves, such as slide valve feed valves, distributing valves, etc. F. J. Borer, Airbrake Foreman, Cen-tral Rd. of New Jersey, in Railway Master Mechanic.

Spark Arresters for Locomotives Burning Non-Coking Coals.

The Board of Railway Commissioners issued the following circular, Jan. 25:-"During the past two years, numerous complaints have been received by the Board as to fire danger resulting from the use as locomotive fuel of certain classes of western coals. A careful investigation of this situ-ation by the Board's officers reveals the fact that excessive sparking results from the use of such coals, and that, even when kept in perfect order, the spark arresting devices prescribed in regulation 2 of General Order 107 are inadequate to reduce within reasonable limits the number of live sparks thrown from the stack. The existence of this situation has been recognized by some of the western railways, which have voluntarily discontinued the use of such coals during the fire season.

"It appears from analyses made by the Mines Branch that the coals in question are not lignites, but that in each case where such trouble has occurred the coal has poor coking properties, or is non coking, while the use of coals which exhibit good coking properties results in only, a normal amount of sparking. The Board does not desire to hamper in any way the legitimate development of any phase of the important industry of coal mining. It is, however, consid-ered essential that some steps be taken to reduce to normal proportions the fire hazard resulting from the use of such coals as are above described. To meet this situation, the Board has under consideration the advisibility of amending Regulation 2 of General Order 107 by adding thereto the following:

" '(c) There shall be such special spark ar-resting device, other than the above, as may be approved by the Board, on every engine burning coal which has poor coking properties, or is non coking, the use of which, as locomo-tive fuel, is not prohibited by regulation 7 of this order.'" "All parties interested are requested to submit their comments to the Board in

submit their comments to the Board, in writing, not later than Feb. 20, 1915. If an order dealing with this matter is issued, it is expected that it will be made effective on and after April 1, 1915. In such event, arrangements will be made by the Board, upon application by any railway company concerned, for the prompt testing, jointly with the company, of any spark arresting device which it is claimed will meet the above conditions."

The Webster Construction Co. has been incorporated under the Ontario Companies Act, with offices at Hamilton, Ont., and an authorized capital of \$40,000, to build railways, canals, bridges, docks, wharves, roads, etc., and to carry on a general contracting business, and in connection therewith to take over the business heretofore carried on in Hamilton and London, Ont., by McKay, McKay and Webster. The provisional directors are, W. G. Webster, J. G. Smallman, Mrs. M. H. Smallman, Mrs. A. B. Webster, A. H. M. Graydon, London, Ont.

The restrictions in the area of the grate openings in locomotives are more generally found as due to failure to clean clinkers from between the bars than from faulty design.