

THE WONDERFUL "NIBBLER"

One of the most useful of the many new models shown at the Machine Tool and Engineering Exhibition held recently in London, was that known colloquially as the "nibbler". Almost every engineering shop finds it necessary at some time or another to cut sheet metal into certain shapes. When the shapes are simple and uniform the process presents little difficulty, but if a variety of odd shapes are required as occasion arises the ordinary methods of cutting are not conveniently applicable. Here the "nibbler" comes to the rescue. It is applied to the surface of the sheet and nibbles away a fine hole or slot so swiftly that by moving the sheet any desired outline can be cut as easily as a jig-saw puzzle can be cut in wood by a fret saw. When it is remembered that in some shops these out-of-the-way shapes are produced by the laborious and clumsy process of drilling or punching a series of fine holes, the handiness of this power-driven nibbler needs no emphasis. The Exhibition referred to was organized by the Machine Tool Trades Association and contained a magnificent display of the latest types of British machine tool.

CHOOSING COAL BY THE MICROSCOPE.

The selection of the particular coal to give the best results for certain purposes has always been an important matter for the engineer. To-day, with the enhanced cost of coal it has become a vital problem. Hitherto it has been the custom to rely on open chemical compositions and tests of the heat value of the coal, but the engineer of a leading firm which buys about a quarter of a million tons of coal every year for various uses confirms the suspicion that something more is needed before the most economical coal in each case can be determined. He has worked out a series of microscopic tests by which various coals are classified, each class being most efficient for steam raising, or gas production, or some other particular service. The method adopted is to grind the surface of a small sample of coal exceedingly smooth, fix it by the smooth surface to a piece of glass and grind away the remainder until a slice thin enough to transmit light remains on the glass. When examined under the microscope this slice reveals the inner structure of the coal. The behaviour of the coal when fixed corresponds to its structure, which thus provides an index to the use which ought to be made of the coal. The same investigator has found that very uniform results are given by samples from the one seam of coal, so that one or two tests are sufficient to determine the qualities of the seam. If this method is developed to an exact specification, much as is now done with special steels and alloys.

Aids to Industry

Some Interesting Details Relative to Technical and Industrial Progress in Engineering and Machinery

CLEANING GAS BY ELECTRICITY.

Blast furnaces are being erected in so many different parts of the world that wide-spread interest will be felt in the remarkable results achieved by a British ironworks in the electrical cleaning of the blast-furnace gas. This gas used to be allowed to burn at the top of the furnace, but in all modern plants it is utilised for burning under boilers or in driving gas engines. Before it can be used satisfactorily for this purpose, the dust it contains must be removed. Some time ago Sir Oliver Lodge, the famous British scientist, suggested that the dust could be made to deposit itself by discharging electricity at high pressure through the gas. Many difficult problems were encountered in applying the process on the large scale but they have been so well surmounted that, with only eight-tenths of the electrical plant in operation, the proportion of the dust is brought down to the point which enables the gas to be used satisfactorily under boilers. Only about sixty horse power is needed to produce the electrical discharges required in the plant, and the cleaning is effected with only a very slight lowering of the temperature of the gas. Another remarkable point is that the dust recovered contains a large amount of potash, which is of value for many purposes.

ROAD ENGINEERING PROGRESS.

In view of the rapid development of road traffic in Great Britain an inspection has been carried out over more than one thousand miles of the principal roads, and careful examination made of the experimental lengths which have been laid on various novel systems of construction. It is anticipated that a sum of at least ten million pounds sterling will be spent within the near future on road making and road improvements. British roads to

have enjoyed the reputation of being the best, all-round, in the world, and there is every sign that the new methods devised by British road engineers to enable road surfaces to withstand heavy motor traffic will maintain that reputation.

NEW METALS IN SHIP PROPULSION.

A very significant hint was thrown out by the chairman of the Institute of Metals at a recent convention of that body. He pointed out that while the internal combustion engines used to drive merchant ships contained only 3 per cent. of metals other than iron and steel, the driving equipment of the latest British submarines (oil engines, steam turbines and electrical machinery combined) showed a proportion as high as 37 per cent. Therefore the maritime engineer would find in naval practice suggestions for increasing power and reducing weight by using some of the wonderfully strong yet light alloys which British metallurgists had developed.

THROUGH FIFTY INCHES OF CAST IRON IN ONE MINUTE.

The "test to destruction" is occasionally reported to be makers of machines to discover how far their products will go beyond the usual limits of effort without breaking down. One British firm of machine tool makers adopts the test to destruction as a regular practice in the case of new models. On a recent occasion a large drilling machine was thus being tested. A twist drill of special high-speed steel, one and a quarter inches in diameter, was set to work at five hundred revolutions per minute on a piece of solid cast iron. General knowledge of the traditional qualities of drilling machines and drills suggested that this ought to have been a test

or the machine, or of both. What actually happened, however, was that the drill penetrated fifty inches of cast iron in one minute without damaging itself or the machine. All that was broken was the record for the rapid drilling of cast iron. The result of the test was therefore a convincing proof of the excellence of the design and of the materials provided by the British machine tool maker and the British manufacturer of special tool steels.

ELECTRIC COOKING FOR THE BRITISH WORKER.

Electric cooking apparatus made in Great Britain has become so robust and so efficient that it is finding its way into the working class dwellings constructed under numerous "housing schemes" undertaken by local authorities or by private enterprise. In one large colony every house is being equipped with an electric cooking range, two electric fires, and an electric copper for washing purposes. There is only one chimney in the house, an open fire being used for burning refuse and also for warming (by means of a boiler at the back of the fire) the water for baths and other uses. The construction of the houses is so much simplified by the use of electric cookers and heaters that the total cost, including all the electrical appliances, is less than that of a similar house built in the ordinary way. Electric light is, of course, installed. The electric ranges are large enough to cook ordinary workmen's meals for seven or eight persons.

THE EMBARGO ON SECURITIES.

After his meeting with financiers in Toronto last week relative to the embargo on the importation of securities held overseas, the following statement was given to the press by Sir Henry Drayton, Minister of Finance:—

"We have had a nice, frank talk on the general financial situation. At the meeting were represented bankers, bond brokers, stock brokers, life insurance companies, mortgage and trust companies, and the whole financial situation was fully gone into. It was determined that, in view of the absolute national necessity that the wheat crop be properly financed and the necessity of keeping in Canada the money necessary to carry on essential Canadian business, the present embargo on the purchase of securities held overseas be continued. The discussion was long and open to all. On becoming fully aware of the national necessities, the different dealers determined to forego the profits that the purchase of these outside securities would yield.

"We have to see that the farmers are able to market their wheat," Sir Henry added. "No man with the interests of the country at heart would want to imperil the marketing of this crop, and you know the amount of inflation that exists in this and every country, so why add to that inflation?"

The Milking of Cows

Shall cows be milked twice or three times a day? To the average reader this may seem of small concern. To the farmer and dairyman it is a question of considerable interest. Tests have recently been made in Nova Scotia, Quebec, and Ontario. Professor Barton of Macdonald College says that it has been found from the standpoint of economy and safety that a cow giving 60 lb. of milk a day should be milked three times. Both Professor Trueman of the Nova Scotia Agricultural College and Professor Barton are agreed, however, that unless the udder is over distended there is little or no advantage to be gained by milking three times a day. These authorities are quoted in the September number of the Agricultural Gazette of Canada. Professor Wade Toole also contributed to a solution of the same problem by giving results of test made at the Ontario Agricultural College. The tests are to be continued and Professor Toole hopes to be able to give a more definite opinion another year than he does at present. In the meantime he shows that three high-class pure-bred cows gave more by thrice than by twice milking a day. His present conclusions however are the same as those of Professors Barton and Trueman.