

## Aids to Industry

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

#### STEAM NAVVIES FOR CITY USE.

Steam navvies have been in common use for excavation in connection with railways, docks and similar works, but they have not been extensively employed in operation in cities. A leading British firm is, however, carrying out experiments in this new direction. It has constructed a steam navvy with an engine of forty-five horse power, mounted on a caterpillar tractor with smooth treads adapted for use on city streets. The total weight of the machine is twenty tons, and the overall length twenty feet. Any ordinary steep gradient can be surmounted by the navvy under its own power, but on abnormally steep inclines, such as one in four, it hauls itself up by means of its own drum. The steam shovel can dig three-quarters of a ton of earth at one time from a depth of fourteen feet and dump it at a height of eighteen feet. It can excavate earth at the rate of sixty tons per hour which is really faster than the stuff can, as a rule, be carted away. Where necessary, this steam navvy can readily be converted into a crane with a thirty-foot boom working a grab bucket. The machine is being put on some extra heavy excavation work in London and similar machines are being manufactured for general use in civil engineering contracts.

#### BRITISH SHIPBUILDING IN SPAIN.

The reorganisation and technical management of a large shipyard in Spain is being undertaken by a British firm of shipbuilders and engineers. As part of the scheme of reconstruction, arrangements will be made to develop the ship-repairing industry. Vessels up to 3,500 tons deadweight have already been constructed in this yard.

#### IMPROVING THE MINERS' SAFETY LAMP.

Interesting experiments have recently been made by a British Government Committee on the improvement of the gauge used on miners' safety lamps. The two points considered were safety and the improvement in the light transmitted by the gauge. Nearly forty different kinds of gauges were tested, first in discs and then in the shape adopted in the lamps themselves. With certain gauges it was found that the light could be increased half as much again over that of the standard lamp without any sacrifice in safety. Bearing in mind that the miners' safety lamp was invented in Great Britain by the famous Humphrey Davy about a century ago and has been the means of saving countless lives, it is remarkable to find it still undergoing improvements in detail.

#### MOVING A BUILDING.

The feat of moving a building bodily from one site to another was successfully performed recently in Great Britain. The building in question was of timber and reinforced concrete; it measured sixty feet in length and in breadth; and it weighed one hundred

and fifty tons. A large wooden platform was introduced under the building. This platform rested on iron rollers, and when all the weight of the building came on the platform, winches and wire ropes were employed to draw the whole structure for eighty feet to the new site. The work of the office went on as usual during the proceedings, even the telephone remaining in operation. It is estimated that the cost of taking the structure down and rebuilding it would have been at least three times that of the process of transfer.

#### A NEW WAY OF GEAR HARDENING

It is clearly of the highest importance that the teeth of gears used in any kind of machine should be extremely hard so as to resist wear and run smoothly after prolonged use. A leading British firm has introduced a very ingenious process of hardening gears after they have been cut. An oxy-acetylene flame is passed over the surface very much in the same way as a brush is used in painting. Owing to the intensity of the heat each part of the surface to which the flame is applied is raised to hardening temperature; further, the heat is conducted away so quickly by the metal (after the flame has been moved on) that the hardest portion is rapidly "quenched". This process can be applied to any accessible part of a casting or forging of high-speed steel, to malleable iron castings, or to close-grained cast iron. No distortion of the metal is produced. Normally the hardening penetrates to one-sixteenth of an inch, but a greater depth can be obtained by prolonging the heating.

#### NOVEL TYPE OF ELECTRIC RAILWAY.

At a time when many countries are tending towards regulations for the standardisation of electric traction equipment on railways, a British engineer comes forward with a proposal for a radically new type, applicable in particular to railways in countries overseas, where electric power is not available along the route. His suggestion is that the trains should be hauled by locomotives of a special design, the engines being oil engines of an improved type and driving electric generators which supply current to motors geared to the driving wheels. This arrangement gives great efficiency in the engine and very flexible speed control. In addition, he proposes that each locomotive should be in electrical contact with an overhead wire and that the rails should be bonded to form a continuous electrical conductor. When a locomotive is standing at a station the generator continues to run and thus supplies current to the overhead line. Again, when a train is running down hill, the motors generate electricity and feed into the line also. The power thus supplied is used to assist other trains in surmounting gradients at high speed. By this means, which really affords an interchange of power be-

tween trains, the engines need not be so heavy or powerful as is required where each unaided has to haul the heaviest train up the steepest gradient. As crude oil is used on the locomotives, and as a high efficiency is claimed, the arrangement offers peculiar advantages in lines running through undeveloped territory where coal and water are scarce. Many of the advantages of electrification are retained, without the disadvantage attached to large and costly generating stations on land, with long transmission mains to feed the line at intervals.

#### DISINFECTING FLUID FROM ELECTRICITY.

For many years past a local authority in London has been manufacturing disinfecting fluid by electrical means. This enterprise is carried out by the Public Health Department for the benefit of the citizens. The fluid is used in the public baths and in the sick asylums and other public institutions. Any resident is supplied with the fluid free if he brings a bottle to be filled. Nearly seventy thousand gallons are distributed in a year, and the cost is only one half penny per gallon.

#### A STRONG AND SILENT GEAR.

Silent gears in machinery have long been an ideal towards which engineers have aspired, but in too many cases silence has been secured at the cost of efficiency and short life. A special type manufactured in Great Britain does, however, offer the ideal without such drawbacks. The teeth of the gear wheels are built up of layers of steel at such an angle to the face of the teeth that they close slightly when the teeth engage. Instead of giving a hard metallic blow as the teeth come together, this design evenly distributes the pressure. At high speeds and under heavy loads all that is heard is a slight buzzing. Lubricant is fed into a space between the layers and the axle, and owing to the centrifugal action of the revolving wheel and to the slight pumping action of the sheets under repeated pressures, the oil is forced outwards between the layers and lubricates the whole surface of the teeth. A pinion of this type is being made for a colliery where it will be used to transmit 750 horse power at 295 revolutions per minute. It will weigh three quarters of a ton and will carry enough lubricant to last two or three months.

## Conditions in the West

### Farmers Bond Land to Raise Funds for Irrigation,—Slow Sale of Crop Affects Business

(By E. CORA HIND.)

During the week the May option was opened for trading and since that time there has been somewhat more liberal offering by farmers, some of whom are selling their wheat and buying May, but this has not yet been done to any great extent. Day by day however offerings have increased since the semi-official announcement from Ottawa that there was little likelihood of the wheat board being re-established. Even with more liberal offers the amount of grain in store at the Lake Head is enormous compared to other years. At the beginning of the present week there were over seven million bushels more wheat in store than at the corresponding date last year, and fully two thirds, if not more, of this wheat was held by farmers. If the farmers continue to hold on there is very great danger of serious congestion at the head of the lakes when navigation closes. The week has developed no evidence of Great Britain getting into the buying game.

#### Effect on Business.

There is no doubt that the slow sale of the crop and the lower prices for cattle and hogs are being reflected in business, and retail business both in city and country is feeling the strain. Another factor has been the long spell of very mild fine weather. No one had so far needed heavy clothing and at present prices no one is going to buy until they actually need it. One result already is that nearly every large retail dry goods house is advertising extensive sales of the more costly grades of clothing at greatly reduced prices.

#### Real Estate.

The movement in farm lands has

slackened materially in the past few weeks. This is due very largely to the curtailment of credits by American bankers. It is estimated that American farmers who sold their home farms at high figures and who had in many cases bargained for farms in Canada have had to abandon these contracts as they have not been able to get more than one third of the credit they expected to receive.

#### Fall Work.

Farm work such as plowing is remarkably well forward and the prairie provinces have more land today ready for seed than they have had since the fall of 1914. There has been enough rain to make the land mellow for work and it has been warm enough to germinate a very large percentage of weed seeds so that land will be in excellent condition for seeding next spring.

#### Irrigation.

The farmers in the district near Lethbridge, Alberta, which is included in the Lethbridge Northern Irrigation project, have left the Alberta Government in no doubt as to their views on the subject of irrigation. On October 22, a poll was taken as to the number of farmers ready and willing to have their lands bonded for the purpose of raising funds for irrigation purposes and out of 278 votes polled only 16 were in opposition to the project, giving a much larger majority than required even by the irrigation act. This voting sanctions the \$5,400,000 bond issue which will carry a two-year guarantee by the Provincial Government. So far as is known this is the first time in Canada where farmers have bonded their land to construct irrigation works.