NEW INLAND AND SHIP CANALS.

For upwards of a generation after George Stephenson gave the world its first railway, canals every year declined more and more in importance, as a medium of traffic. Of late years, however, public interest in this mode of communication has everywhere revived, and canal property which had so long been in a depressed and languishing condition has been steadily improving in value. This result several circumstances have conspired to bring about. As regards ship canals intended for ocean going vessels, the change is of course due to the magnificent success of the Suez Canal, which brings Europe some five thousand miles nearer to the East. The stimulus which the triumphant issue of M. de Lesseps' bold enterprise has imparted to this class of waterways is evident from the number of great schemes of a similar character which have since been projected. The constructor of the Suez Canal is himself pushing on, with his characteristic energy, the cutting across the Isthmus of Panama, which is destined, ere many years have elapsed to revolutionize the extensive commerce of all the rich countries bordering on the western shores of the entire continent of America. Another great work of this kind, which has already made considerable progress, is the ship canal across the Isthmus of Corinth. This work, which is being carried out under the auspices of the Greek Government, will be completed within a couple of years, and will bring Constantinople and all the ports of the Black Sea and Sea of Azoff nearer to all the countries on the shores of the Western Mediterranean and Western Europe generally. A third instance is the great sea canal which has just been completed in the Gulf of Finland, It was originally projected by Peter the Great, but, like the Isthmus of Corinth Canal, which itself was actually begun by the Roman Emperor Nero 1,800 years ago, the idea was allowed to lie dormant until the example set by M. de Lesseps on the Isthmus of Suez inspired statemen and commercial men alike with the requisite courage to undertake the work. In addition to these three great projects, one of which is realized and the other two are now in process of realization, there are several other schemes of a similar description already before the world. There is first the Manchester Ship Canal, which the energetic men of the cotton metropolis intend sooner or later to have in spite of all that the merchants of Liverpool can do to thwart them. Then there is the important canal which Germany, after five-and-twenty years of deliberation, has at length decided to construct across the province of Holstein. This cutting will run from the Mouth of the Elbe near Glückstadt to a point on the Baltic coast near Kiel. The canal is to be of such dimensions as to enable the largest vessels in the German navy to pass through from the North Sea to the Baltic, and *vice versa*. It will be of the geatest benefit to the large shipping trade between England and the Baltic ports, and will save the long and dangerous voyage round the Peninsula of Jutland, for all vessels starting from ports south of Newcastle. The only fear we have is that the German Government may be tempted to fix the dues for foreign ships passing through the canal at too high a figure. This would be a mistaken policy, but as it would largely diminish the dividends of the shareholders the evil would, doubtless, cure itself in time. Another great waterway for seagoing vessels is the canal projected across the Peninsula of Florida, which will shorten the passage between the various ports of the Gulf of Mexico on the one hand and those both of the eastern portions of North America and Europe on the other. With reference to inland navigation, the increasing traffic is due chiefly to two causes: first, the cheapness of conveyance by boat as compared with the high and often almost prohibitive tariffs of the railways; and, secondly, the introduction of steam as the motive power in place of the old system of traction by horses. The use of steam tugs towing large barges and vessels up to 500 tons burthen is everywhere growing on navigable rivers, and some of the canals projected on the Continent are intended to accommodate this class of craft. Among the most important of the new schemes is one for a canal to connect the Danube with the river Oder. In Austria, Hungary, and Germany a strong movement has been inaugurated in favour of this plan which, when realised, will establish a complete system of inland water communication between the Black Sea on the one hand and the North and Baltic Seas on the other. The Danube and Oder Canal, which will be wide enough to enable 500 ton vessels to pass each other without hindrance, will be 171 miles in length. Its width at the bottom will be 50 ft. It will be intersected by eighty-four locks, each 28 feet wide, and 215 feet long. The course of the canal will be from the Danube, near Vienna, to the river March as far as Prerau, thence up the river Botschwa Weisskirchen. From this stream up to the watershed line and down as far as the Oder will be the heaviest part of the cutting. —*Ex.*

HOW RUBBER BOOTS AND SHOES ARE MADE.

Did you ever see any crude rubber, and have you any idea how it is gathered and worked? There are twenty or thirty varities of crude rubber, varying greatly in quality, and of all these the best is known as Para, a South American product, obtained in Brazil, about 1,800 miles above the mouth of the Amazon. It is called Para from the city of that name from which it is shipped to foreign parts. The gum is gathered by tapping the rubber trees, as we tap maple trees for sap for maple sugar. The sap is gathered into a large pot into which the native dips a flat wooden paddle, to which gum adheres. He withdraws the paddle and holds it in a smoke made by burning palm nuts, which dries and cures the film of rubber on the paddle. He then dips again, and smokes again, repeating the process until he has on the paddle a bunch of gum weighing several pounds. Then he splits the ball or roll to get the paddle out, and it is ready for market.

These natives are not models of honesty, however, as these chunks of gum frequently contain palm nuts, rubber nuts, pieces of iron, or are freely mixed with sand to add weight, which often causes the manufacturer great trouble. The public, or a large share of the public, have an idea that crude rubber gum comes something like tamarac, and that it is melted and cast into whatever form is desired; but this is not true. A rubber shoe factory is not a foundry; it comes nearer being a printing office.

These chunks of rubber are sliced into steaks, you might say, by sharp knives revolving rapidly and kept constantly wetted. When one of these knives strikes an iron spike, there is apt to be "music in the air." The operators are on the lookout, however, and accidents are so thoroughly guarded against that they are very rare. These steaks are then put into a chopping machine, where they are made into an article closely rasembling boarding house hash, only that this hash is the straight goods, except that it needs cleaning. The small pieces thus formed are then put through a machine which makes mince meat of them, and at the same time washes out all the dirt and sand. This (not the dirt and sand) is now shoveled into a rolling machine which compresses the mass into rough sheets. This is the first process. These sheets are then taken to another building and put into a steam drying room, where they remain about three months to free them from all moisture.

By the drying process they lose from 15 to 30 per cent of their weight. If the least moisture remains in the rubber when made up into shoes, the heat of vulcanization causes its expansion, and consequently causes blisters in the stock. The dry gum is then run between heavy iron rolls, heated by steam, called grinders, by which it is softened to permit the admixture of the vulcanizing material.

Rubber in its natural state is unfit for use, and Goodyear's process of vulcanization by the aid of sulphur is necessary to utilize it. This mixing is done by running the ground rubber through still another series of rollers, which press the rubber and sulphur together in one soft, fine body, which is finally run through a calender, between great steel cylinders; the mass is pressed out into long smooth sheets of any desired width or thickness. Then comes the printing process. These sheets are fed through steel cylinders on the face of which is engraved the pattern for sole, heel, and upper desired to be produced, and these impressions are as clearly printed on the rubber as this type impression is on this paper.

Then the sheets go to the cutters, who cut out the different parts and send them to their respective departments. The lasting is done similarly to that of other shoes, except that the parts are all put together by rubber cement, and, before removal from the last they are placed in the vulcanizing ovens, where they are subjected to a degree of heat that transforms the various parts into a homogeneous mass in the shape of a boot or shoe with a seam, nail, or peg. Then, if a dull finish is desired, the last is removed, and the goods are ready for market. Otherwise they are varnished to give the bright finish, and dried, when they are ready.—*Ex.*

A MONSTROUS earth worm, six feet five inches in length and proportionately thick, has been sent from Cape Colony, Africa, to the Royal Zoological Society of England.