

**POWERFUL NINE-TON DIPPER DREDGE.**

There are certain lines of engineering work upon which the American engineer has left his mark so deeply and distinctly that the mere mention of them is suggestive of certain great engineering works in the United States, whose fame has traveled to the ends of the earth. Of this kind are the powerful and ingeniously designed devices for removing material in large masses, of which the work on the Chicago Canal presented some of the earliest and finest examples. The accompanying illustrations represent the latest, and next to the largest, of the dipper dredge types of excavating machine that has been built in this country, the largest being the "Pan-American," which has recently been at work at the Portage Lake Michigan. The dipper dredge is so named because of the action of its excavating bucket, whose motions, as it is plunged into the water and drawn up with its load, is not unlike those of the household implement from which it takes its name. The dredge here illustrated was constructed at Ogdensburg, for use on the Massena Canal, and during the fall it was at work opening up the channel from the St. Lawrence River to the canal proper. The hull measures 121 feet 6 inches in length, by 40 feet in breadth, and its depth at the working end, or bow, is 12 feet 2 inches, and at the stern 10 feet 6 inches. In the construction of the hull care has been taken to give it sufficient longitudinal and transverse strength to withstand the heavy strains to which it is subjected when working in hard material. The sides and ends of the hull proper are stiffened by a continuous wall of wooden trussing, and it is further stiffened by running a deep steel truss entirely around the hull in the plane of the walls of the deck-house. This truss extends from the bottom floor of the dredge to the roof of the deck house, and, of course, adds enormously to the stiffness of the whole structure. In the two corners at the bow are two spuds of colossal dimensions, each consisting of a single stick of Oregon fir measuring 36 inches by 36 inches in section and 55 feet in length. There is another massive spud, also consisting of a single stick of Oregon fir, at the stern. The spuds are raised and lowered, each by means of a single steel wire cable, operated by independent engines. An idea of the power and massiveness of this machine may be judged from the fact that the dipper alone weighs 9¼ tons, and has a capacity of 6 cubic yards at a single lift. A novel feature in the machine is the substitution of a single heavy steel-wire cable for the usual chain-lifting gear for operating the dipper. This cable is 3½ inches in diameter and was specially made for this particular work. It leads direct to the hoisting drum, which is operated through compound gears by a pair of 16 by 18 inch engines. The swinging of the boom is worked by a pair of 11 by 12-inch engines, and the backing is done by another pair of engines of the same dimensions. A separate 8 by 3-inch engine is provided for handling the stern spud. There are also two steel capstans, one on each side of the dredge, each of which has its own independent engine. In addition to the considerable plant as outlined above, there is an engine and direct-connected dynamo for furnishing electric light for the whole dredge. The after part of the deck-house is devoted to the living and dining accommodations for the officers and crew, and two substantial scows, one of which is shown on the starboard side of the dredge, complete the outfit. Our thanks are due to Capt. W. J. Daly for courtesies extended in the preparation of this article.

The Rev. Hannibal Goodwin, well known as an inventor of photographic processes, died recently at Newark, N. J.

**Oil Wells in Texas.**

The discovery of oil in such abundance near Beaumont, Texas, is somewhat surprising, as the location of the well which has produced such large quantities is nearly 200 miles from the Corsicana field. This would indicate that the oil belt of Texas underlies an extensive territory in the eastern section of the State, representing a field almost as large as that of western Pennsylvania. Oil was first discovered in Texas in May, 1894, in the suburbs of the town of Corsicana while boring an artesian well. Pittsburg



**POWERFUL NINE-TON DIPPER DREDGE FOR THE MASSENA CANAL.**

prospectors became interested, and a number of wells were bored to a depth of 1,000 feet, but none yielded a paying quantity until two years later. Since that time operations have extended over most of Navarro County, in which Corsicana is situated. During the year 1898 development work increased rapidly, and producing wells increased in proportion. During the year producers were drilled as follows: January, including all previous operations, 66 wells; February, 9 producers; March, 23; April, 29; May, 36; June, 24; July, 26; August, 38; September, 28; November, 23; December, 27, making a total of 342 producing wells on January 1, 1899, besides four gas wells, furnishing large quantities of natural gas, which is utilized here for fuel and steam-making purposes.

In 1898 was commenced by J. S. Collinan a refinery with a daily capacity of 1,500 barrels, which began operation early in January, 1899, its capacity since then having been largely increased, as was demanded by the increased output of the field. Month after month the tankage capacity of the refinery was in-

of oil, which will be shipped to that point and refined.

Since January 1, 1899, development work has gone on uninterruptedly until the number of producing wells in this field is about 600, besides 17 gas wells. The total output of the 600 wells is 4,000 barrels a day. The refinery is not able to refine the entire product, and large quantities of crude oil are shipped to Mexico, where it is refined by a company in a manner connected with the company in Texas. There is a low duty on the crude article, which admits of its being shipped and sold. The residuum of the oil is used in the mills and factories for fuel, and is sold to them by the refinery at 60 cents per barrel after all the illuminant has been abstracted from it. The consumption of this residuum, however, is not so large as the supply, and train-loads of it are shipped weekly to Sabine Pass, at which point it is loaded on steamships and shipped North, where the by-products are utilized for the manufacture of various articles of commerce.

In addition to the oil field in Corsicana, a new field has recently been opened near Powell, eight miles east, in which, at a depth of about 400 feet, oil of the lubricating variety has been found in paying quantities. One well in this field for nearly a week yielded 100 barrels a day, then subsided to a "pumper," with an output of 10 or 12 barrels a day—about the average of wells in that field. There is no market for this lubricating oil yet, but a pipe line will be built to the field in order to get it on the market.

Development work is still being pushed in both fields, and each month furnishes on an average of 25 producing wells, while the wells abandoned average about 9 per month.

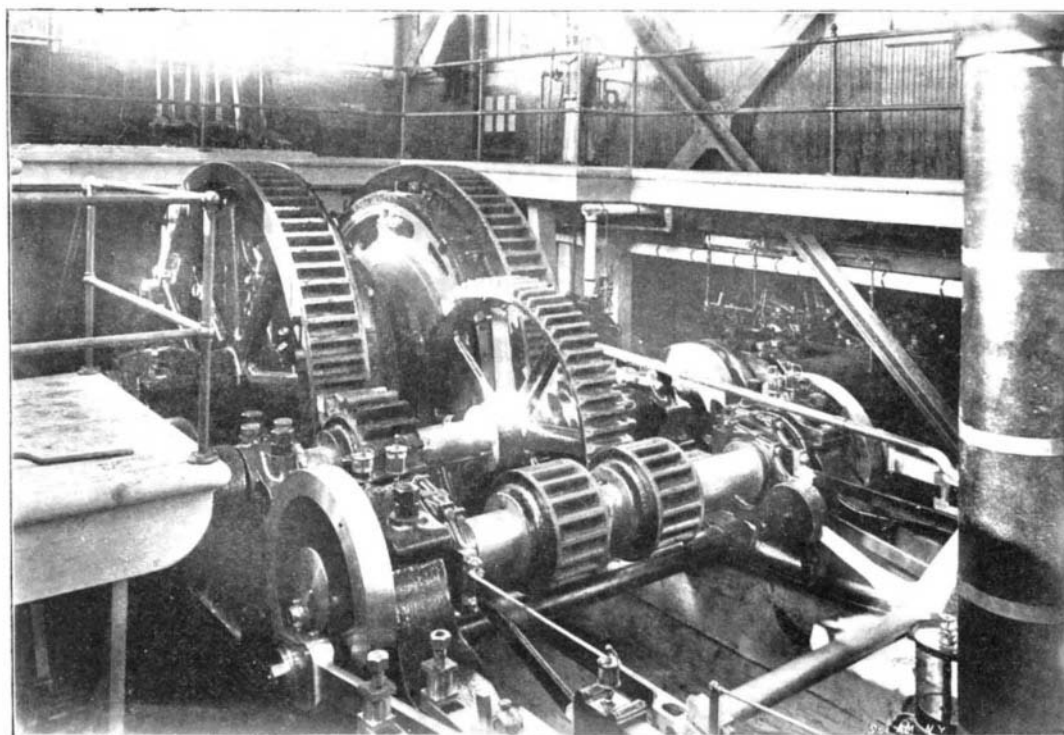
Analyses made by various experts show that the Texas oil furnished the following distillates: One-half liter, or about one-half pint, was subjected to distillation, and the following fractions obtained at the respective temperatures expressed in degrees of the Centigrade scale: Began to boil at 80 degrees; between 80 degrees and 90 degrees gave off 16.4 per cent of its volume; between 90 degrees and 110 degrees gave off 7.8 per cent; between 110 and 140 degrees, 10.4 per cent; between 140 and 170 degrees, 9.2 per cent; between 170 and 200 degrees, 3.6 per cent; between 200 degrees and 280 degrees, 16 per cent; between 280 and 305 degrees, 11.2 per cent; above 305 degrees, 15.8 per cent, making the total volatile matter about 90 per cent, leaving a coke residuum of about 10 per cent. The Corsicana oil compares favorably with the Pennsylvania product, which generally yields in product 60 to 75 per cent of burning oil of first and second quality.

**Russian Sugar Manufacture.**

In our issue of November 3 we published a short notice entitled "How Russia Corners Sugar." We now find that in Russia every manufacturer is required by law to export a fixed amount of his product on which he receives a rebate of one ruble 85 kopeks per pood, excise tax. There are 280 manufacturers of sugar in Russia, but only 20 of them are refiners; they supply the home market, the refined article being too hard for other countries, it being the habit of the peasant class, the

largest consumers of sugar, to hold a lump in their mouths while drinking tea.

Russian sugar is said to be 99 per cent pure, and for that reason the best in the world. Russian sugar stocks pay from 15 per cent to 50 per cent dividends annually. There is some demand for Russian sugar in the United States, and some Russian sugar is reaching this market. Two of the largest refineries in Russia were destroyed by fire last May and the owners were delayed in rebuilding by the scarcity of money and finally decided to rebuild with a decreased capacity.



**HOISTING ENGINES FOR THE DIPPER.**

creased, until now there are between thirty and forty tanks holding from 16,000 barrels to 36,000 barrels each, while others are being added as production increases. The refinery buildings, tanks, machinery, and pipe lines represent an expenditure of about \$300,000. Prices since the first 100,000-barrel contract was made have gone up as high as \$1.11 per barrel, at which point a decline began and continued until oil sold at 67 cents per barrel, which caused a movement to build an independent refinery and pipe line. A small refinery was built at Houston, 250 miles south, and the company has contracted for 100,000 barrels