DECISIONS RELATING TO PATENTS.

U. S. Circuit Court—District of Massachusetts.

UNITED STATES OF AMERICA v. AMERICAN BELL TELEPHONE COMPANY ET AL.

Decided December 18, 1894.

CARPENTER J.:

Patent to Emil Berliner, No. 463,569, dated November 17, 1891, is void because one of the functions of the device shown in the patent No 263,969, dated November 2, 1880, to the same inventor—namely, the function of transmitting articulate speech—is identical with the sole object or function of the device covered by the patent of 1891, and the device for effecting the transmission is identical in both patents. (Miller v. Eagle Manufacturing Co., 66 O. G., 845; 151 U. S., 186.)

The application was filed June 4, 1877; the patent granted Nov. 17, 1891. "The device covered by the patent in suit had been in public use by the respondent corporation since the year 1878. The respondent corporation was of ample means to prosecute the application. The result of any delay which may take place in the issue of the Berliner patent would evidently be to continue so much longer the practical monopoly of the art of electrical transmission of articulate speech." Under these circumstances the duty of the respondent corporation was to use the greatest degree of diligence in prosecuting the application to an early issue. "There should have been at least as great diligence as their own interests would have called for had their business been unprotected by patent rights." The delays subsequent to June 9, 1882, were unwarrantable, were acquiesced in, and therefore intended by the respondent corporation, and were such as to invalidate the patent.

Important Canal Improvements.

It has long been proposed to enlarge and generally improve the canal routes connecting New York with Philadelphia and Chesapeake Bay, and it now appears that this work is to be accomplished. These improvements are much needed and the expense incurred will doubtless be justified by the consequent increase of commerce. The city of Philadelphia some months ago appropriated $10,000 to be expended in making preliminary surveys and maps preparatory to enlarging the Delaware and Raritan Canal, and this has been followed by the appropriation of a like amount by the city of New York, for the same purpose. In addition to this a bill is now before Congress, having already passed the House of Representatives, providing for the appropriation of a sufficient sum of money to commence the actual work. Plans are also under discussion to enlarge and extend the Dismal Swamp Canal and the Albemarle and Chesapeake Canal.

The latest report of the surveyors of the Delaware and Raritan Canal stated that the full length of the proposed new route would be 32 miles. The surface elevation along this route is higher than in the case of the old canal, but it will probably be selected because it saves the building of two expensive overhead bridges. The new canal will then start from Raritan Bay, cross the Raritan River about eight miles below New Brunswick and enter the Delaware River at Bordentown. Eleven miles of its length will be an enlargement of the old canal. The other 21 miles will be an original excavation. It will have a depth of 24 feet, a bottom width of 90 feet and a surface width of 160 feet. It will be provided with two opening locks 500 by 60 feet, and four lift locks with a total lift of 50 feet. The entire cost has been estimated at $12,500,000. Of this amount $50,000 will be expended in deepening the channel of the Delaware River between Philadelphia and Bordentown.

It is, furthermore, proposed to make connections with the Dismal Swamp Canal, and to widen and deepen this canal in a similar way. The Dismal Swamp Canal commences at Deep Creek, Norfolk, Va., and extends in a southerly direction to South Mills, N. C., near the head waters of the Pasquotank River, which empties into Albemarle Sound. The canal proper is 22 miles long and 60 feet wide, and is provided with five locks. It has an average depth of 8 feet. It extends from deep water to deep water. An enlargement is being planned. It is proposed to give it an average depth of 10 feet and provide two locks, one at either end, to be 250 feet long and 40 feet wide. The estimated expense of these improvements will be $5,000,000.

The Albemarle and Chesapeake Canal connects the waters of the southern branch of the Elizabeth River, which has its mouth at Norfolk, with the North Landing River and North River. The canal is 14 miles long and has an average depth of 8 feet. The present owners propose to enlarge this to about the size of the others, so that large ships may pass through the entire system.

RUSSIAN engineers are studying a route for a waterway to connect the White Sea with the Baltic. The total distance to be covered is about 180 miles. Part of the route is already navigable. It is estimated that a uniform depth of thirty feet can be obtained along the entire route at a cost of $6,000,000.

Electric Tramways.

At the recent meeting of the American Society of Mechanical Engineers a paper was presented by Mr. C. J. Field, in which he reviews the first introduction of the trolley system seven years ago and its steady progress since that time. One of the difficulties met with in the introduction of the cable and electric road was the condition of the old horse road construction. The first step was the introduction of girder and T rails, which at first were 3 to 5 inches in depth, requiring the placing of the rails on a cast or wrought iron chair or stringer in order to get the depth over ties. This method proved little better than the old flat rail, especially at the joints. The rail mills then undertook the rolling of heavier and deeper girder and T rails, which, at present state of development, gives us, we believe, a roadbed construction equal to any steam road in the country. The standard to-day for electric tramway roadbed is 70 to 80 pound T rail, or 70 to 98 pound girder rail, the depth running from 7 to 9 inches.

The special work on track work, such as crossovers, turnouts, curves, etc., has also met with large improvement. Now we have as a standard for this special work the steel rails bent to the form required, and surrounded by a mass of cast metal to hold them together, and one company is turning out this special work with the parts welded together; also in cast steel. The electric welding of rails at the joints when laid is then mentioned. After one winter's test of a road built on this system, 6 per cent of the joints pulled apart.

Underground conduits, or the placing of the trolley wire with all its feeders under the surface of the street, is the ultimate and desirable result to be obtained in our large city lines of electric traction. Underground conduits were attempted four or five years ago, but on account of insufficient experience, lack of engineering ability, or amount of money expended on the work, as well as a desire on the part of the company installing them to make them a failure, they were not in general successful. The first really successful underground conduit to be installed and operated was in Buda-Pesth, about seven or eight miles in length, and it is now being extended to 30 miles or more. Similar systems on a smaller scale are in operation in Chicago and Washington. The conduit to be most used will be one similar to a cable conduit, with the trolley conductors placed at the sides in the shape of a channel or angle bar or rod of iron or copper, which will be divided into sections and fed by underground feeders laid along the line of the road. Shoes or brushes will convey the current from the trolley wire to the motors on the car. Such a conduit will only be successful where it is made a double trolley conduit and not depending on the track for the return circuit. The cost of a well built trolley conduit in the form of a cable duct will, in most cases, exceed that of a cable duct on straight track, but less on curves.

The general basis of calculation of the horse power required for a tramway system must take into consideration the local conditions of service, grades, curves, etc.; but, in general, 15 to 25 horse power per car in use on the road is the general limit of a well-designed station, which will include the conditions for continuous service and operation of the plant. A road of 100 cars would therefore require about 2,000 horse power, which horse power should be divided into say four units of 500 horse power each. The number of units in any station should be the fewest number which will give a safe and economical division of the units, and in a station of this kind four or five units, according to the service and conditions, should be the standard.

The old horse car road in large cities operated at a total cost of from 18 to 25 cents per car mile. One car mile is taken as the standard for operating expenses in our tramway service. The heaviest item in this operating expense was the question of power, and this is where the electric road has made its heaviest gains in the reduction of operating expenses. This item is reduced in power in service to-day to a cost, under general conditions, ranging from 1 to 1½ cents per car mile. The relative proportion of operating expenses to earnings in the horse service was from 70 to 80 per cent operating expenses to gross earnings. In electric service we have a considerable increase in our gross earnings over our old horse line, which increase runs from 25 to 50 and even 100 per cent in some cases, and the operating expenses being 40 to 60 per cent of the gross earnings. In this operating expense we include all the operating expenses of the road other than the fixed charges.

The cost of building and equipping an electric road is considerable. The standard price four years ago for an equipment of two 15 horse power motors and the installation of them was $3,000 to $3,500 The price to-day for two 25 horse power motors, which are much superior to the former ones, is under $1,000. This gives us a total cost of a motor car, including car body, truck, motors, etc., of approximately $2,200. A single mile of roadbed construction, with 90 pound girder rail, exclusive of any new pavement, but including taking up of the old track and replacing of old pavement, about $7,500 per mile of single track. This makes no allowance for special work. Overhead-line construction for one mile of double track, with iron poles, feeders, etc., $4,000 to $5,000 per mile; with wooden poles, about $3,000 or $4,000 per mile. Steam and electric plant for direct-connected vertical compound condensing plant—for steam plant, $50 to $55 per horse power, and the electrical, $20 to $25 per horse power, making a total for steam and electric plant, $70 to $80 per horse power. As a general summary, we have for the total cost of the equipment of the electric tram road—that is, the rebuilding of an old horse road—including power plant complete, buildings, car house, cars, equipment, track, and overhead construction, $20,000 to $25,000 per mile of single track, according to the varying conditions of different cases.

War on the Gypsy Moth.

Extensive preparations are being made in New England for destroying the Gypsy moth or Ocneria dispar, which has become of late a very serious menace to agriculture. An appropriation of $200,000 has been asked of Congress to be expended for this purpose, and it is expected that it will be granted. About 150 men will be employed in the work and the whole of the infested region will be kept, as far as possible, under constant inspection.

The Gypsy moth is indigenous in France and was brought to America in 1870. Since then it has multiplied with alarming rapidity. The moth deposits its eggs in clusters in sheltered places on the bark of trees or in cavities of stone walls, old stumps and similar places, but always near the plants or trees on which the insect feeds. Eggs are deposited in the early fall and hatch early in the spring. When first hatched the caterpillars are less than one-fifth of an inch long, and when fully grown they shed their outer covering and become pupæ. They feed only when in the caterpillar state, which lasts about ten weeks. They are nocturnal and feed in bands and attack all kinds of shrubbery.

In 1892, when the first attacks upon this pest were commenced, the clusters were destroyed by scraping them from the trees and burning them. This plan was given up, however, because some of the eggs were often scattered and lost. At present various acids and creosotes are used, and when the eggs are deposited in cavities they are destroyed by chlorine gas or fire. Another plan is to brand the trees with burlaps and lime. Some idea of the extent of this work may be gained from the report made by the State Board of Agriculture recently. It appears from this that $101,411 were expended during the year 1894. Over 200 square miles of farm lands were infected, including some of the most valuable land in New England, and 125 men were employed in carrying on the work.

The Pneumatic Tire.

An interesting series of experiments have been made recently to test the difference between the draught or road friction of a carriage with and without the modern pneumatic tired wheels. Two ordinary box buggies were employed, each being weighted to weigh 254 pounds. On a smooth hard pine floor it was found that the power required to start the pneumatic tire from a standstill was four pounds and the power required to start the steel tired carriage was three pounds. Next an obstruction $\frac{5}{16}$ of an inch high was placed in front of each carriage, and it was found that 25 pounds was required to haul the steel tired carriage over the obstruction and but 11 pounds to draw the pneumatic tired carriage.

Similar experiments with obstructions of various kinds showed that about the same advantage was maintained by the pneumatic tires. To haul the two carriages over an ordinary sand road it was found that the steel tires required about 40 pounds and the pneumatic about 25 pounds. A great many experiments of the same nature showed little or no variation in this proportion.

Gold Fillings.

People, says a dentist, wonder why gold is used for stopping, and are apt to credit the dentist with employing it for his own ends, on the ground that he can charge more and get correspondingly larger profits than would be the case if he used any baser and less expensive metal; but, he says, in explanation, a little reflection would convince the suspicious ones that there is no ground whatever for such ideas, and that the real reason for using gold is that it will weld while cold, and will successfully resist the action of the acids and fluids of the mouth, hence it is unequaled as a preservative for the teeth.

IN a recent issue we explained the proposed system of establishing an international postage stamp. It is already reported that Cape Colony will join this "Universal Postal Union" on January 1, 1895. It has been decided that a five cent stamp will carry a letter to any civilized country of any importance in the world. We take pleasure in announcing that at present the only countries not included in the union are China, Morocco, the Orange Free States, and the islands of Ascension, St. Helena and Pitcairn.