ENGINE AND BOILER ROOMS OF THE GREAT BRIDGE.

Situated under the roadway of the Brooklyn approach, a little beyond the end of the station building, is a large, irregularly shaped room, having an extreme length of about 61 feet, and a width of 39 feet. The ceiling is formed of brick arches supporting the roadways. Occupying the upper end of this room are the engines that move the endless rope to which the cars are attached. The engines rest on masonry beds, and are placed across the room, or in a line perpendicular to the axis of the bridge, one on either side of the drums carrying the rope. The drums are each 12 feet in diameter, with faces 26 inches and 27⅛ inches wide, and have five semicircular grooves cut in the center of the face. Between them is a friction drum having a diameter of 5 feet and a face 31½ inches wide. Passing through this drum is the crank shaft of hammered wrought iron, 12 inches in diameter. The duty of the friction drum is, principally, to take the stress caused by the rope which is wound about the two large drums. On the crank shaft is a pinion having 35 teeth engaging with a gear on one of the main drum shafts, having 84 teeth, the diameters being equal to those of the friction and driving drums, respectively; the face of each is 12 inches wide. Between one crank and the drum is a clutch, worked by a lever, thereby enabling the engines to run together or independently.

The openings in the clutch are so arranged as to bring the cranks quartering. The pillow blocks for the journals are of cast iron, with bottom brasses and Babbitted caps. The cylinders of the engines are 26 inches in diameter and 48 inches stroke, and the depth from center line to the base of the bed is 2 feet. The fly wheels have straight spokes, are built in sections, and weigh 18 tons. The engines are automatic. They were built by the Dickson Manufacturing Company, of Scranton, Pa.

Along one side of the room is a masonry incline, capped with granite blocks, to which are bolted steel rails. On these rails will run a heavily loaded car carrying a sheave, or a grooved pulley, around which the endless rope will pass, thus taking up the slack. The rope, after leaving the two drums, passes up and over a sheave on an iron frame at the higher end of the incline; it then passes around a sheave on the loaded car; then back to a sheave which guides it through a small hole in the roof; passing through this it goes over a summit sheave located on a frame between the tracks; thence to the New York side. On returning it passes over a summit sheave down to the other side of the drums, directly beneath. All the sheaves are 10 feet in diameter.

In the end of the room opposite that occupied by the machinery already described is the plant of the U. S. Illuminating Company for lighting the bridge. There are two engines of the Corliss pattern, each 16 inches by 38 inches, fly wheels 10 feet in diameter, and faces 16 inches. Each engine runs two dynamo machines of the regular style made by the U. S. Electric Light Company. This forms, practically, two independent systems, each having a circuit of 40 lights. As it passes over the bridge one circuit supplies alternating lights on each side; the other circuit supplies those intervening; if one should be broken the bridge would still be illuminated at regular intervals, though with only one-half the number. The engines will run at a speed of 80 revolutions per minute, the armatures making 1,000 revolutions. There will, ultimately, be a total number of 80 arc lights of 2,000 candle power each, of which 62 will be on lamp posts distributed along the bridge, the remainder being in the buildings. The lamps are furnished with two carbons, an automatic cut-out changing the current from one to the other at the proper time.

The boilers which supply steam to all these engines are in a building adjoining the approach. The building is five-sided, the long side being 65 feet, the two ends 28½ feet, and the other two sides forming an obtuse angle. Here is a nest of four boilers made by the Babcock & Wilcox Company, of this city. They consist of a series of lap-welded, wrought iron water tubes, inclining slightly, and connected at either end with a horizontal drum. Their construction and plan are so well and favorably known as to make a detailed description superfluous. The drums are 36 inches in diameter and 18 feet long. There are six sections of nine tubes, each tube being 4 inches in diameter and 18 feet long. The mud drum is 18 inches across. The boilers are each 104 horse power. The supply pipe leading to the engines is 12 inches in diameter. If the steam supply should be found to be insufficient, there is space at one end of the room for two additional boilers of the same size.

Our first page shows the engine room as seen from the upper end, the driving drums and engines being in the foreground, and the incline extending across the rear.

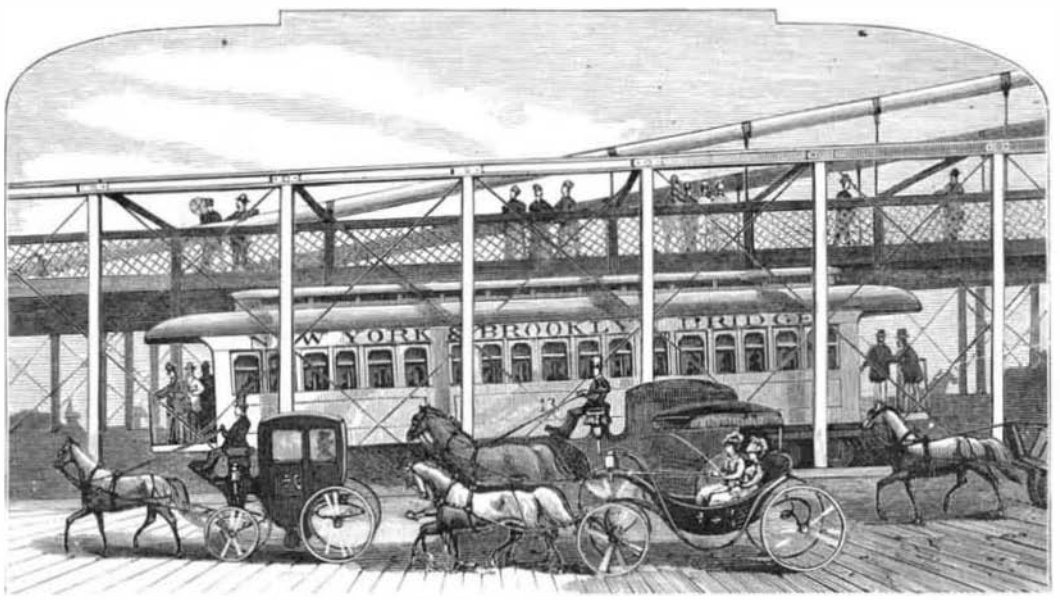
THE Mexicans use a strong solution of iodine in potassium iodide for an antidote for rattlesnake poison.

A Narrow House.

The narrowest house in New York may be seen at the northwest corner of Lexington Avenue and Eighty-second Street. When Lexington Avenue was cut through some years ago, a strip of land five feet wide and one hundred feet deep was all that was left of a certain lot belonging to a person who did not own the next lot on the street. The strip, while of little value by itself, would be valuable to the person owning the adjoining lot on Eighty-second Street, because it would not only enable him to build a house five feet wider, but would give him windows all along the side of his house on Lexington Avenue. The two owners, however, could not agree as to terms, and a house was erected on the lot adjoining the narrow strip. The owner of the latter had nothing to do but to abandon his lot or build a house five feet wide upon it. The latter course was perhaps adopted because such a house would shut up all the side windows of the neighboring building, and considerably reduce its value.

The new building, which has been finished for some months, is therefore 5 feet wide, 100 feet deep, and 4 stories high. It is divided into two houses, each fifty feet long, and the entrance doors are, of course, on the Avenue, as there is no room for a door at either end of the building. The law allows a building at the corner of a street to have projecting bay-windows along the side, and taking advantage of this circumstance, the architect has managed to plan a house which, while peculiar in inside appearance, and probably very uncomfortable to live in, may find tenants. Without these bay-windows or square projections running from the foundations to the roof, it would not have been possible to build a house at all, for no room would have been wider than three feet. Each house has, therefore, two bay-windows, in one of which are the stairs, and in the other one room about eight feet wide by fifteen feet long, upon each floor. The long passage between the stair-well and the room is about three feet wide. Each house contains a kitchen 8′ x 15′, and four rooms, each of the same size, but on different floors. There are also ingeniously-placed closets at each end of the building and under the stairs. Both houses are unoccupied. One is offered for rent at $500 a year.

If the object of the builder of these extraordinary houses was simply to shut out the light from his neighbor's building, he would probably have accomplished the same end at much less expense by adopting Mr. George Kemp's device of sheet-iron shields. Mr. Kemp did not wish the occupants of the building in the rear of his house, at No. 720 Fifth Avenue, to overlook his premises, and so he built an iron scaffolding in his back yard and placed iron shields against the obnoxious openings, shutting out air and light as completely as a brick wall would have done. This arrangement has been for years the source of no little comment from the neighbors and passers-by.—*Evening Post.*



PROMENADE, RAILWAY, AND ROADWAY OF THE BROOKLYN BRIDGE.

The Arlberg Tunnel.

The *Revue Generale des Chemins de Fer*, writes our Geneva correspondent, gives some interesting particulars concerning the Arlberg tunnel, the boring of which is being pushed with great energy and success. The present road over the Arlberg, which forms the frontier between Austria and Switzerland, is 5,400 ft. above the level of the sea; but the tunnel is much lower down, the opening on the Tyrol side being 4,030 ft., and that on the Swiss side 3,770 ft. above sea level. Its total length will be 10,270 meters (11,161 yards, or six miles and 601 yards), and it runs for the most part through a formation of mica schist. The method of excavation differs from that practiced in the making of the St. Gothard tunnel. Instead of piercing the upper part of the passage first, and working down, the Austrian engineers have preferred to begin at the base and work upward. The face of the rock is drilled by perforators actuated by compressed air, which is pumped into the tunnel by turbines stationed at its two extremities.

When a sufficient number of holes have been drilled, they are charged with dynamite and exploded. After the blast, the *debris* is removed by trucks, which follow closely on the track of the perforators, and a few minutes later the drilling is going on as rapidly as before. The drift thus made is 2·75 meters wide and 2 50 meters high. While one drift is being driven below, another, to which access is gained by vertical shafts, is being driven above. This work has necessarily to be done by hand, and the rubbish is shunted through openings, made for the purpose, into an inferior gallery. Until very lately the ventilation had given rise to no difficulty, and the heat has rarely exceeded 14 degrees Centigrade (58 degrees Fahrenheit). The contractors have undertaken to make an average advance of 6·60 meters a day. For every day they exceed the given time they will be mulcted in a penalty of £68; for every day gained they will receive a premium of £68. So far the contractors have kept well up to time. On not a few occasions the agreed rate of advance has been more than doubled. From January, 1881, when the work began, to September 30, 1882, the length pierced on the east side was 2,976 meters, on the west 2,643, together 5,619, equal to 8·80 meters daily, figures which are highly significant of the progress made of late years in the method of boring great tunnels.

In the month of February last the rate of advance per day was 4·68 meters on the east side, 4·74 on the west side, and but for the scarcity of water, owing to the freezing of the sources of supply, a still better average would have been made. On the west side there is now a stretch of 3,070 meters practicable for locomotion, while on the east side the completed stretch is only 1,430 meters. Up to the end of February the quantity of earth and rock removed amounted to 429·082 cubic meters, and the walling to that date executed measured 121·511 cubic meters. The tunnel is expected to be completed and the line ready for opening by the autumn of 1884.

The Age of Inventions.

The number of inventions that have been made during the past fifty years is perhaps unprecedented in the history of the world. Of course inventions of benefit to the human race have been made in all ages since man was created; but looking back for half a hundred years, how many more are crowded into the past fifty than into any other fifty since recorded history! The perfection of the locomotive, and the now world traversing steamship, the telegraph, the telephone, the audiphone, the sewing machine, the photograph, chromo lithographic printing, the cylinder printing press, the elevator for hotels and other many storied buildings, the cotton gin and the spinning jenny, the reaper and mower, the steam thrasher, the steam fire engine, the improved process for making steel, the application of chloroform and ether to destroy sensibility in painful surgery cases, and so on through a long catalogue.

Nor are we yet done in the field of invention and discovery. The application of coal gas and petroleum to heating and cooking operations is only trembling on the verge of successful experiment, the introduction of the steam from a great central reservoir to general use for heating and cooking is foreshadowed as among the coming events, the artificial production of butter has already created consternation among dairymen, the navigation of the air by some device akin to our present balloon would also seem to be prefigured, and the propulsion of machinery by electricity is even now clearly indicated by the march of experiment. There are some problems we have hitherto deemed impossible, but are the mysteries of even the most improbable of them more subtle to grasp than that of the ocean cable or that of the photograph or the telephone? We talk by cable with an ocean rolling between; we speak in our own voices to friends 100 miles or more from where we articulate before the microphone.

Under the blazing sun of July we produce ice by chemical means, rivaling the most solid and crystalline production of nature. Our surgeons graft the skin from one person's arm to the face of another, and it adheres and becomes an integral portion of his body. We make a mile of white printing paper, and send it on a spool that a perfecting printing press unwinds, and prints, and cuts, and delivers to you folded and counted, many thousands per hour. Of a verity this is the age of invention, nor has the world reached a stopping place yet.—*Cincinnati Times-Star.*

TO remove the unpleasant taste which is frequently observable from new wooden vessels is a thing difficult of accomplishment. *The Brewing World* says that the simplest plan, and one that will succeed in most cases, is to scald them thoroughly several times in boiling water, then dissolve some pearlash or soda in lukewarm water, adding a little lime to it, and wash the inside of the vessels well in the solution. Afterward scald them several times thoroughly as before.