

an interference case. The Bell Company owned both the Berliner and Edison inventions. The Bell telephone was amply protected now, and until the original Bell patents expired there was no need of getting a final decision on the Berliner claims. Now that the Bell patents are about to expire, the company allows the Berliner case to go to issue. As this is practically a microphone, and as there is not now known any method of conducting a telephone business commercially, which does not employ the microphone in one of its many forms, the Bell monopoly is continued until 1908 if the Berliner patent holds, and as we understand the case we do not see how it can be overthrown.—*American Manufacturer.*

TRAVEL BY ELECTRICITY.

AN electric railway recently constructed in the British metropolis has been so great a success that an impetus for further means of locomotion by a similar agency has set in. Five bills are to be submitted to the consideration of the Houses of Parliament during the forthcoming session, and all of these bills are either for the construction of new electric railways or for the extension of lines which have already been authorized. These five railways are the Great Northern and City Railway Company, the Islington and City Company, the Grand London Company, the Baker Street and Waterloo Company, and the Royal Exchange and Waterloo Company. We are convinced that the development of electricity as a motor power is yet in its infancy. Great wonders may be expected during this year. In this city the street railway authorities may at any time ask for a change in the by-law granting them power to run cars drawn by "horses or mules only." That power was given less than sixteen years ago, but how great have the strides of progress been since then! Little is risked in predicting that ere the year grows old, not only may electricity take the place of many steam locomotives, and nearly all street car horses, but that, by means of storage batteries, private carriages will begin to course along our public highways. Then will come the halcyon days for the horse and his long suffering companion, the mule. Some people even believe that, through recent discoveries, the marvelous metal, aluminium, will be rendered so cheap, light and strong, that combined with electricity, it will in the near future help to solve the centuries' old problem of aerial navigation. We shall be contented with speedy and inexpensive vehicular transit; let those fly who have a mind to.—*London Advertiser.*

A SPEED DEVELOPING MACHINE.

PERHAPS one of the most original inventions ever produced in this quarter of the world, says the *Boston Herald*, is one that Mr. James O. Brown, of this city, has recently patented. He believes that by its aid alone can the two-minute trotter become anything but a chimera. At first sight the drawings of this remarkable invention appear somewhat complicated to an eye accustomed to the light and elegant racing sulky, as they represent a waggon weighing about 2,000 pounds and carrying a four-horse power engine, or other suitable propeller.

Brown's "horse developing machine" is essentially a waggon with heavy rubber-tired wheels, having in itself sufficient motive power to move at the rate of a mile in two minutes. From the front of the machine heavy shafts protrude, and between these the horse whose gait has to be "improved" is forthwith installed. Once there he is entirely at the mercy of his driver. A stout belly-band of steel, leather covered and padded inside, encircles the stomach of the steed, while equally unbreakable quarter strap, breeching and breast strap hold the horse as in a cage.

Although the restraint is there, it does not gall in the least, so long as the animal does what is wanted, but if he tries to break he will find the quarter strap in his way; should he wish to lie down and roll he will surely be prevented by the belly band, and should he not go fast enough he will find the inexorable two-minute machine thundering in his rear, and, by a mild but irritable pressure on his hindquarters, inculcating the beauty of celerity.

The driver, who has control of all this complicated mechanism, sits on a seat much like any ordinary mortal. In his hand he holds the reins which are included in the outfit, just to accustom the animal to their presence, as he could be as effectually guided without them when once safe within the shafts of Mr. Brown's "developer." By pressing upon sundry levers with foot or hand, the man on the box seat can either increase the speed of the machine; turn the horse and fore-body of the waggon to right or left, raise or lower the shafts, and, in fact, act the part of an irresponsible despot should he desire to show the quadruped in the shafts who is boss.

Mr. Brown claims another valuable quality for his invention. By its aid he can exercise as many as ten colts at a time. In order to do this he affixes a pole to the rear of the waggon, takes off the shafts, and to the end of the pole aforesaid adds a heavy cross-tree with wheels at either end and having shafts for the attachment of five horses on each side of its centre part. It is the intention of the inventor to arrange for the supply of one of these machines to every track in the country.

MAGIC LANTERNS.

THE magic lantern is classed by the British Government at the Patent Office under the heading of "Toys," an act which might have been justified some years ago, but of late it has become a potent instrument in original scientific research, and for educational purposes. It is tending more and more to abolish the use of diagrams at universities and scientific institutions, and photographic departments for the production of lantern slides for teaching purposes are becoming regular appendages to high class scientific educational establishments. Consequently, within the last few years the instruments have increased in complexity and usefulness, so that in the construction of some of the best of them the highest skill of the mathematician and the working optician has been called into requisition, nor does it appear to be likely the present rate of advance will tend to decline for some years to come.

The popular toy of our younger days has a somewhat lively history, especially in the sensation created when it was first used to produce phantasmagorical effects. It may be of interest to mention that the first patent taken out in England relating to the magic lantern was in 1800, by the late Mr. Willoughby Smith, the electrician.

As time passed on the optical system of the lantern was gradually improved, but the Argand lamp had not been invented, the lime-light was unknown, so the illumination must have been poor. "Towards the close of the eighteenth century, Dr. Gravesande, a Dutch man of science, described a magic lantern containing a four-wick lamp. The oil from the lamp traversed a horizontal pipe carrying the wicks. The flames were made up of four little flames, which, by touching one another, made one square flame 2in. wide." A concave reflector behind increased the illumination. This lantern had a 5in. double convex condenser. The objective consisted of two double convex lenses; the diameter of the one next the light was 3½in., and was of considerable convexity. The front lens of the combination was smaller and flatter, and was placed 3in. from its neighbor. There was a diaphragm between the lenses, and the information was published that unless the diaphragm "be just where the rays intersect, it does a great deal of mischief."

Five years after this, in the year 1789, Argand invented his lamp. Before this date the optical lantern was necessarily an imperfect kind of instrument, unless sunlight were used as an illuminant. The solar microscope was invented by Nathaniel Lieberkuhn, of Berlin, in 1738. The influence upon the public mind of the advent of phantasmagorical effects in London may be gathered from the following extract from *Chambers's Journal* of April 28, 1849: "In 1802, a French gentleman, a M. Philipstahl, astonished crowds of people in London by an optical exhibition, which he entitled Phantasmagoria. It was a soul-appalling spectacle to those who had hitherto been ignorant of the wonders of light and shade. The spectery was a room where no light but that of a small oil lamp, hanging in the center, was admitted. On the assembling of the audience, this lamp was drawn up into a chimney, and a pitchy gloom overspread the place. Presently mournful notes of music were heard, and a curtain rose displaying a cavern, on the frowning walls of which were depicted skeletons and spectral figures. The music ceased, the rumbling of thunder was heard in the distance. Gradually it became louder, until at length vivid flashes of lightning, accompanied with peals apparently of the deep toned organ of the skies, gave all the impressions of a tremendous storm. The thunder and lightning continued at their height, when suddenly a small cloud of light appeared in the air; it gradually increased in size, until at length it stood revealed a ghastly spectro around whom the lightning gleamed in fearful reality. Its eyes moved agonizously from side to side, or now turned up in the sunken eye socket, the image of unutterable despair. Away, back to the dim abyss from whence it came it was seen swiftly to retire, and finally vanished in a little cloud, the storm rolling away at the same time. Then came other phantasms, some of which rushed up with apparently amazing rapidity, approaching the spectators, and again as rapidly receding, to return clothed with flesh and blood, or in the form of some well-known public personages. After a display of a number of similar apparitions, the curtain fell."