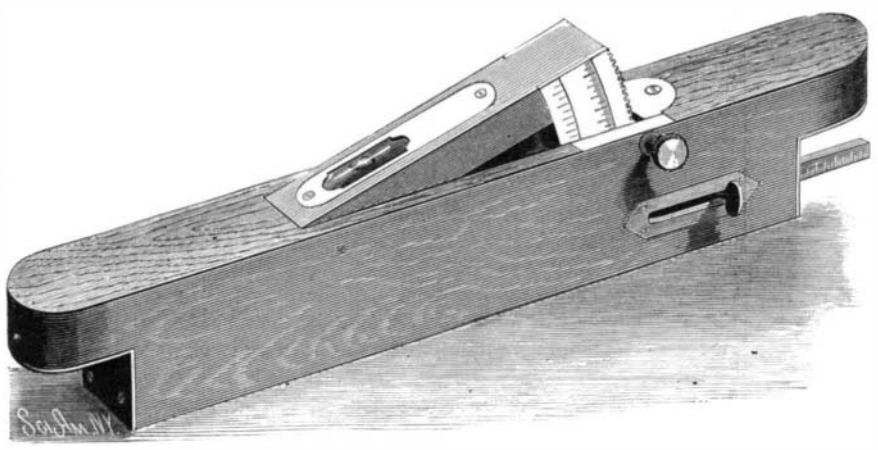
NEW RAILWAY TRACK GAUGE AND LEVEL.

This implement consists of a stock having shoulders which rest upon and fit between the rails. An extended chamber in the top contains a swinging bar, pivoted at one end, and having at the other end a curved rack which is engaged by a pinion on a spindle extending through the stock. The swinging bar contains an ordinary level, and is graduated on its curved end so as to indicate the amonnt of difference in the horizontal planes of the inner and outer rails of a curve. When a curve of short radius is to be made, the distance between the rails is slightly increased. The required increased length of the stock is secured by pushing out the sliding bar in one end of the stock.

In using the instrument the stock is laid transversely between the rails, its shoulders fitting upon the rails. When the track is in a straight direction the level in the bar will level it. When the track is to be curved, the degree of curvature having been first determined upon by the direction or curve of the road, the object then is to determine the difference in the horizontal planes of the two rails—that is, how much one must be raised above the other. It is a matter of calculation that when a curve of certain degree is made, one rail should be raised above the other a certain distance. The scale of degrees and the scale of inches upon the swinging bar are made to so correspond that when a certain degree appears above the edge of the stock when the bar is raised, a certain inch line will also appear, and that line is the exact distance the rail must be raised when a curve of this degree is to be made in the track.

This invention was lately patented by Mr. Charles F. Bergh, of Alma, Cal.



BERGH'S RAILWAY TRACK GAUGE AND LEVEL.

Clearing a Tunnel of Smoke.

Good report is given of the great fan lately constructed for the ventilation of the railroad tunnel between the St. Louis bridge and the Union Depot. It is said that the tunnel can be cleared of the smoke of the heaviest freight train in three minutes; and that when no trains are passing the air is as fresh and clear as that outside.

Postal Parcels in France.

Since May 1, 1881, as the result of a convention between the French Minister of Posts and Telegraphs and the administrations of the various railways in France, parcels not exceeding 3 kilogrammes (6½ pounds) in weight, and subject to certain limits of dimensions, are conveyed between any two points of French territory for 60 centimes (6d.), if called for at the station, and for 85 centimes (8½d.) if delivered. These rates include the duty of 10 centimes (1d.) levied by the government.

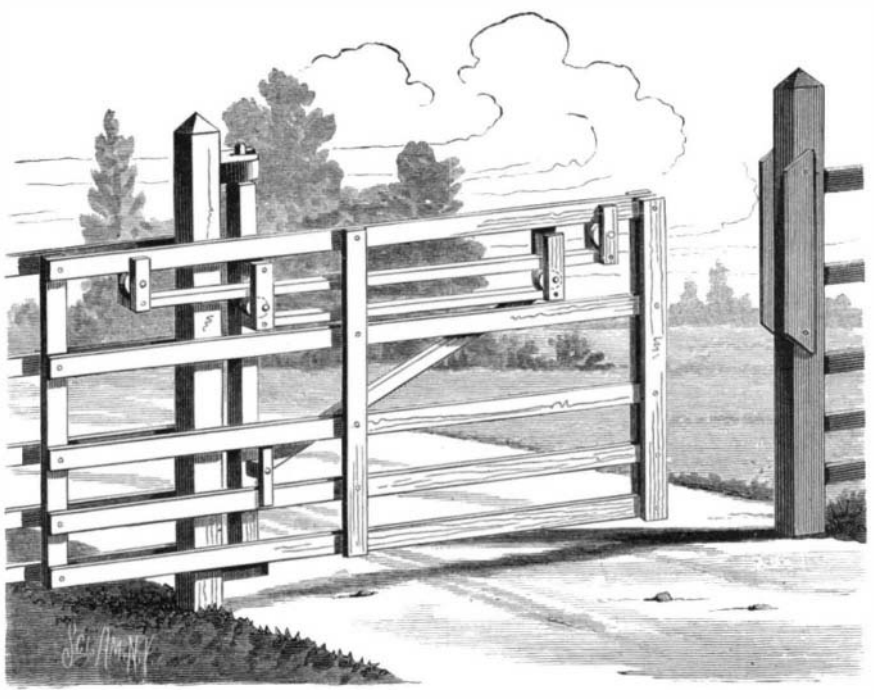
IMPROVED GATE.

The engraving shows an improvement in gates, more particularly applicable to farm gates or other large gates. The gate is formed of horizontal and vertical bars in the usual way. A crane or bracket, consisting of a vertical pivoted post, a horizontal bar, and a diagonal brace form the support and pivot of the gate. On the pivoted post, and on the free end of the horizontal bar, there are rollers that turn between vertical guides and support a movable horizontal bar, having at its ends rollers turning between vertical guides. The upper rail of the gate moves on these last-mentioned rollers, and the movable horizontal bar moves upon the rollers carried by the crane.

A button on the vertical pivoted post engages one of the lower rails of the gate and prevents the gate from swinging out of place. By turning this button the gate may be swung out of the vertical position and lifted off from its roller support, and its second rail may be allowed to rest upon the upper set of rollers. The button will then be placed in position to confine the lower rail, and there will be sufficient space below the gate to permit the smaller animals to pass through while retaining the larger animals. Two cleats nailed to the latch post form a groove for receiving the end of the gate when closed.

This improved gate slides easily, swings readily, and is simple and durable.

Further information may be obtained by addressing Mr. W. A. Preston, Fort Branch, Ind.



PRESTON'S IMPROVED GATE.

Electrical Progress in Vienna.

An exhibition of electricity and its various uses, after the plan of the late Paris Exhibition, will be held in Vienna during the coming summer, under the management of Count Wilczek and Baron Victor Erlanger. It will be held in the central building of the International Exhibition of 1873.

The Telephone Exchange, opened in Vienna in December last, is said to be doing well. By the middle of February there were three hundred subscribers, and connections were being made with two hundred more. The charge is 100 florins, or about $40, a year.

A very successful trial has just been made of the Brush system of electric lighting in Vienna. The Place of St. Stephen and the neighboring streets were lighted with fourteen lamps, with such excellent results that preparations are making for the electric illumination of the famous Ringstrasse, the finest avenue in the city if not in Europe. One hundred and thirty Brush lights will be required. The light will also be introduced into public and private buildings.

The Converting Power of Malt.

Now that brewers are learning to use raw grain in combination with malt, it becomes of considerable importance to be able to determine and compare the converting or diastatic powers of different samples of malt. The value of a malt may depend to a considerable extent on this property, for without it much of the starch in the raw grain will remain unacted upon. The converting agent in malt, usually called diastase, is a nitrogenous substance, but as it is accompanied by several other inert nitrogenous substances, the determination of the nitrogen in the malt gives us no exact idea of its converting power. The proper plan to adopt is to cause some of the malt to act upon an excess of starch, and then to determine the amount of sugar formed. A small quantity of the malt to be tested having been crushed is added to a very large excess of starch, previously made into a paste with warm water; the amount of starch must be in excess of what it is possible for the malt to convert; the mixture is then kept for about two hours at the temperature most favorable to the conversion of the starch, the liquid is then filtered so as to separate the starch remaining unconverted, and in the clear solution the maltose is determined by Fehling's solution. In this way, by making comparative experiments with different malts, their various converting powers may be determined with some degree of precision.—*Brewers' Guardian.*

New Attachment for Vises.

A useful attachment to vises, by which a great amount of work that is usually done with files, etc., can be easily and quickly accomplished, has been recently patented by E. E. Schermerhorn, of New York city. It consists of a milling tool or rotary cutter mounted on a suitable arbor carried by adjustable arms, by which the cutter can be placed in position to work in any direction. When attached to the bench-vise and operated by hand it may be traversed over any piece of work that can be held in the vise, being provided with a suitable feed motion for that purpose, thereby effecting a great saving in labor and files. It is also an efficient drilling machine, and very useful for cutting off metal bars, rods, etc.

The Latest Automaton.

A recent news letter from Vienna says. Two months ago an automaton called King-Fu was exhibited in Vienna for the first time, and caused a great commotion. The automaton, as also the stool upon which it was seated, were too small to admit of the possibility of any person being concealed in them. Besides, the stool was of glass, and disclosed most complicated machinery, consisting of wheels of all kinds and dimensions, and springs and chains. The machine was wound up at the beginning of each performance, and was then able to answer any question in arithmetic put to it by the spectators. The exhibitor, Herr Rosen, was offered money by members of the aristocracy to disclose his secret, but he refused point-blank. When the whole town had gone to see King-Fu, the court's curiosity was roused, and the Emperor had M. Rosen called to perform one evening before himself, the Empress, and little Princess Valerie. The automaton solved all the problems put to it, and, when the performance was over, the Empress said to Rosen: "Now you will not mind telling us the secret of your King-Fu?" But Rosen did mind. The next day he quarreled with his servant, who, being dismissed, betrayed his former master, and he told a dreadful story of a young man who was concealed within King-Fu, and who suffered horrible agonies during each performance. The police intervened, and found that there certainly was a boy (Rosen's own nephew) inside King-Fu, but that he was, all things considered, pretty comfortable, and certainly suffered no agony. The papers got wind of the affair, and Rosen announced his departure from Vienna. But justice, in the shape of the police, stopped him, and actually put him in prison on the charge that he had cheated the public out of 20,000 florins. After five days' detention M. Rosen was liberated, there being no real charge against him. The public, although duped, was entirely on M. Rosen's side. Those who believed that a machine, once wound up, could answer multitudinous questions must have believed in a miracle; and those who did not believe it must of course have tacitly acknowledged that they were being deceived in some manner. When M. Rosen complained of having spent a week in prison, he was answered that he certainly deserved some punishment for having cheated the "very highest court in Europe" into believing—what? He packed King Fu up, and left Vienna with his 20,000 florins, his nephew, and his automaton.

A Dog Goes Over Niagara Falls Alive.

A large dog lately survived the passage over Niagara Falls and through the rapids to the whirlpool. He was first noticed while he was within the influence of the upper rapids. As he whirled rapidly down over the falls no one imagined but that that was the last of him. Shortly afterward, however, he was discovered in the gorge below the falls vainly endeavoring to clamber up upon some of the *débris* from the remains of the great ice bridge which recently covered the water at this point, but which had nearly all gone down the river. The news spread rapidly through the village, and a large crowd gathered on the shore. Strenuous efforts were made to get the struggling animal on shore, for an animal which had gone safely over the falls would be a prize worth having, but without success. Finally the dog succeeded in getting upon a large cake of ice and floated off upon it down toward Suspension Bridge and the terrible whirlpool rapids. Information of the dog's coming was telephoned to Suspension Bridge village, and a large crowd collected on the bridge to watch for the coming wonder. In due time the poor fellow appeared upon his ice cake, howling dismally the while, as if he appreciated the terrors of his situation. An express train crossing the bridge at the time stopped in order to let the passengers witness the unusual spectacle. Round and round whirled the cake, in a dizzy way, and louder and more prolonged grew the howls of the poor dog. As the influence of the whirlpool rapids began to be felt, the cake increased in speed, whirled suddenly into the air, broke in two, and the dog disappeared from view. No one thought that he could possibly survive the wild rush through the rapids. When, therefore, word was received that the dog was in the whirlpool, still living, and once more struggling vainly to swim to land, it was received, however, with marked incredulity. This story was substantiated by several trustworthy witnesses. It seems incredible that an animal could go through the upper rapids, over the falls, through the gorge, through the whirlpool rapids, and into the whirlpool itself, a distance of several miles, and still be alive. The poor animal perished in the whirlpool.

ROSE CULTURE.—The Kezanlik Valley, in Roumania, is entirely given up to the cultivation of roses. The essence is sold wholesale in Paris from £30 to £40 per pound, while it is retailed at £100 or more per pound.