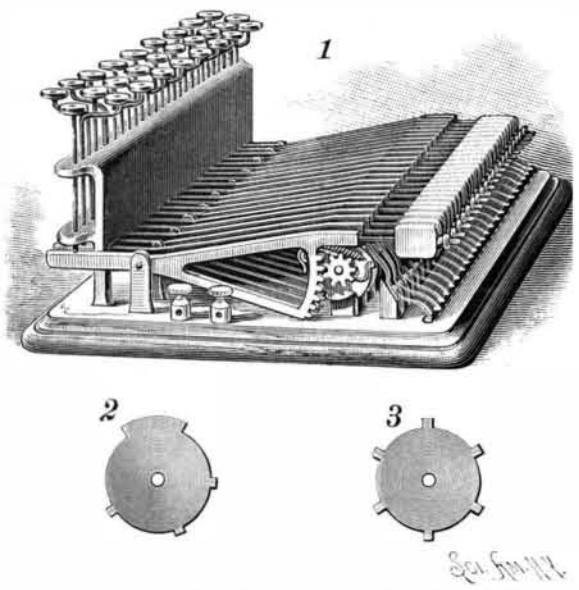
A French Fast Train.

A new locomotive built in the shops of the Northern Railroad has been tried at high speed, with a special train of 16 carriages, having a total weight of 667,800 lb. Lead bars were put in the carriages to represent the average weight of passengers, baggage, etc., carried on an express train. This train ran from Paris to Calais by the direct line, a distance of 184·56 miles, in 3 hours, 53 minutes; two stops were made, one of five minutes at Amiens, the other of two minutes at Abbeyville. The average speed, making no allowance for stops, was 47·53 miles an hour. The run from Paris to Amiens was made at the rate of 51·58 miles an hour, the train going up the Survilliers grade—0·5 cent., 11·19 miles long—at the rate of 46·6 miles an hour. On the return trip another carriage was added, making 17 in all. From Calais to Lille the average speed was 49·7 miles an hour, the highest speed 59 miles. Between Lille and Paris the average speed was about the same, but a speed of 71·46 miles an hour was reached in going down the Survilliers grade.—*Iron Trade Review.*

AN EASILY OPERATED TELEGRAPH INSTRUMENT.

The illustration represents an instrument designed to facilitate the transmission of telegraphic messages with speed and accuracy. It has been patented by Dr. Samuel W. Smith, of No. 24 West Thirtieth Street, New York City. Aligning vertical supports on a suitable base carry horizontal shafts on which are disks having projections varying in length, and adapted by means of varying contact with the trailer to transmit dots and dashes. The disk used in sending one of the longer characters is shown in Fig. 2, which represents a "v" in the Morse alphabet, requiring a dash and three dots, Fig. 3 showing a disk used in sending one of the shorter characters, as the letter "e," which would be represented by a dot. Fixed on each disk-carrying shaft is a ratchet wheel, adjacent to which is a pinion



SMITH'S TELEGRAPH TRANSMITTER.

carrying a spring-pressed pawl, with other mechanism, the arrangement being such that the character disks may be given a whole revolution or any part of a revolution by each movement of the key, the motion being limited and regulated by the mechanism. Each key rests on an outer projecting end of a carriage pivoted between vertical supports, there being near the opposite end of the carriage a segmental rack meshing with the pinion on a disk-carrying shaft, the carriage also having a projecting screw-threaded portion carrying a weight adjustable by means of a nut. Each key is marked with a letter corresponding with the projections on one of the disks, and any person who can read the letters can operate the transmitter, it being only necessary to depress a key to transmit a letter. The movement of the sending mechanism is regulated by the downward movements of the weights, whereby the motion of the character disks is made steady, and accuracy and rapidity are assured. Each key and its mechanism works independently, forming a transmitter in itself. This instrument may be adapted to any code of signals.

The Bordeaux International Exhibition of 1891.

Active steps are being taken in the preparation of this exhibition, which will be opened on the 1st of May, 1891. The exhibition will cover an area of 60,000 square meters, and will be divided into five sections, viz.:

I. Education, liberal arts, furniture, textiles, and clothing.

II. Miscellaneous industries, machinery, mineralogy, chemistry, electricity, etc.

III. Food stuffs, import and export trade, navigation, salvage, fishery, and fish culture.

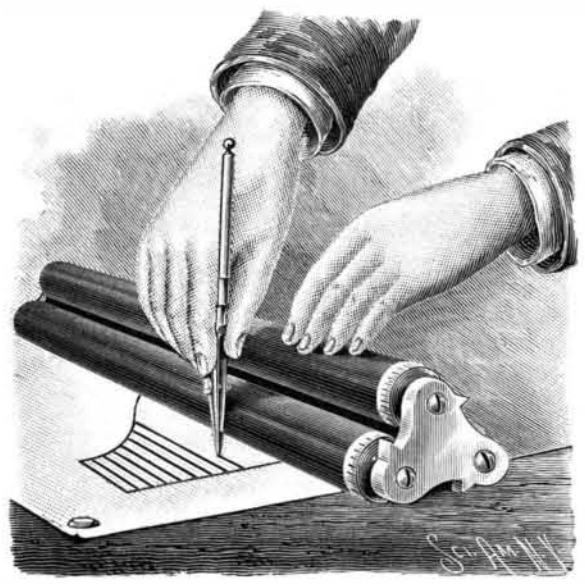
IV. Agriculture, viticulture, horticulture, etc.

V. Fine arts.

Exhibits are invited from all countries, and applications for space should be addressed to Henri Garcin, 7 Allees de Tourny, Bordeaux.

AN IMPROVED PARALLEL RULER.

A simple and convenient device to facilitate ruling with a pen, pencil or brush is shown in the accompanying illustration, and has been patented by Mr. Reginald Forwood, of Paris, Texas. It is made of three



FORWOOD'S PARALLEL RULER.

rollers journaled triangularly in end bearings, the bearings not extending marginally beyond the peripheries of the rollers. The rollers may be made of metal tubing, with plugs in the ends of the tubes to receive screws to act as journals. The ends of the rollers, at one or both ends, have peripheral graduations set or gauged to an index pointer on the adjacent end bearing, whereby, after one line is drawn, the ruler may be rolled a measured distance for the ruling of the following line. These graduations may be spaced differently on the different rollers, to facilitate making evenly spaced parallel lines at different distances apart. The ruler may be set or run along on any two of the rollers.

A Great Magnet.

Hughes & Gawthorp had on exhibition at the Pittsburg exposition an electro-magnet designed for lifting pig iron from the pig bed in the cast house. It was manufactured by the Thomson-Houston Motor Company. This magnet had a lifting capacity of 7,200 pounds. In shape it somewhat resembled a bell with nearly vertical sides, standing about 20 inches in height, and measuring about 24 inches across the bottom. The thickness of the sides of the bell, if it may be termed such, is about 3 inches, and within the bell and being flush with it at the bottom was a large coil forming a powerful electro-magnet. The coil is made a magnet by the passage of a current of electricity through it. The magnet, which is attached to a crane, can be raised and lowered. The lode can be dropped by simply shutting off the current.

The Prophylaxis of Diphtheria.

A *resume* of this subject is furnished by Prof. Loffler, of Greifswalde. The cause of diphtheria is a bacillus, which, contained in the exudation on the affected mucous membranes, is liable to be disseminated in the vicinity of the patient, together with particles of the false membrane. The infectivity of the patient may even persist for some days after all traces of diphtheritic exudation have disappeared. The strictest isolation of cases is necessary; children who have suffered from the disease should be kept from school for at least four weeks. The bacilli have been found to retain their vitality in dry membranes for from four to five months. It is therefore essential that all clothing, bed linen, and utensils likely to have been contaminated should be disinfected, either by boiling or by exposure to steam. The room occupied by the patient should be disinfected by washing the floors with warm sublimate solution (1 in 1,000), and cleansing the walls and furniture with bread.

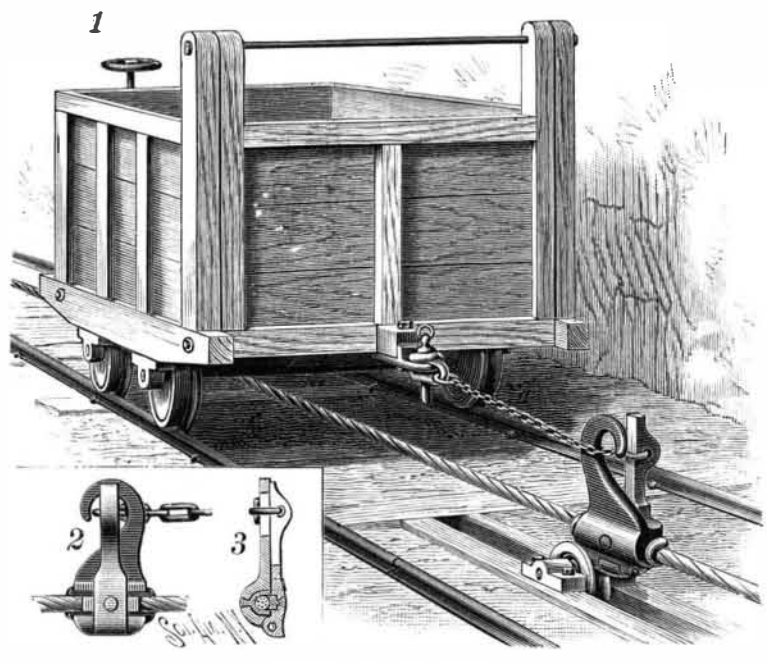
It is uncertain how long the bacilli may exist in the moist state, but it seems probable that moisture is more favorable to their vitality than dryness. Thus, diphtheria would seem to be favored by the dampness of dwellings, and also by absence of light. These organisms can exist outside the body at a temperature of 68 degrees F., and they develop well in milk. The sale of milk should, therefore, be carefully supervised. The diseases affecting pigeons, fowls, calves, and pigs which resemble diphtheria are not caused by the bacillus of human diphtheria. These diseases in the lower animals are not, therefore, to be feared as sources of the human affection. Professor Loffler thinks that the etiological identity shown by Klein to exist between diphtheria in cats and in man requires confirmation. Although lesions of mucous membranes favor the retention of the virus, yet in disposed subjects the disease may arise apart from such lesions. It is advised that when diphtheria is prevalent, a systematic use of disinfectant gargles and washes (*e. g.*, sublimate solution, 1 in 10,000) should be enforced on all children. The meteorological conditions which favor the spread of the disease are still unknown.—*Berliner Klinische Wochenschrift; Medical Record.*

A Lucky Escape.

An unusual whirr of machinery, a hissing and twisting of a broken belt and a shower of small pieces of broken iron in the dynamo room at the Lowell electric light station, a few nights ago, startled all the employes within hearing. Something had broken. As the engineer rushed in to shut off the steam and stop the swiftly running engine he saw a single black streak cutting the air where once had been a heavy fifty-inch pulley, a network of torn wires and a pile of twisted belting. In this room there are two large dynamos for supplying motor power to the electric railway and a circuit of street lights and private motors. On the main shaft are two large fifty-inch pulleys, one of which burst into a thousand pieces and the other was broken and cracked so that it could not be run. When the pulley broke, the force with which the belt flew off lifted everything loose from the floor above. Small pieces of broken wire were thrown with terrific force in all directions, but strange, and very fortunate, besides the broken pulley and belt, very little other damage was done. At the time of the break there was no one in the engine room.—*Modern Light and Heat.*

AN IMPROVED CABLE GRIP.

The grip shown in the illustration, while designed to be simple and durable in construction, is adpated to reduce the strain on the cable and car to a minimum, and is arranged to pass readily over the cable sheaves without displacing the cable. It has been patented by Mr. Elijah Dainty, of Coal Bluff, Pa. The grip has two members pivotally connected together at their lower ends, as shown in side elevation and transverse section in Figs. 2 and 3, one member having a slot in which is fitted a shoe adapted to receive the cable. The cable is clamped into the shoe by a shoe held in the other member, the cable being clamped when the two members are drawn together. The shoes are of a form to be readily fitted to place in the members, and each has an outwardly projecting pin passing into a countersunk aperture adapted to be filled with molten metal to lock the shoe in place. The free end of one member of the grip is connected with a chain which is passed through an eye or loop of the other member to attachment with the car, so that when tension is put upon the chain the members are drawn toward each other and the cable is firmly gripped. The heavier the pull on the chain, the tighter the members are drawn together. The members of the grip are opened sufficiently to apply it to the cable in starting, and when the car arrives at its destination the clevis pin connecting the chain to the car is withdrawn and the chain is thrown out of the eye of the grip, when the latter drops off the cable. When the shoes are worn out, they can be readily replaced by new ones after first



DAINTY'S CABLE GRIP.

cutting out the Babbitt or other metal around the pins which hold them in place. The lower parts of the two members of the grip are so rounded off that it readily travels over the grooves in the sheaves supporting the cable.