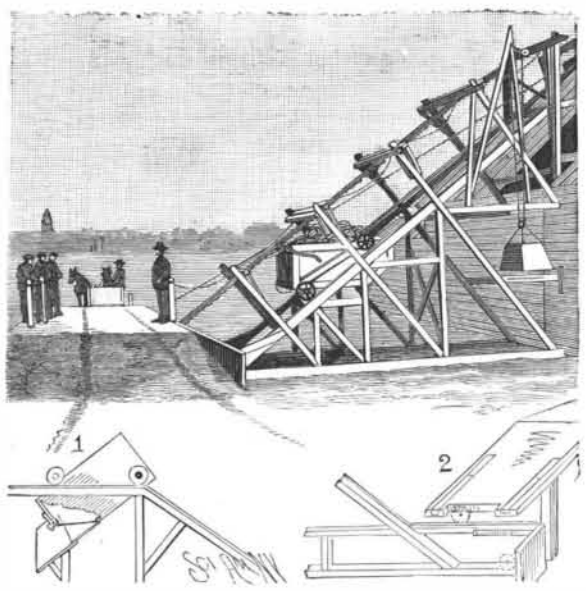
AN INCLINE ELEVATOR AND DUMP.

This improvement comprises a derrick of simple but strong construction, forming inclined tracks, on which travels a car having wheels in different planes, there being at one end a low down dump where the car receives its load, and the contents of the car being automatically discharged into a chute at the upper end of the incline. The invention has been patented by Mr. Samuel E. Kurtz, of Greenfield, Iowa. The large view shows the application of the improvement, Fig. 1 representing the car dumping its load, and Fig. 2 the bottom of the incline, where the load is received, below the level of a dumping platform, upon which a loaded wagon may be readily driven. At the bottom of the inclined tracks are upper and lower parallel tracks, the upper tracks being narrower than the lower ones, and the car comes to a level at the point where it receives its load, as the rear wheels run down to the lower



KURTZ'S ELEVATOR AND DUMP.

tracks without striking the upper tracks. The car is drawn up by a cable passing around a pulley on a cross bar at the upper end of the tracks, thence back and around a pulley on the car, and again around a pulley on the cross bar, from which the cable leads over guide pulleys to a point convenient for attachment to a whiffletree or the axle of a wagon, so that the team bringing the load may furnish the power by which it is elevated and dumped. At the front lower corner of the car is a downwardly swinging door with end flanges overlapping the sides of the car, and adapted to drop into connection with a chute delivering to the desired receptacle in the usual way. The door is held normally closed by gravity catches, which are automatically released when the car is pulled up to its limit, the door being automatically closed again as the car rolls backward. A counterweight is arranged to prevent the too rapid descent of the car, and a rack is also arranged in the framework and a pawl and ratchet on the car. This elevator is very inexpensive to build, costs nothing for power, and is designed to be especially useful to farmers and others for elevating materials into storage bins and for similar purposes.

POLISHING AND BUFFING LATHE.

The lathe shown in the illustration is designed for heavy work. It has extra long babbited boxes, giving the spindle sufficient bearing to insure stiffness. The width of head is reduced to facilitate work upon large irregular pieces, and it is especially adapted for bicycle, stove, chandelier or car trimmings work, permitting the use of a large wheel without jar or spring. The lathe is made in several sizes, with detachable steel taper ends in the next lower size to take the smallest brush or buff. They are designed to be run at a higher speed than any in the market. They are made by the Hanson & Van Winkle Company, of Newark, N. J.

Money Value of Hands and Fingers.

The following estimate of the relative value of the hands and of the several fingers is taken from the *British Medical Journal:* According to a scale drawn up for the Miners' Union and Miners' Accident Insurance Companies, of Germany, the loss of both hands is valued at 100 per cent, or the whole ability to earn a living. Losing the right hand depreciates the value of an individual as a worker 70 to 80 per cent, while the loss of the left hand represents from 60 to 70 per cent of the earnings of both hands. The thumb is reckoned to be worth from 20 to 30 per cent of the earnings. The first finger of the right hand is valued at from 14 to 18 per cent, that of the left hand at from 8 to 13·5 per cent. The middle finger is worth from 10 to 16 per cent. The third finger is valued at no more than 7 to 9 per cent. The little finger is worth 9 to 12 per cent. The difference in the percentages is occasioned by the difference in the trade, the first finger being, for instance, more valuable to a writer than to a digger.—*Food.*

Railway Rates in India.

In the United States we are apt to consider our railroad rates as lower than those of other countries, and this is probably true of freight, but in passenger rates the Indian railroads go far below ours. The government report on Indian railroads for the year ending March 31, 1893, which has lately been issued, gives the average rate on all freight at 1·023 cent per ton mile; our rate for 1892-93, according to the Interstate Commerce Commission reports, was 0·898 cent. Our average on passenger business, however, was 2·126 cents per passenger mile, while the Indian railroads charged only 0·645 cent. This rate was in silver, but it must be remembered that wages and other charges are paid in silver also, though imported machinery must be paid for in gold at a premium. The lowest average rate was found on the Madras Railway; it was 0·414 cent per passenger mile. This rate would give fares in this country of about 37 cents from New York to Philadelphia, 99 cents from New York to Boston, about $3.75 from New York to Chicago, and about $14 from New York to San Francisco.

These low rates are made both possible and profitable by the dense native population which furnishes the railroads with an enormous number of passengers who are satisfied with the cheapest kind of accommodations, provided the charge is low. Over 95 per cent of the passengers are carried in the fourth-class cars, which are used only by the natives, and hardly 1 per cent use the first-class. While in this country the average passenger train load is 42 persons, on all the Indian roads it was last year 231, or over five times as large, while in one case—the East Indian Railway—the average was 247 persons.—*Eng. and Min. Jour.*

Smoke Prevention.

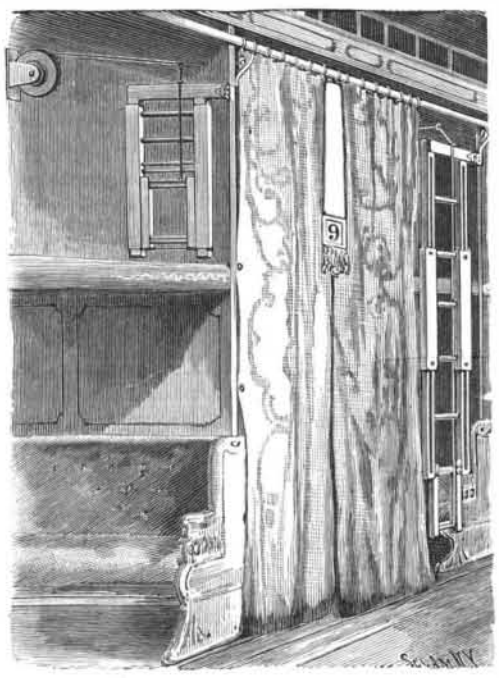
In a recent experiment at Glasgow, Scotland, *Engineering Mechanics* says the coal used showed 31·40 per cent gas, tar, etc., 48·70 per cent fixed carbon, 0·84 per cent sulphur, 6·56 per cent ash, and 12·50 per cent water. Before treatment analysis showed that the products of combustion contained 5·8 grains of sulphuric acid per 100 cubic feet, and after treatment 2·8, while in another case the reduction was from 9·5 to 4·2. As to soot, the first test showed a decrease from 73·5 grains to 2, and the other test from 23·3 to 1·5 grains. In other words, from 94 to 97 per cent of the soot was removed and fully a half of the sulphuric acid. Tests showed that the draught was not affect d, being 5 inches in the flue and 4 inches in the chimney.

A Babcock & Wilcox boiler was used, driving a 220 horse power engine, and consuming 3 tons of coal and a ½ ton of scraps and chips. Before entering the usual chimney the gases ascend a short brick flue, and then descend a flue of steel plates dipped at a high temperature in a tar composition, entering the ordinary stack at the bottom. At the bottom of the ascending flue is a jet of steam at boiler temperature, while at the top of the descending flue is a fine spray of water. The carbon is thus separated, and, with the water, drops into a sump at the foot of the descending flue, being thence carried off in pipes.

POLISHING AND BUFFING LATHE.

AN EXTENSION LADDER FOR SLEEPING CARS.

How inconvenient it som times is, especially for the aged and the feeble, to reach t he upper berth in a sleeping car, has often been noticed by travelers on our railways. To obviate such inconvenience, and enable the traveler to readily get into the upper berth and descend therefrom, is the object of the improvement shown in the illustration, which consists of an extension ladder adapted to be folded and swung out of the way when not in use. It has been patented by Mr. John B. Holbrook, D. K. E. House, Ithaca, N. Y. Upon the usual removable transverse partition separating the upper berths from each other is a hinge connected with an arm or bar forming the upper end of the ladder, which is made in sections adapted



HOLBROOK'S EXTENSION LADDER FOR SLEEPING CARS.

to slide upon each other. When swung outward the ladder drops down nearly to the car floor, just outside the lower berth. To facilitate folding the ladder, a tape extends from the lower rung of the bottom section up through the several sections, passing through an eye to a spring-pressed drum fixed within convenient reach. By pulling on this tape the occupant of the upper berth can readily fold the ladder, which is then swung inward against the side of the partition. When the car is made up in the morning, the partition board is stored with the ladder attached.

High Railway Speeds.

High speeds on railways formed the subject of the inaugural address of M. Du Bosquet, president of the French Society of Civil Engineers. He states that the reason speeds are not maintained on the level is because the engines are not sufficiently powerful for this. Some experiences with the dynamometer made with speeds from 37 to 75 miles, and of which the results have been extended to greater speeds, show that for the same motive force of 17·2 lb. per ton, a train reaches a speed of 75 miles on a decline of one-half of one per cent, 57 miles on the level and 31 miles on an incline of one-half of 1 per cent. To increase the average speed by a small amount, the power of the engines must be much greater. If 800 horse power is sufficient to draw a train at 75 miles an hour up an incline of one-half of 1 per cent, 2,960 horse power will be required to draw the same train up the grade at a speed of 125 miles per hour. In high speeds the weight of the engine per horse power generated is important, as there is always a limiting speed beyond which the engine cannot draw itself, let alone a train. Really high speeds, the speaker stated, will be obtained only by diminishing the weight, per horse power, of the locomotive, and by limiting the load to be hauled to a minimum.—*Railway Engineering and Mechanics.*

Protection against Serpent Bites.

Dr. Calmette is continuing, at the Pasteur Institute, a series of interesting experiments on the poison of serpents commenced by him while residing in Cochin China. He has obtained excellent preservative effects by inoculating or injecting viper's blood in various animals. He treats it first by heat or by chemical agents, such as hyposulphite of soda. His theory is that venomous animals are unaffected by their own poison. His results confirm those recently obtained by MM. Phisalix and Bertrand at the laboratories of physiology and chemistry at the Paris Museum.