

ADJUSTABLE WINDOW BEAD FASTENER.

On the window frame or casing behind the bead three or more metal plates or disks are secured, flush with the surface, and covering each a shallow recess. In each disk is a horizontal slot of suitable length, which receives the coarsely threaded point of a screw passing freely through the head, the slot being as wide as the thickness of the screw at the bottom of the threads. The edges of the slot are adapted to engage with the threads of the screw on opposite sides, thus forming a two-sided nut with straight threads, in which the screw may slide when loosened. The bead fastened to



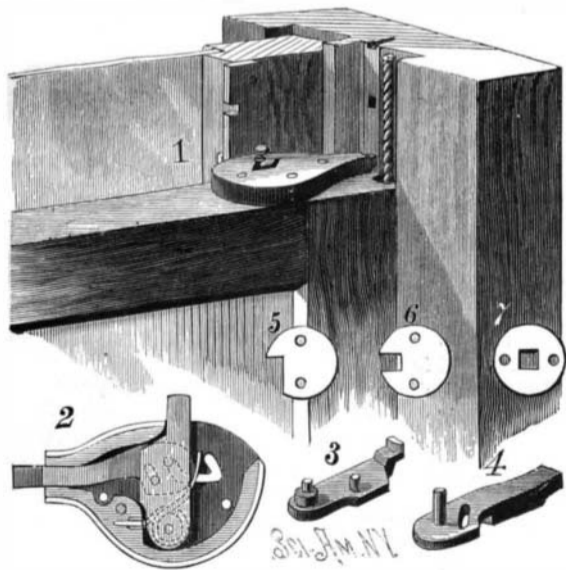
JOHNSON'S ADJUSTABLE WINDOW BEAD FASTENER.

these disks can be quickly adjusted toward or from the sash, to prevent rattling or binding, by a very slight movement of the screws without turning them out from the slots. The disks are cheap, and easily applied to any window; and the screws may be of the common kind, or have heads not needing a driver.

This invention has been patented by Mr. Edwin A. Johnson, of 104 Fayette Street, Allegheny City, Pa.

DOUBLE BOLT SASH LOCK.

The engraving shows a cheap and strong sash lock, recently patented by Mr. Edwin A. Johnson, of 104 Fayette Street, Allegheny City, Pa. The bolts are confined by a removable bottom in a casing secured on the top of the lower sash directly above the side rail. The swinging bolt is held at the inner end by a pivot, and at the free end has a beveled hook which engages with the edge of a notched plate on the upper sash, thus drawing the two sashes together. The sliding bolt enters an apertured plate in the window frame, and is moved by a pin projecting through a guide slot in the top of the casing. The two bolts are connected with each other by a sliding joint, consisting of a pin in a slot, and thus are operated together by the projecting pin and by a spring bearing on the inner end of the sliding bolt. At each end of the slot in the casing is a notch, which receives the projecting pin and thereby holds the bolts in place when drawn and when locked.



JOHNSON'S DOUBLE BOLT SASH LOCK.

Apertures at short intervals in both plates permit the sashes to be securely fastened when partly open for ventilation.

A NEW method of making chlorine has been described by *Le Genie Civil* as the invention of M. M. Pechiney. It consists in the addition of magnesia to a concentrated solution of magnesium chloride, so as to produce a solid mixture, which is then treated with air and heat. Nearly the whole of the chlorine is liberated, a part as free chlorine and a part as hydrochloric acid. The residue consists of magnesia, which is used over again with a fresh charge of magnesium chloride.

A Valuable Train.

Perhaps the richest train that has passed over any road in this part of the country, says a Western newspaper, was that which went over the Hannibal & St. Joe one day recently. The train was composed of two cars of gold bullion, three cars of silver, eight cars of silk, and four cars of tea. The gold and silver were from Colorado, destined to the Philadelphia Mint. The silk and tea were from California, going to New York. A Pennsylvania paper, not to be outdone by the Westerner, claims that the *longest train* ever seen on the Lehigh Valley road was one that passed over that thoroughfare about the same time the *richest train* was coming East over the Hannibal & St. Joe road. It consisted of 123 eight-wheel coal cars, all loaded, and was drawn by a single engine.

Huge Locomotives.

Railroad	Brazil.	Southern Pacific.
Type of engine	Decapod.	El Gobernador.
Weight in working order, lb.	144,000	152,000
Weight on driving wheels, lb.	128,000	121,600
Weight of tender empty, lb.	34,000	50,650
Water, coal, and tools, lb.	46,000	35,000
Total weight tender, lb.	80,000	85,650
Total weight engine and tender, lb.	224,000	237,650
Tank capacity, gals.	3,500	3,000
Coal capacity, lb.	16,000	10,000
Cylinders, diameter and stroke	22x26	21x36
Driving wheels, diameter, in.	45	57
" " number	10	10
Tractive force per lb. av. press. in cylinders, lb.	279.6	278.6
Driving wheel base	16 ft. 11 1/4 in.	19 ft. 7 in.
Engine wheel base	24 ft. 6 1/2 in.	28 ft. 11 in.

It will be seen from this that the Decapod has slightly more tractive force, and is slightly lighter than El Gobernador. There is a singular difference in the tenders. El Gobernador's tender is 50 per cent heavier than that of the Decapod, but carries less water and coal. This is probably due to the fact that El Gobernador's tender has six-wheeled trucks.

One great difference, says the *Railroad Gazette*, between the two engines is in the size of the wheels. The Decapod's wheels are made as small as possible in proportion to the stroke of the pistons, and consequently the saving of weight effected by the smaller wheels and shorter cylinders enables the boiler to be increased to the unprecedented size of 64 inches diameter. The smaller wheels also enable a shorter driving wheel base to be adopted, the large wheels on El Gobernador nearly touching one another, though the wheel base is very long. In the Decapod there is room for two Westinghouse driver brakes on each side of the engine, and the wheel base is shorter, though still of considerable length for working round sharp curves.

The Decapod is a new engine, and the first with ten coupled wheels constructed by the Baldwin Locomotive Works for the wide or standard gauge, though two decapods, each weighing 90,000 pounds, have been built for the 3 foot gauge.

The piston rod is 4 inches diameter, and the main crank pins are 6 inches diameter. All the coupling rods have bushed ends. The Laird cross head is of cast steel, and the slide bars are cast iron. The boiler is fed by two long-stroke pumps and an injector. The reverse gear is a combination of screw and lever, so that either may be used.

The middle wheel of the coupled wheels takes the main rod. The two hind pairs and the front pair of drivers have flanged tires, but the main drivers and the pair immediately in front of the main drivers have plain tires.

The tender is fitted with a roof over the coal space, and is carried on two four-wheel trucks.

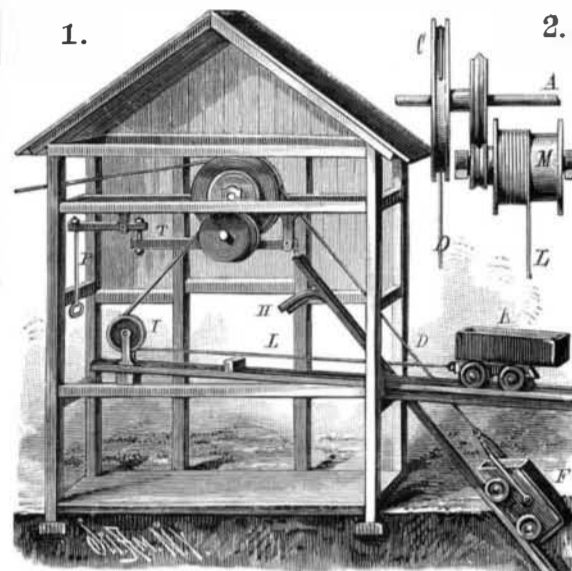
IMPROVED SLED.

The improvement in sleighs patented by Mr. Samuel Baum, Lock Box 66, Little Falls, N. Y., is particularly adapted for those known as "bobsleighs." The under side of the runner is formed with a longitudinal groove in which fits the rib of a steel shoe held to the runner by rivets or bolts. The forward ends of the runners gradually curve upward, and, at a point about on line with the raves, bend backward. These rearwardly bent ends are wider than the body portions, and are formed with flanges (as shown in the sectional view, Fig. 2), which bear against and protect the side edges of the raves; if desired, these might be extended so as to inclose the raves their whole length.

Just back of the flanged portions of the runners, the raves are joined by a sand board, and the rear ends of the runners are turned forwardly and upwardly and then inwardly, and secured to the under side of the sand board. Curved braces connect the runners and the under sides of the raves at their ends. A brace secured to the sand board extends to near the forward end of each rave. From about the center of each runner projects a brace having three branches, two of which are secured to the raves and the third to the sand board. The forward curved portion of the runner is supported at two points by branches of a brace secured to the rave and also to the sand board, as shown. This construction provides a sleigh which is thoroughly strong, which will last a long time, and not be likely to need repairs.

IMPROVED MINE RAILWAY.

The object of the invention herewith illustrated is to lessen the cost of transportation of ore, coal, etc., by utilizing part of the power of the hoisting car for operating a surface car. On a shaft journaled in the shaft house is mounted a grooved pulley, C, over which the hoisting cable, D, passes from the engine house down the inclined shaft to the skip, F, which runs on a track in the shaft and on a track extending upward from the shaft, and provided with a dump, H, near its upper end, where the skip is dumped automatically. Leading from the shaft house to where the ore is to be deposited



IMPROVED MINE RAILWAY.

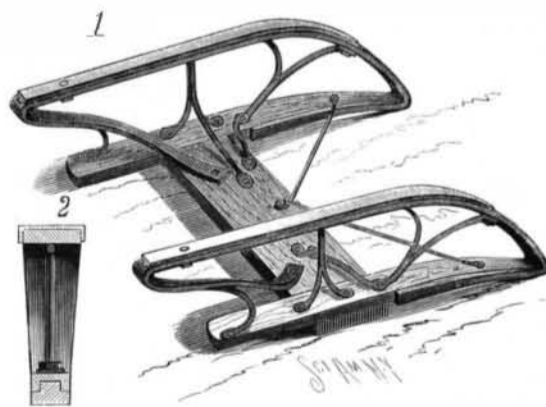
is an inclined track on which the dumping car, K, runs; this car is secured to a cable, L, which passes over the pulley, I, and winds about the drum, M. On the shaft carrying the drum is a grooved friction pinion adapted to be engaged with a friction wheel on the shaft, A. The drum shaft is journaled on a frame, T, one end of which is pivoted and the other end connected with a lever provided with the pulling rod, P.

As the skip is pulled up the incline the pulley, C, is revolved by the cable, D. Upon the rod, P, being pulled down, the frame, T, is raised and the friction wheels brought into contact with each other, thereby revolving the drum and drawing up the dumping car; by the time the dumping car is under the dump, H, the skip arrives at the dump and empties its load into the car, K. Upon the rod, P, being released, the frame moves downward enough to disengage the friction wheels, thus permitting the car, K, to run down. In the mean time the skip is lowered. In operation this arrangement would require only one man in any shaft house to run it, and would do away with all men and horses for tramming about a mine; neither would it require an engine and attendants.

This invention has been patented by Messrs. J. C. Fowle, J. P. Christopher, and W. P. Smith, and particulars can be obtained by addressing Mr. John C. Fowle, Michigamme, Mich.

Census of Occupations.

The census of 1880 gives the number of persons engaged in gainful occupations as 17,392,000, or 47.31 per cent of total persons over 10 years old. These were engaged in the four chief lines of occupation as follows: Agriculture, 7,670,000; professional and personal serv-



BAUM'S IMPROVED SLED.

ices, 4,074,000; trade and transportation, 1,810,000; manufacturing, mechanical, and mining industries, 3,837,000. In 1870 the number engaged in occupations was 12,505,000. Of those in 1880, 2,647,000 were women. The number of persons over 10 years of age is 36,761,000, leaving 19,369,000 unaccounted for. The latter number is about equal to the number attending school or physically incapable of labor. The census shows an increase over 1870 of about 30 per cent in population, but an increase of 39 per cent in the number engaged in occupations. This increase in number in occupations over the gain in population is accounted for by the growth of the factory system.