

Science and Art.

Gum Benzoin.

This gum is said to be the produce of the *Styrax Benzoin*, a lofty tree, which grows in Siam, Sumatra, and Java, but, according to some accounts, it would seem to be also obtained from a smaller tree, cultivated in Borneo. The best balsam is obtained in Siam by incisions made in the trunk of the tree after it has attained the age of five or six years. The resin is white and transparent at first. About three pounds are given by each tree for about six years. It forms an article of export from Siam. Benzoin is the frankincense of the far east, and has long been used for incenses in the Roman Catholic, the Hindoo, Mahomedan, and Buddhist temples, and probably in the Israelitish worship. Wealthy Chinese fumigate their houses with its grateful odor. Olibanum, which is cheaper, is in similar and more general use in other parts of the East Indies.

To Make Siemen's Artificial Stone.

Take 100 lbs. of caustic soda in solution evaporated to 80 quarts, and 1 lb. silica added for every quart. The solution is effected under a pressure of 4-5 atmospheres in a strong steam vessel. This solution, mixed with quartz sand, hardens to a stone which strikes fire with steel. For building stone, millstones, &c., 1 pint of the solution is mixed with two volumes of fine silica, and to the whole are added 10 parts of sand of different degrees of fineness, and sometimes 5 parts of coarse sand or gravel in addition. When the stones are air-dried, they are kept for several days in an apartment heated to 104°. They become quite hard in five or six days.

Improvement in Uncoupling Cars.

The loss of life and the destruction of much property caused in many railroad accidents might have been prevented if suitable means for detaching one car from another, when in rapid motion had been provided.

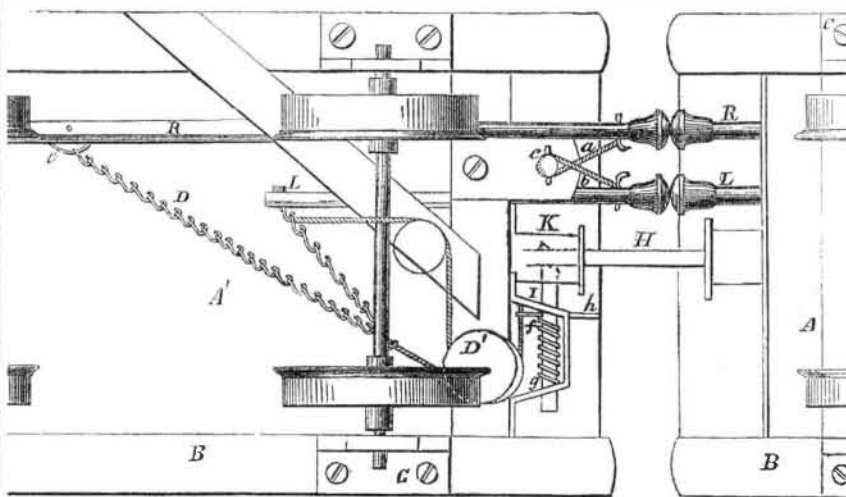
Railroad accidents arise from various causes, some by the breaking of wheels, by the engine being thrown from the track, by coming in contact with cattle or other obstructions, then dragging the train after it, rendering the whole one vast wreck. With proper facilities attached to the cars, they could be instantly detached from the tender, and pass along the road without further accident, unless the obstruction when struck by the engine were only partially removed, in which case it would be again struck by the forward car, which, in all likelihood, would also be thrown from the track. To provide for such contingencies, every succeeding car should be instantaneously detached, in succession, so as to give some one of them a chance to be saved from destruction. It is, therefore, of vital importance that the couplings of every car should be made capable of being simultaneously detached.—To provide such means is the object of this invention, which consists in so arranging and supporting a rod under, and running lengthwise of each car, that the hinder end of every one shall, when operated, strike against the forward end of the rod in the succeeding car, causing it to withdraw the bolt that connects the cars together. By this means the engineer may, in the event of danger, uncouple every car in the train from each other, thus presenting a chance to some, if not to all the cars, to pass along the road uninjured, should the engine happen to be thrown from the track, the same effect being produced upon all the cars in the rear of any particular one which happens to be operated upon in that manner.

The accompanying figure is a plan view of the invention, showing the under side of a tender and car. A represents the tender, and A' a car, connected together by means of the improved coupling; B is the frame-work of each, to the side beams of which are secured the bearings, C, in which the wheels are mounted.

Through mortises in the cross beams of the frame of each car there are passed a series of rods, R, in a line with each other, commencing with one extending from about midway of the

engine backwards, until its rear end rests against the forward end of the one attached to the tender, A, which runs along under its whole length until its rear end rests against the forward end of the one secured to the car, A, and that in turn to the rod on the next car, and so on to the end of the train, there being one attached to every car. To the side and near the forward end of the rods, R, are secured a cord or chain, a, to each, by means

BUMPER ARRANGEMENT FOR UNCOUPLING RAILROAD CARS.



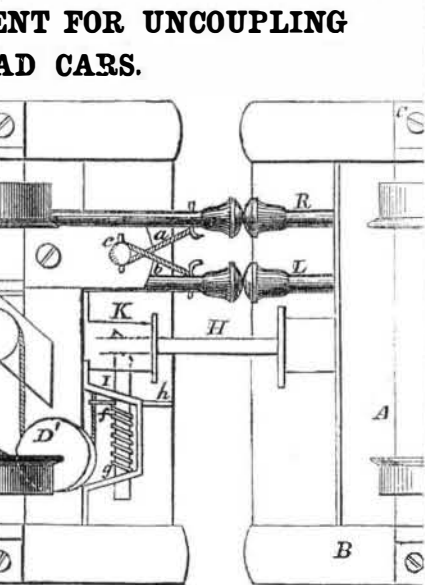
near the middle of the rods, R, on their inner side are secured eye bolts or hooks, e, to which are connected one end of the chains, D, the other passing round a pulley, D', and secured to one end of a pin, f, on the side of the spring bolt, I, the latter passing through a mortise in the coupling box, K, and connecting link, H, and by which the cars are coupled to each other. Around one end of the bolt, I, is wound or coiled a spiral spring, g, having its bearing respectively against the side of the bracket, J, that supports and guides the bolt and pin, f, for the purpose of projecting the bolt, I, to couple the cars when the retreating force is removed, and also causing the rods to assume the proper position to be again acted upon to withdraw the bolt. The pin, f, is caused to pass clear through the bolt, I, and also through a mortise or slot in the front side of the bracket, J, to form a handle, h, by which the bolt may be withdrawn when the cars are stationary.

If the crank, E, of the engine be turned so as to wind up the chain, a, it will cause the butt end of the rod, R, to strike against the head of the corresponding rod of the tender, both of which are enlarged for this purpose. It, in turn, as it is pressed back, strikes against the rod, R, of the car, pushing it before it, and dragging with it in its retrograde movement chain, D, to which the spring bolt, I, is secured, withdrawing the latter from the mortise in the connecting rod, H, thus detaching the car, A', from the tender, A.

The rod, R, of the car, A', will also, when pressed back as described, strike the head of the rod in a line with it in the succeeding car, causing it to detach that car in the same manner as that of car A', and so on through the whole train of cars, having the whole detached from one another. Other means are provided for uncoupling any desired number of cars without detaching them from each other, as in cases of emergency.

Through mortises in the cross beams of the frame, B, and parallel with the rods, R, are passed rods, L, the mortises serving to support and guide the heads or ends of the rods against each other. To the forward end of these rods is connected a chain, i, in a similar manner to the chains of the rods, R, the other end of the chains being attached to the end of the crank shaft, c, like those of the chains, a. At the rear end of the rod, L, of the car, A', and which is so made as not to extend throughout the whole length of the car, is attached one end of a cord or chain, D, the other being attached to the chain of the bolt, I; or, instead of being directly attached to the latter it may be first passed round a sheave, n, so that when the chain, i, is wound upon the shaft, c, by the crank or lever wheel of the car, A', the rod will be drawn backwards, dragging the chain, D, to

of a staple or eye bolt, the other end of which is attached to a staple, also secured to the lower end of the crank shaft, c, the latter being supported in bearings secured to the underside of the cross beam of the frame. On the upper end of the shaft is mounted a lever or crank wheel, by the turning of which the chain, a, is wound upon its shaft, causing the rods, R, to move in a direction towards the rear of the cars. Towards the rear end, and



which the spring bolt is connected, as described, along with it, in this way withdrawing the bolt from the coupling bar, H, thus detaching the car from the tender without uncoupling those in the rear, as would have been the case had the rod, L, of each car extended throughout their whole length. Each car, being provided with this apparatus, will enable the conductor to detach any number of cars from the train.

As it is desirable that the engineer should be able to separate the engine and tender from the cars without being under the necessity of going to the car, or waiting for the conductor or brakeman; therefore, to effect this, the rod, L, of the tender is extended throughout its whole length, so as to bear against the corresponding rod of the car, A', whereby, by turning the crank of the engine so as to wind up the chain, b, the rod, L, of the tender will, when struck by that of the engine, be made to bear against the corresponding rod of the car, A', pushing its backwards, whereby the bolt, I, is withdrawn from the connecting bar, H, and the car detached from the tender.

Through the ends of the rods, R and L, of the engine, are passed pins, to prevent them from moving beyond a certain distance, there being others for the same purpose through both ends of the remaining rods, R and L, on the inner side of the cross beams.

For further information address the inventor, William O. George, Richmond, Va. Patented Oct. 7th, 1856.

The Still-Room.

Time was, when in the still-room "distilled waters" and "cordials" were drawn and dispensed as specifics for maladies to guests and dependants, but now this practice is out of use, because they can be purchased cheaper than they can be made at home; nevertheless the still-room maid preserves her name, though rarely required to perform her ancient duties. To expect the revival of this part of domestic economy would be absurd, yet we must say that a domestic laboratory attached to the conservatory would prove highly instructive and amusing. To those even, who have no conservatory, we would yet advise to set a room apart in their mansions, with the title of "laboratory," or the ancient one of "still-room." Here experiments may be made, scents distilled, and an acquaintance courted with "common things," without interfering with other people of the establishment, or "making a mess about the house." The amount of instruction that can be derived from a private laboratory, is far more than at first sight can be conceived, and the entertainment, changeable as a kaleidoscope, is intellectually considered immeasurably superior either to crochet or Berlin work. The delicate manipulations of chemical experiments is well, even better, suited to their physical powers than to the

stermer sex, and to the ladies, therefore, we commend the charge of becoming the chefs of the modern still-room.—[Piesse's Art of Perfumery.]

The Origin of the Tape Worm.

This worm, for the fishing of which from the human stomach we published an illustrated description in Vol. 10 SCIENTIFIC AMERICAN, is described in the Paris *Gazette Medicale*, to have its origin as follows:—"The Hebrews are never troubled with it; the pork butchers are peculiarly liable to it, and dogs that are fed on pork are universally so afflicted; in fact, it turns out that a small parasite worm, called *crystecersas* (from two words signifying a small sect and a tail, which much affects pork,) no sooner reaches the stomach than, from the change of diet and position, it is metamorphosed into the well known tape-worm; and experiments upon a condemned criminal, have established the fact beyond all contradiction."

Increase of Steamships.

Steamships have rapidly increased within the past few years. There are now no less than 39 steamships regularly running between America and Europe, comprising seven British and four American lines, one French and one Belgian. The average tonnage of these vessels amounts to about 100,000 tons.

To Harden Casts of Plaster.

Immerse them in a solution of alum heated to about 84° Fah., and keep them in it for four or five hours. One pound of alum dissolved in five gallons of water, will make the solution sufficient in strength for the purpose stated.



Inventors, and Manufacturers

TWELFTH YEAR

PROSPECTUS OF THE SCIENTIFIC AMERICAN.

This work differs materially from other publications being an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanic and Chemic Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Mill-work, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

The SCIENTIFIC AMERICAN is printed once a week, in convenient quarto form for binding, and presents an elegant typographical appearance. Every number contains Eight Large Pages, of reading, abundantly illustrated with ORIGINAL ENGRAVINGS—all of them engraved expressly for this publication.

All the most valuable patented discoveries are delineated and described in its issues, so that, as respects inventions, it may be justly regarded as an ILLUSTRATED REPERTORY, where the inventor may learn what has been done before him, and where he may bring to the world a KNOWLEDGE of his own achievements.

REPORTS OF U. S. PATENTS granted are also published every week, including Official Copies of all the PATENT CLAIMS. These Claims are published in the SCIENTIFIC AMERICAN in advance of all other papers.

Mechanics, Inventors, Engineers, Chemists, Manufacturers, Agriculturists, and People of every Profession in Life, will find the SCIENTIFIC AMERICAN to be of great value in their respective callings.

Its counsels and suggestions will save them Hundreds of Dollars annually, besides affording them continual source of knowledge, the experience of which is beyond pecuniary estimate.

Much might be added in this Prospectus, to prove that the SCIENTIFIC AMERICAN is a publication which every Inventor, Mechanic, Artisan, and Engineer in the United States should patronize; but the publication is so thoroughly known throughout the country, that we refrain from occupying further space.

TERMS OF SUBSCRIPTION—\$2 a year, or \$1 for six months.

CLUB RATES.

Five Copies for Six Months,	\$4
Five Copies for Twelve Months,	\$8
Ten Copies for Six Months,	\$8
Ten Copies for Twelve Months,	5
Fifteen Copies for Twelve Months,	\$22
Twenty Copies for Twelve Months,	\$28

For all Clubs of 20 and over, the yearly subscription only \$140.

Post-pay all letters, and direct to

MUNN & CO.,
128 Fulton street, New York.

For list of Prizes, see another page.