

3, secured by double latches, and the lever catch, R, Fig. 4, holds the car in position. A crank lever, the end shown at S, which engages in the space between the two axles, assists in holding the car in place. Cleats running along the sides of the elevator hold the top of the car, so that the elevator can be reversed without allowing the car to escape. By opening the door, Q, and lifting the lever, R, the car can be driven straight through the elevator, so that its suspension at the floor of the gallery will not prevent the passage of the car across the shaft. By the use of the yoke, shown in Fig. 4, the elevator can be completely inverted to discharge soft, cohesive mud or clay.

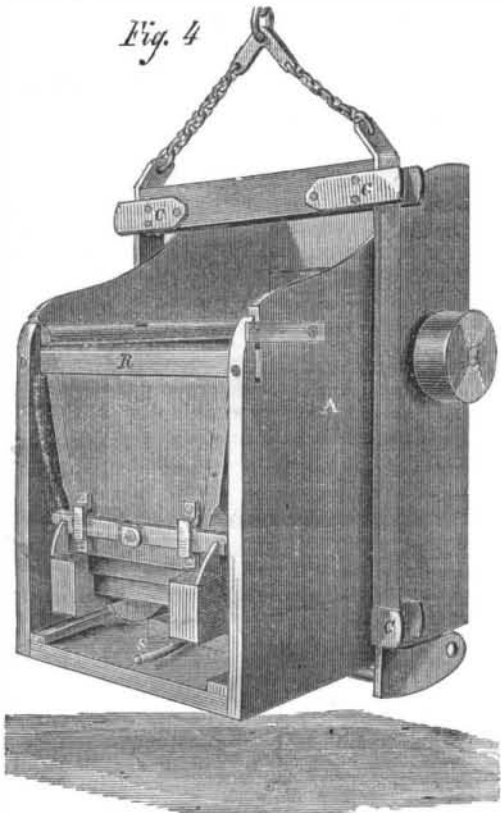
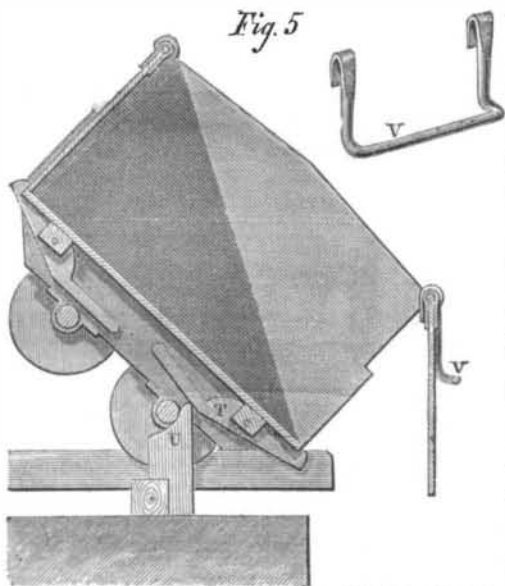


Fig. 5 represents a combined ore and timber car, provided with doors, pivoted at the top, and secured by lever catches at the bottom. By turning the doors up over the top the ends are left open for the conveyance of timber. Closed, the car is adapted for ore, coal or any other material. The engraving represents the car in the act of discharging a load. The long end of the lever, T, engages the abutment, U, which stops the car and opens the door. The hook, V, hangs on the door, and is intended to receive the propelling force of the hand nearer the wheels than the top, so that in meeting any obstruction on the rails it will not tend from the center of gravity, but will ride over the obstacle.



The practical miner will readily see and understand the varied advantages of this combined apparatus. From its rapidity of operation it is admirably adapted to raising water from mines; it can be

employed in coal yards in delivering coal, and can be used in loading or unloading ships or boats with coal, requiring the services of only one man where three are now employed.

It is the subject of two patents, through the Scientific American Patent Agency, dated July 17, 1866, by George Williams, of Sterling, Colorado, Ter.

Patents have been secured in foreign countries also through the Scientific American Patent Agency.

Mr. Williams is temporarily sojourning in New York, and for a few weeks letters will reach him addressed to the care of this office.

[Special Correspondence of the Scientific American.]
THE WORCESTER MECHANICS' FAIR.

WORCESTER, Oct. 8, 1866.

In my last letter I gave you a brief summary of the attraction at the Mechanics' Fair in this city. It has just closed after nearly three weeks' session, and was a most successful exhibition. In addition to the articles mentioned in my previous letter, there are many deserving of at least a brief mention which, with your permission, I will proceed to give them.

LAMB'S KNITTING MACHINE.

This now celebrated machine was shown in operation. The quality of work done by it is certainly beautiful, not only beautiful but durable and reliable in all respects. It will knit *any thing*, and that tells the whole story. I saw a very modest and attractive young lady at work upon it, and therefore examined it with much care and circumspection. She knit me a scarf, and I paid her for it, so this notice is entirely gratuitous and unsolicited, being a simple act of justice to a meritorious invention. The machine runs very easy, being operated by a crank, and is sold for \$65, and if I was in the family line, as much as I used to be, I should certainly have one. The factory is in Springfield, Mass.

CHASE'S MICROSCOPE.

This is a simple and useful little instrument for magnifying natural objects, such as insects, etc. It is also valuable for detecting counterfeit money, as the lines in the engraving are easily distinguished from genuine; exhibited by O. N. Chase, Boston, Mass.

ETHAN ALLEN'S GUNS.

A splendid case of fire-arms was shown by Ethan Allen, of Worcester, Mass. They comprise breech-loading rifles, shot guns and pistols of surpassingly beautiful workmanship. They have just commenced the manufacture of Damascus barrels, and have been exceedingly successful. A shot gun shown had that beautiful mottled exterior, peculiar to this style of workmanship, the finish being brought out in great strength. They make small pistols also that load at the breech, and can be carried in the vest pocket; handy things for one of Sylvanus Cobb's heroines to pull out when the invariable "villain" appears on the scene. They also make shot guns which are sure fire, and as certain to kill as a fifteen-inch gun, at point blank range.

The awards of the Committee have made considerable excitement among the parties interested, medals being distributed without discrimination and "diplomas" being scattered about with a perfect looseness. The value of the "diploma" to a firm which transacts thousands of dollars' worth of business in the course of a year, and which has spent large sums to keep its tools running at the fair, is certainly not very great nor very satisfactory. But who shall decide when the doctors disagree? Bronze medals also were distributed to various individuals who did not value them, and to some who had no earthly right to them, but if the Committee's conscience is sound on this point, mine is. The fair was a complete success, and I hope there will be another next year.

The First American Fire-arms.

As early as 1748 muskets were manufactured in Massachusetts. They were made by Hugh Orr, on the order of the Province of Massachusetts Bay, at his shop in Bridgewater, Mass. He built five hundred for the colony, which were deposited in Castle William, and when the British evacuated Boston they carried off most of them. Hugh Orr came from Renfrewshire, Scotland, at the age of twenty-one, his

only possessions being a knowledge of the gunsmith and locksmith trades and a bundle tied in a handkerchief. He died in 1798, at the age of eighty-two. During the war of the Revolution he cast iron and brass cannon for the Continental army, with calibers of from three to forty-two pounds. They were first cast hollow and bored, but Mr. Orr introduced the method of casting them solid and then boring, which insured a more perfect and a stronger piece

[For the Scientific American.]

WEST ALBANY LOCOMOTIVE WORKS.

We were favored a few days since with a visit to the Locomotive Works of the New York Central Railroad, at West Albany, and although we had heard much of them, yet we were agreeably disappointed in finding them of greater magnitude and completeness than we had anticipated.

The location of the Works is admirably chosen, being about three miles from the city, on high ground, where fresh air and an abundance of room are always enjoyed.

The buildings are new and of immense proportions. They are built of brick and roofed with slate. They are admirably arranged with reference to each other, the various shops being situated in the most convenient manner possible. There is ample room between the buildings for roadways, drives, etc.

The grounds round about present a most pleasing and attractive appearance. They are tastefully laid out, with drives and walks; and on the south of the Works, at the foot of a hill covered with a beautiful pine grove, flows a quiet, winding stream, which gives to the whole scene an air of beauty and repose.

Instead of encountering great piles of broken cars, scattered parts of used-up locomotives, scraps of old iron and masses of unaccountable debris, all is so neat and orderly without, that one would almost fancy he was approaching the grounds of some Shaker settlement. There is absolutely a place for everything and everything in its place. There is a place for superannuated cars, and there you will find them. There is a place for scrap iron, and you will find it all there. There is a place for shop sweepings, and you will find them all there. I was told, on being shown a large mass of these scraps, that what a speculator had offered fifty dollars for, was melted up at the Works, and yielded fifteen hundred dollars worth of metal.

Inside of the buildings and workshops, the same order and good taste prevail as outside. The shops are spacious, well ventilated and well lighted. There is nothing here wearing a gloomy, dingy aspect. Every room is light, cheerful, and clean. Cleanliness, in fact, pervades every department. In the foundry, oil room, and locomotive shop it is the same.

The machinery is of the most perfect of its kind. I have visited many engine rooms on board steamboats, steamships, and at various works about the country, but have never seen equaled the one at these Works. It is a room about thirty feet square, with yellow-pine floor, as smooth and clean and bright as a Shaker dancing hall. The engine is a beam engine, and a perfect model of its kind. It would seem almost impossible that a machine in daily use could be kept so perfectly clean and bright in every part. The room is rendered doubly cheerful by having its spacious windows filled with some of the choicest plants.

The present master mechanic of the road, Mr. C. Manning, has been in charge of the Works only about a year, but has introduced some features which we heartily commend to the consideration of all master mechanics. In most shops of the kind, some of the workmen may be seen with huge pipes in their mouths, enjoying the luxury of a smoke while at work. This is not allowed here. No smoking during working hours. A whole train of evils is thus broken up. The tool room was, to us, the object of greatest interest and commendation. Instead of the tools being scattered about the shop, or kept in a hundred different tool chests and drawers, there is a small, convenient room fitted up at one end of the machine shop, and all the tools are kept there. There are inclined shelves arranged about the room and the tools are placed on these in