

## New Inventions.

## Micro-Geology.

The celebrated German naturalist, Ehrenberg, has made a very curious contribution to micro-geology, by the discovery that a large proportion of the various green sands, which are found in some stratified deposits, is composed of the casts of microscopic shells, the shells themselves having entirely disappeared. The material of these casts is chiefly siliceous, colored with the silicate of iron.

## Wrought Iron Cars.

There is now nearly completed in Patterson, N. J., a first class passenger car a little larger than the ordinary size, constructed almost entirely of wrought iron. This material is employed to obtain great strength, with less weight than usual, and to avoid the injuries to passengers due to the destruction of ordinary cars in any kind of a smash. The experiment, which is being conducted on a most liberal scale, and with a view to establish conclusively the practical superiority of this system, is made at the expense of Mr. E. W. Sargent, a merchant of this city, under the patent of Dr. B. J. LaMothe. The framework is in effect an extremely strong and stiff, yet elastic, basket, each joint or intersection being strengthened by rivets, and the whole being further protected by making the entire platform at each end one strong spring of steel. If the construction runs off the track, falls down a precipice, or comes into collision with another in such manner that the springs at the ends cannot absorb the shock, the car itself will spring, collapse, twist or crumple up, but cannot break and crush its contents with the fragments. One of the great dangers in collisions, &c., arises from the disposition of ordinary cars to penetrate each other with their timbers, or to shut together like the parts of a telescope, and another arises from the facility with which the tops and sides, the seats, &c., separate from the more substantial floors, and are precipitated forward with the passengers. Neither of these, nor many other minor evils, could arise from any violence to this style of car, which is also much lighter than the wooden ones, and thus will absorb far less power in hauling it. The car is constructed entirely of strips, so connected as to be practically without joints. We hope to see this car perfectly successful in practice, and that it may revolutionize the mode of constructing these important carriers of human freight. The principle is beyond doubt an excellent one.

## Improved Steam Gage.

The accompanying engraving represents a Steam Gage invented by Samuel W. Brown, of Lowell, Mass., and secured by Letters Patent dated June 11, 1856. It is one of the forms in which the pressure of the steam acts to compress a spring, and in which the motion is increased, and rendered plainly apparent to the eye by the aid of gearing and a suitable index on a dial. Unlike other forms of these instruments, however, the graduations are equally, or nearly equally, distant, in all parts of the dial. This is accomplished by the peculiar leverage employed, which will be described below.

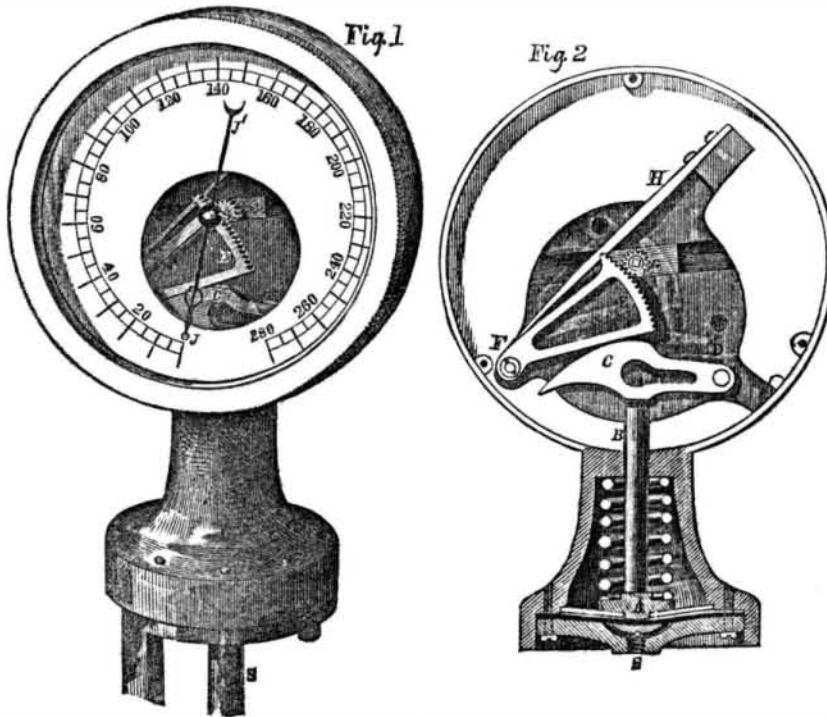
The resistance of a spring either to extension or compression, increases a little more rapidly than in a direct proportion to the extent of flexure. This may be observed in the "Salter balance," as it is sometimes called, where weight is ascertained by the effect it produces on a coiled spring contained in a small case. Without some means of compensating therefor, the graduations on either a spring balance or a steam gage include a less space for a given change under great weights, or at high pressures, than when the spring is less severely strained.

A represents a flexible diaphragm, protected as well as practicable, by metal, from cracking and rupture, and free to receive on its lower surface the pressure of the steam (or of water acted on by the steam) which is admitted through a suitable pipe, S, below. B is a stem or cylindrical rod rising from

A, and surrounded by a stout coiled spring, as represented, which tends continually to depress it. C is a lever hinged to the fixed point, D, with its upper face rounded. E is a sector of a gear wheel, mounted on the fixed center, F, and with a face presented to C, in such manner that as C and E are raised by

the action of B, the leverage of C gradually decreases in a ratio which exactly compensates for the diminution of its motion, so that the position of the gearing on the periphery of E is precisely proportional to the pressure of the steam. G is a small gear wheel and shaft which carries the index, J J' and by this

## BROWN'S STEAM GAGE.



means indicates exactly the pressure. H is a slender spring, which acts on E with sufficient intensity to overcome the slight friction and insure its falling back, whenever the pressure of the steam is lowered and B is depressed by the action of the stout coiled spring.

The whole is very strongly and neatly housed in a metallic casing, and all the appointments appear very neat and durable. A

portion of the face of the dial is left open as represented, in order to see that all the parts are in perfect order. The gear wheel, G, is mounted in a block, so that it may be traversed in a groove across the gage, to facilitate any adjustment which may be necessary.

For further information relating to this gage address the inventor, S. W. Brown, as above.

## SHAW'S PENDULOUS CHURN.



The accompanying engraving represents a novel device for agitating cream, invented by Charles A. Shaw, of Biddeford Me. and patented December 9, 1856.

It is designed to agitate the cream in fully as efficient and rapid a manner as in common churns, and to perform this by a motion which is considerably easier for the operator. The motion of the ordinary vertical dasher is

quite unnatural, and severe on the muscles. A back and forward motion, as in working a pendulum, is far more agreeable, and is that in which the power of the hand is applied in this invention.

The apparatus consists of a cylindrical churn, A, suspended by means of the two slotted bars, B, and the pins, C, to the simple frame represented. D is a portion of a ge-

wheel which is fixed on B, and consequently oscillates therewith. E is a smaller gear wheel, and the effect of this gearing is to give to the arm, F, by the rocking of B, a synchronous and greater degree of motion. G is a link connecting the extremity of F with the cross head, H, the ends of which latter travel in the slots represented in B, so that the motion of the cross head is necessarily in line with the axis of the churn, however much the churn may be inclined to either side by its pendulous motion. I is a rod connected to the dasher of the churn in the ordinary manner. J is a guide secured in the lower extremities of the slots by the pins, K. L is a rod connected by a simple hook to the lower side of the churn, by which the churn may be swung to and fro. This is the only motion required in churning. The swinging of the frame, B, imparts a considerably increased motion to F, which moves the cross head, H, and rod, I, up and down at each stroke. There is a thread or spiral on the rod, I, which travels in a corresponding groove in J, as represented, so that as the churn dasher rises and falls it is rotated alternately in opposite directions, in order the better to agitate the fluid within.

The whole is cheaply and simply constructed, and may be easily repaired by any person of ordinary ingenuity in case of failure of any part, which, however, is not likely. The strains are slight, and the motion easy, and we should presume that this churn would prove very much easier to operate than those working by the vertical motion of the hand.

For further information address the inventor as above.

## The New Cent.

This new coin is a valuable institution, and we rejoice in anticipating the decrease of the ugly old "verdigris" cent, which encumbered our change for such a number of years. The southern and western cities have always ignored the copper cent, the three cent piece being their smallest circulating medium. But the little coin just issued bids fair to receive a hearty welcome at their hands. A large quantity have been forwarded thitherward. But small although the new cent is, in comparison with the "old red," it is singular that our coins of the least value should still be so large. Why should the one cent coin be so much larger than the three cent pieces? There is still room for improvement in this respect. Commencing with one cent as the coin of least value, it should be smallest in size, and all the others be proportioned in dimensions according to their value. There would be some harmony in such a system of coinage as this.

## Toy Balloons.

On page 164, this Vol., SCIENTIFIC AMERICAN, we described the miniature toy balloons which had been introduced with such success into Paris during the holidays of last winter, and suggested their introduction into our cities, as pleasing and beautiful toys to delight Young America. Quite recently they have come into pretty general circulation, and may be seen in various store windows in our city being placed there as quite novel features of attraction.

A number of our boys who have purchased such balloons have been rather astonished to find them daily growing beautifully less in size, and prematurely old in wrinkles, and at last ceasing to be balloons at all. The cause of this is the percolation of the inflating gas (hydrogen) through the pores of the balloon. This gas is so subtle that it will percolate through the pores of metals, goldbeater's skins, india rubber, and the closest and finest known membranous substances.

## Gun Igniters.

There are now extensively manufactured near Vienna, instruments used in lieu of percussion caps, but which are fitted within instead of upon the nipple of the gun. They are represented as exploding just as easy as percussion caps, are perfectly waterproof, and the whole, consisting only of a peculiar chemical composition, leave, when exploded, no residuum whatever behind, and instead of choking up, rather tend to clean the nipple.