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Improved Magnetic Combination Lock.

Ever since the achievements of the celebrated Hobbs, in opening the Chubb's and other famous locks at the great London Exhibition, our mechanics have vied with each other in the production of a burglar-defying lock. An unpickable lock is a difficult thing to manufacture. Perhaps the combination locks which use no keys are the only description of fastening which defy successfully the burglar's art. Some locks can be forced, others blown up, and others, again, opened by tampering with their machinery. In combination locks, having several independent tumblers, which must each be in a certain position to allow the bolt to be moved, there is a chance of picking them by the use of the micrometer, a delicate instrument which shows the movement of the one-thousandth part of an inch. By means of this contrivance the burglar can detect the slightest movement of the catch when the tumbler comes opposite it. It is impossible to make these tumblers so perfect as not to show, in some degree, when the catch and one of the tumblers come in opposition.

The lock which is herewith illustrated, by the use of a powerful magnet, renders a test by the micrometer absolutely impossible. It has no key, and the knob is neither drawn out nor thrust in while locking or unlocking. Fig. 1 shows the interior of the lock, the bolt being in position of locked. A is the bolt, which is a cylindrical disk of brass rotating on the pivot, B. C is a slide, guided by the screw, washer, and slot, D, and in combination with the arm, E, moves the bolt. This arm, E, has a catch, F, which engages with the dog, G, that rotates with the tumblers, H—better seen in Fig. 2—and is attached to the shaft of the knob, I, Fig. 2. This

E, within the attraction of the magnet, which then retains it above the dog and keeps its catch from falling into the recess on any one of the tumblers. Thus it will be seen that no dropping of the arm will denote the coincidence of its catch with a tumbler, so that picking by means of the micrometer is impossible. All of the tumblers must be in the position to which they are set before the magnet will allow the arm to drop. By means of the scale on the flange of the knob, I, one million of combinations may be made, and they can be changed in a moment by means of a key introduced from the

luminous body, the light is more intense than that of the ancient luster, and, moreover, occasions neither smoke nor bad odors.

Heating Railway Trains.

A correspondent, in writing on this subject, advocates the heating of railway passenger trains by steam pipes leading from the boiler of the locomotive, urging as a reason of preference for this method, that in heating by stoves one part of the car, the middle, is in the polar regions, while the ends, or that where the stove is located, is within the tropics. He alludes also to the danger of fire by the overturning of the stove in case of accident by collision or otherwise.

The plan proposed is not new. It was projected many years ago, but there are great objections to its practical application. The boilers of locomotives are not calculated to make steam enough to spare "live" steam for such a purpose, and the exhaust steam would scarcely be sufficient to heat a train of six, eight, or twelve passenger cars. A portion of the baggage or mail car of a train might be devoted to the location of a furnace for this purpose; but if steam was the medium employed for heating, it would suffer much loss by condensation in passing between the cars through the flexible tubes, and if hot water was used it would be subject to the same deterioration, though perhaps in a less degree, and would hardly furnish heat enough for a large car.

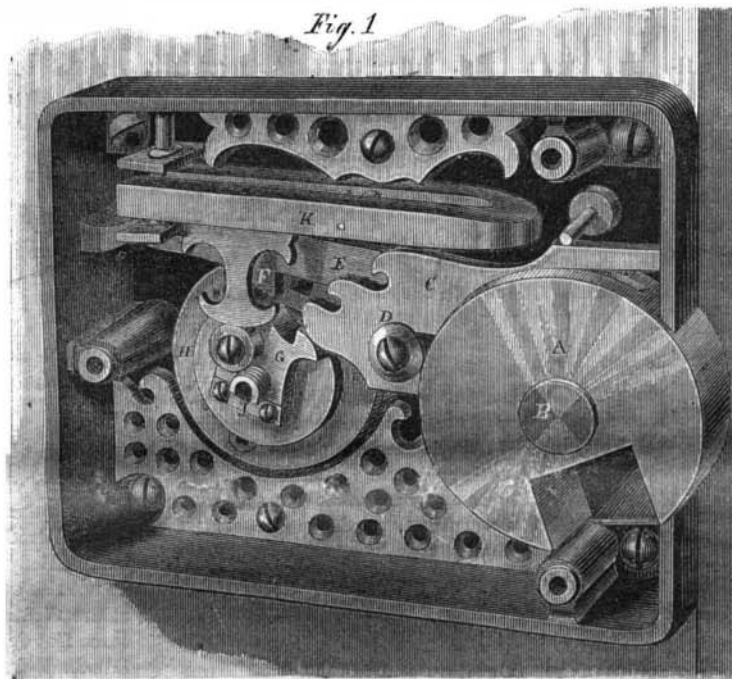
It would seem that railway cars should be heated by independent furnaces, so that each car should have its own source of warmth. To the stoves now in use, or to some constructed the the purpose, reservoirs of water, it appears, might be attached, which, by a system of pipes, would distribute the heat equally throughout the car. If some simple method of this sort was devised, there is no doubt it would be speedily adopted on our railroads. We hope our inventors will set themselves to work to invent some better means of heating cars than those now in use.

A Singular Quality in Steel.

A correspondent, E. P. W., says that he was informed by a practical mechanic, that having made a spatula, or pallet knife, such as is used by artists, and tempered it to the blue, or spring temper, he ground and polished it, when it became as soft as before tempered. Considering it worthless, he laid it one side for a time, but one day he held it over the fire, in thoughtlessness, until it was blued, when he found it had regained its original elasticity.

The fact may be new to some of our readers, although we were practically acquainted for years with this quality of steel, at least of steel of some grades. We believe, however, that cast steel, generally, when brought to the blue temper, loses some of its elasticity if the blue is removed from the surface. Why, we do not profess to determine, but the experience of many workers in steel will confirm our own.

THE Colt's Fire-arms Company, at Hartford, have received orders from the Russian Government for 100,000 Laidley breech-loaders, which are said to be more efficient and destructive than the Prussian needle-gun.



SARGENT'S MAGNETIC SAFE AND BANK LOCK.

inside of the lock through the tumblers, H. The shaft of the knob is made of hardened steel and soft iron. The outside is soft, and from five-eighths of an inch inside the face of the safe door, is of hardened steel. In case of violence to the knob the shaft would yield at the point of junction, leaving the shaft proper beyond the reach of the burglar's tools.

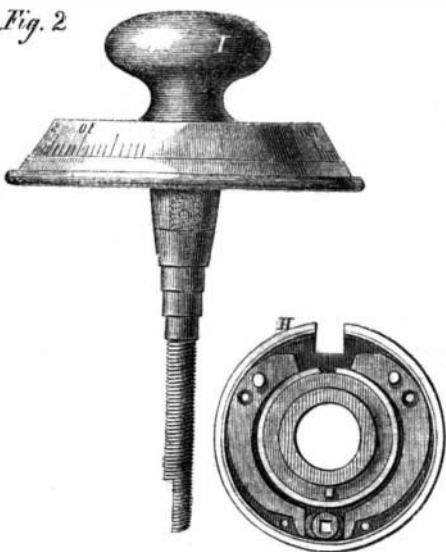
This lock has no springs, no delicate parts to get out of order, the combinations are readily changed, and defy discovery. Without the magnet it is a very superior lock—with it, it is claimed to defy picking. There are no keys to be lost or mislaid.

It is the subject of four patents dated May 2 and 23, 1865, and June 9, and Aug. 28, 1866. For further information address James Sargent, patentee and manufacturer, Rochester, N. Y.

Method of Lighting Theatres.

In a number of the "Revue Encyclopedique," published in 1825, we find the following description of a plan then in use for lighting a Venetian theatre. By the aid of parabolic mirrors, the light of many lamps is concentrated over an opening made in the middle of the ceiling of the theatre, and reflected down on a system of plane concave lenses, of a foot in diameter, which occupy the aperture, and convey into the theatre the rays of light which arrive at the lenses parallel and depart thence divergent. From the pit alone are the lenses seen, and although the luminous focus is sufficient to light the whole of the theatre, it does not dazzle, and may be viewed without fatiguing the eyes. Beside the advantage of being more equal, and mild as that of a single

Fig. 2



dog is secured to the stem of the knob by a yoke, J, fastened by screws against the flattened side of the stem.

K is a horse-shoe magnet, hung on a pivot above the tumblers. When the bolt is turned, or locked, the arm, E, is lifted by the disk of the dog, G, sufficiently to bring the armature on the end of the arm,