Science and Art.

New Patent Lock.

The inventor of this lock—O. B. Thompson, of Hudson, Ohio—has endeavored to produce (and has succeeded in so doing) a simple lock, that will be burglar-proof, and capable of permutation.

In our engravings, Fig. 1 is a view of the lock with the front removed, and Fig. 2 is a view of the back of the bolt detached. Fig. 3 is the key, which folds (as seen) into a little box. Fig. 4 is part of the case of the lock, carrying a small pin, *e*, the use of which we shall shortly describe. Fig. 5 is a detached view of a tumbler.

A is the case, which is of the usual form, constructed of any metal now used for such a purpose. B is the bolt, fitted in the case, A, so that it may slide freely in it in the usual way. To the back side of the bolt, B (Fig. 2), a tumbler, C, is attached by a pivot, Q, this tumbler having a small plate, *b*, extending to the inner end of the bolt. The tumbler has three slots, *c d d*, made through it. *e* (Fig. 4) is a pin, which is attached permanently to the case, A, and prevents the casual movement of the bolt when locked or unlocked, by fitting into one of the slots, *d d*. Within the case, A, a recess, D, is formed, which contains a series of tumblers, *f*, and guards, *g*, that work on a shaft, *h*. The tumblers, below their axis, *h*, are curved toward the front of the lock, *h'*, and slotted downwards at the other end, as seen at *f'*. The The guards, *g*, are similar in shape to the tumblers, *f*, and are formed of metal plate doubled or bent so as to form a sheath to receive tbe tumblers, which are fitted snugly in the sheaths, but still a lowed to move therein. The shaft, *h*, being the common axis for both. To the outer edge of each guard a small bar is attached, the lower ends of which project a trifle below the guards, and the upper ends of the guards project a little above the slotted ends of the tumblers. The slots, *f'*, are made in the tumblers at varying distances apart.

Below the tumbler box, D, there is a chamber, E, in which a series of sliders, *j*, are placed, which work in proper grooves, and have a vertical projection at their inner ends, that tends upward into the lower part of the tumbler box, D. At the back part of the chamber, E, there is placed a short metal plate, and behind it a piece of leather, or other suitable yielding or elastic substance, to serve as a buffer, is placed. Against the outer edge of each guard, *g*, a spring bears, which has a tendency to keep the lower ends of the bars of the guards against the projections of the sliders, *j*. The outer ends of these slides are exposed at the front side of the case, and a key, F (Fig. 3), which is formed by having a series of bits, *p*, screwed into a plate, *q*, the bits, *p*, being of varying lengths, corresponding to the varying positions of the slots, *f'*, in the tumblers. The plate, *q*, may be hinged to a case or box, *r*, so that the bits may be enclosed therein for convenience of carrying it.

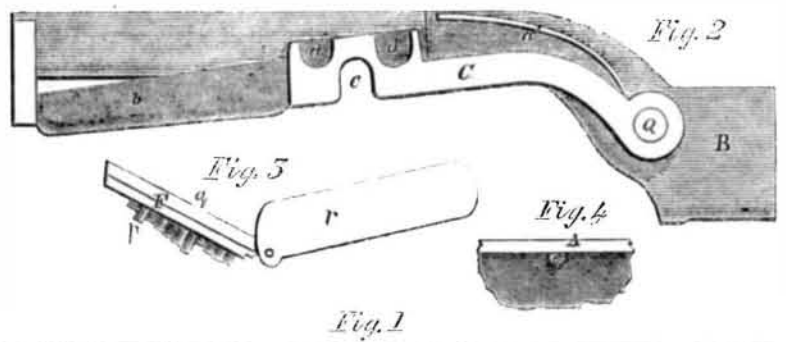
G represents the knob arbor, which passes into the case, A, and has a bit, T, attached to its inner end, and also an eccentric boss, S, the form of which is clearly shown in Fig. 1. H is a bar, one end of which is secured by a pivot, *n*, in the case, A. This bar, when not otherwise acted upon, presses against a ledge or strip in the tumbler box, D. The bolt tumbler, C, has a spring, *a*, bearing upon its upper surface, as shown clearly in Fig. 2.

From the above description of parts it will be seen that when the pin, *e*, is in the back or inner slot, *d*, of the bolt tumbler, C, the bolt, B, cannot be thrown back; and it will also be seen that when the plate, *b*, rests on the tops of the tumblers, the bolt tumbler will be retained in such position as to cause the pin, *e*, to be in said slot. In order, therefore, to unlock the lock, the plate, *b*, must be allowed to fall, so that the pin, *e*, may be out of slot, *d*. This is effected as follows:—The knob, G, is so turned that the eccentric boss, S, will throw up the bolt tumbler and plate, *b*, the latter being, by this means, moved above the upper ends of the guards, *g*, and allowing the same to be shoved towards the front part of the case. When the plate, *b*, is raised, the bits, *p*, of the key are pressed against the outer ends of the slides, *j*, and the latter pressed inwards, so that their projections will actuate the guards, *a*, and the latter by friction move the tumblers, *f*, against a plate; and as the bits, *p*, of the key are made of varying lengths, corresponding to the varying positions of the slots, *f'*, it follows, as a matter of course, that the guards, *g*, will be pressed or forced over the tumblers, *f*, a distance corresponding to the lengths of the bits, *p*, that actuate them, and by withdrawing the key, the springs will force back the guards, the guards carrying the tumblers, *f*, with them, and bringing the slots, *f'*, in line. so that the plate, *b*, may descend therein, and bring a pin upon T into slot, *c*, of the tumbler, C. By turning the knob, G, therefore, after the key, F, is withdrawn, the bit, T, of the knob arbor will enter the recess, *c*, of the tumbler bolt, and throw back the bolt. When the bolt is shoved forward again and the lock locked, the bit, T, depresses the bar, H, which acts against the parts, *h'*, of the tumblers, and throws them into their former positions, so that the slots, *f'*, will be out of line with each other, the eccentric boss. S, previously raising the plate, *b*.

The changes or permutations may be made at any time by removing the front plate, and placing the tumblers and guards differently on the shaft, *h*, the bits, *p*, of the key, F, being correspondently changed. The bits, *p*, and tumblers are numbered so as to always secure a correct adjustment. In case either of the slides, *j*, become fixed or wedged tightly, in consequence of burglars tampering with them, the slide may be driven inward so as to loosen the slides, the plate at their back and buffer preventing the slides from being injured by the pounding. By this invention the tumblers, *f*, cannot be operated upon as usual, and there is no positive connection between the slides, *j*, and the tumblers, *f*, and consequently there cannot be any certain operation, in a pickable point of view.

It was patented November 2, 1858, and the inventor, a student at Western Reserve College, having no opportunity to introduce the invention himself, will be happy to furnish any particulars upon being addressed as above.

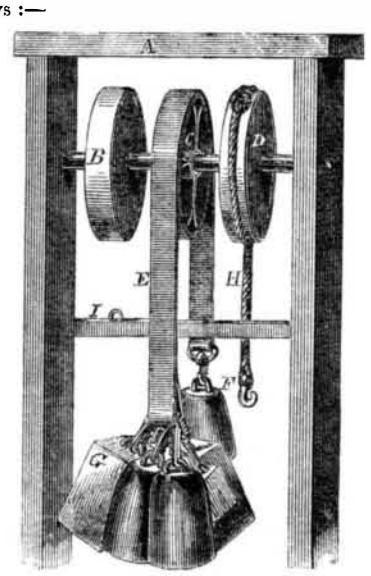
THOMPSON'S LOCK.



Experiments with Belting.

It has long been a question of great interest to all who use belting to drive machinery, whether leather or vulcanized rubber hugged the pulley the best, and hence was less liable to slip. The manufacturers of both articles have been in the habit of talking "considerable high" on this subject, each, of course, making it as "clear as mud" to the intelligent listener, that their own particular manufacture was an illimitable number per cent better than any one else's.

To satisfactorily decide this point, J. H. Cheever, Treasurer of the New York Belting and Packing Co., Park Building, this city, made a series of experiments, which we had the pleasure to witness, by the aid of the simple device that we have illustrated. It consists of three pulleys mounted on an axle or shaft in a frame, A. Pulley B was covered with rubber, C was a polished iron pulley, such as is ordinarily used in machine shops, and D was covered with leather. In the first experiment, a leather belt of good quality, three inches in diameter and seven feet long, was placed over the pulley, with 32 pounds suspended from each end. Weights were then added at one side until it began to slip over the pulley, and the results were as follows:—



Leather belt on iron pulley slipped at 48 lbs.
" " leather " " " 64 lbs.
" " rubber " " 128 lbs.

This arrangement is shown by E F G. The next experiment was with vulcanized rubber. A three-ply belt of the same diameter, length, and thickness as the leather one, was chosen, and being loaded with 32 pounds to keep it "taut," weights were added, as in the former instance, and the result was as follows:—

Rubber belt on iron pulley slipped at 90 lbs.
" " " leather " " 128 lbs.
" " " rubber " " 183 lbs.

The pulleys were held fast by having the axle or shaft clamped to the frame. The experiment was then tried in another way. One end of the belt was secured to a staple, I, in a cross-piece, and the other being thrown over the pulley, B, was weighted with 32 pounds. A rope was passed round the pulley, D, and secured to it, and the free end of the rope weighted. The results were the same; and it took nearly the same weight to rotate the pulleys under the belt as it did to slip the belt over the pulley.

As any one who has occasion to use belting can make these comparative experiments for themselves, it is needless for us to make any comments on them.

EXCITING HEAT.—The facilities which nature has placed within our reach, for the purpose of exciting heat, are worthy of notice. By concentration of the sun's rays any combustible material may be inflamed, even the brilliant can thus be burned. By the compression of air in a small cylinder of glass or metal, we may ignite a piece of phosphorus. By pouring concentrated nitric acid on oil of turpentine, by directing a small stream of hydrogen on small particles of spongy platina, by the flint and steel which our forefathers of many generations have used, &c., we may encite a flame. The products of the vegetable world, both in a fossil and recent state, are destined for the important purpose of maintaining heat.