

NEW KEY FASTENER.

The engraving shows a novel lock escutcheon, by which the key may be held and securely fastened in the lock, and by which the keyhole may be closed when the key is not in the lock. A device is provided for preventing the escutcheon from being operated from the opposite or under side by a knife or sharp pointed instrument.

The escutcheon consists of two plates of circular form, one plate being fastened by screws to the door, and having in it a keyhole and a curved slot, shown by the broken lines. The second or outer plate is pivoted to the inner plate, and has a keyhole with a straight slot opening out of it. A stud passes through a slot in the inner plate and limits the motion of the outer plate, and a knob is provided by which the plate may be moved, so that the keyholes in the two plates will correspond. The key is inserted and turned, throwing the bolt until the flat part of the handle of the key stands in the proper position to be received by the slot in the outer plate, when this plate is moved back to correspond with the under plate, with the key inclosed in and held from turning by the slot.

When the two plates coincide, holding the key in the slot, it would be possible to enter a knife or pointed instrument through the opposite keyhole, and by pressing the point into the under surface of the movable plate to move it back, causing the keyholes to correspond, when the key may be turned or pushed out. In order to prevent this, notches are formed at the inner end and on the sides of the curved slot in the fixed plate, and two wings are formed on the opposite sides of the stud or pin projecting from the movable plate, so they coincide with notches in the fixed plate when the key is locked in; and any pressure against the under side of the plate will push the plate so that the wing on the end of the stud will enter the notches, effectually preventing the plate from being moved in the manner described. This device answers the purpose of an extra lock or bolt, and is very easily applied to a door, and cannot get out of order. It effectually prevents the key from being turned with forceps or pushed out from the opposite side. It makes the cheapest lock perfectly safe, and it presents a neat appearance on the door. It can be used with either flat or round keys.

This invention has been patented by Mr. Edward K. Tolman, of 59 Pleasant Street, Worcester, Mass., who may be addressed for further information.

Vegetable Substitute for Rennet.

BY SIR J. D. HOOKER.

Mr. Stormont, Superintendent of the Government Farm, Khandesh, reported May 10, 1880: "Cheese making is a branch of agricultural industry altogether unknown in this district, and but imperfectly understood in any part of India; yet there seems no reason why it should not be successfully practiced."

Commissioner E. P. Robertson minuted upon this, June 10, "Cheese to be salable among the natives of this country should be made with some vegetable rennet. Natives would not touch cheese made with ordinary rennet, and I am convinced that good cheese cannot be without the use of some rennet. If a good vegetable rennet could be procured, the curd cheeses could be made; they would be cheap, and ryots would soon find a ready sale for them."

These facts having attracted my attention, I consulted Mr. A. H. Church, formerly Professor of Chemistry in the Royal Agricultural College, Cirencester, but who has taken up his residence at Kew, and is now Professor of Chemistry to the Royal Academy. This gentleman very kindly made some experiments on curdling milk, with calcium chloride and with vegetable acids. He arrived at the conclusion, however, that though in the laboratory good results could be obtained, they depended too closely on careful attention to the conditions of the process to afford a workable method for everyday use in India. Meanwhile, I had turned my attention to some suitable vegetable "rennet." Surgeon-Major Aitchison, while engaged at Kew, in working up his Afghan collections, under instructions from the Government of India, suggested a well known northwest Indian plant (*Puneeria coagulans*) as possessing the desired qualities.

The plant in question is one of the best known plants in Scinde, Beloochistan, and Afghanistan. It bears the name of Puneer-bund (cheese maker), from its being used by the Beloochees and Afghans in making cheese (puneer), as a substitute for rennet."

I communicated this information to the India Office. As will be seen from the following extract from Mr. Stormont's report for 1881, the suggestion was immediately acted upon with very gratifying success:

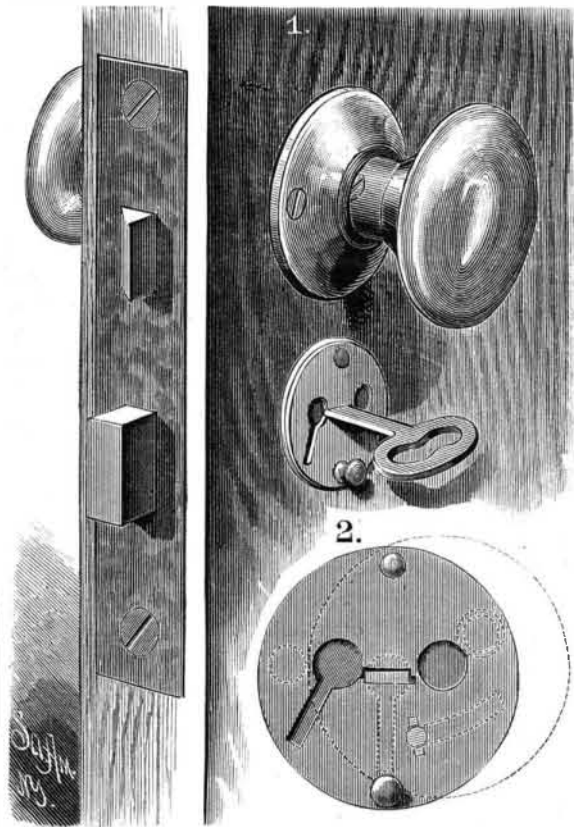
"During the year a good deal of attention has been devoted to dairy experiments, especially the making of cheese after the practice of Italy and Switzerland. The Commissioner, C. D., pointed out that, before cheese making can ever become an industry of the ryots, some vegetable substance must necessarily be found to take the place of the animal rennet used in European countries.

"In connection with this difficulty, Surgeon-Major Aitchison brought to the notice of the authorities at Kew that the fruit of *Puneeria coagulans*, a shrub common in Afghanistan and Northern India, possesses the property of coagulating milk.

"A quantity of the dried capsules of this plant was accordingly obtained, and part of it tried here, and found to be most suitable for the purpose. Being a member of the poisonous nightshade family, its safety was in the first place

carefully and gradually tested. It has been ascertained that an ounce of the pounded capsules in a quart of water is a very suitable strength for use; a tablespoonful of this decoction coagulates a gallon of warm milk in about half an hour. Seeds of the plant sown have germinated freely, and their further progress will be specially reported upon."

The anxiety as to the botanical position of *Puneeria* among the *Solanaceæ* has, I think, no solid foundation. The genus *Puneeria* is now reduced by botanists to *Withania*. This is a member of the tribe *Solanaceæ*, which appears to be gener-



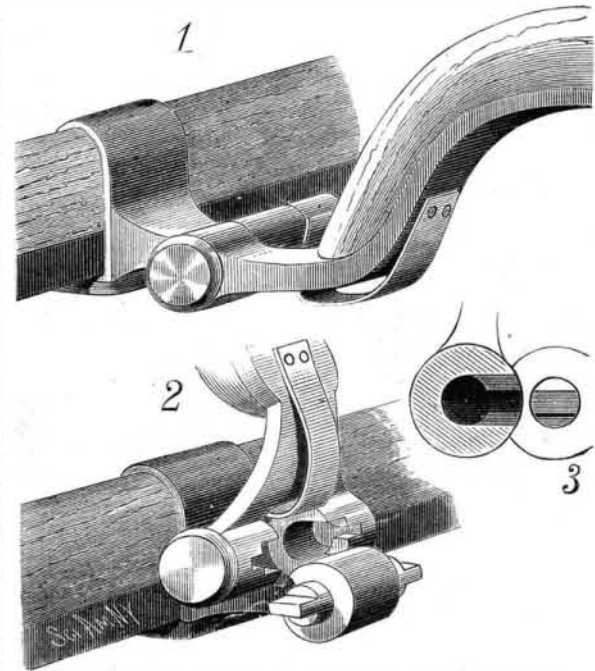
NEW KEY FASTENER.

ally free from the poisonous principles so characteristic of *Atropææ* and *Hyoscyamææ*. It abounds, in fact, in plants producing fruits which daily experience shows to be innocuous, such as the tomato, aubergine, capsicum, *Cyphomandra*, and cape gooseberry.—*Kew Report*.

IMPROVED THILL COUPLING.

The engraving represents an improved coupling for the thills of carriages and wagons, recently patented by Mr. G. W. Beebe, of Swanton, Vt. This device is simpler than the ordinary coupling, while it is perfectly secure against accidental uncoupling. It consists of two parts, one attached to the thill, the other to the axle.

Fig. 1 shows the coupling in condition for use; Fig. 2 shows it with the two parts separated; Fig. 3 is a sectional view, showing the end of the pin and the recess in the fork attached to the thill. The part of the coupling carried by the axle consists of a clip secured to the axle in the usual way, and having on the front side an arm supporting a short



BEEBE'S THILL COUPLING.

cylinder having at each end a cylindrical stud with a flattened end. Each branch of the fork attached to the end of the thill has a cylindrical cavity opening inward and provided with a side opening, which will admit the stud at the end of the short cylinder carried by the clip, when the thill is in a vertical position. When the thill is turned down into a horizontal position for use, the flat portion of the stud will be arranged transversely relative to the narrower portion of the side opening in the end of the fork.

It will be seen that with this arrangement it is impossible to remove the thill except by bringing it into a vertical

position and moving it backward, as shown in Fig. 2. A spring riveted to the fork prevents rattling by pressing against the cylinder carried by the axle clip.

Further information in regard to this useful invention may be obtained by addressing the inventor as above.

The Yankee in the South.

The impression still obtains that the Southern people cherish such a deadly hatred to Yankees that they will neither smell, taste, touch, nor handle anything contaminated by Yankee hands. This is a most egregious error. The Southern people love the Yankee, and they show this affection in a thousand different ways. When they retire at night, they unbutton Yankee buttons to Yankee made coats, waistcoats, pantaloons, shirts, and drawers. They pull off Yankee boots with Yankee boot jacks and divest their feet of Yankee socks. They march to Yankee bedsteads, turn down Yankee coverlets, Yankee blankets, prostrate themselves on Yankee mattresses, and lay their heads upon Yankee pillows. The bedbugs are the only things not made by Yankee hands and imported from the land of the Yankees. On rising in the morning we tread Yankee carpets, stumble over Yankee chairs and sofas, build a fire with Yankee coal taken from Yankee scuttles, in Yankee grates, catch the ashes in Yankee pans, and use Yankee pokers, Yankee shovels, and tongs. We repair to Yankee washstands, pour water from Yankee pitchers into Yankee bowls, and wash with Yankee soap; then use Yankee towels and Yankee tooth brushes. Next we march to a Yankee bureau, stand before a Yankee glass, and use Yankee combs, Yankee brushes, Yankee powder, Yankee cologne in Yankee bottles. We sit down in a Yankee chair to a Yankee table, covered with Yankee cloth, Yankee knives and forks, Yankee dishes, and fed upon Yankee food. We call for Yankee toothpicks, seize Yankee hats from Yankee racks, turn the key to a Yankee lock, open a Yankee door, enter a Yankee buggy, seize the Yankee reins to a Yankee harness, and repair to our place of business, and spend the day in trading on Yankee industry. The South is rich in resources, but our people are so fond of the Yankees that they lavish their wealth upon Yankee enterprise.—*Memphis Appeal*.

Cure for "Spinning."

M. Poisot lately communicated to the *Société de l'Industrie Minérale de Saint Etienne* some useful information as to the means for preventing the "spinning" of locomotive wheels in the Mazenay mines, no more fuel being now employed for hauling out 100 tons than for 80 formerly. He observes that the ventilation is effected by diffusion, and there is constantly in the roley way a tolerably thick smoke, which with condensed steam from the engine and the dampness of the workings causes the rails to be slippery. The consequence is that every time they tried to ascend the gradient of 1 in 66 with a full train, they could only get up half of it, about 180 meters (590 feet) without the wheels beginning to spin; and during the rest of the rise, notwithstanding the use of fine and dry sand, this difficulty frequently began again, so that they lost pressure to such an extent that they were obliged to stop to make steam. This difficulty caused great consumption of fuel, excessive wear of the working parts of the engine, and a rapid destruction of the rails. About two months ago the joint of one of the cylinder cocks leaked, and a jet of steam escaping from it was directed on to the rail, when the train took the gradient without the engine once spinning. For two days they worked without making the repair, and the locomotive drew all the trains without the slightest stoppage. In consequence of this experience they altered the cylinder cocks so as to make them discharge directly on to the rails, and when they get to the gradient the cocks are slightly opened, so that they ascend it without difficulty.

The Inventor of the Incandescent Electric Light.

Prof. W. Mattieu Williams, writing to *Nature*, says: In the "Notes" of *Nature*, vol. xxvii, p. 209, M. De Chagny is described as "the first electrician who attempted to manufacture incandescent lamps *in vacuo*, about twenty years ago." This invention and its successful practical application (irrespective of cost) was made by a young American, Mr. Starr, and patented by King in 1845. A short stick of gas-retort carbon was used, and the vacuum obtained by connecting one end of this with a wire sealed through the top of a barometer tube blown out at the upper part, and the other end with a wire dipping into the mercury. The tube was about thirty-six inches long, and thus the enlarged upper portion became a Torricellian vacuum when the tube was filled and inverted. I had a share of one eighth in the venture, assisted in making the apparatus and some of the experiments, and after the death of Mr. Starr all the apparatus were assigned to me. I showed this light (in the original lamp) publicly many times at the Midland Institute, Birmingham, and on two occasions in the Town Hall, all of them more than twenty years ago. The light was far more brilliant, and the carbon-stick more durable, than the flimsy threads of the incandescent lamps now in use. It was abandoned solely on account of the cost of supplying the power. As a steady, reliable, and beautiful light, its success was complete. In "A Contribution to the History of Electric Lighting," published in the *Journal of Science*, November 5, 1879, and reprinted lately in my "Science in Short Chapters," may be found further particulars concerning this invention and its inventor.