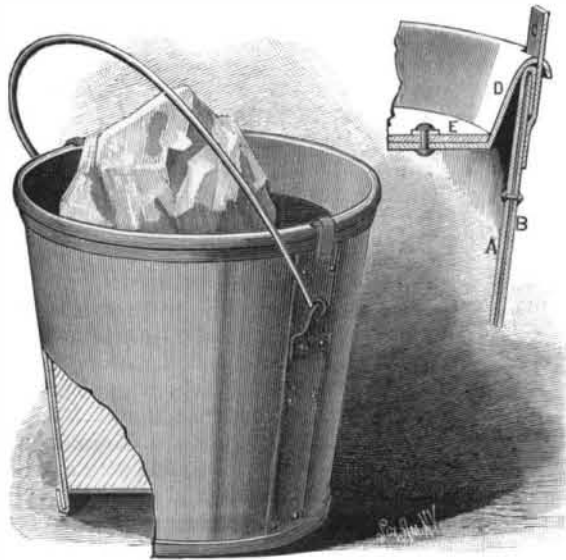


**BUTTER TUB.**

The pail is made of tinned sheet iron provided on the outside with a covering of wood pulp or building paper, held on by bending the top and bottom edges of the metal over the edges of the covering sheet. The metal bottom is placed a short distance above the lower edge, so as to permit the cool air to pass beneath. The joints of the paper may be covered by one or more metal strips, B, secured by rivets. Ears are riveted to the strips to hold the bail. The cover is formed with a flange, D, which is so bent as to fit on the upper edge



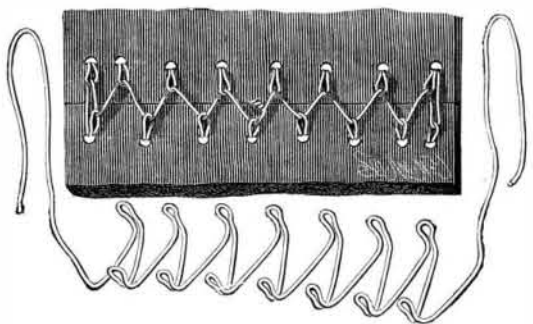
McADAM'S BUTTER TUB.

of the tub. Ice can be placed in the cover to keep the butter fresh and cool. A sheet of building paper, E, is riveted to the upper surface of the lid. The bent part of the flange of the cover is formed with a series of slots, through which metal tongues, C, are passed and then bent down to the outside to hold the cover on; the tongues are riveted or otherwise secured to the tub. The sheets of paper form a very perfect non-conductor of heat, and protect the contents of the pail from atmospheric influences.

Further particulars can be obtained by addressing the inventor, Mr. James McAdam, of Postville, Iowa.

**BELT FASTENER.**

The fastening is made of wire, which for about half its length is bent into a series of zigzags the angles of which are bent upward at right angles, forming loops, the number of which on each side being equal to the



KELLS' BELT FASTENER.

number of holes in each end of the belt. The holes are made at such a distance from the ends of the belt that when they are brought together the holes will be at the same distance apart as the rows of loops in the wire. In using the fastening, the ends of the belt are brought together, and the ends of the wire are passed through the holes in such a direction as to bring the zigzags on the inner side of the belt. The ends of the wire are then passed through the loops successively, forming a second series of zigzags upon the outside of the belt, and are twisted together, as shown in the engraving. In use, the fastening beads itself in the belt so as to leave the surface smooth. The fastener is easily applied, and reliable in use.

This invention has been patented by Mr. Thomas Kells, of 119 Freeman Street, Greenpoint, Brooklyn, N. Y.

**Sugar Made from Potatoes by Electricity.**

Although glucose can be easily prepared from various amylaceous substances, all attempts to artificially produce saccharose or cane sugar have hitherto been unsuccessful, but it is now announced that the synthesis of saccharose has just been accomplished by Messrs. Aubert and Giraud, and it is naturally anticipated that the discovery may eventually be of vast importance to the sugar industry. The process consisted essentially in submitting amylaceous matter derived from the potato, after it has been converted into glucose in the usual manner, to the action of an electric current equal to about 75 volts. The electrodes were immersed in the solution, and the current reversed from time to time. The reaction terminated in about two hours, and the finish was indicated by the liquid no longer giving

the characteristic color with tincture of iodine or a precipitate with alcohol. The liquid was afterward defecated by means of lime, which was subsequently removed by carbonic anhydride, and the sirup was then decolorized and left to crystallize. The crystallized product upon analysis yielded 88.38 of saccharose, 1 per cent of glucose, 3.67 per cent of ash, and 6.95 per cent of water; it was, therefore, far from being pure cane sugar. At present it has not been decided whether the reaction consists in the dehydration of glucose, the union of a molecule of dextrine with one of glucose, or the hydration of dextrine.

**Progress of the Lick Observatory.**

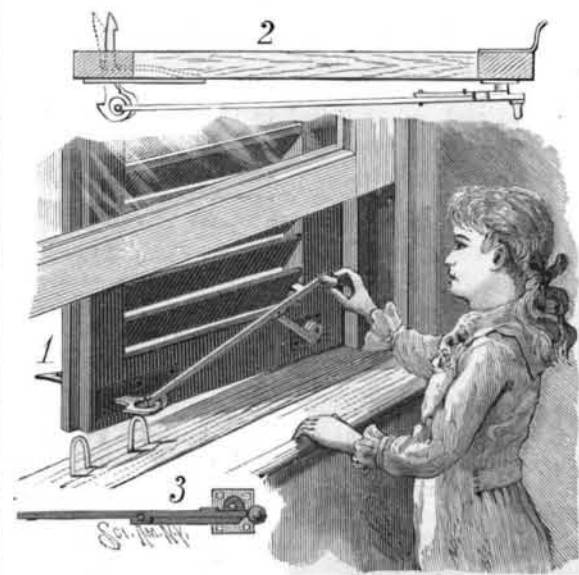
The trustees of the Lick fund have already provided one of the most complete observatories in the world, although the great 36-inch refractor, which is to be its leading feature, is not yet built. The observatory is on Mount Hamilton, about 4,250 feet above sea level, and has a meridian circle which Prof. Holden thinks one of the most perfect of its class. The flint disk for the great equatorial was completed long ago, but it has as yet been impossible to obtain a crown disk. After nineteen unsuccessful attempts, two have been recently cast in Paris, and Mr. Clark, of the firm of Alvan Clark & Sons, visited Europe recently for the purpose of examining them, but reports that both of them were defective. If these glasses had been perfect, it would have taken eighteen months to have ground and finished them. Already the observatory possesses a 12-inch equatorial, a 4-inch transit, a comet seeker, a vertical circle, and a 6-inch equatorial. There are five clocks connected by a complete electrical system.

Thomas E. Fraser, superintendent of the observatory, states that the 36-inch glass, when finished, will be by far the most powerful one in the world, bringing the moon within thirty miles of the earth, whereas eighty miles is the limit of existing telescopes.

Superintendent Fraser states that since records of the temperature have been kept on Mount Hamilton, winters have been growing colder. The lowest point reached during 1881 was 19° above zero; the next year, 17°; the next, 15°; and last season, 13°. Thus far this season the lowest temperature has been 22°.

**IMPROVED SHUTTER WORKER.**

The shutter worker, by means of which the shutter may be readily opened or closed, and locked in either position, is applied to the inside face of the lower rail of the shutter. The rocking spring catch is of any approved construction, and is formed with reverse spurs at its opposite ends for engagement with fixed staples to hold the blind both when closed and opened. This catch is placed near the opening edge of the shutter, thereby relieving the latter of strain on its hinges, and keeping it more securely closed in a high wind. The device for working the catch consists of two rods, the longer of which extends nearly the full width of the shutter, and is connected at its forward end with the catch; the other end is provided with a handle and also with an inner laterally-projecting lip. The other rod is pivoted near the hinge edge of the lower rail, and its free end is pivoted to the long rod in advance of its lip, which occupies a position over the short rod between its two pivots. That end of the short rod secured to the shutter is pivoted in a position slightly above the horizontal plane in which the catch moves, and the rods are so arranged that when lowered the long one will drop below the end pivot and below the level of the catch, until stopped by the lip resting on the short rod, so that when the shutter is closed it will be held locked by the dip of the rods. The catch can be easily operated by raising or lowering the handle, and in



BROWN'S IMPROVED SHUTTER WORKER.

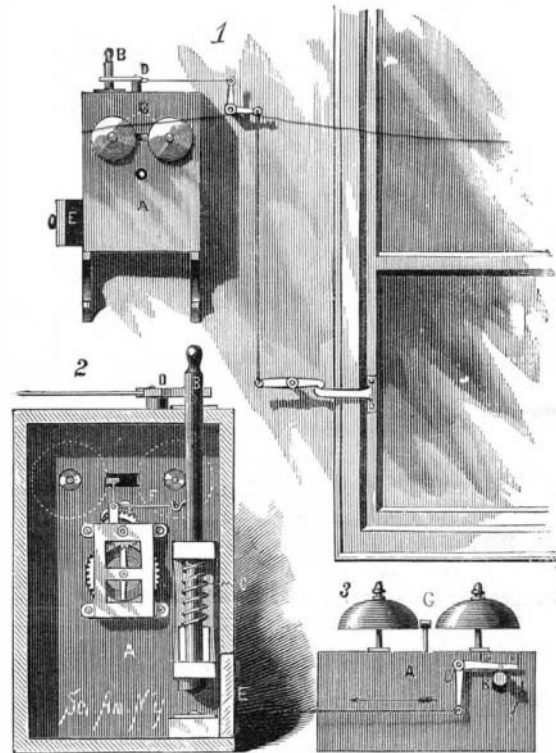
opening and closing the blind there will be no necessity to but very slightly open the window, and never any necessity to lean out of the window.

This invention has been patented by Mr. Robert I. Brown, of 35 West 130th Street, New York city.

**BURGLAR ALARM.**

The engraving represents an improved burglar alarm which rings a bell and fires a cap or cartridge when the alarm is released; the device can be connected with any desired number of doors, windows, etc. On the outside of the box, A, are two bells, between which is a hammer arranged to be operated by a clock work in the box. On the inner end of the hammer is an arm having a hook in its free end, which receives a hook projecting from a hammer rod, B, which moves vertically in guides on the inner sides of the box. The rod is pressed downward by a spiral spring, C. On the bottom of the box and below the rod is placed a firing block to receive the caps, the inside of the box being reached through the door, E. The upper end of the rod passes through a slot in the top of box. Pivoted on top of the box is an elbow lever, D, which is connected by wires and intermediate elbow levers with one end of a lever pivoted to the wall near the window, so that the outer end of the lever can be tripped by an arm on the sash.

The alarm is set by pulling the rod upward, when it will be held by a pin projecting from its upper end resting on top of the box at one end of the slot. A cap is placed on the block, and the arm of the clock work is engaged with the hook on the rod. If the window is opened, the wires connected with the elbow lever,



SIMS &amp; SHORKES' BURGLAR ALARM.

D, will be pulled, thereby pushing the rod from the edge on which its pin rests. The spring will force the rod down to explode the cap, and the clock work being released will operate the hammer to sound the bells.

Further particulars regarding this invention can be obtained from the inventors, Messrs. J. C. Sims and F. R. Shorke, P. O. Box 255, Maynard, Mass.

**On the Canning of Fish, Etc.**

An esteemed correspondent, writing from British Columbia, says:

Noticing your reply to a correspondent about canned goods, I (this morning) opened several cans of salmon that were processed in July of 1879, 1880, and 1881, and on comparing them with last season's cans found it impossible to detect the slightest difference. I hold that if a can is once perfectly sealed, the contents will remain unaltered as long as the metal casing remains intact. A can will keep if every portion of the contents has been subjected to a temperature of 212° Fah., whether the air is expelled or not, as my experiments have conclusively proved.

When I first began the business, I was taught that the air unless expelled would cause the contents to deteriorate, and that was the reason the cans were vented.

I soon found that it was a mistake. The venting is done for the purpose of testing for leaks. A tight can has a sound that cannot be mistaken for a leaky one.

If your correspondent boils his fish, flesh, or fowl with the vents open, he will have dry cans for his pains. The vents must be closed when cooking, and opened, in the case of meats, after boiling one hour, then closed hot, and returned to kettle, and boil three hours for fish and less for meat without bone. Fruit is vented, and closed when finished. S. H.

WE noticed in a recent issue that a London scientist was trying to produce cats without tails. The Philadelphia Ledger suggests that the experimenter will be a greater benefactor by producing the tails without the cat. The writer had evidently heard a discussion on his back yard fence, the night before.