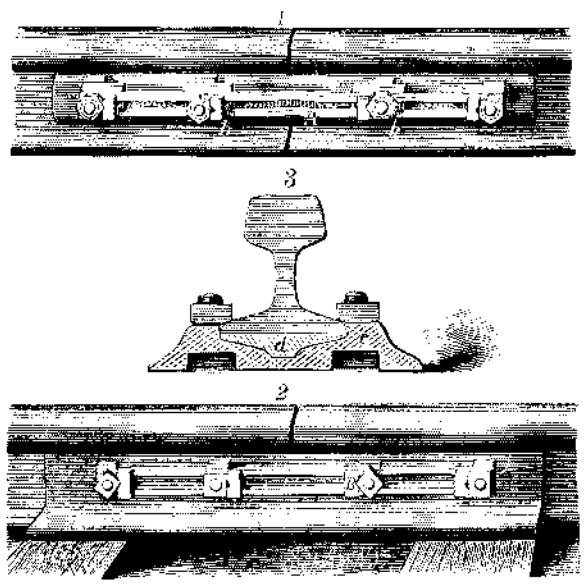
### JCK.

form of nut lock recently
ill, of Pittsburg, Pa. This
hannel bar having holes for
of the bolts, and provided with
as which slide in the slots and pre-
ing by being held in contact with
wedges as in Fig. 1, or by bend-
bar as in Fig. 2. In applying this nut lock,
plates and bolts are placed in position and the nuts
urned down upon the slotted plate, A, until the parts
are clamped together with the required pressure.

The grooved blocks, B, are then moved along in the slots




BERRYHILL'S IMPROVED NUT LOCK.

of the bar, A, until they touch the sides or corners of the nuts, then the blocks, B, are secured in position by bending the bar, A, inward at *a* (Fig. 2), so as to bring a notch formed in its inner surface into contact with the corner of the sliding block. This particular form is especially adapted to square nuts. Where hexagonal nuts are employed the blocks, B, are held in place by wedges, *b* (Fig. 1), which press the blocks against the nuts and hold them securely in place, and *b* is held in its place by bending the upper part of the slotted bar backward over the wedge.

In Fig. 3 is shown a re-enforcing rail, *d*, which forms a part of the rail joint, and is held in place by a chain, *e*, and the bolts which clamp all together.

The blocks are inserted in the bar when manufactured, making the whole very simple in practical operation.

For further information in regard to this invention address the inventor, Mr. Albert Berryhill, Pittsburg, Pa.

### Poisonous Bullets.

A German journal refers to a discovery made by a M. Gros, of Paris, which tends to throw some light on the complaints which were made (but not seriously inquired into) during the Franco-German war, as to the use of poisoned bullets by the combatants on both sides. M. Gros explains that the construction of the modern breech-loading arms causes the bullet to convey with it a portion of the hydrocyanic acid which the explosion of the powder has caused to be accumulated in the barrel. Even if poisoning to a mortal extent does not take place, it is remarked that the healing of wounds is materially retarded by this circumstance.

### NEW OIL CUP.

The illustration shows the Bryant self-feeding oil cup in perspective, in section, and as applied to the cross-head and ways of an engine. A steel spiral spring presses at its upper end against a cup piece, having a socket and set screw to regulate the pressure, while the lower end of it is fastened on a metallic disk attached to a thick circular piece of felt, resting on the bottom of the cup and directly over the small hole in the stem, through which the necessary quantity of oil escapes when the machinery to which the cup is attached is in motion. The pressure of the spring upon the disk prevents all escape of oil when the machinery is idle, but the slightest motion of the journal produces a vibration in the spring, by means of which the pressure on the felt is released and oil is permitted to escape through the felt in proportion to the speed of the machinery. If oiling too freely, more pressure is put upon the spring by means of the set screw above it, and if not enough oil escapes, the pressure is reduced in the same way. Once adjusted, no matter at what variable speed the machinery may run, the lubricator will feed in exact proportion to it.

We are informed that not a drop of oil is wasted, and the outside of bearings, as well as the floors and walls, are kept free from oil or grease.

The cup has been fully tested in machinery running from thirty revolutions to thirty-three hundred revolutions a minute, and, it is stated, with entire satisfaction in all cases. A cup holding three ounces of oil has been in use for six weeks on an eighty-horse power rolling mill engine with one filling, and the same size cup on a locomotive for fifteen hundred miles, in each case giving perfect lubrication.

We understand these cups have been well tried and have proved reliable and effective in lubricating locomotives, stationary engines, and other kinds of machinery, using very little oil, but supplying enough to thoroughly lubricate the surfaces.

Further information may be obtained by addressing the Bryant Manufacturing Company, 230 South St., Philadelphia, Pa.

### Manufacture of Milk Sugar.

The enormous quantity of cheese manufactured in this country, for export as well as home consumption, leads us to ask why we should be under the necessity of importing milk sugar. Those who may be engaged in making the latter, or intending to embark therein, will be interested to learn of the latest improvements in that line.

In the evaporation of whey, from which the cheese has been removed, a considerable portion of the sugar of milk is lost through conversion into uncrystallizable lactose by the action of the acid in the whey. Engling, therefore, recommends the neutralization of the acid with fine chalk, and then after evaporating it to one-half, he allows it to settle. The clear liquid is afterward decanted or drawn off from the precipitate, which consists of albumen and phosphate of lime, and evaporated still further.

The sugar separates from the purified solution in adherent scales and crusts; upon a further evaporation of the mother liquor a second crop of crystals is obtained. The thick liquid that remains can be dialyzed, and more sugar obtained. From 100 quarts of summer whey eight lb. of refined milk sugar can be obtained. If the whey is frozen first, and the crusts of ice that form are removed from time to time, a strong solution of milk sugar can be obtained in a comparatively short time, which is purer than that obtained by evaporation, because the fat, albumen, and salts are for the greater part intermixed with the ice, giving it the appearance of thin scales with dendritic markings.

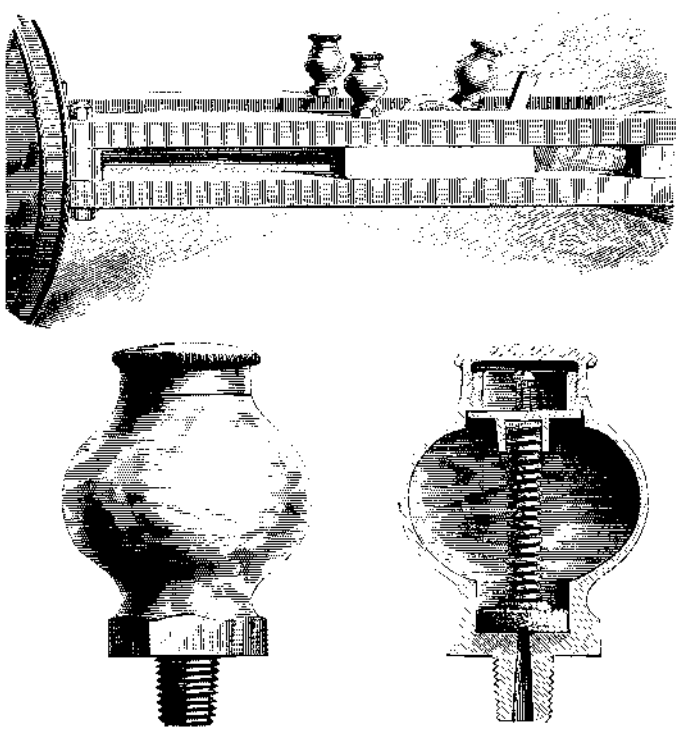
In an experiment in making milk sugar in this way, 10 liters of whey, by careful handling, yielded 380 grammes of snow-white milk sugar, which is better than Schalzmann's results, which were 2½ kilos of sugar from 100 liters of whey, although it was the winter whey, which is poorer in sugar.

### An Ancient Roman Coin found in Illinois.

A farmer in Cass county, Ill., picked up on his farm a curious bronze coin, which Dr. J. F. Snyder sent to Prof. F. F. Hilder, of St. Louis, who writes about it as follows to the *Kansas City Review*:

Upon examination I identified it as a coin of Antiochus IV., surnamed Epiphanes, one of the kings of Syria, of the family of the Seleucidæ, who reigned from 175 B.C. to 164 B.C., and who is mentioned in the Bible (first book of Maccabees, chapter 1, verse 10) as a cruel persecutor of the Jews.

The coin bears on one side a finely executed head of the King, and on the obverse a sitting figure of Jupiter, bearing in his extended right hand a small figure of Victory, and in his left a wand or scepter, with an inscription in ancient Greek characters—BASILEOS ANTIOCHOU, EPIPHANOUS, and another word, partly defaced, which I believed to be NIKEPHOROU; the translation of which is: King Antiochus, Epiphanes (Illustrious), the Victorious. When found it was very much blackened and corroded from long exposure, but when cleaned it appeared in a fine state of preservation and but little worn.

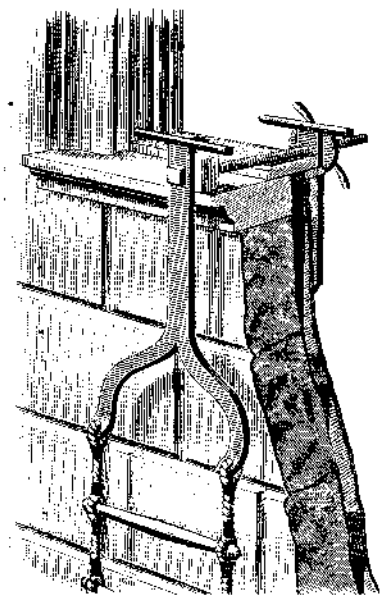


THE BRYANT OIL CUP.

### NOVEL FIRE ESCAPE.

We give an engraving of a new fire escape which, in case of fire, can be very readily attached to the window sill from the inside of the building, furnishing a ladder for the descent of the inmates, and it may be applied to all forms of window sills.

The invention consists of a forked metal plate, to which the rope ladder is attached, and a clamp plate which comes against the inside of the window sill, the two plates being connected together by a screw-threaded bar carrying a clamping wheel, which may be readily turned for clamping the plates to the window sill. A block is used in connection with the clamping plates and screw rod when the escape is



NEW FIRE ESCAPE.

to be attached to a sloping window sill, so as to elevate the escape and give it a level bearing.

The upper end of the fork is provided with handles, to facilitate climbing out of the window and stepping upon the ladder.

It will be seen that this escape, when attached to the window sill, is perfectly safe and secure, and will in no manner mar the window sill, so that no repairs will be needed in case the fire is put out. Besides these advantages, the device is light, strong, and cheap in construction, and when not in use can be stowed away in very small space.

Further information in regard to this useful invention may be obtained by addressing the inventor and patentee, Helen M. Decker, 113 East 14th St., New York city.

### The Lead Keel of the Wenonah.

A twenty-one ton lead keel for the new cutter Wenonah was cast by Mr. Henry Piepgrass, in Brooklyn, May 16. The process employed is thought to have been an improvement on that used in casting the thirty-three ton keel of the Bedouin, noticed some weeks since.

In the former casting there were two pots resting on the top of brick furnaces; in this one there was but one pot, and that was entirely inclosed in the brickwork, so as to economize heat. The pot was oblong in shape, about 8 feet in length, 2 feet in width, and 2½ feet in depth. In the side of this and close to the bottom were two poles three-eighths of an inch in diameter. Leading from these were two iron troughs reaching to the mould, which was formed on the underneath side of the oak keel, which was turned bottom upward alongside of the three furnaces. The keel was 55 feet in length; the mould extended for 30 feet along its center. In the previous casting the molten lead, as it ran into the mould, was cooled to prevent its scorching the wood, by the addition of cold lead; in this one the lead was put in first, the mould being filled with six tons laid loosely, so as to permit the liquid metal to freely flow through it. The wooden keel was also laid with a slight incline, so that its lower end should fill first. The fires in the three furnaces were lighted at noon with about fifteen tons of lead in the pot. As the mass melted additional pigs of lead were thrown in, and at 4 o'clock live coals were thrown on top of the melting lead and a bright fire was kindled on its surface to counteract the effect of the cold wind. At 5:30 there were twenty tons of lead in the pot in a liquid state. Then Mr. Piepgrass, stationing his men at the lower end of the mould, partially withdrew the bar from the hole nearest to this end and permitted the stream of lead to flow as more lead was put in at the top. As the liquid metal reached the top of the mould at its lower end the attendant workman spiked on the covers of plank, repeating the process until the iron trough was reached; then Mr. Piepgrass stopped the flow from this hole and withdrawing the other sufered the lead to flow and fill the other end. When the mould had been entirely filled there was left of the whole quantity of twenty-five tons three and a half tons in the pot and a half ton outside. The lead remaining will be cast in moulds to fit the frames of the yacht, which will have, in addition to her lead keel, twenty tons of ballast inside.