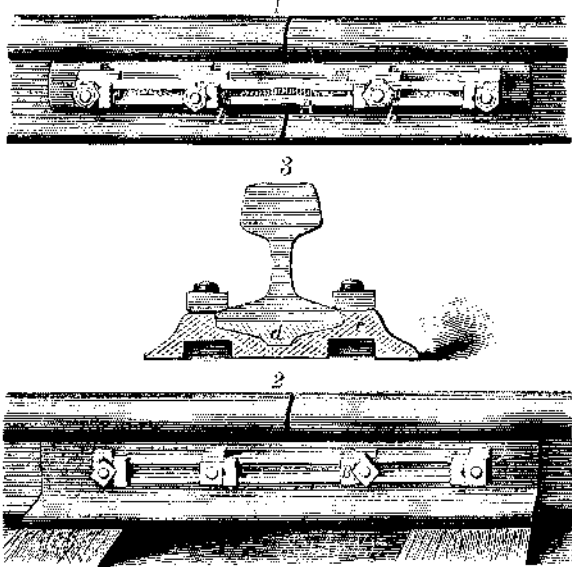


JCK.

form of nut lock recently
 of Pittsburg, Pa. This
 channel bar having holes for
 of the bolts, and provided with
 as which slide in the slots and pre-
 ng 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
 turned 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 ad-
 dress 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 com-
 plaints 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 pres-
 sure, while the lower end of it is fastened on a me-
 tallic 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 nec-
 essary 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 pres-
 sure 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 min-
 ute, 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 fill-
 ing, and the same size cup on a locomotive for fifteen hun-
 dred miles, in each case giving perfect lubrication.

We understand these cups have been well tried and have
 proved reliable and effective in lubricating locomotives, sta-
 tionary 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., Philadel-
 phia, 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 lat-
 ter, 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 ac-
 tion 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 precipi-
 tate, 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 compar-
 atively 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 appear-
 ance of thin scales with dendritic markings.

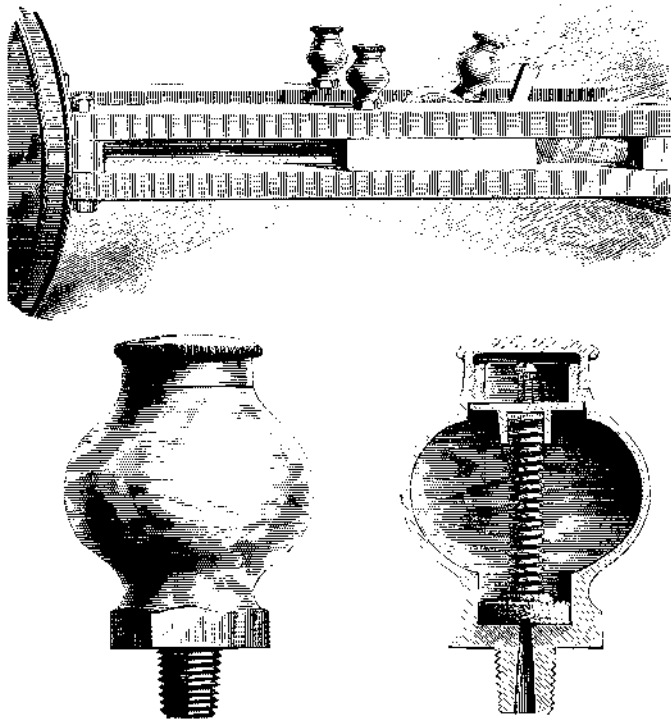
In an experiment in making milk sugar in this way, 10
 liters of whey, by careful handling, yielded 230 grammes of
 snow-white milk sugar, which is better than Schalzmann's
 results, which were 2½ kilos of sugar from 100 liters of
 whey, although it was the winter whey, which is poorer in
 sugar.

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 Mac-
 cabees, 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



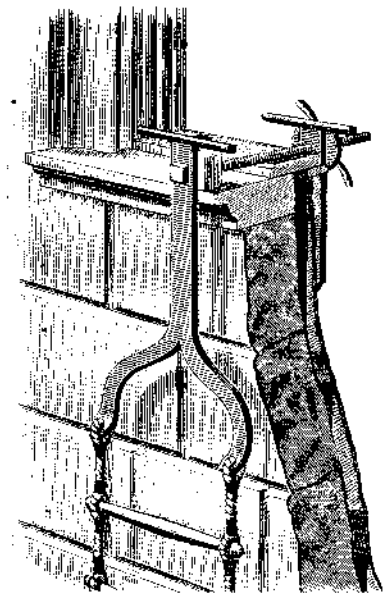
THE BRYANT OIL CUP.

Greek characters—BASILEOS ANTIOCHOU, EPIPHANOUS, and
 another word, partly defaced, which I believed to be NIKE-
 PHOROS; the translation of which is: King Antiochus, Epi-
 phanes (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.

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 de-
 scent 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 win-
 dow 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 de-
 vice 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 improve-
 ment 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 up-
 ward 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 suffered 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.