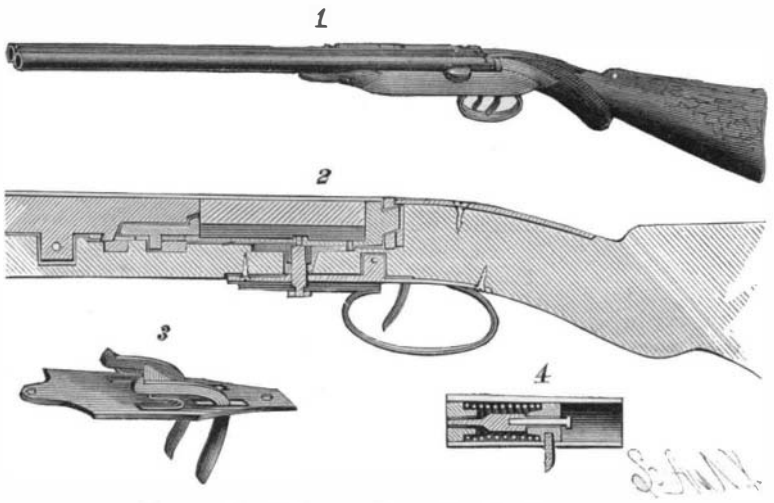
tal receives a sharp blow. These may be seen in any agate mortar which has been extensively used in the laboratory. A perfect funnel-shaped flaw is produced, and is apt to become further developed if an attempt is made to work the crystal.

Viewed as works of art, however, the cups, vases, and pitchers of crystal made during the 16th and 17th centuries at the Louvre, Dresden Green Vaults, and Shatz Kammer at Vienna, are immensely superior to the simple crystal balls. Two pieces of this class, recent Viennese reproductions, were formerly in the Morgan collection. They are in the shape of dishes, and measure from 4 to 6 inches across. They are beautifully engraved in intaglio, and mounted in silver and gems. One of the most notable of these objects in the United States is now in possession of Messrs. Tiffany & Co. It is a circular disk of 9⅞ inches in diameter, on which the Finding of Moses has been beautifully cut in intaglio. Shortly after its completion, this remarkable piece of crystal was unfortunately dropped by the engraver, and is now in two pieces, but even in its mutilated condition it is an admirable work of art. Another piece of good carving and beautifully clear crystal, in the possession of the same firm, is a solid crystal vase of Russian workmanship, 5 inches high and about 3·25 inches broad. The small crystal vial, shown full size in our illustration, is an ingenious piece of work, both balls having been hollowed out from the one opening in the end. The rock crystal itself is full of delicate acicular crystals of hornblende. One of the finest pieces of work in European cabinets is an urn 9·5 inches in diameter and 9 inches high. The entire object, including the pedestal, is made of one piece of rock crystal, the upper part being handsomely engraved. Its cost was about $20,000.

The Japanese have a favorite proverb, "Until polished, the precious gem has no splendor," which will be appreciated when a rough fragment of rock crystal is compared with a finely polished ball; but the fact remains that its real value lies beneath the labor and beneath the polish, in the crystal itself.



JANSEN'S BREECH-LOADING GUN.

A HAMMERLESS BREECH-LOADING GUN.

In the illustration herewith are shown a perspective view (Fig. 1) and details of an improved construction of breech-loading gun in which the hammers are concealed, Fig. 2 giving the longitudinal vertical section, Fig. 3 the trigger plate and triggers, and Fig. 4 a section of one of the lock chambers. The barrels are connected in the usual manner, and have near their breech ends a downwardly projecting tongue, which is secured in a recess in the stock by a pin, the breech ends of the barrels thus resting upon the forward end of the lock and barrel seat. The side of one of the barrels has a long cylindrical eye, through which passes a long pintle, a tube secured to the side of one of the lock casings turning upon the pintle, and there being a twisted slot in the tube in which works a pin, by which, when the lock casings rest in their seat, the lip of the extractor will rest in notches in the breech ends of the barrels, but when the lock casings are swung out to the side, the pin will be forced rearward, drawing the arm and extractor rearward with it, throwing out the empty shells from the breech ends of the barrel. The lock casings are tubular, and have longitudinal slots in their under sides, pins or sears projecting from the sliding hammer blocks through the slots in the lock casing, and sliding therein. The forward ends of the triggers have beveled upwardly projecting lips, so that the lower beveled ends of the sears may be drawn over the lips and engaged by the same, the forward ends of the triggers having springs forward of their fulcra which force the lips of the triggers upward.

Our illustrations show the invention as applied to a double-barreled gun, but the mechanism may as well be employed in a single-barreled fire arm, the principle remaining the same, or portions of the mechanism may be used with portions of other similar mechanism.

This invention has been patented by Mr. Diederich W. Jansen, of Joplin, Mo.

A Scientific Woman.

A regulation as old as the French Academy of Sciences has just been broken through in Paris. Women have hitherto been excluded from the sittings of the Academy, but at the meeting of June 28 the interdiction was raised in favor of Mlle. Sophie Kowlewska, professor of mathematics at the University of Stockholm, and daughter of the eminent paleontologist. Admiral Jurien de la Graviere, who presided, welcomed her in graceful terms, and said that her presence should be a cause of pride and pleasure, not only to the mathematicians present, but to the whole Academy. As she entered, the whole of the members rose to salute her. She took her place between Gen. Fave and M. Chevreul.

A WRENCH WITH LIFT CAMS.

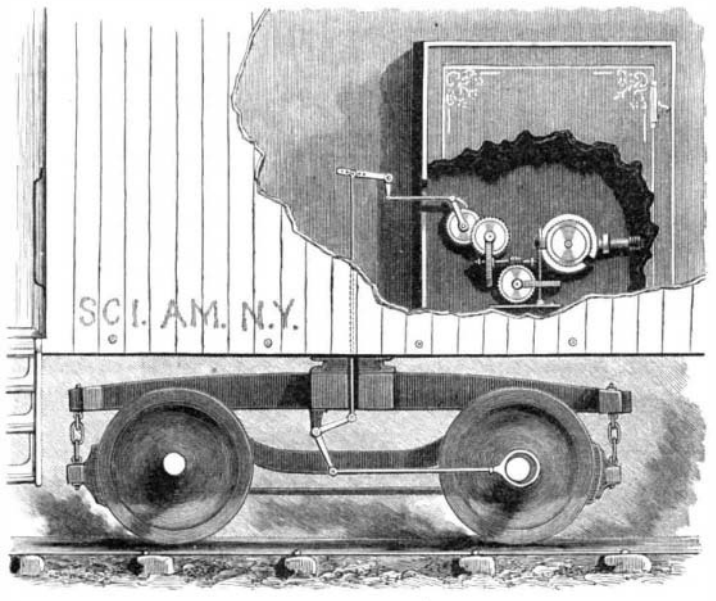
The opposite sides of the socket of the wrench herewith illustrated are formed with cams to act against a nut to lift the wrench between successive turns, thus making a tool which can be used conveniently in place of a ratchet wrench. The square corners or faces which abut against the nut to turn it in one direction are adapted for making a right hand turn on one side of the tool, while the other side has these square corners adapted for making a left hand turn, the withdrawing or backward movement of the wrench being in each case aided by the cams at the corners of the socket adjacent to each angular face that bites on the nut. With this wrench it is only required to move the hand back and forth, as the cams lift the wrench to the top of the nut upon the back stroke, and gravity causes it to drop again over the nut. This invention has been patented by Mr. Alfred Wood, of Trenton, N. J.

WOOD'S RIGHT AND LEFT WRENCH.

ONE pound nitrate of ammonia to two or three pounds water is the best of the simple mixtures for producing cold.

DEVICE FOR CONTROLLING LOCKS ON RAILWAY CARS.

The invention herewith illustrated exhibits a construction by which a railroad express or freight car, or any part thereof, or a safe in the car, may be locked so as to prevent admission thereto while the car is in transit, or only at certain places on the journey, the locking and unlocking mechanism being such as can be set for the distance to be traveled, and not affected by the time taken for the journey. Upon one of the axles is an eccentric, which operates a bell crank connected with a lever in the interior of the car, from which motion is taken to actuate a train of gears forming the running or bolt-controlling mechanism of the lock. A means of regulating the motion of the bolt-controlling mechanism is afforded by making the lever connected with the bell crank with a series of holes at different distances from its fulcrum, with any one of which the rod may be engaged to make the motion faster or slower. The bolt-controlling tumbler, too, may be adjustable, or be provided with a number of slots to provide for the drawing back of the bolt at fixed distances apart on the route. This invention has been patented by Messrs. Roman L. Baca and John L. Leavitt, of Grant, New Mexico.



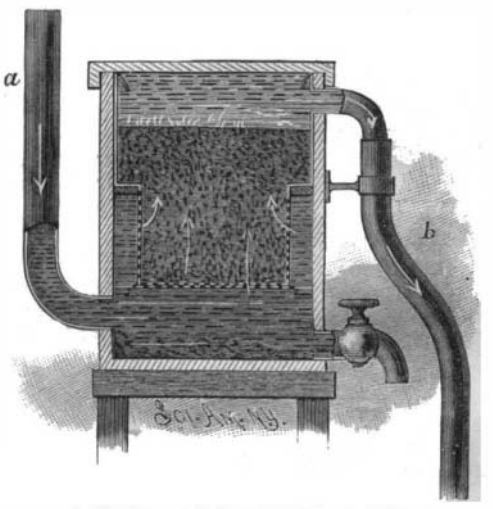
BACA & LEAVITT'S RAILWAY CAR LOCK.

How to Separate the Layers of Insect Wings.

A wing that has never been dried is placed in 70 per cent alcohol, then into absolute alcohol, and after a few days' immersion then placed into turpentine. After remaining a day or two in the turpentine, the specimen is plunged suddenly in hot water, when the conversion of the turpentine into vapor between the two layers of the wing so far separates these layers that they can be easily parted and mounted in the usual way, as microscopical preparations on a slide.—*Royal Microscopical Journal.*

RAIN WATER FILTER.

The simple and inexpensive filter herewith illustrated is designed to purify the rain water flowing from the roof, and conduct it to a cistern. The water from the roof flows through the pipe, *a*, from the leader into a compartment in the lower part of the tank. The first water, which has washed the roof, is allowed to flow through the faucet and go to waste. When the water is comparatively clear, the faucet is closed, when the water flows upward through a false bottom supporting the filter proper, which is made smaller at its lower portion than at its top, and which snugly fits the tank, a packing making it watertight against the sides, to compel the water to pass through the perforated sides and bottom into the interior, which is filled with sand, charcoal, or some other suitable material. The water then flows through the pipe, *b*, to a cistern or reservoir. It is evident that by admitting water at the bottom, and causing it to be purified as it rises through the filter, all leaves or dirt of any kind will be held back by the perforated false bottom, and, after the rain has ceased, may be discharged through the faucet. It is thus impossible for any decomposable matter to find its way into the cistern.



LIGGET'S RAIN WATER FILTER.

This invention has been patented by Mr. Benjamin Ligget, of Tucson, Arizona.

New Source for Verbena Oil.

The *Eucalyptus staigeriana* tree, known as the lemon-scented iron bark, is a native of Queensland, where it was first discovered by Mr. P. F. Sellheim. Its leaves possess an odor exactly like that of the lemon-scented verbena, and the oil they yield is equal in fragrance to that of the so-called oil of verbena of commerce, which is not obtained from the verbena, but from the grass *Andropogon citratus*, D. C. The dried leaves, according to Staiger, yield 2¾ per cent of volatile oil of sp. gr. 0·901. The demand for the lemon grass oil is considerable, as much as 13,515 oz. having been exported from Ceylon in 1875; it is also largely manufactured at Singapore. Hence this tree, the *Eucalyptus s.*, appears worthy the attention of planters on account of its volatile oil. The odor of the oil is quite different from that of *Eucalyptus citriodora*, which resembles and might be substituted for citronelle oil, so extensively used for scenting soap.—*New Commercial Plants and Drugs, Thos. Christy.*

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