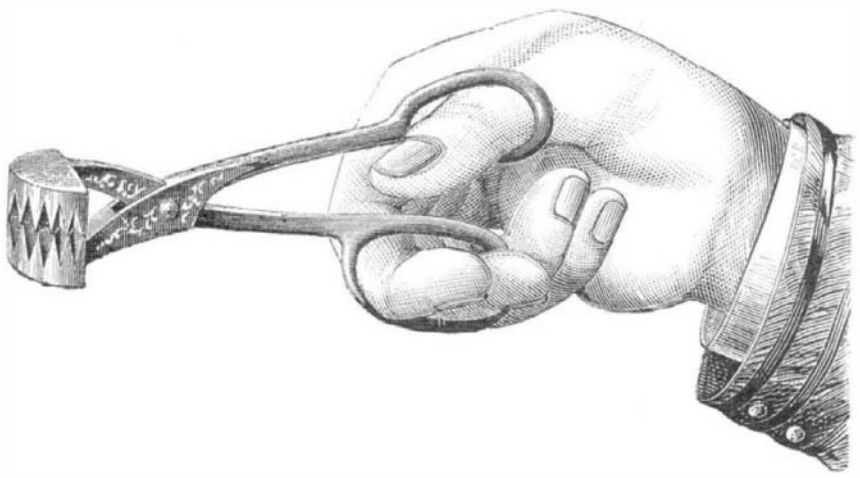
IMPROVED PINKING IRON.

This is an ingenious and handy substitute for the old fashioned pinking iron, or one under which the cloth is usually laid and the cutting done by pounding on the end of the tool with a hammer.

The present invention is nothing more than two cutting blades, of any desired form, attached to levers which are jointed like pincers and are operated like scissors. The upper blade does the cutting, and the lower one is made to correspond to it in shape, having its edge made, however, by beveling one side only. Both are so constructed that, when the jaws are closed, the edge of the upper blade sinks slightly below the surface of the lower tool and just back of the same, so that at each stroke the beveled parts of the blades bear against each other, and the cutting edge strikes against nothing but the fabric.

Of course the dies or blades are varied in form for different patterns, but it is considered cheaper to have an entirely separate instrument for every pattern instead of providing detachable blades.

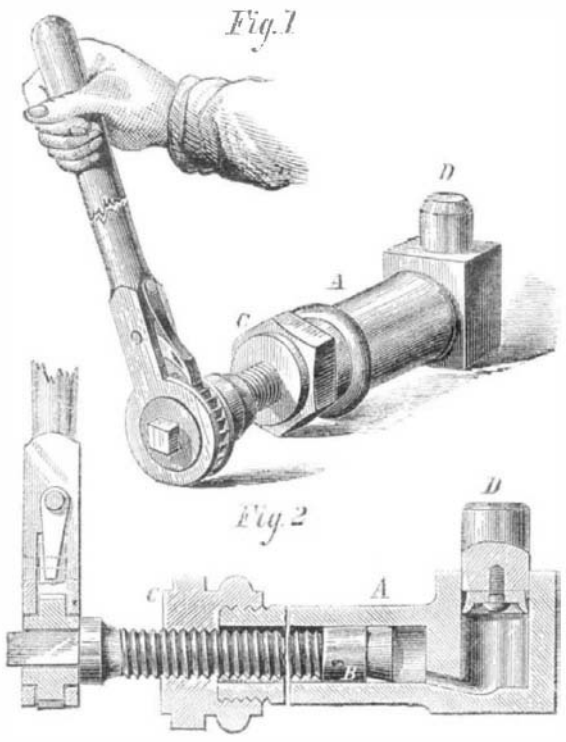
Patented September 1, 1874. For further particulars regarding sale of State rights, etc., address the inventors, Mrs. Eliza P. Welch, Groton, Caledonia county, Vt.



WELCH'S PINKING IRON.

BIDDLE'S HYDRAULIC JACK.

For forcing crossheads out of piston rods, bolts from engine frames and cylinders, crank pins out of locomotive driving wheels, and for performing similar work in which it is necessary to employ a tool of large power in a small space, the invention herewith illustrated will, it is claimed, prove excellently adapted. It is a novel form of hydraulic jack, consisting of a long tube, A, Fig. 2, in which works a piston, B. The latter is provided with suitable packing flanged



at the circumference, for expanding and closing tightly the more the pressure is increased, and is connected by a universal or similar joint to its screw bolt. The screw nut, C, is affixed at the end of the tube, A, and through it the bolt passes, terminating in a square end, to which the ratchet wrench is applied.

The liquid in tube, A, is forced by the advancing piston into the ram tube through a small connecting channel and against the lower end of ram, D, which is packed in the same way as the screw piston. The effect is to push the ram outward, and so to apply power to whatever may be in contact therewith. It will be seen from the exterior view, Fig. 1, that the device is quite compact, and it can be made of any size. It will doubtless prove a very useful implement for work in spaces too small for the employment of common tools.

Patented through the Scientific American Patent Agency, August 25, 1874; caveat also filed in Canada. For particulars regarding sale of rights and other information, address the inventor, Mr. Edward Biddle, Carlin, Elko county, Nevada.

Solid Metal Floating on Melted Metal.

It has been alleged that a cast iron cannon ball will float on molten cast iron, and Mr. R. Mallet, in a paper before the Royal Society, on the fusion of metals, explained the fact that some metals, when solid, float on a melted bath of the same metal, by the assumption of a "repellent force." Before definitely adopting this rather mysterious explanation, Mr. Adolf Schmidt advises all who are yet in doubt in regard to this subject to make the following experiment:

"Have a solid ball of cast iron, of 1½ to 2 inches diameter, cast and filed off pretty smoothly. Have a ladle or vessel, of at least ¾ cubic foot capacity, filled with molten cast iron. If then you lay the cold cast iron ball on the surface of the molten iron, you will find that the ball, in spite of the repellent force assumed by Mr. Mallet, will sink to the bottom of the ladle at once. With an iron rod you can feel the ball at the bottom of the ladle and roll it about. But, after twenty or thirty seconds, the ball will slowly rise to the surface of the bath and remain there. It is thus evident that cast iron at ordinary temperatures is both heavier and denser than molten iron; but that, as its temperature rises, the solid iron expands, and becomes lighter and finally floats on the molten iron. The latter fact shows simply that solid iron, when at a high temperature, approaching its melting point, is less dense and lighter than molten iron, which fact again implies that molten iron must undergo a rapid expansion in the moment of its solidification. The extent of this expansion is, however, less than that of the subsequent contraction in cooling, so that the cold iron is again denser than the molten iron.

The error of Mr. Mallet and of many preceding observers consists in this: Their observation, that the solid metal floats on the molten metal, refers to the former when heated, while their determinations of specific gravity of the solid metal are made with the metal, when cold. But my experiment, as above described, shows that this cold metal, which has the highest specific gravity, does not float, and the heated metal which does float has undoubtedly a smaller specific gravity. There is certainly nothing either incongruous or wonderful in all this, and nothing that would require or justify the assumption of a repellent force. None of Mr. Mallet's experiments prove anything against the temporary expansion of certain metals in the moment of solidification, and all the observations I made on this point in founderies verify it."

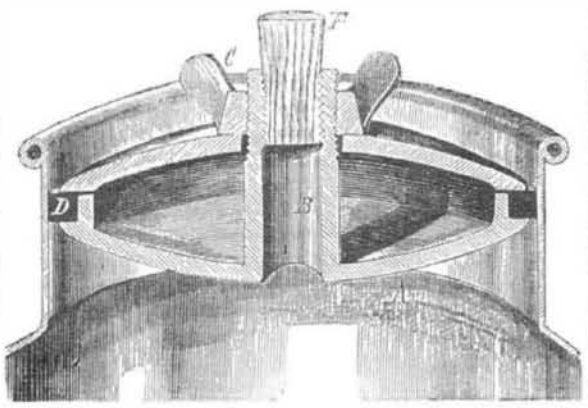
The Study of Chemistry.

We often hear it said, by way of excuse, that the study of chemistry is so dry, and the time required so great that the student must begin young or not at all. Now this is simply nonsense; there is no branch of Science so interesting, and none more easily acquired. Three or four hours a week for a few months would so open the eyes and interest the understanding of any ordinary mortal that, without laying any claim to the prophetic mantle, we may safely assert that he who will make the trial shall have provided for life a source of pleasure for himself, and a power to interest and instruct his fellow men.—*Western Photographic News.*

A NOVEL MILK CAN.

Mr. Marquis D. L. Gaines, of Boonton, N. J., has recently invented an ingenious packing for the caps of milk cans, and also a novel arrangement of plug for binding the milk in the receptacle to prevent its churning during transportation.

After the can is filled, the cap, A, made in two parts, as shown with the same slightly screwed together, is inserted in the neck of the vessel until the milk fills the plug hole, B. The thumbscrew, C, is then turned down, causing the upper plate of the cap to press upon a rubber ring, D (which fits in a rabbet of the lower plate), squeezing the same outward against the inner surface of the can, making a rigid airtight joint. The plug, E, is subsequently screwed down into the milk, forcing it into every interstice of the can, and so preventing its shaking about during carriage. Patented February 24, 1874.



Two thousand millions of dollars ($2 000,000,000), in round numbers, was the total existing debt of the United States on November 1, 1874, according to the report of the Secretary of the Treasury. The debt is being steadily reduced.

Air Pressure in Wind Instruments.

Dr. W. H. Stone, in a paper before the Physical Society of London, describes some experiments on the wind pressure in the human lungs during performance on wind instruments. About six feet of water or 13 lbs. pressure per square inch was the ordinary maximum when a small tube was inserted between the lips. When the lips were supported by a capped mouthpiece, as in brass instruments, a much greater pressure could be sustained, and lip muscles invariably gave way long before the expiratory power of the thoracic muscles was exhausted. The following pressures were sufficient to produce an average orchestral tone: The oboe requires an air pressure of from 5 to 10 ounces per square inch, the clarinet 8 to 14 ounces, bassoon 7 to 14 ounces, horn 2½ to 5 ounces cornet 5 to 18 ounces, trumpet 7 to 18 ounces euphonium 1½ to 23 ounces, bombardone 1½ to 20 ounces.

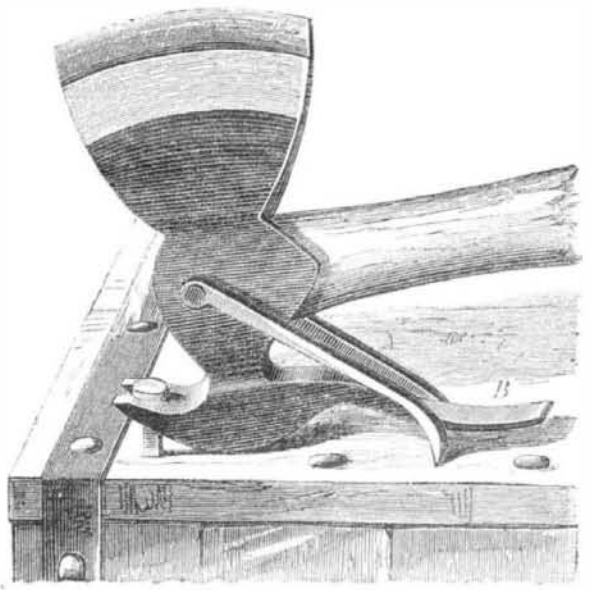
It will be noticed that the clarinet in this, as in some other respects, differs from its kindred instruments, and also that most of the pressures are small, not exceeding or indeed attaining the pressure of a fit of sneezing or of coughing. They are, therefore, very unlikely to injure the lungs, or to produce the emphysema erroneously attributed to them.

Vanilline.

At a recent meeting of the Paris Academy of Sciences, Dr. W. A. Hofmann announced that his two students, MM. Tiemann and Haarmann, who had obtained vanilline (the aromatic principle of the vanilla bean) from pine sap, propose to manufacture this substance on a large scale. The sap of a tree of medium hight gives vanilline to the value of $20, and the wood is not injured by the extraction of the sap. This will be the second vegetable product manufactured by purely chemical methods.

IMPROVED HATCHET.

We illustrate a new hatchet which is provided with a claw attachment, by the aid of which nails can be withdrawn from the wood in a perfectly straight condition. To perform this operation, the claw of the tool is placed near the head of the nail, while the handle is held perpendicularly.



On pressing down on the latter, two dogs, A, pivoted, as shown, to the hatchet, enter the wood surface and thereby force the claw under the head of the nail. By further pressure the handle becomes a lever with the fulcrum formed by the projecting piece, B, so that the claw is carried straight upward, thus pulling the nail in that direction.

Patented May 12, 1874. Mr. James A. Wisner, of East Saginaw, Mich., is the inventor.

Watered Butter.

In the course of some investigations by Professors Angell and Hehner, England, out of analyses of fifteen samples of butter which were determined by them, twelve of the samples, which were undoubtedly good butter, contained 6 to 13 per cent of water; the astonishing quantity of 42 3 per cent was found in one sample from London, or an excess of about thirty-two per cent of water, for which Londoners pay from 32 to 48 cents per pound. Another butter from the same place had 24 per cent, these high ratios being due to the fact that the butter had been treated with milk. On the other hand, a sample purchased in Ventnor was found to contain under 4 per cent of water, and according to the authors it contained 50 per cent of foreign fat. The authors also found that genuine butter spread out on sheets of paper and exposed for a week to the air in the laboratory became, so far as the senses could judge, indistinguishable from tallow. With regard to the microscopic examination of butter, Messrs. Angell and Hehner think that Dr. Campbell Brown said too much when he declared that with polarized light it was the most reliable means of distinguishing pure butter from that containing other fats.

IF the heat which a human being gives off in twenty-four hours could, consistently with life, be retained within the body, its temperature would, at the end of that time, have reached 185° Fah., a temperature above the point of coagulation of albumen, and high enough to cook the tissues.