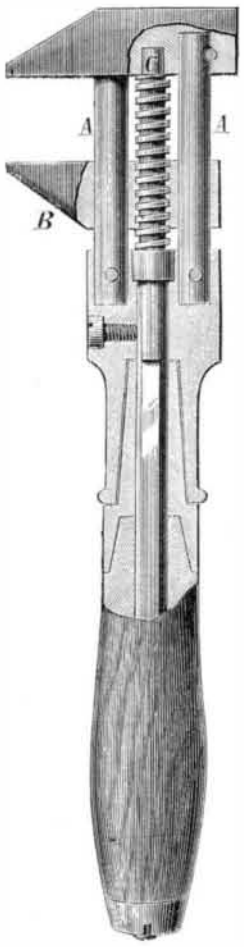
PORT'S IMPROVED WRENCH.

We illustrate herewith a new and simple form of wrench, easily and swiftly adjustable, and so constructed as to insure strength and at the same time lightness. It is made of steel; but it is claimed that, owing to its construction and the small amount of metal therein employed, it is no more costly than an iron wrench of common form. It can be produced, we are informed, by special machinery, so that the corresponding parts of any number of wrenches of the same size may be interchangeable.



The standing jaw is secured upon two cylindrical columns, A, which are rigidly held, and which also serve as guide bars for the moving jaw, B. The latter is caused to traverse by the screw, C; said screw passes through a female thread in the jaw, and is rotated by turning the handle in which its straight shank is embedded, and fastened by the nut shown at the lower extremity. The arrangement of the two columns or guide bars is one well calculated to give the tool strength and stiffness, since, when strain is applied, neither bar can bend without the other also bending; and this is a condition which the construction renders practically impossible. The screw acts as an additional bar, re-inforcing the others.

The device as a whole, as the engraving plainly shows, is ingeniously simple, and it appears to be abundantly able to withstand severe strain.

Patented November 30, 1875, by Mr. Henry Port, of Staten Island, N. Y. For further information relative to sale of rights or of wrenches, address Mr. John A. Amrein, Sinking Spring, Pa.

IMPROVED LATHING MACHINE.

Mr. Charles B. Trimble, of New York city, has recently patented the apparatus illustrated herewith, the object of which is to facilitate the operation of lathing buildings for plastering. It consists of a case for holding the lath in position, and of a machine for clamping and taking up the lath and placing them on the wall or ceiling.

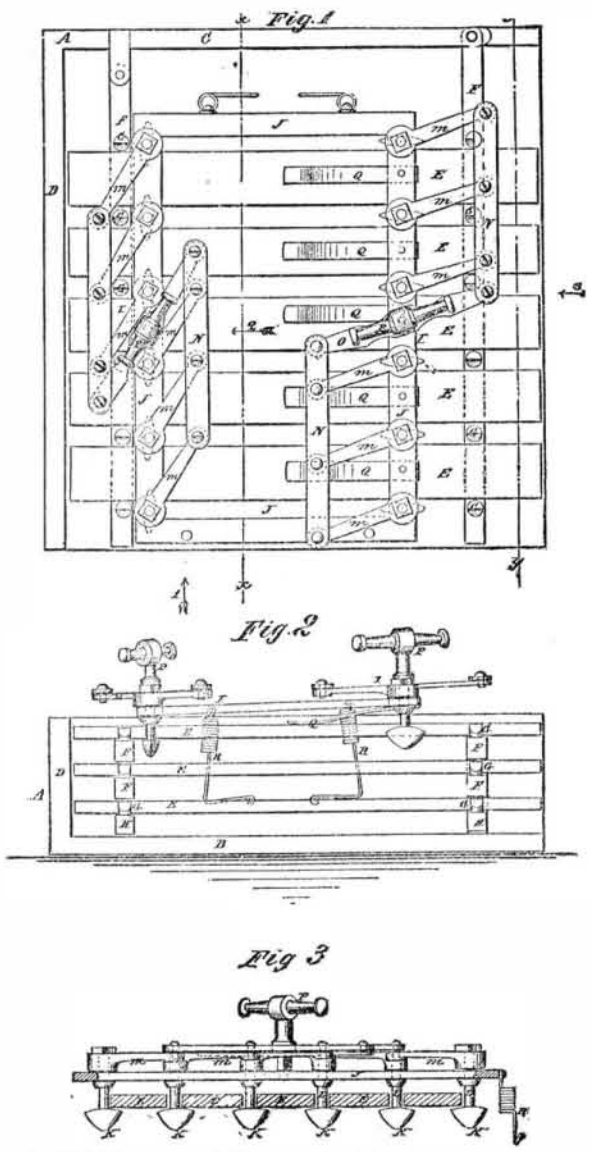


Fig. 1 is a top view of the clamp laid upon the first tier of lath in the case, the left hand clamp being turned to clamp one end of the lath, the other clamp being ready to be turned. Fig. 2 is an edge view of the case and clamp, looking in the direction indicated by arrow 1. Fig. 3 is a vertical section of Fig. 1, looking as indicated by arrow 2, from the line, *x x*. A is the case, composed of bottom, B, and two sides, C D, of square or rectangular form, and of sufficient hight to contain one or more tiers of lath, arranged as shown in the engraving. E is the lath, which is about 4 feet in length, about 1½ inches wide, and ⅜ inch in thickness. These pieces are arranged in the case in the position they are to occupy when nailed on the wall or ceiling. The tiers of lath rest on hinged bars, F, and are separated by the wedge shaped pins, G. On the bottom of the case are two stationary bars, H H, over which the other bars rest, as seen in Fig. 2. The lath, being thus placed in the case, are taken up by the clamps, and laid upon the joist or studs, in the same position they occupied when in the case. There are two sets of gripes, I I, which are arranged to support each of the ends of the lath. These clamps are attached to an oblong frame, J, and consist of a series of buttons, K, Fig. 3, having shanks, L, which pass up through the frame, and receive each an arm, *m*. These arms are connected together by means of the flat bars, N. The bars are attached to the central bars, O, to the middle of which are attached the handles, P, by means of which the central bars, O, and the arms are turned. These bars, O, and the handles, P, are placed in the middle of the opposite sides of the frame, J, so that the frame, J (with clamps), will balance when lifted. One half of the arms, *m*, of each clamp extends outside and half inside of the frame, J, so that when the handles are turned the arms are thrown in opposite directions, but so as to turn all the buttons, *k*, in one direction, to either take up or release the laths. As seen in Fig. 3, a tier of lath is supported by the buttons. When the buttons are turned so that their sides are parallel with the lath, the latter are released. Q are springs attached to one or both sides of the frame, J, the ends of which bear upon the separate pieces of lath to hold them in place. R R are spring hooks to be used in lathing overhead, which engage with the firrings on the ceiling for supporting the frame, while the other end is held up by the bottom engaging with the lath already on. "By means of this apparatus," says the inventor, "labor and time are saved, as the lath can be laid very expeditiously, and the spaces between them are made of uniform width."

IMPROVED SUBMERGED CURRENT WHEEL.

The water motor illustrated in the annexed engraving is intended to be entirely submerged, to be operated by the action of the current or tide.

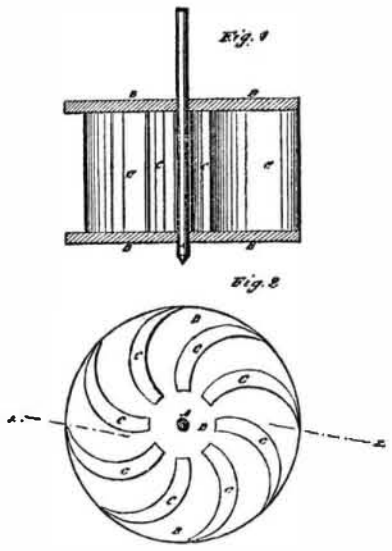


Fig. 1 shows a cross section of the wheel, taken through the line, *x x*, in Fig. 2. Fig. 2 is a top view, with the cover removed. A represents the shaft to which the wheel is attached, the lower end of which is designed to revolve in a step in a simple frame secured in the bed of the stream. The upper end of the shaft is designed to extend above high water mark, and with it is connected the gearing to give motion to the machinery to be driven. To the shaft, A, at suitable distance apart, are secured two disks, B, between which the buckets, C, are placed, and to which the upper and lower edges of said buckets are attached. The buckets are vertical, are thicker at their inner ends, taper to an edge at their outer ends, and are curved, as shown in Fig. 2. The inner ends of the buckets, C, do not extend quite to the center of the shaft, so as to leave a clear space around the shaft, A. With this construction, the water will enter at one side of the wheel, and escape at the other side, giving it an impulse both times, and will rotate the said wheel in the same direction, in whatever direction it may be flowing.

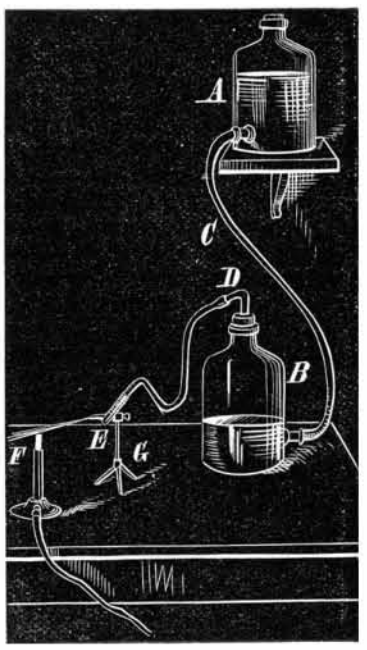
Patented November 23, 1875. For further particulars, as to sale of patent, etc., address Mr. John J. Hill, Hayden's Ferry, Arizona Territory.

The Scientific American in the Pulpit.

An esteemed correspondent, writing from St. Louis, Mo., states that, in one of the Catholic churches there, during an interesting discourse upon the best methods of avoiding evil influences and promoting practical goodness, the speaker took occasion to caution his hearers against the reading of trashy papers. "If," said the preacher, "you want a first class paper, get the SCIENTIFIC AMERICAN. The proprietors of such journals are public benefactors." To which, we have no doubt, a quarter of a million of our readers will heartily say: Amen.

A SIMPLE FORM OF BLOWPIPE.

The simple method of obtaining a continuous self-acting blast for blowpipe work, shown in our illustration, was devised by J. Landauer, of Braunschweig, Germany, and described in a late number of the *Berichte der Deutschen Gesellschaft zu Berlin*. It consists of two spacious bottles, A and B, connected by an india rubber tube, C. One, A, is filled with water and placed on a shelf above the working table; the other, B, is closed by a perforated rubber stopper, from which a tube, D, leads to the blowpipe, E, supported on a standard, G. As the water flows from A to B, the air in B is compressed, and a jet of air is driven across the flame of a Bunsen burner, F.



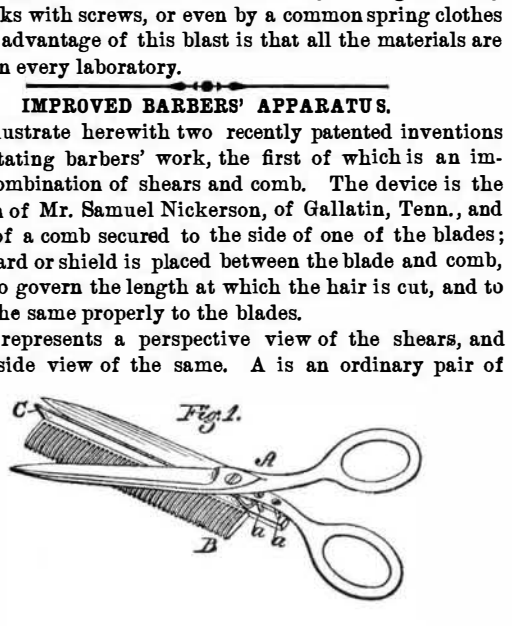
With bottles that hold 7½ pints each, a constant current of air of 0·016 inch diameter is produced, which lasts for 10 minutes. At the end of this time it is only necessary to reverse the bottles in order to put the blast again in operation. With a convenient fall of 35 inches, a reducing flame may be obtained 3·15 to 3·50 inches long, and an oxidizing flame 2·7 to 3 15 inches long.

If bottles with holes at the bottom are not at hand, ordinary bottles can be employed, connected by tubes running to the bottom, like siphons. In this case the air must be sucked out of the tube, C, before beginning to work. The flow of water, as well as the current of air, may be regulated by pinch cocks with screws, or even by a common spring clothes pin. The advantage of this blast is that all the materials are at hand in every laboratory.

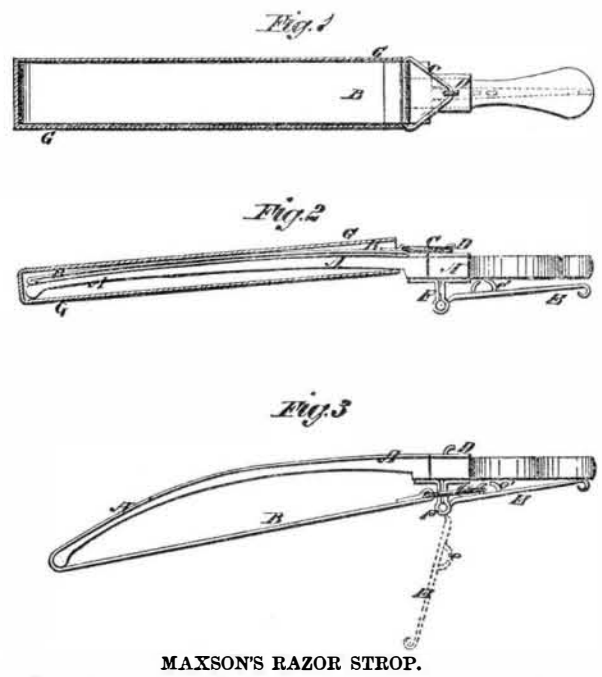
IMPROVED BARBERS' APPARATUS.

We illustrate herewith two recently patented inventions for facilitating barbers' work, the first of which is an improved combination of shears and comb. The device is the invention of Mr. Samuel Nickerson, of Gallatin, Tenn., and consists of a comb secured to the side of one of the blades; and a guard or shield is placed between the blade and comb, serving to govern the length at which the hair is cut, and to present the same properly to the blades.

Fig. 1 represents a perspective view of the shears, and Fig. 2 a side view of the same. A is an ordinary pair of shears, and B is a straight hair comb, arranged outside of and parallel with one of the shear blades, and secured thereto at the inner end by two screw studs, *a*; and C is a guard plate, extending from the back of the comb, over which it is clasped, inward to the edge of the shear blade, as represented in Fig. 2. The parts are arranged to hold the comb and the blade parallel with each other, while the screw studs are so arranged that by turning them, the distance between the



NICKERSON'S BARBERS' SHEARS.



MAXSON'S RAZOR STROP.

blade and comb may be increased or diminished at will. The guard plate, having its edge curled over in the manner shown, is simply slid endwise upon the comb, so that it may be readily removed when desired. In use, the hair is caught upon the comb, and the shears operated in the ordinary manner, the comb serving to present the hair in proper and even shape to the blades, and also, when rested upon the head, to govern the length at which the hair is cut, rendering the same uniform and smooth.

The second illustration shows an improved razor strop, the invention of Mr. John Maxson, of Scott, N. Y. Fig. 1 is a front view of the strop, closed, the case being again shown in section. Fig. 3 is an edge view of the same arranged as a convex hone. The object is to furnish a strop which may be used as a haul strop, a straight hone, a flexible convex hone, and a spring strop.

A represents the stock of the strop, which is faced with leather. To the forward end is attached the end of a loose strop, B, of the same length and breadth as the face of the hone, A, to the free end of which is attached a ring, O, to hook upon a hook, D, attached to the forward side of the handle, and also to hook upon the hooks, *e'*, formed upon the lever, E The lever, E, is pivoted to a stud or bracket, F, attached to the handle, so as to leave room for the hooks, *e'*, when the lever, E, is turned back against the handle, and to allow the lever to turn so that the tension of the strap, B, will lock it in place, the ring, C, being made large enough to pass over the rear end of the lever, E, and over the bracket, F, Fig. 3. When the strap is to be put into the case, ◐, the strap, B, is turned forward upon the face of the hone, A, and the ring, C, is hooked upon the hook, D, which prevents the face of the hone from being rubbed by the case, ◐. This is also the adjustment when the strap is to be used as a haul strop. By detaching the ring, C, from the hook, D, and throwing the strap, B, back, the instrument is a straight hone. By swinging the lever, E, forward, passing it through the ring, C, passing the said ring into the hooks, *e'*, and drawing the lever, E, back, the stock, A, is bent to form a flexible convex hone, to enter the hollow of the blade and keep the edge thin; and at the same time the strap, B, being brought under tension, becomes a spring strop for setting the edge.

Correspondence.

A Second Channel for the Erie Canal.

To the Editor of the Scientific American:

I have a suggestion to make for increasing the capacity of the Erie Canal; and although it involves a large outlay, I believe the State would be justified in adopting it, at least for a part of the distance, say from Buffalo to Rochester. I propose to separate the downward bound from the upward bound boats, thereby having a distinct and separate channel for each; to effect this, I would have the work commence at the west end, at Buffalo, and dig another canal, alongside of the present one, from Buffalo to Rochester, Let the new canal be of the same width as, and 3 feet deeper than, the present one, and make it so that it will have a descent of 7 inches to the mile; this will establish a current of water of about 3 miles per hour; and then a boat will go, where speed is not a matter of importance, at about 3 miles per hour without requiring any steam power, and without any swell or washing of the banks.

This theory of a double channel canal will apply to other canals, or parts of canals, where water is plentiful and the down grade sufficient; and the speed and size may be increased or diminished so as to conform to the topography of the country and the requirements of commerce, the engineers being guided by experience. I have suggested this size for the Erie Canal, because one channel is already constructed; and if the authorities will dig the other of the same width and 3 feet deeper, it will, I think, be of the proper proportion. It should, however, accommodate such a brig as those which sail the Lakes; and the brig could draw 8 feet of water in the down grade channel and 6 feet in the upward. Some changes, however, would be necessary in the upward channel; the bridges would have to be removed, and drawbridges erected in their stead. As the different channels would seldom be on a level with each other, it would be necessary to construct partition locks at all important towns along the way, so as to lock from one channel to the other.

I think this improvement might be constructed from Buffalo to Rochester for $35,000,000, and the State could accomplish it in 5 years. Then, by saving the tolls for 20 years, the State might construct a similar distance further east at a similar cost, always keeping the tolls at such figures that the canal would not become a burden in a financial way.

I claim for this theory that, in the eastward or downward direction, it would double the speed of the boats and quadruple the capacity of the present canal; and that it would be much more convenient for boatmen, for it would enable them to transport freight for one half the price which they now do, and pay the same tolls. I have based my estimates on a knowledge of the topography of the country gained by 20 year's experience; and would be pleased to have the opinions of some of the local engineers.

Sioux Rapids, Iowa. W. T. CROZIER.

A Cheap Refrigerator Wanted.

To the Editor of the Scientific American:

As ice water is a necessity, I suggest that some one of our manufacturers of paper pails should put into the market an ice cooler, made of paper with a jar of glazed pottery inside, with sawdust between the two vessels. Such a utensil would be within the reach of all as to price: and paper being a good non-conductor of heat, it would be far superior to the metal of which most coolers are now made. I made one last summer from a large paper box, in the manner above described. In the next office to mine, with similar temperature, there was a cooler made with an outside of tin, zinc-lined, and filled in with charcoal. Each morning a similar quantity of ice was put into each. The result was that, at about 4 P. M. every day, the ice in the metal and charcoal cooler had disappeared; and in the paper and sawdust one, there was ice left on the following morning.

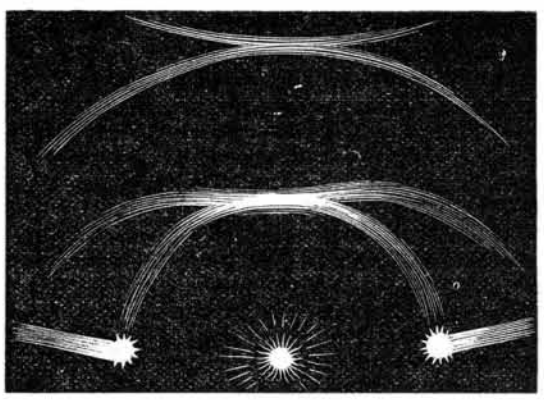
If any manufacturer of paper pails avails himself of this suggestion, I shall be paid for making it, and will have an opportunity of replacing the homemade one I now have with one more ornamental.

Cottonwood Springs, Neb. C. H. ROBERTS.

A Solar Phenomenon.

To the Editor of the Scientific American:

I inclose a diagram of a solar phenomenon which appeared on January 31, at 10:30 A. M. The day was warm and springlike. At night the air turned cold, and a light snow fell. The intersecting circles over the sun formed an Indian bow,



and showed the prismatic colors very brightly. The halos extending from the sun dogs were long and straight, their outer ends being higher above the horizon, as represented in the engraving. C. O. HOWARD.

Waukon, Iowa.

Bored or Driven Wells.

To the Editor of the Scientific American:

Some time since I noticed in your journal the question: "Are not bored wells a failure, on account of the small cistern they have for holding water?" The following are a few facts on the system as used in California.

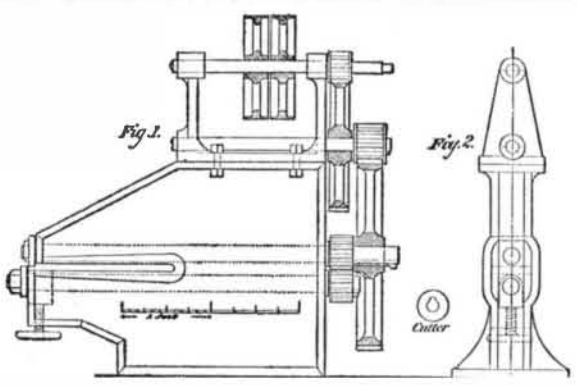
We have been in the business of well boring here for 18 years, and in that time have never seen a well properly bored, which failed to give an inexhaustible supply of water. We have on our place a well of 6 inches diameter and 35 feet depth, from which the largest hand fire engine in the city, running at its utmost speed, had a plentiful supply. At some shops in this city, there are two wells of 13 inches diameter and 75 feet depth, situated 6 feet apart, in which are two six inches by 4 feet pumps, working almost constantly at 24 strokes per minute. At a woolen mill there are two more, of similar diameter and 35 feet depth, in which are two pumps of the same size as the others. In the Sacramento Valley alone, are thousands of wells of from 3 to 10 feet deep, from which water is being drawn for irrigation and other purposes in almost incredtble quantities.

Sacramento, Cal. R. A. ROSE.

Boiler Plate Shearing Machine.

To the Editor of the Scientific American:

In your issue of December 18, 1875, you gave us an engraving of a plate-shearing machine with revolving cutters, made at Manchester, England. I now send you a sketch of one I had made last summer at these works; and it is now running daily, cutting straight or circular work, in iron up to one quarter of an inch thick, and giving good satisfaction. The main shafts are made of steel, and the lower one has a set screw below the box to raise or lower the cutter for



different thicknesses of iron. The two small gear wheels are made of wrought iron, and the other four of cast iron. We run the cutters at about seven turns per minute.

JAMES ORCHARD.

Schenectady Locomotive Works, N. Y.

Destructive Boiler Explosion.

To the Editor of the Scientific American:

On January 25, 1876, an upright boiler exploded at Barnet, Vt. It was in the cellar of a shoe peg factory, and the concussion shattered the building in a fearful manner, the boiler (8 feet long by 3½ feet diameter, with seventy-five 1¼ inch flues) going up through two stories and out through the end of the building into the road, 90 foot in all. The power of the explosion was so great as to throw a dryer in the second story out of its place and drive it, through a double boarded floor, up against the rafters, breaking in its course a cast iron shaft 5 inches diameter, and also breaking four sticks of timber 8x9 inches, and taking two floors clean out; and much other damage was done.

At the time of the explosion there were 16 persons in the building, 8 of them being women, within twenty feet of where the boiler went up; but, happily, no one was killed or hurt. The boiler was run, by a boy of no experience, in a blundering way. Steam was made only for heating and drying.

The explosion was caused, I think, in this way: Around the foot of the boiler there was a space of two inches between the outside plate and the firebox, which was two feet high. The boiler had not been blown off for two weeks or more, and the water that supplied it came from a very muddy brook, and must have filled the bottom full of fine dirt; and this dirt, caking on the fire sheets, caused the firebox to get red hot and bulge out, and then the water above, coming in contact with the red hot iron, caused the explosion.

If any one who has boilers or machinery desires the safety of himself, his work people, and his property, he should invest $3.20 in the SCIENTIFIC AMERICAN, and he would do away with much blundering and many disasters.

Barnet, Vt. ◐EO. H. KIDNEY.

[For the Scientific American.]

A NEW MEDICAMENT.

Boldo is the name given in Chili to a small aromatic tree indigenous to that country. It was first described by Molina, in 1782, under the name of *peumus boldus*. Jussien, in his "Natural System of Botany," places the boldo in the family of the *monimiaceæ*, under the name of *boldea fragrans*. M. Baillon, in the "Histoire des Plantes," now in publication in numbers in Paris, restores Molina's designation, *peumus boldus*. The sub-order to which the tree belongs consists of only eight genera, chiefly natives of South America.

The boldo, always green, grows alone and is not found in forests. Its leaves are in pairs, opposite and unfurnished with stipula. In drying, the leaves become of a reddish brown. The flowers are disposed in upright clusters (cymes), the stem of one cluster being the end of the branch, the others being axillary, or springing from the junction of the leaves. The flowers are of a yellowish tint on a white ground, and are in marked contrast with the brilliant green of the foliage. The bark of the tree, thin, and wrinkled longitudinally, gives out a very pronounced aromatic perfume. The flowers are dicecious, that is to say, unisexed, with the two sexes growing on different trees. The flower has a calyx proper or perianth; and in the male flower the receptacle has numerous stamens. The female flower has from three to five free carpels, each with one cavity, the ovary containing a single ovule or seed germ. The fruit is about the size of the berry of the hawthorn, with a very hard stone.

An interest above its botanical history and classification was given to the boldo in 1869. Specimens of the plant were sent to France, attention having been called to its curative properties, as not unfrequently happens, by accident. A flock of a sheep were tainted and dying with a disease of the liver. The hedge about the enclosure in which they were confined was one day prepared with fresh branches from the boldo. The sheep devoured the leaves with avidity. The repairs of the fence were kept up with the same material, and the flock of sheep recovered and became sound. On such vague reports, no serious data could be founded as to the value of the remedy, or the mode and circumstances under which it can be applied. Careful and systematic experiments were undertaken by MM. Dujardin, Beaumetz, and Claude Verne. Other practitioners in the hospitals of Paris have pursued like inquiries.

Messrs. Beaumetz and Verne submitted to chemical analysis the specimens of the plant sent to them. Treated in succession by ether, alcohol, and distilled water, the results were: An essential oil, a bitter principle named boldina, citric acid, lime, sugar, gum, tannin, and some thick and dark aromatic matter, due probably to the oxidation of the essence.

In South America, this plant is often used in infusions, the properties of which are (analogous to those of tea and coffee) tonic and diaphoretic, and promote digestion. It appears also to be a popular remedy in syphilis and diseases of the liver. All parts of the tree are utilized. The green leaves are used to flavor sauces; and dried and reduced to powder, the leaves serve the purpose of snuff. The wood, which burns slowly, makes a charcoal high in favor with the smiths, and the bark is used for tanning skins. The fruit is eaten, the stones of the berries are strung for necklaces and bracelets, and from the kernels a fixed oil is extracted.

Many pharmaceutical preparations have been experimentally tried by M. Verne. These are two extracts (one alcoholic, the other aqueous), an essential oil, a tincture (little differing from that prepared in Chili), a wine which possesses in a high degree the aromatic properties of the plant, and a sirup, which would seem to be, on account of its agreeable taste, easy of administration. The essential oil has so strong an odor and so sharp a taste that it is found necessary to inclose it in pills or capsules. Each contains eleven centigrammes (a little more than two grains) of the oil. Preparations in the form of a tincture or elixir make a pleasant change for the invalid in his habitual disgust for medicines. Experiments upon ◐uinea pigs and dogs have been made in the laboratory of M. Vulpian; and the results have been drowsiness and a lowering of the temperature, without serious effects upon the organism