

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 draw-bridges 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 meta-

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.

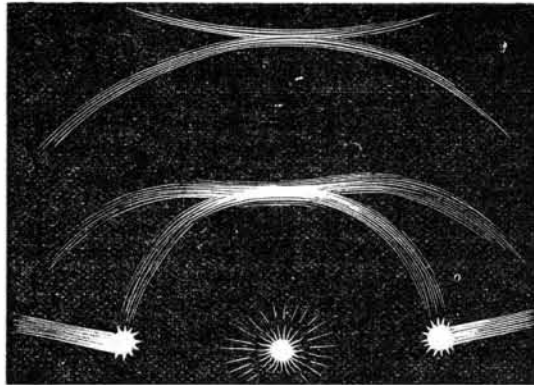
Cottonwood Springs, Neb.

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 spring-like. 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 incredible quantities.

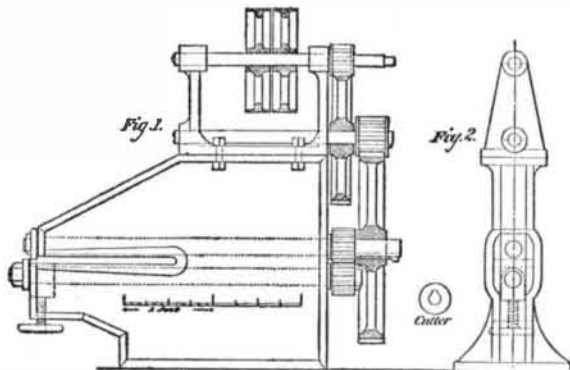
Sacramento, Cal.

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 feet 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 board 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 *monimiaceae*, 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 dioecious, that is to say, unisexual, 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 Guinea 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.