

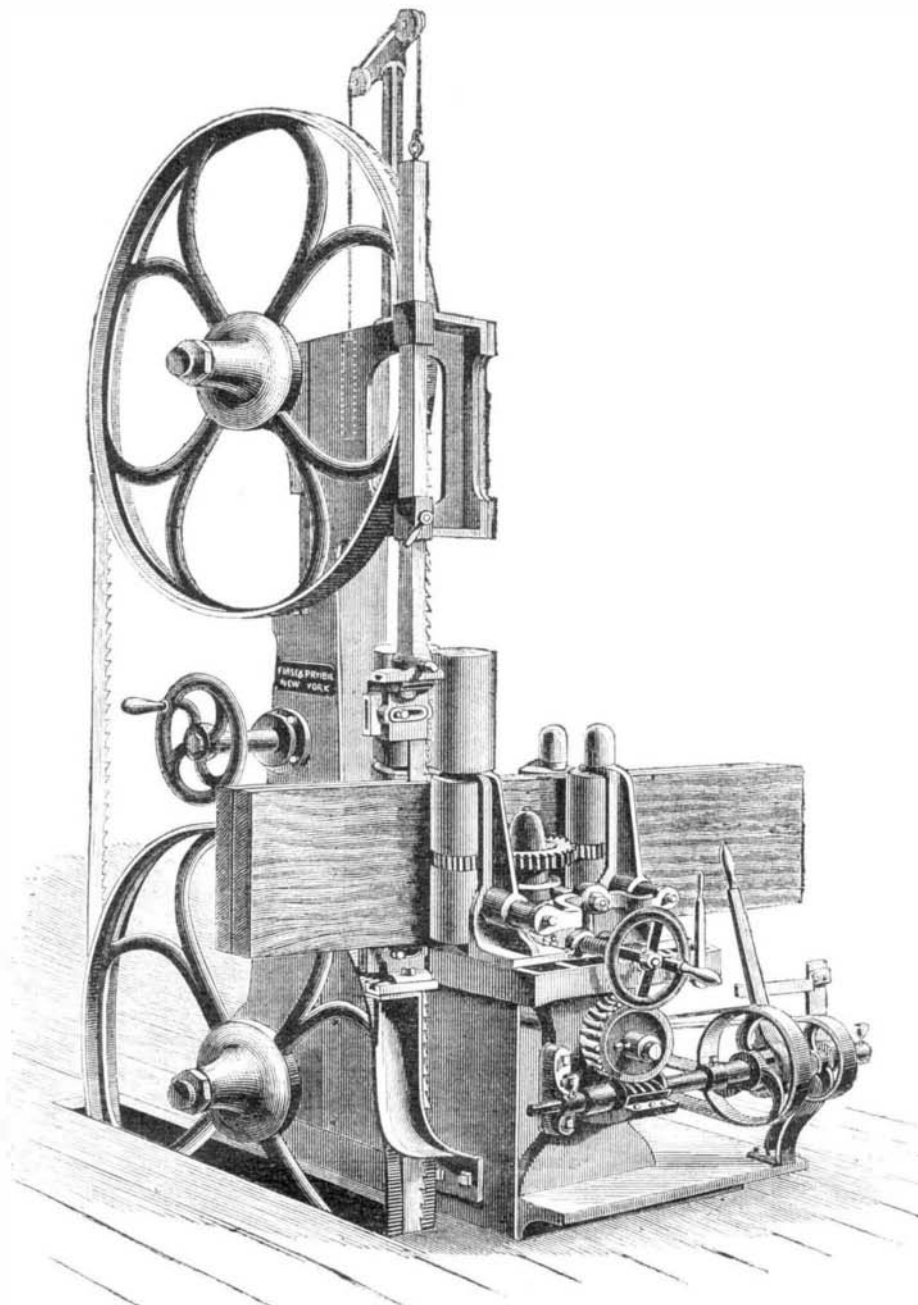
RE-SAWING BAND SAW

The annexed illustration represents a new and improved band saw, designed exclusively for re-sawing. After several years spent in experiments and trials, to construct a machine for the above purpose, Messrs. First & Prybil, of 461 to 467 West 40th street, New York city, a well known firm manufacturing band saws and other woodworking machinery, have succeeded in getting a machine giving full satisfaction, and they have at present several of them in operation.

The capacity of the machine, shown in the engraving, the manufacturers state, is from 12,000 to 16,000 feet of lumber per day. The height of the machine is 10 feet; the wheels are 5 feet in diameter; the weight is between 4,000 and 5,000 lbs. The saw kerf made is from $\frac{1}{8}$ to $\frac{3}{32}$ inch thick, and its sawing space is 30 inches, taking in timber 18 inches thick.

As lumber has become costly, it will be seen that it is of great advantage to use a thin blade; the saving of power is also considerable. On hard lumber, the saving amounts to more than the sawing costs. The general construction will be readily understood from the engraving.

Further particulars may be obtained by addressing the manufacturers as above. On page 141 will be found an advertisement of this machine, and a copy of the manufacturers' correspondence with the Managers of the American Institute.



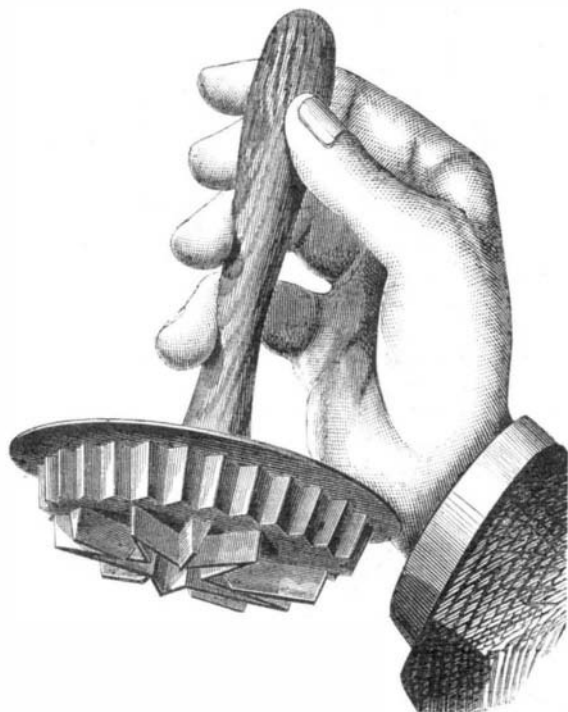
RE-SAWING BAND SAW.

On the Motive Power of Diatoms.

Professor Leidy, in some remarks on the moving power of diatoms, desmids, and other algae, stated that, while the cause of motion remains unknown, some of the uses are obvious. The power is considerable, and enables these minute organisms, when mingled with mud, readily to extricate themselves and rise to the surface, where they may receive the influence of light and air. In examining the surface mud of a shallow rain water pool, in a recent excavation in brick clay, he found little else but an abundance of minute diatoms. He was not sufficiently familiar with the diatoms to name the species, but it resembled *navicula radiosa*. The little diatoms were very active, gliding hither and thither, and knocking the quartz and grains about. Noticing the latter, he made some comparative measurements, and found that the naviculæ would move grains of sand as much as twenty-five times their own superficial area, and probably fifty times their own bulk and weight, or perhaps more.

A NEW PIE MARKER.

The form of this device is plainly shown in the annexed engraving. The stamping portion may be made of any desired shape and of any suitable material. Its object is to give an ornamental appearance to pies, cake, or butter, and it will be found a handy little device for the purposes.



It was patented December 23, 1873, through the Scientific American Patent Agency, to Mr. Thomas S. Macomber, of Hamilton, N. Y., who may be addressed for further particulars.

Look well to the little things, and the larger ones will take care of themselves

Electrical Resistance of Various Metals.

M. Benoit has measured with great precision the electrical resistance of various metals at temperatures from 0° to 860°. He employed both the method of the differential galvanometer and of the Wheatstone's bridge, and for each metal has measured several specimens. The mean of these is given in the following table, the second column giving the resistance of a wire, 39.37 inches long and having a cross sec-

tion of 0.03 inches, in ohms, and column three the same quantity in Siemens units. Column four gives the resistance compared with silver:

Metal.	Ohms.	Siemens.	
Silver, A.	0154	0161	100
Copper, A.	0171	0179	90
Silver, A. (1) ..	0193	0201	80
Gold, A.	0217	0227	71
Aluminum, A. ..	0309	0324	49.7
Magnesium, H. .	0423	0443	36.4
Zinc, A., at 350°	0565	0591	27.5
Zinc, H.	0594	0621	25.9
Cadmium, H.	0685	0716	22.5
Brass, A. (2) ..	0691	0723	22.3
Steel, A.	1099	1149	14
Tin.	1161	1214	13.3
Aluminum bronze, A. (3) ..	1189	1243	13
Iron, A.	1216	1272	12.7
Palladium, A.	1384	1447	11.1
Platinum, A.	1575	1647	9.77
Thallium.	1831	1914	8.41
Lead.	1985	2075	7.760
German silver, A. (4) ..	2654	2775	5.80
Mercury.	9564	10000	1.61

A, annealed; H, hardened; (1) silver 75; (2) copper 64.2, zinc 33.1, lead 0.4, tin 0.4; (3) copper 90, aluminum 10; (4) copper 50, nickel 25, zinc 25.

These results, which are all taken at 0°, agree closely with those obtained by other observers. M. Benoit has extended his observations to a range of temperature much greater than those previously employed for this purpose. He wound the wire around a clay pipe inclosed in a muffle, and immersed the whole in a bath of water, mercury, sulphur, or cadmium, which was kept at the boiling point by a Perret. Constant temperatures of 100°, 360°, 440°, and 860° were obtained. Various temperatures below 360° were also obtained by a mercury bath. The measures were also corrected for expansion. Plates annexed to his memoir, presented to the Faculty of Sciences of Paris, show the results graphically. They show that the resistance increases regularly for all metals like tin, lead, and zinc up to their points of fusion. This increase, however, differs for different metals. We notice that tin, thallium, cadmium, zinc, lead, are found together in the upper part of the plate; at 200° to 230°, their resistance has doubled. Below them are iron and steel; for

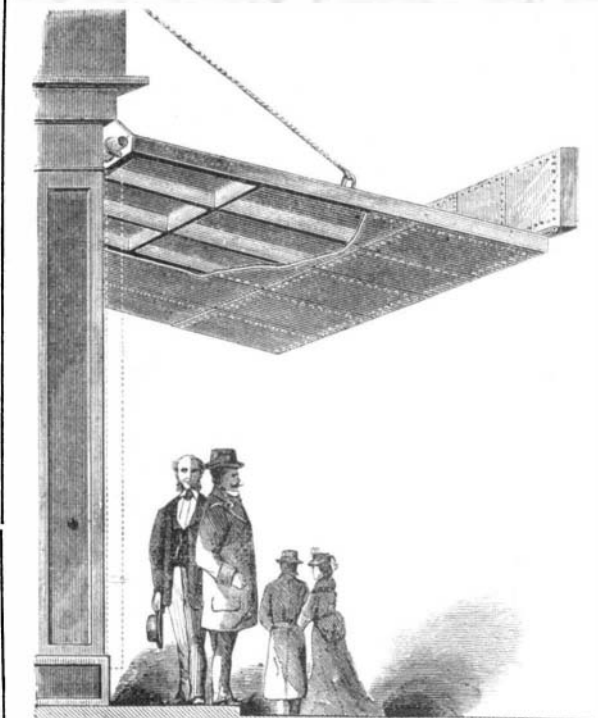
A Curious Artificial Fish.

A Spaniard named Fernandez, says a contemporary, has constructed at San Francisco a submarine propeller, eleven feet long, four feet deep, and four feet wide, and resembling a monitor in its general shape. A forward hatchway opens into a cistern which will hold forty gallons of water, introduced and expelled by means of a force pump inside the boat and under control of the operator. The water passes in both instances through a hole perforated amidships under the keel. When the operator desires to sink his vessel he fills the cistern with water, and when he wishes ascend he empties it. By means of complex machinery, he is enabled to steer his vessel in any direction, and with remarkable rapidity. The hexagonal manhead or trunk, which looks like the turret on a monitor, is three feet long and from one to two feet wide. It is closed over with a hatch cover, held down inside by two iron claws, which are secured by iron rods. A slight pressure on these rods in a given direction instantly loosens the claws and the hatch cover springs open. In this way the inventor purposes escaping from his boat, should anything go wrong with the machinery. The manhead has five small apertures for light, four of the six sides and the top having windows of French plate glass. On either end of the manhead, extending upward several feet, are two wrought iron rods, intended to facilitate the escape of the operator in danger, who uses them to force himself from his place. To the aft rod is connected a contrivance which makes the upper section airtight, and the operator, can, by it, expel the foul air.

IMPROVED AWNING.

The device herewith illustrated serves, when raised in suitable position, as an awning for the exterior of a store; and when lowered, may be used as a single large shutter. The construction and arrangement, as will be seen from the following description, are necessarily suited to both purposes.

To a large inner section, which is hinged directly to the building, a smaller outer section is similarly attached. Both sections are composed of a framework, the pieces of which are set at right angles, so as to form square or rectangular air chambers. The frame is covered with sheet iron, tin, or similar suitable material. When both sections are let down, as indicated by the dotted lines, the device forms a shutter which closes the entire front of the store. When raised at



an inclination to serve as an awning, the outer section is allowed to swing from its hinges for the purposes of a sign.

The invention is simple and convenient, and, doubtless, will be found an economical substitute for the appliances which it is designed to replace. Patented December 1, 1874, to Martin Stonehocker, of Streator, La Salle county, Ill., to whom letters for further information may be addressed.