

**IMPROVED SCROLL SAWING MACHINE.**

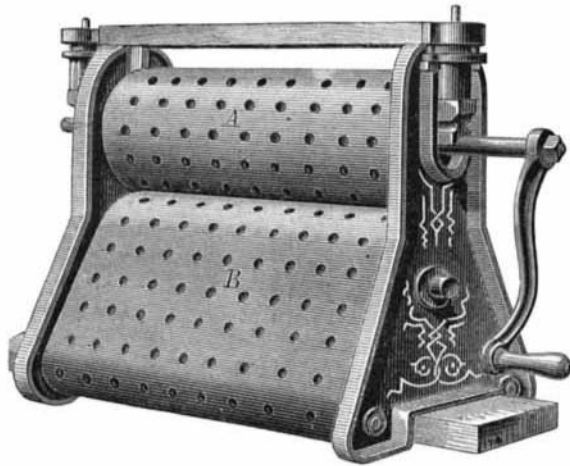
The annexed engraving represents an accurate and durable scroll sawing machine, highly finished in all its parts. The table is black walnut, 2½ feet long, 1½ feet wide, and 1 inch thick. It is ornamented with a heavy moulding, and a case is provided holding two drawers with locks and key.

The machine will saw material up to two inches thick; it saws under the arm seventeen inches. The legs, treadles, and arm are cast iron, and the spindles and shaft are of steel. The spindles are bored so that long saws can be used without bushing them off. The machine operates with a fast, steady, even stroke, and straight up and down. The saw blades are strained equally at all parts of the stroke. The machine occupies no more room than a sewing machine, and is very light running. It is well adapted for the uses of carpenters, joiners, cabinet and pattern makers, and amateurs.

For further particulars address W. E. Lewis, Cleveland, Ohio.

**THE DENNEY WASHING MACHINE.**

The accompanying engraving illustrates a washing machine which is claimed to be well suited for use upon the finest articles of wearing apparel, or other domestic goods. The two washing rollers are about four inches in diameter, and are corrugated; the rounded ridges formed upon the top roll fit into corresponding grooves in the under roll; a sleeve, A, of pure vulcanized India rubber fits tight upon the top roller. To prevent its getting loose by stretching under the severe pressure, there is applied to the top roll a narrow strip of cloth which is inserted in the rubber near to each end of the sleeve; lines of perforations extend lengthwise of the sleeve, directly over the groove formed between the rounded surfaces. An endless band, B, rests upon the upper surface of the under roll, and passes down at quite an angle around small carrying rollers at the lower corners of the frame, and crosses underneath the machine; this band is made, like the roll cover, with narrow strips of cloth near the edges, and is perforated also. The roll cover and band are made of pure rubber. The pressure is applied to the top roller by a rubber spring, which is encased in a chamber, and acts upon a suitable bearing protruding from the same which rests upon the roller shaft. The amount of pressure applied to these machines ranges from 60 to 75 lbs; and yet



from the peculiar adaptability of the rubber, it is stated that the machine operates easily, runs smoothly, and makes little or no noise in running.

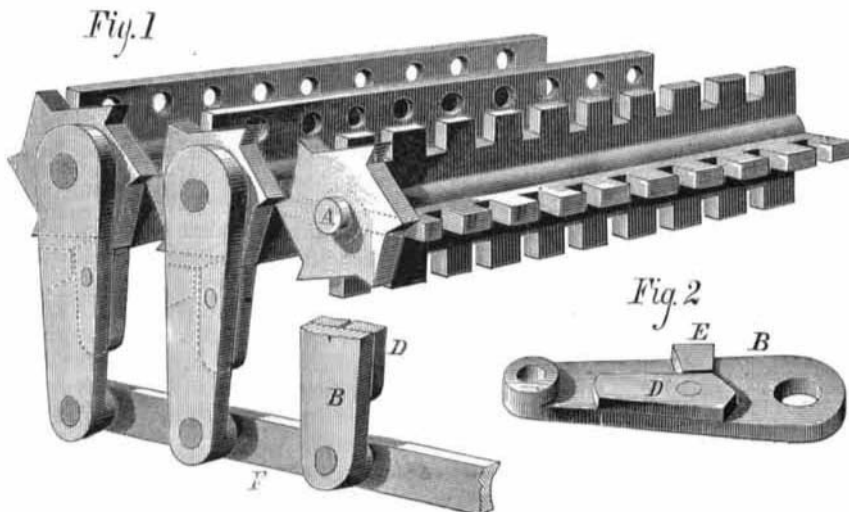
The clothing passes between the two elastic surfaces, and the action of the rolls is such that the water and air which enters the channels in the under roller is forced in jets through the body of the goods. The articles can be passed entirely through, past the rolls, and are carried back by the band, thus washing each piece out to the end without continually dropping down into the tub.

For further information address the manufacturer, Mr. S. L. Denney, Gap, Lancaster county, Pa.

**IMPROVED OSCILLATING GRATE BAR.**

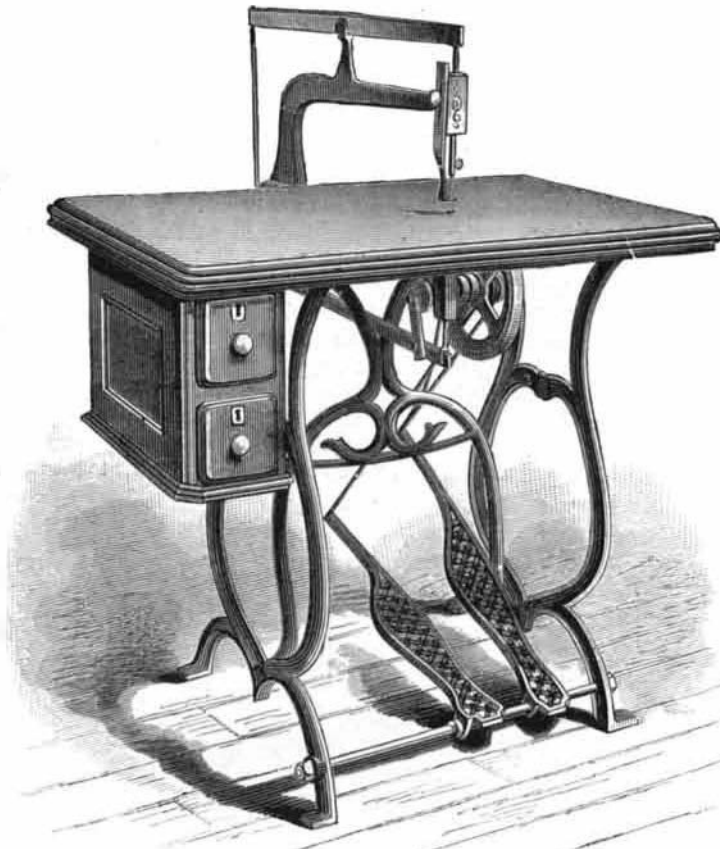
The new grate bar illustrated herewith is claimed to be adapted for burning any kind of fuel with but little loss, to be durable, easily managed, and easily cleaned. Each bar consists of an axis, A, Fig. 1, from which wings or lugs radiate. In the wings are slots or holes, as shown in the illustration, which are so arranged that the apertures do not come opposite each other, so that the fuel that falls from the wings of one bar is caught by the wings of the adjoining bar, without stopping up the passages.

The shafts of the bars project, and upon said shafts the bars work freely. The levers, B, Fig. 2, fit over the ends of the shafts; and



**DENNY & RUTH'S IMPROVED GRATE BAR.**

attached to the bars, and just inside the levers, are ratchet wheels, C, having six teeth. A pawl, D, on each lever, engages with these teeth and gives the bar an intermittent rotary motion when the lever is oscillated back and forth. The lug, E, on the lever acts as a support to the pawl and re-



**LEWIS' IMPROVED SCROLL SAWING MACHINE.**

ceives the thrust. The connecting bar, F, unites all the levers and extends back to the boiler room where it is attached to an upright hand lever.

These bars are placed in furnaces in various ways. When the furnace is constructed with a view to their use, a long, narrow opening may be left in front underneath the furnace doors, and at the back end of the furnace a support is placed, provided with holes a proper distance apart to receive one end of each bar. After the bars have been placed in position, a similar support can be slipped on over the front ends of the bars, thus securing them firmly in their places, and closing up the opening. The bars thus placed cannot be moved out of position, and can be readily inspected. In the case of a locomotive or portable engine furnace, the supports may rest on projections on the inside of the firebox, or be bolted on the lower edge of the same. When used on locomotives a lever extending up into the cab enables the fireman to operate the bars to clear the fire of refuse or to dump the entire contents of the furnace. This bar is also specially adapted to use in stoves, as it enables fuel to be used which would drop through ordinary grates.

The rotary motion of the bars is claimed to break up and discharge all clinkers and dross by crushing them between the lugs or wings. By continuing the rotary motion the grate becomes, in effect, a dumping grate, and the whole contents of the furnace can be discharged.

The bars being set so that the wings or lugs overlap to a greater or less extent, as may be desired, they form a continuous fuel table, so that finely divided coal, sawdust, tan-bark, etc., can be burnt, as it is almost impossible for it to pass through without being caught by the lugs or wings on the adjoining bars.

For further information, address Messrs. Denny & Ruth, patentees, Circleville, O.

A good bell metal consists of copper 100, tin 20 parts.

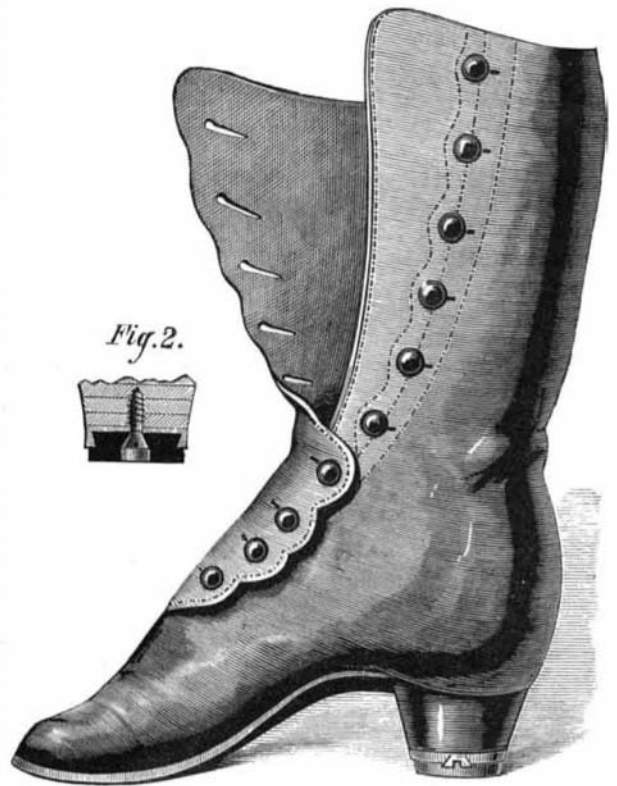
**Origin of the Carbon in Plants.**

It has long been known that the green parts of plants are able in sunlight to decompose carbonic acid and absorb the carbon. To decide the question whether plants can take up carbon in any other way than through their leaves, J. W. Moll undertook a series of experiment, which led to the following results: Leaves and parts of leaves kept continually in a place free from carbonic acid never form any perceptible quantity of starch, even if in immediate contact, by over or underground parts of the plant, with an atmosphere much richer in carbonic acid than the air. Hence the excess of carbonic acid that is at the disposal of any portion you choose of a plant, never causes the production of a perceptible quantity of starch in a leaf or part of leaf united to it, if the leaf is kept in a space free from carbonic acid. The formation of starch in a leaf in open air is not perceptibly hastened when any other part of the same plant is in a place containing more carbonic acid than the atmospheric air. The carbonic acid at the disposal of the roots of a plant, in the soil, neither causes the formation of starch in a leaf excluded from carbonic acid nor perceptibly hastens it in those in the open air.

**REVOLVING BOOT AND SHOE HEEL PROTECTOR.**

The annexed illustration represents an ingenious device which serves the double purpose of protecting the heel of the boot or shoe, so that it cannot be worn away unequally, and also of preventing the wearers slipping upon ice. It also, by affording an elastic cushion to the foot, renders walking easier and less fatiguing.

It consists of a circular metal or rubber plate having a dovetail flange. Inside the latter a rubber disk is inserted, and through the center of the disk is an aperture with a metal conical lining. Through this opening the fastening screw which enters the heel of the boot passes. The screw is forced in just tight enough to enable the plate to be revolved by hand, so that when the wearer walks it will be caused to rotate of itself, and in this way the wear on the India rubber pad will be equalized. When the head of the screw is forced into the conical aperture, the effect is to expand the rubber pad under the flange, thus causing



the former to be tightly secured in place. When the rubber is worn out another disk may be inserted at small expense, and without renewing either plate or screw.

Among the advantages specially claimed for the device not mentioned above are that it tends to support the ankle and to keep the foot erect; it will not mark or soil floors, oil-cloths, or carpets; it gives a neat finish to the shoe, and is furnished at less expense than that ordinarily involved in re-heeling the shoe. Twelve sizes of the protector are manufactured, and it is sold with the necessary implements for applying it. Patented through the Scientific American Patent Agency. For further particulars, see our advertising columns and address the Massey Revolving Shoe Heel Co., 824 Broadway, New York.

The new pipe line between Great Belt and Pittsburg was lately finished. It is thirty-six miles long, and will supply twenty-eight refineries in Pittsburg, all owned by the Standard Oil Company.

The "hygroscopic flowers," as indicators of damp or dry weather, do not appear to be very modern. They were used as early as 1792.