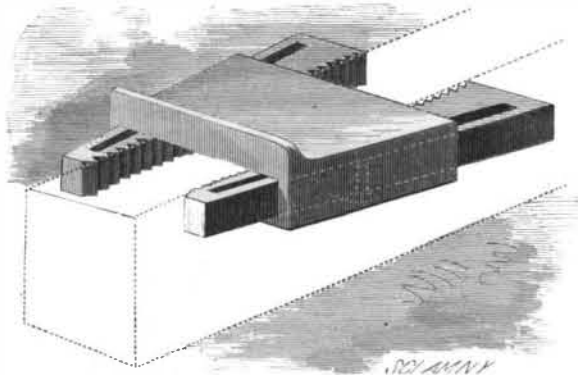


MECHANICS' KEYING CLAMP.

This keying clamp is designed more particularly for carpenters' use, for furnishing an abutment on joist, studding, or other timber, and its principal use is in connection with wedges for forcing together flooring or ceiling. The frame is formed with diagonal side flanges, and is constructed to receive and hold jaws against the flanges, so that when the jaws are moved longitudinally they will approach and recede from the center of the tool, according to the direction in which they are moved. The jaws are wedge shaped and serrated on their inner edges, and each is formed with a slot. They are held in the frame by the inwardly projecting flanges and screws that pass through openings

**ABERNETHY'S MECHANICS' KEYING CLAMP.**

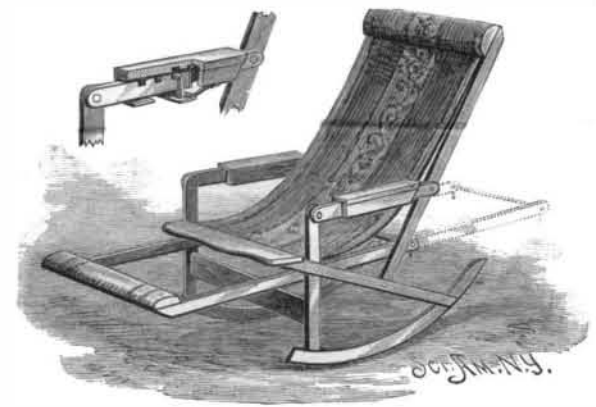
in the flanges and enter the slots. At the narrow end of the frame is a projecting lip, to furnish a broad surface to wedge a fulcrum against, according to the use to which the tool is put.

When used on joists, it is placed astride the timber, and the keys are moved forward until their serrated edges come in contact with the timber, when they will hold the tool in place, so that any pressure on the narrow end of the frame will cause it to slide down the jaws, thereby making them grasp the timber firmly, so that the tool will sustain any pressure brought to bear upon it without displacement.

This invention has been patented by Mr. Robert S. Abernethy, of Rutherford College, Burke Co., N. C., who will furnish any further particulars.

RECLINING ROCKING CHAIR.

The inclination of the seat of this reclining rocking chair can be readily changed without the inconvenience of leaving the chair. The rockers, front standards, and the diagonal braces, carrying at their forward ends the seat board, are united by screws or bolts. The head board is carried by two strips pivotally connected with the brace bar by bolts. The arms consist of box-like structures, formed of side pieces united by a top strip. A short strip secured in the rear part of the groove between the sides projects so as to be pivotally connected with the back bars. The forward ends of the arms are supported by bars pivoted to the standards and sliding in the arms. These bars are guided by plates secured to the under side of the forward part of the arms; and by means of a catch entering notches in the upper sides of the bars, the latter can be moved outward or inward as required, to change the position of the chair. The small view clearly shows the construction of the arm. The canvas or carpet strip constituting the body of the seat and back is tacked to two strips which are fastened to the seat and

**COEN'S RECLINING ROCKING CHAIR.**

head boards by screws. A rectangular frame, upon one end of which is a foot rest, is arranged so that it may be pulled forward or shoved in as shown by the full and dotted lines.

This invention has been patented by Mr. George W. Coen, of Monticello, Ind.

ONE of our most sensible contemporaries says: "If it is a possible thing, the SCIENTIFIC AMERICAN improves with each issue. It is the most interesting and instructive scientific publication printed."

The Cultivation of Licorice.

Consul Woodcock, of Catania, Sicily, says that there are two species of the licorice plant in his consular district. The one sends down a main root to the depth of from three to six feet, with but few lateral roots; the other does not sink so deep in the earth, but creeps beneath the surface at a depth of from six inches to two feet, the latter being most productive, and the most highly prized. It is stated that if the licorice plant were cultivated, instead of being allowed to grow wild, it would yield much larger results; but the Sicilians are of opinion that its culture will not pay, so they are satisfied by collecting it as produced by nature in its wild state. No use is made of the stem except for fuel. The licorice plant grows most luxuriantly in the valleys adjacent to streams of water; it is, however, found among the foot hills of the mountains, but grows less luxuriantly there. It requires a moist soil, consisting of a clay loam; the climate must be warm, such as is adapted to the growth of oranges, lemons, and other semi-tropical fruits. It cannot endure frosts, or cold, high altitudes. The root continues to grow for four or five years, when it is considered in the best condition for gathering. The root will continue to grow for ten or twelve years longer, but it is not considered so rich in juice-yielding quality. The crop is gathered from the same ground once in four or five years, and on the average 100 pounds of the root produces 16 pounds of licorice paste.

During the months of June, July, August, and September, and the first part of October, the root is not disturbed, for the reason that it is then in full vegetation, and for the further more important reason that the ground is dry and baked by the sun, and it is with much difficulty and great expense that it can then be dug. As soon as the autumn rains set in in sufficient quantity to saturate the ground, the root harvest commences. During the months above mentioned the manufactories of licorice are idle, doing little or nothing in the way of manufacture. In Catania itself there are seven manufactories of licorice, which employ from twenty to forty hands each. When the roots are taken from the earth, they are bound in bundles and carried on the backs of mules from the fields to the factories, where they are laid by for a time to season. When the roots are sufficiently cured, men and women with hatchets cut them in pieces ranging from three to six inches in length. These are then plunged into a vat of water and thoroughly washed. They are then crushed in a mill of rude construction. It consists of two circular stones of lava, one in horizontal position, and the other, which is perpendicular, resting upon it. Through the center of the upper stone is an axle, to which is attached a mule, which revolves it slowly in a circle upon the lower stone. A workman with a wooden shovel is constantly employed in keeping the roots beneath the revolving stone. When the roots are sufficiently crushed, they are placed with water in kettles and boiled for twenty-four hours. They are then removed from the kettles and placed beneath a screw press, and all the juice, which is thoroughly pressed out, runs into a cistern beneath. This juice is pumped from the cistern and passed through a sieve into kettles and the boiling resumed. The sediment from the strainer is again pressed; the contents of the boiling kettles are a second time filtered. When boiled to the proper consistency, it is removed to a broad shallow kettle over a slow fire, where workmen, with spades, continue to stir it until it becomes dense enough for paste; it is then removed and placed in wooden moulds of the size they wish the cakes, or worked by the workmen into little rolls or sticks. When cold and hard, the cakes are wrapped in paper and boxes for export. The little rolls or sticks of licorice are placed upon shelves to dry, and when they become perfectly dry and hard, they are packed in laurel leaves in boxes. In preparing the root for market, women, with knives, scrape off the bark, and then cut it into pieces of about half an inch in length, or as desired by the purchaser. These are then dried in the sun, and placed in bags for export.

Casting of a Great Gun.

The fourth attempt to cast the last of the large breech-loading rifle cannon for the Government, by the South Boston Iron Works, was made on the 5th, and was entirely successful. It was witnessed by a number of prominent military men, including Lieutenant Borup of the army and Lieutenant-Commander Lyon of the navy. Several weeks had been spent in preparing for this casting. Three large furnaces were used, each containing about thirty-five tons of metal. The fires were started at nine o'clock on the previous evening, and the casting made shortly after noon. The gun pit had been prepared with the greatest care; the core, which hung down in the middle of it, was one of the stoutest and best ever made. At the end of about twenty-two minutes, the metal had filled the pit, and the rough shape of the last of the 54-ton rifle cannon was completed.

The gun is now cooling, and in several weeks the core will be removed and the gun taken from the pit. When the present one is finished, the four large guns

cast at these works will each be 12 inch bore, and will measure 30 feet in length. The powder charge will be 265 pounds; the weight of projectile, 800 pounds; the muzzle velocity, 1,560 feet per second; the muzzle energy, 19,000 tons; the pressure per square inch of bore, 15 tons; and the penetration of iron plate, 23 inches.

CONVERTIBLE KEG.

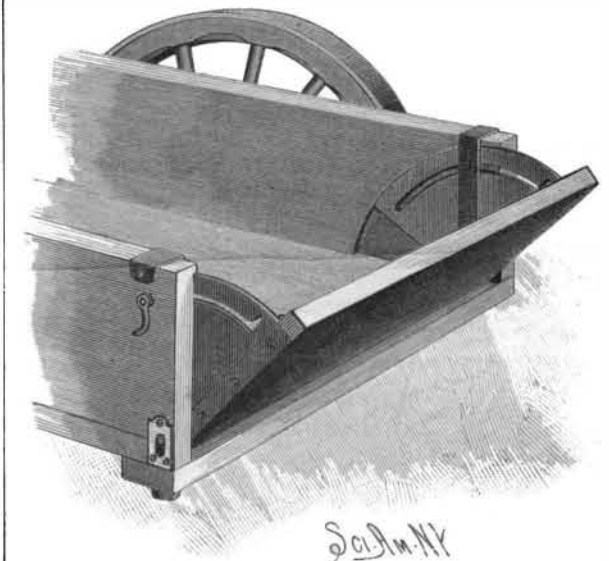
The keg is of the ordinary form and is hooped in the usual manner, except at the head end, where it is provided with a hoop having a bail hinged to it. The length of the bail is such that it can only fall to the level of and rest against the middle or lower portion of the hoop when folded down. When the hoop is applied to the keg, the bail may be folded to one side, when it will

**SCHEEL'S CONVERTIBLE KEG.**

lie in line with the hoop, the keg then presenting the usual appearance, as though without a bail. After the head has been removed and the hoop secured by rivets, the keg may be used as a bucket or pail. By the use of this device—which is the invention of Mr. John H. Scheel, of 5 Front Street, New York city—the small butter and other packages which are now destroyed after the contents have been removed may be made to serve useful purposes.

END GATE FOR WAGONS.

To the opposite ends of the gate are secured plates, preferably made of cast iron, which are sector shaped and which fit into recesses formed in the inner surfaces of the side boards. The angle formed by the straight sides of the plates is a little greater than 90°, so that when the gate is let down into a horizontal position the edge of the plates will overlap the sides of the box, thereby completing the sides to the end of the gate. A curved slot is formed in each plate, and at the end of each slot is a lateral notch. A bolt passes through each slot, through the side boards and through strap bolts which are bent over the tops of the side boards and extended down to support a cleat extending across the under surface of the rear end of the box, and which supports the bottom. The bottom is the thickness of the gate shorter than the sides, and the cleat thus forms a rabbet in which the edge of the gate rests when the latter is lowered. The sides, near the bottom of their rear ends, are provided with slots for receiving the pivots of the gate. When the gate is closed, the bolt enters the notch, the lower edge of the gate drops into the rabbet, and the pivots rest in the bottom of

**NOYES & GARDNER'S END GATE FOR WAGONS.**

the slot. Upon being tightened, the bolts draw the side boards together. To let down the gate, the bolts are loosened, and the gate is raised to bring the pivots into the upper ends of the slots, when the gate may be lowered to a horizontal position, the inner end resting on the cleat and the outer end being supported by the bolts in the curved slots. When lowered, the plates form side pieces, which prevent the escape of the contents of the box over the ends of the end board.

This invention has been patented by Messrs. A. H. Noyes and E. S. Gardner, of Jefferson, Wis.