

PRUNING AND GRAFTING IMPLEMENT.

The tool shown in the engraving is designed for grafting and pruning, the knives being changeable, so that it may be readily adapted to either purpose.

The main portion, A, of the tool contains a toggle joint, B, connected with the sliding bar, C, which carries the knife. A lever, D, pivoted to the part, A, is connected by a link with the toggle joint, B, completing an arrangement of levers capable of moving the knife with great force as the handles of the implement are brought together.

The part, A, is bent to form a support for the limb to be cut, and the support is lined with wood or soft metal to prevent injury to the knife.

The knife represented in the engraving is V-shaped, and the cut made by it is shown in the little detail view. This form of cut is made in grafting. This tool is the invention of Mr. Charles M. Kingsbury, of Tama City, Iowa.

IMPROVED HARDENING TONGS.

The annexed engraving represents an improved implement for holding and manipulating steel articles during the process of hardening. It consists in a pair of tongs having T-shaped jaws, provided with pointed pins which bear upon opposite sides of the article, and prevent it from twisting out of shape when it is plunged into the water to cool, while it allows the water to completely surround the article and cool it as readily as it would if it were plunged in the usual way. One of the jaws is movable and is capable of adapting itself to tapering surfaces.

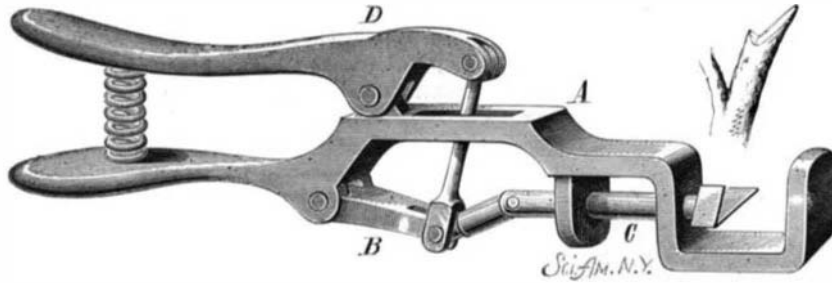
This implement is the invention of Biel Le Doyt, deceased. The patent is issued to Mary M. Taylor, administratrix, Mansfield, Mass.

TYING-IN MACHINE.

The tying-in machine shown in the accompanying engraving is the invention of Messrs. J. P. Binns and J. Shackleton, and is made by Messrs. Greenwood & Batley, of Albion Works, Leeds, England. It is designed for tying-in the new warp to the old in weaving operations, or connecting each end or thread of the new to the ends or threads of the old warp, so as to allow them to be drawn through the mails or eyes in the healds or harness and sley or reed. Until the present time this operation of tying-in has been done altogether by hand, either by taking the two ends of each thread separately and tying them together, or, as in the manufacture of fine goods having a light and elastic warp, by twisting them together. The object is satisfactorily effected by the machine, working entirely automatically and by power, making a secure knot, and thus performing with accuracy and dispatch what was previously a tedious hand operation. The machine, well illustrated by the engraving, has a suitable framework, on one side of which is placed the warp beam with the new warp upon it, and on the other side the healds or harness and sley or reed, with a portion of the old warp in them, the ends or threads being secured to rails, and extending across or lapping over each other sufficiently to allow for the forming of the tie. A carriage is mounted upon the framework, sliding upon rails or rods, and capable of being moved laterally or crosswise of the warp threads. The framework also supports a rotary horizontal driving shaft, which the carriage slides upon, and which carries and gives rotary motion to a barrel having several cams attached to it for operating the various levers which control the movements of the working parts of the machine. This carriage supports a vertical reciprocating slide bar carrying a needle

or hooker by which the threads are seized and placed in position to be tied together, the bar receiving its motion from one of the cams already referred to and a suitable lever. Another barrel or hollow shaft is supported on this carriage, receiving rotary motion from the driving shaft,

pushing the loop off of the boss, drawing the threads tight against the holding of the needle, and forming the knot. The knotted threads are removed by a finger, the next threads are in turn taken up, and the operation is continued until the whole of the warp is tied in. A self-acting stop motion is attached which stops the machine should a knot be missed, thus securing good work, and insuring that all the ends of the new warp are attached separately to those of the old.

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and on one side of it is a boss. A sliding finger is mounted on the outside of the barrel, carrying a cam at one end, and a reciprocating sliding needle within the barrel is operated by another cam and lever. Intermittent motion is given to the carriage across the warp by a screw shaft which is worked by a ratchet wheel and catches. Knives are furnished for cutting the ends or threads of the warp, at the time required, to the proper length for tying together. There are four horizontal shafts, each carrying a half flange or

press, and provides it with a lever attachment, by which it is rotated and caused to take up or wind on the ropes connected with the follower.

Mr. Martin W. McCortney, of Mount Pleasant, Mich., has patented a single cylinder double acting force pump for wells, of novel construction, having its valves and connections fitted in a simple and durable manner, and so as to be readily accessible.

An improvement in that class of drag saw machines in which the saw is attached to a lever that is pivoted in a frame and vibrated by a hand lever, has been patented by Mr. William N. Kyle, of Edinburg, Ind.

An improved windmill, patented by Mr. Ratti Lorenzo, of Loyalton, Cal., consists of vanes affixed to a carriage adapted to move freely on an incline attached to the pivoted head of the mill, and extending backward parallel to the face of the wheel, whereby, when a strong wind is blowing, the carriage is forced out on the incline, and by the greater leverage thus obtained it carries the wheel nearer to the wind, and thus lessens the speed; but when a lighter wind is blowing the carriage descends the incline, lessening the leverage and permitting the wheel to come around in opposition to the wind.

An improvement in parallel vises, patented by Mr. Niels P. Ringstad, of Mankato, Minn., consists in connecting the jaws with links pivoted to a central slotted guide, in which a traveler is held and pivoted to one pair of the links, whereby, when the jaws are screwed open or shut, the links, turning on their pivots, compel the moving jaw to move in a line parallel to the stationary jaw.

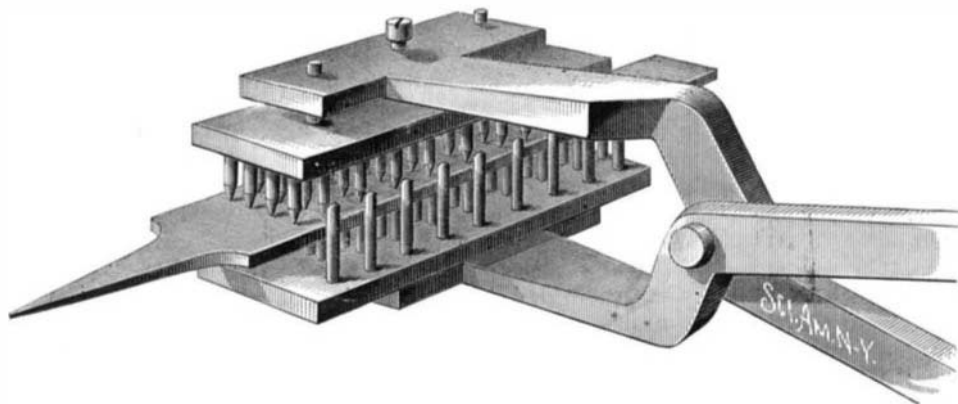
Mr. Alexander McDonald, of Toronto, Ontario, Canada, has patented an improved brake for children's carriages, which is simple, readily applied, and capable of holding the carriages securely, preventing them from moving when left alone.

An improvement in that class of water elevators in which a well bucket is attached to a rope or chain plying over a

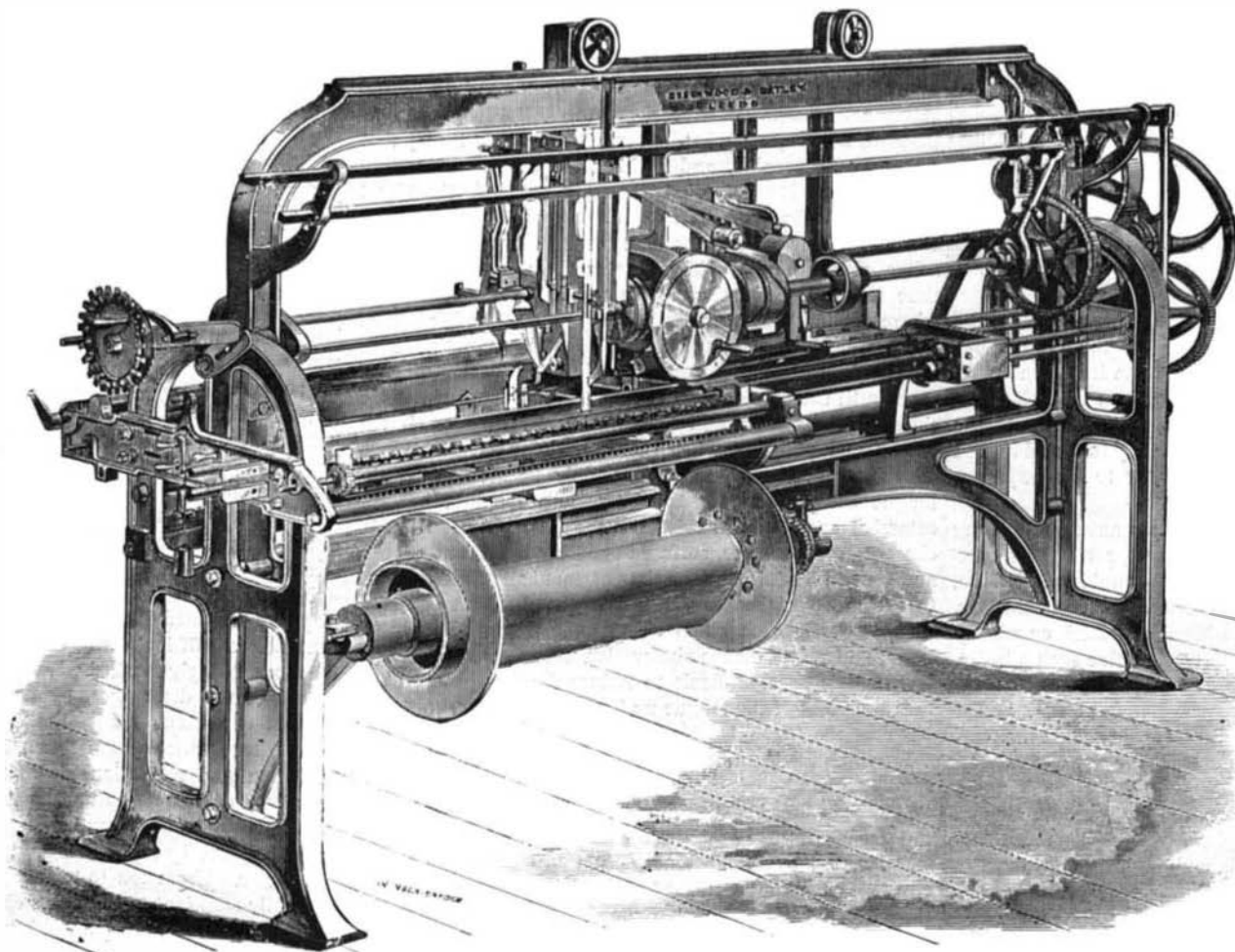
windlass provided with a crank for rotating it, has been patented by Mr. James C. Barrett, of Marion, N. Y. This is an improvement upon that for which the same inventor received Letters Patent of the United States No. 41,410.

Mr. Fredrick Stedman, McBride's, Mich., has patented improved journal boxes for the machine known as "Hall's shingle machine," which is so constructed as to allow the shafts to play freely as the gear wheels are thrown out of and into gear, and which may be adjusted vertically and horizontally, as may be desired.

An improved machine for forming carriage shackles has been patented by Mr. Stratton M. Rowell, of Port Chester, N. Y. The invention consists in the construction of peculiar bending dies, which cannot be described without engravings.

**HARDENING TONGS.**

finger for freeing and separating the warp threads. These shafts are geared together at one end, and intermittent rotary and reciprocating motion is imparted to them by means of a cam with lever and rod, working in connection with ratchets and catches, and operating the screw bushes or bearings of the shafts. In the framework of the machine are two guide pins for the vertical needle to pass and draw the warp threads between after being cut, keeping them together and holding them while the finger on the rotary band turns them around a curved groove in the boss on the end of the barrel to form the loop. When the loop is formed, the sliding needle within the barrel draws the ends of the threads through the loop, and a lever is brought into operation,

**TYING-IN MACHINE.**

An improved pole for telegraph wires, flag staffs, lamp posts, clothes line supports, etc., has been patented by Mr. David Lathrop, of Hazle Dell, Ill. It consists in the pole formed of three sections sliding or telescoping into each other.

Mr. Andrew Elvin, of Paterson, N. J., has patented a steam boiler which is so constructed that they may be easily, conveniently, and cheaply built, and easily, conveniently, and cheaply repaired. It consists in a steam boiler with a flue extending through it and filled with vertical tubes, and provided with braces or partitions, the whole detachably secured into an outside shell.

NEW EGG HOLDER.

The egg holder represented in the accompanying engraving is the invention of Mr. John S. Birch, of Orange, N. J. It consists of a spring tongs having branched and bow-shaped prongs adapted to clutch the sides or ends of the egg. It is designed more particularly for use at the table, and is better adapted than the ordinary cup to hold the egg on the plate. The prongs are provided with guards to compel the egg to assume the right position, and there is an egg shell discharging device consisting of a curved wire hinged to the lower jaw of the tongs and capable of sliding in a slot in the upper jaw. By pulling this wire the jaws are separated, allowing the shell to fall out.

King Cotton.

The stern-wheel iron steamer Charles P. Choteau recently landed at New Orleans the largest cargo of cotton ever carried by one vessel on the Mississippi, and probably in the world. It consisted of 8,841 bales, the huge mass, piled tier above tier, almost hiding the steamer from view.

New Mode of Exciting an Induction Coil.

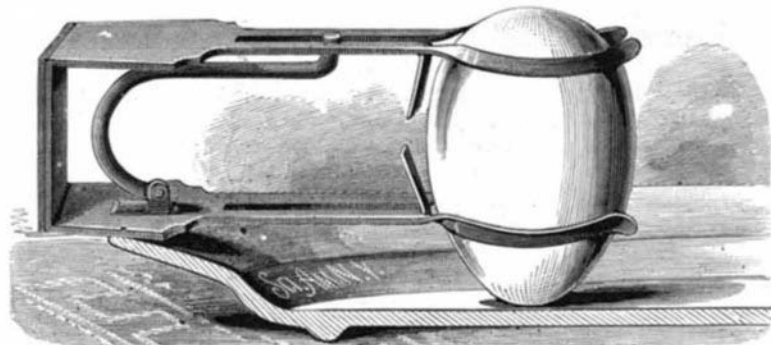
Mr. W. Spottiswoode, LL.D., finds it a good plan to use the alternating currents of a De Meritens magneto-electric machine to excite an induction coil. In this arrangement the "make" and "break" currents in the primary are alternately in one direction and the other, hence the secondary discharge appears to be the same at both terminals. The advantages of the method are: First, the fact that as the machine effects its own make and break, both the contact breaker and the condenser of the induction coil can be dispensed with; secondly, that the breaking of the primary, and consequently the delivery of the secondary currents is perfectly regular; thirdly, that the quantity of the currents in the secondary is very great. With a 20 inch coil by Apps a spark about 7 inches in length, of the full thickness of an ordinary cedar pencil, has been obtained. But for a spark of thickness comparable at least with this and of 2 inches length, an ordinary 4 inch coil is sufficient. In vacuum tubes under this discharge the striæ are perfectly steady, as with a battery (Gassiot's or De la Rue's), and their brilliancy and configuration can be controlled by means of a shunt in the secondary circuit, formed by a column of glycerine and water, so as to diminish at will the amount of current flowing into the tube.

A Mine of Palm Oil.

According to the *Colonies and India*, that portion of the west coast of Africa which lies south of the River Volta furnishes the principal supplies of palm oil. Nearly 1,000,000 cwt. of this oil are annually exported to Great Britain, of the value of \$7,500,000, its principal use being in the manu-

facture of soaps, perfumery, candles, and similar articles. Among the natives it is highly valued, both for food (taking the place of butter), for lighting and cooking purposes, and for anointing the head and body. The so called oil, which is rather a fatty substance, resembling butter in appearance, is obtained from the fruit of several species of palms, but especially from the one known botanically as *Elaeis guineensis*, which grows in abundance on the western coast of Africa, and from which it takes its specific name.

So thickly do these trees grow, and so regular and rapid are their supplies of fruit, that in some localities where the regular collection of the produce is not practiced, the ground becomes covered with a thick deposit of the oily, fatty matter produced by the ripe berries. Deposits of palm oil, which may almost be called "mines" of vegetable fat, exist in



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some parts of the Gold Coast, and which, if not in themselves worth working, at least practically illustrate the natural wealth of the country in such productions, and indicate its undeveloped resources. These "mines" would probably not repay the cost of exploration, as the palm oil is apt to become rancid and valueless for its general uses after long exposure, though for such purposes as candle making these deposits might still be valuable.

THE GILA MONSTER.

This reptile, which Professor Cope calls *Heloderma suspectum*, and to which the specific name *horridum* has also been given, is not uncommon in Utah, New Mexico, and Arizona. It is believed to be very poisonous, but such is not the case. It will bite fiercely when irritated, but the wound is neither painful nor dangerous. The Mexicans assert that its breath is fatal, probably because of its habit of blowing when disturbed.

In the "Zoology of the Survey of the 100th Meridian" it is stated that several specimens were secured in 1881, 1873, and 1874; but with one exception all were lost in transit to Washington. The specimen from which the accompanying drawing was made was kindly forwarded to us by Mr. T. W. Parker, of Phoenix, Arizona Territory, who writes that it inhabits all the mountainous regions along the Pacific coast as far east as the dividing ridge. Very little is known of its habits, except by the natives, who regard it as the most terrible of reptiles, not excepting the rattlesnake.

The Gila monster grows to the length of three and a half feet. Its food is such small reptiles, mice, crickets and other insects that it can easily capture. It is sluggish in movement, traveling no faster than the tortoise. When disturbed it stands as erect as possible and blows at its antagonist, sending forth a stream resembling fog, and believed by

the natives and Mexicans to cause instant death. The first Gila monster Mr. Parker ever saw was on Salt River, ten miles from Phoenix. It was about 14 inches long, and was in combat with a snake 4 feet in length. The snake coiled in the usual manner, and as the monster advanced struck his blow firmly, producing no effect upon the tough scaled skin of his foe. The monster then rushed upon the snake, and seizing it with its arms and legs gave two or three bites, then let the snake go. The latter crawled away slowly, seeming to be badly hurt. The monster also took refuge in the brush. Evidently the monster's breath does not paralyze snakes. However, from what he has seen Mr. Parker is inclined to believe that there is truth in the stories the natives tell.

A saloon-keeper of his acquaintance captured a monster alive, and kept it for the amusement of his customers. It was tied in a corner, and as the floor was of earth, as in all houses in those parts, the reptile burrowed a considerable hole as a hiding place. One day—Mr. Parker does not say that he witnessed the affair—a mouse ventured near the hole; the monster sent forth a stream of poisoned breath, and the mouse fell paralyzed. The monster then seized and devoured it. One cannot but wonder that with so favorable an opportunity no one had the wit to test the truth of the popular belief as to the poisonous character of the monster's breath by submitting to it a variety of small animals.

Mr. Parker does not think the monster able to defend itself with its teeth, the latter being so small. Yet he says that he is credibly informed that a man in Arizona, who was bitten while tantalizing a monster, has been paralyzed on that side ever since. It is certain that the Mexicans and natives of those parts regard the reptile with the liveliest apprehension.

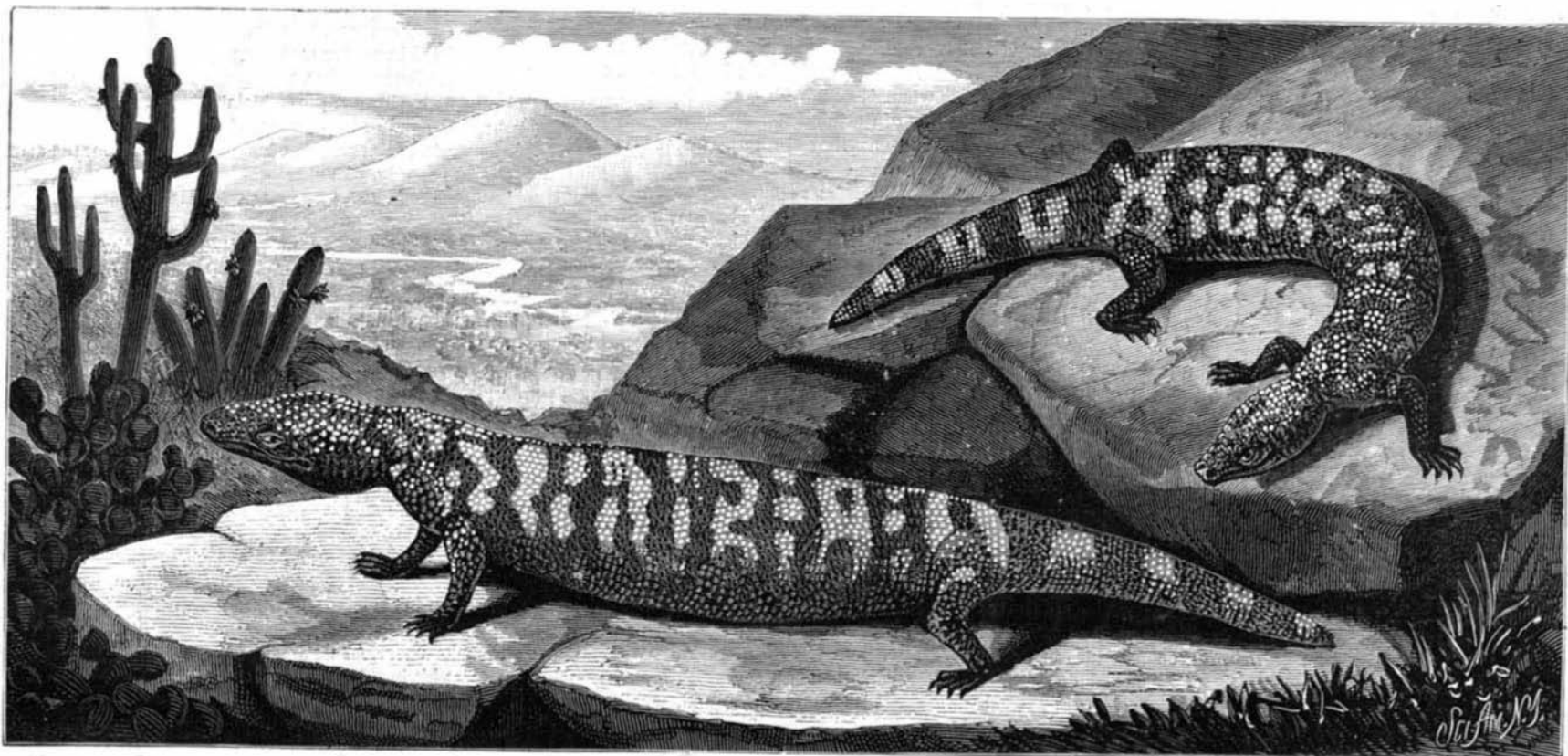
Names of Wood Manufactures Wanted.

Mr. Charles S. Sargent, special agent of the tenth census, to whom has been committed the collection of statistics of forest wealth and products for the coming census, wishes information with regard to uses of unsawn lumber. All lumber which passes through sawmills can be readily reached by the ordinary enumerators. What Mr. Sargent wishes to get track of is the considerable applications of wood in manufacture, where small timber or unsawn wood is employed. Any one who can furnish him lists of such uses may materially aid in increasing the scope and value of this portion of the census statistics. Mr. Sargent's post office address is Brookline, Mass.

Cotton by White Labor.

It used to be said that white men could never take the place of the blacks in our Southern cotton fields. Experience has shown the assertion to have no foundation in fact. Inquiries made during the past season by several Southern members of Congress develop the fact that a large portion of the last crop was raised by white men by their own labor. Mr. Manning, of Mississippi, says that the facts he has collected justify the opinion that three-fifths of the crop of 1879 was produced by free white labor.

To prevent any break in the continuity of their subscription, and to enable the publishers to know how large an edition to print at the commencement of the new year, subscribers are invited to remit for a renewal as early as possible.



GILA MONSTER.—(*Heloderma Suspectum*.)